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Executive Summary

A lot of buzzwords have come and gone in time, but it seems as if the business model concept is here to stay. Despite its fuzzy definition and operationalization, it is capturing more and more attention of academics as well as company leaders.

The aim of this delivery is to draw a baseline paper on the business model concept and discuss if this concept is adding something fundamentally new and important to management theory and practice, as well as in further developing the 'language' (definition, operationalization) needed to study the concept and its innovation adequately. The report is divided in two parts. The first part deals the various definitions and opinions about business model concept and open business model innovation, while the second part tackles the evolution of innovation models.

In the first part, our findings indicate that there are different opinions concerning the components of a business model, its relation to strategy, and its innovation. Thus, we argued for the need to narrow down the large variation by sharpening the following aspects:

- Despite the large variation in opinions regarding the components of the business model, we could still identify a strong resemblance between various authors. Inspired on Osterwalder et al.'s (2004) nine building blocks, Amit and Zott's (2001) analysis, Chesbrough's (2006) open business model innovation, Johnson et al. (2008), and Hamel (2000), we proposed in Table 4 what we argue to be the 7 core components – building blocks of a given business model.
- As to the overall business model template (Figure 5), we argue that strategy as well as organizational culture and leadership, are all embedded within the holistic business model template, and thus, provide the larger [grounded] platform for the core business processes to be solidly based upon.
- As regards business model innovation, various alternatives have been proposed. Linder and Cantrell (2000), in particular, actually regard innovation as part of their so-called change models. It is however conceptually clearer to position that process between the business strategy (intent) and the new [core] business (realized), and define business model innovation as the actual process through which the business strategy is realized (Figures 4 and 5).
- Finally, when do we talk about business model innovation? Based on Rogers (1983), Abell (1980), Amit and Zott (2001), Osterwalder et al. (2004) and Magretta (2002), we propose a broader approach that perceives business model innovation as "the three of innovation" to appear in the form of a three dimensional space (Figure 6).

All in all, our research has led us to believe that business model thinking and business model innovation matter. (More) precise definition and positioning of the key construct, business strategy, business, core business and business model innovation, and their relationships as proposed in this paper, helps reduce the confusion and allows us to design and communicate business model research more rigorously and particular in the NEFFICS project.

The second part of the deliverable studies the evolution of innovation models - from product-, service and process innovation models to models for business model innovation and particularly models for open business model innovation based on networks is related and inspired by two major areas:

1. Business Model (BM) Innovation is the tree of innovation (Taran et al. 2010) which means that all innovation can be related to BM Innovation
2. Rothwell's (1994) view of the evolution of innovation models where Rothwell's findings of the five successive generations of innovation models are seen with a business model innovation model perspective.

This baseline analysis takes us from the conventional linear technology-push innovation models, to the networked models and indicates what will be the inputs to the next generation of BM innovation models – sixth generation BM innovation Models. This state of the art analysis – the baseline analysis - takes us through five very different generations of BM innovation models and analyses these right up to 2010 in the context of predicting and laying the ground for discussing the next generation of BM

Innovation models related to business model innovation – a sixth generation Business model innovation model.

All generations of BM innovation models have been analysed in a Business Model perspective with the purpose of comparing the characteristics of each individual generation of BM innovation model related to the NEFFICS Business Model Framework (Taran, et al. 2010).

This comments on the characteristics found in the different generations of BM innovation models analyses the specific innovation context of each generation of innovation models. They analyses the general BM innovation task to be solved in the particular model generation, the characteristics of the BM field of innovation (technology, market, network and competences (Lindgren 2002)), the BM innovation task that was proposed to act in, the general success criteria of BM innovation each generation of BM innovation models had to achieve and finally comment on why change from one generation to another generation took place.

Finally the analysis comments on which building blocks in the business model were particularly in focus related to the specific generation of that BM innovation model and how this was supported and taken care of by the BM innovation model.

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Part 1 - Baseline on business model concept and open business model innovation.

1 Business Model and [Open] BM Innovation- Literature Review

1.1 Introduction

Business models are a challenge to innovators and effective business models are a tremendously valuable asset to a company (Chesbrough 2007). Most business leaders however, when asked to draw their company's business model, would not have a ready answer to give, and when they do come up with one they will most likely draw their organizational structure and networks. But does this represent a holistic business model? Many managers do not really know what a business model is, let alone they have an explicit model of their own business. And if they do, do they know how to continuously develop it successfully?

What is it about business models that make them so difficult for managers to comprehend? What do we really know about the rationale of business models? What is the difference between innovation of a product and innovation of a business model? At present there is extensive knowledge about innovation, in general, (e.g. Ulrich and Eppinger 2000, Tidd et al. 2005) and how to innovate products (e.g. Wind 1973, Cooper 1993, Baker and Hart 2007) in particular, but very little is known about how to innovate business models.

According to Linder and Cantrell (2000), executives cannot even articulate their business models. Many leaders talk about business models but 99 percent have no clear framework for describing their own model. They do know what business they are in, they just cannot describe it clearly. And if they are unable to describe it clearly, they cannot share it effectively throughout their organization.

Magretta (2002, p.92) continues in this line of thought and argues that both the terms 'business model' and 'strategy' are among the most sloppily used terms in business. 'They are often stretched to mean everything – and end up meaning nothing'. Nonetheless, according to her, these two concepts are of enormous practical value.

Porter criticizes too the 'business model' concept and argues that "the definition of a business model is murky at best. Most often, it seems to refer to a loose conception of how a company does business and generates revenue. Yet simply having a business model is an exceedingly low bar to set for building a company. Generating revenue is a far cry from creating economic value ..." Porter (2001, p.73).

Consequently, although both academic and practitioners alike recognize and appreciate the potential hidden within the business model concept, they share a common difficulty namely that, in spite of the intensive research done in this field in the past 15 years, the concept still remains very fuzzy in its definition, purpose and operationalization.

The aim of this chapter, therefore, is to open the discussion on business model innovation as a new field of research. However, before discussing how to innovate business models, or when a business model could be defined as 'new', a definition, as well as its theoretical background, is required.

1.2 Definition of: 'Business', 'Model', and 'Business Model'

What is a 'business model' really? Unfortunately the answer is inconclusive. Different authors will define the concept in dissimilar ways. In order to simplify things though, it would probably be easier to separate the question into three definitions (a 'business', a 'model' and a 'business model'), and to try and understand, through that, whether the business model concept is simply a merging set of two definitions or a creation of something new.

Definition of the term '*Business*':

- *'In economics, a business (also called firm or enterprise) is a legally recognized organizational entity designed to provide goods and/or services to consumers or corporate entities such as governments, charities or other businesses'. (Wikipedia)*
- *[Trade] the buying and selling of goods or services (Cambridge Learner's Dictionary – C.L.D). e.g.*
 - *'The shop closed last year, but now they're back in business'.*

- 'We do a lot of business with China'.
- 'His company has gone out of business' (= failed)
- [Organization] an organization that sells goods or services (C. L. D). e.g.
 - 'My uncle runs a small decorating business'
- [Work] work that you do to earn money (C. L. D). e.g.
 - 'She's in Vienna on business' (= working)

Definition of the term 'Model':

- 'A model is a pattern, plan, representation (especially in miniature), or description designed to show the main object or workings of an object, system, or concept. Model may also refer to: Abstractions, concepts, and theories'. (Wikipedia)
- (REPRESENTATION) a representation of something, either as a physical object which is usually smaller than the real object, **or as a simple description of the object** which might be used in calculations. (Cambridge Learner's Dictionary)
- (COPY) a smaller copy of a real object, **often used to show how something works or what it looks like**. (Cambridge Learner's Dictionary)

Definition of the term 'Business - Model':

As shown in Table 3, many authors have attempted to define the BM concept. Some authors took a narrow more technological or financial focus (e.g. Chesbrough 2007, Stewart and Zhao 2000), while others adopted a more general perspective (e.g. Amit and Zott 2002, Osterwalder *et al.* (2004). Some have incorporated corporate strategy in their BM definition (e.g. Hamel, 2000, Timmers, 1998), while others left it out (e.g. Weill and Vitale 2001, Selz 1999). However, it seems that most (if not all) authors agree that a BM is simply defined by the combination of the two terms 'business' and 'model'. That is, the business model is a *simple description* (a model) that describes how a company is *designed to provide goods and/or services to consumers or corporate entities* (business).

Timmers, 1998	"Business model stands for the architecture for the product, service and information flows, including a description of the various business actors and their roles, the potential benefits for these actors and the sources of revenues..... the business model includes competition and stakeholders".
Venkatraman and Henderson 1998	"An architecture along three dimensions: customer interaction, asset configuration and knowledge leverage".
Selz 1999	"A business model is architecture for the firm's product, service and information flows. This includes a description of the various economic agents and their roles. A business model also describes the potential benefits for the various agents and provides a description of the potential revenue flows".
Stewart and Zhao, 2000	"Business model is a statement of how a firm will make money and sustain its profit stream over time".
Linder and Cantrell, 2000	"The business model is the organization's core logic for creating value".
Hamel, 2000	"A business model is simply a business concept that has been put into practice. A business concept has four major components: Core Strategy, Strategic Resources, Customer Interface and Value Network"... (Elements of the core strategy include business mission, product/market scope, and basis for differentiation. Strategic resources include core competencies, key assets, and core processes. Customer interface includes fulfillment and support, information and insight, relationships and pricing structure. The value network consists of suppliers, partners and coalitions)".
Petrovic et al, 2001	"Business model describes the logic of a business system for creating value that lies behind the actual processes".
Weill and Vitale, 2001	"A description of the roles and relationships among a firm's consumers, customers, allies and suppliers that identifies major flows of product, information and money and the major benefits to participants".
Magretta, 2002	"BM's are stories that explain how the enterprises work...BM describe, as a system, how the pieces of a business fit together, but they don't factor in one

	critical dimension of performance: competition”....” a good business model has to satisfy two conditions. It must have a good logic - who the customers are, what they value, and how the company can make money by providing them that value. Second, the business model must generate profits.”
Amit and Zott 2002	“A business model is the architectural configuration of the components of transactions designed to exploit business opportunities. The transaction component refers to the specific information, service, or product that is exchanged and/or the parties that engage in the exchange. The architectural configuration explains the linkages among the components of transactions and describes their sequencing”.
Osterwalder et al. (2004)	<i>“A blueprint of how a company does business. It is a conceptual tool that contains a set of elements and their relationships and allows expressing a company’s logic of earning money. It is a description of the value a company offers to one or several segments of customers and the architecture of the firm and its network of partners for creating, marketing and delivering this value and relationship capital, in order to generate profitable and sustainable revenue stream”</i>
Chesbrough 2007	“The business model is a useful framework to link ideas and technologies to economic outcomes”... “It also has value in understanding how companies of all sizes can convert technological potential [e.g. products, feasibility, and performance] into economic value [price and profits]”..... “Every company has a business model, whether that model is articulated or not”.
Skarzynski and Gibson 2008	“The business model is a conceptual framework for identifying how a company creates, delivers, and extracts value. It typically includes a whole set of integrated components, all of which can be looked on as opportunities for innovation and competitive advantage”.

Table 1: Definitions of the term ‘business -model’

If business models are models - what, in fact, are models? Evidence can be drawn from philosophy, economics and biology (Fuller 2010) to discuss a wide range of models – scale models, role models, ‘nutshell’ models, exemplars and ideal types – to show how science uses models in its enquiries. The the business model concept’s role can simply enabling a categorisation perspective – via taxonomies (bottom-up from real world examples) and typologies (top-down from theory) Fuller 2010) Thus business models take on the role-model/exemplar/ideal type. (Fuller 2010)

Business models also can act as laboratories themselves, where academics explore how they work and manager’s experiment with the destiny of their firms (Fuller 2010) Business models as sites to try out change and innovation brings the authors to their final contribution – the notion of the business model as a recipe, building on tacit managerial skills to demonstrate or advise these ‘chefs’ about how best to organise and integrate their ingredients and techniques ‘so that the results will come out right’.

In this baseline analysis and ICI/Neffics project/research we’ve adopted Osterwalder *et al.* (2004) definition, since we’ve found it to be the most comprehensive one in providing concrete details to the core processes, or building blocks, existed within a business. Consequently, according to this definition, a BM serves as a building platform that represents a company’s operational and physical manifestation.

Building on various studies that had been carried out between the late nineties and 2003 (Appendix 1), Morris et al. (2003) tried to build what they called ‘a unified perspective of business models’. The authors argued that a business model framework must be reasonably simple, logical, measurable, comprehensive, operational and meaningful. They conclude their work by presenting six business model building blocks. Also Osterwalder et al. (2004) developed a framework for business models based on a literature study (Appendix 2). They defined the term business model as ‘[a] blueprint of how a company does business’, ‘a conceptual tool that contains a set of elements and their relationships and allows expressing a company’s logic of earning money’. Osterwalder et al.’s nine building blocks, compared to the six building blocks of Morris et al., as well as Chesbrough’s (2006) framework was analysed in 2008 (Taran,Boer Lindgren 2008) As can be seen, Osterwalder et al. overlap partly with Morris et al. and Chesbrough, add more detailed elements (relationship, core

competence, network partners, cost structure, and revenue model), but lack the strategy dimension mentioned in Morris et al. and Chesbrough. Osterwalder and Pigneur (2004) further developed the nine building blocks into the ontological business model and a book called “Business Model Generation” book. The book and the ontology has until now been a bestseller especially in the consultancy line of business as it present a tool that is very easy to adapt and work with.

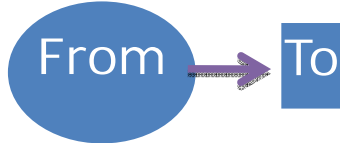
In 2010 the ICI research group (Taran, Boer and Lindgren 2010) came up with a 7 Business Model building block model. We excluded Osterwalder et all’s distribution channel block, since that block is already embedded in the value chain block (i.e. inbound/outbound logistics; e.g. Porter 1980), and we also merged their revenue stream and cost structure blocks into one category - profit formula block, as suggested by Johnson et al. (2008).

In 2010 a paper from Zott et all (Zott et all 2010) provided a broad and multifaceted review of the literature on business models in which academics have examine the business model concept through multiple subject-matter lenses. This paper has been integrated in our baseline analysis

Thus, the challenge for BM ‘designers’ is to first identify the key elements and the key relationships that describe the company’s ‘as-is’ BM before innovating it.

BOX 1

Three + 1 classical examples of business model innovation:



- **IBM** – from computer making to a service and solution company (consultancy and service).
- **Rolls-Royce** – from high quality aero engines to becoming a service company offering 'power by the hour'.
- **Bausch and Lomb** – from 'eye wear' (spectacles, sunglasses and contact lenses) to 'eye care' (laser surgery equipment, specialist optical devices and R&D).
- **Ryan-air** - transportation at the lowest possible prices, fly only to low cost secondary airports, pay for 'extra' services. However, unlike the other three example, this company have set up an innovative BM from starters, rather then shifted from 'as-is' BM and into a new one.

Good business model design is partly an ‘art’, involving distilling ‘deep truths’ about customer desires, and understanding the likely futures of costs and competitor capabilities, and of technological and organizational trajectories. There will always be considerable trial and error - being fast to learn and adjust is important. But while business model innovation ‘may seem less heroic to many citizens’, without it, technological innovation may yield no value to the inventor - or to society at large. (Fuller 2010)

1.3 Evolution of the Business Model Concept

The term Business Model, has become popular in the mid-1990s at the ‘dot com era’. As business ecosystems emerged, many companies have started to rethink their business model and business structure by shifting from a so-called M-form (or “multi-divisional firm”) business to an E-form business (Moore 1998). According to Gordijn *et al.* (2005), the evolution of business model research can be categorized into five core phases. Wearies in the first phase, a number of authors suggested business model definitions and classifications (Timmers 1998; Rappa 2001). In the second phase authors started to complete the definitions by proposing what elements belong into a business model (Chesbrough and Rosenbloom 2000; Linder and Cantrell 2000; Petrovic, Kittl *et al.* 2001; Magretta 2002). The third phase followed detailed descriptions of these components (Hamel 2000; Weill and Vitale 2001; Afuah and Tucci 2003). In the fourth phase researchers started to model the components conceptually culminating in business model ontology’s (Gordijn 2002; Osterwalder 2004) and finally, in the fifth phase, those models are being applied in management and information systems [practice] applications.

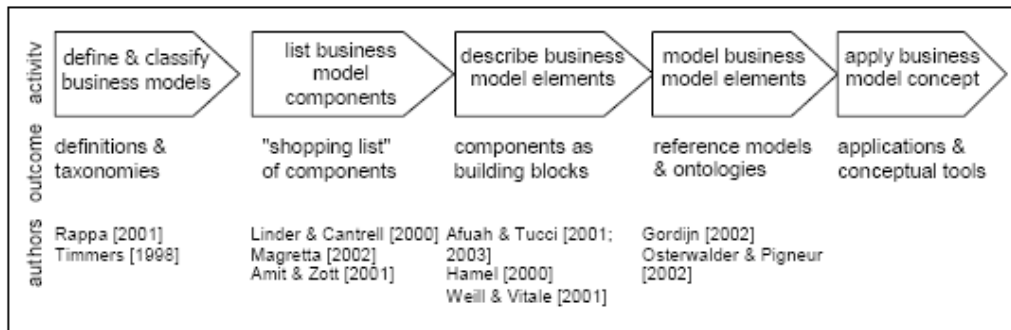


Figure 1: Evolution of the business model concept (Osterwalder *et al.* 2004)

1.4 Linking the 'Business Model' Concept to Other Theories

According to Loukis and Tavlaki (2005) the diverse definitions of the business model notion converge towards the approach that the business model is related to few managerial perceptions. According to them, although the business model captures some of the key components of a business-plan, it is not dealing with a number of additional start-up and operational issues that transcend the [business] model. Furthermore, it is not a strategy but includes a number of strategy elements.

Amit and Zott (2001) have approached the business model phenomena as a unifying unit of analysis and concluded that the findings of their cross-theoretical perspective have led them to believe that no single theory can fully explain the value creation potential of a business enterprise. Consequently, it is impossible to identify a holistic framework for a generic business model depending merely on one author's perspective. They could identify, however, common central ideas and theories with the following details and aspects: business models are built upon ideas advocated by the main theoretical frameworks of strategic management (Porter, 1985) and entrepreneurship research (Schumpeter's 1942). For that reason it is dependable on the importance of transaction efficiency, emphasized by transaction cost economics (e.g. Williamson, 1981), as well as upon the value chain concept (Porter, 1985) and the extended notions of value systems and strategic positioning (Porter, 1985) with particular emphasis on the ideas that processes (e.g. activity chains) and multiple sources of value (e.g. cost leadership and differentiation) matters. Additionally, according to them, since the business model perspective takes into consideration the ways in which resources can be valuable, difficult to imitate, less transferable, less substitutable, and more productive with use, it is therefore built also on the resource-based view of the firm (e.g. Wernerfelt 1984, Barney, 1991).

