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VIRTUAL GOODS SALES:
NEW REQUIREMENTS FOR BUSINESS MODELLING?

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ABSTRACT

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Selling virtual goods is an increasingly popular revenue model for operators of social online services, examples of which are virtual worlds and social networking services. Compared to more traditional revenue models, such as time-based pricing, the revenue generation logic in virtual goods sales has a tighter interdependence with service structures, such as the rules of internal economy and game mechanics. The sold products are in interaction with the virtual environment, both of which are designed by the developers. However, the planning of business models in synergy with such service design is not currently well understood.

This thesis adopts a conceptual-analytical perspective. By reviewing literature pertaining to virtual goods sales and virtual world services, this thesis seeks to identify business aspects of virtual goods sales. Identified aspects and theories are then synthesised under one model utilising conceptual business model frameworks.

The results provide a conceptual meta-model of virtual goods sales business, with further descriptions of business model components. Moreover, the results show business aspects that current business model frameworks cannot sufficiently describe. The thesis suggests modifications to current frameworks particularly pertaining to such aspects as user-generated content, service structure driven segmentation (self-selection), customer equity metric-driven development, and service context, which in virtual world design specifically includes game mechanics, social interaction design and rules of virtual economy.

KEYWORDS: business model, virtual world, game design, virtual economy, virtual goods, revenue model, marketing

TIIVISTELMÄ

Hamari, Juho
Virtuaalitavaroiden myynti: Uusia vaatimuksia liiketoimintamallinnukselle?
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Virtuaalihyödykkeiden myyntiä käytetään enenevissä määrin sosiaalisten verkkopalveluiden, kuten virtuaalimaailmoiden ja yhteisöpalveluiden, ansaintamallina. Toisin kuin esimerkiksi aikasidonnaisessa hinnoittelussa, virtuaalitavaroiden myynnin ansaintalogiikka on vahvasti kytköksissä palvelun sisäisiin rakenteisiin, kuten pelimekaniikkaan ja virtuaalitalouden sääntöihin. Myytävien tuotteiden suhteellinen arvo määrittyy vuorovaikutuksessa palvelun sisäisen rakenteen suunnittelun kanssa. Tämänkaltaista liiketoimintalogiikkaa ei ole kuitenkaan huomioitu liiketoimintamalliontologioissa.

Tässä opinnäytetyössä ongelmaa lähestytään käsitteellis-analyyttisesta näkökulmasta. Virtuaalitavaroiden myynnin liiketoiminnan ja virtuaalimaailmapalveluiden ominaisuuksia tunnistetaan kirjallisuuskatsauksen avulla. Tunnistettuja malleja ja teorioita yhdistetään käyttäen käsitteellisen tason liiketoimintamalliviitekehystä.

Työn tuloksena esitetään abstrakti mallinnus virtuaalihyödykkeiden myynnin liiketoimintamallista sekä kuvaukset liiketoimintamallin komponenteista. Lisäksi johtopäätökset tuovat esille sellaisia sosiaalisten verkkopalveluiden liiketoiminnan ominaisuuksia, joita tämänhetkiset liiketoimintamalliontologiat eivät pysty kuvaamaan. Lisäyksiä liiketoimintamallinnukseen ehdotetaan liittyen käyttäjien luomaan sisältöön, palvelurakenteesta johdettuun käyttäjäsegmentointiin, asiakassuhdevetoiseen kehitykseen sekä palvelukontekstin suunnitteluun, joka virtuaalimaailmoiden kohdalla erityisesti sisältää pelisuunnittelun, virtuaalitalouden ja sosiaalisen vuorovaikutuksen kokonaisuudet.

AVAINSANAT: liiketoimintamalli, virtuaalimaailma, pelisuunnittelu, virtuaalitalous, virtuaalihyödykkeet, ansaintamalli, markkinointi

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1. INTRODUCTION

1.1. Background

During the last decade, selling virtual goods such as swords, magic potions, clothes, badges, virtual houses, and virtual currencies has become a notable revenue model for online services. Some say (e.g. Lehdonvirta 2009) that people buy virtual goods for the exact same reasons they buy material goods. Selling some goods to customers can be considered as the most traditional form of business and respectively business model frameworks should be sufficient for modelling such businesses. However, virtual goods exist in the virtual world, are bound by rules of virtual economies, and are defined by gameplay, all created by the developers and operators of the virtual worlds. With these points in mind, this thesis asks the following question: How can we model virtual goods sales business? Does it present new requirements for business modelling in general?

One of the first services to implement virtual good sales as a revenue model was in 1997 in a MUD (Multi-User Dungeon) called Achaea developed by Iron Realms Entertainment. (Mihaly 2009). Since then, selling virtual goods has become a major revenue model for consumer-oriented online services, social networking sites, massively-multiplayer online games (MMOs) and virtual worlds in particular. This has especially been the case in the east Asian market, where the virtual goods sales model has quickly taken over the previously most commonly used subscription model (Nojima 2007; IDC 2007). According to popular estimates, the market size for virtual goods world wide is approaching $7 billion in 2009 and in east Asian market alone estimates move around $5 billion (e.g. Plus Eight Star 2009). The market size for the U.S. lays around $1 billion. An increasing growth in market sizes, in the amount of related services, and

user amounts arguably merit increased attention to virtual worlds and virtual goods and to the related business models.

The first virtual worlds were called MUDs (Multi-User Dungeons). They were largely text-based in contrast to today's graphical environments. The first MUDs were developed in the late 70's. Later, with the spread of more sophisticated network technologies and the rise of the internet, users could log into the services outside local networks and the services became truly multi-user. At the time, internet connections were scarce and expensive. Many online services used hourly pricing and so did virtual worlds. With the spread of internet connections it became possible to start charging monthly fees. (Bartle 1990.)

Along with the IT development, multi-user online environments started to develop into graphical virtual worlds commonly referenced as MMORPGs (Massively Multiplayer Online Role Playing Games), first with simple graphical worlds in the late 80's and three dimensional worlds in the 90's. Today's widely referenced MMORPGs are for example World of Warcraft and EVE Online.

Another strain of services developing alongside with virtual worlds were messaging applications, such as IRC (Internet Relay Chat), later instant messaging services, and today's Facebook and Twitter. These social networking services are also increasingly implementing virtual goods and game mechanics to add additional value proposition and monetisation enablers. For instance, the biggest virtual goods business currently, the Chinese Tencent QQ instant messaging service, generated over $1 billion in virtual good sales revenue in 2008 (Gurley 2009).

The other most common revenue models, subscription and advertising differ from virtual good sales in that the services' internal economy is not tied to the revenue generation logic, but revenue model is applied as a pricing model on top of the service. With virtual good sales model however the sold value offer-

ings are in interaction with the virtual worlds rules. Virtual worlds have gameplay and achievement hierarchies which developers use to create "needs" for virtual goods. In this way the developers can be seen to create and answer the needs of users simultaneously. This unique situation makes the virtual goods sales business model highly compelling subject of study.

This thesis concentrates on the interdependence between revenue generation logic and service design in virtual goods sales business models of virtual world operators. Business models of firms using virtual worlds as an additional channel or of those entrepreneurs selling virtual goods inside virtual worlds (such as Second Life) are outside the scope.

Nevertheless, the conclusions of this thesis will to a large degree be applicable to other online services as well. These mechanics are gradually more and more implemented in IM services and social networking services because of their effectiveness in monetisation versus advertising lead revenue streams (e.g. Gurley 2009).

1.2. Motivation

Beside the obvious dramatic rise of the virtual worlds and virtual goods sales noted in the last section, there are several other motivating factors for this line of research. First of all there is a lack of academic literature on business models of virtual world operators. While there is some literature classifying revenue models and discussing virtual world industry development, in-depth literature on virtual good sales model is lacking.

There is a large amount of varied industry discussion on virtual goods sales as a business model. One problem facing this discussion however is the lack of coherent structure to the discussion and the very different conceptions of what a business model should cover. For this reason a major part of this thesis will

concentrate on a conceptual examination of business model frameworks from prominent academic literature.

Virtual worlds and social networking services have been the forerunners in virtual good sales. Especially, free-to-play (freemium) and virtual good sales lead virtual worlds have spawned somewhat of a novel perspective to game and service design - "business game design" (e.g. Hamari and Lehdonvirta 2010; Johnson 2009; Cook 2009; Järvinen 2009). Hamari and Lehdonvirta (2010) identify and analyse several game design patterns that are parallel to marketing and suggest a synchronised effort of game design and marketing, as well as further tuning of business models. Johnson (2009)[1] also identifies that the traditional game design does not suffice with free-to-play virtual worlds, but the game design and business model have to match. Cook (2009) identifies "business game design" as a rising trend. Järvinen (2009) identifies several novel design specifics that the virtual worlds and social networking services require.

This novel approach to service design, including game design, virtual economic design and social interaction design is very under-represented in academic literature. This thesis aims to look at the gap between the aforementioned service design dimensions and business models, identifying how service design in virtual good sales business is used as a business driver.

1.3. Scope and definitions

1.3.1. Virtual worlds and goods

The term "virtual" has been used in a variety of contexts, most of which are somewhat unrelated concepts to actual virtual goods and virtual worlds dis-

[1] Johnson has been involved in development of famous computer games such as Civilization IV and Spore

cussed in this thesis. In information systems research field, the term virtual has long been used to address virtual reality, virtual as in digitalized knowledge or virtual value chain (Rayport et al. 1996) and virtual communities (e.g. Rheingold 2000; Hagel and Armstrong 1997).

In this thesis virtual worlds refer to networked, computer-simulated spaces, able to serve a large user populace, which mostly commonly interacts through an avatar. Castronova (2001) presented the most referenced defining attributes of virtual worlds. These include interactivity, physicality, and persistence. Interactivity refers to users being in interaction with the virtual world and other users. The actions of one person affect other users and the world. By physicality, Castronova refers to virtual worlds mimicking real world environments, by being 3-dimensional spaces and having similar physical laws. Persistence refers to the service continuously maintaining the state of the virtual world instance, contrary to for example common online games, in which the state of the space is frequently reset on purpose.

Digital goods, such as music and e-books, have been referenced as virtual goods. However, in this thesis the term virtual goods primarily refers to items such as swords, potions, avatar, virtual clothing, furniture, avatar skills, virtual currencies and virtual value-added service. One dividing factor between digital and virtual goods is scarcity (Fairfield 2005; Lehdonvirta 2009). The scarcity is achieved through the design and rules of the virtual worlds, whereas the scarcity in other digital goods is usually implemented by building the scarcity in the goods themselves with copy-protections. Most importantly virtual goods' value is commonly defined by the context wherein they exist – by virtual economy and other rules and structures of the virtual world.

Fairfield (2005) presented three defining attributes for virtual goods: rivalrousness, persistence, and interconnectedness. Rivalrousness refers to the scarce nature of virtual good, i.e. one good can only be used by a one person at a time,

contrary to digital goods, which can be copied indefinitely. Persistence refers to virtual goods being persistent, i.e. existing for a period of time without vanishing after e.g. a computer shut down. Interconnectedness refers to virtual goods being interactive among multiple actors in a given context.[2]

The virtual goods sales business model of virtual world operators is adopted as the subject for examination because the conventions of virtual goods sales through game and service design are most established within these services. Virtual good sales is nevertheless used as a revenue model in other services as well, most commonly in social networking services, but they are lacking in game mechanics so far. Nevertheless, there can be seen a convergence between game-like services and social networking services (Kim 2009). Virtual worlds are adopting social design from social networking services, which in turn are adopting game mechanics to incentivise for virtual asset purchases and for providing additional context.

1.3.2. Business models and modelling

The term business model has become somewhat of a buzzword in industry discussion. The term seems to be plagued with very inconsistent conceptualisations and understanding about what should be included in the models. In fact,

---

[2] While these defining attributes illuminate the nature of virtual goods in most cases and to some extent separate them from other digital goods, it is still only the decision of the virtual world designers if these attributes apply. There exists only an artificial reason for virtual goods not being copyable. The scarcity or the rivalrous nature of virtual goods is implemented by at least two reasons: 1) it balances the economy of virtual world, and 2) it maintains the user's incentive to buy virtual goods. In this respect rivalrousness is implemented for similar reason as in the music industry in forms of copy-protections. Persistence is as well a design choice. In practice designing virtual goods not being persistent might not be wise, although there exists non-persistent items as well. In several virtual worlds there are items that have a very short lifespan for gameplay reasons. Interconnectedness is parallel to Castronova's (2001) defining factors of a virtual world, wherein actions inside the world must have causal relationships. Fairfield (2005) refers to virtual goods not being in isolation, but in interaction with the virtual world and its users. I argue that interconnectedness can not be as easily defined for virtual goods. For example, a virtual good can exist in virtual world without users interacting with it or a virtual world might have separate instances for individual users, where the owner is alone and therefore not able to interact with others

papers discussing "business" from whichever perspective seem to be tagged and referenced as business model discussion. Clearly, the term suffers from inflation and one could ask why do we even need this term.

However, there is also a growing theoretical discussion on business models in academia. This field of research has attempted to define, conceptualise and create tools for business modelling. The business model discussion in general could be replenished if we found a unified framework and ontology for describing, designing and communicating business models. The business model literature is relatively young, but a consensus on business model definitions has been relatively well reached and some business model frameworks exist. This stream of research has been able to justify the importance of business modelling by filling the gap between firm strategy and processes. However, these conceptualisations and tools seem to have failed in reaching business practitioners. Perhaps one reason for the undervaluation of these concepts is due to the assumed complexity. One of this thesis' aim is to bring business model literature a step closer to practitioners by applying current frameworks in business model analysis and thus providing some example usage of these frameworks.

One source of confusion in discussing business models is that there are a few semantic layers to the term. Most importantly one has to differentiate between instance level and conceptual understanding of the term. The conceptual models concentrate on defining business models, elements that comprise them, and common characteristics that different types of business models have. Instance level business models, on the other hand, describe a real world business model (for example a business model of IBM) that a firm uses. Simply, the conceptual levels define what should be included in the modelling and designing of instance level business models. (Osterwalder, Pigneur and Tucci 2005.)

Having identified these shortages in knowledge transfer, business model literature has attempted to point out the benefits of implementing conceptual busi-

ness model tools (e.g. Linder and Cantrell 2000, Gordjin & Akkermans 2002, Osterwalder 2004, Osterwalder, Pigneur and Tucci 2005), which I will attempt to quickly summarise here. Business models of companies are commonly highly complex, consisting of multiple levels of abstraction layers and several components, which all are also dependent on the perspective applied. This became especially true along with IT development, which has enabled more complex business logic, stronger service orientation and overall integration and dependence on technological development. Business models can be seen to have born from the need arising from the lack of ties between these domains of strategy, IT, organisations structure and outside pressures.

According to Osterwalder, Pigneur and Tucci (2005) the primary functions of business model frameworks are as follows:

- Understanding and sharing
- Analysing
- Managing
- Prospecting
- and patenting business models

Business models are a simplified description or depiction of the overall business logic that provides a mutual conception of business conducted. To be able to serve this purpose business model conceptualisations need to be generic to maintain their comparability across industries and domains. Conceptualisation's visual presentation and causality further provide tools for easier analysis and grasping the interdependencies of different aspects of business. Business model is a sum of its components. A conceptual framework is required to understand which components and which cumulative effects emerging from different kinds of implementations lead to success. Additionally a framework is

needed to compare business models, not only to competitor's models, but to conduct gap analyses to potential future models as well as to simulate them and to measure their effectiveness.

In this thesis the conceptual and instance level business models are examined. Conceptual business model literature is reviewed to get an understanding of the types of business model conceptualisations from which a suited business model framework for modelling virtual goods sales business model is selected. Virtual worlds' business model instances are examined to identify relevant aspects of virtual goods sales which will be then inserted into the selected conceptual framework.

Further definitions of business models will be presented in Chapter 3 along with further discussion on conceptual level business model frameworks.

1.4. Research problem, approach and methodology

The research problem for this thesis is as follows: *How to model virtual goods sales business, taking into account its emerging properties such as the service design?*

The research problem is approached from a conceptual-analytical perspective (see Figure 1). "*The basic assumptions behind structures in previous empirical studies are first analyzed: theories, models and frameworks used in those studies are identified, and logical reasoning to integrate them is thereafter applied*" (Järvinen 2000).

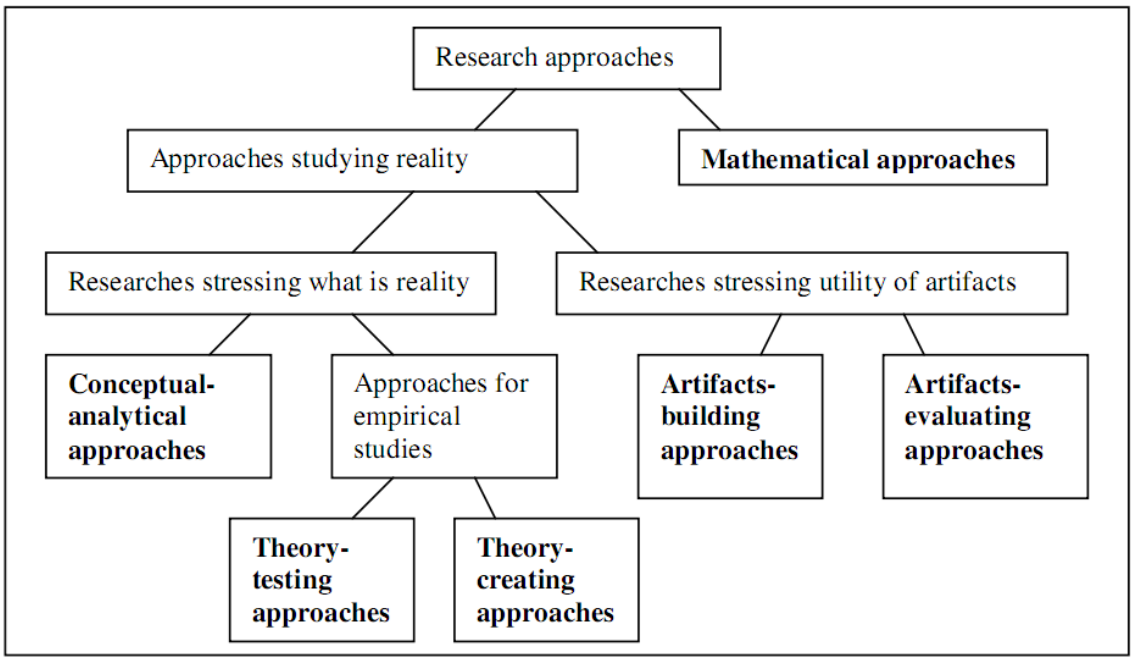

Figure 1: Taxonomy of research approaches (Järvinen 2000)

Following this approach, literature on virtual world business models is first reviewed and central concepts and theories are identified. Second, conceptual business model literature is analysed to form an understanding of how the theories and observations of virtual world business models should be structured. The virtual world business aspects are integrated under one meta-model by party adapting and refining conceptual framework of a business model by Osterwalder et al. (2002-2005). The use of the Osterwalder's model for depicting the virtual goods sales model is justified in subsequent sections.

While a conceptual-analytical approach stresses what is reality, business models frameworks are a compromise between the level of detail included in the model and the model's practical applicability. Business model frameworks are vessels of information and as such they pose some restrictions for holistically depicting reality. "*[Business] model, on the other hand, is only an artificial representation of reality. It therefore has to detract focus from certain aspects while concentrating on other; it is impossible for all the variables that comprise reality to be adequately and consistently represented*" (Petrovic, Kittl and Teksten 2001.)

Although the core study is approached from a conceptual-analytical perspective, some discussion on artefacts is presented, namely on the feasibility on business model conceptualisations. As a secondary contribution, the thesis adapts existing business model conceptualisation to better depict virtual goods sales model by suggesting new business model components.

Palvia et al. (2003;2004) examined what methods have been used in management information system science (Table 1).

Table 1: Methodologies in MIS research (Palvia et al. 2004)

1	Speculation/commentary	Research that derives from thinly supported arguments or opinions with little or no empirical evidence.
2	Frameworks and Conceptual Model	Research that intends to develop a framework or a conceptual model.
3	Library Research	Research that is based mainly on the review of existing literature.
4	Literature Analysis	Research that critiques, analyzes, and extends existing literature and attempts to build new groundwork, e.g., it includes meta analysis.
5	Case Study	Study of a single phenomenon (e.g., an application, a technology, a decision) in an organization over a logical time frame.
6	Survey	Research that uses predefined and structured questionnaires to capture data from individuals. Normally, the questionnaires are mailed (now, fax and electronic means are also used).
7	Field Study	Study of single or multiple and related processes/ phenomena in single or multiple organizations.
8	Field Experiment	Research in organizational setting that manipulates and controls the various experimental variables and subjects.
9	Laboratory Experiment	Research in a simulated laboratory environment that manipulates and controls the various experimental variables and subjects.
10	Mathematical Model	An analytical (e.g., formulaic, econometric or optimization model) or a descriptive (e.g., simulation) model is developed for the phenomenon under study.
11	Qualitative Research	Qualitative research methods are designed to help understand people and the social and cultural contexts within which they live. These methods include ethnography, action research, case research, interpretive studies, and examination of documents and texts.
12	Interview	Research in which information is obtained by asking respondents questions directly. The questions may be loosely defined, and the responses may be open-ended.
13	Secondary Data	A study that utilizes existing organizational and business data, e.g., financial and accounting reports, archival data, published statistics, etc.
14	Content Analysis	A method of analysis in which text (notes) are systematically examined by identifying and grouping themes and coding, classifying and developing categories.

From the 14 methodologies, the argumentation path and results in this study are triangulated utilising seven of the above methodologies. While the subject of study at present is very little researched and little previous literature exists, some *speculation/commentary* is needed to cover issues left untouched by previous literature analysed (*library research* and *library analysis)* in this study. *Secondary data* is gathered from expert websites and used in validating conclusions.

The secondary data mostly includes in-depth web-materials by industry experts. Conclusions are further validated and by first-hand experience in virtual worlds (*field study)*. The observations from triangulation of the above methodologies are further analysed in a business model context utilising *frameworks and conceptual models* along with illustrating *case study* examples.

The secondary data for the study has been gathered primarily from expert blogs and sites. This has been the best option for the variety and amount of insight information of virtual good sales business. These discussions include insights that are somewhat more difficult or impossible to observe by only observing the inner working of the services as a user. Still, I regard participation in the services (Table 2) as a user an essential necessity to acquire first hand information on the services, value propositions and business models. Most of the field study is used to validate other data. The field study is mostly present in this thesis through previous work and documented in Hamari and Lehdonvirta (2010).

Table 2: Services referenced in this thesis

Services references in this thesis	**Publisher , country**
Achaea	Iron Realms, U.S.
Anarchy Online	Funcom, Norway
Chronicles of Spellborn	Acclaim Games, U.S.
Club Penguin	Disney, U.S.
EVE Online	CCP Games, Iceland
Farmville	Zynga, U.S.
Habbo	Sulake, Finland
IMVU	IMVU Inc., U.S.
KartRider	Nexon, Korea
Maplestory	Nexon, Korea
Puzzle Pirates	Three Rings, U.S.
Runescape	Jagex, U.K.
Second Life	Linden Lab, U.S.
Tencent QQ	Tencent, China
Travian	Travian Games, Germany
Whirled	Three Rings, U.S.
Whyville	Numedeon, U.S.
World of Warcraft	Blizzard Entertainment, U.S
ZT Online	Giant Interactive, China

1.5. Structure of the thesis

Chapter 1 provides an introduction to the thesis by explaining when and how the virtual goods sales model came to be. The chapter explains what are the central concepts and keywords studied as well as which research problems and methodologies guide the rest of the thesis..

In Chapter 2 literature on virtual world operators' business models and relevant industry discourse are reviewed and analysed. Aim is to identify relevant concepts bordering and concerning business models of virtual good sales.

