FAKULTÄT FÜR !NFORMATIK
Faculty of Informatics

Die Funktion und Bedeutung von Designrechten in Österreich

DIPLOMARBEIT

zur Erlangung des akademischen Grades

Diplom-Ingenieurin

im Rahmen des Studiums

Business Informatics

eingereicht von

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Wien, 12. Oktober 2017

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FAKULTÄT FÜR !NFORMATIK
Faculty of Informatics

The role and relevance of Industrial Design in Austria

DIPLOMA THESIS

submitted in partial fulfillment of the requirements for the degree of

Diplom-Ingenieurin

in

Business Informatics

by

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Erklärung zur Verfassung der Arbeit

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Hiermit erkläre ich, dass ich diese Arbeit selbständig verfasst habe, dass ich die verwendeten Quellen und Hilfsmittel vollständig angegeben habe und dass ich die Stellen der Arbeit – einschließlich Tabellen, Karten und Abbildungen –, die anderen Werken oder dem Internet im Wortlaut oder dem Sinn nach entnommen sind, auf jeden Fall unter Angabe der Quelle als Entlehnung kenntlich gemacht habe.

Wien, 12. Oktober 2017

Julia Daurer

Acknowledgements

In the course of my diploma thesis many people have actively supported me:

In the first place I would like to thank my academic supervisor Univ.-Prof. Dr. Karl-Heinz Leitner for his valuable suggestions during the work for my diploma thesis and especially for his assistance to keep my progress on schedule. Furthermore, I want to thank Mag. Doris Schartinger for her patient guidance and useful critics. Her willingness to spend her time so generously has been very much appreciated. I would also like to thank the staff of the following companies for participating and supporting my diploma thesis: MAM Babyartikel, Immoankauf.at, Frey Wille, Legero, Wienerberger, Globo Lighting, ZKW, SKIDATA and Wallum.

I also want to extend my thanks to the students employed at the AIT for their constructive recommendations and motivation in stressful times.

Finally, I wish to thank my family and friends for their support and encouragement throughout my study. Especially, I want to thank them for their correction effort.

Kurzfassung

Viele Firmen setzen Design erfolgreich als Differenzierungsstrategie ein, um sich einen langfristigen kommerziellen Erfolg und Wettbewerbsvorteil zu verschaffen. Dem Schutz von Design, den Designrechten, wurde in der Innovationsliteratur jedoch bis dato kaum Aufmerksamkeit geschenkt. Während über Marken und Patente schon einige Studien durchgeführt wurden, gibt es wenige Untersuchungen über die Rolle von Designrechten und die Beweggründe für die Anmeldung. Daher ist das Ziel dieser Diplomarbeit, Hintergründe und Prozesse von Designrechtanmeldungen zu erforschen. Dies umfasst sowohl die Einflussfaktoren bei der Anmeldung als auch die Wahl des Anmeldelevels (national, EU-weit oder international). Speziell soll dabei ein etwaiger Zusammenhang zwischen der Anmeldung von Designrechten und Innovation untersucht werden. Als Grundlage für die Arbeit wird eine Literaturanalyse durchgeführt, um theoretische Hintergründe von Designrechten zu analysieren. Des Weiteren werden neue Strategien in der Designliteratur erörtert und die organisatorische Verbindung zwischen Innovationsprozess, Designprozess und Designrechteprozess untersucht. Im Rahmen einer deskriptiven Statistik werden aktuelle Trends im Anmeldeverhalten offen gelegt und als Grundlage für die empirische Untersuchung miteinbezogen. In der Analyse werden Interviews mit verschiedenen österreichischen Firmen durchgeführt und im Zuge einer qualitativen Inhaltsanalyse untersucht. Die Ergebnisse der verschiedenen Firmen werden zuerst verglichen und in weiterer Folge werden etwaige Relationen abgeleitet. Schließlich werden konzeptionelle Modelle für Einflussfaktoren der Anmeldung, für Komponenten einer Designrechtestrategie, sowie für Beweggründe des Anmeldelevels erstellt.

Abstract

Many companies successfully implement design as part of their differentiation strategy in order to achieve long-term commercial success and establish a competitive advantage. However, the protection of design through industrial design rights, has so far received little attention in the innovation literature. While some studies have already been conducted on trademarks and patents, there is only little research about the role of industrial design rights and the motivation to register these. Therefore, the aim of this diploma thesis is to identify possible reasons for the application and to find out further information on organisational details. This includes factors influencing the application and motives for selecting the application level (national, EU-wide or international). Further, a possible link between the application of design rights and innovation should be investigated. The basis for this thesis is a literature analysis, which contains theoretical background on industrial design rights. Furthermore, new approaches in design literature are discussed and the organisational link between the design right process, the innovation process and the design process is outlined. Descriptive statistics are conducted in order to identify current trends in the design registration behaviour. The insights of these statistics are included as a basis for the empirical investigation. In the analysis, interviews with different Austrian companies are conducted and a qualitative content analysis is carried out. The findings of the cross-case analysis are compared and possible relations are derived. Subsequently, conceptual models were created for influencing factors of the application, for components of a design right strategy, as well as for the selection of the application level.

Contents

CHAPTER 1

Introduction

This chapter covers the introduction to the main topic of this thesis. First of all, the motivation and the aim of this thesis is discussed in Section 1.1 and in Section 1.2. In addition to that, the methodology is outlined in Section 1.3. Finally, the structure of this thesis is explained in Section 1.4.

1.1 Motivation and Problem Statement

The importance of design has steadily increased in recent years with the effect that design is now a key factor in order to establish and maintain a competitive position [D'Ippolito, 2014]. Industrial design right came to a worldwide recognition in 2011, when Apple accused Samsung of copying aesthetic aspects of its products, especially of the iPhone and the iPad. One of these lawsuits concerned the infringement of Apple's community design for iPad products [Filitz et al., 2015]. In this context, especially Intellectual Property Rights (IPR), primarily industrial design rights, provide a good way to protect design from imitators. Further ways to protect intellectual property include trademarks, copyrights and patents. Industrial design rights are primarily aimed at encouraging creativity, as they provide a monopolistic position for a design over a certain period of time. While patents protect the functionality of the product, designs protect their appearance [National Endowment for Science, Technology and the Arts, 2009]. Features that can be protected by industrial design rights are lines, contours, colours, shape, texture, and material as laid down in the Austrian Design Law [Austrian Design Law, 1990]. Significant determinants regarding the choice of IPRs are firm characteristics, for instance, size, strategy and, of course, the selected type of innovation [Munari, 2013]. Nevertheless, in the case of Austrian companies, as the annual statistics of the Austrian Patent Office states, the number of design registrations on the national level declined over the past years [Österreichisches Patentamt, 2015].

Hence, this work aims to find out the influencing factors for the selection of the IPR strategy, especially for industrial design rights, and the reasons for the lower application rate of industrial design rights.

1.2 Aim of this thesis

The aim of this thesis is to portray the current state of knowledge about Austrian companies and their decisions to use and exploit industrial design rights in the face of different types of IPRs. Furthermore, it highlights, how the usage of industrial design rights is related to innovation. Another aim is to find out about firms' strategies and influencing factors for the application of industrial design rights. Thus, the key questions, addressed in this thesis are: What influences the strategic choice of industrial design as a form of intellectual property? How are the IPR process, design activities and the innovation process linked to each other? How do companies consciously shape their industrial design strategy in view of the different levels of intellectual property protection (national, EU-wide, international)? Moreover, qualitative interviews of Austrian companies are carried out and grouped by firm characteristics. For the evaluation, the sequence model by Mayring [2014] for qualitative analysis is used. Finally, this thesis is intended to broaden the understanding of how companies organise and protect their innovation processes and where the key sources of innovation come from. It should highlight, how tasks are divided between people and departments in an organisation, and how they relate to IPR registration activities throughout the product development cycle.

1.3 Methodological Approach

The methodological approach consists of the following steps:

1. **Literature Review**
   At the beginning of this thesis, the theoretical background is described explicitly, including relevant literature research about intellectual property rights: In that regard, legal aspects about industrial design rights, copyrights, patents and trademarks on the national level, the EU-wide level and on international level are addressed. In a next step, the relation between innovation and industrial design rights is discussed. Of course, the main focus lies on industrial design rights as this thesis tries to find out the motives for industrial design right registrations. In the following section, the strategic management of IPRs is discussed. Afterwards informal protection techniques, for instance secrecy or lead time advantage, are explained in detail. Finally, the strategic value and meaning of design is outlined. In the last step, the organisational link between the innovation process, the design process and the IPR process is explained explicitly.

2. **Data Analysis**
   The next step includes the description of the data which should be collected from

Austrian companies. This includes data from several registration platforms: the Austrian patent office, the design register of the European Union Intellectual Property Office (EUIPO) and of the World Intellectual Property Organization (WIPO). Furthermore, data is taken from the mapping of Aurelia and the database of EUIPO and the Austrian Patent Office (done by the Austrian Institute of Technology (AIT)) in order to get key data about Austrian companies (NACE code, data about registration behaviour, etc.). Another data source is the mapping of the EUIPO database with the commercial ORBIS database (done by the EUIPO) in order to detect design-intensive industries. As a further data source the Communication Innovation Survey (CIS) of Austria is taken in order to evaluate innovative Nomenclature Générale des Activités économiques (NACE) sectors in Austria and gain further insights into design-intensive sectors in Austria [Statistik Austria, 2012].

A descriptive analysis is done in order to detect current trends in the registration behaviour, e.g. top locarno classes or the ownership structure. As a further step, the guideline for the interviews is set up. In this guideline, the know-how from previous research both from the theoretical part of the thesis and the descriptive statistic is considered. In order to get as much information as possible a semi-structured interview is conducted. The analysis is done in a qualitative manner, which means that the interviews are done directly with representatives from several Austrian companies (number of interviews: nine). These representatives should have insight in the IPR registration process, the innovation strategy and the design process. These interviews are recorded and finally transcribed. In the analysis part of the thesis the sequence model of Mayring [2014] is used. For the interpretation of the content the Summarising Content Analysis by Mayring [2014] is used, including the following steps: paraphrasing, abstraction level determination, reduction, establishment of a category system and checking the category system against the source material. These steps help to establish theories about the gathered data.

3. **Interpretation**
   Last but not least, the analysed data is interpreted and results are derived. Furthermore, the data should help to explain reasons and influencing factors for the selection of industrial design rights. Another aim of this thesis is to find out about the relation between innovation and industrial design rights. As a further result, a model should be established which explains how companies decide for the registration of industrial design rights on the different levels.

1.4 Structure of this thesis

This thesis is structured as followed: In Chapter 2, the theoretical background is explained explicitly including definitions about intellectual property rights (industrial design right, patents, trademarks and copyrights), followed by the section about the strategic management of IPRs and informal protection strategies. In the following Chapter 3, the value of design is discussed, including definition and boundaries of design, design

in the New Product Development (NPD) process, actors in a design process and the organisational link between innovation, IPR and the design process.

In the next step, a descriptive analysis is carried out in Chapter 4, as a preprocess for the qualitative analysis, in order to detect current trends in the registration behaviour and to get insights about design-intensive industries.

The qualitative analysis is carried out in Chapter 5. This includes the selection of firms, the set-up of the guide line and the explanation of the qualitative analysis technique. In the next Chapter 6, the analysis itself is substantiated and documented by quotes. In this step, Austrian companies with different characteristics are used, for example, with varying size, varying business model etc. Furthermore, results are derived including influencing factors for the strategic choice of industrial design rights, motives for registering on different application levels and the relation of industrial design rights and innovation is analysed. In the last chapter, Chapter 7, the results are summarised and proposals for further research are shown, e.g. further statistical analysis.

CHAPTER 2

Rationales for Intellectual Property Rights and industrial design rights

"*everyone has the right to the protection of the moral and material interests resulting from any scientific, literary or artistic production of which he is the author*"

Article 27 of the Universal Declaration of Human Rights

2.1 Intellectual Property Rights

Intellectual property concerns creations of the mind, this goes from inventions and artistic work over to symbols and images. A common definition by the Virginia Commonwealth University (VCU) states that "*Patents, trademarks, copyrights, and trade secrets are sometimes referred to as 'intellectual property' referring to products that come from the creative mind. Intellectual property is imagination made real. [...] Just like other kinds of property, intellectual property needs to be protected from theft and misuse*" [Publow, 2015, p.1]. Another definition by the WIPO is "*Intellectual Property means the legal rights which result from intellectual activity in the industrial, scientific, literary and artistic fields*" [World Intellectual Property Organization, 2004b, p.3].

Primarily, intellectual property can be divided in two main categories: Copyright and industrial property. Copyrights concern primarily artificial creations, e.g. literary work, film, music, etc.; while industrial property refers to patents, trademarks, utility models and industrial design rights. One of the main differences between these two categories is that copyrights do not need to be registered, the right is generated by the creation of the opus itself. The copyright protection is mainly based on the Copyright Act, which maintains that the copyright owner has the exclusive right to protect his creations [Kletzer and Bauer, 2011; Dickermann et al., 2016].

The main advantage of IPRs is to support creators or owners in benefiting from their own work. This right is, as already mentioned, part of Article 27 of the Universal Declaration of Human Rights. One of the first occurrences of the term IPR was in Paris at the 'Convention for the Protection of Industrial Property' in 1883 and later in the 'Berne Convention for the Protection of Literary and Artistic Rights' in 1886. Both of these events were administered by the WIPO [World Intellectual Property Organization, 2004b, 2003].

In Austria, the Austrian Patent Office is the main address to support scientists in order to protect their inventions. When it comes to the application of IPRs it is important to pay attention to the fact that different organisations have different ways of dealing with IPRs. Assuring, that all partners are in line with the conditions of a contract a letter of intent or a confidentiality agreement should be signed before the actual IPR is registered [Dickermann et al., 2016]. As this thesis concentrates on the application of industrial design rights, industrial design rights are discussed in the following Section 2.1.1 including different levels, e.g. national, EU-wide or international. An overview of trademarks, patents and utility models is given in Section 2.1.2 and in Section 2.1.3. Furthermore, aesthetic innovation strategies and indicators are explained in Section 2.3.1, followed by the strategic management of intellectual property in Section 2.4.

2.1.1 Industrial design right

2.1.1.1 Design Law in Austria

The industrial design right in Austria is mainly based on the Austrian Design Law of 1990. The first two paragraphs are presented below [Austrian Design Law, 1990, p.1]:

> I. Under this Federal Law, design protection may be obtained for designs that are new and have individual character (sections 2, 2a) and are neither contrary to section 2b nor to public order nor to morality. Designs that are contrary to the prohibition on double protection (section 3) shall not be protected.
>
> II. A design within the meaning of this Federal Law means the appearance of the whole or a part of a product resulting of, in particular, the lines, contours, colours, shape, texture and/or materials of the product itself and/or its ornamentation.

According to these paragraphs industrial design right refers to aesthetic aspects of a product. Such a design can be two- (patterns, colours or lines) or three-dimensional (shape or surface). It can be applied for several products, covering a wide range from technical instruments to jewellery or other luxury work; from house wares to vehicles; from textile design to leisure goods [World Intellectual Property Organization, 2003]. In a legal sense industrial design refers to the right granted to protect the design and non-functional features of an industrial product, which is a result of a design process. The design needs to fulfil the following criteria [Heneghan, 2016; World Intellectual Property Organization, 2004b]:

1. It needs to be novel, so there is no disclosure to the public prior the filing.
2. It needs to be original, so it is not commonplace in the design field.
3. Individual Character, which means in this context that the overall impression of the design differs from already published designs.

   [Heneghan, 2016; World Intellectual Property Organization, 2004b]

Design plays an important role, particularly on markets with a wide range of products with similar functions. In these kind of markets, market share can be aggregated by industrial design. Especially nowadays, as people can establish an emotional bonding to aesthetically appealing products [Ashby and Johnson, 2010].

One of the biggest legal cases in the field of industrial design rights was between Samsung and Apple concerning the iPhone and the Samsung Galaxy S 4G, as it can be seen in Figure 2.1. As illustrated, this industrial design right consists of solid and dotted lines. In this context only the solid lines are covered by the law and protected against infringement. Thus, in this legal case there is an infringement of the bezel. In this context, it does not matter that Samsung had different designs in the area of dotted lines. For example the home button is dotted, which means this imitation cannot be claimed. This infringement of the industrial design right brought Apple an enormous amount of 133 million dollar [Nowotarski, 2013]. One of the main reasons for setting up this law is to protect design, since design can help manufacturers to distinguish from other competitors and achieve market success. Thus, this legal instrument also provides an incentive to invest in design and innovation activities [World Intellectual Property Organization, 2004b].

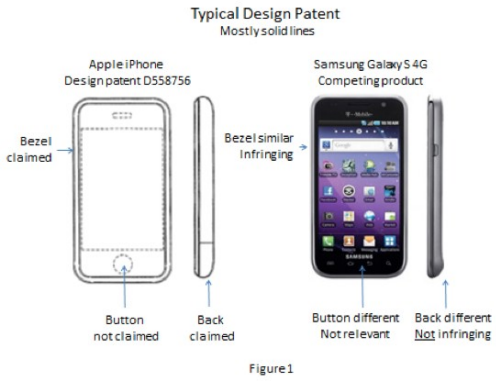


Figure 2.1: Comparison of industrial design rights registered by Apple and Samsung [Nowotarski, 2013, p.1]

In Austria industrial design protection is valid for at least five years and can be extended four times (by a timely payment of a renewal fee) to the total of 25 years [World Intellectual Property Organization, 2004b; Dickermann et al., 2016]. The costs for registering designs on the national level are rather low: The costs of a single design application lie between 100 - 200 €, this also depends on the amount of Locarno classes the design is registered for. Locarno is an international classification system for designs (containing 32 classes in total). Examples are nutriments (class Nr. 1), clothing (class Nr. 2) and textiles (class Nr. 5). These low costs are in turn extremely beneficial for private persons, because they can bear the costs on themselves [Österreichisches Patentamt, 2014; Heneghan, 2016].

2.1.1.2 Registered and Unregistered Community Design

Since 2003, it is possible to protect design EU-wide either by Registered Community Design (RCD) or by Unregistered Community Design (UCD). Prior to the establishment of these systems the protection of design had to be done on the national level, which has clearly led to a particularly prolonged and complex process [Heneghan, 2016].

This new system for design protection is administered by the EUIPO (previously called Office of Harmonisation for the Internal Market (OHIM)) based in Allicante, Spain [Fryer, 2002]. RCDs can only be registered if the design is both new and has an individual character [Heneghan, 2016]. An RCD is valid across all EU member states for initially five years. Furthermore, it can be prolonged block wise to a maximum of 25 years and the costs are about 350 €. Registered Community Designs protect against similar designs. This is also the case, if the infringing design has been developed in 'good faith'. 'Good faith' means in this context, that the applicant can be sued, even if he does not know about the existence of the earlier design [Europe Economics, 2015].

Contrarily, the UCD provides a possibility to protect designs for a shorter time period (3 years in total). While the nature of RCDs lies in protecting the monopoly position of the applicant, UCDs are useful for designers of short time products. This protection covers only the infringement of 'bad faith'. This means that another design can only be sued if that design is an intentional copy of the protected one. In this case the infringer should have been aware of this infringement [Time.lex CVBA et al., 2016; Europe Economics, 2015]. For UCDs the copying of the design must be actually proven by the design holder. Thus, RCDs are stronger and more transparent than the unregistered protection. Generally spoken, it can be said that despite these two forms existing for only 12 years now, the importance of community designs has grown rapidly to one of the largest design registers worldwide [Heneghan, 2016].

In Table 2.1, there is a comparison of costs for national and EU-wide registration of designs. It is quite obvious that the national registration in one country is clearly cheaper than the registration of RCDs. Thus, the registration of design on EU-wide level is only beneficial, if the national cost for all nations, where the design should be protected in, exceeds the costs of the RCD. If the design should be protected in several countries of

the European Union, the EU-wide protection is more advantageous as it also simplifies the whole registration process [Time.lex CVBA et al., 2016].

Member States	**Fees**
AT	87 €
CZ	18.5 € (if designer files) or 37 €
DE	60 € (electronic submission) or 70 € (by post)
DK	26.88 €
ES	63.68 € (electronic submission) or 74.92 € (by post)
FR	38 € + 22 € (black/white) / 45 € (colour)
IT	50 € (electronic submission) or 100 € (by post)
LT	69 €
LU	108 € + 10 € per representation
NL	108 € + 10 € per representation
PL	70 €
PT	104.5 € (electronic submission) or 209 € (by post)
SE	206.55 €
SI	80 €
UK	85 €
EUIPO	350 €

Table 2.1: Comparison of costs for national registration and EU-wide (based on [Time.lex CVBA et al., 2016, p.27])

The Europe 2020 program includes an initiative dealing with innovations and the protection of innovations. One key issue is the reduction of IPR costs by replacing national protection techniques by EU-wide protection e.g. UCD or RCD. Especially Small and Medium-sized Enterprises (SME) should benefit from this development. In the ideal case the saved money should flow directly into innovation activities leading to more innovative products and services. To support these companies even better it is also proposed to offer a stronger assistance for the efficient use of IPRs in the European Union [European Union, 2011].

In Austria, this program resulted in the funding of Knowledge Transfer Centres and Exploitation of IPRs by the BMWFW, the Federal Ministry of Science, Research and Economy. This includes a module for promotion of IPRs with a funding volume over 1 million € per year [Federal Ministry of Science, Research and Economy, 2014].

2.1.1.3 Hague System for International Registration of Industrial Design

The Hague System for International Registration of Industrial Design is administered by the WIPO and consists of the following international treaties: the London Act in 1934, the Hague Act in 1960 and the Geneva Act in 1999. The Hague system simplified the application process for international design protection immensely. Without the Hague system, the application would still include filings at national or regional offices. Furthermore, it also simplifies the management of industrial designs, since it provides the possibility to change or renew the registration with just one single step. Of course,

another benefit is the decreased transaction costs through the usage of just one currency [World Intellectual Property Organization, 2017].

There are two ways for registering a design: The first approach addresses independent filings, the so-called Paris Route, as shown in Figure 2.2. Another way is the filing of a single application through the Hague system. This situation is visualised in Figure 2.3 [World Intellectual Property Organization, 2016].

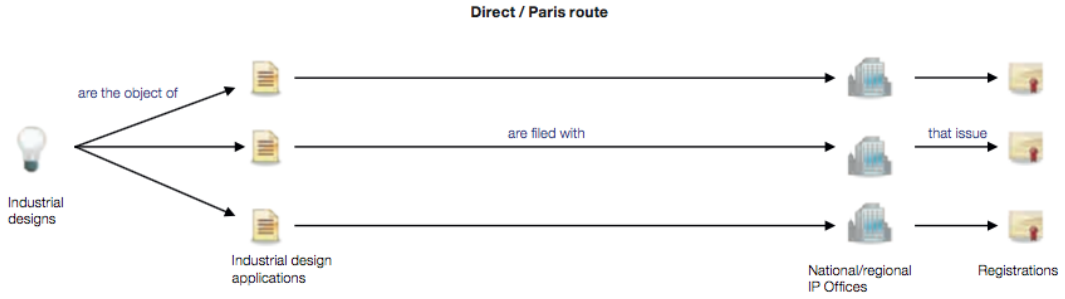


Figure 2.2: Paris Route. [World Intellectual Property Organization, 2016, p.12]

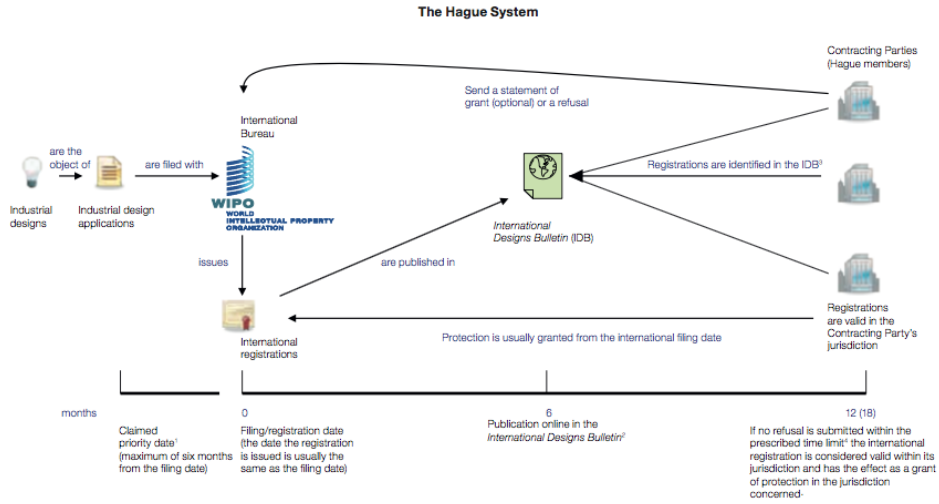


Figure 2.3: The Hague system. [World Intellectual Property Organization, 2016, p.12]

The Paris Route, which is based on the Paris Convention for protection of Intellectual Property (IP), describes the process of filing several applications at each national office directly [World Intellectual Property Organization, 2016].

In comparison, the Hague system provides the possibility to file just one single application and protect it in all chosen member states of the Hague Agreement. In Figure 2.3, it can be seen, that the Hague system process starts with a formal examination at the International Bureau, followed by a recording in the international register, publication in

the international designs bulletin and finally a notification to all members specified in the application. The basic fee is around 397 Swiss Francs. The total cost depends on the number of selected countries [World Intellectual Property Organization, 2016].

According to WIPO Statistics Database, there was an increase in the international industrial design application rate of 40.6 % in 2015. As a new development Samsung Electronics became the largest applicant, displacing Swatch AG of Switzerland [World Intellectual Property Organization, 2016].

Since 2008, the European Union is also a member of the Hague Agreement. Now, protection of designs can be carried out in all participating countries of the European Union [Bardehle Pagenberg, 2015]. Currently there are 66 contracting parties, as one of the most notable members, USA, participated in 2015 [World Intellectual Property Organization, 2016]. In order to register designs in a non-member state of the Hague Agreement (e.g. China), it is necessary to file a national protection [Dickermann et al., 2016].

In summary, it can be said, that the main advantages of this established system are primarily the simplification of the processes and the cost efficiency. Furthermore, domestic manufacturers are motivated to export their products to other countries, which in turn leads to a growth in trade [World Intellectual Property Organization, 2004b].

2.1.2 Trademarks

Trademarks provide a possibility to protect company labels. It is defined by the WIPO as "*sign that individualises the goods of a given enterprise and distinguishes them from the goods of its competitors*" [World Intellectual Property Organization, 2004b, p.68].

Thus, it is a protection that allows to distinguish goods and services of different companies. Of course, trademarks play a crucial role in marketing innovations and furthermore in providing an incentive for firms to offer qualitative products. When an application is filed, examiners search in trademark databases for any conflicting trademarks. If there were no conflicting trademarks, the trademark can be applied. Usually, trademarks consist of one or several words, slogans, three-dimensional signs or audible signs, e.g. musical. Initially, they can be protected for ten years on the national level, although it can be prolonged indefinitely by paying fees every ten years [Mendonca et al., 2004; Landes and Posner, 1987].

At the EU-wide level, EU trademarks (previously called Community Trade Marks) can be registered at the EUIPO. There exists a database called Central European trademark Observation Service (CETMOS), which can be used to search trademarks in force or pending. An online application costs 850 € for a single class and is valid for ten years [Collis, 2015; Dickermann et al., 2016].

Moreover, it is also possible to register trademarks internationally, which is governed by the Madrid Agreement. This system is administered by the International Bureau of the WIPO, as it is also the case for industrial design rights. The algorithm behind this

registration process is quite similar to the international registration of industrial designs [World Intellectual Property Organization, 2004b].

The main difference to industrial design rights is that trademarks protect primarily the distinguishing features of an innovation, while the former protects the aesthetic features of an innovation. Although, these two laws can even be used as complementary protection, e.g. a device mark can be registered as a design (fulfilling novelty and individual character) and the three-dimensional appearance of this product can be registered as a trademark [Bardehle Pagenberg, 2015; World Intellectual Property Organization, 2004b].

There are also parallels between patents and trademarks: While trademarks serve to protect firms' marketing assets, patents serve as protection of the technological knowledge. Thus, both of these tools are an incentive to invest in innovation and marketing [Greenhalgh and Rogers, 2010].

2.1.3 Patents and Utility Models

The most widely investigated IP protection tool is the patent or the light version of a patent, the utility model. Both of them provide the right to exclude others from producing, using or selling the invention without permission. This right can also be transferred to others through selling licences. This IPR belongs to the territorial rights, which means that patents are limited to the countries for which the protection was granted. The maximum duration of protection is 20 years for patents and 10 years for utility models. Patentable innovations need to be novel, contain an inventive step and be capable for industrial application [Dickermann et al., 2016].

Utility models are similar to patents, the difference is that utility models do not need any proof for the inventive process and the duration of the protection is shorter. The application process for a utility model is shorter than for a patent, but it is also a weaker protection. Utility models are sometimes called short-term patent and they are not available in every nation [Dickermann et al., 2016].

Patents can be registered on EU-wide level via the European Patent Office (EPO). The total cost for a registration is around 4500 €. Several different fees are included: the examination fee (around 1400 €), the designation fee (around 525 €) and the publication fee (around 65 €). This centralised system was introduced by the European Patent Convention (EPC) and is linked to the member states of the EPO. The European patent grant procedure can take a long time, between three to five years, from the moment of the filing [European Patent Office, 2016]. For an international protection the Patent Cooperation Treaty (PCT) established an international patent system. Of course, the introduction of the PCT system has major advantages. For instance, it provides a convenient and cost-efficient way to simultaneously protect patents in several countries (in 2015: 151 contracting states) [World Intellectual Property Organization, 2004a]. Generally, the application process consists of two stages: the international and the national phase. At first the applicant registers the patent at the local patent office. Afterwards (maximum time limit 12 months) the international phase starts with the filing

of the international application. This is processed by the receiving office, international search reports are written, and the publication is done via the International Bureau of the WIPO (maximum time limit 18 months). After 30 months the national phase starts including the publication in all selected nations [World Intellectual Property Organization, 2004a].

Addressing IPR bundles, the technical features of an innovation can be protected by patents and the aesthetic appearance can be protected by designs rights [World Intellectual Property Organization, 2004b].

2.1.4 Overview of IPRs

In the following Table 2.2 a short overview of the explained IPR tools is provided. Hereby, the main characteristics of industrial design rights, trademarks and patents are illustrated.

IP Right	Patents	Trademarks	Industrial design right
Subject matter	Inventions (solutions to technical problems)	Distinctive signs that identify certain goods or services and distinguish them.	Original ornamental and non-functional features of an industrial article or product.
Requirements for protection	Novelty; inventive step; industrial applicability	Distinctiveness	Novelty; individual character
Acquisition of national right	Examination by the national patent office.	Examination by the national patent office.	Examination by the national patent office.
Acquisition of EU-wide right	Examination by the European Patent Office (EPO).	EU Trademarks at the EUIPO	RCDs at the EUIPO. UCDs automatically acquired by the act of creation.
Acquisition of international right	Examination by the International Bureau of WIPO.	Registration of international trademarks through the Madrid Agreement.	Registration of industrial design right through the Hague System.
Conferred rights	Exclusive right to make, use and sell the invention.	Exclusive right to use and sell trademarks.	Exclusive right to make, import or sell articles to which the design is applied.
Duration	Typically 20 years from filing, based on payment of fees.	Commonly 10 years from filing. Can be renewed indefinitely by paying fees.	Up to 25 years.

Table 2.2: Main characteristics of patents, trademarks and designs (based on [Munari, 2013, p.16])

This includes the comparison in the subject matter, the requirements for protection, the acquisition of national, EU-wide and international rights, conferred rights and the duration.

2.1.5 Rationales for IP registration

In this section rationales for IPRs are proposed. In the following sections combined uses of IPRs are described in Section 2.2, the relationship between IPRs and innovation is outlined in Section 2.3, and the strategic management of IPRs is discussed Section 2.4.

Recent research (World Intellectual Property Organization [2003]) highlights that investments in Research and Development (R&D), innovation and IPRs are a substantial attribute for economic growth. According to the World Intellectual Property Organization [2003], IPRs spur economic growth, create new jobs and even new industries. Still the impact of IPR protection on economic growth depends on several attributes: These are, for instance, the established intellectual property law and on the ability to innovate and imitate in this country [Falvey et al., 2006].

IPRs also provide an incentive to invest in creative and innovative activities. This is done by the granting of exclusive legal rights for their intellectual property. Several studies have shown that intellectual property shares characteristics to public goods. These are the non-rivalry and the non-exclusivity. Non-rivalry means that the use of knowledge by one actor does not hinder other actors to use it as well. The other characteristics about the non-excludability concerns the creation of knowledge. Once knowledge is produced others cannot be stopped to use it. Of course, these characteristics can remove the incentive to invest in R&D. Thus, the establishment of the IPR protection can restore this incentive [Munari, 2013; Stiglitz, 1999].

