

Redesign of the playpen

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Hangloose Baby b.v.

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MAIN REPORT

Redesign of the playpen by means of co-creation

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PREFACE

The client concerning this Bachelor Thesis is Hangloose Baby b.v., situated in Rijswijk, the Netherlands. Hangloose Baby b.v. (from here abbreviated to HLB) is a young company, consisting of a team with broad experience on the area of children's products and entrepreneurship. There is a right balance between creativity, management, product knowledge, marketing and sales capacities.

HLB wants to become the new international trend setter in the baby- and toddler branch, through innovative, fresh products. It is their mission to be world wide market leader in the area of mobile lie- and carry constructions for the baby. HLB's hammock-playmat (their first and so far only product) creates the ideal lying (hammock-like) position for a baby, and serves as an add-on to the well known playpen. After 4 months, the playmat can be used as an undersoil for the playpen as well as for playing outside.

After talks with HLB's end users and sales partners it becomes clear that there is a need for a playpen which connects more to modern needs and interiors of consumers. Also, HLB suspects that the playpen is not being used outside of the Benelux, thus suggesting a gap in the market. Moreover, a playpen creates an interesting sales combination together with the hammock-playmat. The importance to HLB is to enlarge their market, from her position of selling products in the baby- and toddler branch.

An interesting assignment is composed concerning the redesign of the playpen adjusted to the needs of the users in the playpen market, by means of co-creation with playpen end users. The end users (Dutch parents) are experts on the use of the playpen. Needs and possible improvements are extracted and so a redesign can be formed and be proposed to HLB. The foreign market will

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be researched in order to make a proposal for an introduction of the playpen abroad.

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RESUME

Objectives

The main objective of this thesis concerns the redesign of the playpen, adjusted to the needs of the users in the playpen market, by means of co-creation with playpen end users. The foreign market will be researched in order to make a proposal for an introduction of the playpen abroad. Needs and possible improvements are extracted and so a redesign can be formed and be proposed to HLB.

Execution

In order to obtain the objectives stated, the thesis is split up in four main parts. The main parts are divided into sub parts, starting with the market of HLB. Stakeholders need to be managed closely, Porter's five forces suggest not to introduce the playpen to a market which is already saturated, unless the product has unique selling points and is so able to distinguish itself from competitors. Features of the baby product market are characterized by a saturated market, with heavy competition. Characteristics of the playpen are its square shape, use of wooden materials and primarily white colouring. Price ranges are divers. Consumers desire an emotional connection to the product, wherein storytelling by the company plays an important part. Legislations restrict on the design and use of the playpen, namely through dimensions and use of materials. The furniture sector undergoes heavy competition, mainly from Asia. The made in Europe trend works in HLB's favour. The foreign playpen usage is plotted by means of an online questionnaire. Its results are

questioned. Chapter two starts with an elaboration on the research method called co-creation. By switching roles with user and designer new ideas are to be formed through toolkits which contain say, do and make exercises. A subject-specific co-creation toolkit is formed and subsequently applied to five families with a baby. Current activities are recorded, memories on the use of the playpen are recalled, possibilities for the future are extracted and artifacts for the future are formed.

Results

The outcomes of the co-creation sessions result in the input for a redesign of the playpen, together with the information gathered in the first chapter. A program of requirements is composed and from here, redesigns are made. Concepts are formed through this thesis proposed to HLB. The thesis closes with conclusions, recommendations and critical reflections.

INTRODUCTION

Background

The client concerning this Bachelor Thesis is Hangloose Baby b.v., situated in Rijswijk, the Netherlands. HLB is a young company, consisting of a team with broad experience on the area of children's products and entrepreneurship. There is a right balance between creativity, management, product knowledge, marketing and sales capacities.

HLB wants to become the new international trend setter in the baby- and toddler branch, through innovative, fresh products. It is their mission to be world wide market leader in the area of mobile lie- and carry constructions for the baby.

HLB's hammock-playmat (their first and so far only product) creates the ideal lying (hammock-like) position for a baby, and serves as an add-on to the well known playpen. After 4 months, the playmat can be used as an undersoil for the playpen as well as for playing outside.

An interesting assignment is composed concerning the redesign of the playpen adjusted to the needs of the users in the playpen market, by means of co-creation with playpen end users. The end users (Dutch parents) are experts on the use of the playpen. The foreign market will be researched in order to make a proposal for an introduction of the playpen abroad. Needs and possible improvements are extracted and so a redesign can be formed and be proposed to HLB.

HLB's target group is to be described as prospective parents with a good taste, with middle to high education level and income. Parents who are innovative and have a sense for nice products. HLB chose this target group very specifically. It is a niche which creates a sense of sympathy. Especially this target group wants safety and comfort for the baby, in combination with a cool design. They are also willing to pay for these aspects (*Voller. D, 2014*).

Motivation

After talks with HLB's end users and sales partners it becomes clear that there is a need for a playpen which connects more to modern needs and interiors of consumers. Also, HLB suspect that the playpen is not being used outside of the Benelux, thus suggesting a gap in the market. Moreover, a playpen creates an interesting sales combination together with the hammock-playmat. The importance to HLB is to enlarge their market, from her position of selling products in the baby- and toddler branch. Also, this enhances their vision in becoming a big player in the international baby- and toddler branch.

Objectives

The goal of this Bachelor thesis is to develop a redesign of the playpen, adjusted to the needs of the users in the playpen market. The needs are researched through co-creation with end-users, this way input for an incremental design is generated. At the same time, an overview of the foreign playpen market is desired, for possible implementation abroad. The needs are translated into a program of requirement which comprise the demands of the

redesign. Included in the program are also results from market research on consumer trends and purchasing behaviour. This basis will be transformed into virtual product concepts, which will be presented to HLB. Based on the concepts and information on the needs and the foreign market, conclusions can be drawn whether or not the redesigned playpen would be feasible to be incorporated into HLB's product portfolio and possible implementation into the foreign market.

In stead of a tangible product there will be produced virtual model concepts, to be able to get a clear image of the redesign in a low cost way and in a fairly short period of twelve weeks. The main research will be held in the Netherlands, for much information is available, the access is fairly easy, and communication is clear.

The entire Thesis (reporting included) will be carried out in 12 weeks (April 7th - June 26th) , carried out by Industrial Design student Job van Dongen.

Structure

The objectives stated above are discussed in four chapters.

The first chapter is about the market which HLB is positioned in. Stakeholders and their interests and power are evaluated. Next, Porter's five forces are used to do a proposal of the feasibility of the market entry concerning the rate of intensity of the industry. Competition present in the baby market is taken into account. Next, product features of the baby product market are analyze, its

diversity, the playpen in particular and any trends concerning purchasing behaviour are discussed. Then, any legislation on baby products will be discussed. Activities in the furniture sector are analyzed. In order to get an insight of the foreign playpen market, a questionnaire is distributed amongst 24 countries. The results are discussed after.

The second chapter comprises the empirical research where needs on the playpen are collected from user-experts on the playpen. This is done using a research method called co-creation. By making use of toolkits, information can be extracted from the user. The results on the co-creation practices are discussed subsequently.

The third chapter is about the actual redesign of the playpen. The input of information gathered in chapters one and two are translated in a program of requirements which comprise any demands on the redesign. Concepts are then created and virtual product proposals for HLB are done.

The fourth chapter discusses conclusions and recommendations drawn from the entire process, followed by critical reflections on aspects which could have gone better or more efficiently.

The thesis closes with references including literature, books and websites. A separate appendix document is added to the thesis.

CHAPTER ONE

MARKET OF HANGLOOSE BABY B.V.

1.1. Hangloose Baby B.V. stakeholders

1.1.1. Identification & prioritization

Stakeholders and factors describe all people and parties who are linked to HLB and its activities. HLB designs products primarily for parents, desired by babies (Voller.2014, p.5). Throughout HLB's business model (Voller. , 2014), certain stakeholders are identified, as well as through researching the baby- and toddler segment market online. HLB's business model comprises the main target group, its focus on safety and durability, its supply chain, initiators, vision on the market, its goals (including parties involved), segmentation, positioning on the market, webshop , sales channels and retail. Diverse online baby blogs and shops address many needs, trends, products, brands, legislation and corresponding certificates.

The stakeholders are mapped out in the sections below. This includes not only stakeholders like distributors or investors, but also additional factors like governments, communities and other groups from the environment (Wheelen, Hunger, 2011, p.110). The list of stakeholders is prioritized in the figure on the next page. The stakeholders in the upper right corner attract the most attention for they are the most interested in HLB's works and have the most power to influence HLB's activities. The positions of the stakeholders in the figure is generally elaborated below, in order to gain a quick overview.

Hangloose Baby B.V., initiators, direct competitors, parents

The main focus is on these stakeholders, for they have the highest interest in

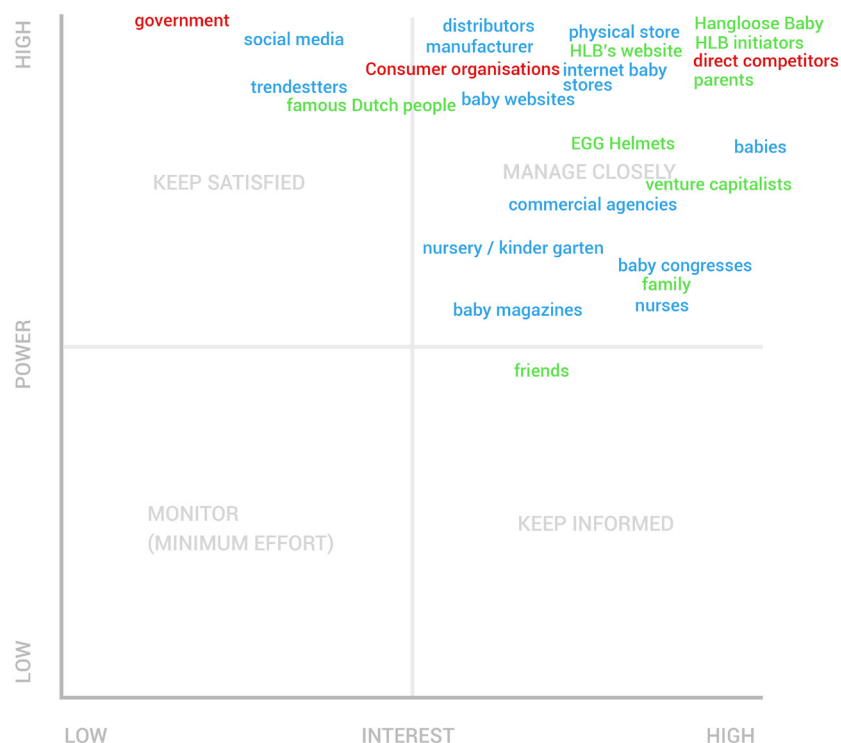


Figure 1.1.: Power/Interest grid for stakeholder prioritization

HLB's products both personally and financially. The products are either made by or for them, and have direct value, either in the form of a physical product or in the form of profit. All choices (on the topic of baby products) made by these stakeholders have direct influence on HLB's activities, which explains the power position in the grid.

Physical stores, HLB's website, internet stores

Products are sold through vending opportunities such as stores and websites. Therefore their interest in HLB's products is high. Because stores can compete with HLB their power is high as well.

Distributors, manufacturers

The same goes for these stakeholders, however their interest lies not only in producing and distributing HLB's products, they deliver their services to other companies as well. This means they would survive even without any contracts with HLB, which gives them power.

Social media

Though social media is more of a community than it is a stakeholder, they have a big influence on the market and its consumers because of their popularity and vast network (e.g. Facebook can reach millions of viewers by posting a single advertisement). Therefore the power is high. Their interests are lower however, for HLB is not the only party with the need of promotion and advertising; this need is shared also with a million other companies around the world.

Baby websites and magazines

They are interested in the world of babies and provide information and advice to parents. They are interested in baby products but their existence is not depending on it (they are not literally selling the product). They have power since a lot of parents often visit and read such websites and magazines. They

might be advised on products like HLB's, which would be in favor of HLB.

EGG Helmets

EGG is closely related to HLB; two of their members work both at EGG and HLB. Also, HLB makes use of EGG's international network and distributors (Voller., 2014, p.15). At the same time, EGG's existence does not depend on the success of HLB, so that puts them in a strong position. However, their interest in HLB is high, for HLB can broaden EGG's network and strengthen relationships with the distributors when HLB proves to be a successful partner.

Venture capitalists

A company needs investments to thrive, often through venture capitalists. Investors are interested, for they invest in the company. The share investors have in the company determines the amount of power they have over HLB and its activities. Until now, the financing is done by the members of HLB themselves, (Voller., 2014, p.8) so no capitalist is yet involved. However the position of the venture capitalists in the power grid remains the same, in case HLB should establish a cooperative.

Commercial agencies

The interest in earning money from HLB is high (it is their job). Their existence does not depend on the cooperation with HLB alone, which gives them power. In the case of HLB it concerns AFAS software (Voller., 2014, p.13).

Competitors

HLB wants to be world-wide positioned in the mobile lie- and carry baby

constructions (Voller, 2014, p.10). This means that all products in this segment are direct competitors. Of course, competitors have high power for the heavier the competition, the lower the prices get (Volkman, Tokarski, Grünhagen, 2010, p.149). Without competition HLB would rule the market, but it would also be hard to determine a right price since there are no observable market prices (Volkman, Tokarski, Grünhagen, 2010, p.37). Also, the people should still be needing an explanation about the function of the product because it was not on the market before (Volkman, Tokarski, Grünhagen & Aldrich/Martinez, 2010, p. 130). Introducing a product which is already existing is an advantage; people have already accepted such a product on the market (Volkman, Tokarski, Grünhagen, 2010, p.59). Naturally, the competitors are interested in HLB's activities, for they are keen on tracking moves of their competitors.