Chapter 3: As a first step, business models are examined on a general level, i.e. answering questions such as what is the purpose of the business models and where are they located in business architecture. The section aims to identify a perspective on business models, which is suited and relevant for examining virtual goods sales business models.

Chapter 4 synthesises the previous chapters by utilising a business model framework selected in the previous chapter to serve as the basis for depicting virtual goods sales. Necessary refinements to the framework are done according to emerging incompatibilities rising from the nature of virtual goods sales business, resulting in a refined business model framework. The business model and its components are explained more thoroughly in this chapter.

Chapter 5 summarises the thesis and presents its main conclusions and implications to business modelling. Potential further research themes will also be discussed.

2. VIRTUAL WORLD BUSINESS MODELS

In this chapter, literature pertaining to virtual world business models is reviewed and analysed to acquire a holistic picture of the general business models used on this field. The aim is to identify relevant concepts bordering and concerning virtual good sales.

2.1. Library research

This sub-section of the thesis covers relevant literature (Table 3) on business models of virtual world's operators.

Table 3: Business model related literature of virtual worlds

Work	Perspective
Alves and Roque (2005)	Value net comparison of VW-business models
Alves and Roque (2007)	Value net comparison of VW-business models
Arakji and Lang (2006)	Avatar as a customer
Cagnina and Poian (2009)	VW design emphases
Hamari (2008)	Categorisation of revenue models
Hamari and Lehdonvirta (2010)	Game mechanics as business drivers
Hsu (2004)	Revenue models
Lehdonvirta (2005)	Categorisation of revenue models
Lin and Holin (2007)	Negative effects of virtual good sales business model to user experience
MacInnes and Hu (2007)	Dynamicity of VW business models
Noam (2007)	Business model classifications
Nojima (2007)	Pricing models' relationship to user motivations
Oh and Ryu (2007)	Methods of selling virtual goods
Ren and Hardwick (2008)	Factors of revenue model change from subscription to virtual goods sales

Hsu (2004), Lehdonvirta (2005), Noam (2007), and Hamari (2008) classify different revenue models used by virtual world operators. Alves and Roque (2005); Alves and Roque (2007), Lin and Holin (2007), and Nojima (2007) assess the differences and viabilities between subscription and virtual good sales revenue models. Oh and Ryu (2007), Hamari and Lehdonvirta (2010) analyse virtual world design patterns as business drivers and Cagnina and Poian (2009) identify value proposition dimensions. MacInnes and Hu (2007) and Ren and Hardwick (2008) also analyse factors for business model changes in China, looking at business models from dynamic business model perspective.

While the above literature references aspects that can be included in business model components, it still mainly covers only revenue model and pricing. It does not cover much of the value propositions or the users of the services. Thus I will also look at complementary literature (Table 4) pertaining to other aspects of virtual world business, regardless of whether it is presented in a business model context. The subjects of study have been virtual world users, virtual items, and virtual worlds. Although this literature has not adopted a business model perspective, it still is highly relevant for this thesis. This thesis attempts to partly fill the gap between the virtual world business model literature and the aforementioned literature by conceptually modelling the current business conducted with virtual worlds. Hamari and Lehdonvirta (2010) partly addressed this issue by identifying virtual world design patterns that are used as business drivers.

Table 4 Complementary literature to business models

Work	**Perspective**	**Business model relation**
Bartle (2003)	Player types	Customer types
Guo and Barnes (2007)	Why people buy?	Customer motivations and value propositions
Guo and Barnes (2009)	Why people buy?	Customer motivations and value propositions
Johnson and Toiskallio (2005)	VW communities	Customer
Lehdonvirta (2009)	Virtual good value components	Value proposition
Lehdonvirta, Johnson & Wilska (2009)	VW communities	Customer
Manninen and Kujanpää (2007)	Value components of avatars	Customer (avatar) and value propositions
Yee (2007)	Value dimensions of VWs	Value proposition

These papers discuss virtual worlds outside a business context and have primarily concentrated on the user. Bartle (2003) in his book formed a widely referenced MMORPG player classification. Guo and Barnes (2007) and Guo and Barnes (2009) examine motivation of users for virtual good purchased using Technology Acceptance Model (TAM). Lehdonvirta (2009) also concentrates on purchase drivers by looking at the attributes of virtual goods. Johnson and Toiskallio (2005) and Lehdonvirta, Johnson and Wilska (2009) examine user categorisations in *Habbo.* Yee (2007) examined users' motivations for using virtual worlds. The main motivational components identified were achievement, immersion, and social. Manninen and Kujanpää (2007) discuss value components of avatar based on Yee's (2007) motivational chart.

The above references will be more comprehensively discussed in the following sub-section and in Chapter 4.

2.2. Virtual world business models by revenue model

This section explores how revenue models of virtual world operators have been previously classified. In most of the literature the terms revenue model and business model have been used interchangeably, which is apparent in the following classifications. The terminology will be further explained in Chapter 3.

Noam (2007) lists eight business models for virtual worlds. However, these suggestions tend to describe how virtual worlds could be harnessed for profit at some point in the value chain.

Lehdonvirta (2005) in his literature review divides virtual worlds' revenue models into five models: Charge for access, Charge for the client program, Charge for services, Advertising, and Virtual asset sales.

Hsu (2005) talks about two business models categories: Play-For-Free, including revenue stream: Retail, Advertising, and Subscription. The name of this category is misleading as in Retail and Subscription -models the player is charged. What the name actually refers to is the notion that the cost to the player is flat and the gameplay is in no way restricted after this cost. Other major business model is Pay-To-Play, which refers to revenue streams of charging the player according to how they play the game. These revenue streams include Premium Servers, Customer services, and Revenue from character and object sales (virtual goods).

Hamari (2008) compared revenue models used by virtual world operators to taxonomy of eBusiness revenue models by Hoffman and Novak (2005). The taxonomy includes: Transaction fees, Hosting fees, Referral fees, Subscription fees, License fees, Pay-per-view, Pay-per-performance, Micropayment, Advertising, Sponsorship, Ransom model, Margin on sale of goods/services, Sale of customer data, Offline customer response, Efficiency & effectiveness gains, Value-added services, and Virtual real-estate. The taxonomy itself is somewhat

incoherent and some categories overlap. For example one can sell value-added virtual real-estate services by subscription through physical retailers, which are given a free trial and the more floor you buy the higher the monthly payment is. This example includes at least five of the mentioned revenue models; Value-added-services, virtual real-estate, subscription, offline customer response, and ransom model.

Mentioned revenue models or business models are not exclusionary by default. For example an operator could charge for the client program and in addition sell virtual assets to users. Also, they can charge for additional services or advertising. This supports the observation that these examples are merely revenue models, not extensive business defining models. On the other hand though, the revenue models require different activities and value configurations. They might also be offered to different user segments. This notion would support seeing them requiring separate business models to begin with.

There are also two different conceptions of which virtual worlds' business models constitutes as "free to play". Games, which have a flat fee to users, are free to play after the preliminary fees. The user is able to use the service without any further costs, because the retail price or subscription fees are paid (e.g. Hsu 2005). Another free to play conception is when a user can enter a virtual world and play it without any fees to the operator. In the case of the latter, operators use several kinds of revenue models to monetise/charge users, such as banner-advertising and sales of virtual goods.

When looking at the revenue model perspective, it seems that business models can roughly be divided into two categories: flat fee and dynamic pricing. Flat fees, including subscription and retail models always has a fixed, single price point and the virtual economic design concentrates on meaningful and engaging mechanics. The other category includes all business models using dynamic pricing, most notably virtual good sales. The virtual economic design in the lat-

ter category not only attempts to acquire and retain users, but to create mechanics that incentivise users to buy virtual goods.

2.2.1. Defining virtual goods sales in contrast to flat pricing model

Discussion on revenue models of virtual worlds has concentrated on subscription and virtual good sales models. In recent years, the growth of the market has increasingly been driven by operators selling goods directly to their users. Instead of requiring users to pay a monthly subscription fee, operators allow users to enter the service for free, with the expectation that some users will nevertheless spend money on virtual good microtransactions (Nojima 2007). For this reason, virtual good sales-based games like *MapleStory* are occasionally called "free-to-play" games. One example of a virtual world that follows the same model is *Habbo*. *Second Life* follows a similar but more complicated model, where users are the primary actors in virtual good production and sales.

Successful subscription-based MMOs currently charge around US$10-$15 per month from their users, while Liew (2008a) estimates that successful "free-to-play" operators earn around $1-2 in monthly ARPU (average revenue per user). The estimate is based on figures pertaining to *Second Life*, *Club Penguin*, *Habbo* and *RuneScape*. Korean-based *MapleStory* is estimated to have a monthly ARPU of $20 in the United States (Liew 2008b), while Hyatt (2008) estimates the average ARPU of "free-to-play" titles as being around $5 per month. At first glance it would therefore seem that the subscription model is often the more attractive option, but if we consider other metrics such as registered users, active users, conversion rates and costs, the situation may change. Users that are willing to pay a subscription fee belong to a fairly limited segment of hardcore users, while "free-to-play" services have the potential to serve much larger audiences.

Considering the above discussion, the microtransaction basically refers to selling the content in considerably small slices. The smaller the transactions, the

closer the total monetary amount of transaction can get to the individual user's willingness to spend, at least in principle.

For these reasons, operators are increasingly applying the virtual good sales revenue model in virtual worlds, MMOs as well as other online services. Understanding how to create and maintain demand for virtual goods is therefore an increasingly pertinent question

Selecting between these revenue models is not only an atomic decision. Revenue models should not be separated from the business model, but as shown above, the revenue generation logic is largely defined by the service design of free-to-play virtual worlds.

Miller (2008) discussed how subscription and virtual good sales models capture potential revenue. He illustrated the situation with graphs similar to ones below (Figure 2, Figure 3 and Figure 4)[3]. In the graphs below, the plot is drawn to better illustrate the percentages of paying and non-paying users. According to Liew (2008a) the average revenue per user in virtual good sales services is around $1-$2 per month, while only around 10% of users buy virtual goods.

3 Although the plot in his graphs did not take into account users that are not willing to pay anything nor the potential of servicing non-paying users.

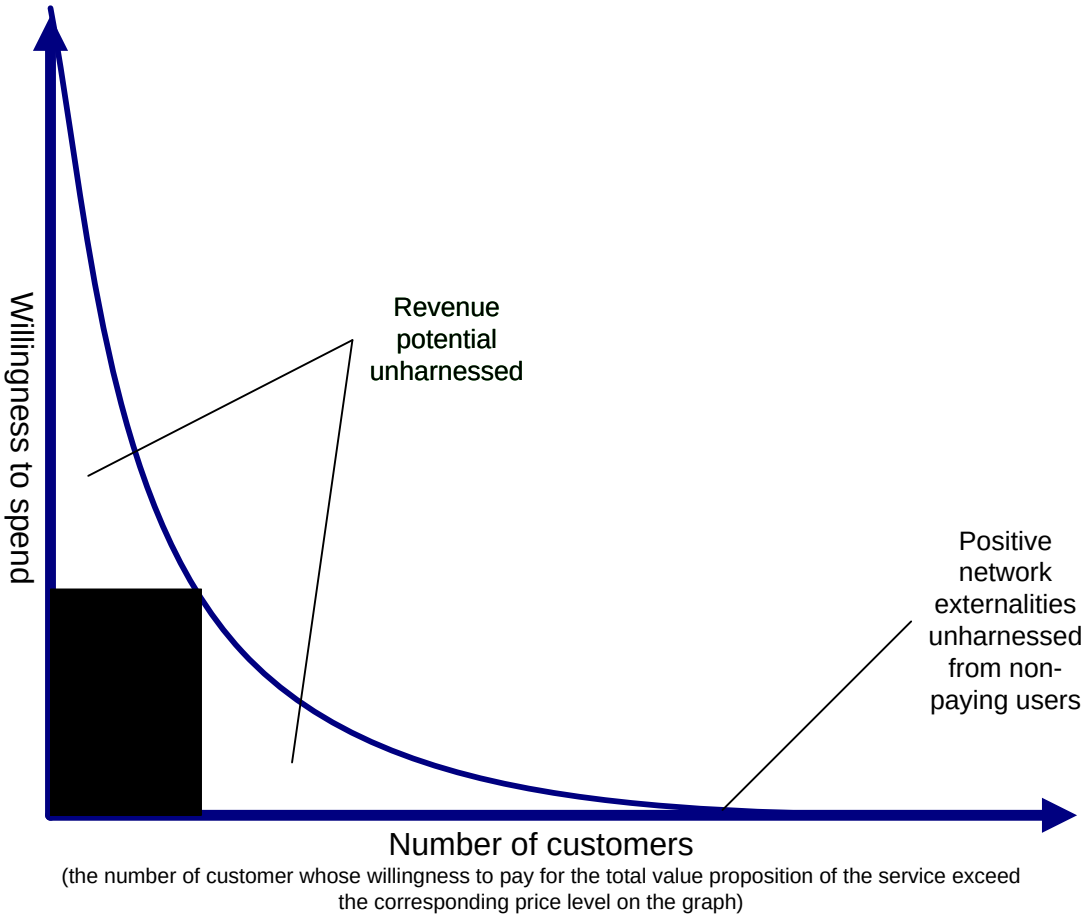

Figure 2: Subscription

With subscription pricing, the potential revenue from users who are not willing to pay the amount of the subscription fee is left untapped. Similarly the potential revenue from users who would be willing to pay more than the subscription fee is not addressed. In fact, third party businesses and other players have started to service this segment of users via acquiring items of value inside virtual worlds and selling the items to other players[4]. However, the virtual world operator will not harvest any of this revenue potential5, but conversely commonly meet higher customer service costs due to scamming done by the third

4 Commonly against service provider' EULA (End-User License Agreement)

5 Except that the third party worker also pay the subscription fees

party businesses. In the same vein, one argument for the virtual goods sales model is to prevent or alleviate such problems.

To better address the demand curve, some virtual world businesses introduced tiered subscription (Figure 3), giving users an option to buy premium content, instead of permitting access to all content with a single subscription fee.

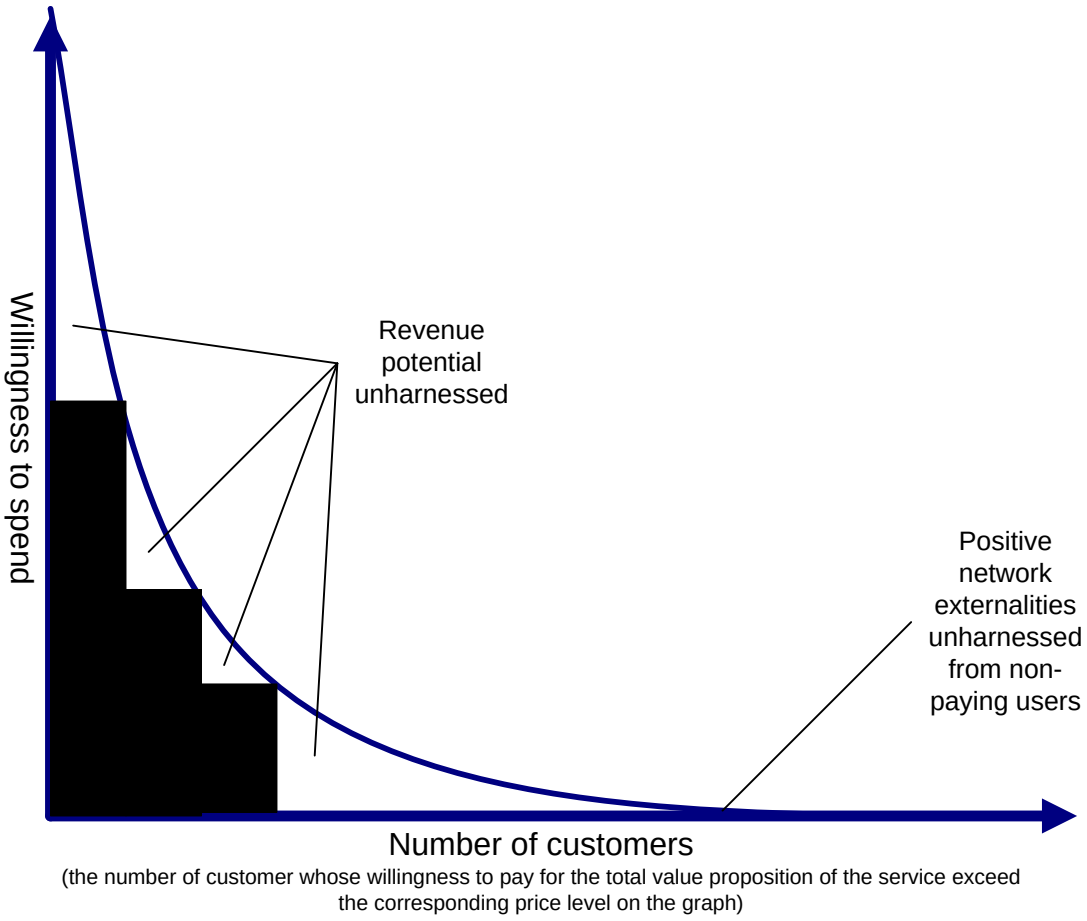

Figure 3: Tiered subscription

Funcom uses a tiered subscription model in Anarchy Online. There are three tiers, free, $5, and $15 per month. Contrary to the above figure, the free entry option also utilises positive network externalities from non-paying users. The different subscription options make users eligible to enter new areas introduced in updates to the virtual world. Another model, on top of subscriptions, is to offer virtual value-added services to fill the unharnessed revenue potential. For

example one free-to-play game, Travian by Travian Games, offers a subscription option with bundled virtual value-added services, but on top of the subscription users can buy "consumable services", such as accelerated resource production for their villages.

The virtual good sales model attempts to also utilise the positive network externalities from non-paying users and price discriminates for differently price sensitive users by slicing the total value proposition bundle of the virtual world via selling virtual goods. Following this line of thought, the difference between free-to-play (a form of freemium model) and premium models is the utilisation of the positive network effects from non-paying users.

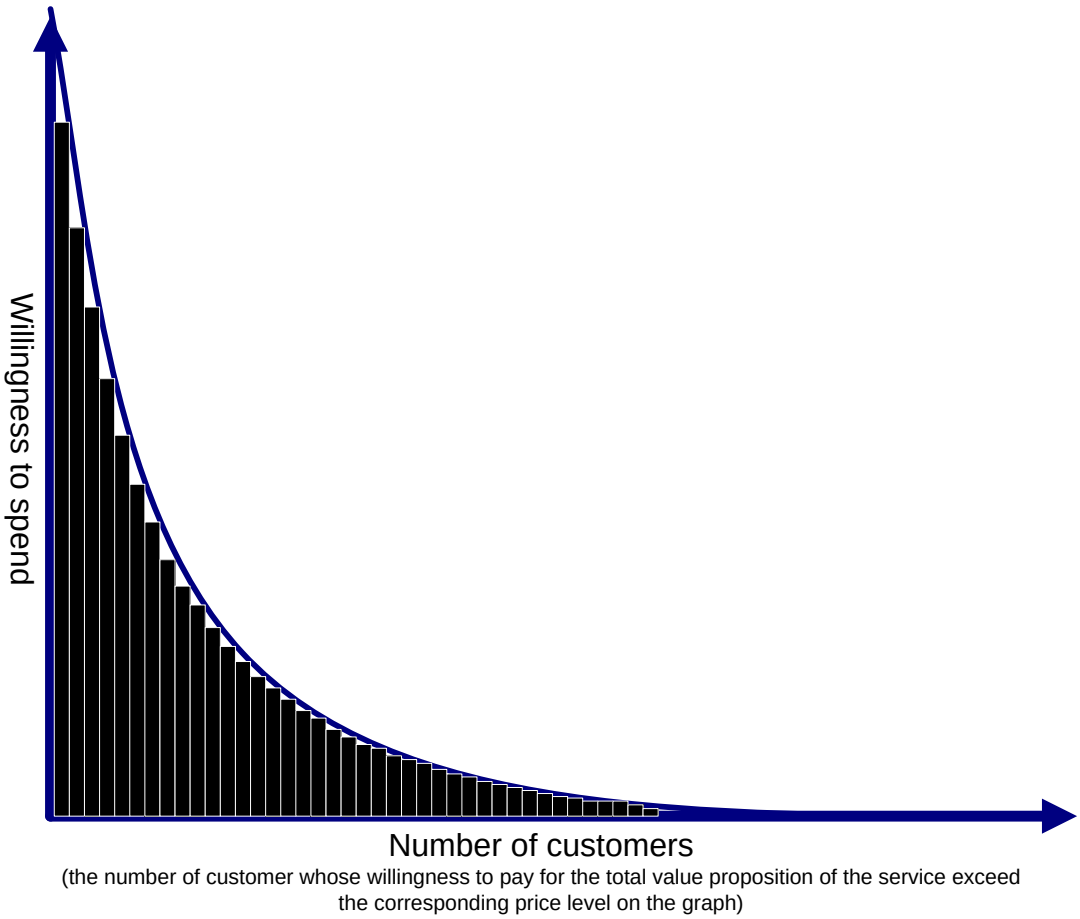

Figure 4: Microtransactions

One argument for virtual goods sales is the ability to address all differently price sensitive users – approaching perfect price discrimination in virtual world pricing. Price discrimination refers to capturing value from differently price sensitive customers for identical products (Shapiro and Varian 1999). Of course, this does not directly mean that price discrimination would be implemented in pricing of a single virtual good, but price discriminating the total value proposition bundle of the virtual world. However, when selling virtual goods, will the total value proposition of a virtual world be similar to users anymore?

Nevertheless, price discrimination for virtual goods is also achieved with certain virtual economic design patterns. It can be achieved by modifying the context of the game environment, altering the degree of need for a certain good emerging from gameplay. For instance, expansions for virtual worlds commonly introduce new content, which by turn commonly lessens the value of old items and content. Therefore, the developer is able to set high prices when items are introduced, and in turn when another iteration of new items are introduced, the developer can set lower prices for old items, hence capturing value from differently committed users.

At present, it seems that most operators attempt to utilise the benefits of both pricing models (see e.g. Ren & Hardwick 2008). For example, World of Warcraft, which has been the biggest subscription-based MMO, started to sell virtual goods on top of the base subscription. ZT Online has separated servers for subscription customers and those wanting to buy virtual goods.

2.3. Virtual world business models by design orientation

This sub-section explores the major different strategic design orientations of the virtual world services that to a large degree determine further viability of different business models.

There is some variety in classifying virtual worlds, but frequently repeated major division is done into game worlds, social worlds, and user-generated content worlds (Dougherty and Lastowska 2007; Cagnina and Poian 2009). However, this division is not taxonomical as the categories overlap. All of these dimensions can be found to some degree from all virtual worlds and even from social online services in general. This classification follows the design emphasis of the virtual worlds and closely resembles the previously defined dimensions of virtual economic design: social interaction, virtual economy design and game design.

One frequently referenced classification divides virtual worlds into open and closed worlds. The openness versus closeness can be seen as to what degree the rules and structures of virtual worlds restrict and determine the activities of users in virtual worlds. At one end of the spectrum are virtual worlds that commonly are more of a platform for user-created content, such as Second Life, and at the other end, game worlds, such as World of Warcraft, that to a large degree very explicitly determine all the activity paths a user can take at a time. This has an impact on feasible revenue models as well. Closed virtual worlds integrate the rules and the revenue generation logic in selling virtual goods as the value is to large extent determined by the virtual economic rules. In open worlds such structures are lacking and the value offerings correspond on some needs, unrelated to the virtual world context, for example, by offering conferencing applications, virtual shops and so forth. Open worlds can be rather similar to service hosting, but using a virtual channel. This thesis primarily concentrates on the closed worlds and to the integration of virtual economic design and revenue generation logic, which is not as clearly present in open worlds.