Another function of IPRs is the acquisition and dissemination of knowledge. Through the publishing of the rights this knowledge is available to other inventors or rival firms. Generally, this dissemination process takes about 10 to 12 months [Maskus, 2000].

Another interesting relationship is between trade and the registration of IPRs. According to the market expansion explanation, strong IPRs are leading to an expanding international market. With the assurance of exclusive rights companies are motivated to export their goods. With the absence of IPRs companies reduce their exports in order to prevent imitation. Thus, stronger IPRs increase exports, because the cost for preventing the loss of the technology are quite low, e.g. foregone revenues from reduced exports or expenses for making the technology difficult to imitate [Smith, 1999].

Another approach is the market power explanation, which says that there is a reduction of trade resulting from the monopoly situation over protected goods. Thus, in this concept the market power is held by the holder of the IPRs. In this case companies with strong IPRs can use their market power on foreign markets by reducing the quantity of exported products and increasing the unit price. Since these two assumptions are countervailing, the relationship between IPRs and trade is indeterminate [Smith, 1999].

In the following Table 2.3, the different situations are illustrated. In this table, situation 1 shows the case of weak imitative abilities and rights, where the threat of imitation is moderate. Situation 2 explains the market power effect with weak threat of imitation and strong IPRs. Situation 3 shows the market expansion effect with strong imitative abilities and weak intellectual property rights, leading to a strong threat of imitation. Situation 4 declares an ambiguous effect with strong imitative abilities and weak IPRs [Smith, 1999].

	Weak IPR	**Strong IPR**
Weak imitative abilities	Situation 1 moderate threat of imitation ambiguous effect (+ / -)	Situation 2 weak threat of imitation market power effect (-)
Strong imitative abilities	Situation 3 strong threat of imitation market expansion effect (+)	Situation 4 moderate threat of imitation ambiguous effect (+ / -)

Table 2.3: Threat of imitation and incidence of market expansion and market power effects (based on [Smith, 1999, p.156])

2.2 Combined uses of IPRs and emerging difficulties

It is not uncommon to register IPR bundles for specific products. Often multiple IPRs are used complementary to each other. As each IPR serves for different purposes, bundles are used in order to protect the product against imitation in different perspectives. Dyson's vacuum cleaner is an example for the successful registration of different IPRs. In fact, Dyson used a three-track IP strategy, which protected the innovative product with patents, registered design and trademarks at the same time [Innovation Policy Platform, 2013].

Of course, sometimes there can be difficulties with the registration of IPR bundles as IPRs have competing principles. Generally, utility patents aim to protect functional features and industrial design rights, trademarks and copyrights protect non-functional features. While the general differentiation between functional and non-functional features is very simple, the legal differentiation between functional and non-functional features can be difficult. However, it is important to show that particular attributes of registered designs are non-functional in order to register trademarks [Cohen, 2004].

In order to show that features are non-functional, the following questions need to be addressed: Is there a utility patent describing the utilitarian advantage of this feature? If this is the case, then it will be very difficult to register trademarks as the utility patent is a strong evidence for functionality of this feature. Are there any alternative designs by competitors? If there are no alternative designs on the market this design

is essential to the function of this product. Thus, the feature is legally functional as the design is essential to the use of the product. It is quite challenging to protect both form and functions of a product without sacrificing one in order to protect the other one. Thus, early in the product development process features of a design should be marked as functional or non-functional and shortly before the market launch design managers and intellectual property councils should work together in order to develop a strategy for design protection. For the successful registration of trademarks design managers should add brand identifying features to the product. In this context, marketing managers should not add functional values to primarily ornamental features. Thus, for the successful registration of IPR bundles communication between design and marketing managers and intellectual property counsels should be fostered. Furthermore, designers should be guided for implementing features, which potentially can be protected via trademarks too [Cohen, 2004].

A study by the Office for harmonization in the internal market [2015] shows that there is even a positive relationship between IPR bundles and revenue per employee.

The result of this study can be seen in Table 2.4.

IPR or combination	All firms	SMEs
IPR owner	28 %	32 %
Patents only	15 %	16 %
Trademarks only	30 %	33 %
Designs only	15 %	17 %
Patents and trademarks	17 %	21 %
Patents and designs	15 %	20 %
Trademarks and designs	39 %	48 %
Patents, trademarks and designs	16 %	34 %

Table 2.4: IPR ownership and revenue per employee (based on [Office for harmonization in the internal market, 2015, p.66])

All firms registering the bundle trademarks and designs have a 39% higher revenue than companies without this protection. For SMEs this correlation is even stronger with 48 per cent. This IPR bundle seems to be the most successful protection, while solely designs alone seems to be to worst [Office for harmonization in the internal market, 2015].

2.3 IPRs and innovation

One of the main reasons for IPRs is the protection of inventions and innovations. According to the World Intellectual Property Organization [2003] the legal protection via IPRs encourages companies to invest in research of further innovations. Furthermore, according to the World Intellectual Property Organization [2003], there seems to be a

positive correlation between innovation and IPRs. In contrast, there are other researchers [Hamilton, 1996; Gollin, 2008] who claim that IPRs even have a negative effect on innovation. They state that IPR hinder innovation and prevent the public to fully use details of innovation due to the exclusive rights given by IPRs. Furthermore, they even raise costs for consumers and create unhealthy monopoly market constructs leading to competition rather than cooperation [Gollin, 2008]. Thus, the relationship of IPRs and innovation seems to depend on the given market situations.

Generally, there is a lot of research about patents, trademarks and innovation ([Racherla, 2016; Mendonca et al., 2004; Belleflamme, 2006]), but only little about industrial design rights and innovation. Still, industrial design rights can also play an important role by assessing innovation in more traditional sections, e.g. footwear or textiles. In these sectors product aesthetics are a key factor for competitiveness and it is worth protecting them [Filitz et al., 2015; Alcaide-Marzal and Tortajada-Esparza, 2007].

Studies concerning industrial design rights are mainly those based on the CIS. For instance, analysis of the CIS indicates that innovating companies make greater use of design registrations than non-innovating companies. It also shows an over emphasis on technical inventions and patents as proxy for R&D [Livesey and Moultrie, 2008]. In this context Mairesse and Mohnen [2004] state, that in the high-technology manufacturing sectors each IPR, except industrial design rights, is used more intensively than in the low manufacturing sector. Thus, industrial design rights are very important for the low manufacturing sectors. The CIS is based on a definition of innovation by the OECD. These are defined by the OECD and Eurostat [2005] as "*the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organisational method in business practices, workplace organisation or external relations*". These four types of innovation are: product innovation, process innovation, marketing innovation and organisational innovation [OECD and Eurostat, 2005].

In order to evaluate the relationship between innovation and design, aesthetic innovation and aesthetic innovation indicators are discussed in the following Sections 2.3.1 and 2.3.2.

2.3.1 Aesthetic Innovation

According to Alcaide-Marzal and Tortajada-Esparza [2007], aesthetic change occurs when a product seems to be novel through the innovation of visual attributes. Aesthetic change can provide the kind of novelty the customers are looking for and this can also establish a competitive advantage. In this context Bianchi and Bortolotti [1996] state, that the result of aesthetic innovations on a product can be perceived as radically differentiated by consumers (subjectively) and moreover, it can even replace earlier products. Still it is problematic to assess innovation capabilities for companies producing these kind of products as innovation lies mostly in non-technological features. Since aesthetic innovation relates to the subjective user perception, it is even harder to measure [Alcaide-Marzal and Tortajada-Esparza, 2007]. A good definition for aesthetic or design innovation is by Mutlu and Er [2003, p.41] who state that "*design innovation comprise (a) the incremental*

novelties in the design of an existing product or service, or (b) radically new products or services obtained by design effort with no or minimal technical novelty". In this definition, the relevance lies on the radically new products without technological change [Mutlu and Er, 2003].

2.3.2 Aesthetic innovation indicators

A set of indicators for measuring aesthetic innovation is proposed by Alcaide-Marzal and Tortajada-Esparza [2007]. The information of the following proposed indicators is also complemented with information about technological innovation indicators:

1. **Number of innovative firms.**
   A firm will be considered innovative if it has marketed a new product during the period under study.
2. **Product renewal rate**
   Number of new products divided by total number of products offered.
3. **Number of design protections.**
4. **Total design expenditure.**
5. **Number of designers on the firm's staff.**
6. **Sources of design.**
   Percentage of production correspondent to internal design and to external design.
7. **Level of cooperation in design activities.**
8. **Purchase of information and information updates.**
   This indicator explores the firm's absorption of information to design new products according to the required style.
9. **Equipment acquisition and maintenance.**
   This indicator explores the firm's absorption of technology utilised to speed up the design process.

These indicators aim to cover different steps in the product design process. They include both indicators related to efforts of innovation, primarily output indicators, e.g. number of innovative firms, number of design protections and product renewal rate, and indicators related to aesthetic change, primarily input indicators, e.g. total design expenditure, number of designers on staff, sources of design, purchase of information and information updates, equipment acquisition and maintenance. There is also an indicator for measuring the collaborative effort, e.g. level of cooperation [Alcaide-Marzal and Tortajada-Esparza, 2007].

2.4 Strategic management of intellectual property

Intellectual property is getting more and more important and makes up a large market value for companies nowadays. Thus, it can no longer just be left to technology or legal departments all alone. In the following the strategic value of IPRs is discussed including questions about gaining and sustaining competitive advantage, granting incumbency advantage, establishing entry barriers, gaining vertical or horizontal power, selling, licensing or donating [Reitzig, 2004].

2.4.1 Competitive Advantage

Intellectual property rights can play a substantial role for creating and sustaining competitive advantage. In fact, they can even help to provide a temporary technological lead to protect brands and to form industry standards. Specifically, patents provide a good way of creating competitive advantage. For instance, in the pharmaceutical industry Novo Nordisk A/S could successfully establish a dominant market position in Europe as a result of their license on a technology. Another possibility of creating competitive advantage is by the establishment of standards. For instance, in the mid 1990s Motorola Inc. had exclusive rights for the GMS technology. Initially, the company pushed the establishment of GMS as a common mobile-telephony standard in Europe. Afterwards IP activities started in order to patent various essential technologies GMS is depending on. This engagement in technological know-how in relation to policy strategy made is possible for Motorola Inc. to create a competitive advantage [Reitzig, 2004].

Industrial design rights can help to stimulate creativity by rewarding companies monopolistic position over a design for a given time period. In that regard, there is also a disadvantage as this comes at the cost of monopoly welfare loss. Of course, the main target is to limit imitations by competitors and by doing so product differentiation activities are reinforced. By the nature of designs, designs will not be excludable in a market (as they cannot be kept secret) thus industrial design right protection may be very important in order to provide excludability [National Endowment for Science, Technology and the Arts, 2009].

However, industrial design rights also have various weaknesses: In fact, companies stated that, in the current system only specific shapes and images are protected. This means that in many industries, it is easy for competitors to produce a near-copy. This near-copy has enough differences for avoiding an infringement of industrial design rights, but it still seems almost identical to the customer. In addition to that, some companies also stated, that there is a limited scope of protection, which does ensure a competitive advantage. Sometimes companies even question themselves if it is really worth registering designs, when they produce designs, which are almost identical to their competitors [Europe Economics, 2015].

2.4.2 Market Power

Typically, the establishment of market power has several advantages: On the one hand, companies hope to raise prices (above competitive level) and thereby increase profitability. On the other hand, companies also aim to price-discriminate among customers. Still there are several drawbacks of exercising market power: First of all, the IPR holder needs to be aware of the dependence between the value of the whole market and the other market participants. If the IP holder exploits his IPRs too aggressively, rivals may loose the interest in this market. This can lead to a steep decline of market prices, when competitors start to launch ineffective products at a low price. This development can be seen in the at-home market. Procter and Gamble revolutionised the whole market with Crest White-stripes, which is a cheap method to whiten teeth. Procter and Gamble designed such a clever patenting strategy, which made it nearly impossible for other companies to invent-around. As the competitor Colgate Palmolive had no other choice, the company decided to launch a very inefficient product at an even lower price with the aim to undermine the profitability of the at-home market. This competition led to a steep decline of the overall market price, from which the market never recovered. Thus, in this situation a less aggressive IPR strategy of Procter and Gamble would have been better for the overall market and the company itself [Shapiro, 2001; Oberholzer-Gee et al., 2005].

With the establishment of market power also network effects should be addressed, as often the value of a product strongly depends on network effects. In order to establish a successful longterm market power, companies need to prevent competitors to capitalise on network effects. For instance, Apple was one of the most profitable companies in the personal-computer market in the 1980s. The company protected their products with many patents and copyrights allowing to raise prices and increasing their profit. But this strategy led to high long-term costs and as the competitor IBM decided to drive down prices and increase sales of their Wintel machine the market share of Apple decreased. The Wintel machine had several network effects as it offers the possibility for their consumers to exchange and share documents seamlessly with a far more varied set of software. These circumstances led to a decline of Apple's share to 1,9 per cent in 2003 and many researchers expected the company to leave the market [Oberholzer-Gee et al., 2005].

Summarised, these different situations show that various drawbacks need to be addressed in order to establish a beneficial long-term market power strategy.

2.4.3 Selling, licensing or collaborating

Further strategic mechanisms include selling, licensing and collaborating. The sale of IPRs is not different from the sale of any other assets. In this context, selling is only advantageous if the IPR is more valuable for the new holder. One difficulty in the selling process is uncertainty: Often, the buyer has limited information about the value of the idea as the seller has no incentive to disclose the idea fully. In order to drive up the cost

of their intellectual assets companies often pursue the so-called 'block-to-fence' strategy. This strategy aims to acquire a large number of IPRs not only for the main innovation but also for similar related solutions in order to drive up the costs for inventing-around [Fisher III and Oberholzer-Gee, 2013; Torrisi et al., 2016; Cohen et al., 2000].

Contrarily to the selling approach, licensing means that the company retains ownership but grants licenses to one or more companies. This kind of strategy is more common and attractive in situations, where rival companies are more efficient and have better resources than the innovator. In market situations, where market power plays an important role, licensing is typically not that common [Fisher III and Oberholzer-Gee, 2013]. Another strategic approach is cross-licensing, which enables market participants to use intellectual assets from each other. Especially, with the help of royalty free cross-licensing each firm is able to compete without fear of infringement and without the burden of a per unit royalty [Shapiro, 2001].

Usually, companies participate in Standard Setting Organisation (SSO) in order to collaborate. Agreements to stick with a specific standard can be quite beneficial, for instance in designing or manufacturing of products. Through the collaboration network externalities are catalysed and information costs can be reduced. Of course, there are also some drawbacks as this collaboration can raise entry barriers with the effect of only a few existing firms in the market. In order to minimise this risk both the United States and the EU set up rules, which govern the structure of SSOs. Also, collaborating companies must licence their intellectual asset to other market participants [Fisher III and Oberholzer-Gee, 2013].

2.5 Informal protection mechanisms

Informal protection mechanisms are more flexible and non-statutory tools compared to the standard IPR protection techniques. Mostly, these methods can even be modified in order to adapt to certain circumstances. Sometimes informal protection mechanisms are more appropriate mechanisms because they actually establish barriers against imitation, while IPRs may not provide effective protection [Ruuskanen and Seppänen, 2013; Hurmelinna-Laukkanen, 2009; Innovation Policy Platform, 2013].

The main difference between informal and formal protections is the purpose: While informal protection mechanisms aim to make imitation impossible, IPRs aim to facilitate the exchange of knowledge. Despite all these differences, these two mechanisms still have a mutuality, they both enable companies temporary monopoly positions and furthermore acquiring monopoly rents [Ruuskanen and Seppänen, 2013; Hurmelinna-Laukkanen, 2009]. Examples for informal protection strategies are described explicitly in the following sections.

2.5.1 Secrecy

One of the most used informal mechanism is the simple use of secrecy. In this case, key knowledge is kept confidential. This includes preventing employees to give away valuable knowledge. For instance, in large consultancy companies sophisticated policies are pursued in order to restrict information to involved employees. This is done to assure that employees do not walk off with a set of capabilities in order to start a competing firm [Blind et al., 2004]. Nevertheless, it is sometimes difficult to find the middle way in secrecy. Overemphasising may result in limiting the amount of collaboration the company can participate in. Finally, it may also restrict the 'know-how' trading. Another drawback is the duration of the protection, since it is not possible to use secrecy as a long term protection [Blind et al., 2004]. Secrecy is a great and beneficial tool for companies which are dealing with process innovations or companies, which are operating in countries with weak IPRs [Ruuskanen and Seppänen, 2013]. In companies with process innovation, it is beneficial to distribute the overall knowledge of the whole process among several engineers. This distribution of knowledge makes it even harder for competitors to find out about the whole process [Lu, 2007].

Concerning product innovations, two techniques can be applied: First of all there is the possibility of home-base integration, which means that the home R&D base comes up with the product specification and develops the core system. This core system is transferred to the host R&D in encrypted form, then the host goes on with the implementation of the sub modules and the testing. The other possibility is the host-based integration technique, which is quite similar to the previous technique. The only difference is that all of the development and integration tasks are carried out by the host lab [Lu, 2007].

2.5.2 Short innovation cycles - Lead time advantage

Another informal protection mechanism exploits the principle of first-mover advantage. A first-mover advantage implies that a pioneer has a competitive advantage through acting early relative to peers [Carow et al., 2004]. In order to sustain competitiveness these companies are trying to create shorter innovation cycles in order to reduce the risk of copying and imitation. Thus, at the time when a potential competitor tries to copy or imitate the idea, it is already too late. This method is often used in the IT industry, especially in the software industry, where innovation cycles are usually even shorter than six months. However, there is also the disadvantage that short lead times are leading to higher innovation costs over a short time period. The other difficulty with this method is that these companies need to innovate constantly faster than the competitors [Blind et al., 2004; Innovation Policy Platform, 2013].

2.5.3 Complex design of products

Another informal protection mechanism utilises complex design in order to prevent competitors from imitating or using reverse engineering. With a more complex design, reverse engineering becomes even more difficult, because imitators would have to work

out the whole innovation process. By using this protection, imitation would take a lot of effort including a lot of time and resources [Innovation Policy Platform, 2013].

2.5.4 Other possible techniques

Other techniques are for example the lock-in effect or entry barriers. Lock-in effects emerge in specific situations: Through the creation of specific related standards and protocols, the client has an offer of related services. These standards are of value for the client, as he uses several of these services. Through this standardisation of processes the user learning time can be decreased and the interoperability of products can be simplified. However, it also locks the client in, as there is a great effort of users needed to switch to other systems. Entry barriers are another mechanism, these are for example professional qualifications and expert knowledge. This does not prevent others from imitating, but at least it can decrease the number of companies which are able to exploit this competitive advantage [Blind et al., 2004]

CHAPTER 3

The economic value of design

"*It's very easy to be different, but very difficult to be better*"

Jonathan Ive
Senior Vice President of
Industrial Design, Apple Inc.

Several studies ([Verganti and Dell'Era, 2010; Ashby and Johnson, 2010; Micheli et al., 2012]), show that today design can be seen as key factor in the innovation process. Several studies ([Hertenstein et al., 2005; Gemser and Leenders, 2001]) have even proposed design as possibility to establish a competitive advantage. Aesthetically pleasing designs can also lead to an emotional bonding between the customer and the product [Ashby and Johnson, 2010; Micheli et al., 2012]. Empirical studies have shown that design leads to a better financial performance, which can also explain the success of big firms with a concentration on design activities, e.g. Philips and Apple [Hertenstein et al., 2005; Gemser and Leenders, 2001].

In this chapter, definitions and boundaries of the term design are discussed in Section 3.1, in the next Section 3.2 design is described as innovation strategy, including the approaches design-driven innovations and design thinking. Further, the organisational link between innovation, design and IPR activities is outlined. Eventually, in the last Section 3.3, design is implemented in the NPD process.

3.1 Definition and boundaries of design

Although, there are many studies in this field and the attention of design in the innovation literature is growing, it is still unclear how to define the scope of design. There are several meanings of design as it touches several disciplines, e.g. industrial design, architecture, software design, product design, etc. [Hertenstein et al., 2013].

Verganti [2008] state that these various definitions can be clustered in three different areas: design as the 'form of thing' and appearance of a product, design as problem solver and design as 'making sense of things' [Verganti, 2008].

Design as the 'form of things' associates design with the shape of products. People associate design with the beauty of the product. Still this definition has little in common with innovation, they are sometimes even in contrast. For instance, does beauty conform to people's aesthetic standards, which they already have in their mind. But when it comes to radical innovations the design of these products are not conform to already established standards [Verganti, 2008].

The drivers for innovation can range from simple aesthetic appearance to a more problem-solving engineering-based approach. For instance, the former CEO of Apple, Steve Jobs, stated that "*Some people think design means how it looks. But of course, if you dig deeper, it's really how it works.*" [Wolf, 1996, p.1]. Thus, in the problem-solving sight design involves the definition of a problem, the identification and the establishment of several solutions and the selection of the most suitable one [D'Ippolito, 2014].

Neither of the two previous definitions can explain how design contributes to innovation and the established competitive advantage through design, thus, the last approach 'making sense of things' tries to explain this influence. The definition by Krippendorff [1989] is very popular, who states that "*The etymology of design goes back to the Latin de + signare and means making something, distinguishing it by a sign, giving it significance, designating its relation to other things, owners, users, or goods. Based on this original meaning, one could say: design is making sense (of things).*" [Krippendorff, 1989, p.1]. In this definition design aims to make things more meaningful. In this category also the emotional impact of an appealing product on customers is analysed. For instance, Verganti [2008] stated, that not only the utilitarian needs are important for the satisfaction of customers, also the symbolic and emotional meanings play a key role [Verganti, 2008].

In the context of these definitions, industrial design is outlined by Gemser and Leenders [2001, p.29], who define industrial design as "*..impact on a product's appearance, user friendliness, ease of manufacture, efficient use of materials, functional performance*". Which means, that industrial design is not only the creation of artefacts, it is a key input for the strategy of the firm. Design seeks to satisfy customers and the profitability of the company through the creation of the design, e.g. the form, the product environment etc. [D'Ippolito, 2014]. Since industrial design is generally known as a term for industrial design rights, only this definition is used in this thesis in order to avoid misinterpretations.

In conclusion, it can be stated, that the term design is a very broad one including several

different perspectives, starting from the form of the products, problem-solving activities, making sense of products and a key input to strategy [D'Ippolito, 2014]. These various divergent perspectives are, of course, challenging for the integration of design in the NPD process [Micheli et al., 2012].

3.2 Design as innovation strategy

In the following sections, approaches for implementing design as innovation strategies are proposed. In Figure 3.1, the drivers for innovation can be meaning and / or functionality. In this figure, both functionality and meaning can include either an incremental or radical change. The meaning of innovation can change radically or incrementally, depending on the new meaning of the product, if it is still in line with current socio-economic models or not [Verganti, 2008].

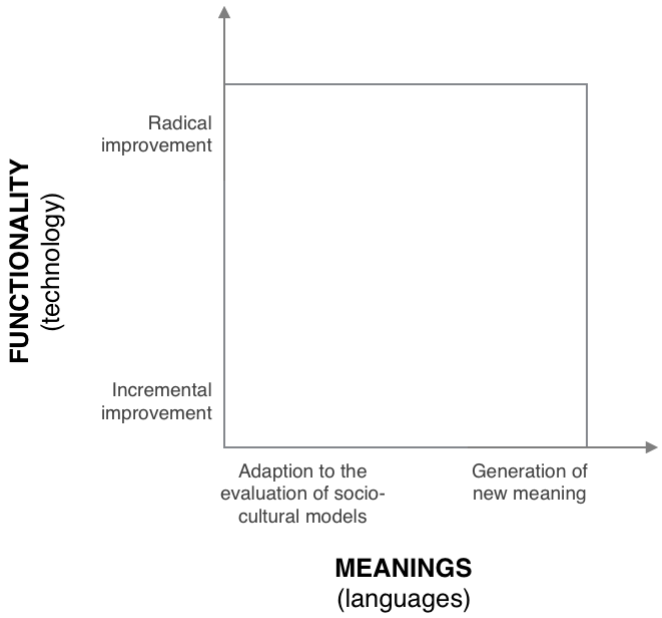


Figure 3.1: The dimensions of innovation [Verganti, 2008, p.12]

In this figure, the area of the right upper corner, which stands for radical change of functionality and meaning, is of major interest. In this dimension, the meaning is totally changed through the emergence of a new technology. For instance, Apple's iPod or the iTunes store revolutionised the way of listening to music. Although Apple was not the first in this category (in fact, the iPod was released four years after the first MP3 player) the company could succeed by changing the meaning of the product radically [Verganti, 2008].

Verganti [2008] states, there are two different approaches for innovating the meaning of things: 'UCD' and 'design-driven management'. These two strategies are explained

explicitly in the next two Sections 3.2.1 and 3.2.2. Another approach for implementing design as innovation strategy is outlined in Section 3.2.3: design thinking. Further, actors in the design process are discussed in Section 3.2.4. Finally, in Section 3.2.5, organisational aspects of the discussed approaches are shown.

3.2.1 User-Centered Design (UCD)

User-centered design was popular in the last decade as design consulting companies had major successes, e.g. Design Continuum [Lojacono and Zaccai, 2004]. This term was first used by Donald Normans' research laboratory in the 1980ies and got worldwide recognition as he published this term in his co-authored book [Abras et al., 2004].

This approach concentrates on user needs, thus, the product development process is based on the analysis of the users. This means, that the end-user influences how the design of a product takes shape. There are many different ways for carrying out a user-centered design process, but they all have one member (sooner or later) involved in the process: the user. Typically, a user analysis is done in the product cycle during the requirement and usability testing. Often, ethnographic research is used, which is the observation of users in the context of use. This process supports companies to get closer to the users and their actual needs [Rosenthal and Capper, 2006; Abras et al., 2004].

User-driven design is mainly useful for incremental changes, as it analyses the current user needs and requirements. Thus, the focus lies primarily on a better usability and not on a radical change of the meaning. Through the usage of the ethnographic methods, the companies try to find out what is missing between the imagination of people and the already existing products [Verganti, 2008].

3.2.2 Design-driven Innovations

In contrast to the previous approach, design-driven innovation aim to radically change the meaning of things. Further, this strategy explains the success of innovative companies in Italy, e.g. Kartell, Alessi, Artemide and further famous companies, e.g. Bang and Olufsen and Apple [Battistella et al., 2012].

This strategy does not start solely from user's needs or requirements. In fact, mostly customers do not help at all in order to achieve radical changes of product meanings. In that regard, Ernesto Gismondi, chairman of Artemide, states, "*Market! What market? We do not look at market needs. We make proposals to people.*" [Verganti, 2009, p.48]. Thus, it is pushed by the vision of companies about breakthrough designs and products, which could emerge in the future and the aim to change the world in a direction closer to the vision - the values and beliefs - of the entrepreneur. As this vision cannot be built only on current user needs, this approach has little in common with the user-centered strategy [Verganti, 2009; Utterback et al., 2006].

Design-driven innovation are also different to radical technologies, as the latter is leading to drastic changes in technology regimes, while design-driven innovations lead to changes

in socio-cultural regimes. It also has less in common with the pure beauty of products. In fact, design-driven innovations aim to set up new aesthetic standards, which will potentially be called beautiful in the future [Verganti, 2008].

Furthermore, it is highlighted, that open innovation and networks are building blocks for innovations driven by design. In this respect, it is important to exchange information with different actors including designers, suppliers, users and even other companies. The larger the network the better is the understanding of the actual socio-economic models. Subsequently, this know-how can help to imagine and establish new meanings [Battistella et al., 2012].

Design-driven innovations can be seen in contrast to technology push or market pull innovations in Figure 3.2 [Verganti, 2008].

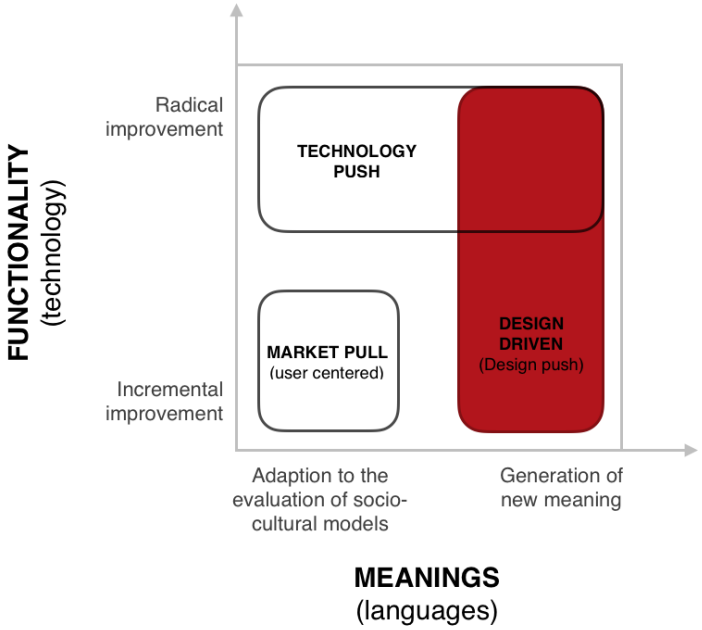


Figure 3.2: Design and innovation [Verganti, 2008, p.17]

The term technology push was originally created by Joseph Schumpeter. He defined technology push innovations as innovations, which are pushed through the R&D department. This approach has clearly one disadvantage, as it is unclear, if there actually exists a need for this sort of innovation [Martin, 1994; Coombs et al., 1987].

Verganti [2008] states there is an overlap between technology push and design-driven innovations. This can be seen in the upper right corner of Figure 3.2. In this area both technology push and design-driven innovations lead to a radical change of technology and meaning. Moreover, it can be stated, that radical changes of meaning are often the result of a radical technology shift [Verganti, 2008].

In contrast to technology push innovation, market pull innovations are developed in the R&D department in order to fulfil an observed current customer need. Hence, market pull innovation are incremental innovations which satisfy evolving needs of specialised users. Verganti [2008] also states, that user-centered innovations can be classified in this group of innovations. This is illustrated in the lower right corner in Figure 3.2 [Martin, 1994; Verganti, 2008].

3.2.3 Design Thinking

Design thinking is a further innovation technique. Several design companies have introduced this kind of approach successfully in their companies, e.g. IDEO and Frog Design, and it is also getting more and more popular at universities, e.g. at the Design School of Stanford and Potsdam [Grots and Pratschke, 2009].

Design thinking is a discipline which aims to use designer's characteristics and methods in order to match needs of people with technological feasibility. In addition to that, this business strategy addresses customers and market opportunities. Accordingly, design touches each department in this approach. In contrast to the traditional meaning of design, designers are no longer involved solely in the design process, they are even integrated into the whole innovation process including the invention of ideas, which should help to fulfil the desires of users better. As there is a shift from industrial manufacturing to knowledge and service delivery, also the field of innovation is expanding. The objectives no longer include only pure products, but also new designed processes and services [Brown, 2008].

The process is not a typical one with a predefined series of steps, in fact, it can be described as system of spaces. Each of these spaces include related activities and together they form the so-called 'continuum of innovation'. This process might seem chaotic to participants from more structured departments, but this impression changes throughout this process. In the course of development, the participants realise, that this process is actually intended and even results are achieved. Generally, such a process is divided in three different spaces: inspiration, ideation and implementation. Inspiration includes the motivation for the search or the problem to be solved. The next space is ideation, which aims to generate, develop and test ideas. These ideas should solve existing problems. Eventually, the implementation space concerns the way from the idea to the market [Brown, 2008].

Design thinking has (similar to the design-driven approach) also a focus on collaboration. The indispensable basis of each design thinking process is a team consisting of different disciplines, departments and hierarchical levels, which can include internal and external members as well. Hence, open innovation can be implemented to support this approach. Through the intermixing of the disciplines, the strengths of such teams are not only the multiplication of their respective content and methodological characteristics, but also the different perspectives and experiences that each member brings into this process [Grots and Pratschke, 2009].

Businesses start implementing design thinking in order to become more innovative, to better differentiate and to have a shorter time-to-market, as design thinking incorporates consumer insights in depth and rapid prototyping [Brown and Wyatt, 2010].

3.2.4 Actors in the design process

Actors in the design process have changed completely, as it is depicted in the following Figure 3.3. In the past few years, there is a lot of evidence that companies seek outside assistance. As explained in the previous sections, collaborations play a substantial role in the design-driven and design thinking approach. This is reached by design contracting in order to acquire know-how and possibilities they do not have on themselves. Another reason is the creation of competitive benefits by contracting out design [Grant, 2000].