Nurseries / kinder gartens

Kinder gartens are of course interested in baby products. Buying large batches of HLB's products could create discount demands, stating power. Parents could take nurseries and kinder gartens and the products they use as an example, which would give them more power.

Baby congresses

Baby congresses have large interest in all products concerning babies, implying HLB's products as well. HLB is not obligated to adjust their activities to the congress's, so the congresses' power is not high in particular. However, most competitors will exhibit their products at the congresses, which almost forces HLB to be present at congresses. This gives the congresses power.

Family

Family are, next to the parents, dedicated consumers. The level of excitement for their new family member is high, which explains the interest. They have less power than parents because HLB's main target group is parents; HLB is mainly focused on them. Grandparents score higher on the power axis for they often pose as extra parent. Friends can be seen as a 'less close' version of family, which explains their position in the figure.

Nurses

Nurses have less power than parents for they are not the ones buying the products. They are, however, involved at the very first stages of life of the newborn baby; from their experience they recommend certain products and services to the parents, which gives them power. Also, it is in their interest that baby products function well and add up to the care of the baby.

Babies

Babies are not able to demand for certain products, but the products are made for them, so their power is high. It is also in their interest that products function well, so that raises the interest level on the x-axis.

Famous Dutch people, trend setters

In order to raise a voice commercially, famous people can lend a hand; in the same way a trend setter would 'infect' the consumers and buyers around them (D. Kasriel-Alexander, 2015, p.9). This way both have great power, but are not necessarily interested in HLB; They trend set every product they love, and HLB could be one of these products in a row of products. Famous people's interests

are higher for their name is attached to the product and so their identity could be at stake.

Government and consumer organizations

The government has power to set rules, boundaries, laws. There is in principle no higher order of authority in a country. At the same time, HLB's activities will not bother the government much, unless ugly cases occur (for example when harm is done to a baby by a product of HLB). The primary goal of consumer organizations such as 'De Keuringsdienst Van Waarden' and 'Kassa' is to maintain a fair market. This way their interest is higher than the government's. Their power is a little less, for they can not determine demands on products. Their reputation and network can however stretch to parties with more power.

This brief overview of the stakeholders and other factors shows the importance of closely managing all parties, as is to be seen in the upper right square of the figure. A few parties need to be kept satisfied and informed.

In the next section the profitability of the baby product market is reviewed, using Porter's five forces.

1.2. Profitability of the baby product market

Porter's five forces

There are five forces which describe the rate of intensity of an industry, concerning the competition present in the market (*Wheelen, Hunger, 2011, p.110*) (figure 2 to the right). For HLB, all forces will be shortly evaluated in order to map the competition of the baby segment industry. After the analysis of the profitability a statement can be made whether or not to continue operating in this particular market and why.

The playpen finds itself in the furniture industry, so certain results and conclusions are drawn from research in this field. The Porter's forces analysis is aimed at both HLB's hammock-playmat and the to be designed playpen, for similar things can be stated about both: both are new products, operate in the baby market, offer unique selling points and are to be manufactured abroad. Their function and materials / design are different, but even these aspects are related; the hammock and playpen fit on top of each other both functionally and aesthetically. A significant difference is that the hammock-playmat is new to the market and the playpen is not. This fact has been taken into account during the evaluation of Porter's five forces.

All aspects in the next sections which are highlighted green indicate a favorable position for HLB in the market, aspects highlighted red do not.

Orange indicates a position just in between. Focus points for improvement and awareness are on aspects highlighted red and orange, green aspects should be empathized and maintained.

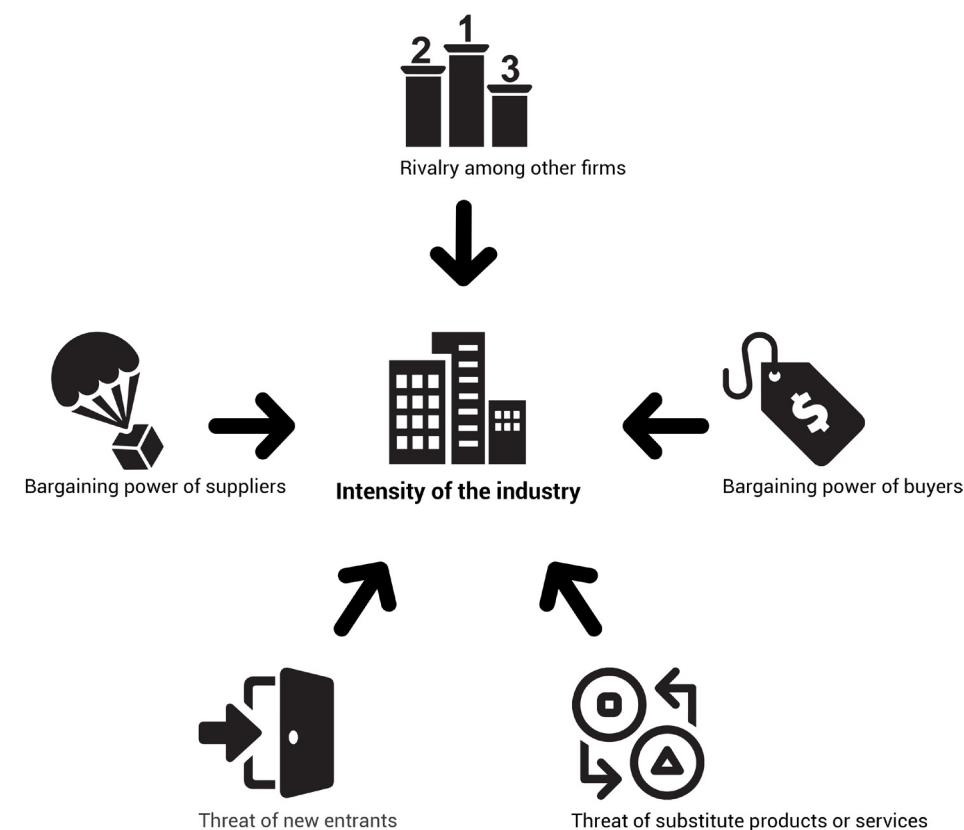


Figure 1.2: Porter's five forces

1.2.1. Force one: Threat of new entrants

Threat of new entrants

Entrance barriers determine how hard it is for a company to enter the market: high barriers are hard to overcome, low barriers are easily crossed. Certain entry barriers of the first force, addressed in Strategic Management and Business Policy Toward Global Sustainability (*Wheelen, Hunger, 2011*), as well as the other four forces and corresponding headers are elaborated below. The furniture market is mature and dynamic (*Centre for European Policy Studies [CEPS], 2014, p.111*), so that makes it harder in general for HLB to enter the market (explaining the red highlight of the header). On the other hand will it be hard for other new companies as well, allowing not every other company to enter the market.

Economies of scale

HLB enters a market where big players are already present. That implies a heavy competition and tough start. A company with high production rates can ask more profitable prices for their products than a company who does not. HLB has to compete with serious players such as Stokke® and BabyBjörn which already have large production lines at hand (and so offer their products at a good price) and have brand awareness (*Volkman, Tokarski, Grünhagen , 2001, p.96*). Next to production costs, other factors also play a role; availability of raw materials, labour costs, investments in machinery, etc. (*CEPS, 2014, p.66*). This means it is hard to sell the same amount of products at the same price. It is the current scale of the thriving economies that highlights this threshold of

economies of scale with red. On the other hand, brands such as Stokke® and BabyBjörn offer their products at a high price, so HLB can ask the same prices without being seen as dramatically overpriced, given that HLB offers the same level of quality. Also, when competing these brands by offering innovativeness and specific knowledge on certain fields, a stronger position could be realized (*Volkman, Tokarski, Grünhagen , 2001, p.96*).

Product differentiation

To stick with Stokke and BabyBjörn as examples, it is to be seen that their level of advertising, branding and brand awareness is high. This sets high standards for HLB to compete with. However, HLB is aware of the importance of design and what they want to project and radiate (*Voller., 2014, p.5-6*). Moreover, with the hammock-playmat they differentiate themselves from the rest, for there is not yet a product on the market which covers the same functionalities. The same idea goes for the to be designed playpen (which should offer unique features as well). This puts HLB in a favorable position. The level of quality which HLB has to match versus the unique selling points they have to offer explains the orange highlight of the product-differentiation header.

Switching costs

When, for instance, a premium retailer is accustomed to sell only one or two specific brands, it is cost intensive for the retailer to switch to another brand. For instance, because of contracts and order/delivery specifications. Thus the risk exists of that it will not adapt HLB's products in its assortment. However, almost every retailer of baby products sells multiple brands (as of online

market research), so HLB could be one of these brands. With a 20% provision rate (Voller., 2014, p.3) they would make for an attractive client. If not through a retailer, HLB could also sell the products themselves, for instance through their own web shop. This saves provision costs, but also infrastructural costs. The uncertainties of finding and convincing sufficient amount of retailers highlights the switching costs orange.

Access to distribution channels

By making use of EGG Helmets' distributors, a minimal cost intensive way of distributing is created, which is favorable and explains the green highlight. As a suggestion, market entry barriers can be overcome by forming a joint venture. That does not necessarily mean joining EGG, but that could also be a venture in a foreign country. This way, legal and cultural barriers can be overcome (Volkmann, Tokarski, Grünhagen, 2001, p.413). Distribution inside of Europe is favorable as well, for there are almost no import costs when trading within countries which are member of the European Union. It is also attractive to trade a lot with China (CBI Market Channels and Segments for Home Decoration, p.8), which pressurizes the distribution market in Europe, in favor of HLB. In other words, why should HLB keep doing business with European distributors when China offers a better alternative?

Cost disadvantages independent of size

The products of HLB have no big market share, for their hammock-playmat is unique and does not exist yet; the playmat is not to be called as a standard in the market. The playpen does, however, have a market share. Therefore, it has to compete with brands who are considered as standard, which is really

tough and so explaining the red highlight. This is also noted at the 'Economies of scale' section two pages back.

Government policy

Governments can be a difficult players for they have authority to restrict industry entry. In the Netherlands for example, there cannot be phthalates or chemicals in children's toys (ECOSA, 2003,p.14), which of course also applies to baby products. However, the Dutch government and policy are fairly tolerant, so no major issues are expected as long as products pass safety tests. It is recommended for HLB to start off properly: "Founding a legal entity for a venture project early on in the process generally enhances survival chances". (Volkmann, Tokarski, Grünhagen, 2001, p.168). Keeping in mind these discussed aspects, a promising (highlighted with green) government policy is to be expected. Should HLB do business outside of the EU, then they need to make sure their manufacturers offer the same requirements that are set in the EU, otherwise penalties could follow (CEPS, 2014, p.114).

1.2.2. Force two: Rivalry among existing firms

Rivalry among existing firms.

The first denominator is the number of competitors: In the baby product segment there are a lot of players, each with their own product portfolio. This is easily seen when looking in baby stores, magazines and at websites. The types of products can be separated in roughly 5 product groups, namely baby hardware, baby care products, baby clothing, baby toys and baby

textile (Hegeman, 2012, p.18). The market is mostly saturated; there exist a lot of brands in each product group (as seen in table A1 in the appendix). It is to be expected that every brand watches over each competitor's move, so the best product price can be guaranteed. To the consumer this will work as an advantage; heavy competition means lower prices (Volkmann, Tokarski, Grünhagen, 2010, p.149). The makes market entry is hard because the consumer's need is probably already fulfilled by another brand, for the saturation is so high. With a market offering a lot of baby products, it could mean that sales will be taken away from one another when a company offers the same products at a higher quality or better price (Volkmann, Tokarski, Grünhagen, 2010), creating a business which is hard to survive in. The high amount of rivalry thus explains the red highlighted 'rivalry of existing firms'.

Rate of industry growth

When more babies are born, more products can be sold. Having the amount of born babies as a bottleneck, it is never safe to say at what rate of growth will be. Sales rates are not easily obtained so no hard conclusions can be drawn about any sale growth or future perspective. Trends in the industry are also determine sales (out-of-fashion products will not sell as well as when they were trending), but are hard to forecast as well. More on trends is noted in section 1.3.3. The uncertainties on sales and trend changes stated explain the orange highlight of the rate of industry growth.

Product or service characteristics

HLB's unique selling point is that they offer a mat which is a playmat and hammock at the same time, while having a sleek design (Voller, 2014, p.9).

Unique characteristics like these should be implemented into the to be designed playpen as well. The uniqueness of the mat and playpen states that they differ from other brands, which sets them apart from the rest; being in a unique position. This is favorable for HLB because the consumer's price sensitivity could drop because of its unique features (Volkmann, Tokarski, Grünhagen, 2010, p.207). The sense of uniqueness highlights this header green. A quote which empathizes this favourability of being unique or have specific targets on the market states the following:

"You need to differentiate yourself not only in terms of price when targeting the middle-high and high-end markets. Develop clear concepts, either based on 'more for less' or 'less is more' rather than 'everything for everybody.'" (CBI Market Channels and Segments for Home Decoration, p.5).

Amount of fixed costs

For it is hard to know in advance how many products there will be ordered, it is hard to know what size one's stock of products should be. Keeping a large stock of products is expensive. Still, the company wants to be of service and deliver products on time, so in the end having too less stock is expensive as well (time-to-volume) (Volkmann, Tokarski, Grünhagen, 2010, p.111-112). Only when sales data is available it is safe to say what the fixed costs will be, explaining the orange highlight of the amount of fixed costs.

Capacity

When selling rates are so high that every brand runs at their full capacity, the

market prices will drop (also addressed in the 'economies of scale'-section). This could mean that HLB has to sell their products at a lower price than they can afford, meaning bad business. They may, however, still keep the costs low through a lean and cost-efficient organizational structure (Volkman, Tokarski, Grünhagen, 2010, p.128). Again, only when sales data is available there can be done a remark on the capacity. This uncertainty explains the orange highlight of the capacity.