Furthermore, from strategic network theory they identified a link between network configuration and value creation (e.g. Burt, 1992). By building on the insight that unique combinations of inter-firm cooperative arrangements such as strategic alliances and joint ventures can create value (Doz and Hamel, 1998; Dyer and Singh, 1998), they conclude that from a business model perspective, inter-firm cooperative arrangements is essential in order for the firm to be able to remain profitable, and new value creations, in many cases, may be the [new] network formation rather than the single firm change.

Accordingly, it could be understood that the BM studies encompass the entire business processes characteristics, associated both with internal operational processes, as well as external strategic partnerships relations. However, although Amit and Zott, were very detailed in linking theoretical substances to the BM research study, still, the theory associated with the BM research is somewhat missing.

1.5 Components of the Business Model

Morris, Schindelhutte and Allen (2003) presented an overall view on business models, were they've tried to build what they called '*a unified perspective of business models*' on top of academic work that had been carried out since the late nineties and up to 2003. This can be seen in the table 4 below.

Source	Specific components	Number	E-commerce/ general	Empirical support (Y/N)	Nature of data
Horowitz (1996)	Price, product, distribution, organizational characteristics, and technology	5	G	N	
Viscio and Pasternak (1996)	Global core, governance, business units, services, and linkages	5	G	N	
Timmers (1998)	Product/service/information flow architecture, business actors and roles, actor benefits, revenue sources, and marketing strategy	5	E	Y	Detailed case studies
Markides (1999)	Product innovation, customer relationship, infrastructure management, and financial aspects	4	G	N	
Donath (1999)	Customer understanding, marketing tactics, corporate governance, and intranet/extranet capabilities	5	E	N	
Gordijn et al. (2001)	Actors, market segments, value offering, value activity, stakeholder network, value interfaces, value ports, and value exchanges	8	E	N	
Linder and Cantrell (2001)	Pricing model, revenue model, channel model, commerce process model, Internet-enabled commerce relationship, organizational form, and value proposition	8	G	Y	70 interviews with CEOs
Chesbrough and Rosenbaum (2000)	Value proposition, target markets, internal value chain structure, cost structure and profit model, value network, and competitive strategy	6	G	Y	35 case studies
Gartner (2003)	Market offering, competencies, core technology investments, and bottom line	4	E	N	Consulting clients
Hamel (2001)	Core strategy, strategic resources, value network, and customer interface	4	G	N	Consulting clients
Petrovic et al. (2001)	Value model, resource model, production model, customer relations model, revenue model, capital model, and market model	7	E	N	
Dubosson-Torbay et al. (2001)	Products, customer relationship, infrastructure and network of partners, and financial aspects	4	E	Y	Detailed case studies
Afuah and Tucci (2001)	Customer value, scope, price, revenue, connected activities, implementation, capabilities, and sustainability	8	E	N	
Weill and Vitale (2001)	Strategic objectives, value proposition, revenue sources, success factors, channels, core competencies, customer segments, and IT infrastructure	8	E	Y	Survey research
Applegate (2001)	Concept, capabilities, and value	3	G	N	
Amit and Zott (2001)	Transaction content, transaction structure, and transaction governance	4	E	Y	59 case studies
Alt and Zimmerman (2001)	Mission, structure, processes, revenues, legalities, and technology	6	E	N	Literature synthesis
Rayport and Jaworski (2001)	Value cluster, market space offering, resource system, and financial model	4	E	Y	100 cases
Betz (2002)	Resources, sales, profits, and capital	4	G	N	

Table 2: Perspectives on business model components (Morris et al. 2003)

Akin to Amit and Zott (2001), Morris et al. have concluded that the findings of their cross-theoretical perspective have led them to believe that no single theory can fully explain the value creation potential of a business enterprise. Consequently, it is impossible to identify a holistic building block framework for a generic business model depending merely on one author's perspective.

Morris et al. continue by arguing that a business model framework must be reasonably simple, logical, measurable, comprehensive, operational and meaningful. The challenge, therefore, is to produce a framework that is applicable to firms, in general.

As a result of their findings, Morris et al. have developed an interactive framework with relation to six basic 'decision areas' of considerations.

- Factors Related to services and products, associated with the core question: **How do we create value?**
- Market Factors, associated with the core question: **Who do we create value for?**
- Internal Capability Factors, associated with the core question: **What is our source of competence?**
- Competitive Strategy Focus, associated with the core question: **How do we competitively position ourselves?**
- Economic Factor, associated with the core question: **How do we make money?**
- Growth/Exit Factor, associated with the core question: **What are our time, scope and size ambitions?**

Morris *et al.* argued that their proposed framework provides users with the possibility to design, describe, categorise, criticise and analyse their business model - for any type of company. They also claimed that a considerable scope of innovation potential exists in each model component, and that their holistic framework model can open a path towards new and general business model taxonomies and archetypes. They did not mention, however, any archetype business model framework explicitly. Nonetheless, they still succeeded in partly improving our understanding of the contour of 'business models'.

Corresponding with the findings of Morris *et al.*, Osterwalder, Pigneur and Tucci (2004) have also developed a framework for business models. Akin to Morris *et al.* they too have summed up the academic work of previous business models adding new theoretical aspects. Table 5 presents their 'nine building blocks' components for the BM's framework, with comparison to the six building blocks of Morris *et al.*, as well as with Chesbrough (2007) framework (Osterwalder *et al.* nine building blocks has been bolded, and delimited into red color).

	<i>Building Block</i>	<i>Description</i>	<i>Chesbrough 2006</i>	<i>Morris et al.</i>
<i>Product</i>	Value Proposition	Gives an overall view of a company's bundle of products and services	Component 1: articulate the value of the proposed offering	Component 1: Factors related to offering
<i>Customer Interface</i>	Target Customer	Describes the segments of customers a company wants to offer value to	Component 2: identify the market segment.	Component 2: Market Factors
	Distribution Channel	Describes the company's various means of getting in touch with its customers	Component 3: define the value chain to deliver that offering.	-
	Relationship	Explains the kind of links a company establishes between itself and its different customer segments	-	-
<i>Infrastructure Management</i>	Value Configuration	Describes the arrangement of activities and resources	Component 3: define the value chain to deliver that offering.	Component 3: Internal Capability Factors
	Core Competence	Outlines the competences necessary to execute the company's business model	-	Component 3: Internal capability factors
	Partner Network	Portrays the network of cooperative agreements with other companies necessary to efficiently offer and commercialize value	Component 3: define the value chain to deliver that offering. Components 5: describe the position of the firm within the value network.	-

<i>Financial Aspects</i>	Cost Structure	Sums up the monetary consequences of the means employed in the business model	Component 4: establish cost structure and profit potential.	Component 5: Economic Factors
	Revenue Model	Describes the way a company makes money through a variety of revenue flows	Component 4: establish cost structure and profit potential.	Component 5: Economic factors
<i>Strategy Aspects</i>	Competitive Factor	-	Component 6: formulate a competitive strategy.	Component 4: competitive strategy Factor and Component 6: Growth/exit factors

Table 3: Comparison of a business model building blocks

As can be seen, Osterwalder *et al.* overlap on four components with Morris *et al.* and five components with Chesbrough framework (2007), but have added more detailed elements to our understanding of the focal company’s business model: Relationship, Core Competence, network partners, Cost Structure, and Revenue Model. However Osterwalder *et al.* lack the strategy dimension related to Morris *et al.* and Chesbrough.

Yet, an important question raised but not adequately addressed in the literature is: what is the relation between strategy and business model? Why is strategy not mentioned in Osterwalder *et al.*? After all, both Osterwalder *et al.* and Morris *et al.* have systematically scrutinized mostly the same literature and yet arrived at different conclusions?

1.6 Business Model VS. Strategy

Business model and strategy - both concepts are used frequently by researchers as well as by company leaders, but, still, is it truly possible to classify the differences between the two?

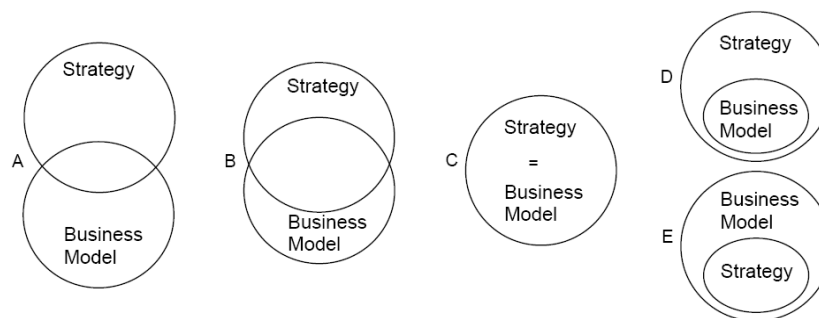


Figure 2: Possible overlaps between ‘strategy’ and ‘business model’ (Seddon *et al.* 2004)

Seddon *et al.* (2004) have tackled this issue. Based on the work of various authors (e.g. Porter 1996, 2001; Magretta, 2002; Weill and Vitale’s, 2001; Applegate, 2001; Linder and Cantrell, 2000), they came to a conclusion that a business model should be viewed and defined as an abstract representation (translation) of a company’s strategy into a visual blueprint (sketch ‘D’ in Figure 6). This means that, unlike strategy, a business model does not consider the firm’s competitive positioning. Furthermore, business models are inward oriented, focusing more on how the firm creates economic value, while strategy is more outward oriented and focuses more on the competitive positioning of the firm.

Osterwalder *et al.* have adopted Seddon *et al.*’s findings and argued that another difference is that strategy includes execution and implementation, while the business model is more about how a

business works as a system. That is why, according to them, some 'winning' business model can be managed badly and fail, just as much as a 'trailing' business model may succeed because of strong management and implementation skills.

Chesbrough and Rosenbloom (2002) have added two more distinctions. Firstly, business models focus on creating, delivering and capturing value. Strategy is about a company's competitive positioning and sustainability. Secondly, while both are targeted towards creating value, strategy is targeted more towards creating financial value to shareholders, while business models are more focused towards creating new value propositions to the business. So, Chesbrough and Rosenbloom seem to conclude that there is a strong overlap between the terms strategy and business model. However they could still present some distinctions between the two concepts (sketch 'B' in Figure 6).

1.7 When is a Business Model 'New'?

Having a conceptualization of business models is one thing, innovating them is quite another. According to Magretta (2002), new business models are variations on a generic value chain underlying all businesses, which eventually can be divided into two categories:

1. All the activities associated with production; e.g. designing, purchasing and manufacturing.
2. All the activities associated with selling something; e.g. finding and reaching customers, sales transactions and distributing the products/services.

For that reason, according to her, a new business model can be seen as a new product for unmet needs (new customer segment), or it may focus on a process innovation and a better way of making/selling/distributing an already proven (existing) product or service (to existing and/or new customer segments). Or, formulated more generally, a business model is new if one of the "building blocks" is new.

According to Amit and Zott (2001), business model innovation refers not only to products, production processes, distribution channels, and markets, but also to exchange mechanisms and transaction architectures. Therefore they propose to complement the value chain perspective by concentrating also on processes that enable transactions. In view of that, they conclude that business model innovation does not merely follow the flow of a product from creation to sales, but also includes the steps that are performed in order to complete transactions. Therefore, the business model as a unit of analysis for innovation potentially has a wider scope than the firm boundaries, since it may encompass the capabilities of multiple firms in multiple industries. Also Chesbrough (2007) and the IBM global CEO Studies (2006 and 2008) emphasize the importance of business model innovation to appear in the form of organization structure and network relationship changes, such as alliances, joint-ventures, outsourcing, licensing, and spin-offs.

A business model may not be new (think Sears/Dell, newspapers/Google), nor the technology - Dell didn't invent computers nor Sam Walton discount stores. But good design of a Business model can establish difficult to replicate advantages. (Teece 2010) The business model will define the firm's system: who its partners and customers are, what value chain it operate and where (what target customer and networkpartners it operates with), how big the overall 'value pie' will be related to its profit formula definition and how much pie then will land on its own plate. (Zott et al 2010, Lindgren 2011)

1.8 Levels of Business Model Change

The debate on incremental versus radical innovation (e.g. Rosenau, 1993; Leifer, 2002; Tidd *et al.* 2005), mentioned earlier, concerns the 'how new' question. With relation to BM innovation, Skarzynski and Gibson (2008) argued that in order to understand how to innovate a business model, there is a need to unpack it into individual components and understand how all the pieces fit together in holistic way. Furthermore, according to them, in order to build a breakthrough business model that rivals will have difficulties to imitate companies will need to integrate a whole series of complementary, value creating components so that the effect will be cumulative.

Another approach to business model innovation, suggested by Linder and Cantrell (2000) discuss the level of radicality of business model innovation and present four, what they call, change models: realization models, renewal models, extension models and journey models. In *realization models*,

where most companies are situated, the main issue is to exploit the current potential within an existing operational framework. This business model is considered to be the one with the least actual change like, for example, geographical expansion of the firm, minor changes in the product line, and customer service improvement. *Renewal models* are firms that leverage their core skills to create a, possibly disruptively, new position on the price/value curve. Examples include the revitalization of product/service platforms, brands, cost structures and technology bases. *Extension models* include radical changes by developing new markets, value chain functions, and product/service lines. Finally, *journey models* involve a complete transformation of the original business model. Here the company moves deliberately and purposefully to a new operating model.

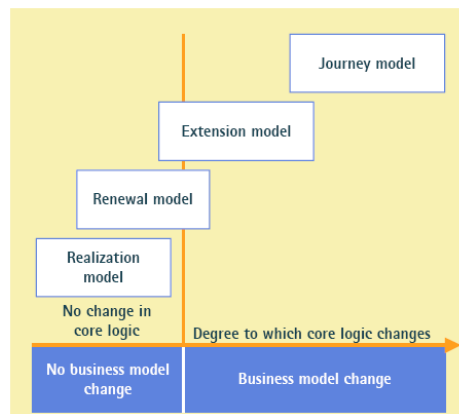


Figure 3: Change Models (Linder and Cantrell 2000)

Interestingly enough, figure 7 suggest that *Realization models* and most of the *Renewals model*, and even several of the *Extensions models* innovation initiatives cannot really be considered as BM innovations, since they are situated at the left side of the figure, under 'No BM change' category. Consequently, despite the attempt of developing a BM innovation typology framework, it seems that Linder and Cantrell's support the understanding that most of the BM innovation initiatives are mostly associated with disruptive innovation process to the core business of the firm. Yet, it is still somewhat fuzzy to grasp where we can draw the line in arguing for what innovation processes could be defined as BM innovation, and which processes are not.

1.9 Business Model [and Innovation] Knowledge Gaps

In order to find out whether the business model concept is just a fad or adding something fundamentally new and important to management theory and practice, we analyzed the business model concept and innovation literature systematically and examined the similarities/ differences, between various theories and studies for the purpose of proposing a genuine opinion regarding the 'business model' concept.

To the best of our knowledge, Porter (2001, p.73) seems to hold the strongest opposition to 'business model' research studies, by arguing that the '*business model approach to management becomes an invitation for faulty thinking and self-delusion*', it should be noted though that he relates his opinion to dot-coms and other internet players and to what he calls: "*the internet's destructive lexicon*", that instead of talking in terms of strategy and competitive advantage, companies are talking instead about 'business models' and 'e - businesses'.

This statement can be fairly understood measured up to the time when the article was written (2001) where the studies on business models were in their early phases. Additionally, it should also be noted that in Porters' 1996 paper, he presented a diagram identified as the "activity system map". According to Seddon *et al.* (2004), activity system maps are so close to what many people call today business models that it is not clear how Porter's conceptualization of strategy differs from what others call business models (sketch 'C' in Figure 6). Given this similarity, according to them, it is easy to understand why Porter's (2001) opinion of the business model literature is so poor.

According to Osterwalder *et al.* (2004), because business model research is a quite young research domain it must still prove its relevancy. Its main contribution area is in the creation of new concepts and tools that can help managers with capturing, understanding, communicating, designing, analyzing, and changing their business logic. Furthermore, the main idea of identifying the business model domains, concepts and relationships is to create a common language and a more formal ontology and focus, through the process of managing change.

All in all, after we carefully, and systematically, analyzed the BM phenomena, a disturbing picture of the current research status became apparent. Clearly, we can conclude that the main reasons to the fuzziness of the 'business model' concept are due to:

1. Inconsistencies regarding the business model components.
2. Inconsistencies regarding the relationship between business model and strategy.
3. Inconsistencies regarding the definition of business model innovation and a lack of business model innovation process (knowledge gap).

Given these circumstances, it can easily be understood why Porter (2001) opposes so strongly against this line of research. Controversially, Chesbrough, in one of his presentations (NEWGIBM conference, Aalborg, 2007), is arguing that '*we have only started to study the elephant*' - a statement that seems to be a 'perfect fit' to our current research findings.

2 Developing a Theory on BM and BM Innovation

In order to find out whether the 'business model' concept is just a fad or do indeed add something fundamentally new and important to management theory and practice, we analyzed the business model concept and innovation literature and examined the similarities/differences, between various theories and studies. Porter (2001) seems to hold the strongest opinion against business model research: the '*business model approach to management becomes an invitation for faulty thinking and self-delusion*'. It should be noted though that he relates his opinion to dot-coms and other internet players and to what he calls '*the internet's destructive lexicon*': instead of talking in terms of strategy and competitive advantage, companies are talking about business models. This statement can be easily understood considering the time the article was written, when studies on business models were in their early phases. Additionally, it should also be noted that in Porter's 1996 paper, he presented a diagram called the activity system map. According to Seddon *et al.* (2004), activity system maps are so close to what many people call business models that it is not clear how Porter's conceptualization of strategy differs from what others call business models (sketch 'C' in Figure 2). Given this similarity, according to them, it is easy to understand Porter's (2001) opinion regarding business models' literature.