Ries (2008) categorises virtual worlds on three scales: subscription versus selling virtual goods, gameplay versus merchandising, and user-generated content versus first-party content. If we leave out the first design choice, which actually

is related to the revenue models already covered above, the remaining design choices correspond with the categories of the design of game worlds, social worlds and user-generated content worlds. Gameplay versus merchandising refers to the emphasis between whether virtual goods are earned through gameplay or whether they are bought. This division to a large extent corresponds with the division between game worlds and social worlds, because in game worlds, a major part of the gameplay is commonly related to acquiring virtual goods, whereas in more socially oriented worlds, such game mechanics are less emphasised. Ultimately, this design choice refers to whether functional and performance-enhancing virtual goods are sold. Aesthetic virtual goods may still be sold as they lack impact on explicit gameplay.

Game worlds (such as *World of Warcraft* and *Maplestory*) refer to virtual worlds emphasising structured rules, goals and gameplay. Social worlds (such as *Habbo*[6] and *Whyville*) emphasise social interaction between users. User generated content worlds, such as *Second Life*, refer to services where the virtual world is commonly more of a platform for users to create and add content to. While most of the virtual worlds could be classified under this classification, there are cases where the categorisation is not as clear. For example, *Whirled* by *Three Rings* heavily encompasses all three aspects by including mini-games while the world itself is a virtual hang-out providing tools for users to create content.

UGC (user-generated content) refers to the ability of users to create content within the service. Examples include houses in *Second Life*, clothes in *IMVU*, and games in *Whirled*. This further begs the question should the users be seen as a customer or a partner if trade of user-generated content is facilitated. Below is

[6] Today Habbo has achievements and other gameplay related mechanics, but Habbo can still be seen in a social world side of the spectrum

a table giving an example of how some of the virtual goods sales models using major virtual worlds divide between these dimensions.

Table 5: world orientation vs UGC

	UGC	**No UGC**
Game world	-	Maplestory
Social world	IMVU	Habbo

There seems to be a lack of worlds that are both gameplay-oriented and have UGC. I speculate this is due to having users create performance enhancing content leads to unbalancing of the game. Cagnina & Poian (2009) identify a trade-off between operator control and user creativity. It might also explain the lack of virtual worlds combining gameplay and UGC as the game-orientation is essentially a form of control. Having game-oriented design implies that there is a large array of rules in place, restricting the amount of free interaction and creativity.

However, another form of UGC can be identified where users generate value through simply using the service (Taylor 2006; Koster 2009). For example by socialising, enhancing their avatars, and decorating their rooms. Some form of user-generated content usually exists in all social online services. These aspects are further discussed in Chapter 4.

Cagnina and Poian (2009) identify further business model emphases (Table 6), including achievement, control, creativity, membership, realism, and sociality. The authors analyse several virtual worlds using a radar map to show how much different virtual worlds are emphasising different dimensions. This mapping shows the overlap between virtual worlds categories.

Table 6: Design emphases of virtual world business models

Design emphasis	Design emphasis (Cagnina and Poian 2009)
Game world	Achievement
Social world	Sociality
User-created content	Creativity
Closed/open - axis	Control
	Realism (Immersion)
	Membership

These design orientations are essentially a strategic choice of positioning the virtual world, which further has an impact on viable business models. The virtual goods sales can be problematic with game-oriented worlds because of the possible negative effects on the balance of the game. For the same reason mixing user-generated content and game-oriented world can be problematic.

2.4. Evolution in conceptualising the relationship between business model and virtual world service design

The core emphasis in new industries is commonly directed to new product innovations and the enabling technologies. This implies that business efforts are mainly targeted to the development of the core product. The virtual world sector seems to have progressed by first emphasising enabling technologies and uses of virtual world (through the 90s) and now (in the 2000s) the research has started to shift to motivations, design, and business models (Jäkälä and Pekkola 2007). There are numerous categorisations of e.g. revenue models in academic literature, but the research on the actual logic in revenue models and on synergised design of services and business models is lacking[7]. Jäkälä and Pekkola

7 Although there is a plethora of discussion on these issues in the developers community

(2007) further argue that technological aspects are now sufficiently understood to move to a more holistic approach in virtual world research.

It is quite common that revenue model is perceived atomically, separate from other aspects of the business model (Linder and Cantrell 2000). This has also been the case with virtual worlds. Perhaps one reason for this is that the subscription model was widely used before virtual goods sales, and the former model does not have as much interaction between the service design and the revenue generation logic. Consequently, virtual goods sales was also perceived only as a revenue model that is to be applied on the virtual world service. While perceiving the service design and the business model separately can cause problems in business planning in general (Linder and Cantrell 2000), I argue that it can be even more problematic in services where the sold offerings are also part of the service design. .In fact, virtual good sales model has a strong interaction between the value offerings and service context design. The revenue generation logic is defined by the synergised design of the former. This implies that in business planning all of the aspects have to be taken into account.

Many virtual world operators have found themselves in a situation where revenue generation logic is distanced from the design of the service. If an operator changed their revenue model, they also had to make drastic changes to the virtual world and to its rules and structures. For example, Chronicles of Spellborn, operated by Acclaim Games, had to undergo a costly re-development due to a change of revenue model from subscription to free-to-play model (Egan 2009).

The discussion about the relationship between the business model and internal design of the virtual worlds was sparked when a virtual good sales model started to be increasingly adopted. Earlier the link with a business model was commonly seen simply as virtual world design should entice users to continue subscriptions. In other words, the emphasis was to create a lot of content to

keep players engaged. In a virtual good sales model, on top of maintaining the continuous engagement, the emphasis has been in creating compelling game mechanics that entice users to buy virtual goods often and continuously (Oh and Ryu 2007; Hamari and Lehdonvirta 2010).

An analogy with non-virtual worlds example might give some useful perspective to the phenomena. The "Monopoly" tabletop board game is a retail game. The goal has been to make the game as fun and engaging as possible. But if the developer were to sell players "get out of prison" cards or monopoly currency for real money during the game, we can see that the revenue generation logic would clearly be connected to how the game is designed. For example, the Monopoly developer could increase the chance of a player ending up in prison and hence raise the relative usefulness of "get out of prison" cards, making players more enticed to buy them. This situation shows the conflict between selling in-game assets and game fairness and balance. This is one of the common balancing acts virtual world developers face when designing virtual economy and revenue models.

A large portion of the academic discussion has touched on this conflict between virtual good sales (or microtransactions) and the game immersion (or "magic circle" concept originally conceptualised by Huizinga in 1938 (in English 1955)). Authors imply that such frequent collection of fares might ruin the fun in virtual worlds (discussed e.g. in Castronova 2004 192-196; Lehdonvirta 2005; Bartle 2003; Lin and Sun 2007). There exist at least two arguments for this: 1) purchased virtual goods give paying players unfair advantage in-game, and 2) spending real money inside "magic circle" breaks immersions.

One solution has been to sell only aesthetic virtual goods that do not directly affect the gameplay. The degree of integration between the business model and service design is then smaller compared to goods sold that determine the capabilities of users. On the other hand, this is to some degree dependent on the

type of achievement hierarchies of the virtual world in question. In MMOs the player competence is commonly measured with explicit performance-oriented scales, whereas in more socially oriented worlds the assessment of one's status is more dependent on the social interaction mechanics. Again in Monopoly, the developers could sell only aesthetic golden pawns instead of aluminium ones if they wanted to use virtual good sales and still maintain the game balance. Alternatively, they could take the more demanding route of selling functional goods and trying to balance the competence difference between players. There are several solutions to these problems, some of which are mentioned in the next section.

Figure 6: Dependence between BM/RM and design of the virtual world

It can be said that game design, through rules and mechanics determines the context where the content is consumed (Oh and Ryu 2007; Alves and Rogue 2007; Hamari and Lehdonvirta 2010). The game design creates content independent rules sets that determine the ways in which users can play, spend, buy, and trade within the service. Oh and Ryu (2007) give some examples of virtual economic design patterns which are implemented directly for business purposes.

Hamari and Lehdonvirta (2010) further compare game design and marketing techniques. They argue that game design is an elementary part of the marketing processes for virtual goods and as such a part of the business model. They present ways in which game design is used in segmenting the user base and how design can be used in differentiation of virtual goods. They also identify design patterns that are used to create sustainable demand for virtual goods. From

these previous papers it can be said that at least some part of the design, especially those creating virtual economic structures partly overlap with the business model.

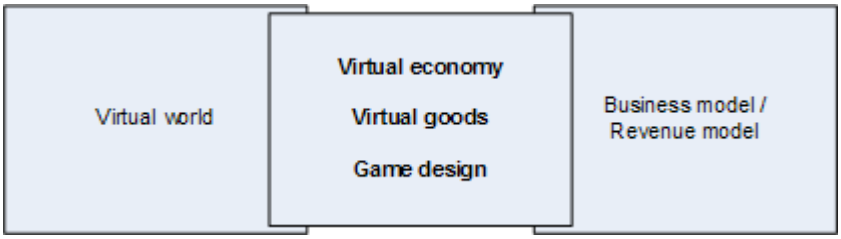

Figure 7: Virtual economic design overlaps with virtual world and business model

When we take into consideration established business model definitions, which contain all the aspects comprising revenue generation logic (e.g. Osterwalder and Pigneur 2005), then it is reasonable to include game design and in-game goods and other aspects pertaining to service context design inside business model concept in virtual good sales model (Figure 8). The revenue generation logic is defined via business model components and their relationships. Virtual goods can be perceived as value propositions (offered products) which naturally belong inside the business model.

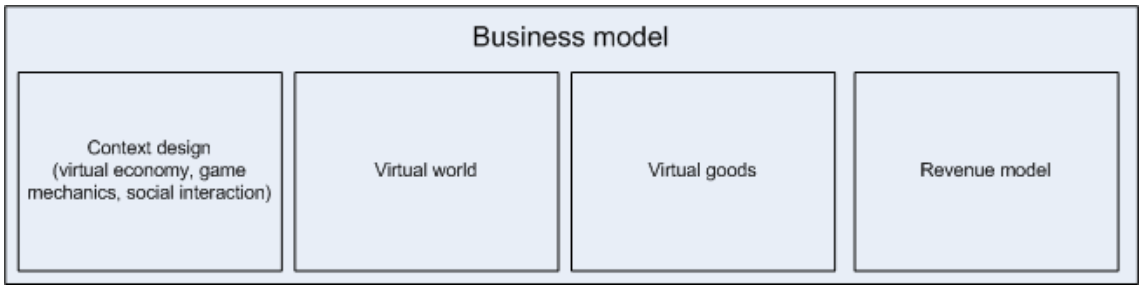

Figure 8: Aspects included in the business model

In the next sub-section the context design and the union of design areas comprising it will be further discussed.

2.5. Business game design

The development of a virtual world or another social online service of course comprises a large array of different design disciplines. Considering the previous sections, this thesis concentrates on such design that forms the structures and rules that define possible interaction of users within the service and their role in revenue generation logic. Game design patterns determine possible actions taken by the users (e.g. Oh and Ryu 2007; Alves and Roque 2007; Hamari and Lehdonvirta 2010). Another vein of discussion concerning virtual world design refers to virtual economies (e.g. Castronova 2001; Castronova 2004; Lehtiniemi 2008). The virtual economy design obviously strongly overlaps with game design and can even be seen as a part of game design. Another complementary perspective comes from the social interaction design, commonly discussing how users are able to interact with each other (e.g. Siitonen 2007; Järvinen 2009). This design also merges with other design disciplines especially in virtual worlds, because social interaction is an elementary part in the gameplay experience and of course user-to-user trading is commonly accompanied by some kind of social interaction, which would be regarded under virtual economic activity.

Defining an exact taxonomical classification of social online services, such as virtual world, social networking services, online-games is rather difficult, because of the convergence and rapid development happening constantly. All of the above mentioned types commonly have some of the same features, only with different emphases. In virtual worlds (e.g. Second life), virtual economy and the world itself are the major innovations. Whereas in social networking services (e.g. Facebook and LinkedIn) the interaction between users is the core value proposition and in on-line games (e.g. CounterStrike) the emphasised innovation is the game play and game rules. Massively Multiplayer Online games

(MMO) (e.g. World of Warcraft and Runescape) are the pinnacle of combining these features in a singe service.

If we consider a generic definition of game design from Wikipedia as ”the process of designing the content and rules of a game”, the part contributing to virtual economic design would mostly be from the game rules side. The rules determine and regulate how the user consumes the content. In the same vein, the content would have the substantial value whereas the rules orchestrate the structure of the content and how the users interact with it.

Järvinen (2009) pondered the same dilemma, when attempting to find terminology for game design in social online services. He compared game design with interaction design, which he further points out is a subset of service design. This is of course quite self-evident at least in the case on online virtual worlds, as the virtual world is essentially a service and the game design is an elementary part of the service.

Järvinen (2009) argued service design of social games comprising of game design and social interaction design. I suggest adding *virtual economy design*, design that determines how users can trade and consume goods. Obviously virtual economic design overlaps with game design and social interaction design, as game mechanics to a large degree determine for example what virtual goods a user can have and use. Social interaction and virtual economy overlap as the communication between the users concurrently with trade is essential. From a business perspective, an example of a procedure that can be defined as a union of all design dimension is a gift-invitation situation where a user gives an in-game good as a gift to a non-user. The invitation itself is social interaction, the virtual economy regulates what goods can be given as a gift and game mechanics determine how the invited user may use the newly acquired good to affect

the gameplay. In most common cases though, the gifted items do not have functional value inside the virtual world, but are only aesthetic such as clothes.[8]

Kim (2008) made a distinction in social game design between the context of the service and virtual goods. The term context is rather good, as the service design defines value of virtual goods sold and consumed within the service. Henceforth the service design, including game mechanics, virtual economy, and interaction design, is called *service context*. It is not the context where the virtual world service in totality is offered, but the context enclosed within the service where virtual goods are offered to users. Further in this thesis (Section 4), a new business model component will be suggested based on the service/business dimension in the below figure 9.

8 Aesthetic virtual goods are more commonly used because an overflow of functional virtual goods might tip the balance of gameplay and entice users for unwanted spamming of gifts in the hopes for their own advantage.

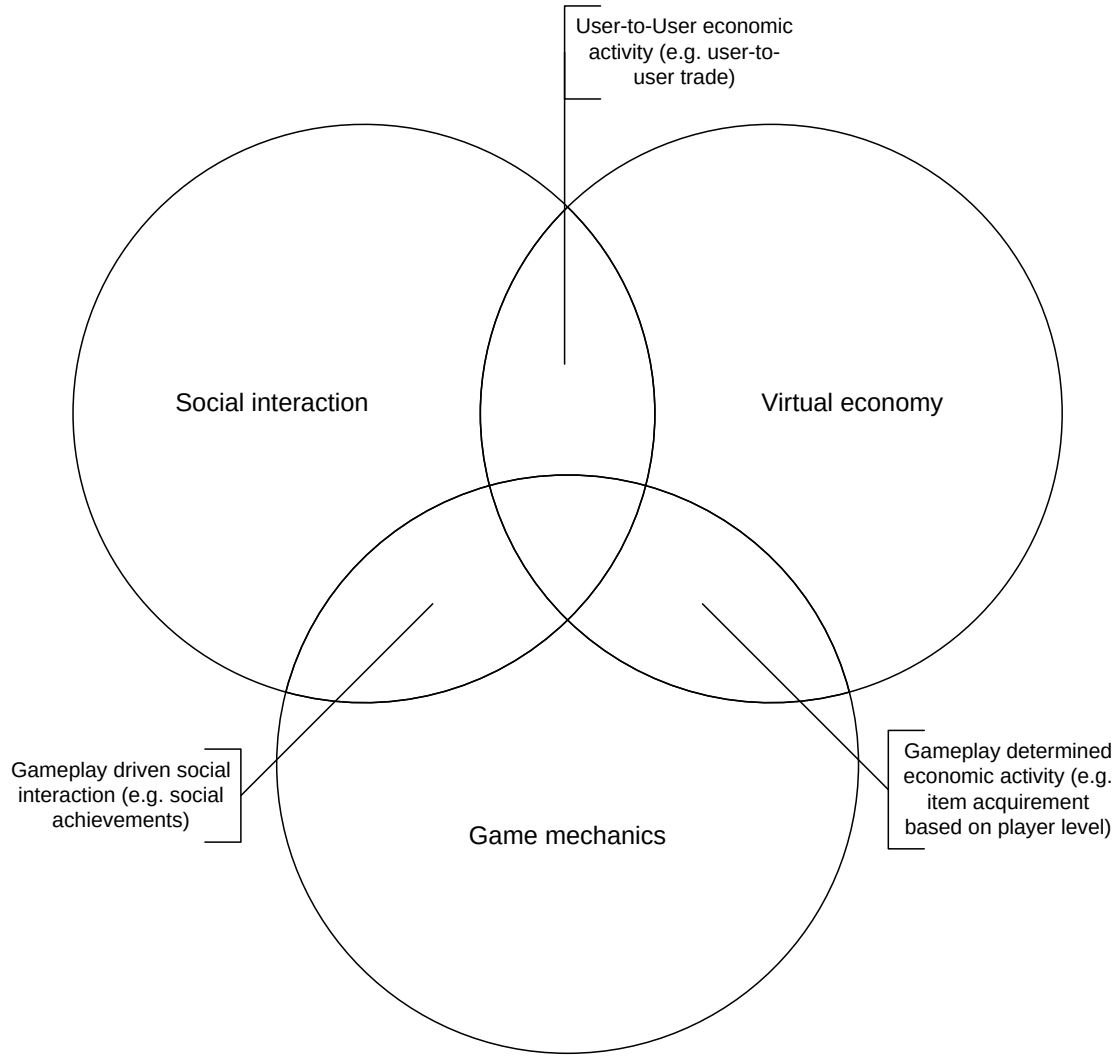

Figure 9: Service context design dimension of social online services

The services examined in this thesis mostly comprise virtual worlds because of their richness in using variety of mechanics under each category. Virtual worlds, especially performance-oriented ones, provide prime cases for studying virtual good sales business models.

In the next sub-section some of these mechanics used in virtual worlds that are both part of service design and revenue generation logic are further introduced from relevant literature.

2.6. Service design patterns in revenue generation logic

Two papers have specifically concentrated on the integration of game design and revenue generation logic – Oh and Ryu (2007) and Hamari and Lehdonvirta (2010). Oh and Ryu (2007) study Korean online services Kart Rider and Special force, and Hamari and Lehdonvirta (2010) identify and assess commonly implemented design patterns used in virtual worlds and online-hangouts analogise them with marketing techniques.

Oh and Ryu (2007) describe game design patterns for accommodating virtual good selling revenue model. These designs include (in bold):

- **Balancing between virtual goods that are purchased with real money and goods that are earned by playing the game**.

The balance here refers to finding the optimum spot where players are enticed for both maximising buying behaviour and engaging play. Hamari and Lehdonvirta (2010) find that virtual worlds commonly have structures that iteratively roll new acquirable items for users when they progress in gameplay. Therefore it is vital that users who buy items still find it meaningful to spend time in the service.

Another widely discussed problem with selling virtual goods is the following imbalance to the gameplay in the form of unfair advantages to paying players. (Castronova 2004; Lehdonvirta 2005; Lin and Holin 2007; Nojima 2007; Oh and Ryu 2007; Hamari and Lehdonvirta 2010). Oh and Ryu (2007) suggest that different virtual goods should be sold separately for real money, and virtual currency (in-game currency) be separated. This actually is the case within many services. Purchasable items commonly are only aesthetic and do not give functional advantages. One solution proposed by company Three Rings is to allow trade between purchasable and earned currencies; hence the purchased currency flows to non-paying users and the earned currency to paying-users.

- **Making functional goods consumable or setting an expiration date, while making ornamental goods permanent.**

Hamari and Lehdonvirta (2010) also discuss setting virtual goods expiration dates or making them degrade due to use or time. The use of this design pattern is again a balancing act between goals of user retention and user monetisation. Ornamental goods can be seen as rewards that players are attempting to acquire using functional goods. It seems reasonable to make achieved goals permanently displayable.

- **Bundling**

Oh and Ryu (2007) suggest bundling items having similar function together and selling large amounts of less bought goods. While the benefits of bundling complementary products is somewhat common knowledge (see e.g. Shapiro and Varian 1999), bundling unrelated goods might also be an efficient strategy (Bakos and Brynjolfsson 1999) (especially when the marginal cost is close to zero and the bundled goods will not cannibalise sales).

- **Abstracting function of items**

This design choice refers to not exactly disclosing virtual good attributes. For instance, the player would not be able to assess exactly how potent a sword she purchased is. Oh and Ryu (2007) justify this design by arguing that it alleviates the negative response of players not buying goods and it prevents players concentrating on acquiring only certain goods. This design pattern essentially addresses the same problem of balance between paying and non-paying users.

Although it is dependent on the nature of the service if this design pattern is beneficial, I disagree to some extent with Oh and Ryu's conclusion. Especially in game worlds, optimisation of one's possession is a significant part of the gameplay experience (See e.g. Yee 2007). Developers choosing to follow this

route should be aware of potentially scoping this motivational component outside the virtual world's value propositions.

One implementation is not to sell potent virtual goods directly, but some form of other tokens or items that indirectly make a user eligible to acquire the functional items. In social worlds, commonly most of the goods are aesthetic, bearing no explicit functionality, in which case abstraction might not even be relevant.

- **Utilise cultural events by selling seasonal goods**

In addition to exploiting real world cultural context, such as Christmas, Hamari and Lehdonvirta (2010) suggest creating virtual world specific cultural occasions that entice virtual good purchases.

- **Designating in-world communal goods**

The patterns identified in the paper by Hamari and Lehdonvirta (2010) can be divided into two categories. The first category (Table 7) consists of mechanics that in marketing terms create segmentation of users and enable differentiation of virtual goods; in other words, game mechanics that divide service content into differentiated contexts along vertical and horizontal lines, and in the process create a need for corresponding virtual goods.

Table 7: Design patterns of segmentation and differentiation (Hamari and Lehdonvirta 2010)

Design pattern	**In marketing terms**	**Towards**	**Aims to**
Stratified content	Segmentation, differentiation	Rules, environment	Create segmentation, enable differentiation and generate incentives for repeated purchases
Status restricted items	Differentiation, planned obsolescence	Items	Enforce segmentation and generate incentives for repeated purchases
Increasingly challenging content	Segmentation, differentiation, planned obsolescence	Rules, environment	Enforce segmentation and generate incentives for repeated purchases
Multidimensional gameplay	Segmentation, differentiation	Gameplay	Create segmentation and enable differentiation and create differentiated additional settings for virtual goods
Avatar types	Segmentation, differentiation	Avatar	Create segmentation and enable differentiation

The second category (Table 8) includes mechanics that are used to create demand for virtual goods and encourage repeated purchases. Inconvenient user interface elements and similar gameplay factors have also been used as means to create a need for complementary and value-added services that augment the core product. Special occasions related to real-world culture as well as to virtual world -specific contexts have been used in the seasonal promotion of virtual goods.

Table 8: Design patterns for creating demand for virtual goods (Hamari and Lehdonvirta 2010)

Design	**In marketing terms**	**Towards**	**Aims to**
Item degradation	Planned obsolescence	Items, rules, environment	Create incentives for repeated purchases
Inconvenient gameplay elements	Core product -> Augmented product	User interface, gameplay	Create settings for additional virtual goods and services
Currency as medium	Psychological pricing	-	Create incentives for (repeated) purchases
Inventory mechanics	-	Items, avatar	Create incentives for repeated purchases
Special occasions	Promotional	Environment, items	Benefit from cultural patterns that encourage buying behaviour and create settings for additional virtual goods
Artificial scarcity	Exclusiveness	Items, environment, rules	Make selected virtual goods more desirable
Alterations to existing content	-	Environment, items, rules, gameplay	Create new settings for virtual goods to have value

The service context including game mechanics is clearly used as a part of revenue generation logic in virtual goods sales model. Some design implementations are quite direct mechanics for enticing users to spend real money, but the counterweight is user acceptance and the disturbances in game balance. In customer relationship terms the situation translates to retention versus monetisation.