Height of exit barriers

The height of the exit barriers in the baby product segment is high, because of the specific products and consumers; switching or quitting a line of products would threaten the existence of a company. This results in a market with high exit barriers and companies who are specialized in producing and selling baby products. This means that for HLB it is a hard segment to enter and to compete with, thus explaining the red highlight of the height of exit barriers.

Diversity of rivals

As stated earlier, there are a lot of companies present in the same market segment. The diversity is hereby middle to low (as is to be seen in A1 in the appendix) as a lot of companies offer the same kind of products. Though while some offer products which are more unique. The low diversity forces each company to take away sales from one another; they are all trying to sell the same product (Volkman, Tokarski, Grünhagen, 2010). HLB however, is choosing to sell their products with added functionality in combination with a sleek design. By doing this, they are competing in a different way than when they would have just copied already existing products. This works in their

favor, for they separate themselves from the rest and this way be unique. This explains the green highlight of the diversity of rivals. The main challenge is to communicate their unique selling points and advantage over the competitors to the consumers clearly (Volkman, Tokarski, Grünhagen, 2010, p.130).

1.2.3. Force three: Threat of substitute products or services

The threat of a substitute product

This is the case when a product fulfills the same need, but is not the same product in particular. (Volkman, Tokarski, Grünhagen, 2010, p.225-226). An example could be breakfast shakes and bread. Since one can drink their breakfast, the need to eat is fulfilled, without the use of bread. When applied to HLB, there are examples of substitute products as well. A baby carrier or sling for example fulfills the need of the parent to be carrying out tasks with both hands and at the same time providing safety for the baby; functions also found in the playpen. Another example could be placing the baby in the middle of little child fences, so they can both play and be safe.

In the Netherlands it is custom to place your child in the playpen (see: section 2.3), but outside of the Netherlands this does not have to be the case per se (see: section 1.4.2.). When parents are used to other products than the playpen, it is a challenge for HLB to convince the customer of any improvements by their playpen and hammock-playmat over the familiar products. Moreover, when competitors should copy any features of HLB's products, another threat is created. HLB should get their products patented, in order to protect

themselves. (Volkman, Tokarski, Grünhagen, 2010, p.96). Because of the risk of copycats, substitute products and uncertainties of new future products by competitors this threat is highlighted red.

1.2.4. Force four: Bargaining power of buyers

If a company cannot sell its products, it will cease to exist. Therefore, buyers have certain amount of power. The following states whether the buyer (being a retailer or consumer) is powerful or not, applied to HLB:

Significant amount

A buyer is powerful when it purchases a significant amount of HLB's products. For instance, when a large retailer purchases a stack of playpens or hammock-platmats, to store in its repository. Or a buyer could be, for example, an umbrella organization of nurseries which provides playpens for nurseries in a certain area. It is powerful because it could demand for discounts on large orders or the buyer could even become the primary buyer of HLB, playing a significant part in its existence. Uncertainties about any fixed selling rates or existing contracts with large clients highlight this header orange.

Re-engineering

When the buyer can re-engineer the product himself, and so rebuild the product from the ground up, then a buyer (in this case the consumer) is powerful. An example could be a handyman that produces his own playpen,

from wood he bought at a local store. Also, there are mothers who sew hammocks or other products for the baby. These buyers won't purchase any of HLB's products and are powerful in that way. However, both will not influence HLB, for the materials of the products are not easily obtainable because of the high quality materials used (Voller, 2014, p.5). The designs can not simply be imitated / reproduced due to skills and tools needed. This puts HLB in a safe position, explaining the green highlight.

Products available at other companies

When the buyer (consumer) can buy the products at any other company and so can pick the least cost intensive, then it is a powerful buyer. This can not be applied to HLB, for HLB produces products which have the unique selling point of making the product multi-functional, while also taking care of a sleek design. There is no other company who sells the same products, let alone the same products for a better price (like is often seen at large electronic warehouses or stores for office supplies). In other words, the product stands out and is only available at HLB, explaining the header's green highlight.

Fairly expensive

In general, baby products are fairly expensive. Therefore, the buyer will not just buy the first next product that comes along. Because it is an investment, the buyer will take the effort of looking around to find the best product for the lowest price possible. This is definitely the case with the playpens on the market, for it is widely available, with ranging prices. The consumer has many choice. The heavy competition highlights the header red.

Cost sensitivity

When a buyer has got not much to spend, it is sensitive to costs and service differences (*Wheelen, Hunger, 2011*). The buyer will purchase a product that fits its needs, for the best price. So most design products, which are mostly expensive) will miss out on sells. However, HLB is aimed at the middle/high segment (retailers included), which implies to not be aimed at the cost sensitive buyers in the first place. In other words, their products are aimed at people who have and want to spend money on products which they like, which highlights the cost sensitivity green.

No worth to the buyer

When the purchased product has no worth to the buyer, the buyer will certainly pick the cheapest product. However, every parent cares about the baby, thus implying that the products will always be of value to the buyer. This kind of buyer's power does not apply to this particular segment, which is in HLB's favor (explaining the green highlight). Also, from the empirical research noted in section 2.3, becomes clear that parents do not want to save on products which provide safety. It would be a strong move to strive for the production of safe products.

1.2.5. Force five: Bargaining power of suppliers

Increase of supplier power

On the other hand (as opposed to the buyer) is the supplier able to show strength, by either raising prices or lessen the quality of their products. The

following states whether the supplier is powerful or not. It is important to know what to do when the supplier power increases, in order to keep thriving in the future:

“When supplier power increases, it is particularly important to improve relationships with your own suppliers. Meet them in person, order and pay on time, look out for interesting opportunities for them and update them on your direction so they are able to anticipate issues/changes.” (*CBI Trends: Tropical Timber and timber products, 2014, p.6*)

HLB is a young company and has not yet established supplier relationships which could prove themselves trustworthy, so it is hard to say whether the supplier's power would increase over time, explaining the orange highlight.

Scarcity of suppliers

“Buyer power decreases with scarcity of suppliers” (*CBI Trends: Tropical Timber and timber products, p.6*). It would decrease the power of the buyer (HLB in this case), if there would be few suppliers which deliver goods or materials which are used for the playpen. However, suppliers of wooden materials (let's pick wood as an example) are well represented, meaning that HLB has the say in which supplier to choose. The supplier power would be enhanced however if the supplier should offer good prices or specific know-how (*CBI Trends: Tropical Timber and timber products, p.6*).

Because of its starting-up stage, HLB has no real contracts with any suppliers yet. The concentration of raw materials suppliers in the furniture sector is

low, giving those suppliers power (CEPS, 2014, p.111). In short, there are no real promising or disadvantageous perspectives to rely on just yet, explaining the orange highlight of the header.

Same supplier

When the same supplier delivers the goods / products to more companies, the supplier can make clever deals, for it has bargaining power. This is in favor of the supplier. No real suppliers have been selected, so no conclusions can be drawn here, explaining the orange highlight.

Not part of the main product

If HLB purchases goods which are just one of the goods among a variety of goods the supplier delivers, the supplier will not lose sleep over a supply contract that maybe ends because of a failure on their side (e.g. if they do not deliver on time every once in a while). While HLB (desperately) needs the product, the supplier has other priorities. Again, no facts are clear about the relationships between HLB and its suppliers, so no conclusions can be drawn just yet. This explains the orange highlight.

1.2.6. Concluding on Porter's five forces

All green markings state opportunities, favorable positions and actions in the furniture and baby market. The most important aspect for HLB is to be offering something unique, so they separate themselves from the rest. This way they gain a promising perspective from Porter's five forces. Just as the

hammock-playmat combo is unique, so has to be the playpen which is to be designed.

What makes the competition hard are the economies of scale, cost disadvantages independent of size, rivalry among existing firms, heavy competition, high of exit barriers and threat of substitute products. These aspects are hard to tackle (red highlights) and tend to suggest not to operate in this particular market. Nevertheless the Thesis is carried out; product proposals are made, might HLB want to introduce the playpen anyway in the long run. Also, doing research by means of co-creation could give innovative insights, and make HLB into a serious competitor by being innovative. Also, the structure of organisation is clear due to the company's small size, which is favourable (Volkman, Tokarski, Grünhagen, 2010, p.31).

There are a lot of orange highlights, which signify uncertainties. In the case of this analysis it is about selling rates, buyer and supplier power. When contracts with suppliers are formed in the near future, more reliable statements can be made. Uncertainties are always present however, for entrepreneurship is all about taking risks while seeing opportunities (Volkman, Tokarski, Grünhagen, 2010, p.5).

1.3. Features of the baby product market

It is necessary to analyze the market and its players, in order to know which products are present. But also to get to know how archetype baby designs look like, what conventional trends are, which materials are used and so forth.

1.3.1. Product diversity

The baby- and toddler segment consists of a lot of brands. A number of brands is collected in the figure below.



Figure 1.3: Baby brand logos

Nineteen known brands and companies are elaborated, in order to map the market and its diversity (see: appendix table A1.). The selection of these brands is based on their popularity and availability on baby web pages and shops. Focus is on the diversity of the product segment, the functionality, the aesthetics the products provide and communicate and finally its unique selling point(s).

Concluding on the diverse market

A distinction is spotted concerning the way of presenting and selling the individual products. The leading, modern companies are storytellers; for each product there is a corresponding story / explanation why this product is not like any other. This carries out a product that is well thought through and is worth buying. It gives a sense of uniqueness; this product must be different from others because it has its own story to tell. Also it suggests that it's no mass production, but carefully selected for each customer. This is reflected in a quote which is used before: "You need to differentiate yourself not only in terms of price when targeting the middle-high and high-end markets. Develop clear concepts, either based on 'more for less' or 'less is more' rather than 'everything for everybody.'" (CBI Market Channels and Segments for Home Decoration, p.5).

There is spotted a trend concerning the aesthetics of baby- and children's furniture; all contain the same level of simplicity, colour palette and combination of materials. Materials are for instance wood and felt. The colour

palette consists of pastel colours and earth tones. Even though the designs are simplistic, they have a high level of detail and quality. A collection is shown in figures B1 and B2 in the appendix.

Also, there is a clear separate colour per part. Strollers for example all have black tyres, handle balusters and clanks, the cabinets have a plain colour, bars and poles often have a metallic / chrome look.

The products offered are focused on interaction between the baby and parent. Also there is thought of ergonomics and safety. Customers can sometimes configure their own products. There is a strong focus on the styling of the baby room as a whole.

1.3.2. The Playpen

To in order to focus on the playpen itself, there are made two stylesheets; one with decorated rooms, one with plain furnitures. Stylesheets are found in the appendix (figures B1 & B2). Bedsteads, playpens and baby beds look all similar and cover somewhat the same functionalities, aside from the dimensions and specific way of usage.

A distinction is made concerning aesthetics and functionality (which together mostly are the unique selling points). Also, pricing is added to map the price range of playpens.

Aesthetics

White is the dominating colour, together with wood, cloth and pastel colours. Materials often used are beech, redwood, hardwood, plywood, multiplex and MDF. Wooden plates are laminated, lacquered, prayed or pickled. The shape is distinctive: every crib and playpen is either square or rectangle. There are some round-shaped variants but they are not very common. All furnitures provide balusters and legs to stand on.

Functionality

A playpen is originally intended to address roughly three needs: to limit the moving space of the baby, to provide a safe playing area, to stimulate movement including learning to roll over, sit and stand up. Some functionalities are copied from cot beds, for they are alike to some extends. Such functionalities are for instance adjustable floor heights, adjustable side dimensions, cleanable surfaces, added drawers underneath, a rocking/ wobble-mode, added changing table, washable cloths, foldable furniture, movable/mobile furniture, added toys.

Some also function as travel cots, can be converted into room dividers, stair gates or fire guards.

Because of the hard subsoil there is always need of an extra mattress, cloth or mat. To limit the moving space of the baby but keep see-through possibilities balusters are added to the sides. Also, they provide a way for the baby to learn to sit, roll over stand up when the baby gets older.

Pricing

Playpens can be found at a large price range. The cheapest ones are available starting at prices around 30-50 euro. In the middle range there are found a lot of playpens, at different prices. The most expensive ones are sold at 600 euro and above.

It is important to keep in mind that playpens are often passed on to family members and friend, and are also bought at second hand stores, either online and offline (also noted in section 1.4.2.).

1.3.3. On consumers

To address the needs and wants more, the consumer of today is analyzed. The following quote (D. Kasriel-Alexander, 2015, p.9) elaborates on consumer trends in 2015:

“Consumption in 2015 is increasingly being driven by the heart: consumers are making choices defined by their positive impact on the world and community through cause-linked buying, the thriving “sharing economy” or the “can-do” attitude that Millennials have in common. “

Furthermore, physical stores do not only function as selling points anymore, they also function as means of community. There is a focus on health, and this is shared and compared with other consumers. Vloggers impact all their

followers with stories. Individualism plays a big role and consumers only want to pay for things that really add up to them personally. Consumers are highly aware of what is offered online and how to operate in the offline world, e.g. in shopping malls (D. Kasriel-Alexander, 2015, p.9). Next to individuality, there is a search for to be original, have unique experiences, gain new skills, have and live by eco-mindsets, a sense of generosity and be connected. (CBI Trends for Home Decoration & Home Textiles, 2014, p.1)

HLB is aware of the convenience of online and real world lifestyles recalled in the previous section. In their business model they state that it is important to be a so called ‘brand butler’, to provide a decent amount of service: “serving is selling” (Voller., 2014, p.12),” Distribution and sales need to be a combination of online and offline sales” (Voller., 2014, p.9). Consumers are focused on pricing and convenience of buying.