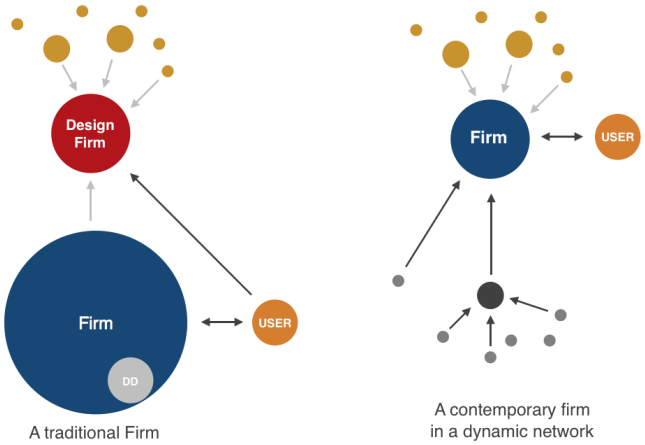


Figure 3.3: Changing relationship between principal firms and design consultancies (based on [Utterback et al., 2006, p.21])

There is a growing market for outside design activities. For instance, Original Design Manufacturer (ODM) are very successful in Asia. These companies design and develop their own products and sell them to Original Equipment Manufacturer (OEM). Interestingly, these ODM even held the intellectual property of designs and have the overall responsibility for the product design. Generally, the design process is changing from small partnerships to more organised and integrated collaborations. This can be seen in Figure 3.3: On the lefthand side, the traditional model is depicted with the design department (DD) as part of the company and knowledge exchange with a design firm [Feng and Lu, 2011; Utterback et al., 2006].

In addition to that Chesbrough [2006] mentions that companies tend to open processes in order to get useful knowledge of many different actors, e.g. customers, suppliers, consultants and universities. As the 'Open Innovation Paradigm' states, there are many useful ideas outside of the firm and the firm should get active in buying or selling IPRs [Chesbrough, 2006]. Contrarily, in the traditional 'Closed Innovation Paradigm', the

ideas need to be invented solely in the firm and IPRs are used in order to protect these ideas from competitors. This 'Open Innovation Paradigm' is illustrated as a clustered environment. In this case, the company exchanges knowledge directly with many different actors. More profitable companies are, of course, also taking the suppliers and the users into account. In this clustered environment both firms and design firms can profit from each other through this knowledge exchange. This increased networking is primarily based on the increasing popularity of open standards and open source development. Certainly, with many actors in the design process, also the question of shared or joint ownership for industrial design rights arises. Since joint ownership can lead to several problems, it is recommended to establish a joint ownership agreement in order to prevent these problems. Statistics about joint ownership are described in the following chapter in Section 4.1.5 [Utterback et al., 2006; European IPR Helpdesk, 2015; Chesbrough, 2006].

Verganti [2008] also states, that this dynamic environment is necessary for design-driven innovations. The basis of design-driven innovation includes a networked research process, which has its boundaries outside the company. It is a platform for the exchange of knowledge, e.g. about socio-cultural models, meanings and languages. In contrast to the user-centered approach, where only the user is in the focus, the design-driven approach actually aims to access and share knowledge with the design discourse [Verganti, 2008].

3.2.5 Organisational link between Design, Innovation and IPRs

The previous sections explained the two main design innovation strategies, in a further step, these strategies should be linked to innovation and IPRs. In the following, a framework is proposed for the organisational structure between the design process, innovation process and IPRs is illustrated in Figure 3.4.

In the first approach, the design process is linked to specific phases of the innovation process. Brown [2008] states, "*design has been treated as a downstream step in the development process [...] designers, who have played no earlier role in the substantive work of innovation, come along and put a beautiful wrapper around the idea*" [Brown, 2008, p.3]. Thus, there seems to be a link between innovation and design process in the final phases of the product development. Also, Verganti [2008] mentions that the classic definition of design declared it as "*design is a style [...] something to make products look better*" [Verganti, 2008, p.4]. In this respect, the IPR management is linked to the innovation process and the design process. The placeholder (PC) stands for other departments.

In newer approaches, design is not only a simple late-stage add-on: Both in design-driven innovation and design thinking it is a very powerful tool, which is linked to the whole innovation process. Therefore, in the middle figure, the innovation and the design process are nearly overlapping. This is based on Micheli et al. [2012], who state that in the design-driven approach "*design is positioned at the center of the innovation strategy*" [Micheli et al., 2012, p.30]. Thus, this overlapping part depicts design as the basis for innovation and vice versa.

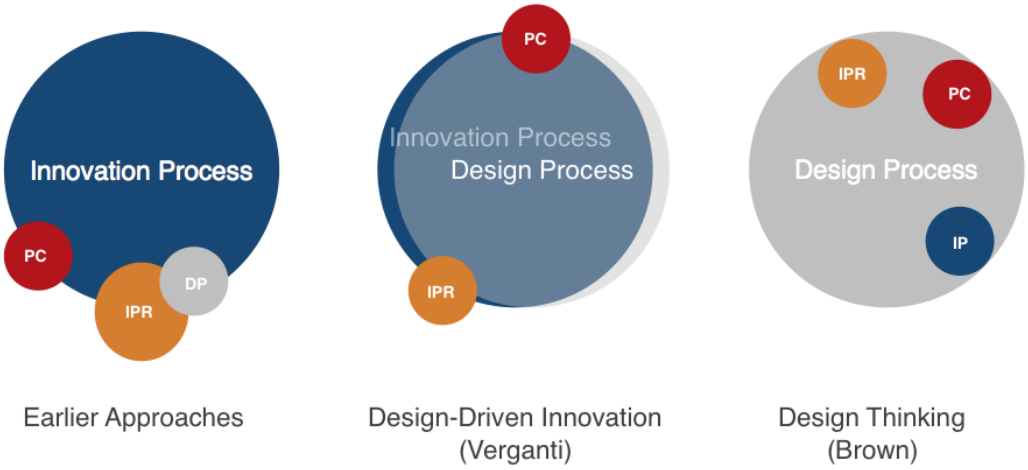


Figure 3.4: Different approaches for the organisational link between Design, Innovation and IPRs

In the case of design thinking, the figure on the righthand side is shown. In this approach design is the basis for everything. As Tim Brown states, "*The firm has moved strategically from designing products, to designing services, to currently designing entire customer experiences with design and services*" [Utterback et al., 2006, p.8]. Design thinking is used in all processes in order to innovate, thus, the innovation process (IP), the IPR management and all other firm-intern processes are a subset of the overall design process.

3.3 Integrating design and IPR management in the New Product Development (NPD) process

Previously, the various conflicting definitions of design were discussed (see Section 3.1), thus, it is challenging to integrate design activities in the NPD process. There are two different ways to reach this: Either design is the basis of the innovation strategy and is less tied to specific steps in the NPD process as it is the case of design-driven innovations or design can be adapted as part of the functional areas in the NPD process. When design is connected with other departments, e.g. R&D or marketing, it can also help to support innovations [Micheli et al., 2012].

Initially, the traditional NPD model along with new arrangements are proposed in Section 3.3.1. The stage gate system is discussed in Section 3.3.2, followed by the implementation of design and IPR management in the NPD process in the Sections 3.3.5 and 3.3.5.

3.3.1 New arrangements for Design in the NPD process

In this section new arrangements for designs in the NPD process are described. In Figure 3.5, the traditional approach for integrating design in the NPD process is illustrated. In that regard, design is a pure function embedded in the NPD process as part of a wider set of the production process [Utterback et al., 2006].

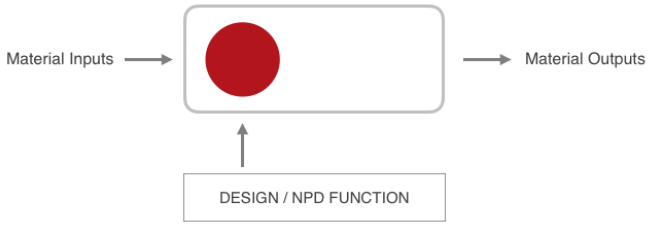


Figure 3.5: Traditional model of NPD embedded with manufacturing (based on [Utterback et al., 2006, p.76])

In contrast to this traditional model, there are several new approaches, depicted in Figure 3.6. In this figure, the first arrangement concerns design outsourcing, when companies decide to contract design consultants and outsource their design capabilities completely. In the second approach, the company decides to start a partnership with one or more design consultants. In this situation, the company still retains a significant design capability. The last alternative way is monitoring, which means that the company retains the capability to design but uses one or more consultants in order to monitor occurring trends [Utterback et al., 2006].

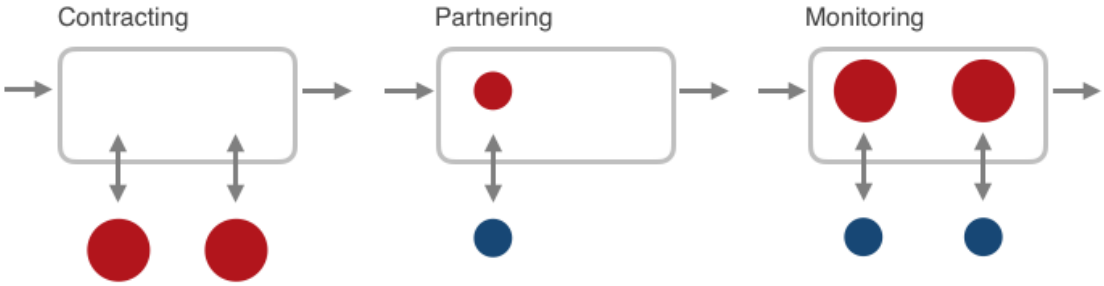


Figure 3.6: The range of new arrangements (based on [Utterback et al., 2006, p.76])

3.3.2 Stage gate model

The stage gate model, introduced by Cooper [1990], is a common tool used in the New Product Development process. This model shows the product development process as a process with several stages and gates. At each stage there is a quality check, which assures that the product fulfils all requirements in order to pass the next station or stage.

In the following Figure 3.7, this process is illustrated [Cooper, 1990].

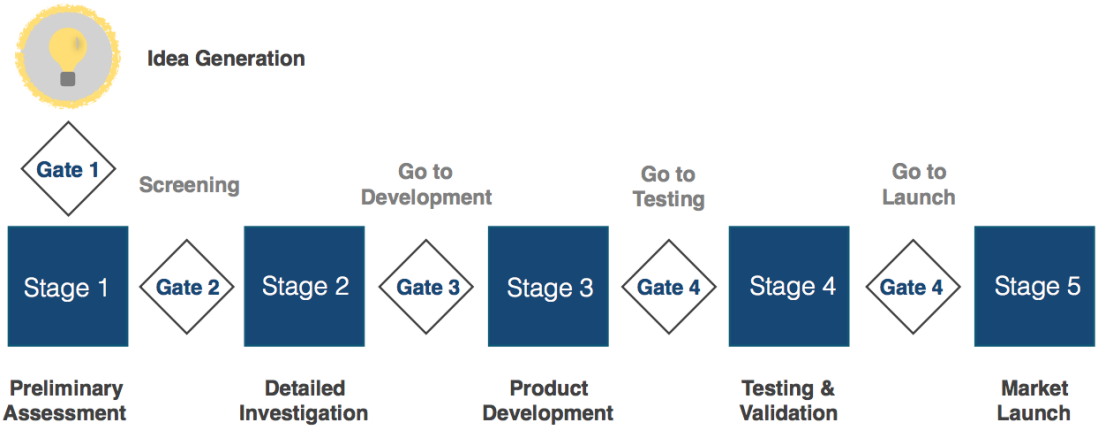


Figure 3.7: An overview of a stage gate system (based on [Cooper, 1990, p.46])

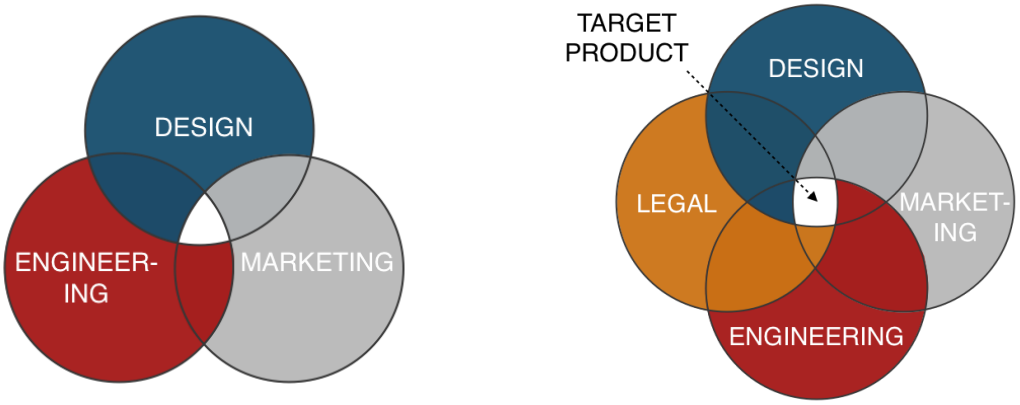
First of all, a typical product cycle includes the idea generation. Gate 1 is initiated by a fitting new product idea. In a next step, preliminary assessment is performed, which includes strategic alignment, project feasibility, market attractiveness, etc. A checklist and a scoring model is used in order to check the quality and start with the detailed analysis phase. In the detailed analysis, market research studies are executed about consumer needs and preferences, followed by a competitive and financial analysis [Cooper, 1990].

Afterwards, the actual product development is conducted, including marketing and operations plans. In the validation process, the entire viability of the project is tested, this includes the product itself, the production process and customer acceptance tests. Last but not least, the market launch and operations plan are prepared [Cooper, 1990].

Cross-functional teams are very common in NPD processes. Hence, in the course of development, people from different departments work together as products are planned, developed and launched. Usually, this team includes members from various disciplines, including marketing, design, manufacturing, finance, purchasing and quality management. This team is ordinarily disbanded as the project is completed and afterwards the participants are assigned to other projects. Typically, key representatives for design, engineering and marketing disciplines are part of these teams, this can be seen in Figure 3.8a. Designers concentrate on the product's appearance by considering ergonomics, feature integration and material selection. Engineers contribute to the functional features, product platform, safety and, of course, the product costs. Marketing managers focus on promotional activities, branding, lifestyle image and the easiness of use [Kahn, 2012; Cagan and Vogel, 2002].

This integration of different disciplines has established a new NPD practice in the past

years, substituting the 'over-the-wall' approach. In this approach, the involved disciplines are independent from each other and the participants exchange only 'over-the-wall', when the product is handed over to the next department. Statistics about best performing business units show that almost 80 per cent of NPD teams are cross-functional nowadays, thus, these kinds of teams are embraced by a great majority of businesses [Kahn, 2012].



(a) Design, engineering and marketing integrated in cross-functional teams (based on [Cagan and Vogel, 2002, p.138])

(b) Integration of a legal discipline in order to evaluate target products (based on [Cohen, 2005, p.3])

Figure 3.8: Integration of IPR management in cross-functional teams

A newer approach, involves the integration of legal disciplines in the cross-functional departments. This is illustrated in Figure 3.8b. This includes the layering of legal criteria with those from other disciplines from the beginning of the NPD process. It is beneficial to include legal actions concerning IP issues early in the process in order to avoid problematic situations such as IPR infringement of others at the time of market launch [Cohen, 2005].

Although the integration of design and, in a further step, IPR management is very beneficial for the whole NPD process, there are still many barriers. In order to implement design successfully in the NPD processes, these cultural and process barriers should be understood at first. After the successful implementation of design, the integration of IPR management can be addressed.

3.3.3 Barriers in the NPD process

There are two kinds of barriers in an NPD process: First of all, there are cultural barriers between design and other departments, and secondly, there are process barriers in the introduction of design into NPD [Micheli et al., 2012].

Design is often seen as an own culture and often designers perceive that their creativity sets them apart to other colleagues in the New Product Development process. A quotation of Hartmut Esslinger, a longtime design partner of Apple and CEO of Frog Design, says

in this context "*Businesspeople are from Mars, and designers are from Venus*" [Lockwood, 2007, p.1]. The stereotypical manager (from Mars) should now learn something from the designer (from Venus). The former is good at controlling processes, structures, deadlines and numbers, while the creative designer does not keep much of a fixed routine and deadlines, and rather avoid numbers [Dirlewanger et al., 2016].

Moreover, it is argued, that designers even have different personalities, values und behaviours than managers. For example, the following characteristics are typical for designers: empathy, integrative thinking, optimism, experimentalism and collaboration. Of course, these cultural differences can lead to tensions between the different participants in the NPD process: Management and designers often have different meanings: Addressing the question, what makes a design actually a 'good' design. To some extent they also use different languages to communicate these concepts [Micheli et al., 2012; Brown, 2008].

The second barrier for the successful adaption of design is the process barrier: Through the creative non-linear process of designing, other departments are often confused about their approach as their process appears to be chaotic in comparison to their own structured process. In fact, each NPD includes many different functional areas with many different objectives. It is the responsibility of the management to find a fitting solution for each of the participants. In the context of design, this can be a bit challenging as the design process is not a linear one [Micheli et al., 2012; Lawson, 2006].

3.3.4 Implementation of Design in the stage gate model

In this section, the impact of design in each stage is explained along with occurring problems and misunderstandings.

In the discovery or idea generation phase, designers can participate by contributing their knowledge about current user needs, and their extraordinary way of thinking also helps to get totally different ideas. In this phase, managers can behave conflictingly, when they are playing down the role of design. In the next stage, preliminary assessment or scoping, designers can contribute in rating alternative designs and refining user needs while keeping the focus on creative solutions. At this stage, the main problems occur from the collaboration of the design department, engineering, manufacturing and marketing. In the detailed investigation, designers can contribute to the generation of cost estimates and establishing design specifications. Conflicts can occur, when other departments reject expensive design without recognising the economic value of design [Micheli et al., 2012].

In the testing and validation phase, designers can help with the generation of CAD models and other prototypes. Since in this phase many problems can arise due to time pressure, designers should behave defensive and insistent in order to promote design development. Also, sometimes in these final stages, designers do not get involved, which in turn can lead to problems as design could be changed drastically without informing the designers. Finally, in the market launch phase, the design department is typically totally excluded. In this stage, it is the fault of the marketing department, as they mostly

want to prepare the market launch on their own, even though designers can have useful input for the product presentation in brochures and exhibitions [Micheli et al., 2012].

Thus, in the overall NPD process, there are still many barriers, and if design is really one of the core businesses of a company, it should be implemented as company strategy, e.g. design thinking or design-driven innovation, in order to assure that all employees identify with design and the economic value of design.

3.3.5 Implementation of IPR management in the stage gate model

In this section the role of IPR management is explained for each stage in the stage gate model.

In the concept or preliminary assessment stage of a product cycle, IPR management can contribute by researching about prior solutions. This research allows the cross-functional teams to 'stand on the shoulders of giants' and to prevent 'reinvention of the wheel'. This is also one of the key targets of the established systems for patents, trademarks and industrial design rights: The promotion and support of innovations and further improvement of already established innovations. Furthermore, inventors should be encouraged to promptly reveal their inventions in order to make this knowledge available for improvements of others. Hence, with the input of other team members, IPR management develops a search strategy in order to find out about current state of the art products. This search is guided by the public classification systems of IPR platforms. Certainly, IPRs are also of great interest for the ideation and risk assessment. Hereby, IPRs help to find out about prospective infringement risks by competitors, e.g. blocking patents. Another advantage is identification of possible partners and merger targets [Cohen, 2005].

In the following phase, a feasibility study is carried out in the detailed investigation phase. In this stage, the feasibility of product concepts is considered from different perspectives (design, engineering and marketing). The IPR management tries to find out about the legal feasibility of the product concept. This is reached by the specification of IP risks and, in a further step, pursuing of IP protection. Identification of specific IP risks concerns the investigation of functional features being part of the product concepts. It is also important to investigate about registered designs. In that regard, ornamental features of the product concept are addressed. If these risks exist, the cross-functional team needs to establish alternative solutions with the help of the IPR management. Also, a 'design-around' approach can be used in order to modify a product concept in a way to prevent infringements of other IPRs. In this stage, the IP department can contribute as well. This includes the utilisation of available modes of IPRs (trademarks, industrial design rights and patents). For example, the exclusive right of registered designs can be also be used for protecting the brand identity. Of course, IPRs are not only registered for the preferred concepts, but also for potential alternatives, which may be preferred at a later stage. This action helps to create a better position in the competition and to establish a sustained commercial advantage [Cohen, 2005, 2004].

In the product development phase, a product concept, which satisfies all requirements of the different departments, is chosen for development. In this stage, a targeted search is conducted in order to identify the most relevant IPRs for the selected concept. Thus, this stage is similar to the previous ones, the only difference lies in the level of specialisation for the risk search. Furthermore, in this stage the IPR management also proposes avenues to the other disciplines (design, engineering and marketing) to reduce risks. The commercialisation phase can be started, when these risks are eliminated [Cohen, 2005].

In the last stage, commercialisation or market launch, the product is ready for launching activities. The main activities for IPR management are memorialising IP review and confirming IP protections. Memorialising IP reviews includes the memorialisation of reasons why the product is not infringing any IPRs. As preparation, a written opinion and a detailed legal analysis of the registered IPR and it's history need to be carried out. In this stage, a documentation of the 'good faith' for the product needs to be done, which helps to avoid accusations of 'bad faith' and wilful infringement. Also, the confirmation of IP protections must be guaranteed. Protection is also required in other countries, where the product is sold. In this stage, it should be assured that all steps for protecting trademarks, patents and industrial design rights are appropriate. Of course, with the launch of the product, the IPR management establishes procedures to monitor competitors [Cohen, 2005].

In summary, it can be stated, that there are obviously many advantages for integrating IPR management in the cross-functional teams. With the integration of the legal discipline, the risk of infringing IPRs of others can be reduced immensely. Thus, in the NPD process a product needs to pass not only the criteria of design, marketing and engineering, but also a legal muster before the market launch [Cohen, 2005].

3.4 Design in the value creation process

Design can also play an contribute in the economic value creation. In the context of economics, utility is defined as the capacity to satisfy the needs or preferences of consumers.

As it can be seen in Figure 3.9, the value, price and cost framework is illustrated. In this figure, the perceived utilities (B) can be divided in the economic value and the economic cost. The economic value consists of the consumer's (B-P) and the producers surplus (the economic profit P-C). In this context the consumer surplus is the difference between the maximum the consumer is willing to pay (monetary value of the perceived value B) and the price (P). The producer surplus (economic profit) is the difference between the market price (P) and the economic costs (C) [Hoopes et al., 2003].

Furthermore, design contributes to functional, social and emotional utilities. Design influences the functionality, the social appearance and the emotional bonding. These utilities are perceived as main sources for the value creation. The functional utility can be assigned to the problem-solving function of design. Social and emotional utilities can

be seen in the dimension of sense making. Thus, design is more an integrator of utilities than a simple add-on. In this regard, industrial design right is also problematic, as it sees design as the original meaning of a pure non-functional appearance of a product. This is in contrast to the new meaning of design as an integrator of utilities. Subsequently, it would make sense to take this strategic value of design into account for the legal concept of industrial design [D'Ippolito, 2014; Verganti, 2008; Nomen, 2014].

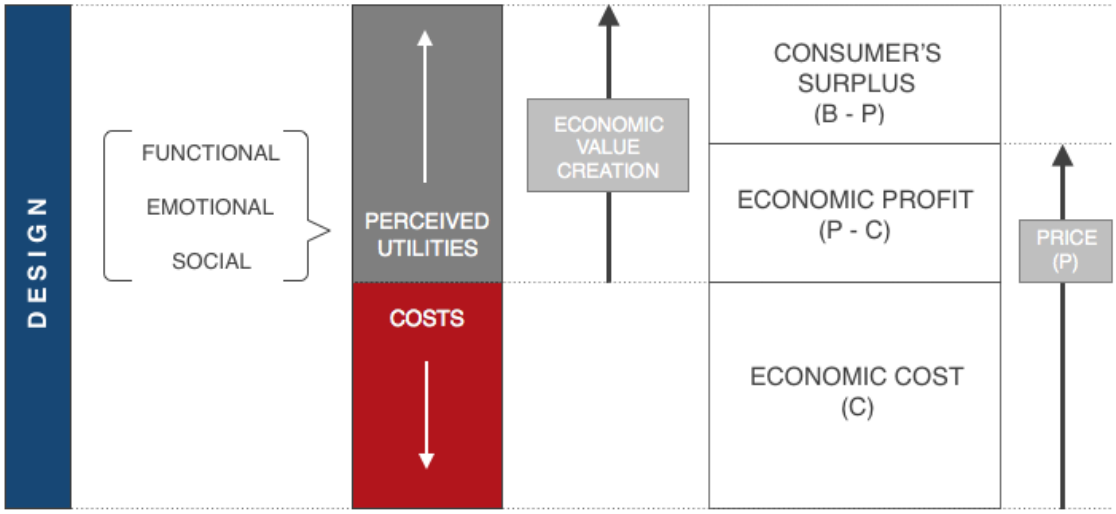


Figure 3.9: Design as integrator of utilities [Nomen, 2014, p.18]

CHAPTER 4

Descriptive Statistics

The analysis of this diploma thesis is divided in two different steps: Initially, the EU database, Eurostat, is used in order to identify current trends in the design registration behaviour in Section 4.1. Secondly, design-intensive industries in the European Union are determined in Section 4.2. Detected trends are used in order to set up the criteria catalogue for the qualitative analysis.

4.1 Registration behaviour statistics

4.1.1 Community design filings over the years 2003 - 2016 of EU or international applicants

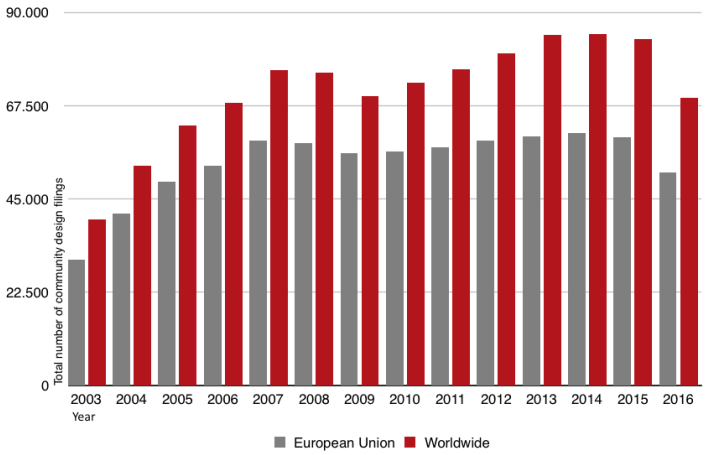


Figure 4.1: Total number of community design filings (2003 - 2016) (based on [Eurostat, 2016c, p.1])

In Figure 4.1, the total number of community design filings of European Union applicants and international applicants at the EUIPO is illustrated.

The community design number takes both registered community designs (RCDs) and unregistered community designs (UCDs) into account. Since this system got established in 2002-2003, the data starts in 2003. In this figure, both the total number of filings submitted by European Union and international applicants increased in the years 2003-2007. As the crisis occurred in 2008-2009 there was a slight decrease in the number of filings. In 2009, the number of filings started to increase again until 2014. In the European Union, Germany had the highest number of design filings in 2015, followed by Italy. Worldwide, the United States had the highest number of filings, followed by China and Japan [Eurostat, 2016d].

4.1.2 Community design filings over the years 2003 - 2016 of Austrian applicants

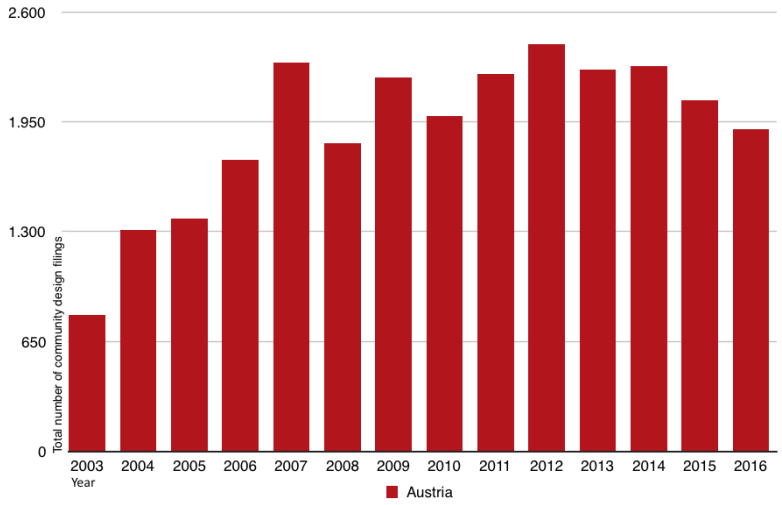


Figure 4.2: Total number of community design filings in Austria over time (2003 - 2016) (based on [Eurostat, 2016c, p.1])

In Austria, the number of design filings also increased continuously, as depicted in Figure 4.2. In 2008, when the economic crisis occurred, the number of design filings declined from 2300 in 2007 to 1823 in 2008. Then there was an increase again, until 2014, when the number started to decline again. Thus, it can be observed, that a similar trend happened as in the European Union. The reasons for the decline starting in 2014 are still not found. In addition to these statistics, the top ten locarno classes are of interest as this classes can help to set up the criteria catalogue.

4.1.3 Top ten locarno classes of the European Union

In the next Figure 4.3, the top ten locarno classes for the European Union are illustrated. The numbers are aggregated over the years 2003-2016. As iillustrated, the top three classes are: 'furnishing', 'articles of clothing and haberdashery' and 'packages and containers for the transport or handing of goods'. In the figure, the absolute share of Austria is also visualised to simplify comparisons.

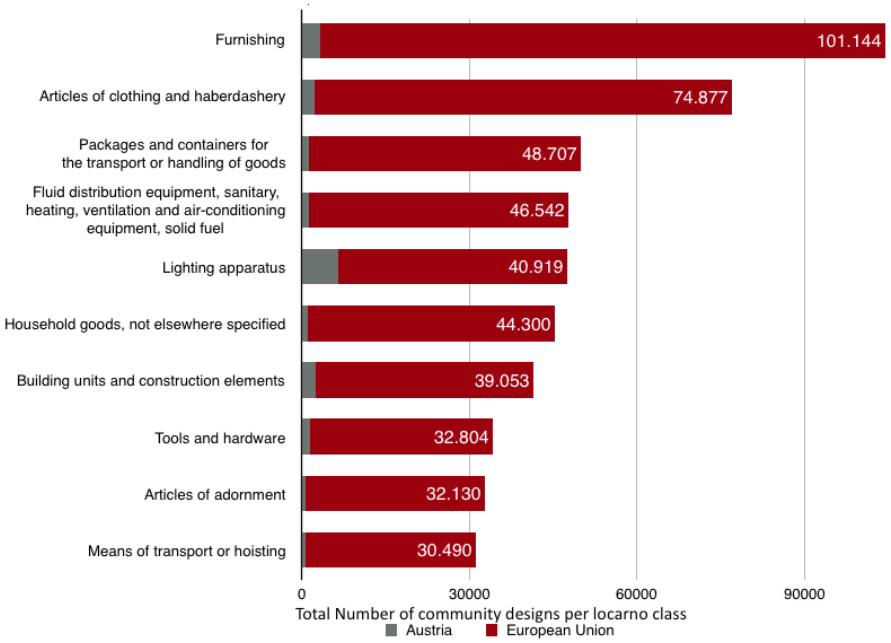


Figure 4.3: Community design by top ten locarno classes in Europe (aggregated over 2003 - 2016) (based on [Eurostat, 2016b, p.1])

In this context, Austria has remarkable filings in the locarno classes of 'lighting', e.g. in the year 2016 the total number for lighting apparatus were 3870 for the European Union and for Austria 615. This trend shows that the locarno class lighting is getting more and more important for Austria.

4.1.4 Top ten locarno classes of Austria

This behaviour can also be observed in the top ten locarno classes for Austria, visualised in Figure 4.4. The 'lighting' class has an aggregated total of 6561 over the years 2003-2016 and is by far the most popular locarno class. This trend can mainly be attributed to a specific family enterprise: Eglo Leuchten GmbH. This lighting specialised company has a total amount of 4980 RCDs. The second most popular locarno class is 'furnishing', followed by the class 'building units'. Of major interest are, especially, the high-tech companies, as they are often strongly innovative [Statistik Austria, 2012]. In this context, the 'tools and hardware', the 'recording, communication or information retrieval equipment' and

the 'games, toys and sports goods' are of interest and will be taken into account for the questionnaire.