On the other hand, companies today, in some industries more than others, are investing more capital and resources just to stay competitive, develop more diverse solutions, and are increasingly starting to think more 'blue' (Chan and Mauborgne 2005) and are, in other words, (thinking about) innovating their business model. Therefore, the business model, however poorly defined and operationalized, seems to be more than a fad and a phenomenon worth studying.

Yet, by glancing through the overall research that has been done so far in studying the business model concept, we can clearly conclude that the main reasons for those perplexities are due to the 3 above mentioned reasons.

Accordingly, in order to provide a solid ground for the business model research to be built upon, and based on the similarities/ differences between the various authors perspectives, there is a need to narrow down and sharpen the large variation of opinions, as well as to develop new concepts, ideas and categories to the term 'business model' in general, and its innovation understanding in particular.

Firstly, as to the components of what we call the *Core* of the business model, despite the large variation in opinions, we could still identify a strong resemblance between the different components. Thus, inspired mostly on Osterwalder *et al.* (2004) nine building blocks, Amit and Zott's (2001) analysis, Chesbrough's (2006) open business model innovation, Johnson *et al.* (2008), and Hamel (2000), we propose the following 7 building blocks (Table 4) to represent the core components of a business model best.

Core building block	Core question
Value proposition/s <i>(products, services and processes) that the company offers (Physical, Digital, Virtual)</i>	<i>What do we provide?</i>
Target customer/s, (customers, users, market segments that the company serves – geographies, physical, digital, virtual).	<i>Who do we serve?</i>
Value chain [internal] configuration.(physical, digital, virtual)	<i>How do we provide it?</i>

Competences (technologies, human resources, organizational systems, culture -).(Physical, digital, Virtual)	What are our competences? What are our core competences?
Network - Network and Networkpartners (e.g. strategic partnerships, supply chains and others (Physical, digital, virtual)	What is our network?
Relations(s) Relationship(s) (e.g. physical, digital and virtual relations, personal, peers). (Physical, digital, virtual)	What are our relations?
Profit formula – both Turnover structure, cost structure and revenue flow. (physical, digital, virtual)	<i>How do we make money and business value?</i>

Table 4: Core components of the business model

Explanation of the choice:

The seven core building blocks are inspired by the work of Osterwalder *et al.* (2004) nine building blocks: (*Value proposition; target customer; distribution channel; customer relationship; value configuration; core competence; partner network; cost structure; revenue model*). However we adopted the term ‘profit formula’ suggested by Johnson *et al.* (2008) to merge their revenue model and cost structure blocks under one category and then added turnover structure (Horngren 2002) as this is missing to form a complete profit formula (turnover – cost = profit). We excluded distribution channel, since its already embedded in the [e.g. porters’ 1985] value chain (i.e. - inbound/outbound logistics) presented in Osterwalder *et al.* as value configuration block. We consider the value chain as the internal part of a business value chain. The reference list and appendix 1 gives a list of our main reference to each of the Building blocks of the BM.

Strategy is not included in the core components of the business model. Although, as mentioned earlier, some key researchers (i.e Morris *et al.* 2003, Chesbrough 2006, Weill and Vitale 2001, Hamel 2000) include strategy in their business model definition. It is conceptually clearer, however, also in view of the role of business model innovation process, to at least analytically distinguish between strategy and the core processes and components of the business model. Strategy, then, involves intentional decision-making on the positioning of the business and the way that strategy will be pursued (outward oriented), while the core business represents the actual implementation of the business strategy (inward oriented).

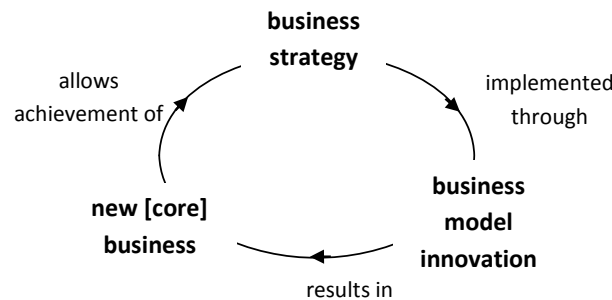


Figure 4: Core business, business model innovation and business strategy

It is therefore conceptually clearer, as Figure 5 shows, to position the business model innovation process between the business strategy (intent) and the core business (realized), and to define business model innovation as the actual process through which the business strategy is realized. Accordingly, as Figure 5 shows, it could be argued that strategy, as well as organizational culture (Hammel 1994) and leadership, are embedded within the overall business model template, providing the larger platform for the core business to be solidly based upon.

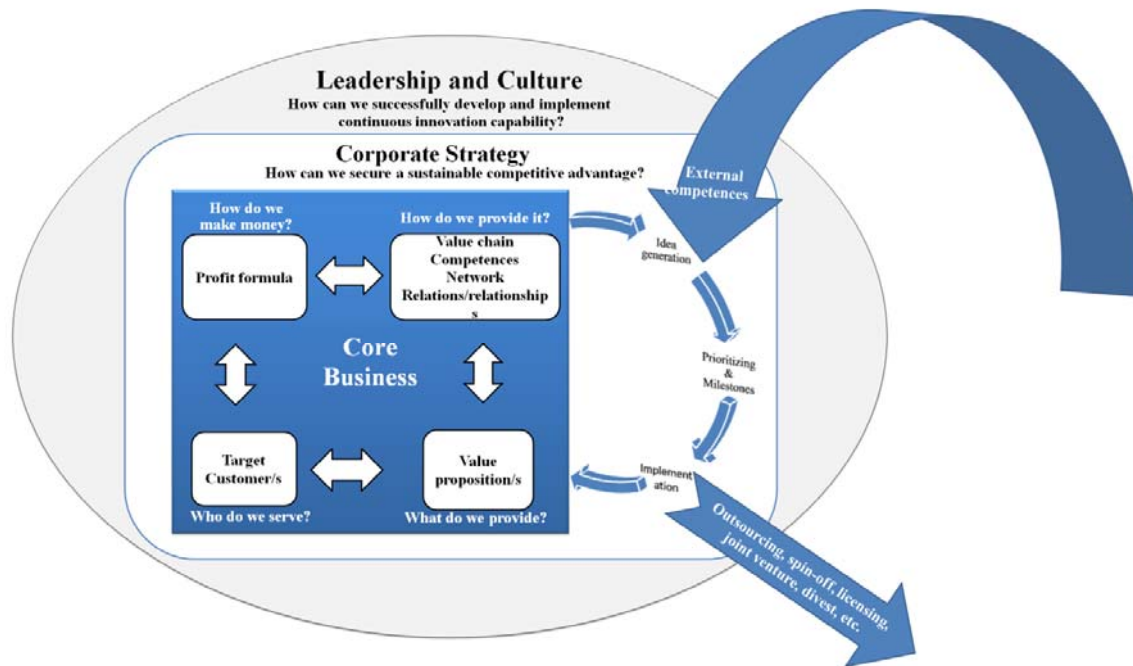


Figure 5: Overall business model template

The next issue concerns the question when we can call a change in the model a business model innovation. Three approaches have been proposed.

The first approach ‘defines’ business model innovation as a radical change in the way a company does business (Chesbrough 2006, IBM 2006, 2008, Linder and Cantrell 2000). Linder and Cantrell, in particular, clearly attempt to draw a line between what can be defined as business model innovation and what cannot.

between them as a form of business model innovation (Amit and Zott 2001, Osterwalder *et al.* 2004, Magretta 2002). A third approach, in line with Abell (1980) and Skarzynski and Gibson (2008), involves considering the number of building blocks that are changed. Any change in one of the building blocks would then constitute an incremental innovation. Changes in all the building blocks would be the most radical form of business model innovation.

The third approach defines innovativeness in terms of, what might be called, the reach of the innovation (e.g. Rogers 1983, Olsen *et al.* 1995, Green *et al.* 1995, Garcia *et al.* 2002). A suitable scale to measure the “new to whom” of company’s innovations could be one ranging from new to the company, via new to the market and new to the industry, new to the world.

If we combine all approaches, a three-dimensional space emerges (Figure 10), which helps in qualifying the innovativeness of a new business model:

- **Radicality** - (how new?) incremental vs. radical of each building block - illustrated in Table 5.
- **Reach** - to whom the innovation is new?
- **Complexity** - number of building blocks changed simultaneously.

Building block	Incremental innovation <i>'Do what we do but better'</i>	Radical innovation <i>'Do something different'</i>
1. Value proposition	Offering 'more of the same'	Offering something different (at least to the company)
2. Target customer	Existing market	New market
3. Value chain architecture [Internal]	Exploitation (e.g. internal, lean, continuous improvements)	Exploration (e.g. open, flexible, diversified)
4. Competences	Familiar competences (e.g. improvement of existing technology, HR, organizational system, culture)	Disruptively new, unfamiliar, competences (e.g. new emerging technology, new HR skills, organizational systems, culture)
5. Network Partners	Familiar (fixed) network	New (dynamic) networks (e.g. alliance, joint-venture, community)
6. Relations	Continuous improvements of existing relations (e.g. channels)	New relations, relationships (e.g. channels physical, digital, virtual, personal)
7. Profit formula	Existing processes to generate revenues followed-by/or incremental processes of retrenchments and cost cutting	New processes to generate revenues followed-by /or disruptive processes of retrenchments and cost cutting

Table 5: Incremental and radical orientation to each building block

Accordingly, any change in a BM can rightfully be called a business model innovation (BMI), but some changes are more radical and/or complex than others, and some (e.g. radical product innovation, incremental process improvement) are better understood than others (e.g. a holistic, new to the world departure from all business models known so far). Consequently, we get around the eternal discussion of when a BMI is indeed radical or incremental, simple or complex, far reaching or not, and, instead, portray the space in which any business model innovation can be positioned in terms of its *degree* of innovativeness by means of its radicality, reach and complexity (figure 6).

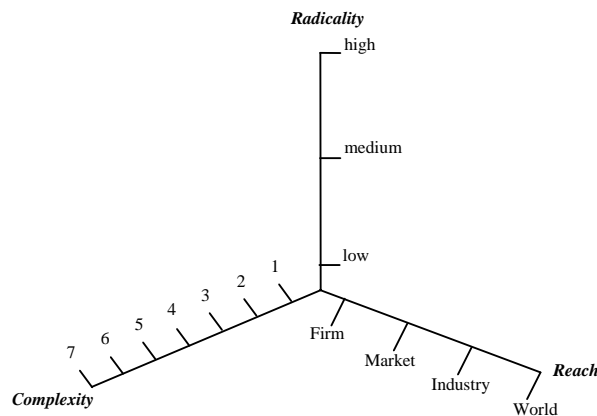


Figure 6: A three-dimensional business model innovation scale

3 Conclusion

A lot of buzzwords have come and gone in time, but it seems as if the business model concept is here to stay. Despite its fuzzy definition and operationalization, it is capturing more and more attention of academics as well as company leaders.

The aim of this deliverable was to develop the 'language' (definition, operationalization) needed to study the BM concept and its innovation adequately.

Our findings indicate that there are different opinions concerning the components of a business model, its relation to strategy, and its innovation. The review revealed that academics do not agree on what a business model is, and that the literature is developing largely in silos, according to the phenomena of interest to the respective researchers. However, we also found emerging common themes among scholars of business models. Specifically, 1) the business model is emerging as a new unit of analysis; 2) business models emphasize a system-level, holistic approach towards explaining how firms "do business"; 3) firm activities play an important role in the various conceptualizations of business models that have been proposed; and 4) business models seek to explain how value is created, not just how it is captured. 5) The network based Business model concept is emerging

These emerging themes could serve as catalysts towards a more unified study of business models.

Thus, we argued for the need to narrow down the large variation by sharpening the following aspects:

- Despite the large variation in opinions regarding the components of the business model, we could still identify a strong resemblance between various authors. Based mostly on Osterwalder *et al.*'s (2004) nine building blocks, Amit and Zott's (2001) analysis, Chesbrough's (2006) open business model innovation, Johnson *et al.* (2008), and Hamel (2000), we proposed in Table 5 what we argue to be the 7 *core* components – building blocks of any given business model.
- As to the overall business model template (Figure 5), we argue that strategy as well as organizational culture and leadership, are all embedded within the holistic business model template, and thus, provide the larger [grounded] platform for the business processes to be solidly based upon.
- As regards business model innovation, various alternatives have been proposed. Linder and Cantrell (2000), in particular, actually regard innovation as part of their so-called change models. It is however conceptually clearer to position that process between the business strategy (intent) and the new [core] business (realized), and define business model innovation as the actual process through which the business strategy is realized (Figures 4 and 5).

Finally, when do we talk about business model innovation? Based on Rogers (1983), Abell (1980), Amit and Zott (2001, 2010), Osterwalder *et al.* (2004) and Magretta (2002), we propose a broader approach that perceives business model innovation to be "the three of innovation" – and it appear in the form of a three dimensional space (Figure 6). If business models are models - what, in fact, are models? Evidence from philosophy, economics and biology can be drawn to discuss a wide range of models – scale models, role models, 'nutshell' models, exemplars and ideal types – to show how science uses models in its enquiries (Fuller 2010). Business model concept's role can simply enable categorisation – via taxonomies (bottom-up from real world examples) and typologies (top-down from theory) the difference between the notion of representative of and representative for BM. Thus business models take on the role-model/exemplar/ideal type mantle.

But business models can also act as laboratories themselves – as the use cases in Neffics will be, where academics and we can explore how they work and manager's experiment with the destiny of their firms – even with the structure of the model itself: unusual laboratories, where they are also factors in their own study. Business models as sites to try out change and innovation brings the us to a contribution – where the notion of the business model as a recipe, building on tacit managerial skills demonstrate or advise these 'chefs' about how best to organise and integrate their ingredients and techniques 'so that the results will come out right'. But this analogy doesn't just see a recipe as a principle/template to be followed, but also establishes the 'kitchen' as the site of managerial experiments to modify traditional models, or to innovate new business models (Fuller 2010).

The business model will as a baseline define the firm's activity system: who its partners and customers are, what value chain it operate in and where (and what kind of bargaining power it will have there), how big the overall 'value pie' will be and how much pie will land on its own plate. In designing the business model, the authors suggest two sets of parameters: the elements (content, structure and governance) describing the activity system's architecture, and the themes (novelty, lock-in, complementarities and efficiency) that define how it will create value.

All in all, our baseline research has led us to believe that business model thinking and business model innovation matter. (More) precise definition and positioning of the key construct, business strategy, business and business model innovation, and their relationships as proposed in this deliverable, helps reduce the confusion and allows us to design and communicate business model research more rigorously in the benefit of to the NEFFICS project.

Part 2 - Baseline study on the evolution of Business Model Innovation models related to the BM

4 Introduction

In the past 60 years models of innovation (Tidd 2006) have proliferated and become ever more sophisticated especially with the development of Information and Communication Technology (ICT). The transition from the 1950s booming markets and economic growth to the highly competitive, internet based and global marketplace that we have seen up to 2010 has influenced and changed the way innovation models have been constructed, managed and operated.

The processes and demands on innovation are increasing, effectiveness, efficiency, agility, flexibility, multi participation and knowledge exchange are required to be independent of time, place and things (Lindgren 2010).

Several firms have marked the transition during these generations of innovation models starting in the 1950s up to 1970s with the generations of Industrial research labs such as Bell Labs and Xerox PARC moving through the mid-1970s to end-1990s where these have been replaced by more market focused innovation models exemplified by companies such as 3M, Toto and IDEO – through to Toyota's rapid innovation models and processes - introducing a whole new range of product, services and processes to the customers within "high speed time".

This was followed in the 1980s – 1990s where customers were included directly in the innovation process. Von Hippel (1986) took this process even further back in the very early stage of the innovation process by introducing the 'lead user' method. Lead users – not customers – who tested products, services and processes still unknown to the public. Lead users 3M and Hilti AG who provided solutions to various needs of the product. are good examples of this new innovation model trend and companies applying these new innovation methods.

In the end of the 1990's initial empirical data were collected by Henry Chesbrough focussing our attention towards open innovation and opening up the enterprises boundaries. Letting knowledge and competences flow in from external stakeholders and out again from the enterprise. Later in the early 2000s Chesbrough coined it as the term 'open innovation' which has gained increasing interest up through the 2000s.

In 2008 Chesbrough extended the scope to include also the open business model innovation concept, which received even more and significant interest from both researchers and organizations.

Through the 2000s the R&D collaborations came more and more into focus - like the Ericsson's network of companies around the 'Bluetooth' technology/standard to LEGO's 'designbyme' where the customer builds their own product, emerged and set a new standard for innovation models – inclusion of the network partners and "bringing back" the customer and user into the very core of innovation and the innovation model (Bessant 2008).

Companies like Zara Inditex, Zappo, Amazon.com, QQ.COM, APPLE, CBS and Tata showed all different ways to achieve this - introducing a higher degree of network collaboration into the innovation model and innovation process. An example is the Android platform which is being developed in a collaborative network of different companies, called the Open Handset Alliance. It consists of a group of organizations collaborating to build a better mobile phone. The group, led by Google, includes mobile operators, device handset manufacturers, component manufacturers, software solution and platform providers, and marketing companies. From a software development standpoint, Android is right in the middle of the open source world which lately has gained considerable attention.