“Price is important here, and consumers will shop around (also on the internet) for the best buy.” (CBI Market Channels and Segments for Home Decoration, p.8)

Because of the wide usage of smartphones, consumers are aware of any changes, anytime and anywhere. In order to keep their interest, this process should be convenient (D. Kasriel-Alexander, 2015, p.3). The sharing of their consumption by use of social media adds up to their individuality. (D. Kasriel-Alexander, 2015, p.9)

Also, it is important to notice that most child giving mothers nowadays are

mothers which are well involved in the world of internet oriented behaviour, are trend sensitive and makes use of social media. In other words, not old-fashioned or rusty. Because of this sensitive behaviour it is important to wake interest of important trend setters: the ones determining what is trending. Consumers are hyper aware of changes in the market and how and where they can find the best buy. Because of this, it is important to make sure the communication to the customer is clear. When a trend setter purchases a product, it must have special value which followers also want to possess. That is the tenancy they are able to create (D. Kasriel-Alexander, 2015, p.9). John Demsey, the group president of Estée Lauder quotes: "Celebrities are increasingly moving from endorsing products to being the product," (D. Kasriel-Alexander, 2015, p.9). Celebrities show which consumption habits they have, and express this to their followers. (D. Kasriel-Alexander, 2015, p.9). HLB makes use of the network of famous Dutch women, such as Frederique van der Wall, Nicolette van Dam and Lucy Woesthoff (Voller., 2014, p.13), thus measuring up to these tendencies of using celebrities.

HLB should make products as practical and convenient as possible, so no user time is wasted. When a consumer can save time through a product that functions well, the willingness to buy the product rises. (D. Kasriel-Alexander, 2015, p.1-2). HLB is focused on the middle/high class segment, on the area of comfort for the parent and baby, ease, safety and price. "It is a niche which wakes a lot of sympathy" (Voller., 2014, p.13). These consumers want to buy the best, while not being able to afford such prices per se (CBI Market Channels and Segments for Home Decoration, 2014, p.8). This means that HLB has to offer good quality products for a good price. When the price is too high, the

target group aimed at will be missed out, while the product is not sufficient enough for the high class segment.

The preferences prior to the actual purchase of furniture can be seen in figure B3 in the appendix. It shows that most important aspect prior to the actual purchase is, if the design fits the customer's taste or purpose, followed respectively by a reasonable price, environmentally friendliness and specifically of the brand. (CEPS, 2014, p.144). The surveyed consumers were also asked whether they would be willing to pay more for a product with certain characteristics, as to be seen in figure B4 in the appendix (CEPS, 2014, p.145). According to this figure, a lot of the respondents agree with the fact that, a furniture in this case, should conform to high standards of durability, is easy to maintain and is friendly to human health. All these aspects are also important concerning the design of the playpen, which is also showed in the results noted in section 2.3.

Respondents are most indifferent about whether the product has protected design rights and if the materials used are from the origin the respondent wants.

When it is about the information a product provides, the dimensions and technical performance (e.g. durability and resistance to wear and tear, dangerous substances contained in the product) are most important, followed by materials used and instructions on use. Sustainability information (environmental and social aspects of production) and identification of the producer and origin of the product come next. Identification of design protection rank last (just like there is to be seen saw in the previous section).

Consumers like product information to be in a standard format, so different furnitures can be compared easily (CEPS, 2014, p.4).

“Consumers are looking for functional and decorative pieces that fit into a coherent style. Dominant styles in this segment (middle/high) include a cottage style, which is nostalgic with natural influences, or a ‘minimalist’ style, which is cleaner, with straight lines and limited decoration. Lifestyle is a trend in this segment, with retailers offering ranges combining home decoration, fashion and furniture.” *Center for the Promotion of Imports [CBI], Market Channels and Segments for Home Decoration, 2014, p.8)*

It is good to know which aspects are important to the consumer; this way the design can be thoughtfully made and so connect to the current needs. When interaction has taken place between the company and the consumers, e.g. through contests and offers, a larger amount of sales can be expected (D. Kasriel-Alexander, 2015, p.29).

In short, the same tendencies come forward: uniqueness, an eco-mindset (including sustainability and green products) and connectivity. This connectivity is expressed in the sharing of their newly obtained products, though online media channels.

Many people are seeking ways to be socially and environmentally responsible. (Sanders, Stappers, 2012, p.16) Other consumers notice reviews placed on websites and it is influencing their buying decisions (D. Kasriel-Alexander, 2015, p.10). This is seen when people buy all sorts of products or services, such

as white goods, holidays, spa treatments, plastic surgery procedures, pension plans or new cosmetics products, moving abroad or choose a training course. And it seems a very logical, why not use the experience of people who already purchased the product? (D. Kasriel-Alexander, 2015, p.13)

According to HLB's research, most of the mothers take a lot of time reviewing baby products online, but make the actual purchase is made in physical stores (Voller., 2014, p.11). The internet is the preferred source for gathering details about a product. Next are the the label of the product and support of shop assistants respectively (CEPS, 2014, p.142).

Shopping online has indeed changed consumer buying behaviour, but offline shopping is still not replaced (D. Kasriel-Alexander, 2015, p.15),

As discussed before, there is a need for individuality and self-expression; the need to not be like the rest. An own style is created, which is gladly shared using social networks. To address these needs, companies enable consumers to design or compose their own products, e.g. through their websites. Personalized objects function as status symbol. An emotional connection with consumers is created by telling the stories, where the products offered are part of. This kind of advertising works better than trying to convince the consumer to buy the product (CBI Trends for Home Decoration & Home Textiles, 2014, p.1-2).

This is also to be seen at the shift of the role of the designer, the focus on objects transforms to a focus on the purpose of designing (Sanders, Stappers, 2012). In other words, it is not only about the object/project anymore, it is

about which purpose it fulfills or what it can mean to the user. Again, much more personal. Also, “Design practice is now moving from preoccupation with the making of stuff to a focus on making stuff for people in the context of their lives” (Sanders, Stappers, 2012), which means that it the design is more than just the design alone. It plays a role in a certain context and it affects the user. More on this subject is noted in section 2.1.

Consumers want to express their identity in the home products they purchase, there is awareness on what a product possesses; design, materials and techniques. Because of this trend people expect products to convey this identity. In other words, the demands on product design have tightened, for the expectations are higher. (CBI Trends for Home Decoration & Home Textiles, 2014, p.2) This trend is confirmed when executing the empirical research, elaborated in section 2.3.

To address these needs, it is recommended to offer choice, so people can compose their own personal collections, which are all part of a range of a certain style. When focused specifically on a certain area or culture, it could help to combine specifications of these areas with the product, to appeal to the consumers. This way a niche market is addressed; specific products for a specific target group. This could be advantageous, for people feel that products are specially designed for them and are as well hyper functional using unique techniques and materials, including a sustainable touch to the design, for that will add extra value to the product and so compete with similar products. Also it could be sold for a higher price this way. (CBI Trends for Home Decoration & Home Textiles, 2014).

1.3.4. Legislation

It is no secret that safety comes first, certainly when it comes to babies. Playpens and other furnitures are mostly made out of wood; the demands on the quality of wood are thus of importance. Also there are specific demands on dimensions and functionalities a playpen should poses.

A summary of demands and regulations on baby furniture are stated in table A2 in the appendix. The Thesis will not elaborate on legislation more, for the focus is on the way on co-creation and the redesigns which follow as a result of the co-creation, while keeping the market research in mind. It is, however of importance to follow the dimensions which are defined. Such dimensions are, according to the Flemish Government Agency Kind en Gezin (2015), the distance between two ballusters should be in between 4,5 - 6,5 centimeters. The highest position of the bottom plate should be no less than 30 centimeters measured from the upper rim, the lowest position 60 should be centimeters and above. Holes and open parts should be in between 0,5 and 1,2 centimeters and not deeper than 1 centimeter. Movable parts should not move more than 0,5 centimeters and less than 1,8 centimeters. Further elaboration is found in table A2 in the appendix.

1.4. Foreign insights on the playpen

1.4.1. Furniture sector

Specific data about playpen selling rates is not easily obtainable. As an alternative, there is taken a look at the wooden furniture market in Europe. The four major markets in the EU are the UK, Italy, France and Germany. These account for 66% of total consumption, 60% of total production and 70% of total imports of household furniture in the EU (*Emerging Markets Group*, 2006, p.3). Competition from Asia (China in particular) is heavy. As a result to the many different choices of furnitures on the market, consumers have become demanding on prices, quality, design and delivery. (*Emerging Markets Group*, 2006, p.3).

Concerning imports, the Netherlands is highly dependent on imports (over 70% of the total market in value). A lot of imports come from Belgium and Germany, also due to the well developed infrastructure. They also make use of imports from extra-EU countries (*CEPS*, 2014, p.42),

The industry of manufacturing furniture owes its success to its creative capacity of combining raw materials and technology. (*CEPS*, 2014, p.43). These aspects can meet the needs of the highly demanding consumer. Each country has its own advantages: Low labour costs are found in countries like Romania and Bulgaria, a lot of raw materials are found in Czech Republic, technological skills and knowledge in Italy and Germany. (*CEPS*, 2014, p.43).

While traditional craftsmanship is still applied, it is seen that furnitures are produces more and more using assembly lines with large productions in mind. A thriving country is attractive to outsourcing countries (*CEPS*, 2014, p.43).

A few important aspects to notice about these four (UK, Italy, France and Germany) major markets are summed up below. Germany has the highest consumption of furniture in the EU (23%), with dining/living room beech sector as a thriving sector. Italy is the second largest consumer in the EU (17%), it is the biggest furniture producer and big importer of parts. The UK's imports are 30% derived from developing countries., particularly dining/living room furniture. It is the third largest market in the EU (14%). France is the biggest importer of parts, with 43% consisting of solid wood. It is the fourth biggest market, with 12% (*Emerging Markets Group*, 2006, p.31).

In short, the furniture market is a hard market to operate in, which lots of demands. Competition from Asia is very high, with high pressure on prices. The outsourcing of furniture parts has been increasing as well. Supplying Eastern Europe countries make a switch from supplying to producing the final product (*CEPS*, 2014, p.29).

1.4.2. Online questionnaire

In order to get an overview of the foreign playpen market and usage, an online questionnaire is composed. The exact questions are found in section C in the appendix. The results should be used for a general understanding of the spread of users across the world and for information on usage of the playpen. The questionnaire is plotted in several countries, including Switzerland, Austria, Italy, France, America, Germany, Czech Republic, India, Papua New Guinea, Australia, Vietnam, Indonesia, Sweden, Finland, America, Mexico, Spain, Kenya, Nigeria, China, Ireland, Brazil and the Netherlands. The questionnaire is only addressed at parents, for they have experience on parenting, including possible usage of a playpen or other similarities.

The main goal of the questionnaire is to address whether or not the use of a playpen is common and if not, why not. To sketch an image of the user in its context, relating questions such as age, country, knowledge of baby brands and use of other baby products are asked. To test opinions about function and design of the playpen, 7-point Likert scales were composed as well as to test the feasibility of possible improvements on the playpen. The results of the questionnaires are shown and elaborated on the next below.

The graphic on the next page shows countries where at least one person is either familiar with the playpen or not (blue = familiar, red = not familiar). In every country where the playpen is familiar, respondents would like to have one. This is even the case in Finland, where the playpen is said not to be familiar because of culture / country traditions. The respondents are asked why they think the playpen is a good addition to the baby product segment.

Functions like creating a safe environment are common, the playpen gives a sense of security. The baby can play in a screened environment while there are also other kids playing around. The playpen is great if the parent needs to get something done without being bothered by the baby. The playpen takes in a lot of space, so in smaller homes there is not always one present. The baby learns discipline and playing by itself. Portable playpens are great to use on holiday, for example when there is no baby crib in the hotel room.

These features and functionalities recalled are similar to the ones found with users in the Netherlands, noted in section 2.3. The playpen is a product that passes on to other family members, as well as baby carriers, strollers, tricycles, swings, cribs, car safety seats, clothes, books and toys. Products that offer similar functionalities like the playpen are exersaucers, bouncers, pack 'n play, circular gates and cribs. Purchasing behavior and price indications

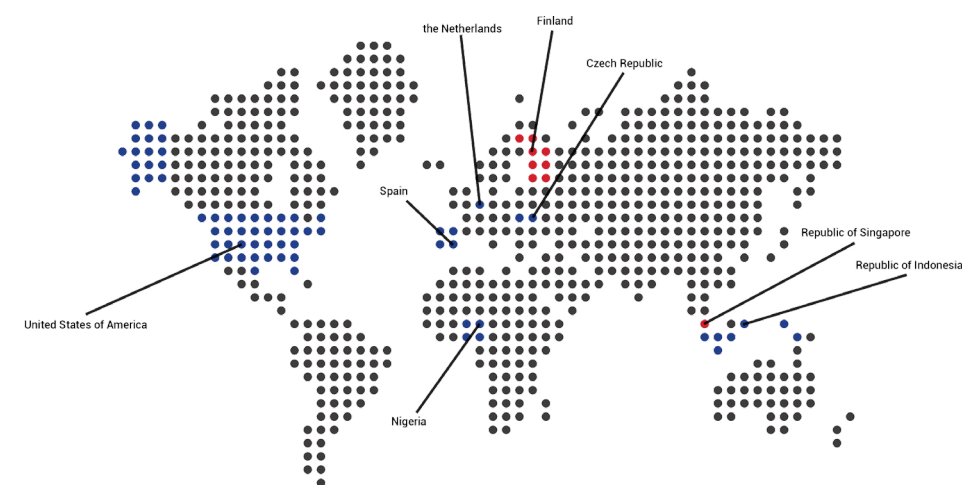


Figure 14: Countries familiar with the playpen

of the countries combined is shown in tables 3&4 below. A number of (new) functionalities of the playpen are composed by student Job van Dongen and respondents are asked to rank these functionalities on a 7-point Likert scale. The same goes for their opinions on the design, usability, quality of materials, durability and sturdiness respectively. Results are shown in tables 4&5 on the next pages. Finally there is asked which characteristics would be a real an improvement on the playpen. An added changing table and foldable (anything portable and attractive) options resulted from this question.