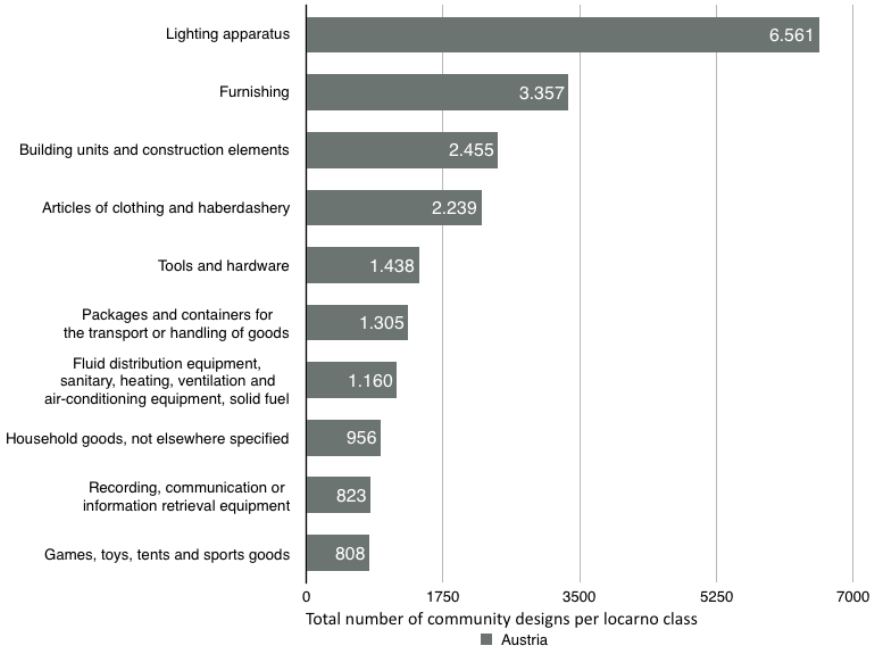


Figure 4.4: Community design by top ten locarno classes in Austria (aggregated over 2003 - 2016) (based on [Eurostat, 2016b, p.1])

4.1.5 Ownership structure for community designs

The ownership structure has also changed in the past years. In the Figure 4.5, the proportion of 'single ownership', 'EU CO-Ownership', 'Non EU-Ownership' and 'EU and not EU CO-Ownership' is illustrated for the years 2003 to 2016. 'CO-Ownership', or also-called joint ownership, is used in situations when two or more persons have proprietary shares of an asset, thus, they co-own a property.

As it is quite obvious in the figure, the 'single ownership' has by far the biggest proportion of the different ownership structures. Though the proportion of 'single ownership' decreased between 2003 to 2013, while the 'EU CO-Ownership' increased in this time period. This can be explained as well by theory, as it is stated in Section 3.2.4, that there is an increase of actors in the design process leading to more networking actors. Also, the 'Non EU-Ownership' increased in this time period, but in 2014 this trend stops sharply. From this moment on, the 'EU CO-Ownership' decreased strongly from 19 per cent in 2013 to 6 per cent in 2016. In-between, the 'Non EU-Ownership' decreased from 6 per cent to 4 per cent, while the single ownership reached the highest rate with 88 per cent in 2016.

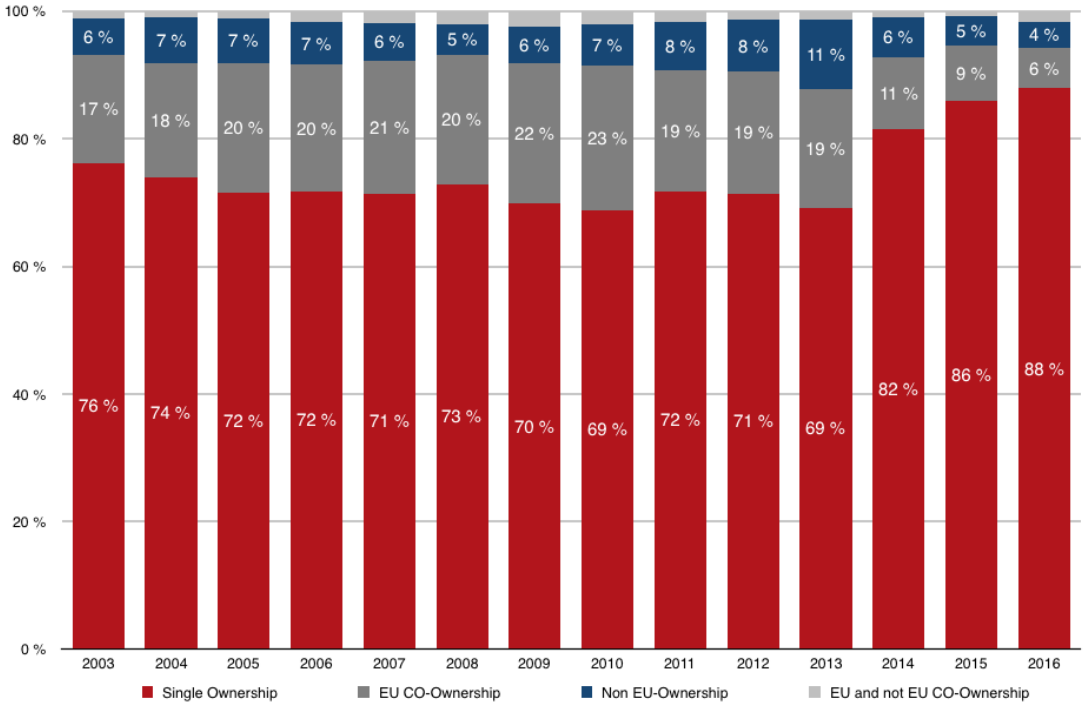


Figure 4.5: Ownership structure for community designs over time (2003 - 2016) (based on [Eurostat, 2016a, p.1])

4.2 Design-intensive industries

In this section, the design-intensive industries are determined in order to select firms as representations of these industries. In order to find out about design-intensive industries, the data from EUIPO about design filings had to be matched with the commercial ORBIS database, which includes industry classifications and other attributes of more than 20 million European companies. This data was filtered to the application years 2004 to 2008 and the absolute number for each NACE industry was aggregated [EPO and EUIPO, 2016].

In the Table 4.1, the top 20 design-intensiv industries can be seen, including the attributes: NACE code, NACE description and Designs / 1000 employees. The last attribute is used to rank the different NACE industries. If the average number of designs per 1000 employees in a specific industry exceeds the overall average of 1.61, this industry is marked as design-intensive. Thus, from 615 NACE classes, 470 industries are using design and 165 are marked as design-intensive [EPO and EUIPO, 2016].

In the table, the amount of manufacturing industries is remarkable, as 16 of 20 ranks are manufacturing industries. This is also quite obvious, since the top ten locarno classes for the European Union include the following: furnishing, clothing, symbols, packages,

transport, household goods and toys. These business segments can also be found in the ranking of design-intensive industries, e.g. 'manufacture of games and toys', 'sports goods', 'leather clothes' etc. Remarkable is also the second place in the ranking: These service companies concentrate on activities such as managing und licensing IP portfolios. The official definition by Eurostat addresses all involved activities for allowing others to use IPs. The main activities are leasing of IP products and receiving royalties or licensing fees [EPO and EUIPO, 2016].

NACE	Description	Designs / 1000 employees
26 . 52	Manufacture of watches and clocks	90.68
77 . 40	Leasing of IP and similar products, except copyrighted works	78.59
25 . 71	Manufacture of cutlery	70.23
23 . 41	Manufacture of ceramic household and ornamental articles	66.24
46 . 48	Wholesale of watches and jewellery	39.80
27 . 40	Manufacture of electric lighting equipment	39.18
28 . 24	Manufacture of power-driven hand tools	36.98
14 . 11	Manufacture of leather clothes	35.53
32 . 30	Manufacture of sports goods	30.79
27 . 51	Manufacture of electric domestic appliances	29.08
32 . 40	Manufacture of games and toys	26.25
28 . 14	Manufacture of other taps and valves	25.21
23 . 49	Manufacture of other ceramic products	24.36
32 . 99	Other Manufacture n.e.c.	23.70
32 . 42	Manufacture of ceramic sanitary fixtures	23.05
46 . 47	Wholesale of furniture, carpets and lighting equipment	22.17
30 . 99	Manufacture of other transport equipment n.e.c.	22.13
25 . 72	Manufacture of locks and hinges	21.57
46 . 42	Wholesale of clothing and footwear	19.66
17 . 22	Manufacture of household and sanitary goods and of toilet requisites	17.08

Table 4.1: TOP 20 design-intensive NACE industries (based on [EPO and EUIPO, 2016, p.138])

CHAPTER 5

Methodology

For the qualitative analysis, the insights of the theoretical basis are combined with the insights of the descriptive analysis. In addition to that, the NACE codes of the descriptive analysis are mapped with the NACE codes of the CIS 2012 in order to detect the most innovative NACE sectors. These overall insights are used to establish a criteria catalogue. For the firm selection top applicants for national, EU-wide and international design filings are presented in Section 5.1. Eventually, interview guidelines are set up in Section 5.2 and the qualitative analysis method is described in Section 5.3.

5.1 Selection of Austrian firms

5.1.1 Innovative and design-intensive NACE sectors

At first, the most innovative NACE sectors are determined by the CIS 2012 in Austria to assure the selection of innovative companies in the firm selection phase. This innovation survey is executed in all member states of the European Union by the national statistical offices. Furthermore, this harmonised survey is also the main datasource for measuring innovation and innovation activities for different sectors and regions in Europe. The CIS 2012 includes data observed in Austria in the years 2010 - 2012 [Statistik Austria, 2012].

In Table 5.1, NACE codes are illustrated along with the absolute number of enterprises and the percentage of innovation activities. The enterprises with higher percentages of innovation activities are highlighted, because these sectors will be taken into account for the selection of firms [Statistik Austria, 2012]. In the table, it can be seen, that the most innovative sectors are traditional manufacturers. The manufacturing sector (10 - 33) itself has an innovative percentage of 55.7. In the manufacturing sector, the NACE classes (26 - 27) 'computer, electronic and optical products'; and 'electrical equipment' are having by far the highest innovation percentage with 86.2. Followed by the NACE class (28) 'machinery and equipment n.e.c' with a percentage of 81.8. Further innovative NACE

classes are 'textiles, apparel, leather and related products' (13 - 15) with a percentage of 61.4 and 'rubber and plastics products, and other non-metallic mineral products' (22-23) with a percentage of 51.0.

NACE	Description	No of enterprises	Innovation activities in per cent
05 - 09	Mining and quarrying	114	21.9
10 - 33	**Manufacturing**	**6.551**	**55.7**
10 - 12	Food products; beverages; tobacco products	1.295	48.2
13 - 15	**Textiles, apparel leather and related products**	**233**	**61.4**
16 - 18	Wood and paper products, and printing	815	47.6
19 - 21	Coke and refined petroleum products; chemicals and chemical products; pharmaceutical products	178	64.6
22 - 23	**Rubber and plastics products, and other non-metallic mineral products**	**655**	**51.0**
24 - 25	Basic metals and fabricated metal products, except machinery and equipment	1.214	52.1
26 - 27	**Computer, electronic and optical products; electrical equipment**	**369**	**86.2**
28	**Machinery and equipment n.e.c.**	**622**	**81.8**
29 - 30	Transport equipment	143	58.0
31 - 33	Furniture, other manufacturing, and repair and installation of machinery and equipment	1.027	49.1
35	Electricity, gas, steam and air-conditioning supply	138	77.5
36 - 39	Water supply, sewerage, waste management and remediation	269	45.0
46 - 73	Services	9.379	53.8
46	Wholesale trade (except of motor vehicles and motorcycles)	3.400	57.5
49 - 53	Transportation and storage	2.369	35.8
58 - 63	Publishing, audiovisual and broadcasting activities	1.189	74.6
64 - 66	Financial and insurance activities	912	54.9
71 - 73	Architectural and engineering activities; technical testing and analysis; Scientific research and development	1.509	56.7

Table 5.1: Enterprises with innovation activities in the years 2010-2012 (based on [Statistik Austria, 2012, p.48]

In that regard, a comparison to design-intensive NACE sectors is of interest. In Table 5.2, the top three design-intensive NACE categories are depicted. As the percentages for manufacturing (10-33) and wholesale (46) are by far the most design-intensive sectors, there appears to be a positive correlation between the percentage of design activities and innovations. These insights into innovative and design-intensive sectors will also impact the selection of firms.

NACE	Description	Design Owner percentage
10 - 33	Manufacturing	**58.8**
46	Wholesale trade (except of motor vehicles and motorcycles)	**21.5**
69 - 75	Professional, scientific and technical activities	**5.7**

Table 5.2: Top three design-intensive NACE sectors (based on [EPO and EUIPO, 2016, p.38])

5.1.2 Top applicants on national, EU-wide or international level

In this section, the top applicants for national design filings (holder country AT), EU-wide filings (both for holder country AT and international) and international filings (with holder country AT) are presented.

5.1.2.1 Top applications for design filings on national level

In Table 5.3, the top ten applicants for 2015 with the holder country AT are illustrated. The four most interesting applicants are highlighted with grey colour, as they have their main business in innovative NACE sectors. Since Patterer Industries is also selling metal fences, the main business can be classified in the NACE sector 24 - 25 'basic metal and fabricated metal products' with an innovation percentage of 52.1. It is also of interest why this company registered a high number of design on the national level, but not on EU-wide or on international level.

Owner Name	Number of Filings
Christian Patterer Metallbau- und Handels GmbH	**32**
Esto Lighting GmbH	**22**
Melanie Hafner	21
Schröcker Tischlerei GmbH	20
Minerva Living Sculptures GmbH	**19**
Josef Gfrerer	18
Andreas Roesler-Schmidt MSc	**16**
Jerzy F. Kucharko	15
Herbert Baumgartner	13
Josef Resch	13
Susanne Spatt GmbH	12

Table 5.3: Top applicants for national filings with holder country AT (based on [Österreichisches Patentamt, 2015, p.40])

Further interesting companies are Minerva Living Sculpture and Andreas-Roesler Schmidt, who owns the company Flug Zeug. These two companies are both very small, but they are

both very innovative, for instance, the company Flug Zeug sells accessories (bags, belts and jewellery) made out of airline material. For this innovative aspect, these companies are also taken into account for the firm selection. Of course, also Esto Lighting GmbH is of major interest as its main business is in the most popular locarno class in Austria, lighting. Furthermore, with the usage of modern lighting technologies, it also accounts as company in the high-tech sector, as the main business is in the NACE sector 26 'manufacture of computer, electronic and optical products'.

5.1.2.2 Top Applicants for design filings on EU-wide level

In Table 5.4, the top applicants for RCD filings in 2015 are illustrated. This table is of relevance as Eglo Leuchten GmbH, an Austrian lighting company, has the the same order of magnitude for design filings as really famous companies like Apple, Nike, Prada and LG. In addition to that, Eglo Leuchten GmbH has also design filings on international level, but there are no national design filings. Subsequently, the question arises, why this company pursues this registration strategy. In the criteria catalogue there will be a focus on the technological degree of the companies. This company can be taken into account (next to Esto Lighting GmbH) as representatives for the high-technology segment.

Owner Name	**Number of Filings**
Rieker Schuh	990
Apple	682
Robert Bosch	677
Nike	619
LG	441
Eglo Leuchten GmbH	**420**
Stroili Oro	403
Decathlon	368
Prada	368
Gabor Shoes	366

Table 5.4: Top Applicants for EU-wide filings in 2015 (based on [EUIPO, 2015, p.12]

5.1.2.3 Top Applicants for design filings on EU-wide level with holder country Austria

In the following Table 5.5, the aggregated number of design filings per country with holder country AT over the years 2003 to 2016 is shown. The top applicant is EGLO Leuchten GmbH, which is obvious as this high number of design filings also explains the high proportion of design filings of Austria in the locarno class lighting (in comparison to the European Union - see Section 4.1.3).

Giesswein Walkwaren is also interesting, as this is a long living firm, founded in 1954, with a continuously high number of design filings since 2004. Legero Schuhwerk is both

EU-wide and on international level a major applicant. In that regard, it is interesting, that Legero Schuhwerk and Think Schuhwerk seem to be connected, as they are 100 % shareholder of each other. Silhouette International Schmied AG is also an example for a company having the main business field in the high-technology sector along with a high percentage of innovation activities.

Owner Name	Number of Filings
Eglo Leuchten GmbH	**4980**
Siro Beschläge- und Metallfabriken GmbH	682
Ada Möbelfabrik GmbH	586
Giesswein Walkwaren AG	**481**
Think Schuhwerk GmbH	**421**
Globo Handels GmbH	386
MK Illumination Handels GmbH	357
Kaindl Florring GmbH	259
Legero Schuhfabrik Gesellschaft MbH	**246**
Topic GmbH	242
Neuhofer	232
Julius Blum GmbH	229
Red Bull GmbH	201
Kaindl Marken GmbH	193
FM Marketing GmbH	180
Eisl Santiär GmbH	179
Frey Wille GmbH und CO.KG.	179
Zumtobel Lighting GmbH	178
Silhouette International Schmied AG	**169**
Hagleitner	162

Table 5.5: Top Applicants for RCDs with holder country AT (aggregated over the years 2003 to 2016 - based on [EUIPO, 2017, p.35])

5.1.2.4 Top Applications for design registration on international level

On international level, Legero Schuhwerk is one of the top applicants next to successful companies like Samsung, Swatch and Volkswagen. This is depicted in the next Table 5.6. The data is taken from the WIPO statistics database and is based on the number of designs in 2015 [World Intellectual Property Organization, 2016]. This trend is also remarkable, as the company appears in 2014, which can be observed in Figure 5.1, and starts to grow strongly until 2015. This company is also taken into account for further research as this registration behaviour needs explanation.

Owner Name	Number of Filings
Samsung Electronics (Korea)	1132
Swatch (Switzerland)	511
Fonkel Meubelmarketing (Netherlands)	438
Volkswagen (Germany)	418
Procter & Gamble (United States of America)	369
Thun (Italy)	183
Gillette (United States of America)	179
Thomas Sabo (Germany)	156
Legero Schuhwerk (Austria)	**153**
Cartier Creation Studio (Switzerland)	147

Table 5.6: Top Ten Hague applicants for design filings in 2016 (based on [World Intellectual Property Organization, 2016, p.15])

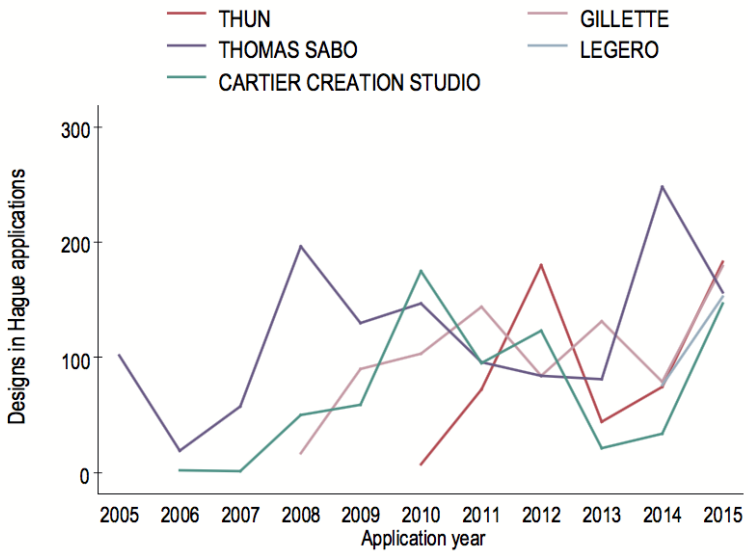


Figure 5.1: Trends in Top Ten Hague Applicants (based on [World Intellectual Property Organization, 2016, p.15])

5.1.2.5 Criteria catalogue for the selection of the companies

After identifying innovative and design-intensive NACE sectors, popular locarno classes and current trends on the different levels (national, EU-wide and international), the selection process for the companies can be started. The firms were consciously selected to maximise sample variance in terms of types of customers, technological intensity, market geography, firm age and proximity to design. Obviously, one of the most important

criteria is the recent flow of design registration. Hence, the selection of top applicants are of interest.

In summary, the used criteria for the selection process are listed in the following:

1. Recent flow of design registration
2. Application level (national, EU-wide, international)
3. High-tech and low-tech industries
4. Service and manufacturing firms
5. World leading company located in Austria
6. Field of customers (B2B vs. B2C)
7. Long living firms
8. Core business in top locarno classes
9. Core business in one of the potentially innovative NACE classes

Additionally to these criteria, only firms willing to participate in this master thesis could be interviewed. It also needs to be mentioned, that the outcome of this qualitative analysis is not representative for whole industries: It just gives insights and indicators for a further quantitative analysis.

Company Name	Main Business	NACE	Inno. Act.	Top Loc. Classes	Reg. Level	IPR
MAM / BAMED	Wholesale of clothing	46 . 42	57.5 %	24 . 04	AT, EU, WW	D, TM, P
Immoankauf.at	Other business support service activities	82 . 99	N/K	14 . 04	EU	D, TM
Frey Wille	Manufacture of jewellery	32 . 13	49,1 %	11 . 01	EU, WW	D, TM
Globo Lighting	Wholesale of other electrical equipment	46 . 47	57.5 %	26 . 04	AT, EU	D, TM
Legero	Manufacture of footwear	15 . 20	61.4 %	02 . 04	EU, WW	D, TM, P
Wienerberger	Manufacture of bricks	23 . 32	51.0 %	25 . 01	EU	D, TM, P
ZKW Group	Manufacture of electric lighting equipment	27 . 40	86.2 %	26 . 06	EU	D, TM, P
SKIDATA	Wholesale of other office machinery and equipment	46 . 66	57.5 %	20 . 01	EU	D, TM, P
Wallum	Other business support service activities	82.99	N/K.	03 . 01	EU	D, TM

Table 5.7: Selected companies according to criteria catalogue I

In the next two Tables 5.7 and 5.8, the final selected companies are represented. Additionally, key information is given according to the selection criteria catalogue. In this table, there are companies in NACE classes with a really high percentage of innovativ activities e.g. ZKW. Contrarily, the clothing class has a low percentage of innovative activities, e.g. MAM / Bamed. Furthermore, for each company the top locarno class is presented. Esto Lighting and ZKW are both representatives for the most popular locarno class in Austria: 'Lighting apparatus'. Of interest is also the locarno class 14.04, 'screen displays and icons', since Immoankauf.at is a service company.

Company Name	Top applicants AT	EU	WW	Man. /Serv.	World-leader	Long-living companies	B2B /B2C	Hightech industries
MAM / BAMED				M		✓	B2B / B2C	
Immoankauf.at				S			B2C	
Frey Wille		✓		M		✓	B2C	
Globo Lighting	✓			S / M		✓	B2B	✓
Legero		✓	✓	M	✓	✓	B2B / B2C	
Wienerberger				M	✓	✓	B2B	
ZKW Group				M		✓	B2B	✓
SKIDATA				M	✓		B2B	✓
Wallum				M			B2B / B2C	

Table 5.8: Selected companies according to criteria catalogue II

Other interesting key facts about the selected companies include information about the top ranks on the different levels (national, EU-wide, international), the competitive market, the customer segment and the companies' age.

5.2 Preparation for the interviews

Before the interviews can be conducted, the guidelines for the interviews need to be set up, this is described in the following Section 5.2.1. The way of conducting interviews is discussed in Section 5.2.2 and, finally, the structure of the guideline is explained in Section 5.2.3.

5.2.1 Set up of the guidelines for the interviews

In the set-up phase of the interview guidelines, first of all, the qualitative interview method needs to be selected. According to social research literature, there are three main types of interviews: structured interview, unstructured and semi-structured interview. Obviously, in structured interviews, on the one hand, a complete script is prepared and no room for improvisation is given. The questioning process is standardised and there are mainly closed questions. Semi-structured interviews, on the other hand, are less structured, there is only an interview guideline. This guideline primarily has open questions and

the interviewer can also ask emerging questions throughout the interview. That means, there are questions prepared beforehand, but improvisation is needed and also welcome. On the other side of the spectrum, is unstructured interviewing. In this approach, the interviewer has a clear plan concerning the goals and the primary focus of the interview. Therefore, there is no complete script and no structured interview. The disadvantage about structured interviews is that with closed questions mainly quantitative data is produced. This thesis aims to detect trends and information should be uncovered, thus, semi-structured interviews are more beneficial. The goal of a qualitative analysis is to uncover as much information as possible about the companies, their employees and their situations. Obviously, closed-ended questions are not beneficial for this requirement [May and Cantley, 2001; DiCicco-Bloom and Crabtree, 2006; Cohen and Crabtree, 2006].

The guideline also includes broader questions, followed by more focused questions for a more detailed explanation. In this respect, the usage of probes is very effective to encourage the interviewee, these are, for example, a pause, a gesture or a raised eye brow. Most of the companies do not have that much time, thus, the included questions in the interview guideline should not take longer than one and half hours. Last but not least, the interview should be practiced with a friend to assure that the questions are all clear [Jacob and Furgerson, 2012].

5.2.2 Conducting the interviews

At the beginning of the interview, each company is asked about the wished degree of anonymity. For transcription purposes, the interview needs to be recorded. There are several different possibilities to record interviews, e.g. written notes during or after the interview, audio recording or video recording. Social research literature suggests audio recording as the best procedure. Therefore, permission for the recording of interviews is sought [Rabionet, 2009; Ritchie et al., 2013].

The purpose of the interview is outlined in order to assure that the interviewer has understood the overall goal of the study. This includes research objectives, details of the selected research method, reasons for the research and explanations about the data analysis. Thus, the interaction with the participant is started with an introduction to the research topic. Afterwards, a summary of the topics is given in order to guide and prepare the interviewee for the following sections. The next step, includes general questions as warming up phase for the interview. If possible, complicated scientific terminology should be avoided during the interview. At the end of the interview, confidentiality should be reassured, permission for further contact in case of emerging questions should be sought and the interviewee should be thanked for taking part of this study [Ritchie et al., 2013].

5.2.3 Structure of the interview guideline

For the establishment of the interview guideline, the knowledge of the theoretical part of this thesis was taken into account along with some insights of the descriptive statistics. The questionnaire is divided in several parts: general information about the company, the

company strategy and innovation activities, importance of design and industrial design rights, and intellectual property in general.

The general part includes information about the interviewee, the size of the company, annual turnover and the ownership structure. These questions are asked as part of the warming up and introduction phase. A further focus is on the company strategy including information about the product (product lifecycle, best selling product, etc.) and the market situation (number of market participants, position of the company in the diffusion process of innovation, main sales markets, customer structure, etc.). The part about the company strategy and innovation activities addresses the corporate strategy, competitive strategy, the role of innovation, organisation of innovation, link of innovation process and design process, actors in the innovation and design process, and the source of innovation (product, process or marketing innovation; radical or incremental). The part about design includes questions concerning the importance of design, e.g. motives for design activities, internal or external activities, design in the NPD process, utilities of design, etc. The part about design rights concerns reasons and motives for design registrations, organisational processes for registering designs, level of registration, questions about the different design registration systems (EUIPO, WIPO), legal cases and prolonging design rights. The last part includes questions about registering IPRs in general, motives, implementation in the NPD process, link between innovative products and the registration of IPRs, influencing factors for the different application levels, relationship formal / informal protection strategies, and combined uses of IPRs. The final interview guideline is shown in the appendix (see Appendix 7.3).

5.3 Qualitative analysis of the interviews

The qualitative content analysis by Mayring [2014] is chosen for the systematic evaluation of the material. The method focuses not only on the content (as the name suggests), but also on the way of communication. The advantage of qualitative content analysis is that the material is evaluated qualitatively: This is performed, according to fixed, theory-based rules to satisfy the demands of scientific work for reproducibility and traceability. Traceability is ensured by means of a theory-based approach, which assures that the material is systematically analysed and evaluated [Mayring, 2014, 2008].

In the following, the general step-by-step model of qualitative content analysis is explained in Section 5.3.1, along with the Summarising Content Analysis in Section 5.3.2. The application of the step-by-step model on the source material of this master thesis is in Section 5.3.3.

5.3.1 A general step-by-step model of qualitative content analysis

In the following Figure 5.2, the general content model by Mayring is illustrated. At the beginning of this study, the material, which will be examined, needs to be selected with great care, since it should not be changed during the course of analysis. The material

should represent a representative sample of the population. In addition to that, an analysis of the situation of origin needs to be carried out. This includes the circumstances under which the material was created: This concerns informations about the author and other involved parties, the targeted group, the socio-cultural, the emotional and cognitive background of the author. Afterwards, the form of the material needs to be described explicitly. Typically, content analysis requires written text as a basis. Mostly, interviews are recorded and need to be transcribed. This can be done via different transcription models, e.g. selective / comprehensive protocol, clean read or smooth verbatim read, pure verbatim read, etc. Even at this point, the material can be changed immensely depending on the choice of transcription method [Mayring, 2014, 2008].

After the description of the basic material, the next arising question concerns what exactly should be interpreted. The analysis cannot be carried out without specific questions or without further determination of direction of analysis. The interpretation can either concentrate on the content of the material, on the author of the material or on the recipients of the material. Further, the theoretical differentiation of sub-components of the problem is carried out. This means that the focus of analysis needs to be specified in advance and viewed under consideration of recent research. The aim of the research is to link the current research to the questions in order to provide a theoretical orientation of the interpretation. Furthermore, the research questions need to be divided into sub-questions and sub-issues [Mayring, 2008].

Additionally, the technique for the analysis / interpretation needs to be chosen. There are three different fundamental forms: summary, explication or structuring. In the summary analysis, the material is reduced to essential contents in order to get an abstracted and representative overview of the basic material. Contrarily, in the explication analysis, additional material is taken into account for unclear passages or sentences. This additional material can include information about the participating persons or the socio-economic background of the situation. In the structuring analysis, particular aspects of the material are filtered in order to give a cross-section view. In this analysis, criteria are set up in advance along with anchor examples (prototypical examples for specific situation). Moreover, coding rules are defined, which specify the selection of categories in case of doubt, e.g. if a statement can be assigned to several categories [Mayring, 2014, 2008].

Afterwards, the content analytical units need to be described. This includes the coding unit, the minimum portion of text, which can fall in one category, e.g. word, phrase, paraphrase, etc. The context unit determines the largest component for one category. The recording unit specifies the portion of text for the system of categories [Mayring, 2014, 2008].

Last but not least, the actual analysis is started using one or more of the previously mentioned interpretation techniques (summary, explication or structuring) and categories are established. This category system is re-checked and finally interpreted in the context of the main problem and issue [Mayring, 2014, 2008].

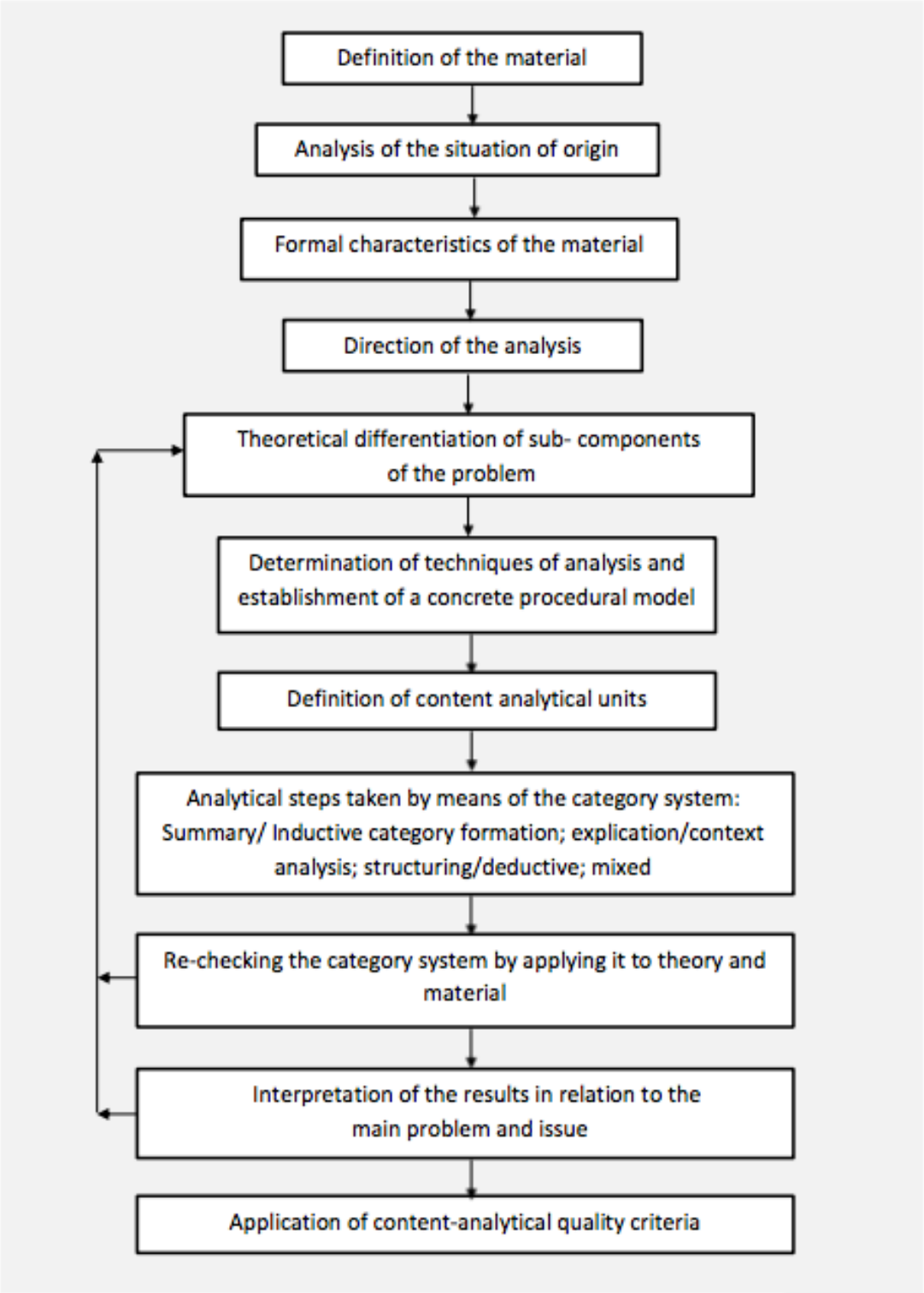


Figure 5.2: General content-analytical procedural model [Mayring, 2014, p.54]

5.3.2 Summarising Content Analysis by Mayring

In the following Figure 5.3, the summarising content approach is depicted. As already explained, the interpretation is done by abstracting the material step-by-step. In step 1, the material is described in the view of the questions and direction of the analysis. Furthermore, the units of analysis (the coding unit, the context unit and the recording unit) are described explicitly [Mayring, 2014, 2008].