A company's ability to innovate and renew its business model through creative processes and quickly being able to execute commercialization became of increasing importance in the late 2000s. The latest predictions for 2010 from Silicon Valley USA, Shanghai, Mumbai and Sao Paulo 2010 talk about innovating and bringing new business model to the market within just a week. According to the CEO of Younoodle.com: Rebecca Wang representing a platform hosting more than 20000 start-up companies' business models worldwide, the demands to speed up the time of innovation of a business models are pretty much sharing the same characteristics as was seen back in late 1990 and early 2000 for products and services (Verganti 2000, Lindgren 2002). Life cycles of business models become more and more shortened as illustrated in Figure 1 – Life Cycle Development of Business Models (Lindgren, Jørgensen 2010)

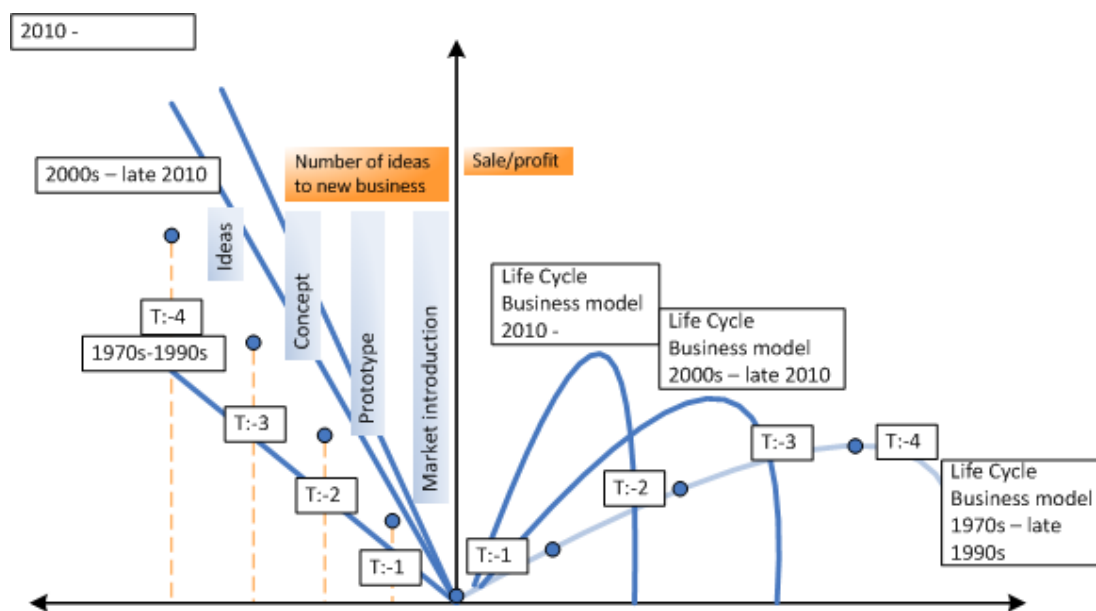


Figure 1 – Life Cycle Development of Business Models (Lindgren, Jørgensen 2010)

Because of the shortening life cycle of the business model the number of proposed ideas to new business models has naturally also been increasing tremendously up to 2010 – left side of the Y-axis. Venture Capital has never before been exposed to so many new business models and the professional business model developers – the so called “serial business model developers” – have increased tremendously.

Business model innovation has turned into a kind of new industry – an industry for business model development with a number of different supporting service providers around. An industry where the innovation task is to quickly develop new business models, quickly develop them to a level of where they are prepared to be sold to others – and finally sell the business model - to start a new business model development.

However – we claim on behalf of our research - it is still not only a challenge of being speedy in business model innovation, it is also a matter of controlling the speed related to the context of business model innovation – right speed business model innovation - and thus be timely to the market, technology, network partners and own competences. This ability seems to be of even greater focus (Lindgren 2002, Nobelius, 2004, Lindgren 2010).

Business leaders have through the different generation of innovation models come to realize that innovation based solely on product innovation and aimed towards only local markets is no longer sufficient to sustain competitiveness and survival of their enterprises (Taran 2009). Competitors can relatively easily copy products and local market segments today and many examples of quick captures of markets by global rivals located elsewhere are taking place today.

Proposed as a new line and mindset of innovation - a new way to meet the increasing global competition on innovation (OECD 2010) – the ICI research group proposed early in 2010 to consider business model innovation as the tree of innovation (Taran 2010). Creating continuously unique business models through business model innovation; excellent business model innovation models are considered on the one hand to be more difficult for rivals to copy and are on the other hand thought to have longer lasting effects relative to growth, building blocks of the business model and the overall business model survival of the enterprise.

This baseline analysis on business model innovation models indicates that the next generations of business model innovation models should be able to support business models and business model innovation that are much more complex, intangible, dynamic, independent of time, things and place to keep up with the development on the global business model innovation market – which will indeed be an integration of both, physical, digital and virtual business models.

5 Research Framework and Design

There is extensive knowledge about innovation models (Wind 1973, Ulrich and Eppinger 2000, Tidd *et al.* 2009, Chesbrough 2005) and on how to innovate products and services (Wind 1973, Cooper 1993, Baker and Hart 2007) in particular. There is a magnitude of theoretical definition of innovation models. In this research we've adopted the definition

“a company's operational manifestation of the way innovation works and is carried out”

Since we've found it to be the most comprehensive one in providing concrete details to the definition of an innovation model existed within a business. Consequently, according to this definition, an innovation model serves as a model or a picture that represents the “roadmap” for any innovation carried out in the business. However these pictures can be very different from one company to another and even within the same company on different innovation tasks.

Consequently innovation models can take very different character e.g. a linear stage gate (Wind 1973, Cooper 2005) or a more flexible, agile and open character (Corso 2002, Coldman and Price 2005, Chesbrough 2005, 2008). Innovations models even if they are certified turns out not always to be strictly followed (Lindgren 2002). Therefore one could register a formal Innovation Model, which the company want to or says they follow and an informal innovation model which is more in line with what goes on or even support the formal innovation model to move faster e.g. by “jumping” stage- and gates. Further the “picture” of the innovation model at a given time might – the start up of an innovation might be totally different to the “picture” followed and seen in a retro perspective context. Also in companies that are ruled by ISO Standards.

There is however a lack of knowledge about how and if innovation models fit into a business model context. As we – the NEFFICS project – regard business model innovation as “the tree of innovation” please see Part 1 it is possible for us to analyze the different generations of innovation models in a business model innovation context.

The study of the evolution of generations of innovation models and analyzing them in a business model innovation context is not confined to a single discipline. Theories and concepts will be modified as a result of doing our research hence this deliverable will adopt an analytical induction method for data analysis (Znaniecki, 1934) in order to improve existing and, if necessary develop new, concepts, ideas or subcategories. The data collection in the analysis has primarily been done through desk research. The desk research involved collecting of information through books, articles, and websites. The time frame set for this study goes back from the early 1950s up till 2010s, and the review has mainly covered European, and US research within the area.

In this context an explorative research framework and design have been developed for this baseline analysis.

Both in a scientific point of view and in a research methodology context it is the aim to answer the question:

What is the relation between the different generation of innovation models and Business model Innovation?

A research framework has been constructed on the basis of five focus areas of the baseline analysis:

- The concepts, framework and characteristics of the generations of innovation models related to business model innovation
- The task of Business model innovation – what was the most dominated task to be carried out by BMI
- The field of Business model innovation - What was the main characteristics of the BMI environment - technology, market, network and competences, where the BM was going to be innovated into and with.

- The success criteria of Business model innovation – What was the dominated success criteria for BM’s and BMI tasks.
- The concept of Business model innovation in the specific generation – What was the main concept/understanding of how to do Business model innovation
- The Process of Business model innovation is the “way” that the BM follows through the Business innovation model from idea to market introduction and so on. This is not covered in this delivery.

As earlier mentioned there has not been any research on the different generations of innovation models related and compared to the business model framework and context (Osterwalder 2010, Hagmann 2008, Chesbrough 2008, Taran et.al, 2008, 2009 and 2010). The aim is therefore to establish a comprehensive overview of state of the art knowledge on innovation models analyzed in connection with business models and its building blocks. In this context we established an overall analytical framework, which can be seen in table 1. **Error! Reference source not found.**

Business Model Building Blocks Vs. Generations of innovation	Value Proposition	Target Customer	Value Chain	Competences	Networks	Relations	Profit Formula
First, second, etc.	Yellow	Yellow	Green	Red	Red	Green	Yellow
Change between generation models in a business model context							

Table 1 – Business Model Framework vs. Generations of Innovation Model

The structure of the research findings relates the generation of innovation models to the business model and particularly the different building blocks of the 5 generations of innovation models. The analysis is organized so that each generation of innovation model is summarized into a colour measurement representing:

Green – when the building block is very much in focus/represented in this generation of innovation model. The colour Green symbolizes dominant building block(s),

Yellow – when the building block is to some extent in focus/represented in this generation of innovation model. Yellow symbolizes medium represented building block(s),

Red – when the building block is in general not in focus/represented in this generation of business model. Red symbolizes submissive building block(s).

It has to be stressed that this is not a black and white depiction. If for example the competence building block has been proposed to be colored red in a generation it does not mean that it was not a part of that generation. A business will always have competences, customers, value chain and so on, the colors merely work as an indicator visualizing that during this generation of innovation models when seen in a business model context that those particular building block(s) did not have a central position in that generation and where they were not a main resource to innovation, that is not to say that it did not exist.

The baseline analysis touches upon the innovation model(s) capabilities related to handling different business model contexts and thereby lays the ground to our next work and the answer to the question:

What will scenarios of future innovation models of business models look like?

In each generation of business model innovation models the questions in table 2 have therefore been asked to better understand and explain the phenomenon and to improve our understanding and explanation of the phenomenon generation of innovation models related to business model innovation.

Basic Scientific Research and Focus Areas	Main Questions	Sub Questions
The task of Business model Innovation	What type of innovation task was in focus – related to technology, market, and network?	What was the level of innovation measured on a scale of incremental and radical business model innovation
The Field of Business Model Innovation	How did the field of business model innovation look like?	<ul style="list-style-type: none"> • Which type of technologies was in focus and was involved? • What type of market, customer and customer needs was in focus? • What type of network was in focus and involved? • What type of competences were in focus and involved?
The Success criteria of Business Model Innovation	What criteria for success exists both short term (time/cost) and long term (improvement, continuous innovation, learning/)	
The Model of Business model innovation	How did the innovation model typically look like (stage gate, dynamic ...?)	Practice <ul style="list-style-type: none"> • Who were the major players involved in the innovation? • Who interacted and participated in the innovation and innovation model?
The building blocks of business model involved	What elements from the business model building blocks were in focus related to the innovation model starting with 'value proposition' then 'target customer' and etc.?	<ul style="list-style-type: none"> • Which Building Blocks were involved in the generation of innovation model • What are the dominant building blocks in focus? • What are the submissive building blocks in focus? • Where were the major challenge in the specific innovation model related to innovating the business model ?
“SWAD” of innovation Models related to business model innovation	What were the Strengths and Advantages with this model? What were the Weakness and Disadvantages with this model?	

Criteria and Evaluation of innovation models	What were the main feature(s) in the specific innovation model (what was changed from previous generation?)	<ul style="list-style-type: none">• What and Why caused the change/shift?• How was it changed?
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Table 2 –Structure of Questions

6 Historic Evolutionary Overview of Innovation Models

Berkhout (2006), Tidd (2006), Tidd and Bessant (2009), Hobday (2005), and Libecap, Berkhout, Duin, Hartmann, & Ortt (2007) all rely on Rothwell (1994) research on the evolution on innovation models. Rothwell (1994) has provided a useful historical perspective on innovation management. He argues that nature of the innovation model has evolved from simple linear models (1950s-60s) to increasingly complex interactive models (1990s). Rothwell (1994) divides the evolution of innovation models into five generations.

From the literature review conducted it seems that there is some incongruence between different researchers about the timeframe of the five generations more specific it concerns the fourth and fifth generation. Rothwell (1994) argues that the fourth generation runs from early 1980s – early 1990s and the fifth from early 1990s –onward. Nobelius (2004) argues that fourth generation runs from early 1980s and ends in mid 1990s thus fifth generation starts mid 1990s and onward. Libecap, Berkhout, Duin, Hartmann, & Ortt (2007) states that fourth generation starts mid 1980s – early 2000 arguing that the fifth generation is merely an implementation of the fourth generation and can as such not be classified as a generation. Hobday (2005) agrees with Rothwell stating that fourth generation stretches from early 1980s – 1990 and fifth generation post 1990. Table 4 gives an overview of the different opinions

	Rothwell (1994)	Nobelius (2004)	Hobday (2005)	Libecap et al. (2007)
Timeframe for 4th. Generation	Early 1980s – Early 1990s	Early 1980s – Mid 1990s	Early 1980s - 1990	Mid 1980s – Early 2000s
Timeframe for 5th generation	Early 1990s - onward	Mid 1990s - onward	Post 1990	None

Table 3 – Timeframe of the 4th and 5th Generation of Innovation Models

The precepts aspired to in this paper agree with Rothwell (1994) to the extent that there exist five generations of innovation models. Regarding the timeframe of each generation we believe that it is a fluent transition that did not happen from one day to another, but extended for years and for that reason no specific year was the turning point. We have discussed the different precepts and supported them with own experience and in retrospect analyzed several articles and events showing different changes both in society, business and theory and came to the conclusion that the timeframe of the fourth generation stretches from mid 1980s to a period between late 1990s and early 2000s and fifth generation starts somewhere in late 1990s and early 2000s and onward.

Before examining each individual generation of innovation models, it is useful to emphasize five caveats stressed by Rothwell (1994) in his introduction to the five generations: (Hobday, 2005)

- " The evolution from one generation to another does not imply any automatic substitution of one model for another; many models exist side-by-side and, in some cases, elements of one model are mixed with elements of another at any particular time;
- Each model is always a highly simplified representation of a complex process that will rarely exist in a pure form;
- Often the progress from one generation to another reflects shifts in dominant perception of what constitutes best practice, rather than actual progress;
- The most appropriate model will vary from sector to sector, and between different categories of innovation (e.g. radical or incremental);
- The processes that occur within firms are to an extent contingent on exogenous factors such as the pace of technological change."

6.1 First Generation

The first generation of innovation models which also is referred to as technology push models (Berkhout (2006), Tidd(2006), Tidd and Bessant (2009), Hobday (2005), Libecap (2007), and Rothwell (1994)) consider scientific discovery as the starting point of innovation processes and ‘pushed’ technological innovation via applied research, engineering, manufacturing and marketing towards the customer. The first generation models relied heavily on internal resources and neglected the market and customers as such, it focused on getting the best “brains” into the company to secure successful product innovation and commercialization. Basically the first generation assumes ‘more R&D in’ equals ‘more successful products out’.

First generation models were simple linear models developed in the 1950s post war era, where economic growth was made largely through rapid industrial expansion. The first generation innovation model is sequential linear as depicted in Figure 2. During the linear innovation process different departments contribute when necessary, and the network contributors were primarily found inside the company. The innovation task lay within the company where there were new technology opportunities in industrial innovation and where governments and companies had to technological regenerate existing sectors, e.g. textiles and steel, and enhance productivity and quality of agricultural production.

The need to grow and get past the dark shadows of the Second World War was the primary concern, and through heavy investments in industrial innovation the developments resulted in rapid employment creation, rising prosperity and an associated consumer boom, where demand sometimes exceeded production capacity, especially consumer electronics, white goods and automobiles were a high demand (Rothwell, 1994).

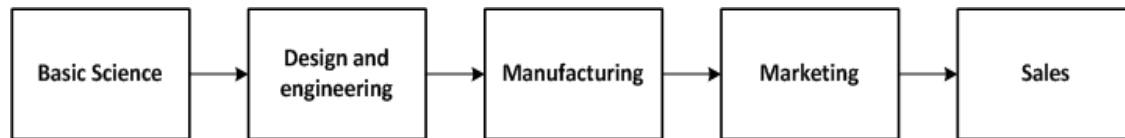


Figure 2 – The General Structure of First Generation Innovation Processes (Technology Push Models) (Rothwell, 1994)

6.1.1 Advantages and strength



Figure 1: Replica of the first transistor from Bell Labs

The strength and advantages of the first generation was by bringing together the best scientific minds in a field and providing them with unlimited resources, it was possible to innovate and develop technological products in a never before seen pace. Aside from unlimited resources scientists were given maximum freedom to innovate and develop radical new innovations. The innovation task and success criteria of the innovation projects are very clear and narrow – related primarily to solving technology challenges. This generation brought several radical technological innovations to surface that continues to resonate in the 21st century e.g. Bell Labs’s transistor (figure 3), nuclear power plants, polio and measles vaccinations, DNA ‘finger prints’, commercial jet transport with Boeing’s 707 aircraft (figure 4), to name a few.



Figure 2: Boeing's 707

6.1.2 Disadvantages and weaknesses

The disadvantages in this first generation are significant, the final responsibility is vague because the project travels through departments with no project manager appointed. It seems that scientific freedom of professionals is more important than relevance (in terms of commercial results). Costs are very high in recruitment and technology development and low in marketing and market research which means that market needs and commercial aspects are incorporated late in the innovation process; this significantly heightens the failure rate related to market success (Libecap, 2007, Rothwell 1994).

6.1.3 Business Model Discussion

On basis of analyzes made by (Rothwell, 1994) (Nobelius, 2004) (Hobday, 2005) (Libecap, Berkhout, Duin, Hartmann, & Ortt, 2007), we will now analyze and discuss the first generation of innovation models in order to be able to compare the characteristics of each individual generation of innovation model related to the seven building blocks in the NEFFICS Business Model Framework (Taran, Boer, & Lindgren, 2010). Thus each generation of innovation models will be analyzed in the order.

The value proposition in the first generation was primarily aimed at offering people and organizations radical technological innovations through heavy investments; it primarily focuses on development of physical products, where the values and core benefits offered were defined primarily by the company – “from an inside out perspective” and a technological point of entry. The values and benefits were primarily defined by the company related to market needs.

Target customers were hardly defined in this generation because the focus was on ‘pushing’ products to the market. Focus can widely be defined as “physical” B2C and B2B markets – meaning no digital and virtual customers exist.

There was a strong internal focus making the internal **value chain** the central building block in the business model as it has to be able to cope with the numerous radical technology innovations and production capacity demand.

High emphasis is placed on core **competences** which are a central building block in this first generation. This is seen in the significant attention there is on getting the best scientific minds into the company and providing them with unlimited resources.

Little attention was paid towards **network partners**, as practical all activities are performed in-house.

Relations are also largely based on physical personal relations between departments inside the company where an innovation project travels through different departments. There was often a lag in relationship between general management and researchers.

In the **profit formula** building block - the primary profit formula was a cost plus profit formula. There was hardly any innovation related to the profit formula. Most profit formulas were only calculating direct costs.

From the above mentioned it can be concluded that the most overall dominant building blocks and focus found in the first generation innovation models are the [internal] value chain and the competences. Competences were primarily defined as technological competences and scientific competences.

This early generation of innovation model cannot be argued to handle and focus on the business model framework as such which can be seen in table 5.

Business Model Building Blocks Vs. Generations of innovation	Value Proposition	Target Customer	Value Chain	Competences	Networks	Relations	Profit Formula
First (push)							
Change between generation models in a business model context	No changes happened yet						

Table 4 – First Generation Innovation Model vs. Business Model Framework

6.2 Second Generation

The structure of the innovation process remains still linear sequential as illustrated in figure 5 (Hobday, 2005, Libecap, 2007). But Rothwell (1994) argues that in the 1960s and early 1970s “empirical studies of innovation processes began to emphasize market led (or need pull) theories of innovation”. In this generation a switch in the way the process of innovation is structured was discovered as “in fact the market is now regarded as the main source of ideas” (Libecap, 2007) where consumer research becomes the basis for new product ideas. The innovation focus begins to shift from an inside out perspective to an outside in perspective.