How can your purchasing behaviour be described?

Research	Buy	Amount
physical store	physical store	3
physical store	online store	1
2nd hand store	2nd hand store	1
online	2nd hand store	5
online	physical store	6
online	online store	5

Table 3: Purchasing behaviour (N=122)

How much would you spend on a playpen?

Price range (€)	Amount
0-50	1
50-100	4
100-150	6
150-200	0
200-250	1
250-more	0

Table 4: Price range preferences (N=12)

Do you think the following added functionalities would make the playpen a better product?

1 = not at all, 7 = yes, definitely	1	2	3	4	5	6	7	Average > 3,5?
balusters become walls	6	1	1	2	0	0	2	no
playpen is made foldable	0	0	0	1	2	1	8	yes
added rocking chair function	2	3	1	2	2	1	1	= 3,5
adjustable bottom plate height	1	0	0	2	0	3	6	yes
adjustable length and width sizes	1	0	0	2	1	4	4	yes
integrated changing table	4	1	1	1	1	1	3	= 3,5
added corresponding toys	1	1	2	3	0	3	2	yes
seperate sleeping option provided	1	1	2	3	0	3	2	yes
added HD camera	3	0	3	2	0	1	3	= 3,5

Table 4: Functionalities ranked on a 7-point Likert scale (N=12)

Please indicate the extent to which you agree with the following statements. I am satisfied with:

1 = not satisfied at all, 7 = satisfied	1	2	3	4	5	6	7	Average > 3,5?
design	0	1	3	2	4	1	0	yes
usability	0	0	2	3	1	4	1	yes
quality of materials	0	1	2	3	3	2	0	yes
durability	0	1	0	5	1	4	0	yes
sturdiness	0	0	0	6	2	3	0	yes

Table 5: Opinions on the design of the playpen (N=11)

1.4.3. Concluding on the online questionnaire

Conclusions which are drawn are summed up below; the playpen is known in countries all over the world and is desired by everyone in these countries. Most respondents (N=22) do research online and then buy the baby products either in physical stores, 2nd hand stores or in online stores. Most respondents (N=11) would spend 100-150 euro on a playpen. A foldable playpen, a playpen with adjustable bottom plate, width and length, added corresponding toys and HD camera score above average and would be improving the playpen. All aspects of the playpen score above average (N=11), which supports a positive opinion on how the playpen is known today. Durability and sturdiness could be improved however, for they score lowest.

The reliability of the questionnaire and its results are questioned in section 4.3. Here, will also be discussed what value the results could have to HLB.

CHAPTER TWO

EMPIRICAL RESEARCH: USER NEEDS ON THE PLAYPEN

2.1. Co-creation elaboration

2.1.1. A general understanding

A design approach characterized by user involvement is not necessarily co-creation; co-creation has its particular methods and techniques, it is its own way of researching (SPINUZZI, 2005, p.163). End-users should have a main part in a design process, according to the User Centered Design philosophy (Bont, Ouden, Schifferstein, Smulders, Voort, 2003, p.35). With active user involvement, an active role is given to the end users to gain insight about their needs, practical knowledge and about usage situations. (Bont, Ouden, Schifferstein, Smulders, Voort, 2003, p.36). Mostly is it about one thing: gain the user's knowledge, be it tacit or practical. (Bont, Ouden, Schifferstein, Smulders, Voort, 2003, p.39).

Tacit knowledge is extracted by letting users 'do' things, i.e. by building or testing new concepts in stead of letting them describe things with words (Bont, Ouden, Schifferstein, Smulders, Voort, 2003, p.39). Because it is hard for a designer to come up with and foresee problems in real user situations, the practical knowledge of the user is needed to come up with realistic problems. (Bont, Ouden, Schifferstein, Smulders, Voort, 2003, p.39). These problems can then be translated into solutions, with the help of the designer(s):

“Designers will be needed because they hold highly developed skills that are relevant at larger levels of scope and complexity. By selection and training, most designers are good at visual thinking, conducting creative processes, finding missing information, and being able to

make necessary decisions in the absence of complete information.”

(Sanders, Stappers, 2012, p.15)

Participatory design has not been broadly adopted in the industry, in comparison to user centered design and other active user involvement techniques. This is often because it is hard to define how a group of end users would look like. Also, communities are not homogeneous. Moreover, users can just choose to buy one product and leave the other. This way choosing feasible products will happen anyway, be it before or after the design process (Bont, Ouden, Schifferstein, Smulders, Voort, 2003, p.40).

HLB however, has a very distinct target group, thus a thoughtful selection can take place. This allows the adoption of participatory design.

The communication between users and a design team is hard for both parties. Users do not necessarily understand the language the designers speak, so coming up with clear communication and so extract the right answers can be challenging for the designers. Also, it is difficult for the users to translate their own experiences and uses into new product ideas or solutions (Bont, Ouden, Schifferstein, Smulders, Voort, 2003, p.40).

That is why certain practices/exercises are created, to help this translation. Examples used on this research are noted in section 2.2. Every practice has its own use and purpose, for example to lower the threshold for users to start with the co-creation (Bont, Ouden, Schifferstein, Smulders, Voort, 2003, p.40). As a first exercise, a miniature living room was composed, using 3D-printed furnitures. Because it was fun to do, the users were enthusiastic and so immediately involved in the research.

The use of tool boxes helps focusing the way of co-designing. The tools help the

user to give shape to ideas that fulfill their needs. (Bont, Ouden, Schifferstein, Smulders, Voort, 2003, p.42). Literally shaping (like sculpting, using clay, building artifacts) was not the case with this research however. To just shape the design of a new playpen (e.g. out of clay or LEGOs) was foreseen to be too hard to do. The exercise would be too abstract; also because of the strong archetype of the playpen. This created a challenge to come up with a toolkit that would work, even with an object like the playpen. The exact methods are elaborated in section 2.2.

There are a lot of extraction methods and toolkits available, for example interviews or paper prototypes. Because of the specific target group in every research that is done, each toolkit needs to be specified to that exact research, which is challenging. On the other hand it does not draw any limits; there is no exact toolkit that promises the best results, so varying on different toolkits and methods is possible. A thoughtful selection of tools can help, however.

“There is not ‘a single toolkit’ that can be used everywhere and constructing the toolkit is part of the generative design research process.” (Sanders, Stappers, 2012, p.70).

The challenge which this Thesis faces is to come up with tool sets which translates the language of the user into product ideas, to help them express their creativity (Sanders, Stappers, 2012, p.25). People are more creative on the fields where they have a passion for; this could be living or working for example (Sanders, Stappers, 2012, p.15). That is advantageous for this research, for parents are passionate about their babies and like to create

an environment that enhances safety and comfort. Also, people want to control their way of living and prefer products that will add up to this vision. (Sanders, Stappers, 2012, p.16). Co-creation can be implemented at every point of the design process (Sanders, Stappers, 2012, p.16). In this thesis at the beginning of the redesign of the playpen; the playpen is already an existing product, but the design is done from the ground up.

In a co-design process, the roles of the user and researcher (which is a designer in this case) switch: the user will be the designer, serving as an expert of their experiences (Sleeswijk Visser et al., 2005). The user generates ideas and develops concepts. The role of the researcher is to help the user by providing tools to let them be the designer, for they are not used to be a designer and need help to be and act like one. The tools help express themselves. The designer gives form to the created ideas, after the user created them. (Sanders, Stappers, 2012, p.23-24). The giving of form to the ideas is an essential part, for a user can never totally replace a designer. This is because of the skill set a designer possesses, they have experience in designing and have know-how. Designers are visual thinkers, finders of missing information, decision makers and help conducting the creative process which takes place at the user during the co-creation. (SPINUZZI, 2005, p.24-25). The advantage designers have is that they keep track of new designs and technologies on a professional level, as well as knowledge about how products are made and how it is placed on the market (Sanders, Stappers, 2012, p.25).

2.1.2. Say, do and make-exercises

Figure 2.1 below shows that say, do and make tools and techniques complement and reinforce each other. This means, that if one wants to subtract information from, say a user, the researcher has to use all three types of techniques to get the most information out of the user.

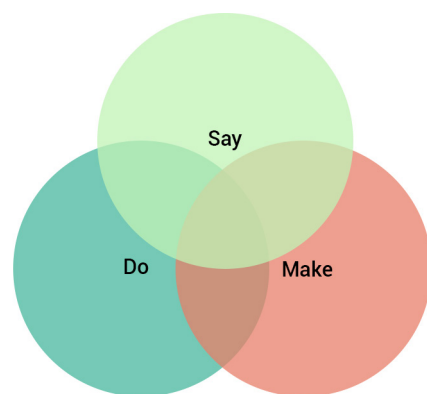


Figure 2.1: Say, Do and Make tools and techniques complement and reinforce each other. (Sanders, Stappers, 2012)

The same is to be seen in figure 2.2. on the next page, where different methods reach different kinds of knowledge, varying from superficial to deep levels. Say-exercises can be conducted using questionnaires, interviews, etc. Users can express what they think, and why they think so. They can report on events that occurred before the interaction with the researched had taken place (Sanders, Stappers, 2012, p.69). At this research, this is done by handing out a preparatory booklet a week before the actual co-creation session with the user.

More on this booklet is noted in section 2.2.

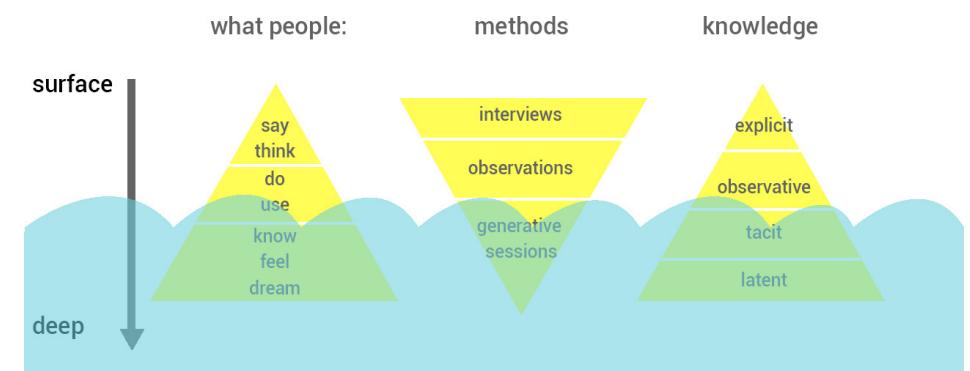


Figure 2.2: Methods that study what people Say, Do and Make help access different levels of knowledge. (Sanders, Stappers, 2012)

Do-exercises are meant for the researcher to observe what people do, what their activities are and which object they use. This can be observed by eye, written down on paper, recorded on audio or video, etc. (Sanders, Stappers, 2012, p.69).

Make-exercises let users express themselves through the making of stuff (Sanders, Stappers, 2012, p.70), through 'toolkits of expression'.

"They are used for recalling memories, making interpretations and connections, seeing and explaining feelings, or imagining future experiences. creating a toolkit that is fit for the study is a key skill and key factor to success." (Sanders, Stappers, 2012, p.70).

Make tools could grant access more information on the understanding of the user, both tacit and latent knowledge. The make tools help imaging the future by making the user aware of what happened in the past. (Sanders, Stappers, 2012) This is exactly what the toolkit used in this research does, noted in section 2.2.

The toolkits need to be composed of different aspects. The content should be varied; photo collections should not only offer people, but also places, moods, etc). The level of abstraction should also vary, as well as the levels of ambiguity and openness; abstractions could be perceived differently by the user than was originally intended by the researcher. It should also be varied in aesthetics; it is important that users feel free when expressing themselves. When toolkits vary in aesthetics, the user's creativity is encouraged. (Sanders, Stappers, 2012). The toolkits and materials need to be free from errors, but not necessarily be overly designed, for people are less likely to engage with the toolkits if the toolkits look too 'finished'. A balance between sketchy and designed is to be found (Sanders, Stappers, 2012, p.159-160).

It is recommended to let the user elaborate on their own observations and reflection of the situation they are in, before talking about what to be doing in the future (Sanders, Stappers, 2012, p.161). This is done through the booklet which is handed out a week before the actual research.

2.2. Co-creation approach

As discussed in section 2.1., there is not 'a single toolkit' that can be used everywhere (Sanders, Stappers, 2012, p.70). The book "Co-creation and the new landscapes of design" by E. B.-N. Sanders & P. J. Stappers gives a clear and structured approach to conducting a good co-creation session. Four main steps are described, which are quoted below. By creating tool kits that follow the structure of the four steps, a specific co-creation session is created.

The four main steps are (quote from the book):

- "1. start with observing and documenting their current activities (what people do) around the topic of study*
- 2. then recall memories from earlier experiences using a make exercise that includes photographs and other evocative triggers*
- 3. reflect on those memories and possibilities for the future with a make exercise that allows for abstract and/or experiential expression*
- 4. then express in a make exercise with a make tool such as Velcro-modeling to create artifacts for future experiences."* (Sanders, Stappers, 2012, p.160)

The research is built up in six parts, introduction and ending included. The remaining four parts describe the four steps mentioned above. All parts will be elaborated in sections 2.2.2. through 2.2.7. It serves as a guide though the co-creation process with the participants, which are experts on the use of the playpen. At the preparation of this co-creation session, the information noted

in section 2.1. is used, in order to create a solid approach. The words user and participant are used interchangeably, they have the same meaning in this context. The same goes for co-creation session and research, researcher and designer (both refer to the same person, student Job van Dongen).