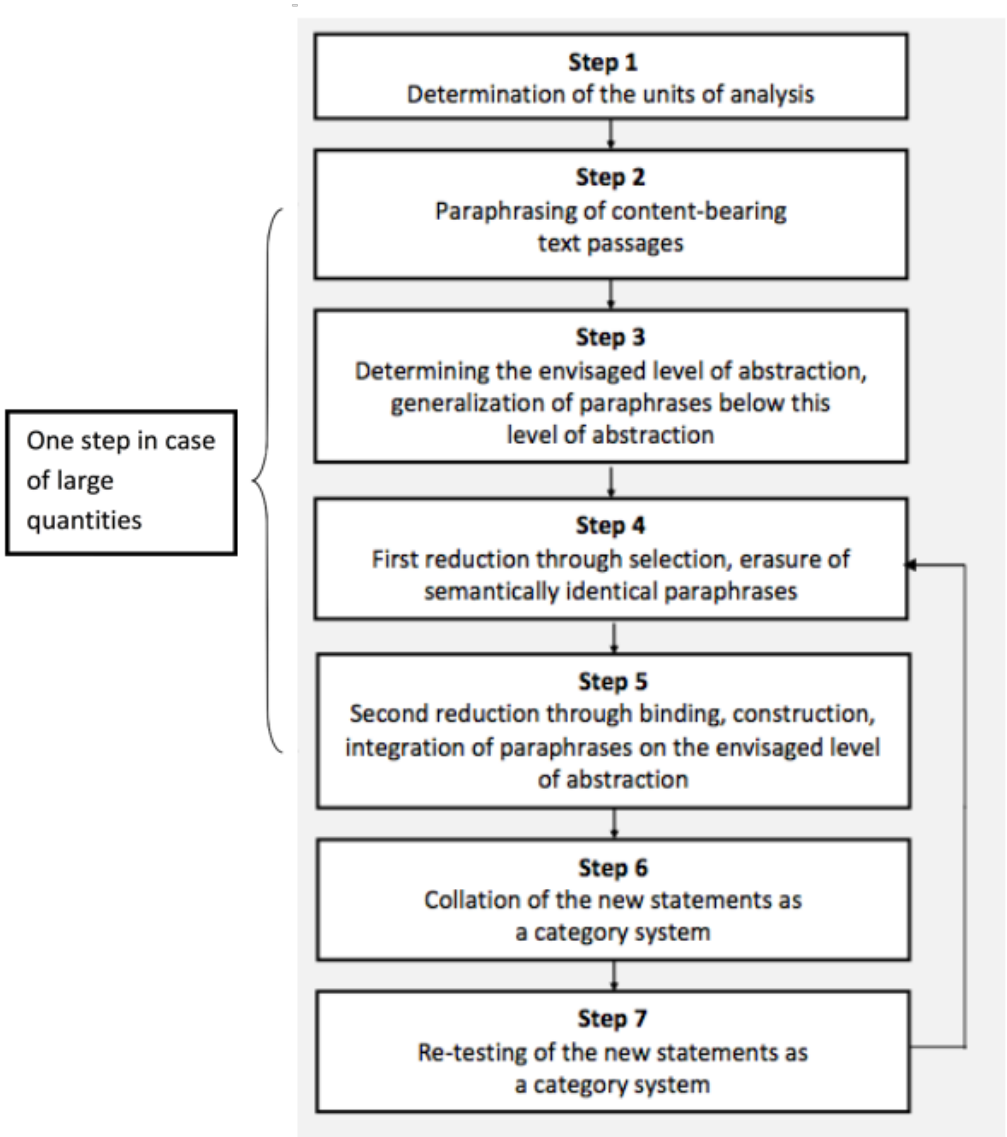


Figure 5.3: Step-by-step model of summarising content analysis [Mayring, 2014, p.66]

Afterwards, the actual paraphrasing is done, depending on the amount of data, there are

two different ways: If it is a manageable amount of material, phrases are written out and summarised in content-bearing paraphrases. In addition to that, the abstraction level of the first reduction is determined leading to generalisation of all phrases below this level. Phrases above this level can be left initially, while insignificant or vague phrases can be omitted. In the second reduction, paraphrases, which refer to one another, are summarised in single new statement. If the basic material is very large and complex, paraphrasing can be applied with the further reduction steps simultaneously. In this approach, the phrases are paraphrased to the intended abstraction level in the first run already. When a paraphrase is written out, checks are made to assure that there are no relations or duplicated paraphrases. If there are similar paraphrases, new paraphrases are set up summarising the related paraphrases [Mayring, 2014, 2008]. After this reduction phase, the final statements are taken as category system. At this point, the category system needs to be checked to ascertain whether it represents the basic material. With this step the first run of the summary is completed. Mostly, further summary runs are needed in order to raise the abstraction level and re-apply interpretation steps. This cyclical process should be repeated until the results correspond to the preferred abstraction level and the category system is very brief and general [Mayring, 2014, 2008].

5.3.3 Step-by-step qualitative content analysis of the conducted interviews

In the following the step-by-step qualitative content analysis is carried out on the conducted interviews.

1. Definition of the material
The material for the qualitative content analysis are the nine conducted interviews. The interviewees had an insight in the application process of IPRs and the innovations processes in the companies. In Figure 5.9, the list of interviewees is shown:

Cases	Company	Job Position	# of Participants
Case A	Mam Babyartikel / BAMED	Manager Regulatory Affairs & IP Leader of Innovation & Project Management	2
Case B	Immoankauf.at	Shareholder / Purchase Management Managing Director / Purchase and Sales Manager	2
Case C	Frey Wille	General Counsel	1
Case D	Globo Lighting	Director of Sales	1
Case E	Legero	Managing Dircector	1
Case F	Wienerberger	Head of Product Management Wall & House Solutions	1
Case G	ZKW Group	Group Director Intellectual Property Innovation Manager	2
Case H	SKIDATA	Director Hardware Development	1
Case I	Wallum	Chief Executive Officer (CEO)	1

Table 5.9: List of participants of the nine conducted interviews

2. Analysis of the situation of origin
The interviewees were contacted per email and asked to participate in this master thesis. Eight of these interviews were conducted in the headquarters of the firms directly. One interview had to be conducted via telephone due to the physical distance to the interviewee (Vorarlberg).

3. Formal characteristics of the material
The interviews were recorded with the permission of the interviewees and transcribed. As transcription technique the clean read or smooth verbatim transcript was selected. In this technique, the transcription is done word for word, but utterances such as uhm or ah are left out. Moreover, short cut articulations and dialect words are translated in standard language. Furthermore, special characters from the Gesprächsanalytisches Transkriptionssystem (GAT) system of transcription were used [Selting et al., 1998].

Symbol	**Meaning**
(-), (- -), (- - -)	Small, medium or long pause
[ ]	Overlaps and simultaneous responses
( )	Not understandable passages
?	Pitch rise
,	Lower pitch
((laughing))	non-verbal activities (e.g. laughing)

Table 5.10: Used rules for the transcription process (based on [Selting et al., 1998, p.31])

4. Direction of the analysis
In this analysis, the main focus is on the content itself, although the socio-economic background is also taken into account.

5. Theoretical differentiation of sub-components of the problem
The aim of this analysis is to portray the current state of knowledge about Austrian companies and their decisions to use and exploit industrial design rights in the face of different types of IPRs. Furthermore, it highlights how the usage of industrial design rights is related to innovation. Another aim is to find out about firm's strategies and influencing factors for the selection of the industrial design rights. Thus, the key questions which are addressed in this thesis are: What influences the strategic choice of industrial design as a form of intellectual property? How are the IPR process, design activities and the innovation process linked to each other? How do companies consciously shape their industrial design strategy in view of the different levels of intellectual property protection (national, EU-wide, international)?

Research is performed as theoretical background about the strategic management of IPR, about aesthetic innovations, about the integration of design and IPR management in the NPD process, about the actors in the design process. A descriptive statistic is conducted

about the top locarno classes and current trends in design registration behaviour on the national, EU-wide and international level. Eventually, design-intensive NACE sectors are determined along with the percentage of innovation in these sectors.

6. Determination of techniques of analysis and establishment of a concrete procedural model
The Summarising Content Analysis by Mayring [2014] is taken as technique of analysis as previously described. In addition to that, the procedural model by Mayring [2014] is used.

7. Definition of content analytical units
The coding unit is a phrase made by one of the different participants of the interviews. The context unit is the entire material.

8. Analytical steps taken by means of the category system
The qualitative analysis is done with the help of the qualitative analysis tool Maxqda. A screenshot of this software is presented in Figure 5.4 [VERBI, 2017].

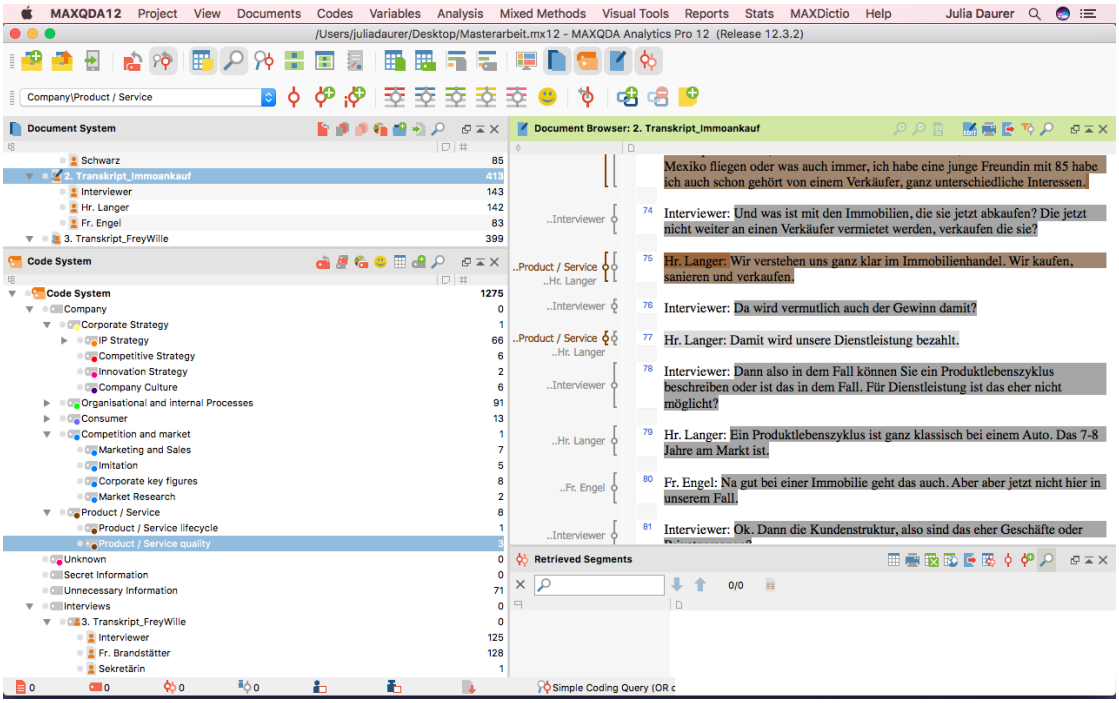


Figure 5.4: Screenshot of the qualitative analysis in Maxqda [VERBI, 2017].

9. Re-checking the category system
Last but not least, the set-up process of the category system with the re-checking cycles is visualised in Figure 5.5.

Figure 5.5: Category system after 10% (left) and final category system (right) [VERBI, 2017].

10. Interpretation of the results in relation to the main problem and issue
The interpretation of the results is shown in the following Chapter 6.

CHAPTER 6

Findings and Interpretation

6.1 Detailed analysis of the sample

In this section, a detailed analysis is carried out for each category per company. On top of that, each category it summarised overall and an overview is presented. Eventually, the research questions are discussed.

6.1.1 MAM Babyartikel GesmbH

a. General Information about the company

Product / Service
The main product of the company MAM is the pacifier through which the company became successful. With this product MAM is already the market leaders in many markets. The baby bottle is the second strongest product and the target is to grow even more in this market. Other products are teething rings, toys, breast pumps and other accessories. The product with the highest sales, the 'original pacifier', has been on the market for 30 years and is still very successful. This is a special characteristic of the market because there are no customers who buy the products over a longer period of time. That is the reason why a product can remain on the market for a very long time and still be perceived as innovative by customers.

Customer
On the consumer side, the market is primarily B2C, which means that in most countries there are central import companies, which are sales subsidiaries of MAM Babyartikel GmbH. There are also countries where the distribution is done by external companies, in this case, there is a B2B market. In general, the products are made for individuals, of course. The main customers are parents with children. Since the birth rate in Austria is

only between 1-2 children, parents are customers for these kinds of products for about three years. That explains why the products are new for parents, even if it has been on the market for years. An important marketing tool is 'word of mouth': The company focuses on quality and functionality, which should convince parents to recommend the product to other parents. The pressure to innovate is not as strong as in other markets, this is stated by the Leader of innovation '*But the pressure on innovation is a bit less than somewhere else because there is no new technology or similar*".

Market information, competitors and organisational structure
MAM is represented in approximately 60 different countries, with Austria accounting for 4-5 per cent of sales. The highest sales are generated in the USA, while other core markets include Europe and Brazil. Depending on the country, there are also geographical differences as knowledge about raising children is passed on from generation to generation. Accordingly, there are varying product assortments. However, due to economies-of-scale and scaling factors, a product is being offered in as many markets as possible. In this context, market research is carried out in the different countries in order to gain input locally. The company MAM has about 600 employees and consists of 15 interrelated companies. They sell approximately 60 million products per year; the share of the main product pacifier is 40 million. It has grown as a family business and is still in the hands of the founder. Departments such as R & D, Marketing and Brand Management are organised as distinct companies. There are separate sales offices in each of the main export markets. Approximately 97% of sales are generated abroad.

b. Corporate strategy & company culture

The elementary company strategy and the primary reason for the founding of MAM Babyartikel is to produce baby articles which meet both the requirements of medical functionality and aesthetics. Corporate culture is characterised above all by a strong innovation culture. Part of the spirit in the company is to try out new products, processes and even radical improvements. It is even wanted and strongly supported by the management to try out new things. Even if an idea is not successful, the lessons that the employees learn from this failed attempt are seen as a success. From the beginning of its founding, it has been important for the company to focus on innovation and design, which is one of its elementary values, as it is stated by the Leader of Innovation "*So this is really this long-term way of thinking and to really put emphasis on innovation and design, which is anchored in the company right from the start and is also still so and will surely remain so.*".

Competitive strategy
As a competitive strategy, the company MAM Babyartikel is primarily pursuing a differentiation strategy with the goal of being a premium supplier on the market. Through long product development cycles with field studies and quality assurance, the company wants to ensure that its products meet consumer needs better than others. The high

quality of the products can also ensure that the products remain on the market for many years.

Innovation strategy
The innovation strategy has a strong focus on product innovation with a share of 80% of innovations in the company. Still, process innovations are also important. For example, the company is constantly trying to improve internal organisational processes, such as the product development process. They are also trying to integrate new trends such as agile project management or digitalisation in the company. In addition, another focus is on radical innovations and the development of new business areas, which logically involve a higher risk, but generate a higher turnover in the long term.

Design strategy
Design is not only firmly anchored in the company culture and vision, it is also strongly associated with the company. Customers praise this European quality design even in comparison to other products on the market, for example from Asia. Trends are also being tracked through childcare article fairs. With the input of these fairs, colourings of the current fashion are transferred to their articles. The utility of design is primarily the focus on functionality, thus, the product should convince by quality, functionality and design.

c. Intellectual Property strategy

Design right strategy
The informal industrial design right strategy stipulates that all products which are innovative and presumably profitable are protected. For example, the original pacifier, which is still the most successful product today, has been protected for 20 years by repeatedly extended industrial design rights. One of the newer pacifiers, the perfect pacifier, which is expected to generate a large turnover, is protected by a whole bundle of protective rights, starting with design, patent, trademark, etc. Industrial design rights also have a strategic importance in the company; it is seen as a quality feature, which is even advertised on the packaging. The advertising effect is very important for the company, as the manager of IPR states, "*..And it [the company] is really innovative, so it [the company] was justifiable to register its own intellectual property rights.*", which means that the registration of industrial design rights shows others (competitors, customers) that the company is really innovative. Products, which are not considered as outstanding, or products where there are very similar ones already on the market, are not protected by industrial design rights. The primary reason for the registration of industrial design rights is, of course, to avoid imitation and to prevent the production of competing manufacturers. Costs do not play a substantial role in the registration of industrial design rights, because, on the one hand, the industrial design right is a very cheap IPR and, on the other hand, the company also wants to remain competitive.

General IPR strategy
There is no explicit IPR strategy, however, there are many IPRs in the field of technology and functionality. If a product is perceived as very innovative, attempts will be made to register both patents and industrial design rights, since highly innovative products are expected to generate high sales. This is underlined by the manager of IPR "*If there are many innovations in the product, both in process and in functionality. Then we have a protection on the product, on the process and on the [...] design.*". If after years it becomes obvious that the product is not that successful, the patent rights will be phased out. The company has protected 27 patents, 4 utility patents and 42 designs (summed up in all countries 212).

Level of registration
The industrial design right is, of course, registered on EU-wide level as this application is very cost-effective and simple. This also explains why no industrial design rights are registered on national level anymore. The registration of IPRs on international level takes place through another interrelated company (Bamed) and depends on several factors. Industrial design rights are primarily registered on the main sales markets. This is discussed in a meeting between the manager, the IPR department and sales. Primarily, it is registered in countries where production facilities of the main competitors are.

Informal protection strategy
Secrecy is used as an informal protection strategy. For example, process patents are not filed, because this type of protection reveals more than it protects. For this reason, some procedural patents are not filed and are kept secret instead. In general, however, most of the intellectual protection rights are applied whenever possible.

d. Operational structure

Innovation process
The innovation process is structured as a typical stage gate process with the following stages: idea generation, scoping, idea evaluation, business case, conceptual project, development project, realisation project and market launch. In the idea generation phase, a product roadmap is created based on the collected ideas. Idea generation is carried out internally via a platform called Idea-head. All of the employees can contribute in this phase. In the next phase, clustering and combining ideas, is carried out. If an idea seems mature enough, the product cycle continues to the project phase. In the following steps, a concept is drawn up, feasibility is checked, investment decisions are made, the prototype is tested, compliance tests are carried out and, last but not least, the serial production is started. The innovation process is managed by an interdisciplinary team consisting of product management (PM), product design and development (PDM), technical product management (TPM) and packaging (PKG). Subteam members are the IP department, compliance department and design offices.

Design process
The design process begins at the end of the concept phase with first scribbles. Then, an

order to external design offices is created. As the design process starts in the final steps of the product development process, when the functionality of the product is already settled, the company pursues the 'design follows function' approach. The Leader of Innovation states in this context, "*functionality [...] is the core of the product and then the design is added*". Actors of the design process consist of one industrial designer in the company and external cooperations. Most of the design activities are, however, carried out by external design offices and are assigned via a tender by the product management.

Intellectual Property Right process
After the functionality and design activities are completed, the IPR process begins. At this point, a work package called patent issues is launched, which includes IPR investigations to avoid infringing other rights and filing of IPR to protectable innovations. The main actor in this process is the internal IPR department, which is directly subordinated to the management. Registrations of the patent rights are carried out by an external law firm.

***E:** Imitation, legal dispute and collaboration strategies*

There has been almost no legal dispute over the intellectual property rights in the past 25 years. The company was warned by a competitor once, but an out-of-court agreement was reached. In general, the company is not afraid to run a process and sue competitors. For example, industrial design rights are also extended if similar designs are found by competitors in order to sue them afterwards.

6.1.2 Immoankauf.at

a. General Information about the company

Product / Service
This SME is active in real estate trading and offers the service to buy, renovate and sell real estate. The main focus of this business idea is the emotional side of the customer: Customers are offered a tailored real estate sale process and it is the aim to meet customer requirements to the best possible extent. In the course of the business activity of the last four years, a second service has established, which includes buying properties from customers and renting it back to customers for a limited period of time. Reasons for that are, among other things, when customers quickly need money or need more time. The company offers the best possible quality service by reviewing the purchase contracts and transactions of recent years in order to provide the customer with a fair and, above all, customer-compliant price.

Customer
Customers are private individuals, thus, it is clearly a B2C market. As many customers or heirs often combine positive or negative emotions with real estate, these customers

are willing to accept a lower price in return for a quick qualitative sales process of the property.

Market information, competitors and organisational structure
The main market for Immoankauf.at is primarily the Austrian region with a concentration on Vienna and surrounding areas, which is mainly due to the fact that this service requires a deep knowledge about legal requirements and these legal bases vary in different countries. Nevertheless, the company gets a lot of inquiries from Germany and also considers building a second position in Germany in the future. Competitors include WKI.at, Immomarie.at and Morgen-Immobilienankauf.at. Since the market is still very young, all these competitors have been established in recent years. Immoankauf.at is currently in a transition phase, as one of the former managing directors has left the company recently. That is also the reason why only three people are employed at the company at this moment. During the peak period 8 to 10 people were employed. One of the employees works from Tyrol and is responsible for the area of Tyrol and Vorarlberg. There are also plans to hire additional employees for the remaining area of Austria.

b. Corporate strategy & company culture

The corporate strategy of Immoankauf.at is to offer the service of real estate sale, whereby it should be ensured that a simple uncomplicated qualitative process is offered. In the future, the aim will be to offer the service of Immoankauf.at throughout Austria.

Competitive strategy
Immoankauf.at pursues a differentiation strategy through quality. They want to provide the customer a simple and fast real estate sale process. At the same time, priority should be given to reliability, which is why landmark excerpts and purchase contracts of the last 9 years will be taken at a first appointment.

Innovation strategy
As part of the innovation strategy Immoankauf.at is pursuing a trendsetter role. In recent years, Immoankauf invented this service to offer real estate sales and to acquire customers via an innovative website. Obviously, with the success of Immoankauf.at there has been an increase in the number of market participants. As a further strategy, Immoankauf.at wants to focus on branding and making the brand even more popular in Austria.

Design strategy
Immoankauf.at aims to demonstrate reliability: The design should help to reduce the bounce rate on the website and it should be perceived as very trendy and innovative. Primarily, the customer should visit the website and, immediately, feel comfortable. This means that the design awakens emotions in particular, because feelings are also associated with the sale of the property. For this reason, it was tested in the past with different colour combinations and it has been found out that some colour combinations affect people more than others. A relationship of trust can be established through this website and through the unique design. This is stated by the managing director, "*But that is*

really a trust relationship, that is started over the design, over the homepage and over the professionalism..".

c. Intellectual Property strategy

Designright strategy
Immoankauf.at has no concrete industrial design right strategy. In fact, the industrial design right was registered as a substitute for a trademark or a patent. The legal consultant found out about the possibility to register website surfaces as industrial design rights. That was the reason why an industrial design right was registered, as well as preventing direct imitation.

General IPR strategy
There is no general IPR strategy, only informal meetings with the legal consultants are held from time to time.

Level of registration
Immoankauf.at has registered industrial design rights only on EU-wide level. The reason for this is primarily the planned expansion to Germany. Trademarks are also registered on EU-wide level.

Informal protection strategy
The company Immoankauf.at does not use any informal protection strategies.

d. Operational structure

Innovation process
As Immoankauf.at is a service company, there is no specific innovation process.

Design process
Design of the website is discussed internally and implemented by a web designer externally.

IPR process
There is no explicit IPR process, but the company has a cooperation with a legal consultant externally.

***E:** Imitation, legal dispute and collaboration strategies*

Industrial design rights have already helped twice in legal disputes. In these cases, the competitors had to modify their websites. A further legal open case concerns a website in Germany, which is a one-to-one copy. In this situation, the charge is done with the help of the industrial design right.

6.1.3 Frey Wille

a. General Information about the company

Product / Service
The company Frey Wille mainly produces jewellery, this includes bracelets, rings, earrings, watches and pendants for chains. There are several collections, such as Hundertwasser or Monet. Since very much attention is paid to quality in the production, a product can last up to a lifetime. The material from which the products are made is enamel, which is very resistant.

Customer
Customers are first-class adults who want to buy high-quality jewellery. Since the sale is primarily via Frey Wille stores, there is a direct customer contact through these stores (B2C). Sometimes there are cooperations with jewellers who have customer contact. Then, the consumer market is B2B, but this is rather the exception. Regular customers make up a large proportion of customers and expect new collections or designs every few months as it is stated by the General Counsel about the importance and economic value of designs: "*..from this point, new designs are also very important to satisfy the existing regular customers and, ultimately, to generate revenues*".

Market information, competitors and organisational structure
Frey Wille is very well positioned in Europe, especially in France, Germany and obviously in Austria. There are very strong sales in Russia with 14 boutiques and in China. In general, the Asian area is very interesting in this respect. In the United States, the market has already been withdrawn because of cost reasons. Depending on tendencies new markets are opened or the company withdraws. Frey Wille is organised in such a way that the headquarter of the company is decentralised in Vienna. The company is active in 30 countries with nearly 90 boutiques worldwide. The parent company is in Vienna and all boutiques worldwide are regulated as subsidiaries, which take over the distribution in the respective countries. The company has approximately 115 employees. The company has emerged from a family business and the founder still owns 100% of the shares. There are not many competitors, as the products are produced with such a unique technique and with such a unique appearance, that there are no real direct competitors.

b. Corporate strategy & company culture

Part of the company culture in the company Frey Wille is the interest in art, as the general counsel notes that: "*I would say it [interest in art] is an essential part of the spirit within the company, so if you are not interested in art, then you do not fit in the company*". The company's strategy stipulates the production of beautiful, remarkable jewellery.

Competitive strategy
Frey Wille focuses on a differentiation strategy, especially with their unique way of manufacturing the products (processing of enamels), the unique appearance and quality of the products. On the enamel jewellery market, the company sees itself as a market leader. A further competitive advantage is the excellent customer service, for example, customers can also order individual jewellery with special requirements. This exclusivity combined with design and quality is the primary competitive strategy.

Innovation strategy
At Frey Wille, innovation is seen primarily in the design. With the design, the company is trying to keep up with the developments and, in particular, to address new and younger customers. If innovations are carried out on products, this occurs solely via incremental innovations. There is also no interest in carrying out radical innovations because the products are already very successful.

Design strategy
The designs should generate a recognition value for the customers. Since it is a luxury object, it should also be perceived as a prestige object. In addition, design is a key value for the company, and it is always questioned whether the ideology of an artist fits the company. It is also intended to attract the younger generation through fresher and younger motifs. Furthermore, the emotional component is also essential, as the jewellery is made especially for art lovers who can be moved by art.

c. Intellectual Property strategy

Industrial design right strategy
The industrial design right strategy stipulates that all products are protected by designs. Since industrial design rights are protected on international level, the total cost of industrial design rights is very high. Therefore, it is part of the strategy to let industrial design rights expire after five years. In case of a legal dispute, it serves along with the included priority date as proof for the copyright. Copyright is a right, which is very hard to prove, but with an already active industrial design right from previous times, it is easier to proof the copyright. As the IPR is stronger than the industrial design right (longer duration, no costs) it is a better protection against imitators. For each product, there are certain bundles of countries, which are protected.

General IPR strategy
In some countries, registered copyrights are applied as a substitute for industrial design rights. This is mostly done in countries with weak and expensive industrial design rights, for example China. Products are protected by complementary usage of IPRs, mostly, the combination industrial design right and brand. Moreover, the brand is printed on the product as additional protection.

Level of registration
Frey Wille registered industrial design rights both on EU-wide and on international level, including countries, e.g. USA and China. By registering designs also on international

level, the cost of these design registrations increases massively. Therefore, in some countries with weak industrial design rights, it is considered, whether it makes any sense to register industrial design rights. Industrial design rights are registered, mostly in countries, where a lot of imitation is practiced. Trademarks are also registered on international level, while patents are not registered at all.

Informal protection strategy
The method of production is kept secret by Frey Wille. There are even restrictions on the access to the production facility. The method of production needs to be kept secret, ultimately, because it portrays a key value of the company. Protecting with patents is also not advantegous, because then the company would have to disclose information about the production. The competitors try to imitate the products but since they do not know the exact method of production, the quality of their products does not reach the same level of quality as of Frey Wille.

d. Operational structure

Innovation process
At the beginning of the innovation process, design activity are carried out. In this step, sketches are created. Based on these sketches, the enamel production can be started. In addition to that, test runs are carried out with the prototype. Improvements are done until the final product is satisfying. As it can be seen, the entire production and manufacturing process is undertaken internally in the headquarter.

Design process
Design activities are conducted right in the beginning of the product development. The head of design and the managing director are involved in the selection process, which evaluates the most successful designs. Additionally, feedback of country managers gives input about local preferences. Moreover, cooperations with external artist are performed in order to gain inputs from outside.

IPR process
The registration of IPRs and IPR researches are done in the headquarter in Vienna. All sold products are protected by industrial design rights. This occurs, typically, after completion of the prototype phase.

E: *Imitation, legal dispute and collaboration strategies*

Imitations are common in the jewellery industry. There are many legal issues on international level, particularly in the Asian region, e.g. China and Russia. For instance, a strategy of imitators portrays the registration of industrial design right for foreign designs. If the originator has not yet registered the industrial design right in that specific country and he tries to import a product into this country, the products can be confiscated at the border. This already happened to Frey Wille, but fortunately the company had registered all their designs earlier, as the General Counsel states: "*..there*

are also quite outrageous ones, who register designs of our products in their own name as design registrations or copyrights in their country. And if they are faster, then they can take away our products..". In addition to industrial design rights registrations, screenings and automatic enforcements are also carried out online.

6.1.4 Legero

a. General Information about the company

Product / Service
In the company, there are three different brands, each of them pursuing different business strategies. Firstly, the children's shoe brand Superfit is the best-selling brand with 4.2 million pairs. Secondly, the brand Legero is in a niche segment, the comfortable casual ladies' shoe. Lastly, think shoes put a focus on sustainability in the whole production process. For the production of these shoes the qualitative usage of PU is preferred over the cost-efficient and commonly used argo technique. This specialised manufacturing technique ensures light soles and, above all, resistance. There is no standardised life cycle for all products. It is very dependent on the class, the shoe type, and eventually, the success on the market. Generally, there are short life cycles in the shoe markets as new collections appear at least every six months.

Customer
Legero has mainly a B2B consumer market, which consists of 4,000 retailers in Europe. In the past years, the sale of footwear is moving more and more into the internet. Legero wants to leave these market opportunities not only to Amazon, Zalando and Otto, therefore, it is planned to compete on these kinds of markets as well. Consequently, Legero recently opened its own online shop and in the future the focus on B2B is enhanced.

Market information, competitors and organisational structure
The children's shoe brand Superfit is still a fairly manageable market. There are about 10-12 relevant brands and the market share here is around 30%. In that regard, the German shoe manufacturer Ricosta, is one of the main competitors. Moreover, the Legero brand has a market share of 5-6%, which is also due to the large number of competitors in the market (thousands). The largest competitors may have about 15%. The company has a concentration on Europe as main sales market. Further, the company wants to grow outside of this market, among others, especially in Asia and Turkey. The product range varies greatly from country to country, since the customer needs are very diverse everywhere. For instance, in England due to the compulsory school uniform only simple black shoes are sold. The company Legero has 150 employees in the headquarter in Austria. There is a factory in Romania with about 440 employees and there is a logistics company in Hungary with 120 employees. The market with the strongest penetration is Austria, here the penetration rate is 90%.

b. Corporate strategy & company culture

The corporate strategy addresses the separation of the different brands (Legero, Superfit and Think shoes) and the development of independent business units.