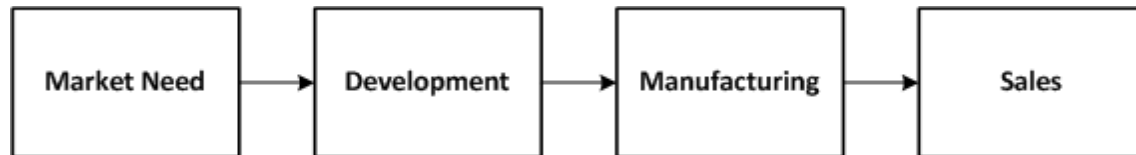


Figure 5 – The General Structure of Second Generation Innovation Processes (Demand Pull Models) (Rothwell, 1994)

New products are however mainly based on existing technologies thus being of a more incremental nature. The high prosperity experienced in the first generation starts to decrease making supply and demand more in balance, affecting increased competition levels in industries. This meant a switch in how corporations invested from first generations’ heavy technology investments in innovating new products towards rationalization technology investments.



Figure 4: NBC, promoting their

As large established companies in this generation also started to fight for market share, increased emphasis were put on sales and later on marketing. This means that the innovation task changes from focusing on internal values to external values and from radical product innovation – most technological issues to incremental product innovation with incremental customer value fulfillment. A change of fulfillment of needs to demands is seen in this generation moving closer to even fulfillment of wants. Switching to a sales and later market-oriented

view where the R&D operates in a primarily ‘need-pull’ and “demand pull” model of innovation in order

to fit with rising competitive market which also is marked by changes on demand side factors, new innovation and change to existing innovation models e.g. AT&T Bell Labs and their CCD chip used in video cameras, PAL and SECAM broadcast color TV systems (figure 7) and Digital Equipment Corporation’s minicomputer 12 bit PDP-8 (figure 6).



Figure 3: the first generation of PDP-8s

6.2.1 Advantages and strengths

In the second generation innovation models, companies tried to solve some of the problems found in the first generation e.g. a project innovation leader is now assigned to have the final responsibility for the overall transformation process of an innovation project and market needs and commercial aspects are now incorporated early in the innovation process. This meant that innovations had to focus much more on solving market needs and demands, taking requirements and demand factors from customers into real consideration during the innovation process.

The innovation task was still very simple and very clearly defined with a primary focus on market and consumer direct needs and demands – and not particularly on customers wants. This helped the companies to narrow the success criteria down to focus on primarily the same purpose and primarily short term success criteria as cost and to some extent performance.

6.2.2 Disadvantages and weaknesses

The shift of focus to incremental improvements and innovation of existing products resulted in challenges related to how potential consumers should express any wants beyond the values solved by

familiar and existing products (Libecap, Berkhout, Duin, Hartmann, & Ortt, 2007). Because there was a situation where capacity at times exceeded demand, increasing competition significantly began to take place and more companies began to think about other inputs and models of innovation.

Because of the intense competition many companies neglected long-term R&D programs. Innovation in many companies became locked in to a kind of “a regime of technological incrementalism” as those responsible of innovation primarily tried to find solutions by adapting existing products and product groups features to meet the increasing changing of user requirements along maturing performance trajectories” (Rothwell, 1994).

Because each project was often serving goals of different internal company clients, strategic relationships amongst the innovation projects were often not established. As a result many innovation projects were treated separately and a high degree of sub optimization and cost of innovation was the result.

This in turn also affected the relationship between strategic goals of the company and innovation projects (Libecap, Berkhout, Duin, Hartmann, & Ortt, 2007). The reason was that departments focused on serving innovation goals internally missing the overall picture for the company’s overall strategic innovation goals.

6.2.3 Business Model Discussion

The shift towards a need-pull focus in the innovation process changed the **value proposition** to have a higher focus on market needs and later market demands. Changing from need to demands, side factors of consumers developed as a result of the exceeding production capacity related to market demands, increasing the competitive climate in various industries, especially the commercial goods industry.

Target customers are now in focus as competition rises between companies, customer demands and market needs are pride of place although R&D still is placed in-house. Late in the generation when marketing is introduced, the terms market segmentation, target marketing and positioning begin to be the standard way to innovate the target customer building block.

Because the innovation field has changed to primarily having an incremental focus, the internal **value chain** has changed thus the company infrastructure now is concentrated on developing incremental product innovations. Production costs are affected in the way that the focus has changed from radical innovations to incremental improvements lowering the production costs as companies to a higher degree, can take advantages of economies of scale. Marketing and consumer research have now been introduced and given a central role in the innovation process and innovation model.

The market focus also affects **competences** which were previously centered around technology and now change to be more centered around market needs and customer demands. In other words a company’s core competences now lay within market and consumer knowledge, where sales and marketing competences play an important role in order to live up to changing consumer demands in a much more competitive market environment.

As in the first generation little attention is paid on **network partners**, practically all activities are still performed in house.

Relations are becoming more visible and important however it still involves internal personal and physical relations across different departments. Relations between company and market are getting increased attention through increasing research of market needs and consumer demands. Central relationships are in this context developed especially between R&D and marketing in the companies’ innovation projects.

The **profit formula** is still very classic and seldom innovated - with primarily a cost plus pricing profit formula. The costs switches from being mainly on science and technology development to being placed in marketing where consumer and market research is given primary focus.

Most overall dominant building blocks found in the second generation are ‘target customers’ the ‘[internal] value chain’ and ‘competences’ feature - particularly the sales and marketing competences. The Second generation of innovation model is challenged by increased innovation activities outside the company but is still not able to cope and handle the business model framework in a holistic

perspective not taking the medium and submissive building blocks into consideration. This causes the need for the third generation innovation models as seen in table 6.

Business Model Building Blocks Vs. Generations of innovation	Value Proposition	Target Customer	Value Chain	Competences	Networks	Relations	Profit Formula
Second (pull)							
Main Change between 1 st generation and 2 nd generation models seen in a Business model context	The 'Target customer' building block is now a medium focused building block to be innovated, there is market and consumer research but the innovation still happens in-house. The change happened because the second generation innovation model takes basis in market needs and consumer research as opposed to the first generation innovation model which was rooted in scientific research.						

Table 5 – Second Generation Innovation Model vs. Business Model Framework

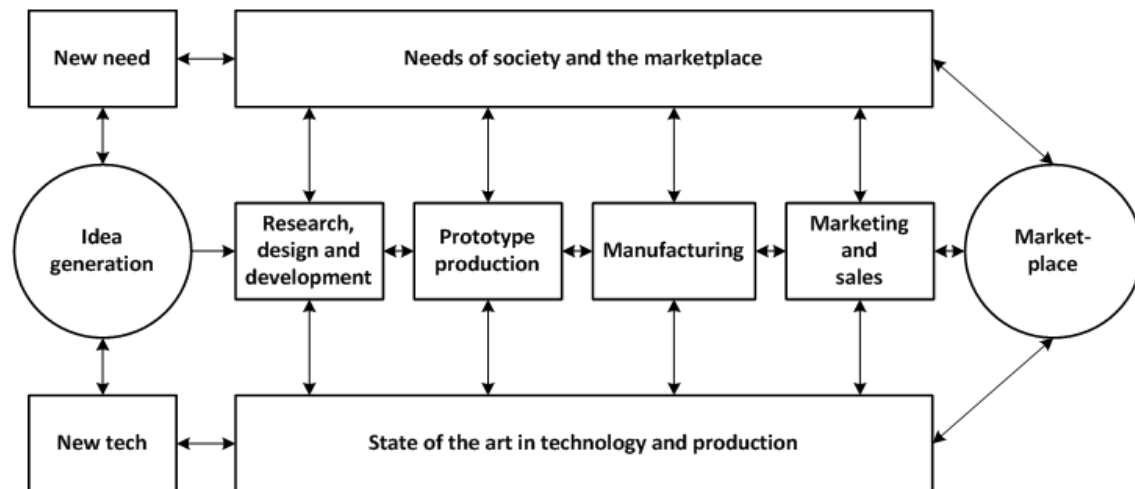
6.3 Third Generation

Several societal events highly influenced industries and organizations during the 1970s, forming a new generation of innovation models and processes. It was especially the two major oil crises that marked the period, creating high rates of inflation and demand saturation (stagflation). This situation changed the innovation task, forcing companies to adopt strategies of consolidation and rationalization, with growing emphasis on the benefits of scale and experience (Rothwell, 1994).

The decade suffered from severe resource constraints leading to a strategic focus on cost control and cost reduction. In other words success criteria were short term focused on cutting cost and in long term focused on improvements both in innovation processes and innovations. These conditions made it more critical for companies and governments to understand the basis of successful innovation in order to reduce failure rates.

During this generation IBM invented the 8-inch floppy disk, Intel introduced the first microprocessor, Hewlett-Packard's HP-35 developed the first scientific pocket calculator and the mass-market success of VCR's with a format battle taking place between Sony's beta-max and JVC's VHS.

Empirical studies during this generation showed that the early linear innovation models were atypical of industrial innovation (Hobday, 2005; Rothwell, 1994). Empirical studies also showed a need to combine science and technology with market trends hence the third generation of innovation models can be said to be a combination of the two former innovation models as seen in figure 8 (Technology push and Demand Pull) thus the model is also referred to as 'the coupling model' (Hobday, 2005, Libecap, 2007, Tidd, 2005, Rothwell, 1994).



**Figure 8 – The General Structure of Third Generation Processes (The Coupling Model)
(Rothwell, 1994)**

The cost of innovating and innovation models are indeed in focus through trying to lower waste and heightening success rates of innovations by forming feedback loops, communication networks and balancing tasks in production and R&D departments. The first attempt - to lean innovation - takes place in this generation of innovation.

6.3.1 Advantages and Strengths

Although Feedback loops were added the structure was still essentially sequential linear as shown in Figure 8. Rothwell (1994) notes “that the process of interaction was not necessarily continuous but could be understood in terms of functionally interacting and interdependent stages, involving complex communication paths and intra- and inter-organizational linkages”. To reduce wasteful failures, communication networks are formed with partners perceived to have extensive technological and market knowledge. These advantages for the third generation were up until the mid-1980s believed to be best practice. In the early generations, success was associated with doing one or two tasks brilliantly, during the third generation this belief shifted, towards doing most tasks competently in a balanced and well coordinated manner (Rothwell, 1994).

6.3.2 Disadvantages and Weaknesses

The main disadvantages in the third generation models is the focus on product and process innovation rather than taking organizational and market innovations into account (Libecap, 2007; Berkhout, 2004). One of the reasons is the limited experience of R&D departments with market and organizational renewal making the transfer of innovations from company to market increasingly difficult. The focus was still on improving existing products and rationalizing production to cut costs instead of thinking about innovating breakthroughs (Libecap, 2007).

6.3.3 Business model discussion

The combination of technology push and market pull with the introduction of feedback loops and communication networks with partners’ changes the **value proposition** as the changes reduces the level of wasteful failures, therefore heightening the innovation success level. Although innovation essentially still functions in-house, the value proposition in this generation still cannot be considered central. Value focus and value innovation are now developing towards the customer’s wants – and not any longer purely needs and demands.

Target customers are still physical B2B and B2C customers but are getting more attention with the increasing focus on decreasing innovation and production failure rates. Therefore innovation focus on taking market demands and customer demands into consideration – even very early in the innovation process – idea and concept phase - more efficiently.

The complexity of the internal **value chain** is growing as more elements need to be considered in the production and innovation development processes where feedback loops and communication networks are receiving significantly attention. The internal value chain is still physical but in order to lower failure rates and get customer feedback, service is becoming a central focus element in the value chain. The reason is that customers are getting more aware of their wants, increasing the importance of value benefits towards the customers.

With the combination of push and pull innovation models, **competences** are needed in both areas- in balancing internal push and external pull tasks in a successful matter so that failure rates are lowered. New competences are needed in areas of communication and services.

The majority of **network partners** are still physically and internally based, but communication networks specifically focused on partners bringing extensive technological and market knowledge into the company, this change in network focus is a result of the increasing need for companies to reduce failure rates and locate customers and their demands in a efficient and effective manner.

Relations are still physical and personal, but they are receiving more attention in the business model with the extension of communication networks with key partners out-side the company with knowledge about technology and market. Reducing and controlling cost levels are receiving significantly more attention during this generation.

Revenue streams in the **Profit formula** are still created from physical transactions between buyer and seller. Price innovation begins to be popular with differentiation of pricing methods where costs innovation is in focus.

Table 7 illustrates to which degree the building blocks are represented in the third generation innovation model. The main changes from the second generation to the third generation are that more building blocks become objects to innovation, but it is able to cope with all building blocks in the business models framework.

Business Model Building Blocks Vs. Generations of innovation	Value Proposition	Target Customer	Value Chain	Competences	Networks	Relations	Profit Formula
Third (push + pull)							
Main Change between 2 nd generation and 3 rd generation models seen in a Business model context	Focus is on reducing and controlling costs; a combination between push and pull innovation models are created where feedback loops and communication networks are introduced to increase innovation success.						

Table 6 – Third Generation Innovation Model vs. Business Model Framework

6.4 The Fourth Generation

During the 1980s the world experienced an economic recovery heavily influencing companies and the strategic goals changed with an increasing awareness evolving generic technologies. New generations of IT-based manufacturing systems led to a new focus on manufacturing strategy (Rothwell, 1994). Companies increased the number of strategic alliances and general networking activity grew significantly, influencing a notion of global strategy.

With the increasing introduction of IT-systems to support both production and innovation processes, shorter and shorter product life-cycles became the output and further changing the competition focus to “high Speed innovation” (Lindgren 2003). The increased importance in speed of innovation led

companies to adopt time-based strategies focused around 'Just-In-Time (JIT)' principles (Rothwell, 1994) (Libecap, Berkhout, Duin, Hartmann, & Ort, 2007).

A feature of great importance, which had a high influence on the shift of generations was Japanese companies and their remarkable competitive performance on world markets especially Toyota and their product innovation systems, which enabled them to innovate more rapidly and efficiently than their western counterparts (Rothwell, 1994).

The fourth generation innovation models represents a fundamental change in the construction of innovation models; as the innovation task and projects usually took place inside the R&D departments, the complexity of innovation tasks were increasing as it was now carried out in cross-functional teams performing simultaneous parallel activities, instead of the former sequential activities, to enhance speed and efficiency of the product development process (Figure 9) and large external networks involving e.g. universities, suppliers, customers and government agencies contributing with extensive knowledge and experience. New products are developed with an increased speed in a significant frequently manner because of the parallel innovation process (Libecap, 2007; Berkhout, 2006; Hobday, 2005; Rothwell, 1994;).

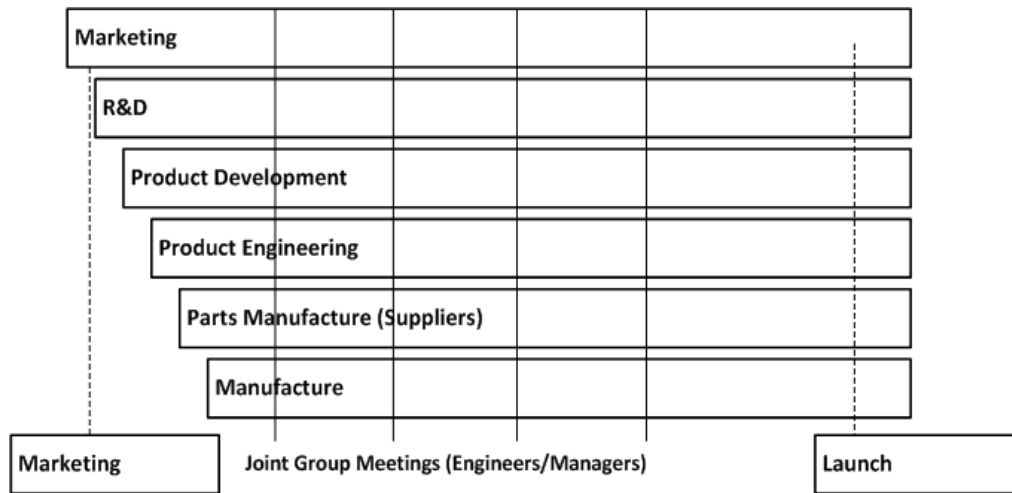


Figure 9 – The General Structure of Fourth Generation Innovation Processes (The Integrated Models) (Rothwell, 1994) and (Hobday, 2005)



Figure 5: the World Wide Web logo designed by Robert Cailliau

The criteria for success in fourth generation is much more focused on the ability to be timely and efficient, leading attention towards learning from and with customers, adapting the customers wants and quickly, which became an integrative activity in the fourth generation innovation models. The previous product focus is replaced by a total value concept focus. These changes lead to an increased notion of market and organizational innovations required to successfully introduce product innovations from the IBM PC model 5150 (figure 10), to CERN's publication of the World Wide Web in 1991 (figure 11). Hereafter businesses start to build E-commerce websites; E-commerce-only companies such as



Figure 6: IBM PC Model 5150

Amazon.com, eBay, AOL, and Yahoo! grow rapidly.

The first GSM network was launched in Finland in 1991 and mobile phones gain massive worldwide popularity (figure 12). Zara inditex was another good example of the fourth generation innovation models – especially on high speed innovation – setting new standard of high speed innovation via changing 25% of their shops products every week. This is combined with 3 – 400 innovation scouts around the world, who quickly via advanced ICT-based communication reported back on customer and led users wants and use of products.



Figure 7: An evolution of mobile phones

Berkhout (2006) states that fourth generation models can be characterized by the following properties:

1. "Innovation is embedded in partnerships: 'open innovation'".
2. Attention is given to an early interaction between science and business.
3. Hard knowledge of emerging technologies is complemented by soft knowledge of emerging markets.
4. The need for new organizational concepts is acknowledged by emphasizing skills for managing networks with specialized suppliers as well as early users
5. Entrepreneurship plays a central role".