Game design also lays down a developer designed segmentation scheme, from which users self-select the paths of segments they progress through. This is a uniquely flexible ability of firms as traditionally firms are only able to harness self-selection segmentation within strict boundaries. Virtual world operators seem to be able to create customer attributes and some of the needs beforehand.

3. THE BUSINESS MODEL CONCEPT

As a first step, business models are examined on a general level, i.e. answering questions such as what is the purpose of the business models and where are they located in the business architecture. Next, research on business models is covered and research streams will be identified, from which relevant streams will be further examined. This chapter is based on a literature review and synthesising the literature to form relevant theoretical foundations for this thesis. The section aims to explore a large portion of theoretical business model literature and attempts to identify a suitable perspective to business models and a framework for depicting the virtual goods sales model. The selection criteria are based on the previous sections and aspects of business model frameworks introduced in this section.

3.1. Business model in context

A business model is located between firms' strategic and process layers. It ties them together and serves as an integrator (Figure 10). It is used to translate vision and goals of a firm to a model that describes how these goals are to be achieved and offers a starting point for planning business processes. (Osterwalder and Pigneur 2002.) This illustrates the context and place of a business model. More elaborate descriptions will be derived from definitions from relevant literature below.

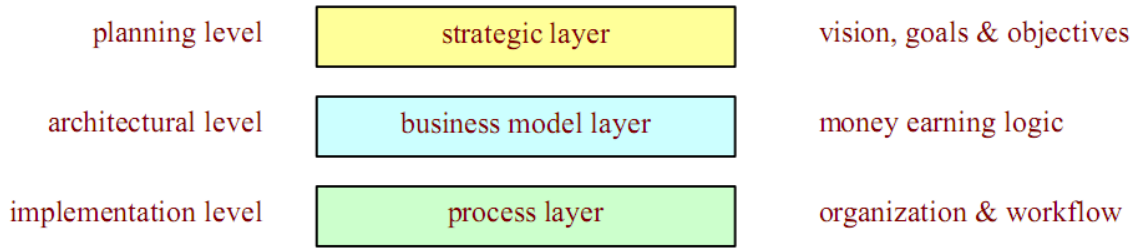

Figure 10: Business layers (Osterwalder 2004).

As business models are constantly changing and are subject to external pressures, it is beneficial to also perceive the concept in a wider context. Here is such a perspective of business model location (Figure 11) by Osterwalder et al. (2005).

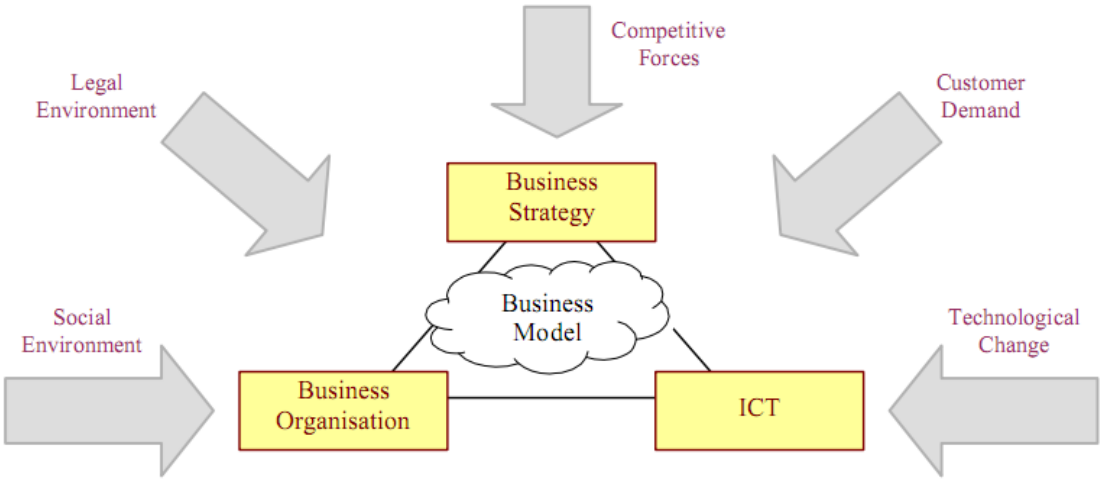

Figure 11: The Business model's place in the firm (Osterwalder et al 2005).

Osterwalder et al. (2005) identifies different roles of the business model concept from current business model literature. These include

- understanding and sharing,
- analysing,
- managing,
- prospects and
- patenting of business models.

3.2. Research streams

In this section an overview on business model research is provided by describing business model research streams from relevant literature.

Osterwalder et al. (2005) see that business model research has been progressing through a continuum of stages (Figure 12). This has naturally started with the formation of definitions and building of taxonomies, mostly consisting of e-Business taxonomies. To gain a better understanding of business models, they were reduced to components to realise what the business models consist of. While the components had now been named, the third stage addressed the content of those components, describing in more detail e.g. the activities involved in the components. Based on this knowledge, reference models could be formed that describe the relationships of the components. These conceptual models were further used in modelling actual implemented business models. In Figure 12 below, applications and conceptual tools are still missing. By the year 2009 some tools have emerged, for example software for modelling business models with e3value framework by Gordijn and BM|DESIGN|ER for business model ontology by Osterwalder.

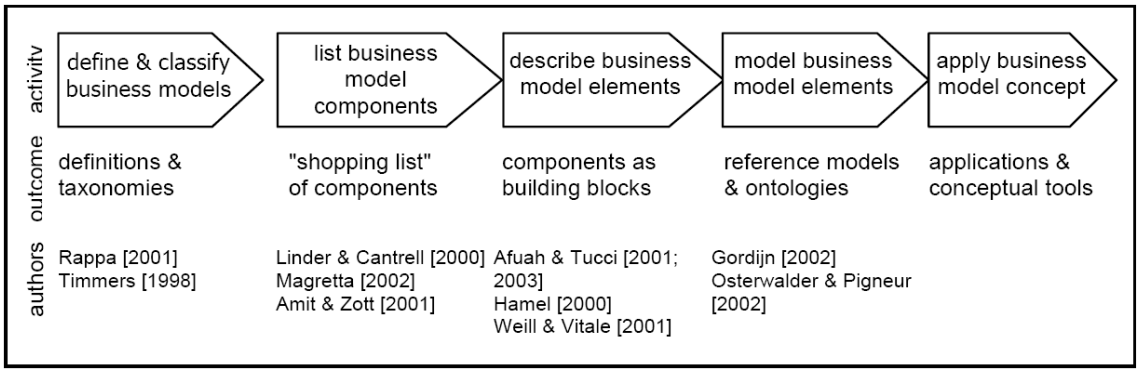

Figure 12: Evolution of the Business Model Concept (Osterwalder et al. 2005)

Pateli and Giaglis (2003; 2004) identify eight perspectives (Table 9) in business models literature. The research streams are defined by Pateli and Giaglis (2003; 2004) as follow:

Table 9: Business model research streams (adapted from Pateli & Giaglis 2003;2004)

Definitions	Research in this domain concerns defining the purpose, scope and primary elements of a business model, as well as exploring its relationships with other business model concepts
Components	Research in this domain is concerned with analyzing the business model concepts to further decompose it into its fundamental constructs
Taxonomies	Research in this domain relates to possible categorization of business models into a number of typologies
Conceptual models	Research in this sub-domain focuses on identifying and describing the relationship between these elements in an abstract but rational way. As a part of research in this field, a number of possible representational formalism (usually graphical) for visualizing the main elements of a business model, as well as their inter-relationships, under a specific aspect, have been produced
Design methods and tools	Research in this field concerns the development and use of methods, languages, standards, and software
Adaptation factors	It involves research on factors that affect the organizational adoption of business models, as well as research on socio-economic implications of business model innovation
Evaluation models	This domain is concerned with identifying criteria for either assessing the feasibility, viability, and profitability of new business models or evaluation them against alternative or best practice cases
Change methodologies	This domain includes research efforts that focus on formulating guidelines, describing steps, and specifying actions to be taken for either changing exiting business models or choosing new ones to adapt to business or technology innovation

From the above research perspectives, three streams are essential for outlining relevant business model aspects to support the examination of virtual goods sales. First, business model *definitions* will be reviewed to acquire an understanding what business models are. Secondly, business model *components* need to be examined to see what parts construct business models, and thirdly, the thesis examines business model conceptualisations (frameworks) which further

conceptualise the relationships of business model components. One framework will be specifically selected for further analysis of virtual goods sales model.

Osterwalder et al. (2005) present a complementary classification of business model perspectives (Figure 13) to Pateli's and Giaglis' (2004) taxonomy of business model research streams. Whereas Pateli and Giaglis present research streams, Osterwalder et al. show different semantic levels of discussing business models:

- 1 "*Authors that describe the business model concept as an abstract overarching concept that can describe all real world businesses.*"
- 2 "*Authors that describe a number of different abstract types of business models (i.e. a classification scheme), each one describing a set of businesses with common characteristics.*"
- 3 "*Authors presenting aspects of or a conceptualization of a particular real world business model.*" – (Osterwalder et al. 2005)

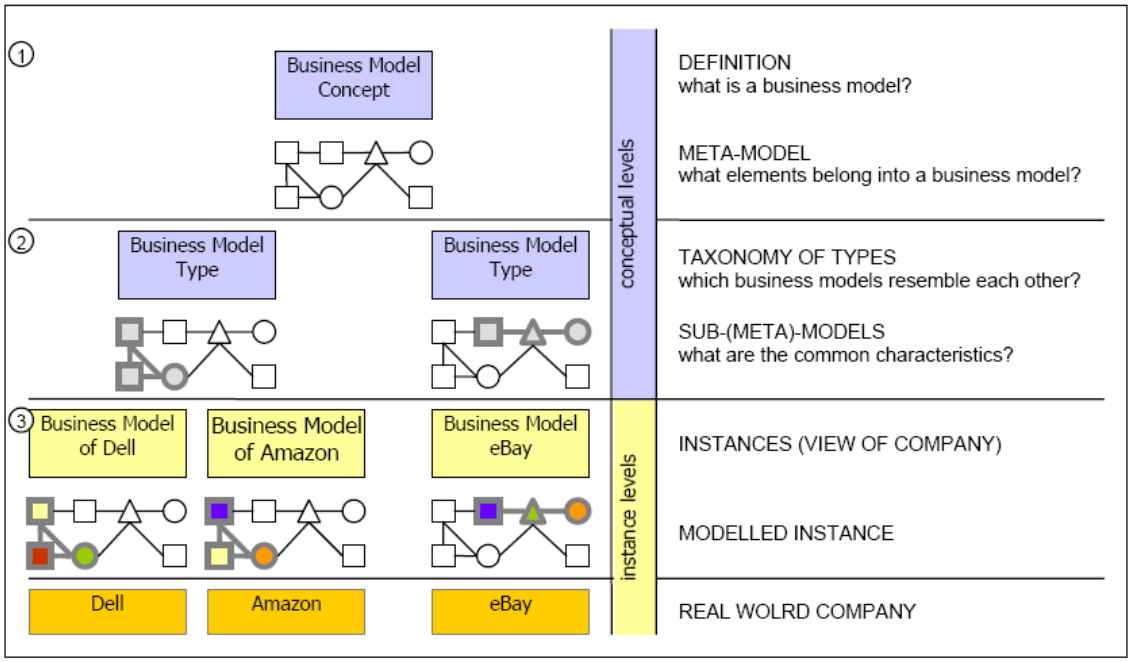

Figure 13: Business model concept hierarchy (Osterwalder et al. 2005)

Considering the business model concept hierarchy (Figure 13), this section of the thesis progresses through first *defining* a suitable perspective to business models, and secondly examining various *meta-models* from which a suitable one is chosen for further mapping of *instances* of *real world companies'* virtual goods sales business models.

This chapter aims to find a suitable *meta-model* for depicting virtual goods sales business models. The following chapter builds a virtual good sales specific *meta-model* based on the selected business model framework.

The first step is to review and examine the previously mentioned relevant business model research streams: that is, *definitions, components*, and *conceptual models*, to acquire a comprehensive view of business models and to map relevant aspects of each of these streams.

3.3. Definitions

A large part of business model literature recognises an inconsistency in the use of business model terminology (e.g. Timmers 1998; Mahadevan 2000; Gordjin and Akkermans 2001; Rappa 2000; Petrovic 2001; Linder and Cantrell 2000; Osterwalder 2004; Shafer et al. 2005; Morris et al. 2005). For example, the terms business model and revenue model are often used interchangeably. While business model is more of a description of the whole business conducted by an organization, a revenue model only describes revenue streams, i.e. where the money comes from (Linder and Cantrell 2000; Afuah and Tucci 2003; Amitt and Zott 2001; Osterwalder 2004). The term "business model" has also been used to refer to pricing models (e.g. premium), channel models (bricks'n'mortar, etc.), and to several more components, which are regarded as being included in a business model (Linder and Cantrell 2000). These misconceptions are understandable for the fact that business models are generally described by their most innovative or critical component. For example referring to a business

model as a bricks'n'mortar in the "dot-com bubble" era is quite reasonable, but has lead to major misconceptions (e.g. Mahadevan 2000, 56).

Linder and Cantrell (2000, 2) further explain that the business model misconceptions have mainly been caused due to the new innovations that e-business has enabled, causing business models being named with descriptions of e.g. revenue model, value proposition and channel configurations. These misconceptions can be seen in industry discourse as well as in academic literature.

The term business model attains several definitions and meanings. Linder and Cantrell (2000) assert business model being used in three primary contexts: business model components, real operating business models of organizations and dynamic business model (emphasizing adaptation in dynamic environment). Osterwalder (2004), based on the previous categorization, asserts business models being used in contexts of abstract business models (as in business model conceptualizations), operating business models that are implemented and used by existing organizations, and scenario business models that are used in different scenarios to serve special purposes such as in simulating opportunities. The term business model is also used to refer to conceptual models and business process models (Osterwalder 2004). Business model concepts are further examined in this section of the paper based on prominent business model literature.

Timmers' (1998) description of a business model is three-fold:

- *"An architecture for the product, service and information flows, including a description of the various business actors and their roles"*

- *"A description of the potential benefits for the various business actors"*

- *"A description of the sources of revenues"* – (Timmers 1998).

Timmers' (1998) definitions reflect a value chain and/or value network perspective to business models where the main contribution of the business model is to describe actors and the value flows between them. The description does not stress for example how the value is created and configured.

Magretta (2000) compares business models to stories that explain how enterprises work. It describes who the customer is, what does the customer value and how an enterprise makes money in the business. It also describes the underlying economic logic that explains the process of delivering value to customers at an appropriate cost. "Creating a business model is, then, a lot like writing a new story." (ibid. 2000, 4.)

The story perspective in Magretta's (2000) definition emphasizes the relationships of business model components, such as a story can be regarded as somewhat of a chronological chain of events. This perspective to business models is valuable considering the scope of this thesis since interplay between business model implementations will be discussed. I regard the story perspective valuable also for the fact that one major function of a business model is to be an intermediary of information of one's business and as such a coherent description. (Osterwalder 2004).

Weill and Vitale (2001) as well as Timmers (1998) adopt a more outer-organizational perspective to business models, where the relationships, interfaces, and flows are in the centre of attention. These definitions concentrate less on the actual processes of how the value is being created.

> "*A description of the roles and relationships among a firm's consumers, customers, allies, and suppliers that identifies the major flows of product, information, and money, and the major benefits to participants*" (Weill and Vitale 2001).

Rappa (2000) also sees business models from a value chain perspective. Business model can then be seen as a description of how an entity on a value chain

adds to the value being created on a chain, as well as how a company translates this surplus in created value into revenue streams. This definition deviates from definitions of Timmers (1998) and Weill and Vitale (2001) in that it emphasizes the revenues of the firm, positioning this definition closer to marketing-based business model definitions.

> "*In the most basic sense, a business model is the method of doing business by which a company can sustain itself -- that is, generate revenue. The business model spells-out how a company makes money by specifying where it is positioned in the value chain.*" (Rappa 2001.)

Amit and Zott's (2001) abstract definition moves into the direction of marketing-based understanding of business models. It starts to emphasize the value creation process and is concentrated on the actual content a value chain produces. However, the definition still is clearly connected to earlier mentioned definitions (e.g. Timmers 1998; Weill and Vitale 2001; Rappa 2000).

> "*A business model depicts the design of transaction content, structure, and governance so as to create value through the exploitation of business opportunities. We propose that a firm's business model is an important locus of innovation and a crucial source of value creation for the firm and its suppliers, partners, and customers.*" (Amit and Zott 2001, 493.)

In this thesis, the concepts of value chain and network are somewhat disregarded and outside the scope, because of the emphasis on intra-organisational design choices, although that is not to say a value chain does not exist inside an organisation. Rappa (2000) and Amitt and Zott (2001), however, refer to inter-organisational value chain and to organizations' role in such chains.

Linder and Cantrell (2000) define business model by the following phrase: "*A business model, strictly speaking, is the organization's core logic for creating value*". This definition does not only deviate from the previous definitions in its simplicity, but promotes the value creation as the core of the business model, whereas the previous ones state that the business model is derived from the location on the value chain.

> *"The business model of a profit-oriented enterprise explains how it makes money. Since organizations compete for customers and resources, a good business model highlights the distinctive activities and approaches that enable the firm to succeed-to attract customers, employees, and investors, and to deliver products and services profitably. Only the business model components that are part of the essential logic are included, so one company's operating model may look dramatically different from another's."* (Linder and Cantrell 2000.)

Concerning this thesis the definition underlines an important notion of business models - the scoping of business model. Business model depicts the value creation logic from a certain relevant angle and is not supposed to explain all the aspects of business conducted, but only the essential building blocks for the given purpose. While this thesis concentrates on value creation in relation to virtual world's rules and mechanics, this definition provides support for a distinct approach to business models.

Osterwalder (2004) adopts a more pragmatic perspective and defines business models as business tools. This definition is further extended to a conceptual model in the same paper. The definition and the further conceptualization communicates a certain chain of events in delivering value to customers; from the customer segmentation attributes to organization's core competencies and activities, to differentiated value proposition and further to delivering the value, and harnessing them as revenue streams.

> *"A business model 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 streams."* (Osterwalder 2004, 15; Osterwalder, Pigneur, and Tucci 2005, 10.)

In addition to the most basic defining properties of a business model, other deviating properties presented above will be adopted for this thesis. Business model will not be used to model the whole business of a company, but separate business models can be used to cover different aspects and goals of a company (Linder and Cantrell 2000). Business model describes business logic in a chain of activities or events (Magretta 2000; Osterwalder 2004, 15; Osterwalder, Pigneur, and Tucci 2005, 10), as well as value proposition and customer orienta-

tion, i.e. marketing orientation to business models (e.g. Linder and Cantrell 2000; Osterwalder 2004). The value chain and network perspectives (e.g. Weill and Vitale 2000; Rappa 2000) that emphasize inputs and outputs of a business entity will be left with less attention.

3.4. Components

In this section, literature on business model components will be reviewed. As relevant literature can be regarded papers which not only define, but describe components from which business models are composed. There are several papers including discussion on this research stream. Pateli and Giaglis (2004) mention the following papers pertaining to business model components: Mahadevan 2000, Hamel 2000, Linder and Cantrell 2000, Chesbrough and Rosenbloom 2002, Klueber 2000, Afuah and Tucci 2003, Alt and Zimmermann 2001, Weill and Vitale 2001, Applegate and Collura 2001, Petrovic et al. 2001, Osterwalder and Pigneur 2002, Magretta 2002, Krüger et al. 2003, and Hedman and Kalling 2003.

Business model components are the elementary building blocks of which the business models consist. In most literature components are merely a concept of a component of business such as a revenue stream, a partner network or a product, and not a documented or extensively specified application. There is a very large variety of component compositions in literature, in which authors describe business model constructs from differentiating perspectives. In fact, Shafer et al. (2005) identified 42 different components from relevant works (Figure 29). This illustrates the variety and perspective dependence in business model analysis.

I reviewed all of the above mentioned business model component arrangements, but further descriptions of them all would not significantly contribute to

the general view of this thesis. Figures and tables of the components can be found from the Appendix section of this paper. One more reason not to describe all of the business model components here is that the business model conceptualisations (reviewed in the next sub-section) already include specific set of business model components. Hence, the business model conceptualisations will determine the included components in the end. However, it is essential to have an understanding of the variety of components used if the frameworks require modifications or combinations with other frameworks.

Osterwalder (2004) further divides component constructs into two streams: 1) product-, actor- and network-centric business model frameworks and 2) marketing-specific frameworks. The first category includes a value network emphasized perspective while the second covers components from a marketing-based perspective. (Osterwalder 2004, 30.) This kind of division between business model perspectives could already be seen reflected in the definitions of business models described in previous section.

Considering the scope of this study which aims to examine the virtual goods sales business model, value networked perspectives are disregarded and a marketing-based view to business models is adopted because of the depth of examination it allows contrary to value network perspectives.

The literature also supports the view that business models should be examined from a certain perspective. As Linder and Cantrell (2000) state, the business models describe parts of the whole business conducted and therefore attempting to cover all parts of business with a single model might not be feasible. Examining what core competencies or resources virtual world operators have does not help to answer the research questions directly. More importantly this study is concerned with questions of what and how value is being created (value configuration), what is being offered (value propositions), via which channels, to whom, and how the value is priced. Costs, which are mentioned as

a business model component, will be left outside examination as assessing cost effectiveness of different strategies used is outside the reach of this study. Outer-organisational factors, which have been presented in couple of business model component arrangements (e.g. Alt and Zimmermann 2001; Afuah 2004), are also left outside the scope.

None of the reviewed business model components included business aspects (identified in the previous section) pertaining to a firm's abilities to affect the value context, i.e. the rules and structures according to which goods are used and consumed. This is possible for virtual world operators, as discussed in the previous sections. Business model components assume businesses act on markets, where customer's valuations are based on existing "real world" needs and that a firm has no ability to affect them outside traditional marketing efforts. Also components for integrating users to value creation are missing, as well as business performance metrics outside revenues and costs.

3.5. Conceptualisations (frameworks) - selection

In this section, business model frameworks are compared to map their suitability for the purposes of this thesis as to which could be best suited for depicting and modelling the virtual goods sales business model in an appropriate depth. In addition the conceptualisations' compatibility to selected business model components discussed in the previous sub-section will be examined.

Mäkinen and Seppänen (2007) reviewed thirteen prominent business model conceptualisations. They give a thorough description of how business model conceptualizations were selected from literature. I consider the process rigorous and similar to the process of finding business model conceptualisations conducted for this thesis. The presentations of business model conceptualisations covered by Mäkinen and Seppänen (2007) are: Afuah (2004), Hamel (2001), Rayport and Jaworski (2001), Morris et al. (2005), Hedman and Kalling (2003),

Osterwalder (2004), Gordjin (2002), Betz (2002), Weill and Vitale (2001), Alt and Zimmermann (2001), Pant and Ravichandran (2001), Mahadevan (2000), and Timmers (2000). Some of these presentations have already been covered in figures in previous sections of this thesis and therefore will not be repeated. I have, however, examined the conceptualisations first-hand, and thus the selection does not solely rely on the analysis of Mäkinen and Seppänen. In addition to earlier mentioned conceptualisations a STOF framework (Faber et al. 2003) will be analysed.