Competitive strategy
Legero establishes a competitive advantage mainly by pursuing a differentiation strategy. Cost leadership would not be possible due to high design investments. Competitors, who rely on imitation as a core competency, are able to offer cheaper products. Whereas, Legero has a concentration on quality and a convincing design and, therefore, higher design investments than competitors. This focus on quality constitutes the reason why no sub brands or downgraded second brands in the low-cost area are established. Addressing the competitive market, Legero' s plan is to grow more in the home market (Austria and Germany) in order to become more attractive for surrounding countries.

Innovation strategy
Within the framework of the innovation strategy, the focus is primarily on product innovations with a share of 75%. Another focus is on incremental innovation, as the managing director notes on radical innovations: "*I believe radical innovations are perhaps missing in the shoe area, especially in the casual shoe area*". The traditional shoe has looked the same for many decades. Radical technologies come from the sportswear areas, e.g. Adidas or Nike. Incremental innovations assure a continuous stable development in sales figures, whereas, radical innovations potentially undermine older generations. Therefore, radical changes are better of in start-ups. However, these must be careful that their success is not just a one-hit wonder.

Design strategy
Legero wants to distinguish itself from other competitors by a uniform handwriting of their product range. Therefore, Legero tries to offer the same products in most of the countries (apart from small local differences). The managing director of the company portrays uniform design as kind of differentiation strategy: "*There is a creativity that cannot be found [...] in Asia, so we try to keep the European handwriting*". Another key aspect is the functionality: The customers should be convinced by the good quality, for instance waterproof and breathable shoes.

c. Intellectual Property strategy

Designright strategy
According to the industrial design rights strategy, Legero primarily registers shoes which are unique, which stand out from the competition and which have a significant difference to other products. Design rights are registered only in the main sales market of the products. Industrial design rights are only extended, if the products also have a longer period of stay in the market, e.g. soles.

General IPR strategy
There is no explicit IPR strategy and no standardised process. Still, it is discussed on a

high level of the company, mostly, by the managing director. Another focus is on the application of patents, whenever it is possible patents are registered in the production.

Level of registration
Legero portrays one of the top applicant for design protection via the Hague System. Design protections are registered mainly for the European Union. Trademarks and patents are also filed on international level.

Informal protection strategy
For Legero informal strategies are very important, especially, in cooperations with suppliers. In these situations, knowledge is protected by secrecy clauses.

d. Operational structure

Innovation process
The innovation process has a very short lifecycle, since collections have to be introduced every 6-month cycle. At the beginning of the innovation process, there is a meeting between the designers and the management. Brainstorming is carried out and projects are subsequently realised. In design teams, the ideas are further refined and a business case is created. In addition to that, a prototype is created and, eventually, the serial production is performed.

Design process
From the beginning onwards the design department is constantly integrated in the innovation process and receives input from the marketing department. Further input sources are external freelancers. All designs are reviewed by the chief designer in order to ensure the uniform handwriting.

IPR process
The IPR registration is performed in cooperation with an IPR specialist for the shoe industry. The protection of innovations is managed, at a high level of the hierarchy, by the CEO. All soles and the most unique shoes with the greatest market potential are protected. Research about IPRs are, of course, carried out before serial production.

E: *Imitation, legal dispute and collaboration strategies*

Imitation is very often carried out in the shoe industry. In that regard, the managing director states, "*The fundamental problem of our industry, the shoe industry, is that it is imitated impertinently or even slavishly copied*". Even wholesalers complain that all brands present similar shoes and it seems as if there is a lack of ideas. Legero's bestsellers are also being imitated and, it has been shown, that sales figures are going down by 20%, when a shoe is being imitated. Since these competitors are building their business model on imitation and are also significantly more price-aggressive, they can establish a competitive advantage through this strategy. The company tries to take legal action against this, but the imitators change only small details and the adapted design is no longer infringing the design right. Usually, in these cases a comparison is striven

for. Moreover, Legero is careful to not infringe designs of big players, e.g. Nike. These companies have strong legal department and are always looking for infringing designs of the competitors.

6.1.5 Wienerberger

a. General Information about the company

Product / Service
The main product of Wienerberger are ceramic building materials, for instance bricks, blocks and rood tiles. Brick houses are, of course, very long lasting, as they can easily get 100 years old. The average duration of products on the market is about ten years, mainly due to the fact that a product introduction also takes a very long time. This is underlined by the Head of Product Management Wall "*..in the innovation management, we have a period of 5 - 7 years, depending on the product category, during this period a product is regarded as innovative.*". The product line is constantly being adjusted and it is ensured to have at least 25-30 % innovative products. The ceramic building products accounts for almost 2 billion sales of a total of 3 billion Wienerberger AG sales.

Customer
The customer structure is very heterogeneous in the construction industry, that means Wienerberger sells to construction material distributers, construction material distributors to construction companies or house builders. Therefore, it is clearly a B2B business, whereby, the estate is, ultimately, sold to private individuals. Since a whole chain of actors is involved in a house construction, it is important to establish personal contact with everyone, from the planner, to the construction company, to the investor.

Market information, competitors and organisational structure
Wienerberger has its origin on the Austrian market, but the Austrian market is no longer that important in Wienerberger's total sales. Larger markets such as Germany, France and the UK are gaining in importance due to increasing sales potential. Wienerberger is the market leader in brick construction materials. Competitors are primarily local businesses in different countries, as there are only a few international competitors. There are four main business units in the Wienerberger AG, the first one is the traditional business unit bricks and roof tiles, the second is about plastic pipes, the third is about ceramic pipes and the fourth is about concrete (and ceramic) pavers. The Wienerberger AG is an Austrian stock company with 60 % holding of shareholders coming from the Anglo-American area.

b. Corporate strategy & company culture

In the strategy 2020, the focus lies on the following priorities: innovation (continuously improving and developing the products), market proximity (take the individual needs of customer groups, stakeholders and decision makers into account), digitalisation (digital

transformation in the company) and industrial potential (participate in market growth and generate more earnings).

Competitive strategy
Wienerberger is also pursuing a differentiation strategy on the competition market. However, quality is already a prerequisite of the customer, therefore the differentiation comes through the characteristics of the product. Further features concern, firstly, functional characteristics, such as heat protection and noise protection, safety, etc, and secondly, aesthetic characteristics. Therefore, the differentiation strategy is followed by the improvement of several different characteristics. Another focus of the competition strategy is the market penetration. The company has better sales structures and can therefore launch faster, more efficiently and more convincingly on the market.

Innovation strategy
The innovation strategy focuses more on incremental innovations. Incremental innovations are performed continuously on the production process, on technological features, on products and services. Radical innovations are less frequent (in a 10-year cycle), for instance, digitalisation is a very important issue at the moment. The number of product innovations outweighs the number of process innovations, since process innovations are the more investment-intensive. Another focus of the innovation strategy is the purchase of third-party innovations. If the company knows that start-ups, research institutes or competitors have created a good innovation, they try to buy it and integrate it in their portfolio.

Design strategy
Wienerberger, on the one hand, has a focus on the technical function or prestige function of design. Therefore, customers should feel comfortable and proud about their home. On the other hand, Wienerberger also wants to create flagship projects showing what they already accomplished. For Wienerberger, the optimal combination of aesthetics and functions convinces the customers to buy Wienerberger products.

c. Intellectual Property strategy

Designright strategy
Industrial design rights registrations are unusual in the building material industry. Products are more often protected by technical approvals. It does not necessarily depend on the innovativeness of the product. There are some really innovative products by Wienerberger, which are not protected at all. This is stated by the Head of Product Management Wall "*It may be that there this is an innovative product that is highly successful, which has no intellectual property right, except the trademark*".

General IPR strategy
In general, intellectual property rights are not important to Wienerberger. Wienerberger is more focused on the market penetration strategy. Nevertheless, there is a standardised process for registering IPRs in the company. This means that subsidiaries must inform

the headquarter about potential IPR applications. Eventually, the headquarter decides on which level the IPR shall be registered.

Level of registration
Wienerberger registers designs, patents and brands on international level. Registration in the different countries mainly depends on the relevance on the market and on the expected profit.

Informal protection strategy
Collaboration with research or testing institutes is based on non disclosure agreements. The moment collaborations with external actors are started, there is a risk of a publication. To avoid that the company protects the know-how via non disclosure agreements.

d. Operational structure

Innovation process
The product development process is similar to a stage gate process: Initially, a first evaluation is carried out, then, a project application is created and a project is released. Actors in this process are a cross-functional team consisting of engineering, production, etc.

Design process
Usually, the design or the idea of a product design is at the very beginning of the product development cycle. It occurs very rarely that designs emerge from a coincidence throughout the innovation process. 60% of the design activities are carried out internally and the rest is awarded externally via invitations to tender.

IPR process
In the company, there is an internal legal department, but Wienerberger is additionally supervised by external IPR consultants. In the beginning of the idea generation phase, IPR research is involved and infringing ideas are rejected immediately. There is an explicit registration process for IPRs.

E: *Imitation, legal dispute and collaboration strategies*

There have been some legal disputes with competitors. However, IPRs are not considered as a strong protection. Patent applications are not often done due to their long processing period.

6.1.6 Globo Lighting

a. General Information about the company

Product / Service
The main products of Globo Lighting are decorative lights for home, house and garden.

These are distributed through construction markets or furniture houses and are assembled by the customer himself. The product life may vary widely: There are products that have been on the market for 15-20 years. However, on average products are offered for 3 - 5 years. The share of innovative products is around 15-20%.

Customer
The sale is performed, primarily, via furniture distributers, construction markets, stationary lighting markets and increasingly via online trade. That means, Globo Lighting does not distribute directly to the end customer, but via intermediaries (B2B). These intermediaries are mainly won over a broad product range. Mostly, the contact is produced by well-known lighting trade fairs.

Market information, competitors and organisational structure
In Austria, the main competitors are Eglo, Esto and Globo Lighting in the decorative lighting industry. In each country, there are a few regional producers and a few external importers. On the market, the competition is beginning to get stronger and stronger due to a growing online trade and due to lighting activities also from other industries, such as the food retailer, Lidl. The largest sales market is Germany, where approximately 50% of sales are acquired. Overall, Europe accounts for 90% of the sales. Therefore, the protection of designs is mostly important on EU-wide level. The whole company has a total number of 250 employees, 160 are employed in Austria. Most of the sales offices are in Europe, but also in Russia und China. The company founder is still the main shareholder.

b. Corporate strategy & company culture

Globo Lighting is aiming to offer end users a decorative light coming with the combination of a good design, a reasonable quality and an attractive price. For the customers, it is important that both quality, a good price and a high delivery capacity are offered. Delivery capacity is necessary in order to prevent out-of-stock situations.

Competitive strategy
Cost leadership is definitely a strong issue for Globo Lighting. Initially, the company has started with the offering of promotional products, e.g. a typical supplier of promotional items, seasonal merchandise and sell-out campaigns. Over the years, a regular product range has developed consisting not only of promotional items. Still, the market expects an attractive product at a very attractive price.

Innovation strategy
The decorative lighting industry is certainly not an innovation leader, as radical innovations usually come from other sectors such as object lighting. This also depends on the low price of a decorative light compared to a front-light. Only when an innovation has proved itself on other markets, it is taken over by the decorative lighting industry. Obviously, mainly incremental innovations occur, such as a change in the colour, a new length of the light chain, a slight change in the technique. Radical innovations happen at most every few years. A further focus is on product innovations. In fact, the company

is trying to meet a proportion of 500-800 innovative products across the entire product range of 3500-4000 (15-20%).

Design strategy
For Globo, design is of primary importance because it portrays a unique selling point. The design needs to please a person. Further, an emotional bond should be established, which influences customers to buy the product.

c. Intellectual Property strategy

Designright strategy
There is no explicit strategy for the registration of industrial design rights. Whether an industrial design right is registered depends mainly on the expected profit of the product and on the duration on the market. If a product is only planned as one-shot marketing, clearly, no industrial design right are registered. Furthermore, the most successful products are often those without any protection. Industrial design rights can be a market entry barrier, so that, other wholesalers cannot import the product as well.

General IPR strategy
Apart from industrial design rights, only trademarks are protected. Patents are not registered at all because the production takes place externally.

Level of registration
The registration of IPRs mainly depends on information about products, competitors, market situation and customers. For instance, products need to be considered as innovative and unique to be registered. Industrial design rights and trademarks are registered on EU-wide level.

Informal protection strategy
Since the production does not happen internally in the company, no production method needs to to be protected by means of informal property rights. Concerning designs, an informal protection cannot be used since design will always be published. For instance, the informal protection technique, secrecy, is not used as stated by the Director of Sales "*Keeping a design secret does not make sense if I want to sell it.*".

d. Operational structure

Innovation process
There is no product development process, since 95% of the products are imported as already finished products. Only a really small percentage of products is assembled directly in the company. The imported products are also tested in long time tests by many different actors, starting from manufacturers to certification institutes. Sometimes products are given in contract manufacturing, then designs are created directly in the company and are the basis for the following production.

Design process
Globo has design capabilities internally, but input is given also by designers outside of the company. If products are given in contract manufacturing, design activities occur straight in the beginning. The technical implementation is derived from the design and the form.

IPR process
The decision of registering intellectual property right lies mainly on the management level. In general, there are two different IPR processes: Either the design is created internally, then immediately after the creation of the design, the registration of IPRs is done. The other option is that products are imported from Chinese companies. These are offered distribution activities for Europe, but the latter has to give the consent that the products are sold in Europe and industrial design rights are registered for the products.

E: *Imitation, legal dispute and collaboration strategies*

Initially, Globo is attempting to settle legal disputes out-of-court. Hereby, attempts are made to reach an agreement by licenses or claim payments. Some competitors insist on their rights, then relevant products have to be destroyed and it is judicially fought. However, this is rather the individual case and is avoided due to high procedural costs. This statement is underlined by the Director of Sales "*And that is why we try to avoid that and prefer to agree out-of-court because it involves such high amounts ..*".

6.1.7 ZKW Group

a. General Information about the company

Product / Service
The main product of ZKW is the niche market 'headlight of cars'. A headlight series is produced about three to four years for a particular car. Obviously, that means the production period depends on customer requirements. After this production period, the company is obliged to produce spare parts for 15 years. The average product lifecycle of a car headlight is 15 to 20 years, depending on the use of the customer.

Customer
Customers are primarily acquired through classical competition. This means that the customer, an OEM, writes an offer and ZKW tries to implement the best solution in order to win the bidding. The other approach is that, ZKW reaches out to car manufacturers with new developments and tries to convince them by showing them these new developments. Thus, the customer market is a classic B2B market.

Market information, competitors and organisational structure
The headlight business is located in a special niche. In this market, the company ZKW occupies the 6th or 7th rank worldwide. In general, the market is very manageable, there are only a few vendors. The competitors, which are larger than ZKW, also have further

core businesses, e.g. the combination of headlights and vehicle electronics. The main market is the selling of headlights to car companies in Europe. The company ZKW has a strong growth rate, as the company has grown from a number of employees from 250 in 1989 to 7500 nowadays. There is a German sole owner of the company. Revenue has also increased immensely since 2008 from 200 Mio. EUR to 965 Mio. EUR.

b. Corporate strategy & company culture

As a company strategy, ZKW wants to produce qualitative high-end headlights in order to stay a successful competitor in this market, to generate profits and to remain family-owned. Therefore, the invested capital in the company should be preserved and maintained.

Competitive strategy
In the case of ZKW, the focus is on niche and quality as a competition strategy, since the quality also has an impact on the price. That is why customers are mainly more expensive car brands such as Audi, Daimler and BMW.

Innovation strategy
ZKW is already trying to establish itself as an innovation pioneer, for instance the successful introduction of the BMW headlight. That is also the reason, why a major part of the budget is invested in innovation activities as they are crucial and even supported. There is a stronger focus on product innovations than on process innovations. Radical innovations portray only 10% of the overall innovation activities, the majority of changes are of incremental nature.

Design strategy
ZKW does not have an explicit design strategy, since no design activities are undertaken internally.

c. Intellectual Property strategy

Designright strategy
There is no explicit industrial design right strategy, since industrial design rights are registered by the OEMs. The OEMs also have their design capabilities internal and are responsible for the creation of the designs.

General IPR strategy
Patents are of great importance for ZKW, there is even a formulated process for the registration of IPRs. Since IPRs are a key asset in the company, the IPR strategy is kept secret and cannot be explained in detail here.

Level of registration
Industrial design rights are not registered by ZKW. There are patent applications on international level, although patent applications are sometimes stopped because of cost-related reasons. Primarily, attempts are being made to register patent applications in countries where the main sales markets are and where the strongest competitive pressure

is. In countries with a weak strength of IPRs, they are usually not registered because it does not pay off. Brands and designs are also not registered on the product because ZKW is in a B2B customer market and, therefore, the products are made directly for other companies. The company brand is, of course, registered on international level.

Informal protection strategy
Secrecy as an informal protection strategy also plays a very important role at ZKW. Clearly, ZKW is committed to secrecy regarding customer information (the car companies), since ZKW receives sensitive data, e.g. designs of new cars. Especially, protectable applications are protected by confidentiality clauses and it is not allowed to publish protectable applications or even try to register them.

d. Operational structure

Innovation process
At ZKW, the innovation process usually starts with ZKW participating in pre-development projects from the OEMs, in this step, all competitors can participate. At first, the designs are created by the OEMs. These designs are reported and ZKW tries to build headlights according to the design requirements. With the completion of the pre-development process, ZKW and the OEM try to agree about the price level. If the agreement is successful, the process continues in the serial production. Parallel to this contract activity, there is also an internal innovation department, which tries to generate new ideas and technologies. This innovation process is a typical stage gate process. In this resprect, designers are contracted externally, as the company has no design abilities internally. This innovation process is managed by cross-functional teams consisting of several departments.

Design process
The design is the basis for the product development process and is created by the internal design department of the customer. For this reason, it is not necessary to have an internal design department. Only if ZKW develops technologies and products internally, designers are contracted externally, however, this occurs very rarely. In these situation, design is included in the later steps of the product development cycle. In the case of external design activities, a contract stipulates that the design and, in addition to that, the industrial design rights belong ZKW. Hereby, the Group Director of Intellectual Property states that "*So, therefore, of course, if an industrial designer is included, then the contract defines that the design right belongs to me.*". This is common in the industry and also the way the OEMs handle industrial design rights in cooperations with ZKW.

IPR process
IPRs are of great importance for ZKW, that is why there is an internal legal department at ZKW. Still the registration is done by representatives at law firms. In the innovation process, the legal department is involved from the beginning and it is constantly ensured to not infringe other IPRs and, consequently, to register possible IPRs. Furthermore, the organisation of IPRs is hierarchically on a very high level, as the IPR process can

influence the whole company and subsidiaries.

E: *Imitation, legal dispute and collaboration strategies*

ZKW is trying to reach a consensus out-of-court. Generally, legal disputes concern patents, as only few industrial design rights are registered. Since there are only few competitors on the market, ZKW tries to keep a friendly relationship with their competitors. In addition, ZKW is trying to avoid massive costs in billions, which can arise from a patent dispute.

6.1.8 SKIDATA

a. General Information about the company

Product / Service
The product or the solution of SKIDATA is primarily an access system solution. There are three different product families: 'car access solutions', 'people-access solutions' and 'event and attraction solutions'. SKIDATA was founded with the core business of 'people-access solutions', primarily in the ski area. This business is still one of the core competencies of Skidata and a market leader position could be established. The hardware products are currently offered seven plus seven, which means they are distributed for seven years and are still supported on the market for another seven years.

Customer
SKIDATA has a clear B2B business as customers are car park operators, ski lift companies and airports. Currently, SKIDATA still has a focus on large companies, but it is the aim of the company to be even more popular even on markets with smaller companies. Customers are won mainly through trade fair appearances and tenders. The interrelated companies of SKIDATA have certain regional experience and they also participate in regionals tenders by the local cities.

Market information, competitors and organisational structure
SKIDATA is the market leader in their core sector, the ski access systems. The proportion of SKIDATA is 80%, the remaining 20% belong to a splitting-off of SKIDATA, accordingly, the competition is very strong. In the park access systems, SKIDATA also occupies the position of the market leader, but this is very difficult to determine as their competitors consist mainly of local competitors. A few years ago most of the sales were aggregated in the European area. Nowadays, SKIDATA expands internationally, especially, in the North American region. Worldwide, the company SKIDATA has 1350 employees, 300 are in the headquarter in Salzburg. SKIDATA is a so-called fabless company, which means there is no internal production. SKIDATA designs their solutions, their products and their software, and based on these information suppliers perform the production. SKIDATA belongs to the Kudelski Group in Switzerland. In general, the basic products are regulated

centrally by the headquarter, these products are passed on to the subsidiaries? companies in the different countries, which subsequently adopt local adaptations.

b. Corporate strategy & company culture

Depending on the different business units, SKIDATA has a range of different strategies: For the ski sector, SKIDATA wants to remain market leader, in the already saturated market. In event and parking, the market shares should be increased, as there is still a great growth potential. For the future, it is also planned that these three business units grow even more together and merge. For example, a skier should be able to access the ski lift and the parking lot in front of a skiing area with the same ticket.

Competitive strategy
SKIDATA pursues a differentiation and niche strategy, which is driven by several characteristics: quality, design, longevity and the variety of possibilities and adaptations that can be varied on the product.

Innovation strategy
SKIDATA relies primarily on incremental innovations, but also radical innovations are important. There is even a separate business unit, which was created only to try out radical innovations. At the moment, there is also still a large proportion of product innovations, but the trend is going to more process innovations.

Design strategy
For SKIDATA, design should communicate the unique product language and it serves as a sales argument. It is also a part of the company culture, since the employees identify themselves to SKIDATA over the design. For the customer, the primary focus is on functional importance.

c. Intellectual Property strategy

Designright strategy
SKIDATA registers design as part of the overall IPR strategy. Mostly, products are registered if they are outstanding and if the company sees it as competitive advantage. But in the overall strategy, patents are of a greater importance than industrial design rights.

General IPR strategy
There is a general IPR strategy by SKIDATA, which is formulated by the parent company. The parent company has a strategic focus on patent rights and, consequently, also a large IPR department with the main advantage of creating a strategic advantage through cross-licensing. Thus, the registration helps to improve the negotiation position in IPR disputes.

Level of registration
SKIDATA registers IPRs (patents, trademarks, designs) primarily in Europe and the

USA. Primary patents are registered where competitors have their production facilities. Mostly the registration depends on the number of competitors and the market situation. For instance, IPRs are registered more likely in countries, where an an open dispute with a competitor exists.

Informal protection strategy
SKIDATA works in collaboration with secret clauses. Thus, non-disclosure agreements are made with all collaborators. Basically, there are two ways to deal with knowledge: either one shouts it from the rooftops, publishes it, and protects it through IPRs; or one keeps it secret and does not tell anyone. However, if cross-licensing or other IPR strategies are followed, a certain degree of publicity is required.

d. Operational structure

Innovation process
In the innovation process, there is initially a concept development process. In this respect, necessary requirements for product development, such as hardware and software are formulated. Then the process is started with the creation and testing of a prototype. Eventually, a regular product development process is pursued. In this process step, the production is outsourced to partners who have the needed core competences. Therefore, Skidata is relying on a large network of actors, including research institutes, universities, etc. The cross-functional team, which manages the innovation process, can gain insights and inputs of many actors.

Design process
In the design process, attention is paid to a uniform design, usability and efficient product design. There are many actors in the design process, among others, the University of Salzburg. The company has also internal design capabilities and there are cooperations with other designers in order to receive external impulses. In addition, the topic Visual Product Language is being promoted in a working group. In the innovation process, design activities take place primarily at the beginning. The designers are not continuously part of the cross-functional team.

IPR process
Concerning the IPR process the director of Hardware Development mentions, that IPRs are sometimes the basis for innovations: "*Sometimes the patent idea is there and then a product is started [...] of course, then it is checked whether it is novel or not..*". In the company, explicit processes exist for the registration of IPRs, these are predefined by the parent company. Mostly, IPR registration is done in the prototyping phase. There is also a working group for IPRs, hereby, the focus lies on registration activities and not on researching activities. This can only be done, however, because SKIDATA is active in a niche where there are only a few market participants.

E: *Imitation, legal dispute and collaboration strategies*

Legal disputes concern primarily patent infringements. Design infringements are less frequent. However, SKIDATA is trying to solve legal disputes, in the first instance, out-of-court.

6.1.9 Wallum

a. General Information about the company

Product / Service
The product of Wallum is a credit card holder, which is available in different variations, including colours, vertical or horizontal position, RFID blocking, etc. The product is designed to last for at least five years.

Customer
60 - 70% of the sales are acquired by merchants in the B2B area. The rest of the sale is done via the own online website, directly to the end customer (B2C). It is also planned to strengthen both sales markets, with a focus on B2B through trade fair appearances.

Market information, competitors and organisational structure
The traditional market of wallets has a very large share of leather wallets and a very small share of card holders. As this market is still having a positive growth rate, the number of market participants is still increasing. The company has an online shop both for Europe and for America. Germany is the most successful market. Wallum has no internal production, in fact, the manufactured products are produced external. The managing director takes over all activities, e.g. marketing activities and sales activities.

b. Corporate strategy & company culture

The vision is to create a stylish looking credit card holder that is functional and easy to use, which has a long durability and carries the Made-In-Austria seal. Concerning the strategy, it is planned to expand sales and to drive the development of the product.

Competitive strategy
The company Wallum relies on differentiation, which should be achieved, above all, through quality and the Made-In-Austria seal. This quality is intended to push the product and to prevail over cheap products from Asia.

Innovation strategy
Wallum relies primarily on design innovations because the innovative strength lies primarily in design. The design should help to solve problems and simplify life, for instance, from the thick heavy wallet to a handy credit card holder. Primarily, there is a focus on incremental innovations with a share of 2/3. The last published product was radically altered and redesigned. Product innovations are another focus with a share of

3/4. On the market, Wallum has the role of a trend setter, as the market of credit card holders is still a quite new one, which has not established it yet.

Design strategy
For Wallum, the primary strategic importance is the recognition value. The design is intended to stand out, above all, by a unique design from the mass of products. A further meaning is the functionality, the customer should be offered a well-functioning beautiful product. Another aim is to establish a social meaning, thus the marketing is focused on marketing it as a lifestyle product.

c. Intellectual Property strategy

Designright strategy
Wallum registers industrial design rights, because of one main reason: one-to-one copies should be avoided. In this context, stated the company owner about the importance of industrial design rights: "*A design generates a recognition value and if you cannot protect a design, then the recognition value you have possibly created is lost*".

General IPR strategy
Wallum has no explicit IPR strategy, since everything is managed by the company owner himself.

Level of registration
Wallum registered industrial design rights on EU-wide level because it is cost-effective, fast and simple. Brands are also protected at international level. The application depends mainly on the number of competitors and the main sales markets. There are no patent applications.

Informal protection strategy
The company Wallum does not use any informal protection strategies.

d. Operational structure

Innovation process
In the innovation process, there is initially an idea-finding process with initial sketches. The next step, is the prototype creation, which also includes design activities. In that regard, the so-called 'design follows function' approach is used. In addition to that, the prototype is tested and improved over several feedback loops. If the final result of the prototype is satisfying the serial production starts.

Design process
The design process begins in the prototype phase, and product designs are planned in cooperation with a graphic designer.

IPR process
IPR registrations and research begins between the prototyping step and the serialisation, or at least it planned to start here. In reality, this deadline could not always be met.

Registrations are made by the owner himself, as the system on EU-wide level is very simple.

E: *Imitation, legal dispute and collaboration strategies*

At this point Wallum has had no legal dispute or any problems with imitation.

6.2 Overview of the cross-case analysis

In this section an overview of the cross-case analysis is given in Figure 6.1 and in Figure 6.2.

In these figures, it can be seen, that most companies in the sample have a B2C customer field. This can be explained, by the fact, that design activities are mainly carried out in low-tech industries. Concerning the category 'market and organisation', most of the companies are active on EU-wide or on international level. For the majority of the companies, the field of business is manufacturing, though there are also two service companies part of the sample, the wholesaler Globo Lighting and Immoankauf. For the competitive strategy, the companies mostly perform a differentiation strategy. Only one company, Globo Lighting, is pursuing a cost leadership strategy. For the majority of the participants, the innovation strategy has a focus on product and marketing innovations. In that regard, the high-tech companies have also a concentration on process innovations. Often incremental adaptions are carried out on the product, while radical adaptions are rather unusual.

Design activities are perceived as essential part in the company. The reasons for design activities are primarily the creation of a recognition value and an unique selling point. Furthermore, design is part of the branding strategy by the implementation of a unique product language. All the utilities of design (functional, social and emotional) are equally used by companies. Designs are protected, if a product is perceived as unique and innovative, if the expected revenue is high and if the duration on the market is long. Most of the companies protect over a complementary strategy including either the bundle trademark and design or trademark, design and patent. For the production method secrecy is used as informal protection strategy.

In the product development process, the cross-functional teams consists of the departments marketing and engineering. Occasionally, the legal department and the design department are also permanent members. Concerning the category 'imitation and legal dispute', companies have problems on crowded markets, especially, in countries with weak IPRs. If imitation is performed by competitors, out-of-court agreements are preferred and licenses are granted.

	MAM	Immoankauf.at	Frey Wille	Globo Lighting
Customer	▪ B2C ▪ same customers only for 3 yrs. ▪ word-of-mouth ▪ low pressure to innovate	▪ B2C ▪ + / - emotions combined with real estate	▪ B2C ▪ satisfy regular customers	▪ B2B
Market and Organisation	▪ EU-wide / international ▪ family business ▪ manufacturing	▪ Austria ▪ start-up ▪ establishment of new market ▪ service	▪ EU-wide / international ▪ family business ▪ manufacturing	▪ EU-wide/ international ▪ wholesaler ▪ service
Competitive Strategy	▪ differentiation through quality	▪ differentiation through quality	▪ differentiation through design & quality & exclusivity	▪ cost leadership
Innovation Strategy	▪ focus on product innovations ▪ process and marketing innovations ▪ incremental and radical both important	▪ focus on product innovations ▪ incremental innovations	▪ focus on product innovations and marketing innovations ▪ incremental innovations	▪ focus on product innovations and marketing innovations ▪ incremental innovations
Design Strategy	▪ anchored in company culture ▪ quality design ▪ functional utility in the foreground	▪ reduce bounce rate on website ▪ establishment of trust relationship ▪ emotional utility in the foreground	▪ recognition value ▪ prestige object ▪ social utility in the foreground	▪ unique selling point ▪ emotional utility in the foreground
Designright Strategy	▪ protect all designs ▪ prolong unique designs	▪ design as substitute for patent / trademark	▪ protect all designs ▪ proof for copyright	▪ protection depending on expected profit, innovativeness, duration on the market
General IPR Strategy	▪ design / trademark / patent	▪ design / trademark	▪ design / trademark / copyright	▪ design / trademark
Level of registration	▪ EU-wide/ Hague / international	▪ EU-wide	▪ EU-wide/ Hague / international	▪ EU-wide
Informal protection strategy	▪ secrecy about production method	▪ no informal strategies	▪ secrecy about production method	▪ no informal strategies
Innovation process	▪ engineering and marketing part of crossfunction team	▪ design, engineering and marketing part of crossfunction team	▪ engineering and marketing part of crossfunction team	▪ design, engineering and marketing part of crossfunction team
Design process	▪ design activies in prototype phase ▪ form-follows-function	▪ design activities in idea generation phase	▪ design activities in idea generation phase	▪ design activities in idea generation phase
IPR process	▪ IPR activies in prototype phase	▪ IPR activies after market launch	▪ IPR activies in prototype phase	▪ IPR activities in idea generation phase
Imitation and legal dispute	▪ no legal disputes	▪ few imitators	▪ many imitators ▪ legal disputes ▪ design right as proof	▪ many imitators ▪ licensing ▪ market entry barrier

Figure 6.1: Overview of the conducted interview I

	Legero	Wienerberger	ZKW	Skidata	Wallum
Customer	▪ B2B	▪ B2C	▪ B2B	▪ B2B	▪ B2C
Market and Organisation	▪ EU-wide / international ▪ manufacturing	▪ EU-wide / international ▪ world-wide leader ▪ manufacturing	▪ EU-wide ▪ manufacturing	▪ EU-wide / international ▪ world-wide leader ▪ fabless economy ▪ manufacturing / service	▪ EU-wide / international ▪ Start-Up ▪ manufacturing
Competitive Strategy	▪ differentiation through design & quality	▪ differentiation through design & quality, functionality ▪ market penetration	▪ Niche and differentiation through quality	▪ Niche and differentiation through quality, design, interrelated services	▪ Differentiation through quality and made-in-Austria seal
Innovation Strategy	▪ focus on product innovations and marketing innovations ▪ incremental innovations	▪ focus on process and product innovations ▪ incremental / radical both important	▪ focus on process and product innovations ▪ incremental / radical both important	▪ focus on product innovations and marketing innovations ▪ incremental / radical both important	▪ focus on product innovations and marketing innovations ▪ incremental innovations
Design Strategy	▪ uniform handwriting ▪ usability ▪ emotional and functional utility in the foreground	▪ prestige function ▪ aesthethic and functional utility in the foreground	▪ design activities externally ▪ no specific function	▪ unique product language ▪ part of the company culture ▪ functional utility in the foreground	▪ recognition value ▪ social and functional utility in the foreground
Designright Strategy	▪ protection depending on uniqueness, duration on market ▪ all soles are protected	▪ design protection very unusual ▪ protection depending on uniqueness	▪ designs registered by OEMs	▪ protection depending on uniqueness ▪ patent more important	▪ all products will be protected by designs
General IPR Strategy	▪ design / trademark / patent	▪ design / trademark / patents	▪ trademarks / patents	▪ design / trademark / patent	▪ design /rademark
Level of registration	▪ EU-wide/ top applicant Hague	▪ EU-wide/ Hague / International	▪ EU-wide	▪ EU-wide / Hague	▪ EU-wide
Informal protection strategy	▪ secrecy about production method ▪ secrecy clauses with supplies	▪ secrecy agreements with research institutes	▪ secrecy about production method ▪ confidentiality clauses about protectable applications	▪ non-disclosure agreements with all collaborateurs	▪ no informal strategies
Innovation process	▪ design, engineering and marketing part of crossfunction team	▪ engineering and marketing part of crossfunction team	▪ legal, engineering and marketing part of crossfunction team	▪ engineering and marketing part of crossfunction team	▪ engineering and marketing part of crossfunction team
Design process	▪ design activities in idea generation phase	▪ design activities in idea generation phase	▪ design activies in the prototype phase ▪ form-follows-function	▪ design activities in idea generation phase	▪ design activies in the prototype phase ▪ form-follows-function
IPR process	▪ IPR activies before market launch	IPR activities in idea generation phase	▪ continously IPR activities	▪ continously IPR activities	▪ IPR activies after market launch
Imitation and legal dispute	▪ many imitators ▪ lack of ideas ▪ strong competitors	▪ only few legal disputes	▪ few imitators	▪ few imitators ▪ licences / cross licencing	▪ no legal disputes

Figure 6.2: Overview of the conducted interview II

6.3 Comparison and analysis of the category system

In this section a detailed analysis of each category is carried out in order to detect trends and correlations between the different companies.