2.2.1. Before the research

Selecting participants

In order to increase the success of outcome of a co-creation session, it is necessary and difficult to select the specific target group the product in question is aimed at. (Bont, Ouden, Schifferstein, Smulders, Voort, 2003, p.40). In this case, it is about parents with babies. People part of this group are widely available in the network of student Job van Dongen. Five sets of parents with babies of different ages are selected (3 - 20 months old). This way the playpen could be evaluated in each stage of usage and so gather a complete set of information. One couple of the set of parents did not possess a playpen however. The selection of this couple is done consciously: interesting information could be gathered since the parents deviate from what is received as standard. Moreover, one of these parents is a nurse, which is a good source of information on babies. One could argue that the toolkits are specifically designed for the redesign of a playpen, so this co-creation would not work with parents who do not own a playpen. Still, this is not received as problematic; the parents do have their vision (they specifically chose not to take one) on the playpen and know its use. Moreover, questions about styling of the playpen

can easily be imagined by the parents: they can pretend what they would have liked if there would have been a playpen or other baby furniture in the room. Certain functionalities they think that miss out on the playpen could function as usable input in the redesign.

In short, a promising group of parents is selected. After informing the parents, they were found to be willing to participate, in the right time span of this research.

Weeks before the research: the preparatory booklet

A few weeks before the actual research, a preparatory booklet is designed and handed out. During a week, the users have to note down their activities with the baby in a small diary, note down the times the baby is placed in the playpen and recall any positive / negative concerns that may pop up. At the end there is space for possible notes and comments. The booklet is designed to be looking open and inviting, while still looking sleek. It is made using Google's Material Design elements. The booklet is found in section D the appendix. Through the booklet current activities are recorded, this way a scenario and the way of use is mapped. It also creates a way to look back upon what happened, and so to recall any memories during the co-creation session concerning the baby and the use of related products. Moreover, the user is prepared on the subject of the playpen and so be on the same level of awareness with researcher and designer Job van Dongen at the time of the co-creation session.

A few days before: requests

Normally people clear up their homes when they expect any visitors. This time however, the participants are asked to not clear up the room. This way the co-creation session can take place in an every day situation, creating realistic results. (Sanders, Stappers, 2012,p.169). People need to be asked if they are okay with the researcher using a microphone. State that their absolute anonymity is guaranteed. Next, state what the length of the co-creation session will be, so the participants know what to expect. Lastly, inquire about the preparatory booklet. Is everything going as planned? Are there any struggles? At the end of the request leave any space for possible questions, so the participants feel at ease and not under pressure.

The kit

One of the main parts of this co-creation research is the development of the toolkit(s). Multiple toolkits are used and explained in the next sections. A composition of the different toolkits is shown on the next page (Figure 2.1), with a legend on the page after clarifying each element. A more detailed view of each element is found in appendix section E. A smartphone is used to record any audio, an SLR to take pictures.

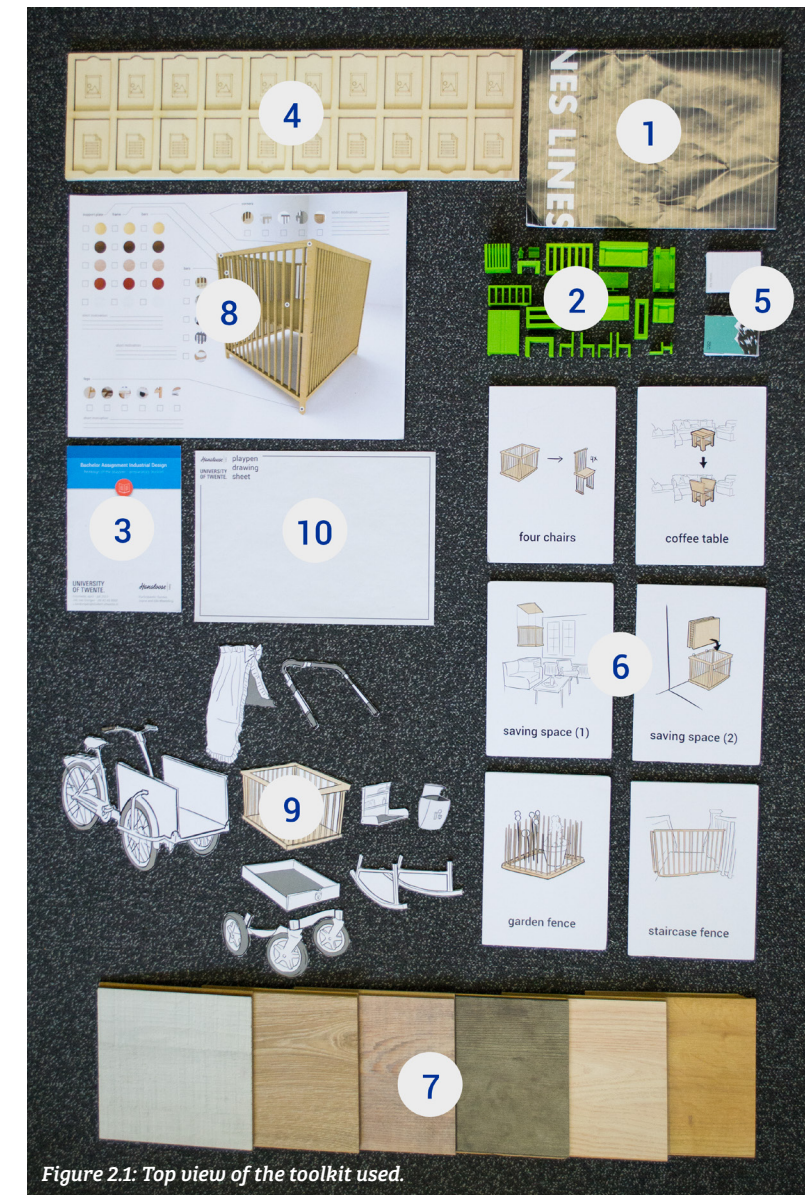


Figure 2.1: Top view of the toolkit used.

Legend

1. Notebook, including a session script of the co-creation session, used throughout the whole session.
2. 3D-models, used in part three.
3. Preparatory booklet, used in part three.
4. Stylesheet board, used in part four.
5. Images and key words cards, used with the stylesheet board in part four.
6. Out-of-the-box concepts, used in part four.
7. Different types of wood, used in part four.
8. Mass-customization spread, used in part five.
9. Products combined, used in part five.
10. Playpen drawing sheet, used in part five.

The actual research is described on the next pages. Words marked with blue are important elements throughout the co-creation sessions.

2.2.2. Part one - introduction

At the start of the actual research, note down the **time** in the **notebook** (number one in the toolkit overview) in order to keep track of the length of the co-creation session. Again, ask permission to turn on the **microphone**. Normally the research is done in teams, however this research is carried out by one person, student Job van Dongen. Therefore there is need of a microphone, to record results which are not noted down. When permission is not granted, a request to answer slowly needs to be made, in order to match the talking and writing speed.

In the introduction there is room to thank the participants for taking part of the research. Next, a short story about HLB and the corresponding assignment is to be told. The structure of the research should be made clear, so participants know what to expect globally.

2.2.3. Part two - Recording current activities

This part starts off with a short tour through the **baby chamber** and **living room**, in order to sketch a scenario. Take a look which products are used and how furnitures are positioned. Use the **SLR** to take pictures so it is recorded. After the short tour the user should show how the **playpen** is used, to get an idea of how the interaction between baby and parent is and what problems/struggles could occur. Make pictures of the playpen and the objects which are inside so a comparison with playpens at other houses can be made.

Next, the [HLB hammock-playmat](#) is handed out (Section E in the appendix). Its use and unique selling points should be elaborated. Also the [one page manual](#) of the hammock-playmat is shown (section E in the appendix). The user's opinion on the playmat is asked through questions like: "What are your first impressions?", "What do you like, what not?", "Are there any aspects you already think could be done better?", "How much would spend on such a hammock-playmat?".

After the introduction of the hammock-playmat, make clear that from now on, the focus is on the playpen, not on the mat.

2.2.4. Part three - Recalling memories

To start with a fun exercise (to break the ice a little), the users should arrange their own living room, using the first tool provided: [3D-printed furniture scale models](#) (number 2 in the toolkit overview). By creating a living room on scale, the context of the living room is right in front of the user. They can empathize with the furnitures and arrange them else if they will. Also, the user is made familiar with the co-creation process, by executing a 'do'-activity. Questions like "Why is the playpen placed over there?", "How and where would you move it if you had to?", "How would you store it if you had to?", "What is the role of the playpen in the living room?", "Does it need to be involved more?", "Does it bother you that it is in the living room?" are asked. All answers (also quotes not related to the specific questions) should be noted, in case useful information might be shared.

After the introductory exercise, ask for any remarks on the [booklet](#) (number

3 in the toolkit overview) and the playpen in general. "How did it go recording the baby's activities last week?" and "Do you have any questions which you already like to ask?" could be questions to start with.

Next, the booklet's [diary](#) should be addressed. Questions like "What did you think of keeping track of your parenting and the baby's activities?", "Did any exiting things happen or thinks you did not expect?", "While you were more aware of your parenting, were there things you noticed specifically?" could be asked. Let the discussion flow and note down carefully. The diary lets the user recall his/her memories and makes them aware of the situation and so certain activities, actions or struggles may become clear and can so be discussed. To recall the section from 2.1.2. again: the make tools help imaging the future by making the user aware of what happened in the past. (*Sanders, Stappers, 2012*)

Next, the booklet's [playpen graph](#) should be discussed. The same questions mentioned above could be asked. There is always room for more questions, might they pop up.

The main part of the booklet are the [concern pages](#), where the user notes down any worries about the playpen and its use. [Negative concerns](#) could be, for instance, that the baby would get stuck with its legs between the balusters of the playpen. A [positive concern](#) would be that the baby can play safely without being bothered by, say, running and playing older siblings. Try to find underlying reasons for the concerns. Let the users think of possible solutions to the negative concerns and possibilities to address positive concerns even more. How would they realize these solutions? If there are not much concerns

noted down, why is that? Could they think of additional concerns? After these questions, let the discussion flow.

When any **notes** were taken in the booklet, discuss them. Try to find out underlying reasons and possible solutions.

Next, try to **recall memories** about the purchase of the playpen. Where did the user buy the playpen? Why a playpen and not a similar product? What aspects were important when buying the playpen (both functionally and aesthetically)? What is the maximum price the user would spend on a playpen? Can they describe any other baby products they like, and why do they choose these particular product?

According to the time schedule, the research would be at half time. In order to keep the minds of the researcher and participants fresh, a short break should be taken. When the first part went by faster than expected, shift the break to after the next part.

2.2.5. Part four - Possibilities for the future

The second exercise comprises the user's **composition** of ten favorite **images** (number 5 in the toolkit overview) out of a stack with over a 100 images (section E in the appendix), with descriptions (**key values**) of why the participant chose those particular images. The images and descriptions can be placed in corresponding **stylesheet boards** (number 4 in the toolkit overview),

which creates a clear overview (found in section E in the appendix). This also serves as a practical means for data collection afterwards. The images are selected are divided in eight categories: A: baby related, B: fashion, C: architecture (outside), D: art, E: animals/nature, F: people, G: architecture (inside) and H: products. The purpose of this exercise is to find out what key values are concerning design, styling, needs and parenting. The participants get familiar with describing what they see and feel, which could help with designing later on. The participant gets inspired and by noting down key values nice and unique value combinations are formed (e.g. ease of mind & spacious), where designs can be inspired on.

After letting the participant compose the stylesheets, questions like "Can you elaborate on the pictures you chose?", "Why these particular images?", "Is there a clear structure present?", "How important is styling of your home / living room?", "Can you trace that importance back to the pictures you chose?", "Are there certain values present which you would like to see applied to the design of baby products or more specifically, the playpen?" could be asked. Let the discussion flow. By answering these questions, the participant is unconsciously defining an image of products he/she likes and why, which could help later on in the co-creation process.

Next, recall the **concerns** noted in the booklet again. This serves as a preparation on the next exercise. Try to actively come up with solutions to the negative concerns, discuss how to prevent the negative concerns. Are there other products than the playpen which already provide solutions to these negative concerns? How are the positive concerns guaranteed? Could they be guaranteed more or better? Are there other products which also guarantee

these positive concerns? If there are not much concerns noted, try coming up with concerns together.

Before heading to the next exercise, the **need of change** should be discussed. Is there even a need for change (look at negative and positive concerns)? What should a playpen be offering concerning its functionality and aesthetics? Can they come up with something that could be used in the same way? In other words, how would an ideal playpen or playpen-like product look like? What should the design communicate to the baby and its surroundings? What should the playpen offer the baby? What are the user's wishes?

Not all of these questions have to be asked necessarily; when the participants elaborate on certain questions and so come up with good answers and solutions, the goal of this section is achieved.

Next, show **out of the box concepts** (number 6 in the toolkit overview) in order to inspire new product ideas or ideas for incremental designs. Out of the box concepts include odd ideas which are hardly feasible but at the same time funny and inspiring. Concepts explaining additional usage of the playpen when it is out of use are also showed. Discuss the peculiarities together with the participant, what do they think? Could some concepts be feasible? Should the playpen always be square or rectangular? And why?

Next, bring in **different kinds of wood** (number 7 in the toolkit overview) for different looks and feels. It serves as an inspiration and as a bridge to the next exercise. Could these types of wood be used on the playpen or other baby products? Which kinds would be nice and why? Should it always be made of

wood? And why? Which types of wood match well, aesthetically speaking?