Table 10: The summary of the assessment of the business models (Mäkinen and Seppänen 2007)

		Model					Taxa			
Clusters	Authors	1	2	3	4	5	6	7	8	9
A	Afuah (2004)	C	4th	Yes	Yes	Yes	No	No	No	Yes
	Hamel (2000)	D	3rd	Yes	Yes	Yes	No	No	No	Yes
B	Rayport and Jaworski (2001)	D	2nd	Yes	Yes	No	–	No	No	Yes
C	Morris *et al.* (2005)	C	2nd	Yes	No	Yes	No	No	No	No
	Hedman and Kalling (2003)	D	1st	Yes	No	Yes	No	–	No	No
D	Osterwalder (2004)	C	3rd	Yes	No	No	–	No	No	Yes
	Gordijn (2002)	C	2nd	Yes	No	No	–	No	No	No
	Betz (2002)	D	2nd	Yes	No	No	–	No	No	Yes
	Weill and Vitale (2001)	C	2nd	Yes	No	No	–	No	No	Yes
	Alt and Zimmermann (2001)	D	1st	Yes	No	No	–	–	No	Yes
E	Pant and Ravichandran (2001)	D	1st	No	No	No	–	–	No	No
	Mahadevan (2000)	D	1st	No	No	No	–	–	No	No
	Timmers (2000)	D	1st	No	No	No	–	–	No	No

Notes: C, causal; D, descriptive; –, not applicable, *Legend for model and taxa criteria:* 1, mode of inference; 2, level of analysis; 3, generalizability; 4, hierarchy; 5, collective exhaustiveness; 6, parsimony; 7, mutual exclusivity; 8, internally homogeneous; 9, representative naming

According to my literature review, the covered concepts by Mäkinen and Seppänen (2007) are among the most cited and notable works in the field. In addition STOF framework (Faber et al. 2003) and CSOFT models (Heikkilä et al. 2008) are included in the comparison. I will analyse which of them offer the best preliminary conceptualization to depicting the virtual goods sales business model. In addition, I will apply selection criteria (Table 11) for the conceptuali-

sations and in addition to the comparison by Mäkinen and Seppänen (2007) (Table 11).

If we consider the different requirements and usages of business model frameworks presented in sections 1.3.2 and 3.1., there are several attributes that positively affect on their appropriateness for using as a tool. For a business model conceptualisation to functions as a vessel of information and as a skeleton for structuring business models, it is highly beneficial to use a visual model. Business models consist of several causal components. To present the relationship of components a causal model is required.

Inconsistency and confusion about business models has plagued the related discussion, although the mentions of the term business model in academic literature has dramatically increased. On one hand, of course, all fields of study has to develop by trying out different conceptions, however, on the other hand, the lack on unified and generalisable framework has lead to much of inconsistency and even further this situation seems to have invited single authors to decide on using yet another new conception of a business model in papers. I attempt to avoid stepping into this trap by selecting a highly generalisable framework (with enough depth) in aims to form comparable analysis of virtual goods sales business models. If additions and modifications to the selected framework will be deemed necessary, they are more accessible when presented in a generic model, instead creating yet another new model.

One aspects contributing to the inconsistencies are the two categories of business model conceptualisations: value chain and value creation perspectives. It is essential to understand the abstraction level difference between these conceptions. Whereas the former conception concentrates on the locations of a business on a value chain, the value creation perspective looks at the inner logic of a business models, hence providing a very different perspective. In this thesis the service design and revenue generation logic are in central role in business

model analysis and therefore the latter conception of value creation perspective is one criteria for selecting the framework for further analysis.

Virtual world business model literature was reviewed in Chapter 2. The most notable aspects of virtual world business model emerge from its digital and highly service oriented nature. These aspects elevate for example highly user equity metric development. I attempt to avoid locking further business aspects of virtual world operators at this stage because none of the business model framework might not be able to describe all of these aspects. These aspects should nevertheless emerge from attempting to depict the business aspects in a generic business model framework. Therefore, the aim is to select a very general framework and attempt to fit the business aspects into it and hence find shortcomings in the frameworks and in parallel validate the frameworks by providing actual application of their use.

Table 11 Selection criteria for business model conceptualization

Criterion **- BM specific 1.3.2 and 3.1., VW specific 2.1.-2.6.**	**Reasoning**
Visual, causal and supporting the functions of a business	Supports clear presentation and further usage as a tool
	Enables examination of business model applications' relationships
Generic (not specific to domain)	Supports comparability across industries as well as within virtual world industry
Value creation/ marketing/ customer orientation, instead conceptualisations defining business model of its location on value chain	Enables relevant depth to business model analysis
Service orientation	Virtual world business is service oriented
	Virtual goods sales uses servide design as part of the revenue generation logic
User-generated content	UGC is an integral part of social online services

The criteria of visuality and causality eliminates about a half of the conceptualisation candidates, leaving Afuah (2004), Osterwalder (2004), Gordjin (2002) and Weill and Vitale (2003) for further examination.

The conceptualisation by Weill and Vitale (2003) would not meet the criteria for the purpose of this thesis as the emphasis in their conceptualisation is on flows of products, information and money; and the products and actual value configuration are not discussed as thoroughly.

In the works of Gordjin et al., e3-value modelling concept is presented. While I recognize the potential of this modelling language, it does not provide one clear conceptualisation of a business model, but instead concentrates on modelling value transactions in actor network. Additionally, the e3-value modelling

framework can be regarded as a design tool for multi-party value-creation modelling rather than a conceptual model of a business model.

Afuah's (2004) conceptualization includes five components, one of which is industry factors. The definition of a business model offered earlier locates such factors outside the business model. Afuah's (2004) conceptualisation compared to the pragmatic model of Osterwalder (2004) is clearly on a higher abstraction level and is not meant for describing instances of business models, but more generic business models. The aim of this thesis is to identify and create a framework that is both suitable for describing business model instances as well applicable in presenting the nature of the business.

The CSOFT ontology (Heikkilä et al. 2008) includes service, technology, finance, organisation of network, and customer relationship components. However, this framework does not provide detailed descriptions of the components, leaving the ontology relatively general in nature. On the other hand the CSOFT ontology supports the previously noted increased customer relationship emphasis in business models.

The STOF business model framework (Faber et al. 2003) in addition to Osterwalder's works, is another extensively developed business model conceptualisation that aims, not only to describe what a business model consists of, but to act as a design tool for businesses. STOF was initially presented by Faber et al. 2003. Whereas Osterwalder's model consists of pillars for infrastructure managements, customer interface, product, and financial aspects, the STOF model consists of service, technology, organization, and financial domains. In both conceptualisations these pillars are further divided into smaller entities.

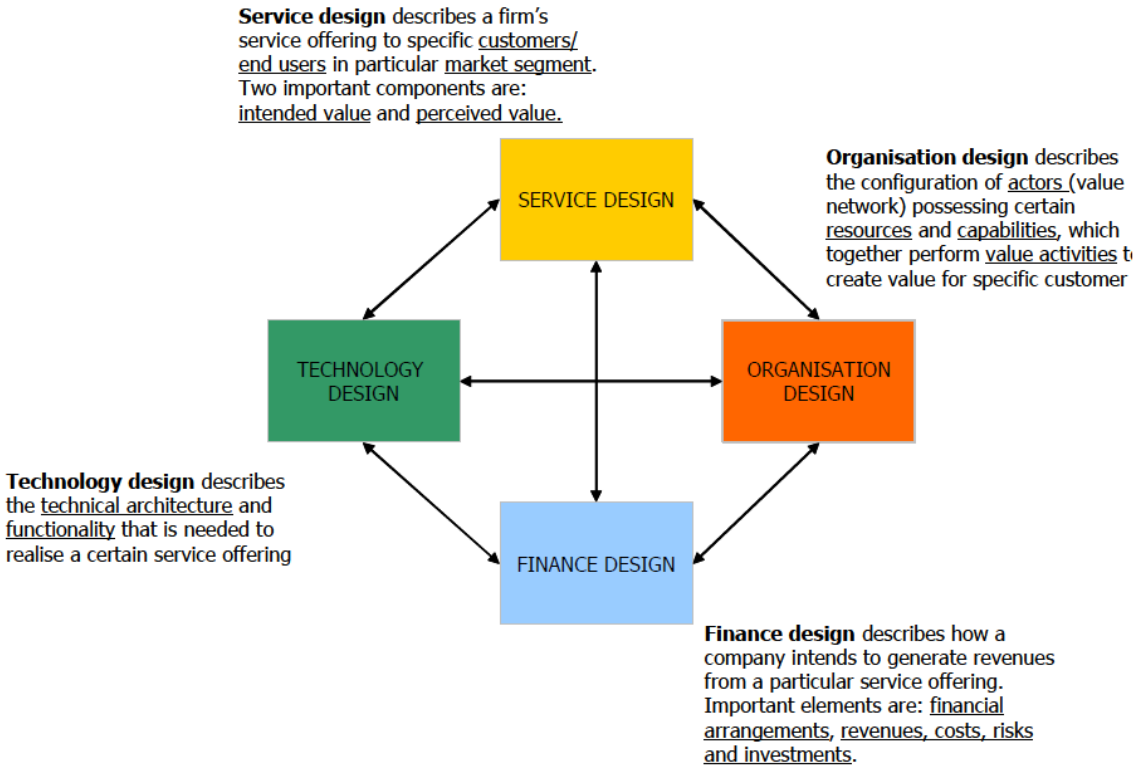

Figure 14: Higher level conceptual framework (Faber et al. 2003)

Each of the business model domains in Figure 14 divides into about ten components (see Faber et al. 2003). While I regard this level of examination important especially in designing business models, it might not be suitable for the aims of this thesis, which concentrates more on presenting a meta-model level description of a business model. STOF model would be more suited for accurate and specified depicting of actual business model instances of organizations. The framework is rather restrictive, and modifying or reducing it to a more general and suitable form would be substantially difficult. While the relevance of organisation and technology design domains is high, they are for most part outside the scope of this thesis. The extensiveness of the STOF framework also seems to exceed the earlier defined role of a business model as an integrator of strategy and processes. STOF's fidelity comes close to defining actual processes of a business network. The advantage of the STOF model, however, is that it includes service design, but as the STOF framework is specifically targeted to

modelling mobile service providers' business models, the service block is somewhat incompatible.

After comparing and analysing the above business model conceptualisations, the business model ontology by Osterwalder (2004) is chosen for depicting virtual goods sales business conducted by virtual world operators. My arguments, in addition to fulfilling the selection criteria, for using the business model ontology presented in the work by Osterwalder et al. (2002-2009) are the following:

- It is grounded on a rigorous literature review of many of the previously mentioned prominent papers on business models
- The conceptualisation has been refined throughout many publications on the subject
- It has been previously noted in research on virtual worlds
- The conceptualisation allows examination on several abstraction levels
- The conceptualisation presents alternative applications for business model components
- It enables modular examination of business model components
- There is much additional documentation about its implementations (Osterwalder 2009)
- There is now a tool for using the framework (BM|DESIGN|ER)

3.6. Summary of Business Model Ontology

Descriptions of business model components are listed in Table 13. Figure 22 depicts relationships of the components. In the next section the virtual goods sales business model and the virtual economic design in revenue generation logic are

discussed following the business model ontology. For a more detailed description of the business model ontology see Osterwalder (2004).

Table 12: Business model building blocks (Osterwalder 2004)

Pillar	Building Block of Business Model	Description
Product	**Value Proposition**	A Value Proposition is an overall view of a company's bundle of products and services that are of value to the customer.
Customer Interface	**Target Customer**	The Target Customer is a segment of customers a company wants to offer value to.
	Distribution Channel	A Distribution Channel is a means of getting in touch with the customer.
	Relationship	The Relationship describes the kind of link a company establishes between itself and the customer.
Infrastructure Management	**Value Configuration**	The Value Configuration describes the arrangement of activities and resources that are necessary to create value for the customer.
	Capability	A capability is the ability to execute a repeatable pattern of actions that is necessary in order to create value for the customer.
	Partnership	A Partnership is a voluntarily initiated cooperative agreement between two or more companies in order to create value for the customer.
Financial Aspects	**Cost Structure**	The Cost Structure is the representation in money of all the means employed in the business model.
	Revenue Model	The Revenue Model describes the way a company makes money through a variety of revenue flows.

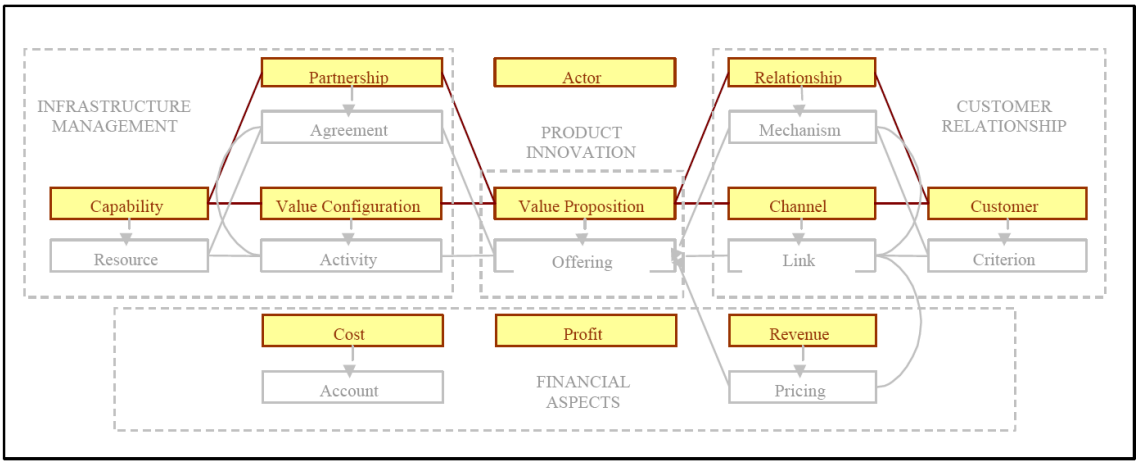

Figure 15 Business model ontology (Osterwalder 2004)

4. VIRTUAL GOODS SALES BUSINESS MODEL

This chapter describes and discusses the components of a business model of virtual good sales. The sections are divided in accordance to business model components in the framework by Osterwalder (2004), which was considered to be the best candidate for describing virtual goods sales model in the previous section. If we consider the research approach defined in the introduction, this section of the thesis combines the identified theories, models and frameworks pertaining to virtual goods sales to business model ontology, resulting in depiction of virtual goods sales business model.

I will attempt to restrain the examination on aspects already presented in literature in somewhat close relation to business applications. I will also emphasise design that somewhat directly pertains to actual sales of virtual goods. Further identification of game mechanics is left outside the scope of the examination. The purpose here is not to show how all available mechanics fit into the business model framework, but to start filling the gap between business modelling and internal virtual world design by providing analytical examples.

The benefits of using the business model framework instead of a purely descriptive presentation is that it gives a structured conceptualisation of the business model, helping in understanding the relationships of the aspects in business model components. It also allows us to see if business model framework is compatible with social online services' business models. For the practitioner, the use of a framework also provides example applications of a business model framework implementation. From a scholarly point of view, this thesis on the one hand makes progress in business model literature by offering one more adaptation of its use and hence further validating the ontology, and on the other hand by suggesting modifications to it.

Some aspects in instance level business models of virtual world operators are somewhat out of reach, especially cost structure and capabilities The channel component in the customer block does not include directly relevant aspects to revenue generation logic and service context design. The scope will be detached from these business model components in the following analyses.

4.1. Value proposition / product or service

Whereas other business model building blocks include many components, the product block includes only the value proposition components, which include the value offerings that are offered to the defined customer segments. Osterwalder (2004) defines value proposition component as a "definition of how items of value, such as products and services as well as complementary value-added services, are packaged and offered to fulfill customer needs". The term “packaged” here refers to how value offerings are bundled into a large value proposition. Following this line of thought, the value proposition can be regarded as the totality of all the value offerings. This would include for example, graphics, narrative, user interface design, and other value adding design dimensions, but I attempt to limit the scope on virtual goods and on the context design, including game mechanics, social interaction design and virtual economies, which differentiate from other design categories in that it creates rules on how users can interact within a service and thus is relevant in answering *how* the revenue generation logic works.

Categorising different value offerings from a total value bundle of what the total service offers to users seems complex in the context of virtual worlds and virtual goods sales model. Virtual worlds are very complex and dynamic services. For example, it is problematic to decide how to perceive virtual goods. Do they only have complementary value to the service or the other way round?

Could they be perceived as the primary value offerings, where the virtual world would only be adding value to the virtual goods?

I argue that this problem is partly solved when we perceive the business of selling and marketing the virtual world itself somewhat separated from selling virtual goods within the service. Essentially, the virtual world and the virtual goods are sold on a different market. In the acquisition stage, the virtual world is marketed to users, who have little experience or cannot value the virtual goods inside the virtual world. Only in the retention stage, when users have been acquired and engaged, can the user assess the value of virtual goods offered. While these stages are essentially inside one business model, the goals attempted to achieve in each phase are different, the reasoning behind business patterns vary, and thus I suggest that it would be beneficial to perceive these stages as separate, but causal instances of a business model. The virtual goods sales is another layer of business building on the initial sales of a boxed game in retail (or giving it out for free with acquisition pricing).

Another distinction can be seen when assessing user segments. When selling the service itself, the segmentation is based on real world segmentation factors (e.g. demographics), whereas when selling virtual goods, major part of the segmentation is based on the behaviour of users inside the virtual world. In summary, the service has an elementary value as such, but the virtual goods augment the experience, just as real products augment the real world experience. The value of virtual goods is then to a large degree defined as a function of the virtual good attributes and the needs emerging from the game environment.

To put it simply by a crude analogy, virtual world developers are "gods", who create a world and its rules. People interact in the world bounded by the rules laid down by the designers. Needs emerge from the daily lives (gameplay) and the gods address needs by giving (or selling) goods to people. Gods, however,

have multiple problems: 1) how to convince people to choose their world (acquire) 2) how to keep the world constantly engaging and fun (retain); and 3) how to make people give offerings to the gods (monetise). The "offering" analogy actually has some explanatory power because in game environments, players buy virtual goods to cope better in relation to world design.[9] The virtual world operator is essentially creating a closed dynamic market for selling their virtual goods in their virtual world.

The articulation for such service design through engagement and interaction is lacking from the business model ontology and it can not be inserted in any other component either. Nonetheless, the structure and rules of virtual economic design also have value in itself.

This situation, where the developer is able to constantly adjust the attributes and relative usefulness of sold products, is rather rare. A close example could be the situation where a business sells augmenting complementary products to a larger service or product. In this situation the elementary service's value caveats can be seen to some extent as creating needs for additional value. Nevertheless, the tools for modelling such a situation is lacking from business model conceptualisations. Value context is in close interaction with value offerings by defining value of offerings to selected user segments. Value offering can thus be seen to address needs created by the value context.

Business models instances represent what is relevant for the company in question and thus it is somewhat irrelevant to go into much detail about value offerings. However, on a general level, the value propositions of these kinds of services and products can be discussed. Next I will review some of the literature pertaining to what value virtual worlds and virtual goods offer to users.

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9 Fairfield (2009) also uses the god analogy in "The God Paradox" article when discussing potential regulatory problems pertaining to virtual world operator's power.

The most commonly referenced work pertaining to why people use virtual worlds is a motivational chart by Yee (2007).

Table 13: Motivations of play (Yee 2007)

Achievement	Social	Immersion
Advancement Progress, Power, Accumulation, Status	**Socializing** Casual Chat, Helping Others, Making Friends	**Discovery** Exploration, Lore, Finding Hidden Things
Mechanics Numbers, Optimization, Templating, Analysis	**Relationship** Personal, Self-Disclosure, Find and Give Support	**Role-Playing** Story Line, Character History, Roles, Fantasy
Competition Challenging Others, Provocation, Domination	**Teamwork** Collaboration, Groups, Group Achievements	**Customization** Appearances, Accessories, Style, Color Schemes
		Escapism Relax, Escape from RL, Avoid RL Problems

The results by Yee (2007) mirror what people actually do in virtual worlds, particularly in MMOs. These types of activities have been to some level catered for by the developer. Furthermore, these motivations correspond with what users feel are important dimensions of a service (see discussion on service dimension in User segments section). The motivations for buying virtual goods, respectively, correspond with the motivations of using the virtual worlds and thus the service context design can be seen to create needs for users. Next I will review motivations of buying virtual goods in related materials.

4.1.1. Value components of virtual goods

Lehdonvirta (2009) identifies drivers for virtual goods purchases. He divides the drivers under three primary categories: functional, hedonistic, and social (Table 15).

Table 14: Why people buy virtual goods (Lehdonvirta 2009)

Component	**Sub-component**
Functional attributes	Performance
	Functionality
Hedonistic attributes	Visual appearance and sound
	Background fiction
	Provenance
	Customisability
	Cultural references
Social attributes	Branding
	Rarity

Sulka Haro (2009), lead designer of Habbo, adds *versatility* and *multiplicity* to Lehdonvirta's classification. Versatility refers to how many different types of applications an item has. Multiplicity refers to whether owning multiple copies of an item gives cumulative value.

Guo and Barnes (2007;2009), through the Technology Acceptance Model and focus groups, suggest the following purchase drivers that directly affect purchase behaviour: perceived profit making opportunities, social influence, motivations from game context, effort expectancy, virtual item resources, performance expectancy, and personal real resources. The study by Guo and Barnes (2007;2009) utilises previously extensively tested theoretical framework (TAM) as basis for modelling motivations, which is lacking from other classifications. Comparison between other classifications is pretty difficult as some classify virtual good properties, and some the actual end goals that users are trying to achieve via purchases.

Kim, M. (2009), CEO of Nexon, describes eight different value propositions of virtual goods: function, envy/prestige, recognition, collecting, rarity/scarcity, competition, friendship, and peer pressure. According to Liew (2009), people buy virtual goods for the same reasons people buy digital goods, but he points out three major reasons specific to virtual goods: doing more (functionality), building relationships (e.g. gifts), and establishing identity (customisability, brands, cultural references). Balfour (2009) of Viximo, a virtual monetisation platform provider, also describes three primary drivers for virtual good sales: status, socialising, and winning.

The difference between these classifications is that Lehdonvirta (2009) describes attributes of the virtual goods themselves, whereas other authors refer to motivations for buying virtual goods. The classifications are quite similar, but are not directly comparable. Additionally, the categorisations do not seem to be taxonomical, but many of the motivational components can be seen in a causal relationship and even as a sub-component for other component(s). For example, it might be quite difficult to assess the primary motivation between prestige, envy, competition, winning, and which actual virtual good attributes correspond to players achieving these aspirations. These attributes are also somewhat dependent on the virtual world in question, as the character competence and status are achieved through different mechanisms. In this vein, performance might refer to actual mathematical performance calculation of items, or it might be the appearance or the scarcity of a virtual good that promotes players status. Clearly more work on the classifications and their relationships would be needed to construct a taxonomical model.

4.1.2. Value context

The above authors do not explicitly mention service context, except Guo and Barnes (2009) show a clear link between needs emerging from game context and

buying virtual goods. Kim (2009) further identifies the service context providing the environment which entices virtual good purchases. Hamari and Lehdonvirta (2010) show clear links of how game mechanics have been used in determining user needs.

The naming of the component is rather difficult. Kim (2009), in similar discussion, suggests *context*. Järvinen (2009) compares such design to service design and interaction design. Guo & Barnes (2009), in assessing motivations for virtual goods purchases, referenced some motivations emerging from contextual factors.

This design dimension could also be argued as belonging in game design, or it could be called virtual economic design, or social interaction design, as the context design includes all of these aspects and design patterns comprising the union of these designs. *Value context* could be a suitable name for such a business model component, as it would not be service product or service type specific and it would fit the value proposition block. Game mechanics, social interaction mechanics and virtual economic rules seems to be the primary design dimensions for value context in social online services, but perhaps the relevant dimensions are specific to services. Still, these social online services illustrate the value context existing. In virtual worlds business, the developers have the ability to create rules and a context which determines the ways in which the users can interact, the needs emerging from the context, and how the users are divided or self-select[10] into different interaction paths, or in business sense, into user segments.

[10] Self-selection refers to customer selecting a "version" of a product themselves and thus indicating the valuation towards the different alternatives offered (Shapiro & Varian 1999).