6.3.1 General information about the companies

Industry, market information and competitors
The descriptive analysis and the analysis of the companies has shown that industrial design rights are not that important in the service industry. The only exception are wholesalers, who import goods, e.g. Globo Lighting. Immoankauf.at is also a service company, but in this case the industrial design registration was primarily a substitute for another IPR. Thus, the most industrial design rights are registered in the traditional manufacturing industry, e.g. furniture or clothing. These are also the industries where design activities are of major importance. In the high-tech industry industrial design rights do not have such a strategic importance as patents, but they are also important and registered. Industrial design registrations are more likely in markets, where there are many competitors. If there is only a small number of competitors or the sales market is not important, design registrations are not as likely. Also for SMEs industrial design registrations are affordable (on EU-wide level), since the costs are not as high as for other IPRs, e.g. patents. Furthermore, the new established system is simple and easy for start-ups to register designs without having further legal competencies. Still in some industries the registrations of industrial design rights is not usual at all, this is the case in the building industry (e.g. Wienerberger), which is also an output of the descriptive statistics.

Customer
Customers are primarily B2C markets. On these kind of markets design registrations can have a branding value: Registrations can show customers and also other market participants how innovative a company is. In the case of MAM Babyartikel the company even printed their industrial design rights on the package. In collaboration with businesses industrial design rights are not that likely to be registered. The reason is, that the buyers market consist of businesses and there is no use of registering designs in these situations. In the case of ZKW there are nearly no industrial design registrations as the products are directly sold to OEM. In fact the rights for registering design lies with the OEM.

6.3.2 Corporate strategy & company culture

Competitive strategy
Companies with a differentiation strategy through quality are more likely to register design rights. This makes also sense when having a closer look at the situation of Legero: Legero relies primarily on differentiation through quality. Competitors of Legero are following a cost leadership strategy through imitation. Thus, they are imitating products with slight changes to avoid infringements of industrial design rights. This strategy is combined with lower costs for design activities and R&D and, therefore, with lower unit

costs. Legero would not be able to lower the cost as much as these competitors without building on imitating as business model.

Innovation strategy
Concerning the innovation strategy, most of the companies describe innovation as key value of the company, although in most cases there are no formulated innovation processes. Most of the low-tech manufacturing companies have a larger percentage of incremental innovations as radical innovations occur only rarely. Thus, it seems more likely that companies with a focus on incremental innovations register industrial design rights. Most of the companies also concentrated on product innovations rather than process innovations.

Design strategy
Design is very important for all of the companies, wether their main business is high-tech or low-tech. But the importance of design does not necessarily relate positively with internal design activities. In the case of MAM, design is described as one of the key values in the company and still design activities are contracted externally to design consultants. Thus, wether design activities occur internal or external, has no influence on the registrations of designs. Perhaps, the utility of design influences internal or external design activities. If the design utility lies more on the functional side design activities are included in the later steps of the product development cycle and external design activities are more likely. If the focus is on the emotional or social value of design, design activities are rather implemented in the beginning and it is more likely that design activities occur internally. There is a rather positive influence of design importance in the company on the application of industrial design rights.

6.3.3 Intellectual Property strategy

Designright strategy
Mostly, industrial design registrations are done, if a product is outstanding and if the expected profit is high. Still, there is not necessarily a relation between the most successful products and the registrations of designs. In most of the cases, the most successful products are those without any IPR protection. The registration of industrial design rights also depends on the life cycle of the product. If a product is sold only as one-shot marketing activity, no design registrations are registered. The industrial design right strategy can be also combined with other rights. For instance, the company Frey Wille only registers industrial design rights once as a proof for the copyright. The registration of industrial design rights can also raise market barriers for wholesalers, since the application of industrial design right for a specific product prevents other competitors to import that product as well.

General IPR strategy
Most of the low-tech manufacturing companies do not have an explicit IPR strategy, while all the companies in the high-tech sector had an explicit strategy. This can be explained by the immense value of patents in the high-tech branch. But indeed IPR

bundles are often registered. In fact, patents and design are registered on products, if the product is perceived as very innovative. This is the case with one of the newest product of MAM, the perfect pacifier, as it is expected that this product will be very successful and it is perceived as very innovative, both patents and designs are protected. In the case of Frey Wille the brand is printed on the product and protected as brand, this is done as an additional protection.

Level of registration
Most of the companies register industrial design rights on the EU-wide level. This has mainly the reason that the EUIPO system is simple, cost-effective and fast. Thus, in most situations the application of designs on the EU-wide level is easier. This can be also the reason why none of the participants registered on the national level any longer. If a company has markets outside of the EU, the Hague system is even better. If design rights is registered on international level in countries, which are not part of the Hague agreement, issues arise. Mostly, in these countries there are very weak IPR legislatures, and thus companies have to face many problems.

Informal protection strategy
As informal protection strategy, secrecy is done by a majority of the participants. Secrecy is mainly used for protecting specific know-how about the production methods, where competitors should not get an insight. There is no specific correlation between the usage of informal protection strategies and industrial design registration.

6.3.4 Operational structure

Innovation process
Nearly all the companies have implemented a similar process to the stage gate process. The duration of the innovation process is quite differentiating, at ZKW the innovation process lasts some years, while Legero has a 6-month cycle for each season. This innovation process is leaded by cross-functional teams with several disciplines. Sometimes design and IPR management is part of the cross-functional team, sometimes they are external and only contacted by the cross-functional team if needed. If designers are a fixed part of the cross-functional teams design activities are rather done in partnering or monitoring collaborations.

Design process
Design activities are mostly included in the beginning of the innovation process, in the idea generation phase. Sometimes these activities are included later in the product development phase, in the detailed investigation. It seems there is some kind of relation between the utilities of design and the point of time, when design activities are carried out. It seems if the utility is emotional or social, design activities are implemented earlier in the process. Contrarily, if the main utility is on the functional side, design activities are included later in the process and an 'design follows function' approach is followed.

IPR process
IPR research and registration can be included continuously throughout the product

development process. This is the case in the high-tech sector: ZKW and SKIDATA both stated, that the IPR department is continuously doing IPR related activities. In the low-tech sectors IPR activities happen rather once in the product development process. Here, it seems that larger companies register earlier than smaller companies. This can be explained by the fact, that SMEs do not have the same capabilities as bigger companies and potentially they do not have a great knowledge about IPRs. Thus, the registration of IPRs could be even after the market launch, but it is only possible to register designs in a specific time frame (12 months after publication).

6.3.5 Imitation, legal dispute and collaboration strategies

Most of the companies stated that industrial design rights are helpful in legal disputes, but still it is not a very strong protection right. In the low-tech industries there are many competitors imitating the product design. Actually, a few companies even build on imitation as a business model. In the high-tech sector, it seems that the imitation of design is not that common. Industrial design rights can even have a strategic value, similar to the registration of patents.

6.4 Assignment of categories to the research questions

For a further analysis the categories are assigned to the research questions in Figure 6.3.

Background information (e.g. details about the product, the customer field, the corporate strategy and the organisational structure) help to understand underlying trends in the analysis.

For the evaluation of the first research question, the categories 'imitation and legal dispute', 'the design strategy' and 'the design right strategy' are taken into account. These categories helped to understand relations between firm, market and product characteristics and the propensity of design rights.

The second research question concerns the organisational link between the innovation process, the IPR process and design activities, therefore the category 'operational structure' is considered.

The third research questions examines motives for the registration of design rights on the different levels. In this context, obviously, the category 'level of registration' is assigned.

The explicit discussion of the research questions is done in the following sections.

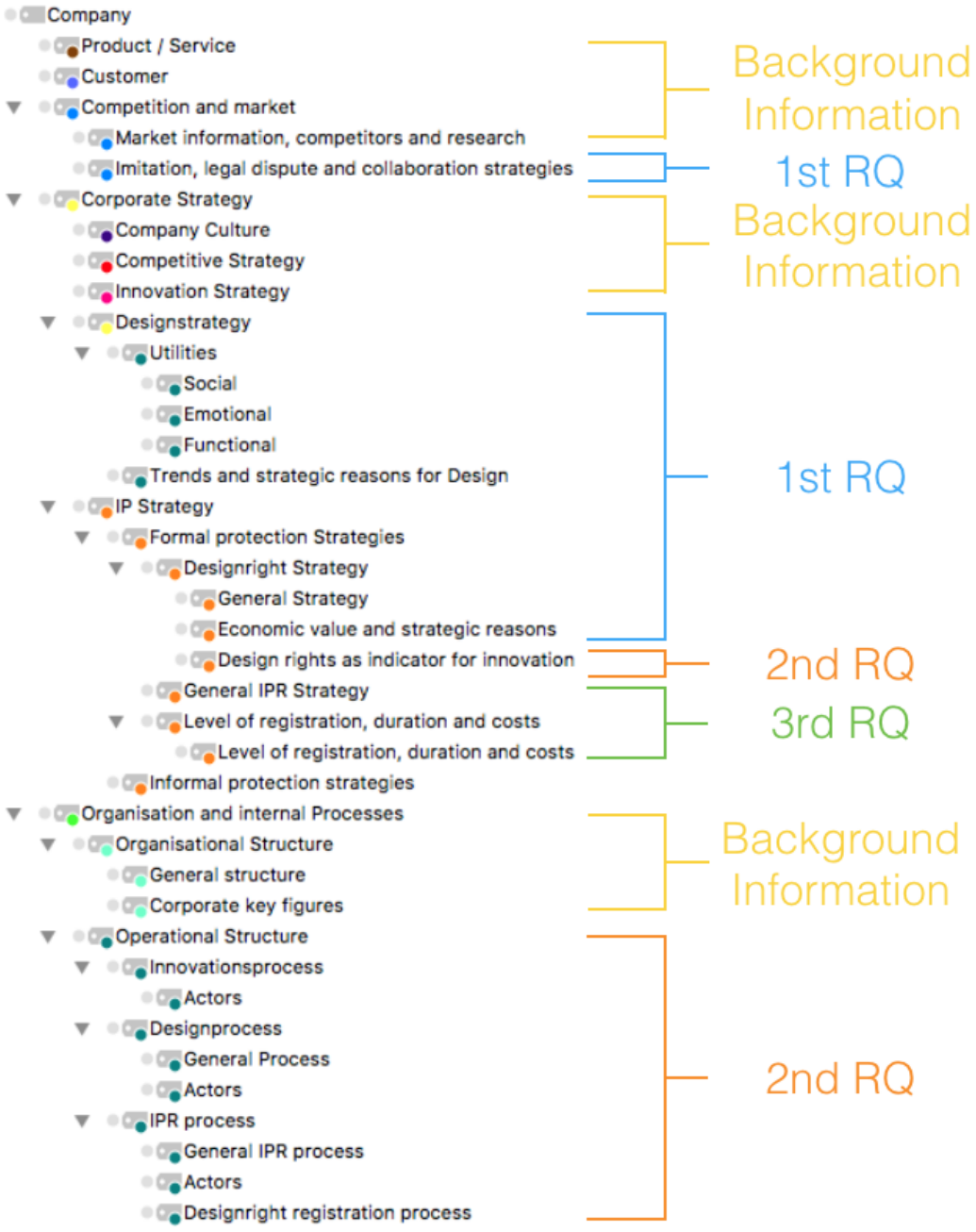


Figure 6.3: Assignment of categories to the research questions

6.5 Influencing factors for the strategic choice of industrial design rights

The first research question concerns influencing factors for the selection of industrial design rights as part of the IPR strategy. The question is presented below:

Research Question I

What influences the strategic choice of industrial design as a form of intellectual property?

The analysis of the conducted interviews has shown that there are four focal influencing points: firm, market, and product characteristics along with the corporate strategy. These points are part of the Figure 6.4.

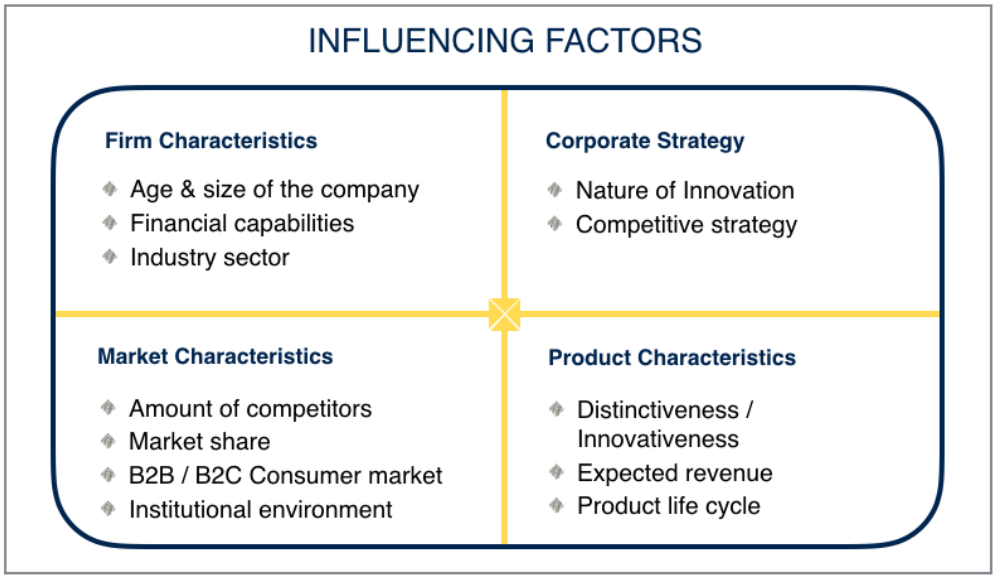


Figure 6.4: Influencing factors for the choice of industrial design rights

This model is based on Munari [2013], who states that the main influencing factors are the nature of innovation, firm characteristics and the industry sector. This study was carried out for patents and trademarks. The qualitative analysis has shown that this theory can also be applied to the registration of designs. In fact, industrial design rights are more likely registered in larger companies with better financial capabilities, e.g. both of the start ups registered industrial designs after the product launch. This leads to the assumption that larger companies have better financial capabilities and a greater know-how about IPRs. Since most of the larger companies stated they would not register industrial design rights after the market launch. In some countries, this

is not even possible due to legal requirements. Research has shown that the industry sector of the company also plays a major role. For example, the registration of industrial design rights is more likely in low-tech industries, e.g. lighting, clothing, etc., while in the building industry it is very unusual. In the high-tech branch industrial design rights are important, but most of the participants stated that patents are still a lot more important. This assumption fits the statistics about design-intensive industries by EPO and EUIPO [2016] and top locarno classes by Eurostat [2016b]: In these statistics a large proportion of design-intensive industries are in the low-tech sector. Also the top locarno classes are in low-tech areas, e.g. lightings and furnishing. Another insight is that the registration of industrial design rights is of nearly no importance in the service sector with the only exception of wholesalers. This fact is not very surprising, since wholesalers are the only service companies, who are part of the top design-intensive industries [EPO and EUIPO, 2016].

Market characteristics also have an impact on the registration of design. It is more likely that designs are registered in countries with many competitors and a great market share. This trend is related to the institutional environment: If countries have a weak IPR legislature the registration is not as likely as in countries with strong IPRs. In this respect, many participants mentioned problems with the protection in Asian countries. The decreasing trend of registration in countries with weak IPRs can be explained by the model of Smith [1999]. According to Smith [1999], the market expansion effect is influenced by weak IPR legislature and strong imitative abilities leading to a lower registration number of designs. Also the consumer market is part of the influencing factors, since industrial design rights are more likely to be protected in B2C markets. If a product is created in collaboration with other businesses the registration of designs is not necessary. This assumption is also described in literature: A study by Kalanje [2017] declares that both industrial design rights and trademarks can be used for branding. In fact, both enable customers to distinguish products by different companies. Thus, the registration of industrial design rights is more important on B2C markets. Another influencing factor is the corporate strategy: Munari [2013] named the nature of innovation as one of the key attributes. In the analysis of the conducted interviews a positive relation between product innovations and the registration of industrial design rights could be observed. This correlation is also outlined by a study of the Department of Trade and Industry [2005]. In this study design-intensive industries are more likely to have production innovations as nature of innovation. The competitive strategy is another important component. If a differentiation strategy is followed, the registration of design is much more likely than with a cost leadership strategy. This relation is quite obvious, since cost leaderships in low-tech sectors are mostly combined with an imitation strategy. Companies with high design investments cannot offer products as price-aggressive as imitators. In that regard, there seems to be a relation to the branding function of designs. Since mostly distinguishing designs are protected, differentiation is chosen as competitive strategy. This positive correlation is also outlined by Piirainen [2017]. The last influencing factor concerns product characteristics: Most of the participants stated that distinctive and innovative products are chosen for industrial design registration.

Also, the expected revenue and the time on the market is of importance. In the literature many researchers ([Hertenstein et al., 2005; Gemser and Leenders, 2001]) see design as an important part for financial performance, which leads to the assumption that these attributes are also important for the registration.

In summary, it can be said, that these components are the main influencing factors for industrial design rights. In this analysis, the question arises wether industrial design rights also have a strategic importance similar to the role of patents. This is explained more explicitly in the following section.

6.5.1 Competitive design right strategy

In this section, an approach is done to illustrate components of a competitive industrial design rights strategy in Figure 6.5.

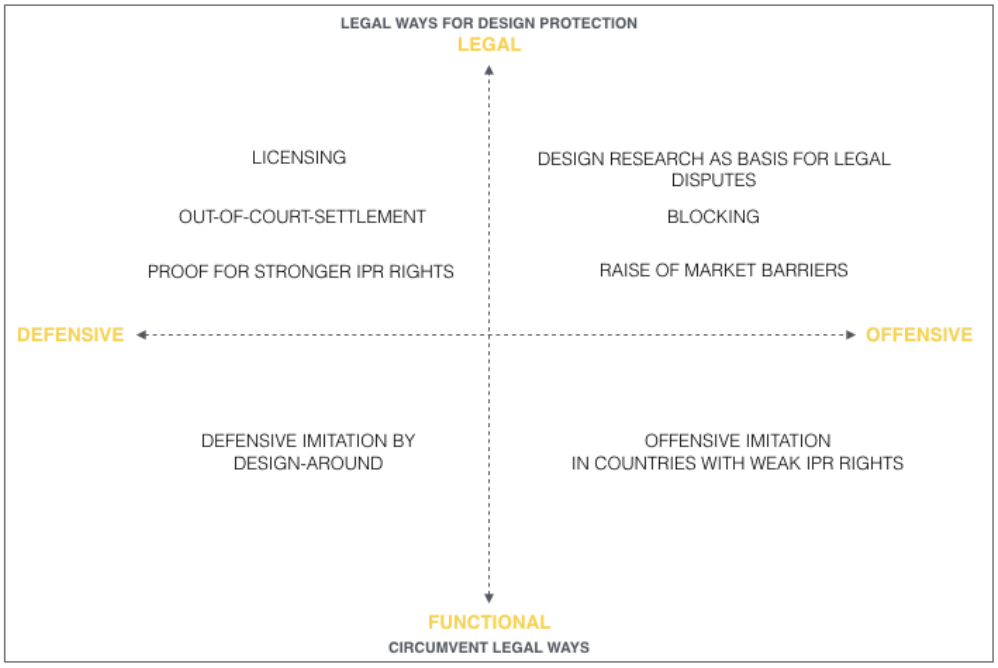


Figure 6.5: Components of a competitive design right strategy (based on [Iyer, 2017]

There are almost no studies about industrial design rights, which is why patent literature was researched in order to build on this knowledge [Blind et al., 2009; Iyer, 2017]. In patent literature patent strategies can be divided into offensive/defensive strategies and legal/functional ways. In the following steps, the components are explained in more detail:

Licensing
Participants of the conducted interviews stated that licensing is also performed as

defensive strategy on markets with many participants. If there is an infringement of another industrial design right, licensing is often used to avoid further legal disputes.

Out-of-court-settlement
Out-of-court-settlements are very common, since legal disputes can be very expensive. Most participants prefer to do claim payments.

Proof for stronger IPRs
Another defensive legal strategy is the proof for stronger IPRs. An industrial design right can serve as proof for another right, e.g. copyright. In this case, industrial design rights are only registered once with a specific date of application. If a legal dispute occurs, even after the industrial design right is phased out, it can be used as proof for their creation of the design in court.

Design research as basis for legal disputes
A more offensive strategy is the conduction of industrial design right research in order to find imitations and to sue competitors. This is mainly performed by larger companies such as Nike, etc. When one of these companies starts a law suit a smaller competitor can be driven out of the market due to high claim payment.

Blocking
Blocking is a well-known patent strategy, but it is also possible to block competitors with the help of industrial design rights. In countries with weak IPRs, competitors try to register designs rights of others. Especially, this is possible, if the industrial design right was not published in that specific country before. In China, for instance, imported products can be confiscated if somebody else registers the design for the product, even if this competitor is not the originator.

Raise market barriers
Industrial design rights can even help to raise market barriers. This is mainly the case for wholesalers, since wholesalers sell their distributing capabilities in exchange for the rights to register designs. Other competitors can no longer import these products themselves and they are not able to access this market.

Offensive imitation in countries with weak IPRs
Offensive imitation is done in countries with weak IPR legislature. It is possible to imitate offensively in such countries and there is no legal way to protect from such imitating capabilities.

Design-around
Design-around is the counterpart to offensive imitation in countries with strong IPRs. In these countries design-around strategies can help avoiding an infringement of industrial design rights. This is mainly the case in low-tech sectors, where competitors have imitation as a core strategy.

6.6 Relation of industrial design rights and innovation

The second research questions concerns the organisational link between the different departments (innovation, design, IPR). The research question is presented below:

Research Question II

How are the IPR process, design activities and the innovation process linked to each other?

This question covers many aspects. That is the reason why the results are explained in the following sections.

6.6.1 Organisational link - Cooperations

The companies can be classified according to their type of collaboration in design related activities. Figure 6.6 shows the type assignments as defined by Utterback et al. [2006].

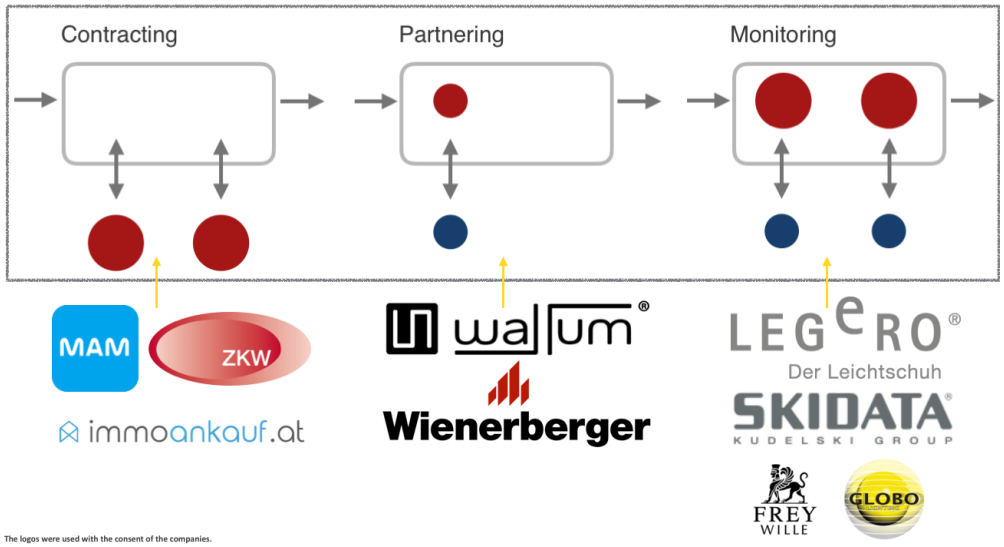


Figure 6.6: Cooperations in design activities (based on [Utterback et al., 2006, p.76])

Figure 6.6 shows that there is no preference for one particular type in our sample. There is no relation between the value of design and the chosen cooperation constellation. MAM, for instance, defined design as key value for the company, but they do not have design capabilities internally. There is also no relation between the application of industrial design rights and the chosen cooperation constellation. Thus, in this analysis no further relations could be detected.

6.6.2 Organisational link - stage gate process

In the Figures 6.7 and 6.8, design and IPR activities are shown in the stage gate process.

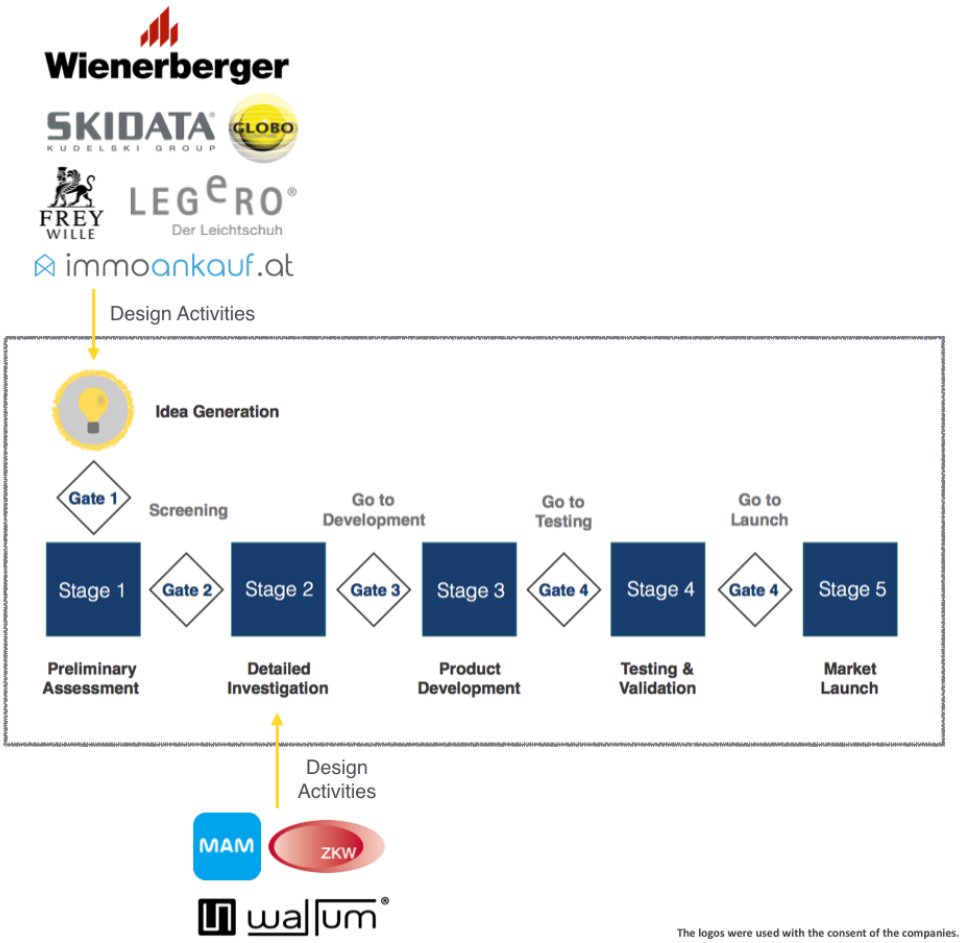


Figure 6.7: Design activities in the innovation process (based on [Cooper, 1990, p.46]

Design activities are carried out in two possible phases of the stage gate process: in the idea generation phase and in the detailed investigation phase, when a first prototype is built. Furthermore, it seems as though there is a relation between the utility of design and the point of time when design activities are included. If the utility of design is emotional or social, design activities are the basis for the innovation process. If the utility is functional, design activities are included later in the innovation process. The latter is similar to the traditional 'form-follows-function' approach, since design is perceived as an add-on later in the innovation process. The former is more related to approaches like design thinking by Brown [2008], the CEO of IDEO, and design-driven innovations by Verganti [2008]. Especially, SKIDATA stated, that not only the product is designed, but whole processes in the company and, in addition to that, the overall customer-experience.

Thus, it can be said, that these newer approaches with a new meaning of designs are getting more and more important.

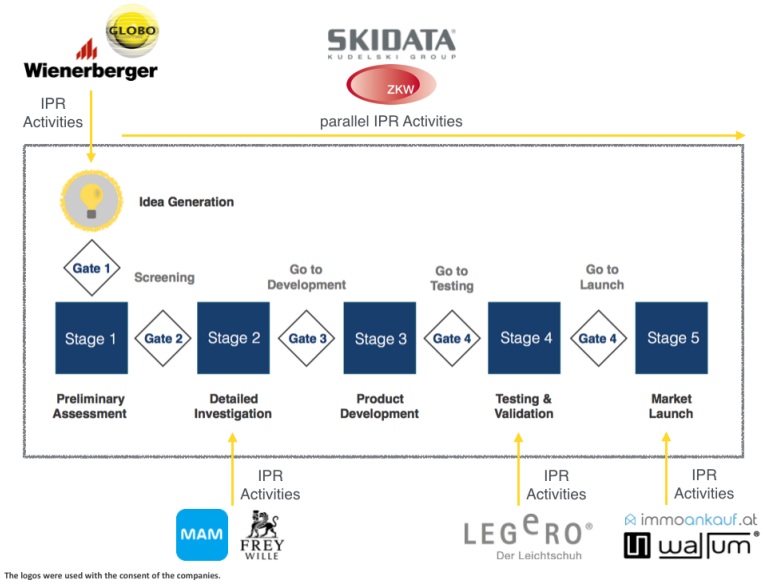


Figure 6.8: IPR activities in the innovation process

IPR activities are included throughout the innovation process. However, if research about IPRs is included early in the innovation process, IPRs are more important for the company. In the high-tech sector, where IPR (especially patent) research is even more crucial, IPR activities are continuously integrated. For instance, SKIDATA mentioned that products can even be based on patents. Contrarily, low-tech industries include IPR activities only at a certain point of time. Interesting is the fact, that start ups in the sample registered designs even after the market launch, which could be explained by missing IPR capabilities.