2.2.6. Part five - Artifacts for the future

To simulate the concept of **mass customization** (to pick up on its popularity (*CBI Trends for Home Decoration & Home Textiles, 2014, p.1-2*)), hand out a **spreadsheet** (number 8 in the toolkit overview) with a render of a playpen and different options of materials, looks and shapes. Let the user compose its own perfect playpen. A summary of the results are found in the appendix section F, a few results are shown in section 2.3. Afterwards, discuss what they think of composing a personal playpen. Can they elaborate on any explanations given? Are there explicit opinions, options that should be applied to the playpen no matter what (e.g. it should be white at any case)? Also ask the participant if they would like to have to concept of 'mass customization of a personal playpen' online. EGG helmets uses such a system on their helmets, HLB could apply this as well.

To inspire more, show the participant **combinations of other products** together with the playpen (number 9 in the toolkit overview). For instance, the handle bars and wheels of a stroller in combination with the playpen forms a new product: the strollerpen. Let the participant combine different products, with different products present in this toolkit. What do they think of the combinations? Could there be formed feasible combinations? Why yes or no? Can they come up with combinations of other products together with the playpen themselves? What about these new concepts?

As a last exercise, hand out **drawing sheets** where all inspiration and new ideas can be drawn on. Show / exhibit all exercises done so far and let it serve as an input for 'the playpen of the future'. Wrap up all ideas and remarks made during the research. If they would sell this playpen, why should people buy it?

Afterwards, discuss the new ideas that are created together. Be serious about what could be realized and what could not.

2.2.7. Part six - Ending

Have a discussion afterwards wherein any questions could be asked and remarks can be done. Thank the participants for participating. Hand out a suiting present and ask what they thought of doing the research. Do they have any tips or suggestions?

Turn off the microphone at the very last moment, for sometimes the most valuable things are expressed when the 'official part' is over and one can have a nice chat without any pressure (Sanders, Stappers, 2012, p.160).

2.3. Co-creation results

As a result to the elaborated approach in section 2.2, the following results are recorded and evaluated. Every piece of text results directly from the co-creation sessions, without any interpretation of the researcher. The basis of the to be designed playpen are the ideas, expressions and drawings of the participants. A few photo's of the co-creation sessions are shown below.



Figure 2.1a: Co-creation session



Figure 2.1b: Co-creation session



Figure 2.1c: Co-creation session



Figure 2.1d: Co-creation session

2.3.1. Recording current activities

Baby rooms are calm, peaceful and functional. Dressers are often normal cupboards / closets with the height of a dresser. On top there is a cushion which is used to change the baby. But also traditional dressers are spotted. In small houses, the baby sometimes sleeps in the parent's room. A co-sleeper is sometimes used. Photo's of baby rooms of the participants are shown in appendix section F.

Putting the baby in and out of the playpen is done easily, no struggles are recorded. The amount of possible bottom plate heights varies. On top of the bottom plate there is a soft cloth (sometimes with an additional foam mattress), to soften the hard undersoil. The playpen is full of toys, sometimes there is a baby mobile installed on top of the playpen. Parents addressed that they like the playpen to be a place to store toys and other baby products; it is the perfect spot for all objects that have to do with the baby. The playpen would be standing in the way, if it would not provide this storage functionality, according to one of the parents. Audio has a strong impulse on the baby. Music is often used in baby mobiles or toys. The playpen is mostly placed in a corner, at a position which is clearly visible. This way both baby and parent have good overview. Playpens with wheels are easily involved in the activities in the house, such as cooking and conversing on the couch.

The HLB hammock-playmat is, according to playpen participants, a nice add-on. It is not received as really necessary, unless, it is scientifically proven that the lying position provided by the mat is healthy for the baby. Participants think the cloth looks nice and that it would fit in any interior. It is also soft,

warm and comfortable. It would be handy especially for babies who are premature or for mothers who can not walk up and down the stairs easily after delivery. Instead of putting the baby to sleep in their rooms, the baby can rest on the HLb cloth. In contrast, all researched parents think that playing and sleeping space should remain separated. However, in the first months the baby will not be aware of the exact place it is sleeping.

Because the bottom plate is hard, the comfort of a mat is nice. Concerns are addressed about if the hammock-playmat is safe in the first place; it is placed on the top of playpen and in theory the baby could roll off (especially when the baby is growing towards an age of four months). Another concern which is expressed is when the hammock-playmat should loosen, which could make for serious casualties. The risk is not present (the buckles are strong and tight), but still the concern is expressed. Price estimations are made around 30-40 and 70-100 euro. The hammock-playmat possesses extra functionalities, so it could be sold at a higher price than ordinary playmats.

One couple did not make use of a playpen. Because of their relatively small apartment, but also by their vision on parenting (carrying the baby is preferred over letting the baby be on its own in the playpen). Variants on the playpen they are using are carrying slings and Tula® baby carriers. Because of the sling or Tula®, the baby is close to the mother all the time which is the main part of this parenting vision. This way the baby does not have to be on itself in the playpen. The baby carriers are fool proof, since there are extra safety buckles attached.

2.3.2. Recalling memories

The preparatory booklet shows the interaction between the parent, the baby and the playpen during one week. The diary in the booklet does not show special events in particular. The playpen graph in the middle shows that the playpen is primarily used between 07:00 and 18:00, with peaks when the baby wakes up and before dinner. This tendency is seen at all researched families with a playpen. Users state their contentment that they can do whatever they want, without constantly holding the baby. The baby gets bored when it is in the playpen too long. Also, the older the baby gets, the less it wants to be in the playpen. It is important that playpen serves as the baby's own spot, where it feels safe and comfortable. Parents do not like the box to be the eye catcher of the room, looking at its (old-fashioned) design. Reasons why some parents do not have a playpen but a baby carrier or sling instead, is because lack of space, for example in small apartments downtown.

Putting on the baby carrier and the baby all day long has an image of hassle and clumsiness. Some parents have a different mind-set and do not think it is such a hassle. This implies that the use of a playpen is, next to a cultural custom, a personal choice.

Parents had not thought about buying products other than the playpen, for it is indeed normal to have a playpen in the Dutch culture. Ease of use is important, as well as safety, design and colouring. Washable cloths and diapers are addressed as handy; not every playpen mat or mattress is washable, which turns out to be problematic sometimes. Younger babies are mostly focused on what is happening above them, because they are not strong enough to roll over and see other sides of the playpen. A playpen is an object

which one just should possess, it is part of the list of necessary baby products; it is in the Dutch culture. Daycares use little baby fences placed on the floor and at eye-level suspended playpens. Underneath these suspended playpens kids can play or there is room for cupboards / closets.

Playpens are often not used longer than a year, so buying an expensive one is not always convenient to the user. On the other hand, the product is being used every day, several times a day. So a good functioning playpen is desired. Alternatives such as setting up small fences in the living room demand a lot of space. Parents do not feel comfortable about the idea of the baby playing on ground level. This is because of hygiene (cat/dog hair for example) and safety reasons; the baby can be trembled by possible pets or toddlers. Clearing the fences afterwards together with the stuff which was placed inside does not seem convenient. Fences would be a better solution for when the baby is grown up more or for holiday or traveling purposes. Worries about draught in house are expressed, so parents prefer to have the baby positioned on a higher level. Because of the height of the playpen, the baby can interact on eye level, when people are sitting down. This way the baby is present in the living room, even while it is not actively involved in a conversation or other activity in the living room. Also, the baby is picked up more easily when it is in the playpen than it would be playing on ground level. Parents do not want to save on money when safety is at stake (for example at car / bicycle seats). The playpen is often bought second hand, provided that it is a sound purchase.

Positive and negative concerns are easily summed up, with positive concerns that the baby is safe in the playpen, also from pets. It is a handy furniture to

let the baby play safely while the parent can do something else, while still able to observe the baby from a distance. By making use of the balusters the baby can learn to roll over and stand up. It would make sense for the playpen to be offering a disassemble (or folding) function, to store the playpen if needed. The drawer underneath provides storing space, the readjustable bottom plate makes the playpen usable for different ages. Negative concerns are the threat of the baby getting stuck with its legs between the balusters of the playpen. The cloth on the bottom of the playpen is either too small or too large. This way the cloth does not fit snugly inside the playpen. Also, the bottom plate is slippery, causing the cloth to shove. Moreover, the bottom plate is hard, forcing the parent to put a cloth on top. Some playpens are non-movable, so moving it to another space of the room and cleaning behind the playpen is hard. When the baby stays over at family, for example a day or weekend, the playpen can not be disassembled and be moved to the stay-over address.

2.3.3. Possibilities for the future

Styling is very important, for certain reasons: it is nice to live in a space which feels comfortable, but also to create a space where other people (e.g. visitors) are feeling at ease. The need for styling is found in the selection of the pictures and their corresponding explanations in the exercise noted in section 2.2.4., also shown in appendix section F.

Styling elements are wood, white, light atmosphere, spacious, sleek and minimalistic design, neutral and light colours (white colours nine out of ten

times). Designs should radiate calmness, elegance, authenticity and neutrality. The playpen is not the furniture in the living room, so it should not necessarily stand out. Playpens should have a natural look, also they should be easy to clean.

The playpen should be sturdy and solid. The shape of the playpen is interior dependent; a large house could provide a large (even round) playpen, while a small house demands for a square rectangle one. A wooden structure gives a sense of sturdiness and quality. Hard edges are sometimes rounded off, to provide safety and comfort. An open structure between the playpen's legs and bottom plate gives a sense of wobbliness and inexpensiveness. The colours of the playpen are often adjusted to the colours of the floor and walls.

Certain functionalities which are addressed during the co-creation sessions can result in redesigns. Wheels underneath the playpen are found to be an asset; parents want to be able to involve the baby in the room they are in, for example in the kitchen when they are cooking. Just as important is the drawer beneath the playpen, to store baby care products, toys and so on. The space beneath the bottom plate remains unused in the first year of the baby. This unused space could be used as a storing space. The bottom plate can be adjusted, however that appears to be a difficult job; it takes about 10 minutes and is preferred to be done by two people. To avoid a slippery undersoil, the bottom plate should have a surface which is more rough. Because of different sizes of playpens and playpen mats, it is hard to find matching combinations concerning their dimensions. Hooks attached to the side walls are nice additions, to suspend diaper bags for instance. A standard to install a baby mobile is also mentioned. The playpen could also be used to seal off a particular room,

when the width of the doorway is smaller than the playpen's. A clothes horse could be installed on top of the playpen, to save space in small apartments. Adding a rocking chair function is received as a funny extra functionality, but would not necessarily be a unique selling point. Washable playmats are dressed as a pleasing improvement.

The biggest issue concerning the playpen is its size; not every family has too much living space and still they want to provide enough space for the baby in the playpen. At daycares it is seen that playpens are placed on top of cabinets, to save space; instead of placing the baby inside the playpen from the top, one of the side walls is movable, functioning as an entrance.

Parents are afraid the baby will hurt itself when it learns to stand up in the box; the baby could fall against the balusters or chew off the paint of the top rim. Larger width and length dimensions are mentioned as solutions to the falling problem, added chewing rings could prevent the baby from chewing on the painted wood. Round edges and corners, soft balusters and thicker play mats were also provided as solutions. Round balusters are in general preferred over square ones, for they are easier to hold on to. Balusters are also perfect to keep good sight on the baby, for dense walls would hinder any sight on the baby. Moreover, the baby uses the balusters to learn to stand up for example. To address learning to stand up and walk more, options like mini staircases and high suspended toys (there is always a market for toys) were addressed. Cleaning the furniture is hard when lots of ornaments are added to the design.

The strange combinations of products noted in section 2.2.5. are received differently. The idea to put the playpen in the middle of the living room and use

it as a playpen and coffee table at the same time is received to be funny, but not feasible; a playpen would be too big and clumsy to be having in the middle of the living room. Also combining a tricycle with a playpen is not received as feasible.

Ideas about what to do with the playpen once it is out of use are received well. The transformation from a playpen into a staircase fence, garden fence, sofa bed or slatted bench would be handy. The staircase fence is the participant's favorite option; when one or two sides of the playpen would be used to converted into a staircase fence, the own playing space of the baby would still be there, and at the same time safety at the staircases is guaranteed. There are also ideas about turning the playpen into a sandbox or playing house. The playpen could also be folded like a harmonica. This way the room would look cleared up, which gives a good feeling. When it is folded, it could be attached to a wall and serve as a wall piece. Adding a commode to the playpen was found to be a good idea. There is also spoken of a convertible of a cabinet and playpen. This is however in contrast to the opinion of separating playing and sleeping. A suspended playpen could work, but only if it is designed very well. Otherwise it would trigger similarities with bird cages and it would also limit seeing space. To store toys, a matching toy bag would be desirable. Parents believe that the playpen is already functioning, but having a nice design would add up to the playpen as a whole.

Using the concept of mass customization is received well. Suggestions concerning use of colouring were to use one kind of colour and alternate with a different teint or complementary colour. Examples are noted in section 4.2.4. In the future it is expected that the playpen will remain relatively the same, "People are not too busy with the evolution of the playpen, they are used to the

playpen the way it is today." Any additions are seen however, for example the integration of electronics such as music or tablets.

2.3.4. Artifacts for the future

All possibilities for the future are translated into (feasible) concepts by the participants during the co-creation sessions. Different sketches show how the possibilities take shape on the playpen.

A few of the sketches are shown on the next pages, a collection of all co-creation sketches is found in appendix section F.