4.2. Value configuration

The value configuration component defines activities for value creation, answering the question of how the value propositions are created. In the business model ontology value chain typologies are in central role in defining the value configuration activities. There are a couple of value creation typologies. Most notable are value chain, value network and value shop (Stabell and Fjeldstadt 1998; Osterwalder 2004). Although these typologies are quite general, they have fundamental differences (Table 15).

Table 15 Value configuration typologies (adapted from Stabell and Fjeldstad 1998)

	Chain	Shop	Network
Value creation logic	Transformation of inputs into products	(Re)solving customer problems	Linking customers
Primary technology	Long-linked	Intensive	Mediating
Primary activity categories	• Inbound logistics • Operations • Outbound logistics • Marketing • Service	• Problem-finding and acquisition • Problem-solving • Choice • Execution • Control/evaluation	• Network promotion and contract management • Service provisioning • Infrastructure operation
Main interactivity relationship logic	Sequential	Cyclical, spiralling	Simultaneous, parallel

Value shop is one of the value configuration models originally conceptualised by Thompson (1967) and further refined by Stabell and Fjeldstad in 1998. Value shop is a customer problem centric typology of creating value to customers, contrary to value network and value chain typologies, which are more concentrated on inputs, outputs and relationships in value chains and networks. Value shop concentrates on creating value by solving problems rather than creating value by producing physical products. Value shop is especially applied in information and technology intensive industries, where specialized products are being offered. (Stabell and Fjelstad 1998.)

Traditionally value shop is seen as a process of creating value through products and services to address existing needs of customers. But I argue that the cus-

tomer needs and problems in virtual world environment are to a large degree derived from the game design laid out by the developer. Therefore, the traditional way of seeing the value shop might not apply in this context as such.

4.2.1. Iterative development of service context

Value shop would traditionally seek to solve the problem of what are the customer needs (Stabell and Fjeldstad 1998). But when we consider the previously described issues, the problem component in the value shop framework then translates to what needs should be built into the world and how should they be implemented. The value context design, including game mechanics, virtual economy design and social interaction mechanics, are the major underlying answers to this problem, among other approaches outlined in the previous section of this paper.

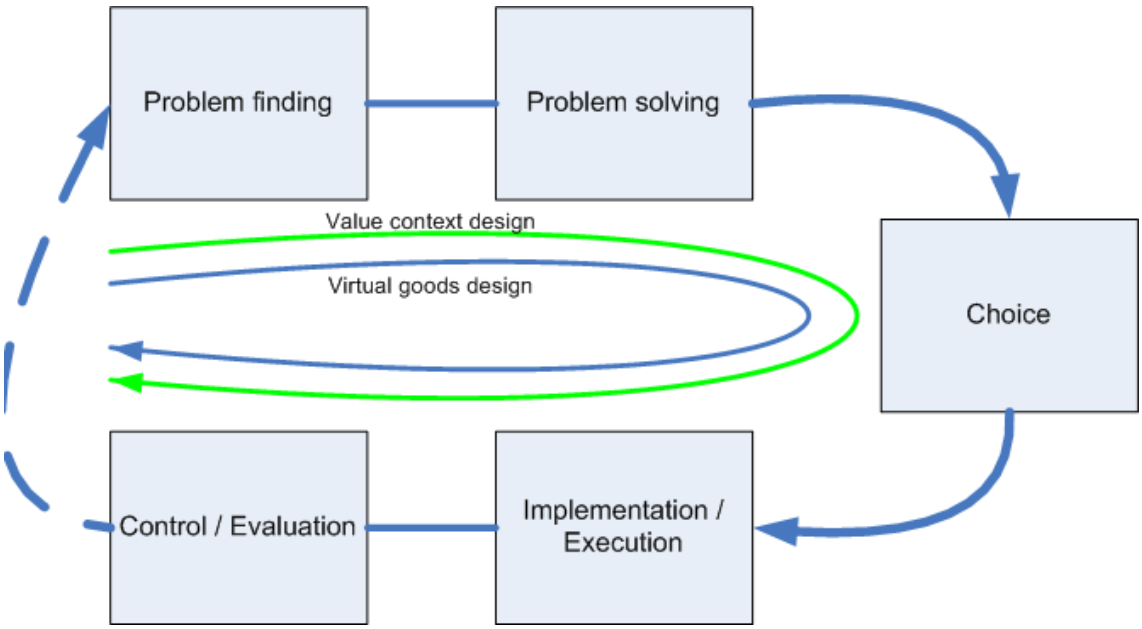

Figure 16 Value shop stages (derived from Stabell and Fjeldstad 1998)

I suggest that one possible way for outlining the value configuration process for virtual economic design is through a problem solving activity and thus bearing

close resemblance to the value shop typology, at least when comparing to the other presented typologies. Game design, including for example narrative, level design, and graphics, might be more of a traditional production of value products, and follow more of a value chain kind of typology. The design of the rules and structures of virtual economy design however resembles a problem solving approach. Designing attributes relating to virtual economic rules, such as how the item degrades or how the trade of the items is limited, adheres to a problem solving situation where the interdependence of a virtual good and the environment where it is used has to be carefully analysed.

Also the iterative nature of service context design development fits the value shop problem solving aspects. The design is commonly under constant development to better function to meet the goals which the design patterns aim to address. The value shop typology comprises five primary activities stages: problem finding, problem solving, choice, implementation, and evaluation. (Stabell and Fjeldstad 1998.)

Problem solving in a virtual goods business model is in essence a balancing act between user retention and monetisation. For example, implementing virtual good degradation might affect positively on sales, but negatively on retention as acquired goods degrading away might be quite a frustrating feature for some of the users.

The problem finding stage includes the activities for finding the key question as to what the design patterns should address. On a larger scale, the problems would be to address the goals of acquisition, retention, and monetisation, and the problems of trade-offs between implementations aimed at one of the goals. For example, one previously mentioned problem with balancing retention and monetisation is the user acceptance of virtual goods sales and its disruptive effect on game balance. With the iterative development, new sub-problems emerge that need to be dealt with.

Problem solving comprises of assessing and forming alternative solutions to problems, i.e. finding suitable design patterns that fit the overall design of the service. Some commonly harnessed design patterns were discussed in previous chapters and referenced papers: Oh and Ryu 2007 and Hamari and Lehdonvirta 2010.

Choice: Consists of activities of choosing potential solutions from alternatives proposed in the previous stage.

Implementation of chosen solutions.

Controlling and evaluating implemented solutions commonly includes, for example, logging virtual economic activities, game balance, customer equity metrics, and testing between concurrent alternative implementations. The resulting data is further used in subsequent iterations.

4.2.2. User-created and user-generated content

User-created content is a central part of the business model of the so called UGC-oriented worlds. The terms user-generated content and user-created content are commonly used interchangeably. Here user-generated content refers to content that is generated through the "normal" usage of the service. By using or playing the game in a virtual world, a user adds to the perceived value as the users get more engaged and concretely progress in status. This has further business applications for operators in segmentation and differentiation as discussed earlier. User-created content, on the other hand, refers to concrete content such as virtual goods that users create.

There are borderline cases, which are difficult to categorise to only one category, such as customisation of an avatar. On one hand, customisation commonly only uses existing objects made by the developer and the way the customisation can be done is determined by service rules. On the other hand, users

conduct creative behaviour and can come up with new solutions. For example in Habbo, users have used furniture in many creative ways to create new kind of content from virtual goods that were originally meant for other purposes (Johnson & Sihvonen 2009).

It is important to distinguish these types of value creation by users. User-generated content is an essential part of the majority of modern social online services, in the form of commenting, recommending, customising, and so forth. Perhaps the easiest line between UGC and UCC could be drawn between users creating content using "materials" outside the virtual worlds and users generating content using already existing "materials". The consumption and usage of the virtual world can be perceived as user-generated content, as the user putting the time and effort into using the service creates further value for them and other users, at minimum via positive network effects. This is one of the core arguments for using a freemium model, as the non-paying users also create value to the service. In either case, in a business sense, both types are value creation requires the operator to facilitate the integration of users to the value chain and further considerations of how to capture the created value (Cagnina and Poian 2009).

Koster (2009), CEO of a company creating Metaplace, which is very much concentrated on UCC/UGC, provides further categorisation of UGC/UCC dimensions, which are in line with the above discussion. These categories can be divided under the definitions of UGC and UCC above.

1. user expression permitted (UGC)
    a. social interaction (chat, status updates, etc)
2. user-assembled content (UGC)
    a. creating content from smaller bits of content

3. user-customized content (UGC and UCC, if using materials outside the VW)
4. user-created content (UCC)
5. user-modifiable framework

4.3. Relationship / goal

A feasible way for outlining virtual goods sales business goals is through the user relationship perspective, which is a major component of business model concepts (see e.g. Osterwalder 2004; Heikkilä et al. 2008). Blattberg and Deighton (1996) divide customer relationship into three stages: acquisition, retention and add-on selling. Following this line of thinking locates virtual goods sales to the add-on selling stage, while the first business model stage addresses the questions of acquiring users into the core product, i.e. the virtual world, and retention of keeping the users using the service.

4.3.1. Acquisition

According to Blattberg et al. (1996) there are two ways to define acquisition of customers: 1) a transaction perspective, which defines customer acquisition period ending in first purchase, and 2) a process perspective, which defines acquisition spanning through first purchase and other non-purchase activities preceding a repeated purchase.

While the above definitions might well define acquisition in traditional industries, it might not feasibly present reality in modern internet services, where the core service is free for customers or the whole service might be advertising based, in which case the user might not buy anything for their whole customer life time. On the other hand, the free entry can be regarded as acquisition pric-

ing (3rd stage of ACTMAN model). How should the acquisition period then be defined? Is the customer acquired when she comes into the service or webpage for the first time, registers, sees the first ad, or buys the first virtual good? Ultimately it is the firm's decision to choose the most appropriate definition as to what processes and activities they direct towards user acquisition. The acquisition process is dependent on service specific design choices and the degree of awareness that is appropriate for the service in question. Nevertheless, in this thesis acquisition towards a single user is seen to end where the retention strategies start, i.e. when a non-user becomes a user.

4.3.2. Retention

Customer retention was given its popular rise when firms understood that the major part of the profit came from returning customers and less from newly acquired customers. (Thomas 2001)

Blattberg et al. (2001) suggest a following definition for retention: "*The customer continues to purchase the product or service over a specified time period.*" However, the authors point out that this definition might not be applicable to situations where products are bought rarely, such as cars. For this reason Blattberg et al (2001) present two parallel definitions for products with short purchase cycles and for products with a long purchase cycle.

While the previously presented definition of retention, again, is clearly understandable for traditional retail business models, this might not be the case in the context of freemium business models. A user is retained at two points: entering the service for the first time and/or when a user conducts some directly11 revenue generating behaviour, be it clicking ads or buying virtual goods.

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11 Directly because users take part in indirect monetisation behaviour such as recommendations and such

If we consider the conceptualisations from the industry (e.g. CEO of Shanda, and CEO of Three Rings), we see them referring to the first point of retention. On the one hand there is the retention as in converting prospects to users and on the other converting users to customers. Following this line of reasoning suggests that the monetisation stage would then include acquisition, retention and add-on selling in the traditional manner, whereas in the context of freemium business models, other different acquisition and retention stages exist within atomically perceived virtual goods sales business model, apart from overall acquisition and retention.

4.3.3. Add-on selling / monetisation

The term *monetisation* is adopted here for its wide use in the virtual world, gaming industry discourse. While add-on selling might better present the situation where additional products (virtual goods) are sold to augment the experience of the virtual world, the term monetisation gives a more generalisable meaning to the sub-model as it can cover other means of monetisation as well, such as advertising.

Following this line of reasoning, the virtual goods sales business model is divided into three sub-models of acquisition, retention, and virtual goods sales (monetisation). Considering the Osterwalder's (2004) business model ontology, and Heikkilä et al.'s CSOFT model, these sub-models are then derived from the relationship components. The relationship component can be regarded as the goal of the business model (Osterwalder and Pigneur 2005; Osterwalder 2004).

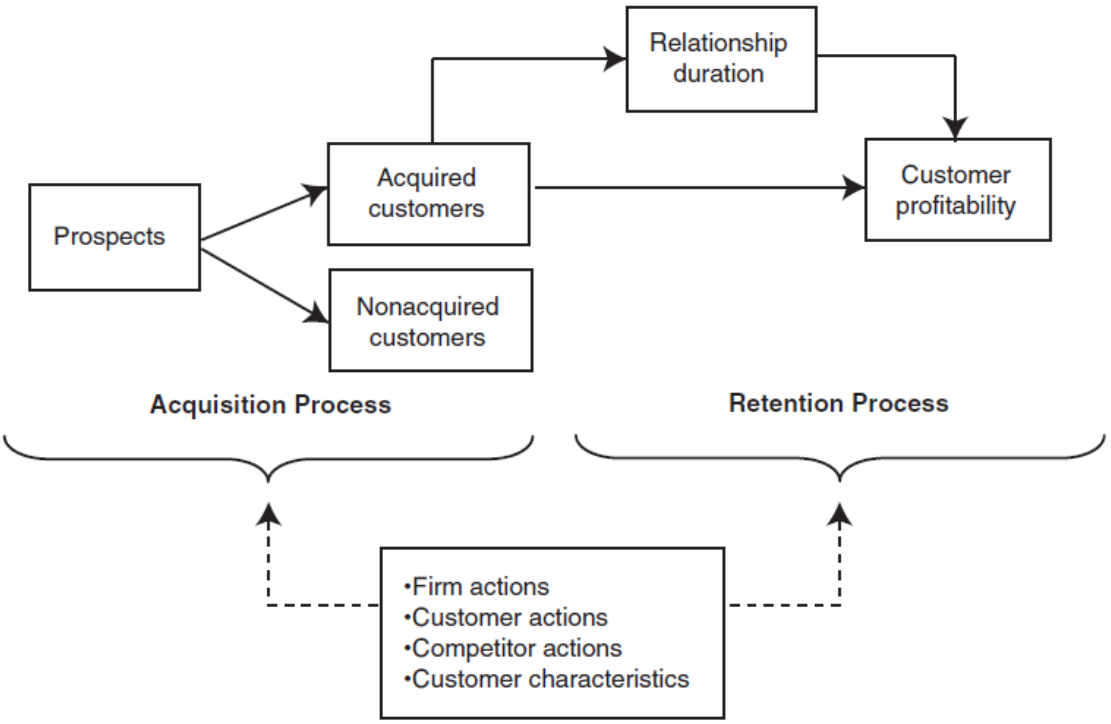

Figure 17: Linking Customer Acquisition, Relationship Duration, and Customer Profitability (Reinartz et al. 2005)

The customer acquisition process affects the customer retention (Thomas 2001) process and it is reasonable to assume, that the previous have high impact on customer lifetime value.

A virtual world business model consists of atomic, but causal models of acquisition, retention, and monetisation. This conceptualisation will henceforth be seen as the articulation of the business model goals. But as discussed, the acquisition is somewhat separate from retention and monetisation in that it is directed to a different market, that has not yet been engaged by the virtual world, and their segmentation factors are not yet based on the context structures of the virtual world. For this reason the virtual goods sales business model is more reasonable to be perceived, at least on a modelling level, outside the acquisition process, although they have causal links. The model poses some practical limitations as to how many entities can be reasonably modelled in one instance.

In summary it could be said that acquisition translates to marketing the service as a whole, retention translates to keeping users, and monetisation translates to selling virtual goods. Hence, the resulting model concentrates on the latter stage of selling virtual goods. However, there is a continuum between business stages and it is vital to measure the transitions of users from relationship stage to another.

4.3.4. Relationship mechanics

In the business model ontology (Osterwalder 2004), the relationship mechanism is a sub-component for the relationship component. It describes what functions the business model has for relationship building (Osterwalder 2004). Taking the relationship stages of acquisition, retention and monetisation, the mechanism component defines what functions are in place for supporting the customer transition between relationship stages, from non-user to acquired user, from acquisition to active user, and from active user to buying user. In other words, the relationship mechanism component includes mechanisms that the firm puts in place to entice users to conduct beneficial behaviour towards building customer relationship or generating revenue.

A representative example is viral mechanisms that social online services have put considerable amount of attention to. These mechanisms are widely used in acquiring customers and in marketing of virtual goods to established users. For example, Farmwille, a Facebook game, encourages users to invite their friends to the service. The invitation mechanism harnesses the viral mechanics of Facebook by generating game related status updates. Another way of inviting friends is by giving out in-game virtual goods that only have functionality inside the service. Invitation and gifting mechanisms are common techniques in relationship marketing on social online services.

In the above example, the relationship mechanism is tied to value context. The invitation itself is sent in accordance with social interaction design, the ability to include a gift is determined by the virtual economy inside the service, and the functionality of the item, once accepted, is tied to the game mechanics inside the service. The included virtual goods are also part of the value offering. The invitation itself can be regarded as value creation (inside value configuration), as it adds to the perceived value of the service to the invited user. Hence, there is a link from user segments, through relationship mechanism to partner element and further to value configuration. This type of social interaction can be perceived as user-generated content. The value for the firm is the resulting strengthened relationship or the conversion of relationship.

As seen in the above example the relationship building mechanics in a business model can be defined through many business model components and with social online services, the value context (missing from business model conceptualisations) has again a major role in relationship building. Additionally, the effectiveness of the mechanisms should be measured with a feedback loop to the performance block and the data used in further tuning of the service through value configuration.

4.4. User segments

In the business model ontology (Osterwalder 2004) the customer segments components is part of the customer interface block. The customer interface defines who the target customers are, what products are offered to different segments and how the products are delivered. It also defines relationship types to segments. (Osterwalder 2004.)

Simply, the customer segments -component defines strategically relevant segments of customers/users. Segmentation's purpose is to identify and divide populations into strategically relevant homogeneous segments based on proven

segmentation variables and matching customer needs. This enables companies to target their marketing efforts according to the defining attributes of the segment (Day 1981; Jonker et al. 2004; Kotler and Keller 2006).

When considering customer differences between real world, digital and virtual channels, the most considerable differences is that in virtual worlds, a customer acts through an avatar (Table 16). Arakji and Lang (2006) based the analysis on users of the open world Second Life. However, there is an even greater difference to a customer type in closed worlds, where the developer actually defined needs for the avatar, whereas in open world such structures are lacking.

Table 16: Avatar business value analysis (Arakji & Lang 2006)

Commerce Type	Location	Customer Type	Income Type
Virtual Commerce	Virtual Store in a Virtual World	Avatar	Virtual and/or Real Currency
Electronic Commerce	Webstore, or Conventional E-Commerce Ready Website	Internet Shopper	Real Currency
Physical Commerce	Brick-and-Mortar Store	Physical Person	Real Currency

Following this thought, a user satisfies her needs or goals via addressing the needs of an avatar, which to a large degree emerge from the service context. Of course, users have their own aspirations, but they are met through an avatar, whose interaction is determined by the structures of the virtual world. This is especially true in gaming oriented worlds. On the other hand, in social worlds, where not so many rules determine the status of a user, users might behave more directly based on real world needs. Nevertheless, both segmentation factors based on "real world" and virtual world apply, but their effect on the user aspirations and behaviour varies. Also, not all the virtual goods offered are tar-

geted to certain segments, but commonly a large part of the offered goods are targeted to the whole populace, although the benefits of a certain good vary between segments.

Traditionally, self-selection segmentation can be seen as the customer self-selecting products offered, which is then used as a basis for segmentation (Moorthy 1984; Kotler and Keller 2006). Within virtual worlds, users can be seen self-selecting the actual segment, that has most value to them (such as an avatar class). In a way the situation is similar to selecting a product (free avatar class), which further determines which augmenting products can further be sold and marketed. This segmentation then determines the strength of need towards items and/or determines which goods the user is eligible to use and/or purchase. With the iterative additions to service content/context and the in-built achievement hierarchies, the user constantly conducts self-selection on the perceived segmentation paths determined by the context design. Further, self-selection enables price discrimination strategies (Moorthy 1984), as virtual economic design can determine differentiated benefits for different segments, and this can be further strengthened by *status restricted items* (Hamari and Lehdonvirta 2010).

In game environments users commonly progress through gameplay and at the same time progress through the segments defined by the developer. This enables the operator to sell different virtual goods in short iterations. According to Hamari and Lehdonvirta (2010) many virtual goods are set with restrictions as to how many segments a virtual good can span through. For example vertically, a low status character can not use high-end virtual goods, and horizontally, a warrior type avatar can not use goods differentiated for mage type avatars.

As discussed above in previous sections, some of the earlier research hints possible horizontal and vertical segmentation schemes. Bartle (1996) and Bartle (2003) identify four player types in MMO-games. These include achievers, kill-

ers, socialisers, and explorers. Yee (2007) suggests that Bartle's (2003) player types probably overlap, but this is commonly the case when segmenting customers by behavioural segmentation factors (See e.g. Kotler and Keller 2006).

Lehdonvirta, Wilska, and Johnson (2009) referring to fansites of Habbo show five different emergent clothing styles in Habbo: punk, gothic, teinix (i.e, teenage-like), wannabe, and own style. It seems, that as with Bartle's player types some of these styles are enabled by the developer by selling or making available clothing that enables emergence of such user segments or alternatively the developer enables users to realise their real world styles.

These classification criteria segment users horizontally (player types - Bartle 1996; Bartle 2003, style groups- Lehdonvirta, Wilska, and Johnson 2009) and vertically (status – Johsson and Toiskallio 2007 and level systems in MMOs).

Users seeking to represent certain style might attempt to combine, customise and use unrelated virtual goods to achieve the wanted effect. In Habbo for instance, users who wanted to identify as goths initially used Halloween-related virtual goods to decorate their rooms. Later, Sulake the developer, introduced a gothic virtual good line-up to address the clearly present need for such furniture. In the end the developers design the service and create new virtual good line ups in interaction with the data provided by different feedback loops from user behaviour. (Johnson & Sihvonen 2009.) This situation has a strong link to user-generated content, more thoroughly discussed in 4.2.2.

Johnson and Toiskallio (2005) observe that users come up with categorisations schemes themselves if explicit types designed by the developers are missing. One such categorisation observer by Johnson and Toiskallio (2005) divides users into novices, amateurs, pros, and superhabbos. In *IMVU*, similar user classifications are built into the service. In IMVU users can rate each other on a vari-

ety of social metrics. *Habbo* has already implemented a ”respect” metrics to users’ avatars, which is determined by how much respect co-users give you.

Hamari and Lehdonvirta (2010) show four design patterns that are used in segmenting players in virtual worlds and in offering differentiated virtual goods accordingly. These include stratified content, avatar types, increasingly challenging content, and the utilisation of service dimensions. Whereas stratified content and increasingly challenging content divide gameplay into vertical iterations, the horizontal gameplay and avatar types create horizontal segmentation factors.

Vertical status restrictions have been implemented in at least two ways: 1) an item cannot be used if the avatar’s level is too high (e.g., *ZT Online*), and 2) an item cannot be used if the avatar’s level is too low (e.g., *World of Warcraft*). In this way, the avatar has a sliding window of usable items at a given time depending on the avatar’s level, thus iteratively directing buying behaviour. According to Davis (2007), in *ZT Online* players essentially have to renew their inventory every five levels. Status restrictions are also implemented horizontally, e.g. via avatar type restrictions, offering goods that are only usable by a certain avatar type.