The term 'Open innovation' and open innovation models is emerging late in this generation, the term is coined by Chesbrough (2003) where he refers to the fact that companies start opening up company border and innovation models leading in external partners. The former closed innovation model (Technology push, Demand Pull and Coupling Model) is depicted in Figure 13 – Closed Innovation Model (Chesbrough, 2003)

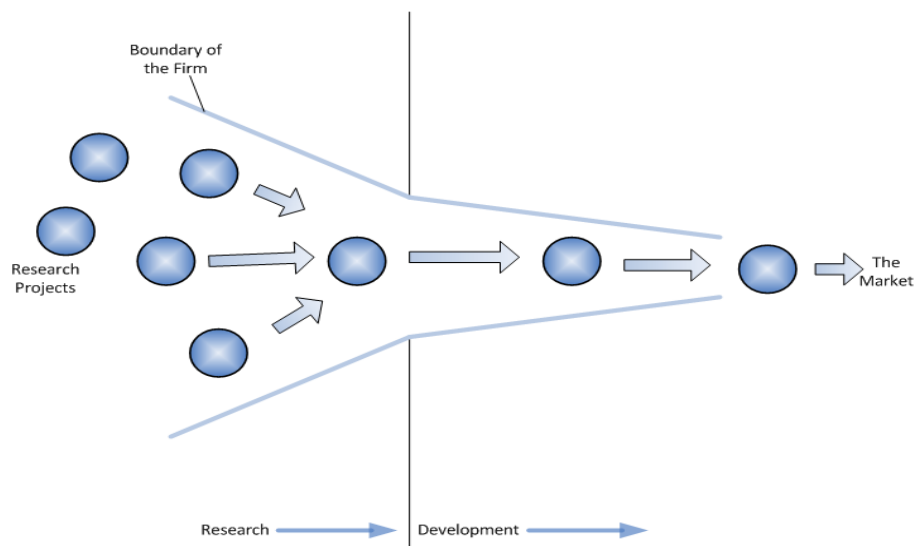


Figure 13 – Closed Innovation Model (Chesbrough, 2003)

The 'Open Innovation Model' which characterizes the fourth and fifth generation innovation model can be seen in Figure 14

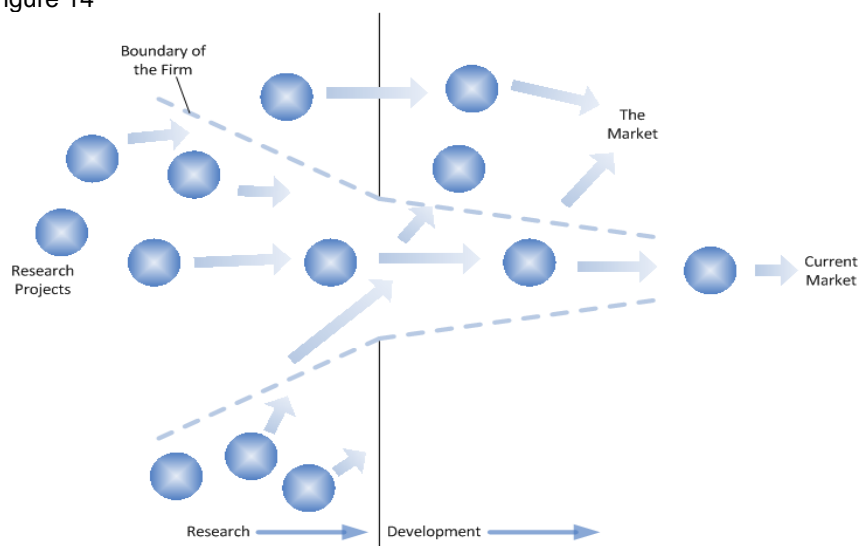


Figure 14 – Open Innovation Model (Chesbrough, 2003)

6.4.1 Advantages and strengths

The fourth generation innovation model is also referred to as the 'Cyclic Innovation Model' (CIM). Another side of this innovation model besides the fact that this innovation model incorporates networks of partners in the innovation process is that it "includes feedback paths so that adaptive steering and learning processes can be made more explicit". (Berkhout 2006) (Libecap, 2007) The feedback paths can be seen as interconnected cycles and (work) processes which become cyclic, giving increasing flexibility in the innovation system. The basic feedback loop is represented in figure 15 and the advantages besides those already mentioned are that the participants continuously are being confronted with consequences of their actions.

Another element which appeared during the fourth generation of innovation models is 'lead users': users of a product have needs currently unknown to the public and who also benefit greatly if they obtain a solution to these needs. (Von Hippel, 1986)

Companies who can be mentioned to have enjoyed this methodology are 3M, Hilti AG and Nortel. This methodology makes it possible to adjust quickly to unforeseen events and adds a learning element to this dynamic system (Berkhout 2006, Hobday 2005, Libecap 2007, Rothwell 1994). This is done as a response to increasing competition and shorter product life-cycles.

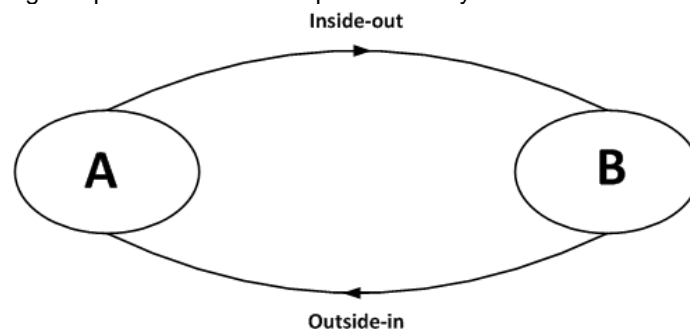


Figure 15 – Basic iterative cyclical innovation system (Berkhout, Hartmann, Duin, & Ortt, 2006)

Berkhout (2006) argues that the cycle shown in figure 15 should be seen as an "elementary building block for designing non-linear models for innovation systems, similar to those seen everywhere in physics and biology".

6.4.2 Disadvantages and weaknesses

This new integrated cyclic innovation system and open innovation model also holds disadvantages which lie within the complexity of the system and the innovation processes. The complexity can be decreased by introducing more flexible organizations and the application of information technology (Libecap 2007).

Through the generations of innovation models companies have been forced to take an ever increasing number of elements into account. In the fourth generation with the introduction of IT-Systems and the initial steps in Internet usage the complexity in all aspects of a company increased along with an increased need for networking and integration with internal and external partners in order to solve the innovation task and being responsiveness toward changing customer demands and wants.

The weakness lies within the need for more flexibility especially when thinking of innovation processes which needs to handle an increasing complexity where more knowledge about the application of information technology is needed to handle the growing need for communication, networking and doing business via the internet - e-business.

6.4.3 Business model discussion

The **value proposition** changed considerable in the fourth generation of innovation models to focus not only on physical products and services but also to processes and including more and more both digital and virtual products and services. Innovation is brought to the customer inform of 'lead users' participating active in the development process. This creates a higher level of value benefit to the customer as the innovation is done speedier, precise and timely with an intense focus on customer wants and demands.

The "cradle to grave" concept seen in figure 16 is late in the generation taken in to the innovation process changing and increasing the focus on values to products and services – before – during and after the consumption of goods.

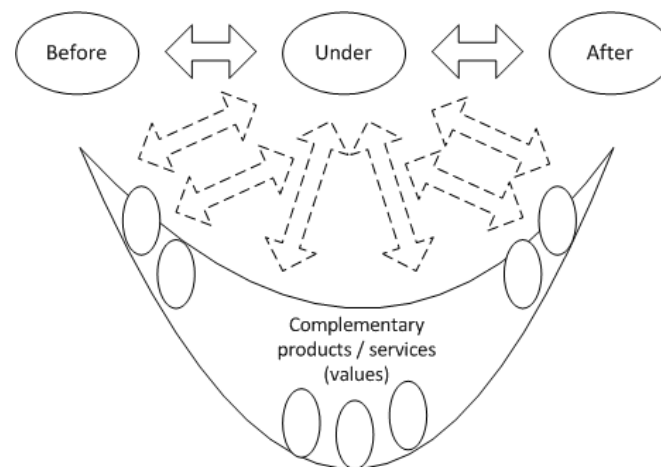


Figure 16 – The "Cradle to Grave" concept (Lindgren and Saghaug 2010)

Target customers can now also be considered to be digital and virtual B2B and B2C. There is an intense focus on target customers analyzing demands and needs to create enhanced value, this is also done by not only performing R&D in-house but moving innovation and R&D to the customer or as Bessant 2009 pronounced it "bringing back the customer into innovation". (Cinet conference Valencia 2009)

This creates new challenges for the internal **value chain** that needs to handle more value chains and different value chains - the physical value chain, service value (Hollensen, 2010) and virtual value chain. This increases the complexity level significantly. The focus is on incremental and radical innovations where users are integrated into the development process. New business opportunities are being born with the introduction of the Internet where goods can be sold virtually and also digitally.

This calls for whole new **competences** in order to handle the extended network structure where increasing number of partnerships are required, also the introduction of IT-systems demands new competences in order to handle the growing complexity of processes all through the company from production, to R&D, to Marketing and Sales. The shift from sequential innovation processes to cyclic processes where customers are actively drawn into the development process in order to enhance the efficiency of the innovation process is a core competence that companies have to take into account in order to stay competitive.

Network partners are becoming a critical element in the fourth generation of innovation models, more knowledge is needed about technology and even more knowledge about customer needs and demands. Initial signs are seen in strategic partnerships not only being physical but also digital and virtual, which has become reality with the World Wide Web. A company's network is significantly extended through the fourth generation to involve strategic partnerships with different partners e.g. universities, suppliers, customers and government agencies.

The increasing complexity also affects the **relations** internally and externally, from earlier generations of innovation models where relations mainly existed between departments where a project travelled through to this generation where cross-functional teams from different departments are put together to enhance development speed and efficiency. The growing number of external partners also sets new demands for relations that usually were internally based. With the introduction of IT-Systems relations are not only physical but also digital and the World Wide Web leads to virtual relations, which are now becoming more and more crucial for companies' survival.

Investments in IT-systems explode up through the fourth generation in order to enhance production and R&D speed to stay competitive. Innovation begins to take place in the clouds – in cyber space as illustrated in Figure 17 – Innovation moves to the clouds

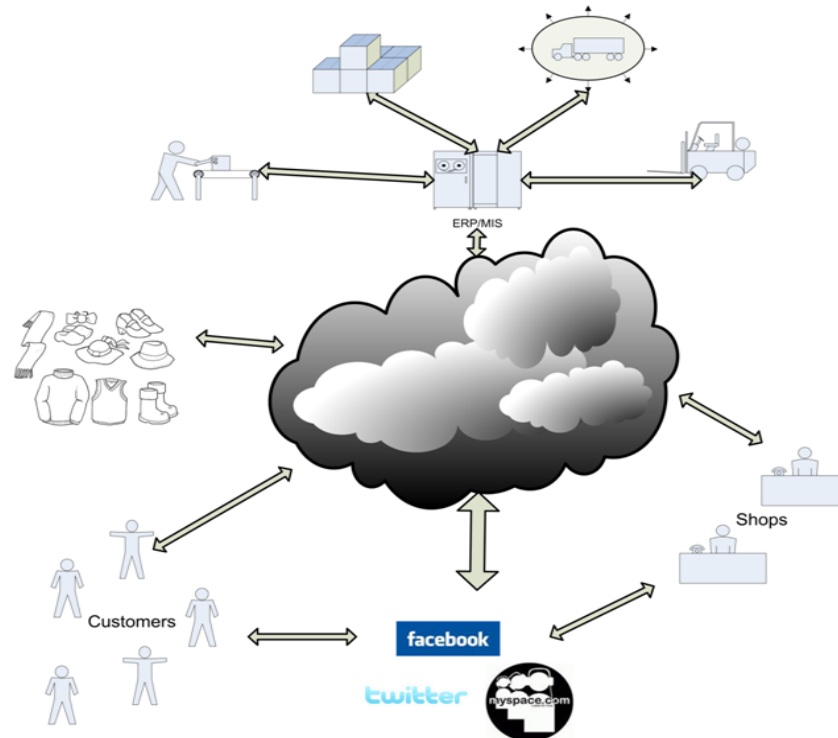


Figure 17 – Innovation moves to the clouds

Increasing efforts to get customers or 'lead users' engaged in the innovation process is an area where significant investments are made. The acknowledgement of Japanese Lean thinking forced western corporations to increase focus on cost reduction and control in production in order to lower waste, to stay competitive. In the end of the fourth generation e-business becomes a reality with the increasing interest in the Internet, creating whole new business model opportunities for companies, which makes it e.g. easier to transfer money from buyer to seller enabling a radical change in the whole **profit formula**.

The fourth generation of innovation models is the first model starting to acknowledge the importance of involving most of the building blocks in the business model innovation framework. Focus in innovation becomes now more and more a question of improvement in every aspect of the company's business model and every building block has to be focused at the innovation process. The value proposition becomes more specific, and the introduction of IT-systems radically changes how the companies value chain and organization functions internally and externally. In **Error! Reference source not found.** it is possible to see to which degree the individual building blocks are involved related to the innovation model.

Business Model Building Blocks Vs. Generations of innovation	Value Proposition	Target Customer	Value Chain	Competences	Networks	Relations	Profit Formula
Fourth (integrated)							
Main Change between 3 rd generation and 4 th generation models seen in a Business model context	The fourth generation innovation models become cyclical and incorporate networks of partners in the innovation process. This includes feedback paths so that adaptive steering and learning processes can be made more explicit making the innovation system more flexible, lead user are brought into the innovation process before commercialization in order to enhance efficiency and product quality.						

Table 8 – Fourth Generation Innovation Model vs. Business Model Framework

6.5 The Fifth Generation

During the 1990's (Rothwell, 1994; Hobday, 2005; Libecap, 2007; Tidd, 2006) the fifth generation innovation systems emerged, with integration and network based innovation models emphasizing learning within and between companies. The fifth generation innovation model is characterised by innovation fundamentally working as a distributed networking process.

The strategy trends established in 1980s continues e.g. with time-based strategy, integrated product and manufacturing strategy, technology strategy and a strong emphasis on quality and performance features. The 'fifth generation' BM innovation models are practically an implementation of the fourth generation, where further emphasis is focused on vertical relationships (strategic alliances, joint ventures, etc.) and with collaborating competitors. (Libecap, 2007; Hobday 2005)

Although the fifth generation model essentially is a development of the fourth generation it represents also the electronification of business model innovation (Rothwell 1994; Libecap, 2007, Lindgren 2010). The change from the fourth generation to the fifth generation lies within the electronification adding a whole new dimension to the field of business models and business model innovation.

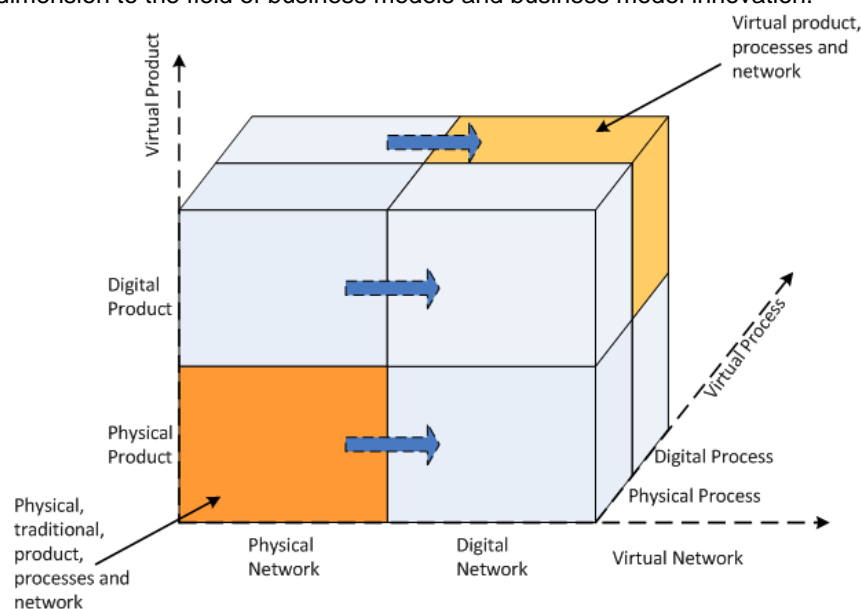


Figure 18 – Lindgren, Taran, Saughaug, Clemmensen 2009 “From Physical to Digital to Virtual Business model based on networks” inspired by Whinston, A. B. Stahl, D.O., and Choi, 1997

An interesting synergy and spinoff of the above mentioned is a development of a completely new and changed understanding of products and service – taking us from a product to the process view combined with the delivery or supplier methods seen as a process as seen in Figure 18 – Lindgren, Taran, Saughaug, Clemmensen 2009 “From Physical to Digital to Virtual Business model based on networks” inspired by Whinston, A. B. Stahl, D.O., and Choi, 1997

Business models become now not only physical, not only digital, not only virtual but commence to be based on building blocks – at the moment primarily products, services and processes that are continuously in process, integrated and connected, delivered in a continuously process - where ever and whenever the customer demands it.

Not only the product and the value chain is changed and brought into a process perspective. We see in this generation of innovation models that more and more companies begins to challenge – or innovate on all building blocks and start to think about how they can change the business model in the innovation processes – both individual, across building blocks and together – creating interesting new business models. The first contour of the multi business model concept (lindgren 2010) seems to emerge and for which the fifth generation BM innovation models have some challenges to deal with.

The above mentioned development also gives some important input to next generation of business model innovation models. It is both a challenge of the future business model innovation models but also a big potential to new business models and new business model innovation model – a 6th generation of business model innovation models seems to be close to emerging.

The new advantages and trend in applying more electronic tools to the business model innovation process – with the aim of operating and moving more towards real time business model innovation and business model innovation models challenge the 5th generation BM innovation models tremendously. The need for increasing speed, effectiveness, efficiency and automation in the value chain and value development process across networks of innovation and across the building blocks of the BM challenge the capacity to the 5th generation model.

The Internet brings innovation up into the ‘clouds’ creating new opportunities for innovating business models, which in many cases are intangible opportunities, as seen in Figure 17 – **Innovation moves to the clouds**

However the internet also puts some critical questions about safety, security, IPR, protection of core competences. A paradox of maximizing the freedom to BM innovation together with maximizing the security when opening up one’s competences, core competences and business model to the world becomes of outmost importance. What about security and what about profit on intangibles and which model of profit formula to choose?

The fourth and fifth generation marked the ‘dot-com bubble and following the burst covering the period 1995-2010, where rapid growth in Internet-based companies who experienced massive investment attention. By 2001 the first bubble was deflating at full speed, where several dot-com’s ceased trading, burning through their venture capital. This event gave birth to a new discussion on the term business models, which have gained increasing awareness both in literature as wells as in organizations (Amit et.al 2010).