6.6.3 Organisational link - cross-functional team

Cohen [2005] and Cagan and Vogel [2002] proposed cross-functional teams. These teams consist of different disciplines and manage the innovation process together. These two approaches are visualised in the top of Figure 6.9. Since the majority of the participants had different disciplines as part of their innovation process, further constellations are proposed. The majority of the participants stated that they have marketing and engineering as fixed members of the team. At some point of time, legal and design departments are included. Contrarily, in the case of ZKW, the legal department is a fixed member of the cross-functional team. This can be explained by the immense importance of IPRs for the company. Another common constellation is a team consisting of design, engineering and marketing. The proposed model by Cohen [2005] could not be assigned to any of the companies.

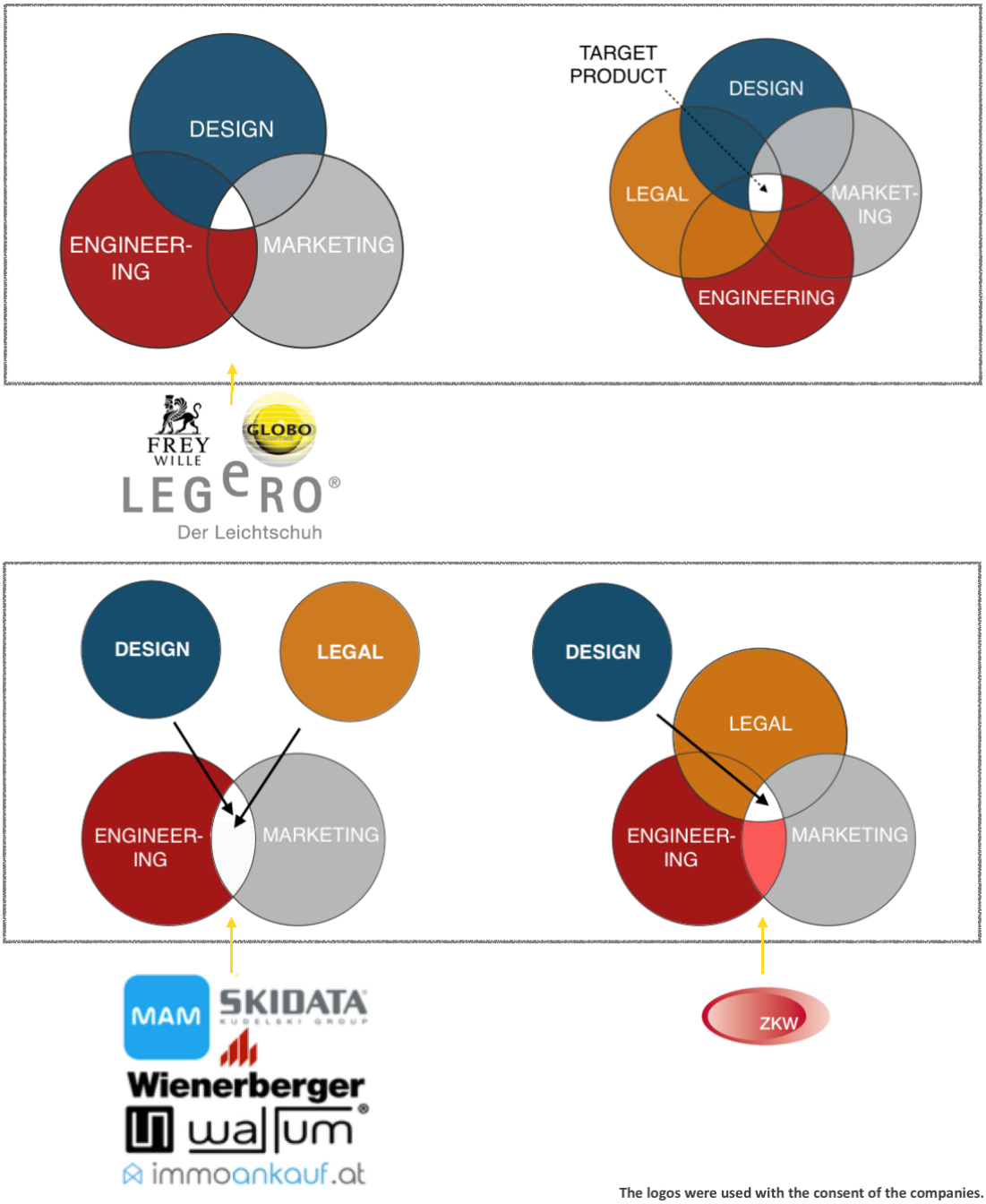


Figure 6.9: cross-functional teams in the innovation process (based on [Cohen, 2005, p.3], [Cagan and Vogel, 2002, p.138])

6.7 Industrial design rights on the different application level

The third research question concerns the application of industrial design rights on different levels. This question is presented in the following:

Research Question III

How do companies consciously shape their industrial design strategy in view of the different levels of intellectual property protection (national, EU-wide, international)?

As described in the introduction (see Chapter 1) this thesis aims at builind a conceptual model, which describes reasons for the registration of designs on the different levels (national, EU-wide and international via Hague or local). This model is shown in Figure 6.10.

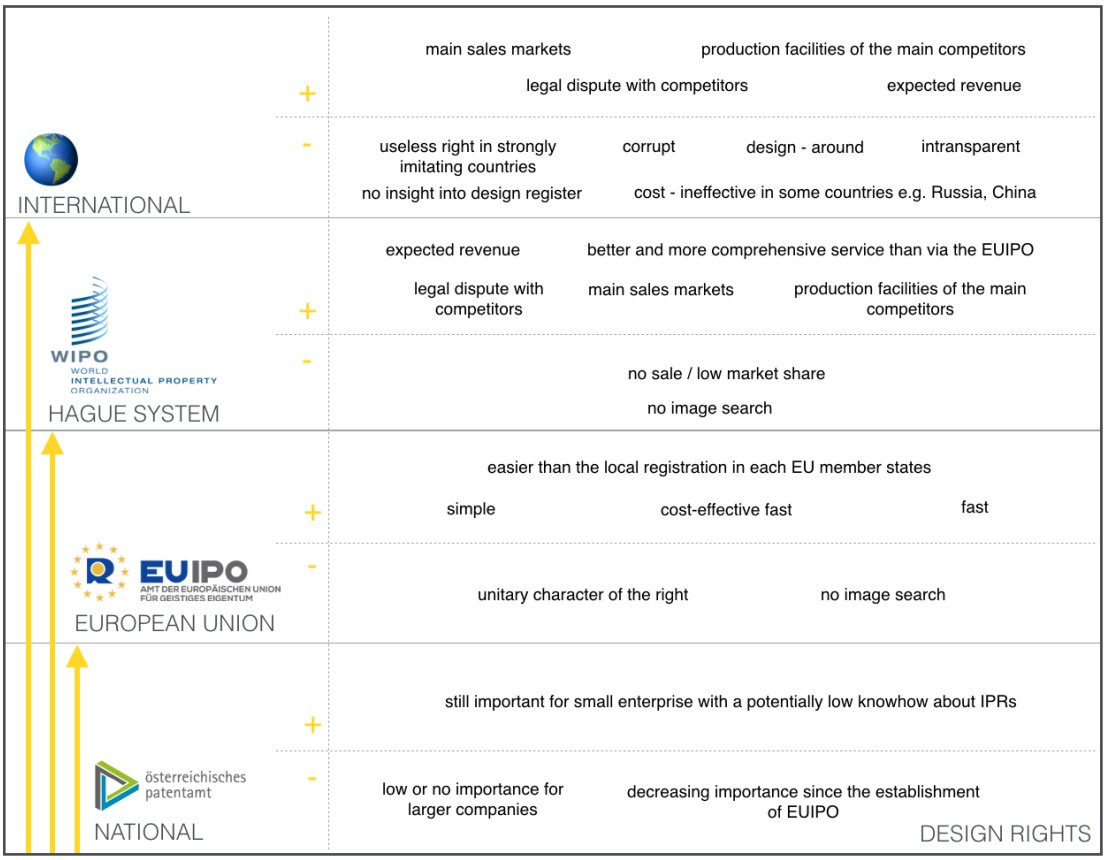


Figure 6.10: Reasons for registering design on the different levels (national, EU-wide and international)

None of the companies registered specifically at the national level, that is because most of the companies decided to register designs on the EU-wide level instead. Thus, it seems as if the national registration is no longer of importance since the establishment of the EU-wide system. This is motivated by a closer look at the national registration behaviour in 2017 [Österreichisches Patentamt, 2015]: Mostly SME or start-ups registered industrial design rights in Austria. This leads to the assumption, that either these small companies do not have the knowledge about registered community designs or there is no need, since they are only active in Austria. This trend is also discussed in the literature, where the correlation of IPR registrations and firm size is highlighted Munari [2013]. Most of the participants registered either on EU-wide level or on an international level. The EUIPO system has many advantages: It is cost-effective, fast, simple and, especially, it is easier than the local registration, where companies are confronted with different languages or different legal details. The only disadvantage is, if one country objects, the protection is lost for all EU member states. When comparing the EUIPO System and the Hague System, the participants stated that the latter has many advantages: For instance, it is possible to register designs in more countries. Hence, if a company has sale markets in the whole world, this system is advantageous. Reasons for registering industrial design rights abroad in specific countries are: the production facilities of competitors, the main sales market, open legal dispute with competitors and a high expected revenue of the product. Industrial design rights are not registered in countries with a low market share. Many participants stated that they are missing the option to find industrial design rights by image search. If a country is not part of the Hague System, e.g. China, India, companies need to register industrial designs on the national level. It is very difficult to protect designs in countries with weak IPRs especially in strongly imitating countries. Often, the registration process in these countries is intransparent, cost - ineffective, sometimes even corrupt, and mostly it is not possible to have an insight in the design register.

6.7.1 Industrial design rights as an indicator for innovation

As a further result the main sources for innovation could be observed in the qualitative analysis. The Oslo Manual defines innovation as product, process, organisational and marketing innovation [OECD and Eurostat, 2005]. The sample suggests that there is a positive relation between product innovations, marketing innovations and the registration of industrial design rights. Most of the participants stated that in comparison to product and process innovation, the focus is on product innovations. Further research has shown that marketing innovations are even more important than product innovations. This can be explained by the fact that design activities and design improvements on products are counted as marketing innovations [Statistik Austria, 2012]. At this point of the analysis, I want to to analyse the following sectors separately: low-tech and high-tech. A majority of the study survey has its main business in the low-tech manufacturing. This high proportion can be explained by the fact that low-tech manufacturer make up a large part of the most design-intensive sectors and in these sectors designs are registered more likely compared to other industries [EPO and EUIPO, 2016]. This is also outlined by Mairesse and Mohnen [2004] who states that all IPRs, except industrial

design rights, are used more intensively in the high-tech sector than in the low-tech sector. In these sectors most of the participants named design as a key value in the company. In addition to that, design activities are crucial for the economic success of these companies. Therefore, many incremental innovations are performed on products, while radical innovations are rather neglected. Radical innovations are also not needed, since products can remain on the market for many years and are still perceived as very innovative. For instance, the most successful product of MAM has been on the market for many decades, and it is still perceived as new. During the analysis, marketing innovations were proposed as explanation for perceiving these products as innovative even though there were no fundamental changes on the functionality. In fact, all of these products were adapted over the years and a lot of design activities were carried out, so that, the products are still perceived as innovative and new. In high-tech sectors, radical innovations are much more common, both in product as well as in process innovation. In the case of high-tech industries there is a stronger focus on product innovations and process innovations than in the low-tech industries. These indicators also explain the fact that most of the participants protect rather through the combination of patents and designs as these companies want to protect their innovations: Process innovations can be rather protected by patents, while marketing innovations can be rather protected by designs. Another indicator for innovation is the concept of aesthetic innovation by Alcaide-Marzal and Tortajada-Esparza [2007]. In this paper, it is stated that the CIS is mainly based on technological innovations and the registration of patents. In this context, aesthetic innovation indicators are proposed, which have a focus on design activities and the registration of industrial design rights. Therefore, the percentage of innovation activities could be higher in low-tech industries, if the CIS addressed these kinds of innovations.

In conclusion, it can be said, that low-tech firms in the sample are engaged in continuous incremental innovation processes with long life cycles, where the focus is on the branding function and the protection of design. High-tech firms seem to register industrial design rights not solely, but in combination with patents in order to protect both process, product and marketing innovations. Overall, a positive relation between innovativeness and the application of industrial designs could be detected. Based on these measurements a correlation between innovation activities and design registrations could be confirmed, which was already found out in a quantitative study about french companies based on the CIS Gallie and Legros [2012].

6.8 Critical reflection

The discussion of the exploratory results in the context of the theoretical literature was already conducted in the previous sections. Whereas, the critical reflection is concerned with discussions about the validity of the results and the limitations of analysis.

6.8.1 Validity of results

The validity of results addresses the semantic validity, the sampling validity and the consistency of this thesis.

Semantic validity
Semantic validity deals with the correctness and appropriateness of the category systems, encoding rules, etc. Therefore, cross-checks were conducted by the supervisor in order to assure the reliability of the category system [Mayring, 2014].

Sampling validity
Mayring [2014] proposed to single out extreme results and test if these findings point in the predicted direction. In this analysis, the derived results of the interview with Immoankauf.at were quite outstanding. These materials were tested and finally omitted, since they did not fit in the overall findings.

Consistency
For consistency checks the material was split in two halves according to Mayring [2014] and it was checked if both data sets yield similar results. This could be proven for the derived results of both data sets.

6.8.2 Limitations

The following limitations could be observed in the qualitative analysis.

Insights not representative for whole industries
This thesis is based on a qualitative analysis with a sample of nine companies. Since, this sample is too small to derive trends for whole industries, only insights can be provided. Therefore, it is proposed to carry out a quantitative analysis based on the insights of this thesis in order to verify these results.

Geographical applicability
Another limitation is the geographical applicability, since the IPR legislature is very diverse in different countries, the proposed insights in this thesis cannot necessarily be applied in every country. For instance, in some specific Asian countries, design rights have a very weak legal basis. In those countries, the findings cannot be applied.

CHAPTER 7

Conclusion and Outlook

This thesis is intended to broaden the understanding of how companies organise and protect their innovation processes. Moreover, influencing factors for the selection of industrial designs rights are addressed. It highlights the division of tasks between people and departments in an organisation, the organisational link to IP registration activities throughout the product cycle. Last but not least, a conceptual model for the registration of industrial design rights on the different levels (national, EU-wide, international) is proposed.

First of all, a methodological summary of the followed approach is presented in this thesis. Furthermore, the main findings and further research possibilities are proposed.

7.1 Methodological summary

At the beginning of this thesis a literature research was carried out: This includes relevant literature about the legal background of IPRs, especially designs rights. Furthermore, economic rationales for registering IPRs are discussed, e.g. expected market success and increasing trade [World Intellectual Property Organization, 2003]. At this point, it could be extracted that increasing trade heavily depends on the strength of IPRs and the intensity of competition in specific countries. In addition to that, literature about the relation between IPRs and innovation was discussed along with the relevance of IPR bundles. Research has also shown that both the bundles of trademarks and design and of trademark, design, patent are very common [Office for harmonization in the internal market, 2015]. Moreover, the organisational link between design activities, IPR activities and the innovation process was examined. The strategic value, the different meanings of design and the economic rational for design activities were evaluated. For a better understanding of the organisational link new approaches in the design literature were discussed, e.g. design thinking by Brown [2008], the CEO of IDEO, and design-driven

innovations by Verganti [2008]. Cohen [2005], Cagan and Vogel [2002] proposed different actors as part of cross-function teams in the innovation process.

As a further step, a descriptive analysis was carried out in order to gain insight into design-intensive industries and registration behaviour on different levels of registration. Based on this information and the literature review, a guideline was established and interviews were conducted with-in nine different companies. The summarising content analysis by Mayring [2014] was used to build categories and to conduct the analysis. These categories were presented for each firm individually and summarised overall. In the following, the derived information from these categories was assigned to the research questions. Indeed, it could be shown that some of the categories had a strong impact on the registrations of designs (e.g. customer market, market information and competition, imitation and legal disputes, competitive strategy, innovation strategy). Based on this analysis a conceptual model for influencing factors was established, components of a competitive industrial design right strategy were described, the organisational link between innovation, design and IPR was visualised and a model for the selection of industrial design rights on the different levels was build. Eventually, the critical reflection was carried out including both the validity of the analysis and limitations of this thesis.

7.2 Main findings

7.2.1 Industrial design as an indicator for innovation

Industrial design rights can be seen as an indicator of innovation, though the nature of innovation is different in low-tech and high-tech industries. Low-tech industries focus on the protection of product and marketing innovations in order to protect designs and distinguishing functions. Industrial design protection is even more important for low-tech industries, since design is part of their differentiation strategy. Whereas high-tech industries not only focus on the protection of product but also on process innovations. Hereby, the main innovation source is technology. Therefore, a complementary strategy is followed by the combination of designs and patents.

7.2.2 Influencing factors in patent literature applicable to industrial designs

It was proven that the influencing factors for patent registration also apply to industrial designs. The proposed influencing factors by Munari [2013] are the nature of innovation, the firm characteristics and the industry sector. These influencing factors can be extended by the product and market characteristics. The product characteristics include time on the market, expected revenue and innovativeness of the product. The market characteristics are the number of competitors, the market share and the consumer market.

7.2.3 No impact of organisational implementation on design propensity

In the course of this research no direct effect of firm orranization on the propensity to register be designs could be shown.

7.2.4 Low importance of national industrial design registrations in Austria

Answering the third research question about the different levels of registrations, it could be shown that the importance of national design registration has diminished. This can be explained by the successful introduction of design registration systems on EU-wide and international level. Furthermore, the original problem statement of this thesis can be answered: The decreasing registration numbers in the past years in Austria and the reasons for them.

7.2.5 No design protection in countries with weak IPRs

The research has shown that companies do not register designs on international level in countries with weak IPRs. There, the registration processes are intransparent, cost-inefficient and occasionally corrupt. Often there are many competitors and there is no legal way to avoid direct imitation.

7.2.6 Design right is a weak IPR

All participants stated that design right are very weak IPRs and design-around activities can be easily performed by their competitors. Especially, in the low-tech sector, where design is a key factor and part of the branding strategy, design rights cannot protect these distinguishing features. Legal cases can easily be avoided by performing small changes on the design and this design is no longer in conflict with the original one.

7.3 Conclusion and further research options

In summary, it can be stated, that even though industrial design rights are of importance, they seem to be a very weak IPR at the moment. Industrial design rights can be a longterm competitive advantage, especially, if the following criteria is met: Design and industrial design protection need to be integrated into the corporate strategy. Design activities are still not seen as important as they should be. In order to address this issue, the proposed design approaches 'design thinking' by Brown [2008] and 'design-driven innovations' by Verganti [2008] can be implemented. The strength of industrial design rights needs to be improved in order to avoid design-around activities of competitors. This includes unifying the legal system across countries, expanding the Hague system and improving the strength of design rights on the same level of patents or at least utility patents. With all of these proposed improvements industrial design rights could

be a valuable protection even in countries with high competition and strong imitative capabilities.

For further research, a quantitative analysis on the basis of the evaluated insights in this thesis should be carried out. In addition to that, research can be performed about the impact of industrial design rights on financial performance, since there is only little literature on this impact. Furthermore, the registration of different IPRs on different levels (national, EU-wide and international) needs to be analysed in more detail. In the qualitative analysis only little could be found out about strategic reasons and influencing factors for the choice of IPRs on different levels.

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Acronyms

AIT Austrian Institute of Technology. 3

CETMOS Central European trademark Observation Service. 11

CIS Communication Innovation Survey. 3, 17, 47, 109

EPC European Patent Convention. 12

EPO European Patent Office. 12

EUIPO European Union Intellectual Property Office. 3, 8, 11, 13, 42, 45, 56, 96, 108

GAT Gesprächsanalytisches Transkriptionssystem. 61

IP Intellectual Property. 10, 12, 15, 19, 20, 31, 36, 38, 39, 46, 111

IPR Intellectual Property Rights. 1–4, 6, 9, 12–17, 19–22, 25, 32–34, 36, 38, 39, 56, 60, 61, 67–69, 71, 73, 74, 77, 79, 80, 82–88, 90, 91, 94–97, 99, 100, 102–105, 108–114

NACE Nomenclature Générale des Activités économiques. 3, 45–52, 54, 62

NPD New Product Development. 4, 25, 27, 33–39, 56, 62

ODM Original Design Manufacturer. 31

OEM Original Equipment Manufacturer. 31, 83–85, 94

OHIM Office of Harmonisation for the Internal Market. 8

PCT Patent Cooperation Treaty. 12

R&D Research and Development. 14, 17, 22, 29, 30, 33, 94

RCD Registered Community Design. 8, 9, 13, 42, 43, 50, 51, 117

SME Small and Medium-sized Enterprises. 9, 16, 69, 94, 97, 108

SSO Standard Setting Organisation. 21

UCD Unregistered Community Design. 8, 9, 13, 27, 42

VCU Virginia Commonwealth University. 5

WIPO World Intellectual Property Organization. 3, 5, 6, 9, 11, 13, 51, 56

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Appendix A
Interview Guideline

INTERVIEW GUIDELINE

- Die Bedeutung von Designrechten für österreichische Firmen

Verfasser:

Daurer Julia, BsC

25.01.2017

1 Allgemeine Informationen zu dem Unternehmen

Dieser Abschnitt betrifft unternehmensspezifische Fragen unter anderem die Position der interviewten Person als auch andere firmenrelevanten Characteristika wie Firmengröße und Alter.

Informationen über den Interviewer

1.1 Beschreiben Sie den Aufgaben- und Verantwortungsbereich Ihrer Position im Unternehmen.

1.2 Wie lange sind Sie in dieser Position bereits tätig?

Informationen über das Unternehmen

1.3 Wie viele Mitarbeiter sind in Ihrem Unternehmen beschäftigt?

1.4 Wie hoch ist der ungefähre Jahresumsatz Ihres Unternehmens?

1.5 Können Sie mir sagen, wie hoch sind ungefähr die jährlichen Ausgaben für F&E?

1.6 Wie ist die Eigentümerstruktur in Ihrem Unternehmen?

- Teil einer internationalen Unternehmensgruppe
- Headquater
- Börsennotiert

1.7 Wenn Sie auch im Ausland tätig sind, wie viel Prozent des Jahresumsatzes wird ungefähr im Ausland erwirtschaftet?

2 Unternehmensstrategie und Innovation

Dieser Abschnitt bearbeitet strategische Fragen über das Produkt / die Dienstleistung, die Wettbewerbsituation, die Konkurrenzsituation, die Unternehmenstrategie und Innovationstrategie.

Produkt und Marktsituation

2.1 Was ist das Hauptprodukt oder –dienstleistung des Unternehmens?

2.2 Ist Ihr Hauptprodukt ein Konsum- oder ein Investitionsgut?

2.3 Was gibt es für Nebenprodukte oder –dienstleistungen?

2.4 Können Sie den Produktlebenszyklus Ihrer Produkte für uns beschreiben?

2.5 Wie würden Sie Ihre Kundenstruktur beschreiben?

- B2B
- B2C

2.6 Wie ist die Wettbewerbsituation auf dem Markt in dem das Unternehmen aktiv ist? Welche Position nimmt Ihr Unternehmen ein (Marktanteil)?

2.7 Sehen Sie sich in Bezug auf Produktentwicklungen als Trendsetter oder Technology Leader?

2.8 Auf welchen Märkten sind Sie aktiv? Österreich / Europa / Weltweit?

Unternehmensstrategie und Innovationstätigkeit

2.9 Wie würden Sie die Unternehmensstrategie des Unternehmens beschreiben?

2.10 Wodurch versuchen Sie Kunden zu gewinnen und zu halten?

2.11 Welche typischen Strategien werden von Ihrem Unternehmen verfolgt?

	weniger zutreffend	sehr zutreffend
Kostenführerschaft		
Nischenstrategie (Konzentration auf bestimmte Marktsegmente)		
Differenzierung (Wettbewerbsvorteil durch bestimmte Faktoren wie Qualität / Design erzeugen)		

2.12 Würden Sie Innovation als Bestandteil der Unternehmensstrategie bezeichnen?

2.13 Wie wird Innovation in Ihrem Unternehmen organisiert?

- in bestimmten Abteilung
- durch bestimmte Prozesse
- kontinuierlich (innovationsprojekte oder kontinuierlich – inkrementell)
- offen (mit wem wird kooperiert?)
- geschlossen (ohne Kooperation)

2.14 In welcher Abteilung werden Innovationstätigkeiten in Ihrem Unternehmen durchgeführt?

2.15 Sind Designprozesse und Innovationsprozesse in Ihrem Unternehmen verbunden? Wenn ja, wie?

- organisatorisch (verschiedene Abteilung)
- sequentiell (zeitlicher Aspekt, Gestaltung)
- personell (designer, techniker räumlich eng,..)

2.16 Wer ist in den Designprozessen eingebunden?

- Kunden
- Lieferanten
- Externe Designer
- Interne Designer
- Externe Beratungsfirmen

2.17 Bringen Sie Designrechte mit Innovation in Verbindung?

2.18 Wenn es externe Kooperationen gibt, wer meldet die Designrechte an? Gibt es eine spezielle Firmenpolitik?

- geteilte Designrechte

2.19 Wie würden Sie (prozentuell) den Anteil der Innovationstätigkeiten in Prozess- und Produktinnovationen aufteilen?

2.20 Wie würden Sie (prozentuell) den Anteil der Innovationstätigkeiten in radikale und inkrementelle Innovationen aufteilen?

3 Designrechte

Dieser Abschnitt bearbeitet strategische Fragen über die Wahl von Designrechten als Schutz von Geistigen Eigentum, die Bedeutung von Industrie Design, die Portfolio Strategie für Designrechte, den Anmeldeprozess und die Ebenen (national, EU-weit oder international).

Zusammenhang - Design und Innovation

3.1 Welche Bedeutung messen sie Design in Ihrem Unternehmen bei?

- Design ist nicht relevant
- Design wird nicht näher spezifiziert
- Design betrifft rein ästhetische Aktivitäten in der finalen Phase d. Produktlebezyklus
- Design ist ein integrierter Prozess, aber kein fester Bestandteil der Unternehmensstrategie
- Design ist ein integrierter Prozess und fester Bestandteil der Unternehmensstrategie

3.2 Was sind für Sie Motive für design-spezifische Tätigkeiten?

	weniger zutreffend	sehr zutreffend
Umsatz erhöhen		
Kosten reduzieren		
Etablierung auf neuen Märkten		
Marktanteil erhöhen		
Kompetitiven Vorteil erhöhen		
Konsumenten Loyalität erhöhen		
Konsumentenbedarf direkt addressieren (Utterback Sattel)		

3.3 Werden in Ihrem Unternehmen Design Aktivitäten unternehmensintern oder extern vorgenommen?

3.4 Können Sie sagen wie hoch sind ungefähr die jährlichen design-spezifischen Ausgaben?

3.5 Haben sich die Ausgaben für design-spezifische Aktivitäten in den letzten Jahren erhöht?

3.6 In welche Phasen des New Produkt Development Prozesses ist in Ihrem Unternehmen Design verankert?

- Design wird in keinem Abschnitt inkludiert
- Design wird in der Phase der Ideenfindung benutzt
- Design wird in der Phase der Voruntersuchung als Bestandteil von Konsumentenbefragungen benutzt
- Design wird in der Produkt-Entwicklungsphase benutzt
- Design wird am Beginn der Produzierung von Produkten benutzt
- Design wird während der laufenden Produzierung von Produkten miteinbezogen
- Design wird beim Launch von Produkten miteinbezogen
- bzw: eigenes Modell
- DP = IP; DP = f(IP) oder IP $\subset$ f(IP)

3.7 Was ist für Sie wichtig als Ergebnis des Designprozesses?

- Neue Funktion (Funktionale Bedeutung)
- Neue Emotion / Bindung (Emotionale Bedeutung)
- Neue soziale Gruppen (Soziale Bedeutung)

Anmeldeprozess und Ebenen von Designrechten

3.8 Wer entscheidet welche Designs geschützt / angemeldet werden? Wie viele Produkte in Ihrem Unternehmen werden (prozentuell) durch Designrechte geschützt?

3.9 Welche Gründe gibt es Designrechte anzumelden?

- Imitation vermeiden
- Unternehmens Policy
- Um der Konkurrenz voraus zu sein
- Um das Ansehen der Firma zu verbessern
- Um die Mitbewerber zu überzeugen, dass selbst keine Imitation benutzt wird

3.10 Gibt es für Sie Gründe Produkte nicht durch Design Rechte zu schützen?

- Es würde keine Vorteile bringen
- Die Lebensdauer für Design ist zu kurz
- Die Designs sind nicht sehr innovativ
- Die Kosten sind zu hoch

- Es ist nicht sehr profitabel
- Die Anmeldung schützt Design zu wenig

3.11 Was sind Kriterien für die Auswahl von Produkten, welche durch Designrechte geschützt werden sollen?

- Innovatives Design
- leicht imitierbar
- Wenn es stark anders als das der Mitbewerber ist
- Produkt Lebedauer
- Der erwartete Return of Investment für das Produkt

3.12 Werden Designrechte auch außerhalb von Österreich geschützt (EU-weit, international)?

3.13 Wenn ja, welche Gründe gibt es Designrechte auch in anderen Ländern zu schützen? Wer ist der Entscheidungsträger?

3.14 Wie einfach sind die Anmeldeprozesse der verschiedenen Ebenen (auch durch die Einführung neuer System bspw. Hague System oder Registered Community Design in der EU)?

- Spielen Kosten eine Rolle?
- Welche Kosten gibt es außer Preis für die Anmeldung?

3.15 Hat die Etablierung der EU-weiten bzw. welt-weiten System für Designrechte die Anmeldeanzahl über diese Systeme im Vergleich zur nationalen Anmeldung steigen lassen?

- Ist es leichter?
- Melden Sie deshalb mehr an?

3.16 Welche Vorteile gibt es im Anmeldeprozess durch die Etablierung dieser Systeme?

3.17 Wonach entscheiden Sie, in wie viele Locarno Klassen Sie anmelden?

3.18 Werden Ihre Designrechte oft verletzt bzw. müssen Sie oft gegen solche Designrecht-Verletzungen gerichtlich vorgehen?

3.19 Nach welchen Kriterien werden Designrechte verlängert?

3.20 Aus welchen Gründen werden bereits bestehende Designrechte durch neue ersetzt?

4 Geistiges Eigentum

Dieser Abschnitt behandelt Strategien für den Schutz von Geistigem Eigentum, Verantwortlichkeiten für den Schutz, Arten und Ebenen des Schutzes und Wirksamkeit des Schutzes im Vergleich zu informellen Strategien.

Strategien für den Schutz von Geistigen Eigentum

4.1 Gibt es in dem Unternehmen eine explizite Strategie für den Schutz von Geistigen Eigentum?

4.2 Wenn ja,

- Wer formuliert und implementiert diese Strategie?

- Wie stark sind die diese Aktivitäten mit der Innovationsstrategie bzw. der Unternehmensstrategie verbunden?

4.3 Wenn nein,

- Was sind die Gründe?

- Wer ist verantwortlich für den Schutz von geistigen Eigentum?

4.4 Welche Motive gibt es für die Unternehmen IPRs anzumelden?

- Imitiation vermeiden
- Das Bild des Unternehmens verbessern (Branding)
- Wettbewerber blockieren
- Neue Märkte öffnen
- Unternehmenswert erhöhen (durch Lizenzierungen)
- Positition in Verhandlungen mit Unternehmenspartner erhöhen
- Indikator für R&D Effizienz für Investoren (Zugang zu Venture Capital)
- Schutz in Kooperationen (open innovation)
- Signalisieren von Kompetenzen für den Kooperationspartner

4.5 Verbinden Sie verschiedene Stationen im Produktlebezyklus mit verschiedenen Formen von IPRs?

4.6 Welche verschiedenen Schutzrechte wurden in Ihrem Unternehmen angemeldet?

- **Industrierechte**
    - national
    - eu-weit (registriertes / nicht registriertes Community Design)
    - international (Hague Agreement)
- **Marken**
    - national
    - eu-weit
    - international
- **Patente**
    - national
    - eu-weit
    - international
- **Copyrights**

4.7 Von allen neuen oder signifikant verbesserten Produkten / Dienstleitungen, die sie auf den Markt gebracht haben, denken Sie an das mit dem höchsten Umsatz: Haben Sie ein Designright, Patent oder Trademark angemeldet oder wurde es informell gelöst?

4.8 Welche Faktoren beeinflussen die Wahl der verschiedenen Schutzrechte bzw. auch die Wahl auf verschiedenen Ebenen (national / EU-weit / international)?

4.9 Wie effizient finden Sie formelle Strategien im Vergleich zu informellen (bspw. Geheimhaltung, Lead time advantage)?

4.10 In wie weit gibt es Bündel von Schutzrechten (Anmeldungen von mehreren Schutzrechten)?