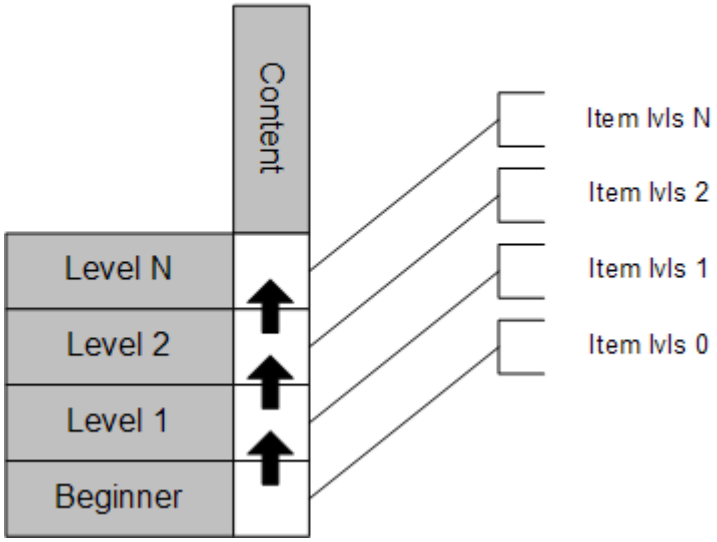

Figure 18: Vertical segmentation and differentiation (Hamari and Lehdonvirta 2010)

Virtual worlds and related services offer a variety of value propositions, i.e. service dimensions. Hamari and Lehdonvirta (2010) name examples of performance-oriented gameplay (game design), socialising (social interaction design), and trading (virtual economy design) etc). These service dimensions are used in segmentation. Different users use the service in a variety of ways. Some users might concentrate on trading while others just slay monsters. Horizontal segments enable developers to design non-rivalrous differentiated virtual goods to address player needs in different service dimensions.

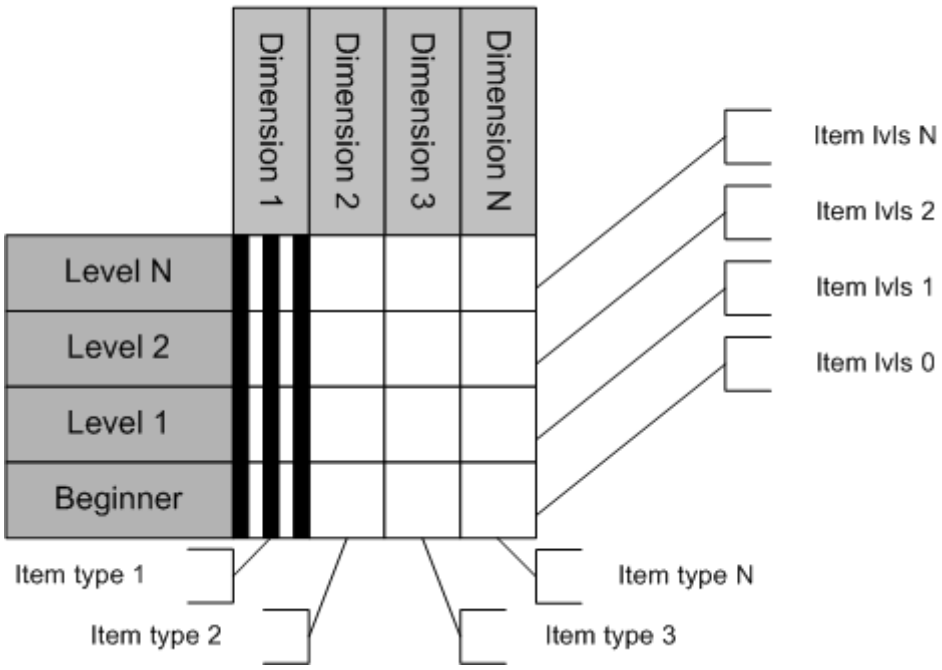

Figure 19: Vertical and horizontal segmentation and differentiation (Hamari and Lehdonvirta 2010)

Segmentation of customers in games marketing roughly divides players into casual and hard-core players. (Sotamaa 2007). Comparing this division to the previously presented user segmentation schemes, the casualness or hard-coreness could be defined as a function of how far and how fast a player progresses vertically and how versatile is the playing style or in how many service categories the user participates.

Customer segmentation derived from service context develops in a loop comprising virtual economic determined (value configuration) segments and through self-selection into the pre-determined segments. Through usage of the virtual world (value definition and value proposition), the users progress in vertical segmentation and participate in multiple horizontal dimensions of the services. At the same time users, via usage, add value to the value proposition as they get more invested in the services by acquiring virtual goods and skills and forming relationships. There is a feedback loop of user behaviour (gaming,

self-selection and buying behaviour), which is used in iterative development of the virtual world and virtual goods, which further adjust the segmentation paths, that users have selected.

In summary of avatar attributes, avatar competencies and behavioural factors have been used to form segments of users on the basis of self-selection. On the other hand, avatar attributes and competencies to large degree are dependent on design decisions implemented by the developer. Contrary to traditional industries, where segmentation is commonly formed according to "real world" factors, such as age, gender, and other demographic factors, virtual world developers are able to build avatar attributes beforehand as means of segment users.

In essence, designing avatar types and attributes is equal to designing game-based behavioural and demographic segmentation factors. Whereas in traditional marketing, independent customer attributes are examined to segment customers into strategically relevant groups, the design of avatar attributes is actually a process of deciding and forming some of those factors beforehand. This is not to say that real-world segmentation factors would not apply, but both have a role in determining and creating user segmentation and differentiation of virtual goods.

4.5. Partners

The business model ontology explicitly states that a partnership is a "cooperative agreement between two or more *companies* in order to create value for the *customer*" (Osterwalder 2004). But as is evident in social online services, users are creating value as well. There exists a value loop where users participate in the value creation (value configuration) through user-generated and created content. Users add to value proposition and at the same time they consume it.

Users participate in the service as “customers” and “partners”, adding value to the service they consume at the same time.

Business model frameworks seem to assume a firm is conducting business on a simple and static market where the firm offers its product to passive customers. In the business model ontology by Osterwalder (2004) the link from customers to partners is also missing. There is no component or a coordinated outcome of components which would articulate the facilitation of value creation by users. On one hand, it might be enough to separately depict users as value creators in the partnership component, without any causal link from users. But on the other hand, the value creation is to large extent determined by the service context within virtual economy. In Osterwalder et al. (2009) the notion of users as value creators is noted, but it has not been appropriately taken into the model. At present it is just mentioned in the customer relationship component, but the link between value proposition and customers is still one way from value to customers. This implementation does not appropriately support further mapping of user integration to value chain.

Respectively, the value loop of user-created value starts from service structures determining the possible interaction with restrictions built in the user segment. These attributes could be translated to the partnership component. These partner entities then conduct value creation, described in value configuration component. The created value then is transferred to the value proposition component adding the service content and potentially the value offerings to users.

Based on the above, I propose that a stronger emphasis on user-created value should be built into business model conceptualisations. Partner component could simply inherit user segment properties and the user-created content restricting factors from value context would define the value configuration activities.

4.6. Performance / Financials

The financials-block in the BMO (Osterwalder 2004) is the "under the line", block of the business model. It describes cost drivers, revenue streams and the remainder, i.e. profits.

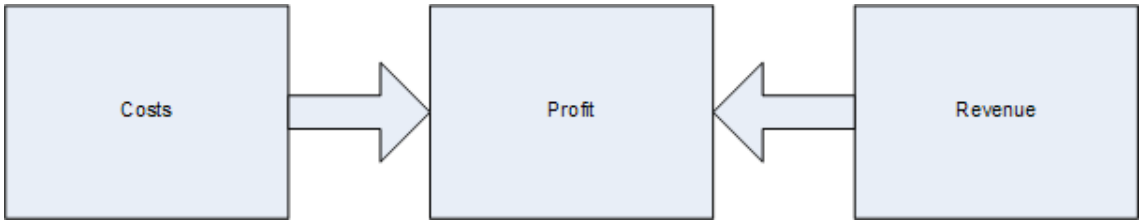

Figure 20 Financials block (Osterwalder 2004)

The term revenue model generally refers to a model of how a company generates revenue. A revenue model can be seen either as a collection of all revenue streams or as a model for single revenue stream. In the works of Osterwalder, a revenue model consists of revenue streams, which are further divided based on pricing elements. *"[I]t measures the ability of a firm to translate the value it offers its customers into money and incoming revenue streams."* (Osterwalder 2004).

However, in social online services, especially those using freemium and free-to-play business models, revenue streams are highly dependent on customer acquisition and retention through engaging and valuable core services, thus commonly requiring preceding steps before customers take on any revenue generating behaviour. Thus it is elementary to measure other performance metrics besides revenues as well. It is important to measure what factors lead customers to transform from free use to the premium part of the services, or, in a virtual goods sales model, to buy virtual goods. Cagnina and Poian (2009) suggest that conversion rate (acquisition) and participation rate (retention) as well as the user integration to value chain (user-generated content), are essential factors for virtual world business.

Industry discourse has also revolved around metrics pertaining to getting users, keeping them, and revenues. Developers commonly articulate business model goals through metrics similar to customer equity terminology as Acquisition, Retention, and Monetisation (Chen 2009). CEO of Shanda (a major Chinese MMO publisher) articulates it as Come-Stay-Pay (Chen 2007).

While this line of thinking is already stressed in traditional industries, the nature of a freemium business model puts an even more considerable amount of emphasis on user acquisition and retention as the revenue is *only* provided by the users that are sufficiently invested into the core service. Many of the papers addressing the acquisition and retention concentrate on analysing optimisation and balance of the stages (see e.g. Rust and Zaborik 1993; Blattberg and Deighton 1996; Blattberg et al. 2001; Thomas 2001; Reinartz et al 2005). Further measurements of the relative importance of these stages will not be conducted in this study, but I will rely on the notion and further reasoning that all of these stages are crucially important for a well performing freemium business model.

If we considered the previously presented expert opinions, which divide the business into Come, Stay, Pay (CEO of Shanda) and Acquisition, Retention, Monetisation (Chen 2009), we can see, at least on terminological level, a match between the conceptualisations.

The digital social online services have an ability to very cost-effectively measure all the activities of user from the first hit. As these virtual environments are highly structured, every action taken by users can be logged and a plethora of metrics becomes relevant in a constant effort of tuning the service fully, not only to reap revenue from users, but to entice them to other beneficial behaviour, such inviting other users. The massive user bases and the cost-effectiveness to measure all the actions in a digital space makes the development metric-driven.

If we want to perceive acquisition and retention as separate business models, as justified in the previous sections, they do not posses a revenue model component as such, as the goal of these business model stages is to acquire and keep a user base, whereas a monetisation model generates revenue through e.g. virtual asset sales and advertising. The revenue model component is then more reasonable to convert to component corresponding to the acquisition and retention metrics in the acquisition and retention sub-models..

Commonly used metrics in measuring acquisition of users are for example the amount of registered users, unique visitors and conversion rates. Retention is measured with retention rate (revisit rate after a defined amount of time), and user activity. Monetisation metrics measure revenue generating behaviour, such as clicking ads and purchasing virtual goods (Chen 2009.) In the end, of course, it is the firm's choice what metrics and to what depth is strategically important. For example, firms may be interested in data on how the service is used, what segments are monetised most efficiently and so forth.

Monetisation is most commonly measured via ARPU (Average Revenue Per User). ARPU is often used as a number for comparison of a service's monetisation effectiveness. It must be said that ARPU might not be a very reliable indicator of performance, since the question of how much customers pay on average is somewhat business model and strategy dependent. Other firms might value high prices over a large customer base, and vice versa, making ARPU numbers very different, although the profit rates might be close to each other. Nevertheless, ARPU is a useful metric for internal monitoring and managing lifecycles of offerings.

Everything that leaves a mark in a database can be measured. Thus virtual world operators can explicitly measure incoming revenue from every individual user as well as all the activities they engage in that lead to the revenue generating behaviour. These huge datasets that social online service operators can

gather enable a very metric driven environment. Firms operating in this space can optimise the design and offerings in relatively short iterations.

As the information value of such metrics is high when communicating and planning business, I add acquisition and retention metrics to the financial block. With these additions, the block could be given a more corresponding name, for example *performance* block. Considering the level of abstraction in this study I will not go further into the specific metrics that could be included in the components, but only give some examples of the metrics commonly used above.

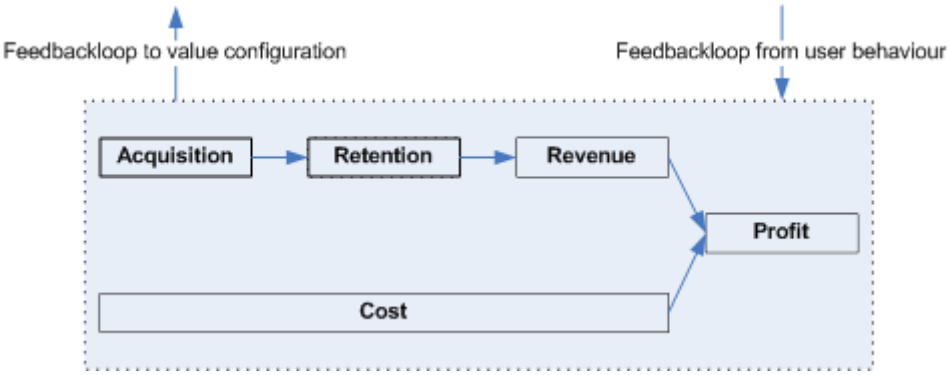

Figure 21: Performance block

The arrows between the components communicate the continuum between the metrics. It is vital to measure the conversion rate between the customer relationship stages, but the user relationships should not be perceived as atomic, but as overlapping goals in business processes. Such conversion metrics would include, for example, the percentage of paying users, conversion rate from acquired users to retained users, and "time to pay" (how long a time a user has to be engaged to convert to paying user).

4.7. Overview and limitations

The summarising Figure 22 below presents a virtual good sales business model on a conceptual sub-(meta)-model level (see Figure 12 for model levels), meaning that it depicts common characteristics of virtual goods sales business model,

but not actual real world instance level contents. The model is an adaptation of the Osterwalder's (2004) business model ontology to better suit modelling virtual goods sales business.

The customer relationship stages acquisition, retention, and monetisation were discussed throughout this thesis as the driving business goals in the overall social online service business. But here the scope of the model is purposefully limited only to cover the actual virtual goods sales stage of the total business and thus leaving many relevant factors for acquisition and retention outside. Earlier I argued that these stages might be better modelled in separate causal instances as the customer segments, marketed product, and metrics are different. A few acquisition and retention related aspects are included in brackets to illustrate the continuum between customer relationship stages.

The acquisition and retention models can be simply derived by leaving the performance block untouched, selecting the appropriate stage from the customer relationship, and making separate instances of all of the other components. Of course some of the content of components might not change, but for example the value offerings are different, large part of the user segmentation factors change to ones defined by value context and the relevant metrics for measuring performance shift to ones corresponding with the goals of the business model stage.

Business model components capabilities and channels are detached from the below figure as the business aspects pertaining to them were not regarded as essential in describing the revenue generation logic and service design. In actual business models planning the components can be normally be added. It can be said though that significant capabilities in virtual goods sales relate to the cost-effective nature of the digital industry and the capabilities in having to design the context where the value is offered.

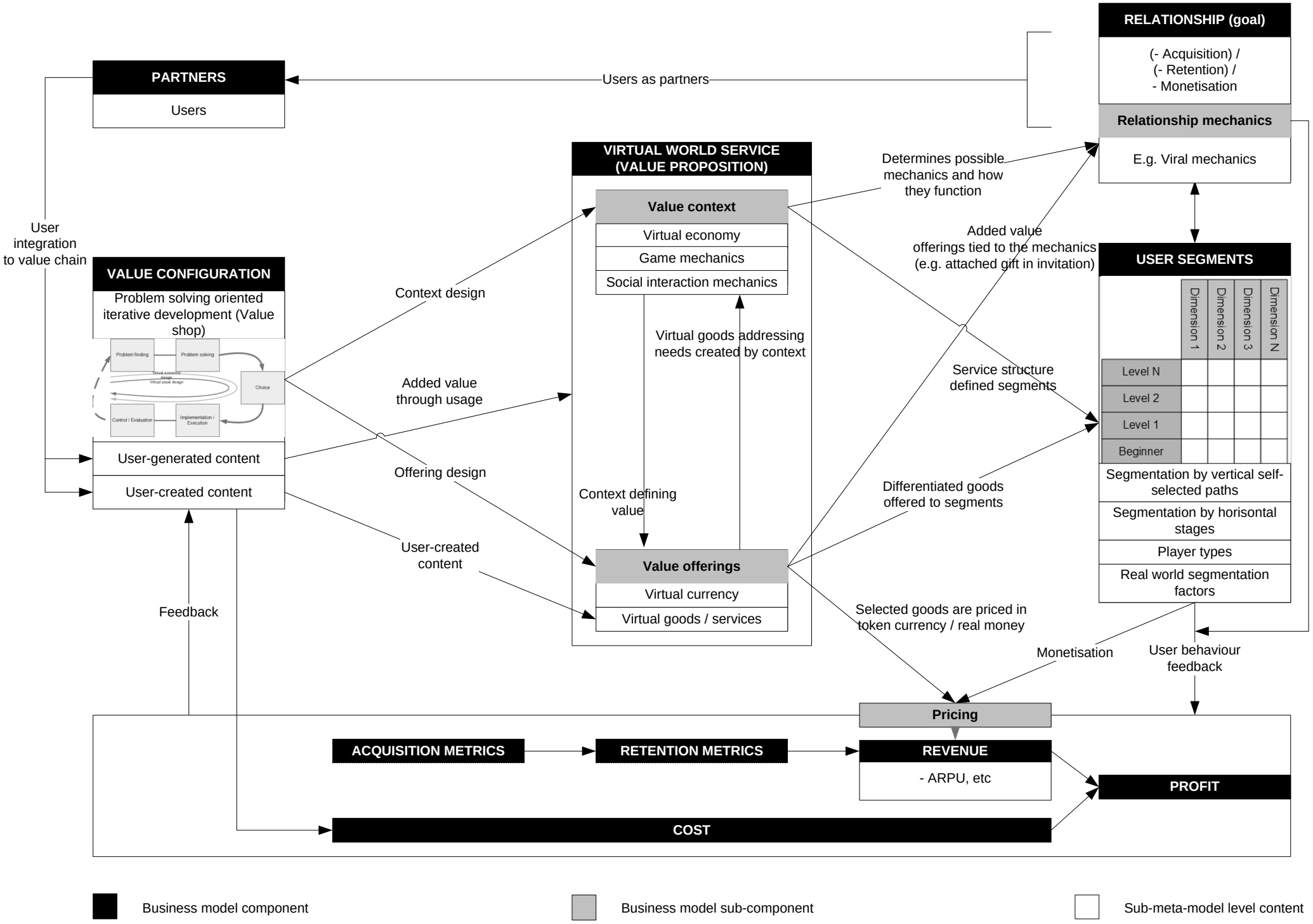

Figure 22 Virtual goods sale business meta-model

5. CONCLUSIONS

The purpose of this study was to investigate virtual goods sales business model. The first step was to analyse relevant literature on virtual world operator's business models in general and models relating to virtual goods sales. Relevant and repeatedly occurring themes were selected for further analysis, based on which preliminary definitions were drawn.

For further analysis and presentation of the findings a large part of the thesis was dedicated to reviewing conceptual business model literature. One reason for this is the vague and conflicting views on what a business model actually is and what it consists of. For instance, concepts of business model and revenue model are often used interchangeably. This thesis aims to provide some structure for further discussion by implementing business model ontology in depicting and describing the revenue generation logic in virtual goods sales model.

The business model ontology by Osterwalder (2004) was selected as a framework for business model analysis, in which context relevant virtual goods sales business model aspects were discussed. The results are summarised in the revised model (Figure 22) depicting general business model aspects of a virtual good sales model.

5.1. The virtual goods business model

The virtual worlds business is intriguing because of the capabilities of the operators in regulating and actually creating a closed dynamic market for virtual goods within the service. Inside their own virtual space, they have total control over pricing, the level of differentiation and the rules of internal trade of the virtual goods, but of course limited by the customer churn. Traditional authorities in marketing emphasise that marketing is about identifying and meeting human and social needs (Kotler and Keller 2006; Drucker 1993). In the ideal case,

marketing results in a customer who is willing to buy. Thus the aim is to understand the customer (Drucker 1993). On the other hand, marketing can also be seen as an activity that creates needs. This view is particularly pertinent in the context of virtual worlds, where designers create the rules and mechanics that determine to a large extent the activities and specific needs of the participants.

When comparing different business models of virtual world operators, the virtual good sales model differentiates from e.g. the subscription model in that it requires an additional layer to service design. In subscription and retail models the goal is to design the product/service to entice users to pick their product and retain the acquired users. The virtual goods sales model also requires design aiming for further user monetisation and the driving force of it is the interaction between the service context, virtual goods, and the users.

The way that the virtual world is designed strongly dictates which virtual goods customers find desirable. In the "real world", firms are able to choose what kind of commodities they provide, but their control over the environment where the commodities are provided is often very small. This does not hold in the virtual worlds as the designers have total control over both, the characteristics of the virtual world and the commodities that are available there. Thus whereas in the real world producers serve some existing demand for goods, the virtual world providers can be seen to both create the demand and then serve it simultaneously.

In traditional marketing activities, products are offered on an already-existing market and customers are segmented mostly based on existing segmentation attributes, such as socio-demographic variables. The designing of a virtual world, its rules and internal economy can be regarded as marketing activities concerned with creating the underlying needs and conditions for customers to become incentivised to buying virtual goods. The design and creation of virtual goods can then be regarded as separate design iterations that address the needs

created in the previous stage (see e.g. Stabell and Fjeldstad 1998 and Porter 1980 on value configuration). This sets the value creation for virtual worlds operators somewhat apart from traditional value creation, as the value for the goods has to be first created through designing the context for the goods.

Virtual world operators are able to adjust the environment in which their products are sold and marketed, and the rules according to which the products are used, not to mention their role in creating the environment to begin with. This uniquely wide and flexible position the company occupies in the life cycle of the products requires a wide approach to business modelling.

This situation is largely analogous to selling augmenting products to a core product that have very high lock-in effects, such as large software systems or banking services. The core product in such cases can impose such large lock-in effects that the company can harness monopolistic strategies in selling value-added augmenting products as the purchased augmenting products are only compatible with the core product purchased earlier, and respectively the lock-in effect grows even further. In virtual worlds, whether users actually buy virtual goods, they get more and more invested in the service as they develop and progress their avatars, acquire virtual goods, make new friends, and generate content. The *value context* component introduced here not only attempts to refine the business model conceptualisations towards modelling virtual goods sales model, but also to help in planning business models of such services harnessing significant lock-in effects and where the value caveats of a core product and resulting needs are designed.

In the virtual goods sales model, the segmentation of users and product differentiation can be quite explicitly structured beforehand. In game design, the developers lay down a structure of possible interaction paths that a user can progress through. This type of progression through the product portfolio is analogous to self-selection segmentation, but is even more structured. The self-

selection in practice commonly refers to users selecting a product from variety of alternative versions, but in virtual worlds, the users also select their own attributes, which further determine the alternative products they find valuable. The developer is able to determine user segments through the service context design and is able to differentiate and price discriminate all the designed segments freely. Many of the needs of user segments emerge from the designed vertical and horizontal paths of user progression and interaction.

The virtual world business is highly metric driven. This is first of all because of the ease of measuring almost all of the user behaviour within the service and the iterative development that actively monitors the resulting data. From a business perspective, all of the user behavioural data can be articulated in user equity metrics: acquisition, retention and monetisation (revenues). Therefore the thesis suggests adding components corresponding to acquisition and retention metrics to performance block of Osterwalder (2004) and thus better capturing the nature of performance measurements in social online services in general.

As to limitations of the modelling, I attempted to maintain an abstraction level where only directly relevant aspects to service context design and revenue generation logic were depicted. This kind of scoping is appropriate. For example, Petrovic et al. (2001) state that depiction of business model instances have to detract focus from certain aspects while concentrating on others and that it is impossible to depict all variables comprising business conducted. The resulting model (Figure 22) depicts virtual goods sales on a sub-meta-model level. The level refers to a model level where commonly occurring aspects specific to certain type of a business model are depicted, abstracting aspects of company specific business models.