Companies began to realize the importance of considering their business model and innovating their business model to secure competitive advantage. Amazon.com – just one example - revolutionized online bookstore sale and later expanded the business to include CDs, Movies and various other products. Amazon moved on and has now evolved to be one the most popular online vendors in the world.

The initial business model was simple; use the Internet rather than the conventional value chain to reach customers. The virtual value chain (Hollensen 2010) was introduced. Apple – another good

example – changes completely the game of business model innovation and ended up by 2010 to be the number one business model innovator.

Open Source got some growing attention from 2005 – 2010. More companies and organizations were now actively and seriously considering and implementing Open Source Software instead of expensive licensed software from e.g. Microsoft or Oracle into their core business model.

Many start-up companies build their business model on Open Source - because it was free, contributing to a leaner start-up process reducing costs. The big companies followed this trend. Software companies were increasingly programming with Open Source software, and sharing some of its code with communities, who could not initially be considered as customers but just as contributors in developing the software. This mega trend began to change the context of business model innovation and how business models were created. Openness, visually, sharing and speed of innovation research a new dimension.

Github.com - an example of one company specializing in handling such open source programming for other companies, who want to share their “open source code” - came out of the sky just within 2 years late 2008 - becoming a major player in the market of “social coding” or “social innovation”.

Until now Open Source had not been considered stable enough for companies to practice, but as software developers were getting better at using open source and developing open source - the Open Source software was suddenly getting a major player and component in many companies.

Virgin America was one of the first big companies, who shifted a large part of their software from expensive licensed companies such as Microsoft, to free online Open Source software, reducing costs significantly.

The increasing openness and complexity in innovation encouraged the fifth generation innovation system to involve and consider more stakeholders than had been seen in the fourth generation - e.g. competitors, in-house functions, suppliers, customers and external collaborators.

The main characteristics of the fifth generation can be concluded into these areas:

- Greater overall organizational and systems integration (including external networking);
- Flatter and more flexible organizational structures, including devolved decision making;
- Fully developed databases;
- Electronically assisted business model development;
- Effective and external electronic linkages
- Increasing use of free and open source



Figure 8: Google becomes the Internet's most visited website.

business model life cycles were decreasing rapidly.

Furthermore customers and users are getting more influence and more involved in development of new values. They are also becoming on the one side far more quality minded concerning both products and services and having an increasing focus on the perceived value benefit of a product and/or service, changing the innovation task to a high complexity level but on the other side also more and more willing to try products and services that were only earlier beta types.

In table 9 the characteristics are elaborated along with the underlying strategic elements. During the 1980s and early 1990s the speed of development became more and more evident for companies to be a ‘fast innovator’ where it was seen as an important factor determining a company’s competitiveness. The Internet opened up whole new business opportunities where it became even more imperative to be fast innovators as rates of technology change increased significantly and



Figure 9: The iPhone Revolutionized the Smartphone

This leads to a new criteria for success where the early criteria’s where short-term based on cost and long-term based on improvement especially performance - is changed to focus short-term on time and

long-term on learning to now including an imperative need for controlling the product development speed separating the R from the D (Hobday, 2005; Rothwell, 1994; Nobelius, 2004).

Companies such as Google, Facebook and Apple with their iTunes and Iphone apps business are experiencing rapid growth and have shown remarkable skill in controlling the development speed and fitting their business to shorter and shorter product cycles. Figure 20 adapted from Hobday (2005) presents some base characteristics and underlying strategic elements of the fifth generation model.

Underlying Strategic Elements	<ul style="list-style-type: none"> - Time-based strategy (faster, more efficient product development) - Development focus on quality and other non-price factors - Emphasis on corporate flexibility and responsiveness - Customer focus at the forefront of strategy - Strategic integration with primary suppliers - Strategies for horizontal technological collaboration - Electronic data processing strategies - Policy of total quality control 			
Primary Enabling Features	<p>Greater organizational and systems integration:</p> <ul style="list-style-type: none"> - Parallel and integrated (cross-functional) development process - Early supplier involvement in product development - Involvement of leading-edge users in product development - Establishing horizontal technological collaboration where appropriate 	<p>Flatter organizational structures to gain flexibility:</p> <ul style="list-style-type: none"> - Greater empowerment of managers at lower levels - Empowered product champions/project leaders 	<p>Fully developed internet data-bases:</p> <ul style="list-style-type: none"> - Effective data sharing systems - Product development metrics, computer-based heuristics, expert systems - Electronically assisted product development using 3D-CAD systems and simulation modeling - Linked CAD/CAE systems to enhance product development flexibility and product manufacturability 	<p>Effective external data link:</p> <ul style="list-style-type: none"> - Co-development with suppliers using linked CAD systems - Use of CAD at the customer interface - Effective data links with R&D collaborators

Table 9 – Characteristics of The Fifth Generation in Terms of Underlying Strategic Elements and Primary Enabling Factors (Chaminade & Roberts,2002)

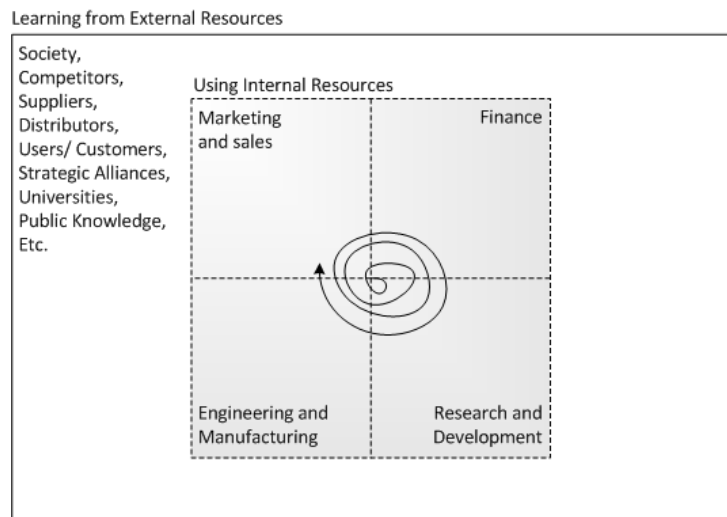


Figure 20 – The General Structure of Fifth Generation Innovation Processes (Systems and Networking Model) (Hobday, 2005)

6.5.1 Advantages and strengths

The fifth generation of innovation models included various potential long-term benefits, especially the efficiency and real time handling of information across the whole system of innovation which was a great advantage which includes internal functions, suppliers, customers, and collaborators. The strengths in the fifth generation innovation model lies in the process of parallel information processing, one in which electronic information processing and the more traditional informal face-to-face human contact operates in a complementary manner.

6.5.2 Disadvantages and weaknesses

The fifth generation innovation models left however an increasing need for knowledge management behind in order to handle and systematize tacit and explicit knowledge. The protection of IPR and knowledge comes into focus because how can IPR, knowledge and core competences be protected in an open, dynamic, flexible and integrated physical, digital and virtual innovation environment. Chesbrough 2005 and 2008 argues to open up the IPR and even to open up companies business models to others to increase value and market opportunities. However Chesbrough never came up with an answer to the paradox of security/safety and freedom/openness.

6.5.3 Business Model Discussion

The electronification of the innovation system results in a radical change and opening of the companies' **value proposition(s)** making it possible to offer high quality products, services and processes specified to fit customer demand in both the physical, digital and virtual world/market. The business model innovation process was brought closer to the customer, inviting lead users, users and customers to play an active role in innovation of new values.

Another distinctive element influencing the value proposition in the fifth generation is the Internet, creating business opportunities that before were unthinkable. Values could now be delivered to customers which now not only included physical products and services but also involve digital and virtual products and services such as the customers designing and buying online clothes for their avatar in Second Life, figurers in World of Warcraft which later can be traded online, intangible products, services e.g. in Farmvill.com environment.

The network building block comes to play an even bigger role in the Business model and the innovation process because network of different kinds and with different connections to various business models and practice begin to be deeply involved and of major importance to even realize and commercialize a BM. Yet independent in each BM innovation projects we see the first tendency of a change in value focus from a product and service value focus to a process and network partner value focus. It is a change from values as standalone values to values as value relations, shared values and value relation networks. A first tendency to focus on values related to society is emerging (Fines roadmap 2011).

The complexity of defining a company's **target customers** hereby becomes significantly difficult. Companies now have to consider chain of customers, customer life-cycles, vertical and horizontal customers, communities, and customers and even networks with different values. The target customers are though still mainly B2B and B2C but they have been broadened by the Internet to now include digital and virtual customers exemplified in Second Life, Zynga's Farmville and World of Warcraft. Furthermore new market segments are rising such as Customer to Customer (C2C) where eBay is a major player, which makes it possible via auctions to create a situation where customers are both buyer and seller.

EBay is in this context operating with a high level of BM innovation offering not just a BM but a business model platform – “a eco system for BM’s”, where different business model can be attached and transfer their values to customers and other BM’s. A “BM eco system” – a business model platform - was introduced as by Apples Apps system. Apple show hereby a nice example of a business model platform, where the producers of Apps – the App industry – produces apps to the business model platform – like the furniture industry in old days produced furniture to the big chains of furniture's – IKEA, Sears, Metro. Innovating a ecosystem for BM’s is far more complex than innovating a single BM. It also challenges existing BM innovation models as it has to cover more BM at a time and support BM innovation on a system level.

Business to Governments (B2G) has been steady growing in attention. The Internet creates new possibilities for companies doing business with governments, public sectors and society. The trend is that BM innovation is moving from a company level to a higher level, where a society level is one of these levels. This will be comment upon in the sixth generation BM innovation model.

This results in target customers being giving an even bigger and more central role in the innovation process, enhanced by the advance of the Internet, which gave companies' a unique possibility to narrow down who the essential target customer is, a close to 360° view of customers and a much more close understanding of what values the individual customer possess before – under and after the buying process.

The electronification of the innovation system and the evolution of the Internet into the business world gave new challenges for the internal **value chain**. The complexity of the value chain increased significantly, it was no long enough to focus on the physical value chain and the service value chain, but as seen in the fourth generation the service value chain needed even more attention together with a new element introduced in form of the virtual value chain. Companies increasingly set up virtual value chains who only exists when there was a task for them (Coldmann and Price 2004, Vervest et al 2005).

Production of virtual goods, virtual services alone and as a supplement to the physical products forced the value chain in businesses into new dimensions and innovation – with the aim to both serving the traditional physical market, the digital market and also the virtual marketplace. The first sketch and contour of the integrated physical, digital and virtual value chain was seen.

This became a reality because of the Internet and created a whole new understanding of the value chain setup – an understanding and operation of chains of value chains both physical, digital and virtual supported by a continuous expanding network comprised of both physical, digital and virtual suppliers, customers, competitors etc. The virtual value chain, introduced by (Rayport & Sviokla, 1996) seen in Figure 21 – The virtual value chain as a supplement to the physical value chain adapted from Hollensen (2010) below extends the conventional value chain model; it treats information as a supporting element in the value-adding process. It furthermore shows how information can be used to create value.

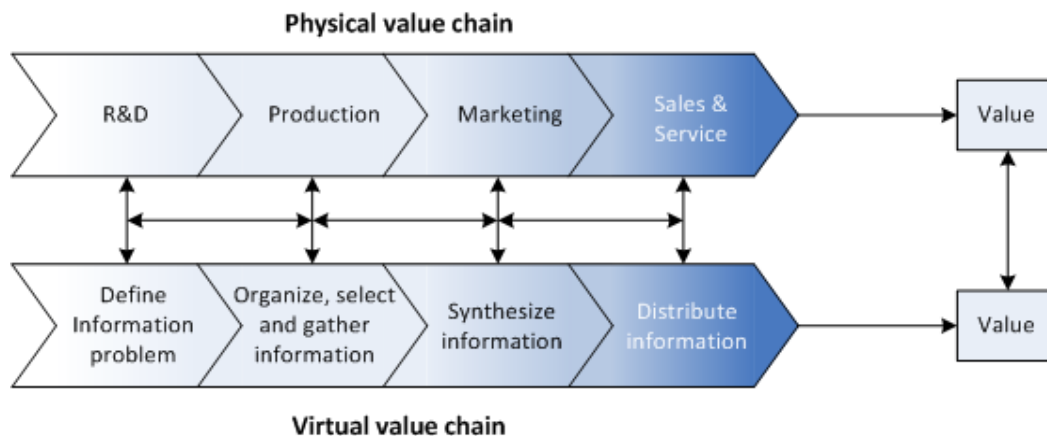


Figure 21 – The virtual value chain as a supplement to the physical value chain adapted from Hollensen (2010)

As in the fourth generation innovation models focus was both on incremental and radical innovations, where customers and now also network partners are playing a still more increasing active part in innovation of the business model.

The view on competences also changed in the fifth generation innovation model from being focused on having all **competences** largely based in-house to establish an understanding of one's core business and the core competences needed to run this business, and then outsourcing other parts of the company to network partners with core competences in a particular field.

Outsourcing and sourcing were the big mantras – where new companies evolve as born globally and born virtually, which set a whole new standard to competence innovation in business model innovation and business model innovation models. The necessity for being a fast business model innovator eventually becomes somewhat equal with business success and survival in high competitive industries.

The extended value chain leads to a continuously expanding **network** involving e.g. even competitors, in-house functions, suppliers, customers and external collaborators, strategic alliances, joint ventures, governments, public knowledge etc. Network partners are now both physical, digital and virtual which increases complexity and increases the need for focus on knowledge management but also to knowledge relationship management – The Innovation Super Highway (Amidon 2008).

Finding and leveraging competences from the right network partners seems to be an even more critical task in the fifth generation innovation models where knowledge in technology, market, network and competences inside the company is all in all a crucial element in a company's business model to perform innovation leadership.

Relations come to play a key role in fifth generation innovation models as internal complexity increases and the need for finding and maintaining long term relationships with customers, suppliers and other network partners needed to fulfill competence gaps or other functions for the focal company. Relations to many of the other building blocks in the business model are now becoming increasingly digital and virtual, which makes communication across business models possible – though just seen fragmented in the last period of the fifth generation.

With companies becoming more global, relations plays an important part in the internationalization of a company, where different entry barriers exist on new markets, where relations as well as network can help ease the entry process. Relations have come to play a whole new part in the society, with the introduction of Facebook and LinkedIn, which brought relations into the center of attention in our society, creating a whole industry called 'social networking' building on peoples relations to one another.

The evolvement of the digital and virtual marketplace creates whole new market places and new possibilities for company's **profit formula**; a company can now have open 24-hours a day serving customers world-wide. Business models starts to get increasing attention. The way to attract new customers and increase number of recurring customers by modeling the profit formula, such as done by the **freemium** model (Anderson, 2009) gives birth to a new important phenomenon in business – the users.

Ryanair e.g. changed the game in commercial air flight industry, where it offered cheap tickets, but charged the customer for everything else from baggage check-in to priority seating and now to visit the lavatory during a flight. Another sign of the upcoming multibusiness concept is users as persons who don't pay for a products, services and processes, but contribute to innovation, reputation and developing critical mass so that other customers and other customer groups together with other business models becomes possible and achievable as seen in Figure 22 – User Innovation Curve

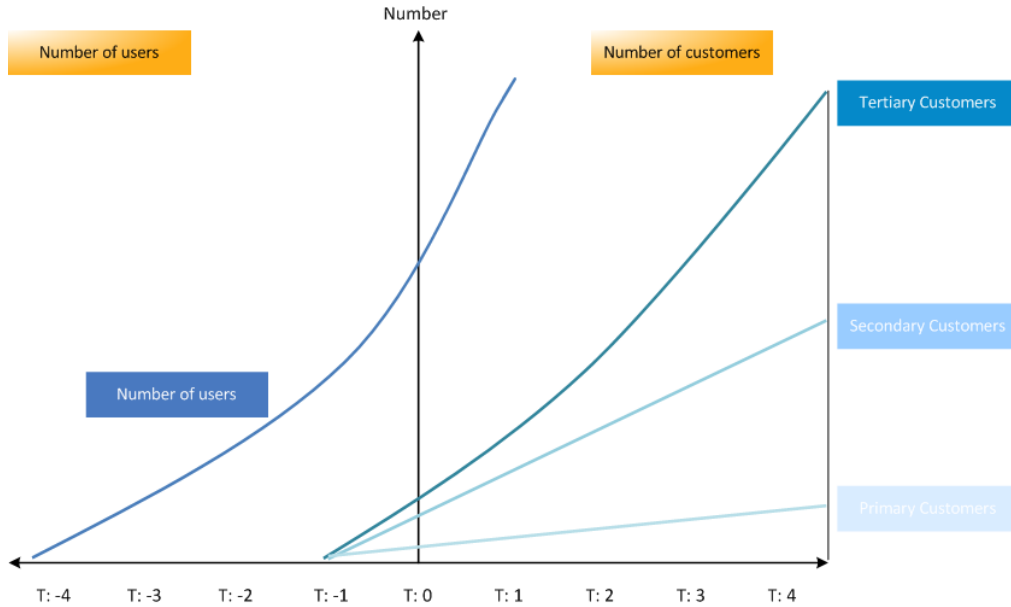


Figure 22 – User Innovation Curve

Virtual born companies only offering digital and virtual products and services has these opportunities as their costs are often far lower than e.g. a traditional manufacturing company, and at the same time the Internet give the possible to reach a mass market that has never before been accessible to them and especially small enterprises.

The fifth generation of innovation models can be argued to be the most complete yet, when analyzed in connection with the business model framework (Taran, 2010). In a business model building block perspective it takes all seven building blocks of the business model framework into account and into innovation, and treats them with equally intense effort as seen in table 10

Business Model Building Blocks Vs. Generations of innovation	Value Proposition	Target Customer	Value Chain	Competences	Networks	Relations	Profit Formula
Fifth (integrated)							
Main Change between 4 th generation and 5 th generation models seen in a Business model context	Electronic tools are employed in order to operate real time and the company network continues to expand. The Internet is playing an important role in the innovation system by opening up new windows for creativity.						

Table 10 – Fifth Generation Innovation Model vs. Business Model Framework

Further the innovation model adds two new dimensions to the business model – the vertical and the horizontal business model dimension. This has also to be covered by the BM innovation model but they are not covered as such in the fifth generation innovation model because this focus on single business model innovation and not multi business model innovation.

6.5.4 Summary

Table 11 adapted from Rothwell (1994), Libecap (2007), Tidd (2006), Hobday (2005) and Chaminade (2002) gives an overview of five generations of business model innovation models where it is possible to see the explanation of why the different generations of innovation models has changed significantly from one generation to another.