5.2. Contributions to practitioners

The thesis discussed the nature of virtual world's business models, different design orientations and the union of revenue generation logic and service design. The thesis illuminated the essentiality of the synergised planning and design of the services and business models, implying that game designers need new tools in designing the service to not only have fun and engaging mechanics but also to have business goals in mind. The business model framework presented here is one of the tools addressing this problem and the refinements suggested to the framework here attempt to further help in synergising these different design goals.

As the business model conceptualisations are a rather new subject of study in the academia, the implementations of the conceptualisations in the actual instance level design are scarce. One reason for this is that only big companies seem to have enough scale to put considerable effort into implementing these design tools. This thesis covered a comprehensive array of different business model conceptualisations, showing what tools are available and which would be suitable for modelling actual real world business models. The thesis attempted to bring conceptual level business modelling a step closer to business planning, especially in the case of virtual goods sales.

The thesis concentrated on game mechanics and virtual economy in business models of social online services. However, the thesis can be seen contributing to other direction as well, namely to traditional businesses utilising game-like structures. Traditional industries are increasingly implementing game-like structures and meta-games, creating sort of *value context*, introduced in this thesis, inside their services and customer communities. Marketers already use persuasive game design devices, such as, progression, levels, prizes, collectibles, membership and points. This thesis paved way for integrating such marketing techniques into business models.

5.3. Contributions to business modelling

Virtual worlds are prime cases for examining social online services, as they are very comprehensive in using different service design features. The business modelling done in this thesis shows a few business aspects that are not taken into account in previous business model conceptualisations. These primarily include the interaction between the value offerings and service context, integration of users to value chain, user equity metrics, and customer segmentation through self-selection determined by service context.

I introduced the value context component to the business model ontology, based on the service design in virtual worlds that partly determines consumption and need creation for further products. The value context component defines the underlying value proposition and the determinants and structures for potential value-added services or products. The value context components also support segmentation through self-selection, which is not expressed in business model ontologies.

However, an interesting link can be found between the value context and the discussion in marketing field on whether marketing can also be seen to create needs, instead of only satisfying them. I will not participate this discussion by stating to what extent this is true, but as the thesis showed at least the virtual world developers very explicitly create structures and "needs" into the services. If we accept that firms do not only serve existing needs of customers, but also affect these needs, and especially in cases where firms do this consciously and as a part of the overall revenue generation logic, then, it is reasonable to take it into consideration in business model design. Since now there has not been a component or articulation for this aspect in business model conceptualisations.

Some example applications of value context could be fashion cycles, planned obsolescence and the core product – augmenting product strategies, where core

product is intentionally left with value caveats which can be addressed via buying the augmenting products. The value context component introduced in this thesis contributes to modelling such businesses harnessing such value offering logic. Further refinement of the component is left for subsequent studies.

Another business modelling contribution is the preliminary expansion of the financial block. As argued throughout this thesis, measuring service performance only by revenues and costs does not coherently describe all the relevant metrics, but presentation for commonly presented data such as user amounts and retention rate were lacking. This is especially true for such service-oriented businesses that court large user masses, have low cost entry pricing, and user/customer behavioural data management is cost-effective. I suggest including metrics for acquisition and retention to the financial block. The relevant metrics for separate model instances can be derived from customer relationship component, which already in the business ontology has the corresponding customer stages. Some frequently used metrics in virtual worlds were discussed in the previous section, but more specific pinning of certain metrics is left for further study. It can be said that all the user behavioural metrics can be regarded as pertaining to acquisition, retention, and monetisation in the end.

The online social services, such as virtual worlds, facilitate user value creation and hence the integration of users to the value chain becomes essential. However, tools for modelling such business aspects are missing from business model ontologies. It could be modelled through the relationships of user segment and partner component. Thus, users participate in value configuration through user-created content and user-generated content (further explained in section 2), which further affects the value proposition and consequently has a feedback loop back to user segments, affecting them through self-selection and by purchasing virtual goods. Following this line of thought, the integration of users to the value chain follows a feedback loop through the business model,

affecting all the components in the loop. Through interaction with the service (user-generated content), users create engagement and further value for themselves, and to other users through social interaction, as well as through user-created content, in which users participate in creation of actual "tangible" content.

5.4. Suggestions for further study

While game mechanics and virtual economy design patterns are increasingly discussed, quantitative measurements on their effectiveness are scarce. Thus, as a further study I suggest quantitatively measuring the impact of design patterns on, for example, buying behaviour. Implementation of two or more different parallel designs in cooperation with virtual world operators would significantly contribute towards reliable results.

Based on such quantitative analysis, one could more rigorously model interrelationships of design patterns and their significance in revenue generation logic. Value modelling, applying for example e3-value methodology (Gordijn 2002), could provide a suitable methodology for business-oriented study.

Another avenue for further research would be in studying game mechanics and virtual economy design outside virtual world context. These designs are increasingly adopted in other digital services already and the increasing amount of implementing digital value-added services to physical goods might enable novel ways in implementing these designs into other industries as well.

While Osterwalder's business model ontology is quite generic, but appropriate for modelling higher abstraction level of a business model, more fidelity would be required to model revenue generation logic in detail. The STOF – model (see e.g. Faber et al. 2003) for modelling mobile ICT services is a good example of a field specific framework. As a further study I suggest developing a business

model framework for modelling virtual world business models. None of the frameworks covered in this thesis address the type of service design, here coined as value context.

Business model frameworks require new components to describe the business models of social online services and other complex services where the service design creates the basis for further added value consumption. Caveats in contemporary frameworks include:

- user integration to value chain through user-generated and created content
- interdependencies between service context and value offerings
- interdependence between service context and user/customer segments and self-selection
- other relative metrics besides directly monetary metrics
- the closed dynamic market - modelling the value loop from value configuration, through value propositions to user segments and back to value configuration through users integration to value chain.
- … as well as the metrics applied between steps in value loop

This thesis began by pointing out that selling virtual goods should not greatly differ from traditional form of business as essentially both are about selling some goods to some customers. The thesis went out to examine business models of selling virtual goods and found that current frameworks could not sufficiently model all of the most relevant aspects of these business models, especially the value context design and integration of users to value chain. The thesis suggested new component to business model frameworks addressing shortages that emerged from the nature of business models of social online services.

These aspects, however, can be found from business models outside this industry, implying that the additions suggested here improve business modelling in general.

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APPENDIX

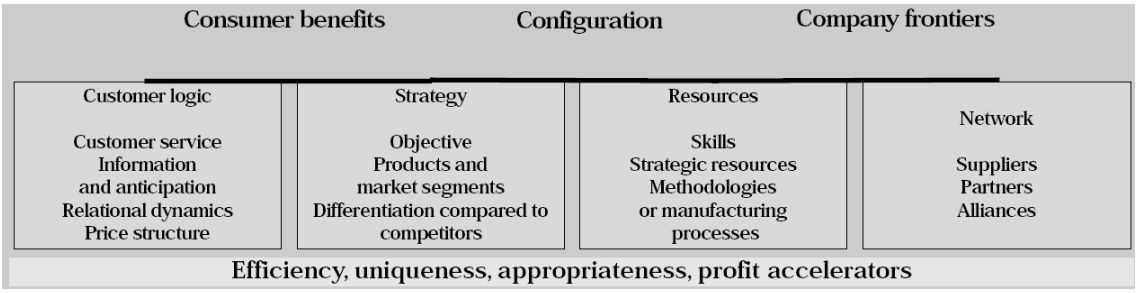

Figure 23: The components of the business model (Hamel 2000)

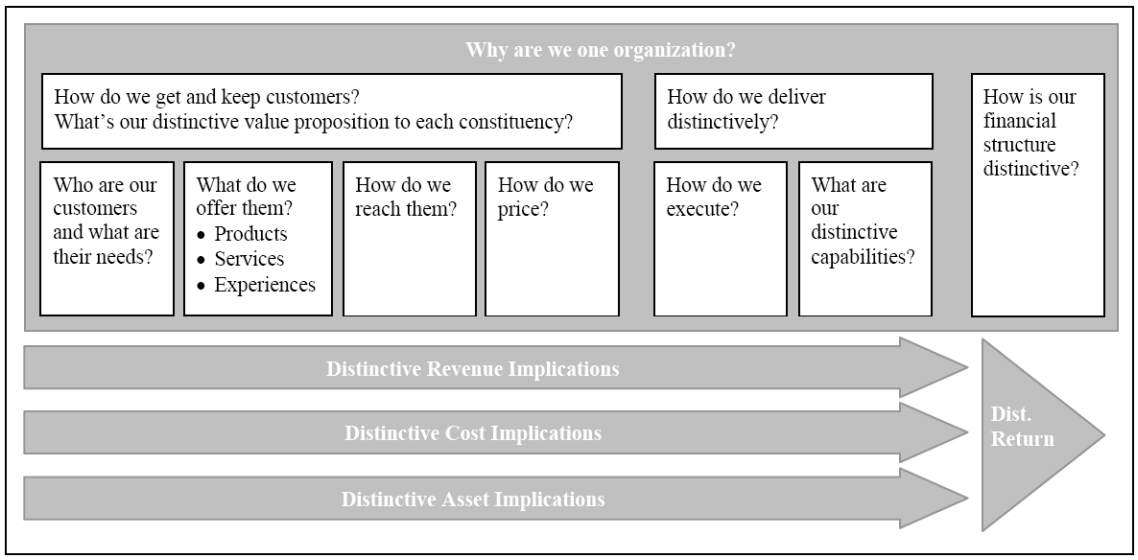

Figure 24: Operating Model Framework (Linder and Cantrell 2000)

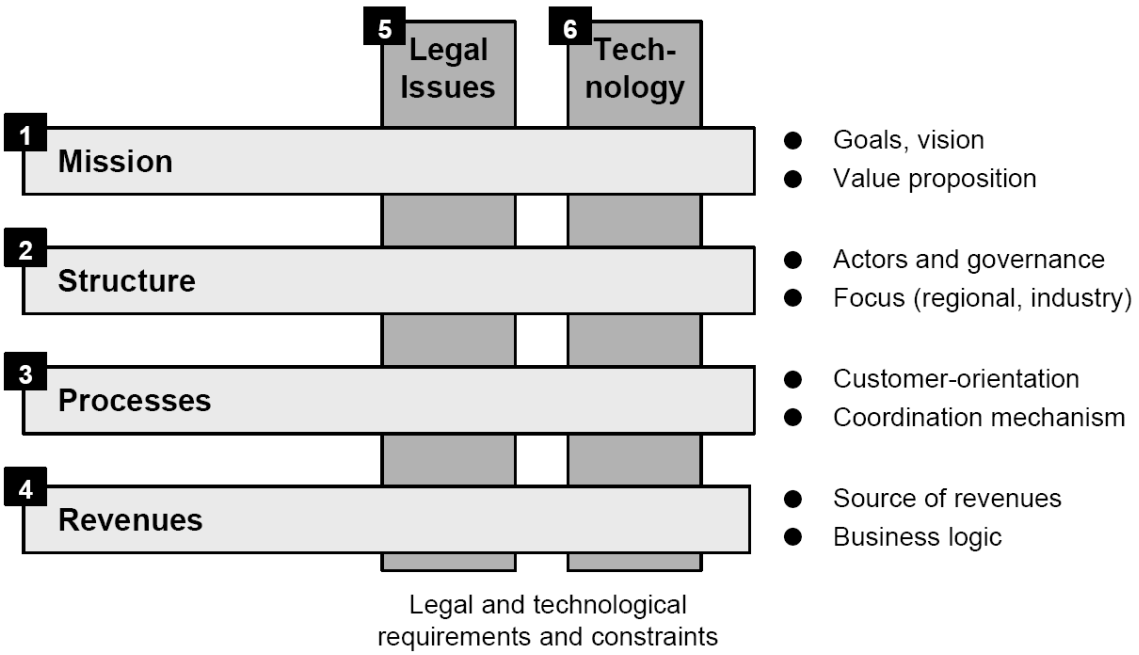

Figure 25: Generic Elements of Business Models (Alt and Zimmermann 2001)

Table 17 Business model sub-model (Petrovic et al. 2001)

Value Model	Describes the logic of what core product(s)/service(s)/experience(s) are delivered from the core competence
Resource model	Describes the logic of how elements are necessary for the transformation process, and how to identify and procure the required quantities
Production model	Describes the logic of how elements are combined in the transformation process from the source to the output
Customer relations model	The logic of how to reach, serve and maintain customers. It consists of the following sub-models: Distribution model - the logic behind the delivery process Marketing model – the logic behind reaching and maintaining customers Service model – the logic behind serving the customer
Revenue model	Describes the logic of what, when, why, and how the company receives compensation in return for the products
Capital model	Describes the logic of how financial sourcing occurs to create a debt and equity structure, and how that money is utilized with respect to assets and liabilities, over time
Market model	Describes the logic of choosing a relevant environment in which the business operates

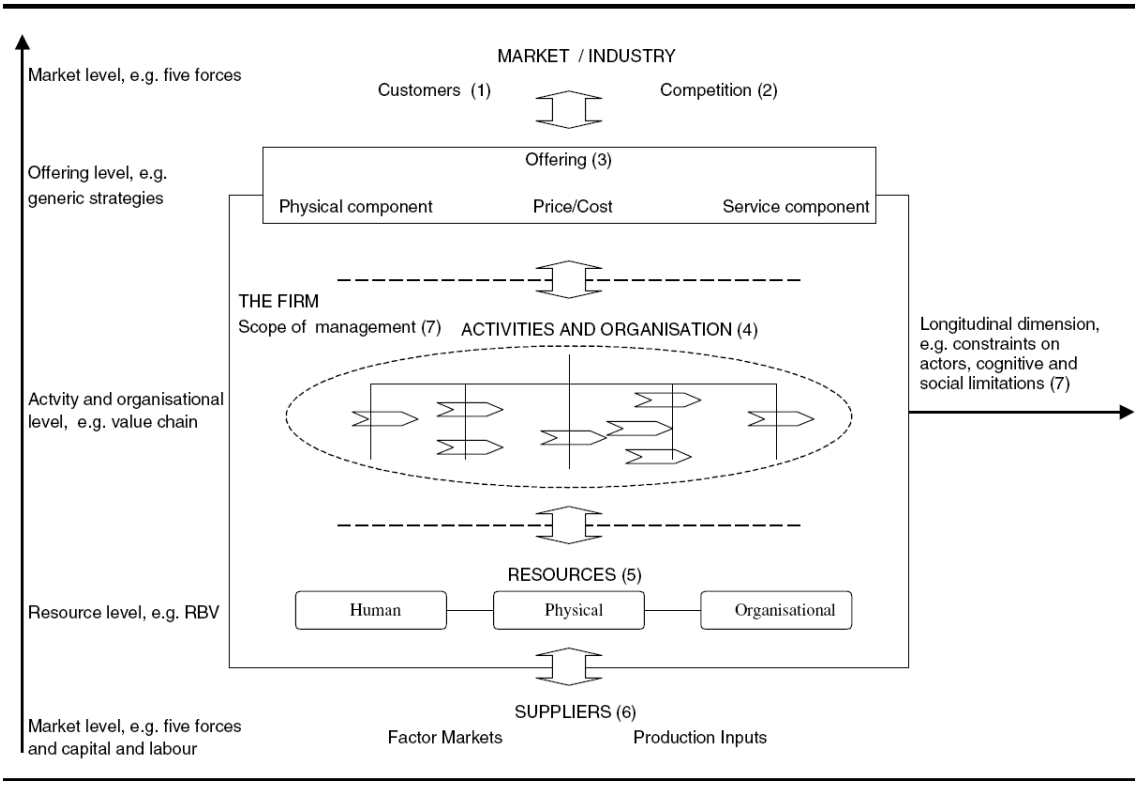

Figure 26: The components of a business model (Hedman and Kalling 2003)

Table 18 Components/elements of a business model (synthesized from Afuah and Tucci 2003; Afuah 2004)

Components (Afuah 2004)	Sub-components (Afuah and Tucci 2003)	Descriptions (Afuah and Tucci 2003; Afuah 2004)
Positions	Profit site	What is the relative (dis)advantage of the firm vis-à-vis its suppliers, customers, rivals, complementors, potential new entrants, and substitutes
	Customer value	Is the firm offering its customers something distinctive or at a lower cost that its competitor
	Scope	To which customer segment is the firm offering value
	Pricing	How does the firm price the value
	Revenue source	Where does the money come from? Who pays for what value and when? What are the margins in each market and what drives them? What drives value in each source?
Activities	Which	What set of activities
	How	When to execute
	When	How connected are these activities
	Implementation	What organizational structure, systems, people and environment does the firm need to carry out these activities? What is the fit between them?
Resources	Capabilities	What are the firm's capabilities and capability gaps that need to be filled?
	Resources	Assets and abilities to use those assets to effectively perform to activities that its business model calls for
	Competence	A firm's ability to turn assets into customer value
Industry factors	Sustainability	What is it about the firm that makes it difficult for other firms to imitate it? How does the firm sustain its competitive advantage?
Costs		What drives costs in each component of the business model?
== Profitability		

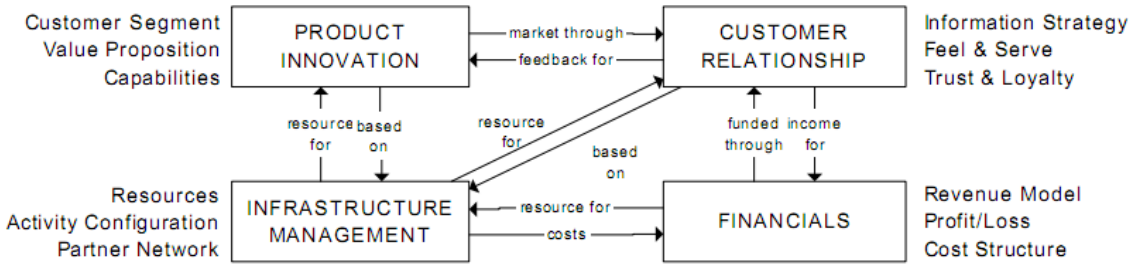

Figure 27: e-Business Model Ontology e-BMO

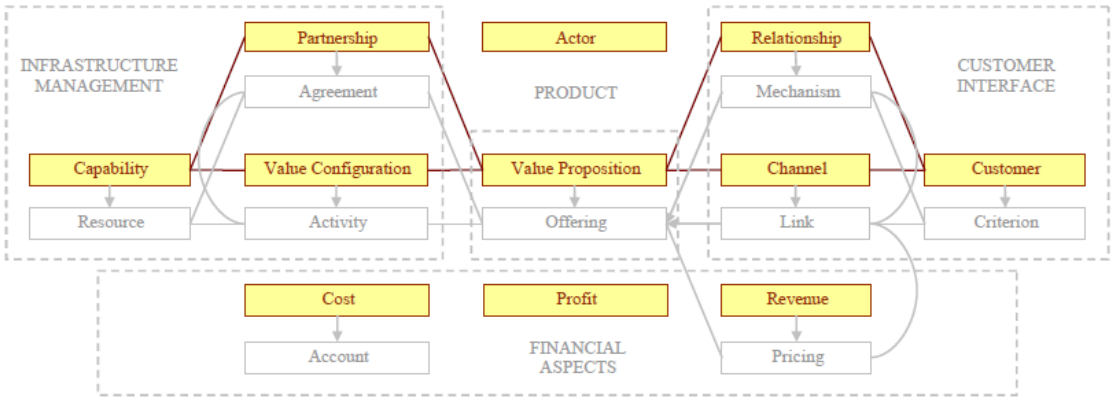

Figure 28: Business model ontology (Osterwalder and Pigneur 2004; Osterwalder 2004).

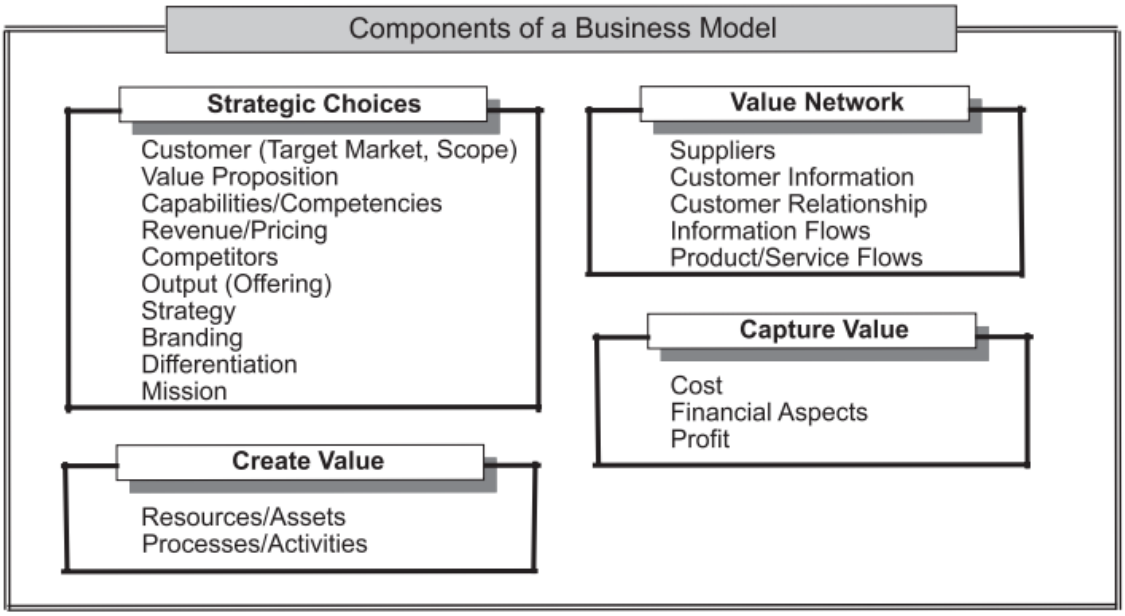

Figure 29: Components of business model affinity diagram (Shafer et al. 2005)

Table 19: Business model components (Shafer et al. 2005)

	Timmers (1998)	Hamel (2000)	Afuah and Tucci (2001)	Amit and Zott (2001)	Weill and Vitale (2001)	Dubosson-Torbay et al. (2002)	Magretta (2002)	Rayport and Jaworski (2002)	Van Der Vorst et al., 2002	Hoque (2002)	Chesbrough (2003)	Hedman and Kalling (2003)
Context	E-Business	Strategy	E-Business	E-Business	E-Business	E-business	Strategy	E-Business	E-business/SCM[a]	Technology	Strategy	IS[b] and strategy
Components												
Value network (suppliers)	X	X			X	X			X	X	X	X
Customer (target market, scope)		X	X			X	X	X		X	X	
Resources/assets		X		X		X		X		X		X
Value proposition			X			X	X	X	X		X	
Capabilities/competencies		X	X	X		X						X
Processes/activities		X	X			X			X			X
Revenue/pricing	X	X	X			X					X	
Competitors								X		X		X
Cost						X	X				X	
Information flows	X			X	X							
Output (offering)				X				X				X
Product/service flows	X			X	X							
Strategy		X								X	X	
Branding						X				X		
Customer information		X				X						
Customer relationship		X				X						
Differentiation		X								X		
Financial aspects						X		X				
Mission		X								X		
Profit						X	X					
Business opportunities				X								
Cash flows					X							
Create value				X								
Culture										X		
Customer benefits								X				
Customer interface		X										
Economic logic							X					
Environment										X		
Firm identity										X		
Firm reputation										X		
Fulfillment and support		X										
Functionalities									X			
Implementation			X									
Infrastructure—applications									X			
Infrastructure—management						X						
Management												X
Product innovation						X						
Specific characteristics									X			
Sustainability			X									
Transaction content				X								
Transaction governance				X								
Transaction structure				X								

[a] Supply chain management.
[b] Information systems.