Organizational structures behind the business model innovation models changed over the generations from functional structures to matrix structures and further on to network structures. With each generation various disadvantages followed a new generation, which tried to overcome these - but inevitably lead to new challenges or disadvantages.

The first generation of business model innovation models handled the innovation from department to department and was challenged and had to move into a multi-disciplinary project process. This became a standard for the **second generation** and later generations.

Innovation projects organized in direct relationship with a company’s strategy was a characteristic of **the third generation**. The transition to **the fourth generation** involved increased focus on external and internal partners which in a network organize innovation context created new challenges.

The combination of the first and second generations’ technology push and demand pull model are in later generation combined because more attention was lead to the notion that market and technological aspects were considered to be important throughout the whole innovation process.

Feedback loops were in this context introduced in the innovation processes. The need for re-evaluation of previous steps during the innovation process raised concurrently with the increasing complex and multi-phase processes furthermore the focus on innovation activities organized more in parallel to increase speed of development. (Libecap, 2007)

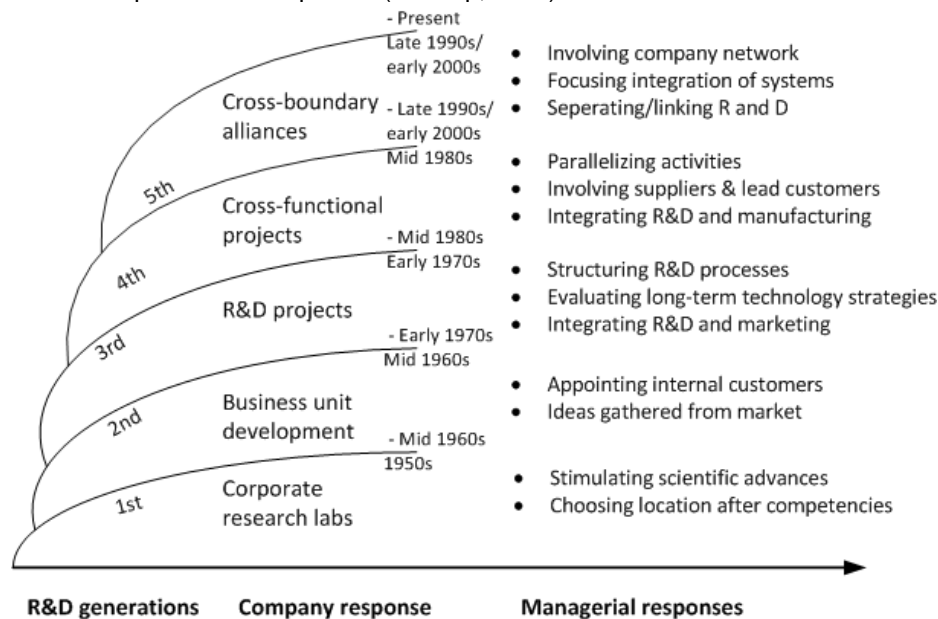


Figure 23 – Visualization of five generation business model innovation models adapted from (Nobelius, 2004)

The challenges in managing R&D and innovation processes as can be read above changed throughout the years from being focused on science, then to market, then a combination over to an integrated focus and in the fifth focused more around networks.

It is possible to see that some issues have stood their ground and others have arisen such as the need for competent employees, extensive knowledge about technology and market trends. This view is

more cumulative and evolution-oriented in contrast to the static description of the five generations of business model innovation models (R&D) as seen in table 11.

A more dynamic presentation of the five generation can be seen in Figure 23 adapted from Nobelius (2004), here are noted both five generations related company responses and managerial approaches. Table 11 summarizes the five generations, the first column considers estimated time period in which a specific generation has functioned. The second column describes the philosophy and main characteristics of the generation in focus as well as the specific generation's main disadvantages. The last column takes a brief consideration about the structure of the innovation process that prevailed during each generation.

Description of the generations	Advantages and strength	Disadvantages and weakness	Structure of the innovation process														
<p>Technology push. (1950s- mid 1960s) The industrial innovation process was generally perceived as a linear progression from scientific discovery, through technological developments in the firms, to the market place. Because science is seen as the starting point.</p> <table border="1" data-bbox="174 495 720 560"> <tr> <th colspan="7">BM building blocks</th> </tr> <tr> <td>VP</td> <td>TC</td> <td>VC</td> <td>C</td> <td>N</td> <td>R</td> <td>PF</td> </tr> </table>	BM building blocks							VP	TC	VC	C	N	R	PF	<p>Preferable when unlimited resources to innovation are given and when it is the aim to innovate and develop technological products in a fast pace. Scientists are given maximum freedom to innovate and develop radical new innovations – no restriction in the BM innovation model as such.</p> <p>Preferable when the innovation task and success criteria of the BM innovation projects are very clear and narrow – related primarily to solving technology challenges and radical technological innovations.</p>	<p>Little attention is paid to the transformation process, or the role of the market place Scientific freedom is more important than the relevance and of the research No strategic goals in projects, maybe short-term goals on the project level. No direct relationship with general management Commercial aspects are incorporated late No project leader is appointed and therefore final responsibility is not clear. Professional project management practices are not applied</p>	<p>Linear sequential process from department to department starting with scientific discovery</p>
BM building blocks																	
VP	TC	VC	C	N	R	PF											
<p>Market Pull. (mid-1960s – early 1970s) The market role is the source of business model innovations and the R&D organization merely has a reactive role.</p> <table border="1" data-bbox="174 755 720 820"> <tr> <th colspan="7">BM building blocks</th> </tr> <tr> <td>VP</td> <td>TC</td> <td>VC</td> <td>C</td> <td>N</td> <td>R</td> <td>PF</td> </tr> </table>	BM building blocks							VP	TC	VC	C	N	R	PF	<p>Preferable when the innovation task is still very simple – (incremental BM innovation) and very clearly defined with a primary focus on market and consumer direct needs and demands – and not particularly on customers wants.</p> <p>Preferable when companies needs to narrow the success criteria down to focus on primarily the same purpose and primarily short term success criteria as cost and to some extend performance.</p>	<p>Neglects long-term R&D programs and therefore leads to “incrementalism” Projects are individual units, strategically relationships between these projects and corporate goals were not yet established. It was impossible to serve company goals that superseded the interests of separate internal clients</p>	<p>Linear sequential process in a project, starting with market need.</p>
BM building blocks																	
VP	TC	VC	C	N	R	PF											
<p>Market pull and technology push combined (early 1970s - mid 1980s) Business model Innovation is a process that at each stage enables interaction between technological capabilities and market needs. Communication networks link R&D to in-house functions and link the firm to scientific and technological communities as well as to the marketplace. The goal of the portfolio of projects are aligned with the corporate strategy</p> <table border="1" data-bbox="174 1161 720 1226"> <tr> <th colspan="7">BM building blocks</th> </tr> <tr> <td>VP</td> <td>TC</td> <td>VC</td> <td>C</td> <td>N</td> <td>R</td> <td>PF</td> </tr> </table>	BM building blocks							VP	TC	VC	C	N	R	PF	<p>Preferable when the combination of technology push and market pull with the introduction of feedback loops and communication networks with partners' in in focus with the aim of changing the value proposition, reduce the level of wasteful failures to heightening the innovation success level.</p> <p>Preferable when innovation essentially still functions in-house and when the value proposition still is not considered most central - Value focus and value innovation are developing towards the customer's wants – and not any longer purely needs and demands.</p>	<p>Focuses on product and value chain innovations rather than market and organizational business model innovations Focuses on the creation of innovations rather than the exploitation Focuses on evolutionary improvement rather than breakthroughs</p>	<p>Model of an essentially sequential process with feedback loops and interaction with market needs and state of the art technology at each stage</p>
BM building blocks																	
VP	TC	VC	C	N	R	PF											

Description of the generations	Advantages and strength	Disadvantages and weakness	Structure of the innovation process														
<p>R&D in alliances. (mid 1980s – early 2000s)</p> <p>Parallel and Integrated R&D. R&D departments are in a network of internal departments and external organizations. R&D management means managing research links, networks and external research environments. Because of the number of actors involved, development processes are scheduled in parallel.</p> <table border="1" data-bbox="176 570 732 630"> <tr> <th colspan="7">BM building blocks</th> </tr> <tr> <td>VP</td> <td>TC</td> <td>VC</td> <td>C</td> <td>N</td> <td>R</td> <td>PF</td> </tr> </table>	BM building blocks							VP	TC	VC	C	N	R	PF	<p>Preferable when cyclical routines and networks of partners in the innovation process are incorporate. The model includes feedback paths so that adaptive steering and learning processes can be made more explicit making the innovation system more flexible.</p> <p>Good when lead user are brought into the innovation process before commercialization in order to enhance efficiency and product quality.</p>	<p>Increased networking and integration with internal and external partners increases complexity</p> <p>The level of corporation and communication is to low and difficult to handle</p> <p>Inflexibility in the structure of business model innovation processes</p>	<p>Coordinated process of business model innovation in a network of partners. The required coordination is often attained by system integration (with key suppliers and customers) and parallel development (of components or modules of the innovation)</p>
BM building blocks																	
VP	TC	VC	C	N	R	PF											
<p>Innovation networks. (early 2000s – present)</p> <p>Relies increasingly on electronic tools operating real time enabling increased speed, efficiency and automation across the network of business model innovation, widening the business model innovation system. There is a need for controlling the business model innovation speed which separates the R from the D.</p> <table border="1" data-bbox="176 959 732 1019"> <tr> <th colspan="7">BM building blocks</th> </tr> <tr> <td>VP</td> <td>TC</td> <td>VC</td> <td>C</td> <td>N</td> <td>R</td> <td>PF</td> </tr> </table>	BM building blocks							VP	TC	VC	C	N	R	PF	<p>Included focus on various long-term benefits, especially the efficiency and real time handling of information across the BM innovation model system including internal functions, suppliers, customers, and network partners. Enables parallel information processing, one in which electronic information processing and the more traditional informal face-to-face human contact operates in a complementary manner. Electronic tools are employed in the BM innovation model in order to operate real time and the company network continues to expand. The Internet plays an important role in the BM innovation system by opening up new windows for creativity.</p> <p>The BM innovation model adds two new dimensions to the business model – the vertical and the horizontal business model dimension. Focus is still on single business model innovation and not multi business model innovation.</p>	<p>Increasing need for knowledge management in order to handle and systematize tacit and explicit knowledge.</p> <p>Protection of IPR and knowledge comes into focus because how can IPR, knowledge and core competences be protected in an open, dynamic, flexible and integrated physical, digital and virtual innovation environment</p>	<p>Same basic structure as in fourth generation. The business model innovation process is electronificated and further emphasis is on vertical relationships (strategic alliances, joint ventures, etc.) and with collaborating competitors</p>
BM building blocks																	
VP	TC	VC	C	N	R	PF											

Table 11 – Short Description of The Five Generations of Business Models on Innovation Management Rothwell (1994), Libecap (2007), Tidd (2006), Hobday (2005) and Chaminade (2002)

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Appendix 1. Source of Inspiration to BM Building blocks

Building Blocks	Description	Added description	Core questions	Theoretical Background - baseline	Tools for measuring - today
Value Proposition/s	Product, Services, Processes - Physical, Digital and Virtual	Value proposition/s (products, services and processes) that the company offers. Wants, Demands, Needs	What do we provide to our customers?	<ol style="list-style-type: none"> 1. The Marketing point of view (Philip Kotler, 2000) (Tzeng et al., 1998) (Derek F. Abell 1980) 2. The Customer point of view (Kotler, 2000) (Derek F. View) 3. The Technical point of view (Ulrich & Eppinger, 2000) 4. The Design Point of view (Verganti et al., 2001) 5. The network point of view (Håkansson & Johanson, 1992) (Child and Faulkner, 1998), (Coleman & Price 2000) 6. Value in business markets: What do we know? Where are we going? (Lindgreen et al., 2005) 7. The Strategic view (Derek F. Abell 1980) 8. The Blue and red Ocean View (Mabourgne et al - Blue Ocean 2008) 	<ol style="list-style-type: none"> 1. The Strategic canvas and six path framework analysis 2. Kotlers core benefit "Ring model" 3. Attitude and Attribute measuring 4. Con Joint analysis 5. Defining the Business framework "Lindgren 2002 inspired by Derek F. Abell's model" 6. Value analysis in B2B markets "Reeder R., et al. 1991) (Kotler 2000) 7. Network value analysis (Child and Faulkner 1998) 8.
Customer	Customer - B2C, B2B - Physical, digital, Virtual Customers - (Chains of Customers)	Target customer/s , B2c B2B B2G market segments and geographies. Target Markets Global markets Bottom of the Pyramid	Who do we serve?	<ol style="list-style-type: none"> 1. The Marketing View (Philip Kotler 2000, Hollensen 2010) 2. The E-business view - Physical, Digital and Virtual View (Efraim Turban 2010 inspired by Choi et al 2002) 3. Mabourgne et al - Blue ocean 2008 4. The Global market view (Hollensen 2010) 5. The Long tail view (Anderson C. 2006, 2008) 	<ol style="list-style-type: none"> 1. B2C customer 2. B2B customer 3. G2C customer 4. G2B customer (Kotler 2000, Hollensen 2010) 5. Segmentation analyses (Kotler 2000, Hollensen 2010) 6. Potential and real market, customers (Kotler 2000, Hollensen 2010)
Value Chain	Value Chain according to description from M. Porter with all the primary and secondary function	Value chain configuration [internal]	How do we provide the values to the customers?	<ol style="list-style-type: none"> 1. The Competitive Advantage: Creating and Sustaining Superior Performance. (Porter, M. E., 1985 Van Nostrand) 2. Value Chain a) Physical, Service and Virtual Chain analyses (Hollensen, Svend 2008 Prentice Hall) 3. Svend Hollensen - The Chain of value chains 4. Value Stream Mapping (Toyota - lean) 5. Value Mapping (Andrew 2001) 	<ol style="list-style-type: none"> 1. Value Chain - single based primarily intra company based - a) Physical value chain b) Service Value Chain c) Virtual Value Chain analyses 2. The chain of value chains - first stage - (Hollensen 2010) 3. Value Stream Mapping
Competences	Competences and core competences	Competences (assets, processes and activities) that translate company's inputs into value for customers (outputs).	What are our competences? What are our core competences?	<ol style="list-style-type: none"> 1. The core competence of the corporation (Prahalad & Hamel, 1990, Harvard Business Review) 2. Core Competences related to Five Forces Michael Porter 1985 3. Competence Strategy (Drejer, A. & Riis, J.O., 2000, Børsens Forlag, ISBN 87-7553-740-0) 4. Exploring Coporate Strategy 2005 Johnson and Scholes 	<ol style="list-style-type: none"> 1. Competences - technology, knowledge 2. Core Competences analysis 3. Core Competences and five forces analysis Michael Porter
Networks	Physical, digital and virtual networks	Network and Partner network : strategic partnerships, alliance, joint ventures, communities, portals,	Who are our network?	<ol style="list-style-type: none"> 1. Child, J. & Faulkner D., 1998 2. Strategies of Co-operation – Managing Alliances, Networks, and Joint Ventures' (Nagel & Price, 1998) 3. Agile Competitors and Virtual Organizations' (Goldman et.al, 1995, Van Nostrand Reinhold) 4. Social network and social systems (Knoke and Kuklinski, 1982; Burt and Minor, 1983; Wellman, 1988; Scott, 1991) 5. Amidon D. Super High way - Knowledge zones 6. Verna Alee 	<ol style="list-style-type: none"> 1. Traditional network analysis 2. Personal networks (Wellman, 1988). 3. A structural network approach (Granovetter 1973, 1982). Weak and strong ties 4. Diffusion across subgroups within a system (Granovetter ...) . 5. A Third networks approach to diffusion - Structural Equivalence - Burt (1980, 1987) (the degree of equality in network position) 6. Other personal and social network characteristics (centrality, density and reciprocity (Rice, 1994; Valente, 1995). 7. A fourth model of diffusion networks with threshold effects - Threshold models of collective (Granovetter, 1978).
Relations	Physical, digital and virtual relations	Relationship/s (e.g. physical, digital, virtual, personal, peers, mass awareness).	What are our relations?	<ol style="list-style-type: none"> 1. Chaffey D. internet marketing 2. CRM - Mike Moran internet and Search Marketing Search Engine Marketing, Inc. by Mike Moran and Bill Hunt 3. Turban Efraim - E-commerce - Digital relationship 4. Andersen, J.C. & Håkanson & Johanson " Dyadic Business Relationship within a business network context. Journal of marketing 58, october 1 - 15. 5. Amidon Debra, The Innovation Super Highway - How to manage, benefit and profit from it? 6. Social Networks (Knoke and Kuklinski, 1982; Burt and Minor, 1983; Wellman, 1988; Scott, 1991) 7. Granovetter 2006 "Weak and strong ties" 8. Verna Alee 	<ol style="list-style-type: none"> 1) Relation ship analysis (2) Threshold models ((Granovetter, 1978; Macy. 1991) 3) Critical Mass analysis ((Marwell et al., 1988; Macy, 1990; Oliver et al., 1985; Oliver and Narwell, 1988) 4. Diffusion of innovation models ((Ryan and Gross, 1943; Rogers, 1983; Valente, 1993) 5. Diffusion of new communication technologies models (Markus, 1987; Rice et al., 1990) 6. Time-of-adoption of the innovation (Rogers, 1962; Coleman et al., 1966; Becker, 1970; Rogers and Kincaid, 1981)
Profit formular	Turnover - Cost = Profit Transaction cost economic model, resource-based economic model (complementarity of capabilities of firms),	Profit formula – both turnover structure, cost structure and revenue flow.	How do we make profit? What is our profitformular?	<ol style="list-style-type: none"> 1. Robert S. kaplan and Robin Cooper Cost & Effect - ISBN Harvard Business School Press Boston ISBN 0-87584-788-9 2. The Investor's Guide to Understanding Accounts: 10 Crunch Questions to Ask Before Buying Shares by Robert Leach (Paperback - 19 Jul 2004) 3. Amidon Debra, The Innovation Super Highway 4. Lindgren P. (2010) "39 Profit formular" 	<ol style="list-style-type: none"> 1. Transaction cost economic model 2. Resource-based economic model (complementarity of capabilities of firms) 3. Activity based costing 4. Balanced Score Card 5. "39 profit formular" Lindgren (2010)