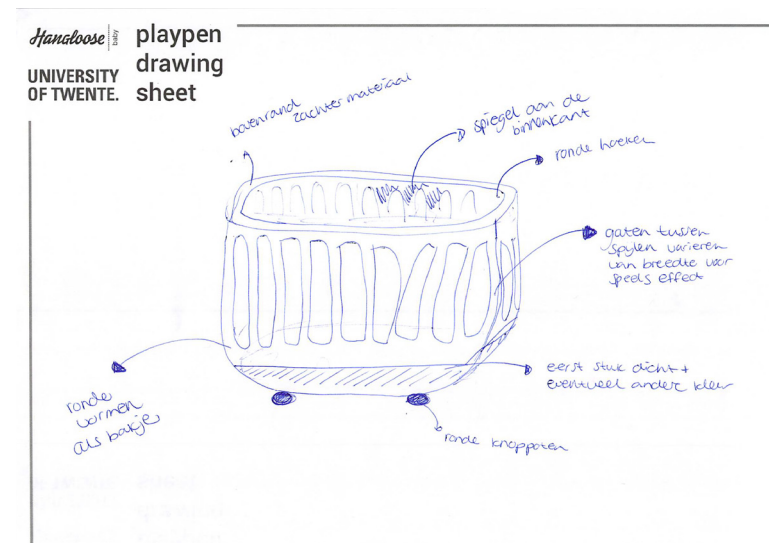


Figure 2.3a: Co-creation sketch

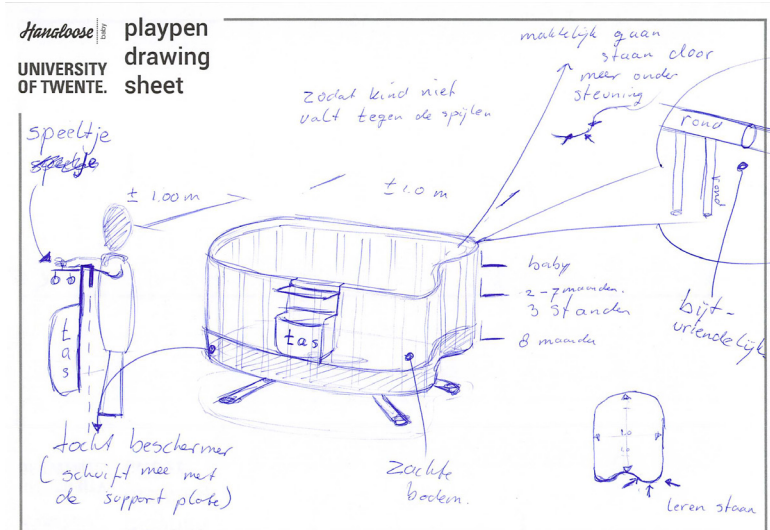


Figure 2.3b: Co-creation sketch

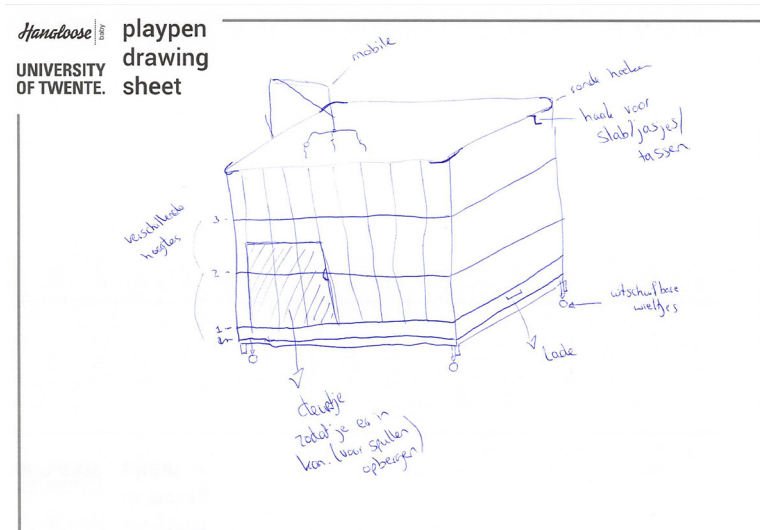


Figure 2.3c: Co-creation sketch

During the co-creation practices the users were able to express their thoughts about different looks en feels of the playpen. Through a mass-customization demo an 'ideal' playpen is composed by the participant using different aesthetics and materials. This way the user's preferences are recorded. Three results are shown below and on the next page. A summary of all input is found in the appendix..

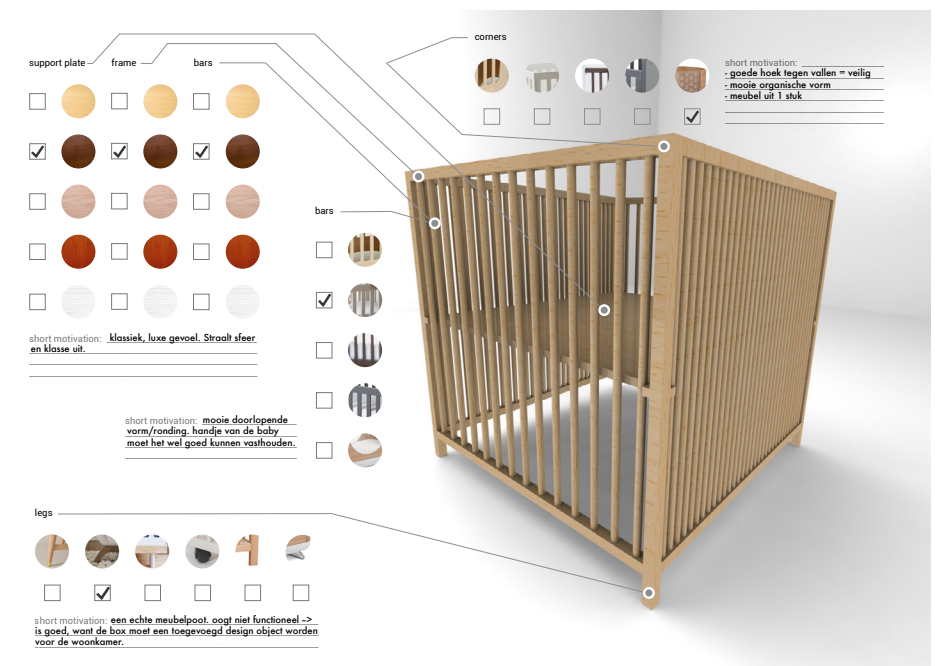


Figure 2.4a: Co-creation mass-customization sheet



Figure 24b: Co-creation mass-customization sheet



Figure 24c: Co-creation mass-customization sheet

CHAPTER THREE

REDESIGN OF THE PLAYPEN

3.1. Input for the redesign

The input for the redesign of the playpen is collected from different channels. This includes the co-creation session outcomes, functional and aesthetic elements of playpens and cots analyzed in the market analysis, legislation on playpens, trends on the purchasing behavior of consumers and results from the online questionnaire. Also important are the styling elements and values which HLB wants to carry out.

3.1.1. Program of requirements

All these aspects result in a program of requirements; demands where to design from, certain features and values the redesign should possess. In other words, all research done and discussed results, summarized in one overview. The program is found in table A3 in the appendix. All input noted down in the program result primarily from the co-creation sessions with the users: how to fulfill functions, how the design should be and what their needs are. The input of the co-creation sessions is supplemented by section 1.3.3. (On users), market analysis of the playpen in section 1.3.2., results from the online questionnaire, legislation (section 1.3.4.) and HLB's styling elements and values (Voller.2014, p.5-6,9-10) It is endeavored to fill out the program to the best knowledge possible, while using all generated input. The program of requirements results in redesigns, discussed and evaluated in the next section.

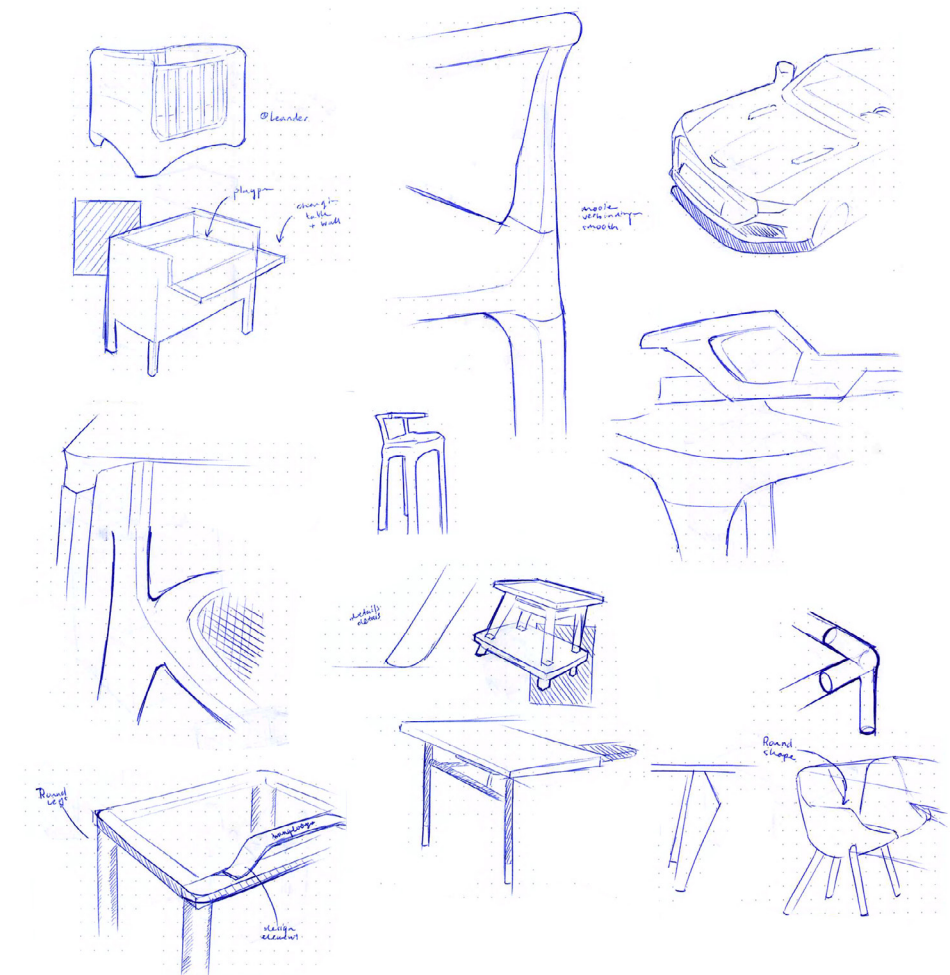
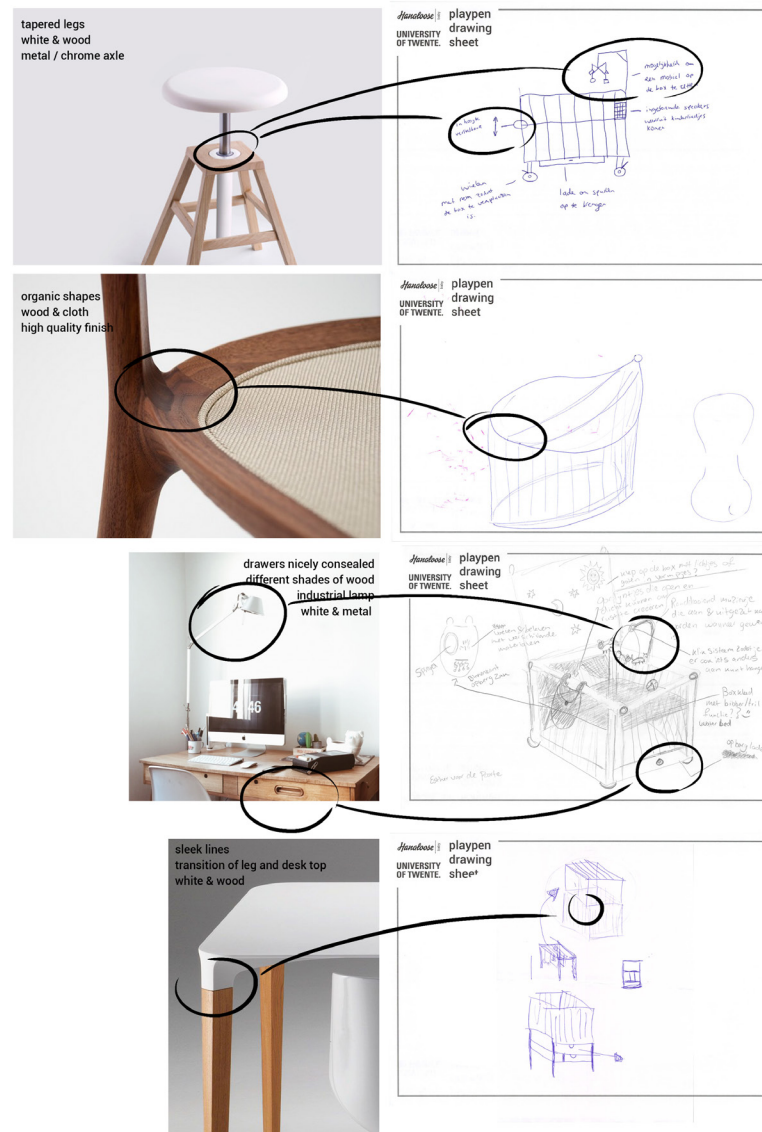
3.2. Generating concepts

The co-creation sessions have resulted in a number of sketches, also noted in section 2.3.4. One can not just copy the sketches and work them out one on one; some ideas are not feasible or have not the right dimensions or scaling. Again, a user can never totally replace a designer because of the skill set a designer possesses. They have experience in designing and have know-how. Designers are visual thinkers, finders of missing information, decision makers and help conducting the creative process which takes place at the user during the co-creation (SPINUZZI, 2005, p.24-25).

In order to realize these sketches into concept designs, a link is made between these sketches and existing furniture. A stylesheet of inspirational furniture is made and next to the furnitures the sketches are laid out. There is evaluated what aesthetical features of the furnitures are, so these aspects can be translated into the concept designs as well. A few of the examples used are shown on the next page in figure 3.1.

Based on these findings own sketches are made to make the ideas more realizable. Three types of sketches are made in order to make a complete design: styling, functionality and design sketches. Styling is about styling in general, design is purely focused on the design of playpen. Those sketches which conform most to the program of requirements are shown on the next pages in figures 3.2 through 3.4.

Through these sketches new concepts are produced, split up in three kinds of concepts:



O'

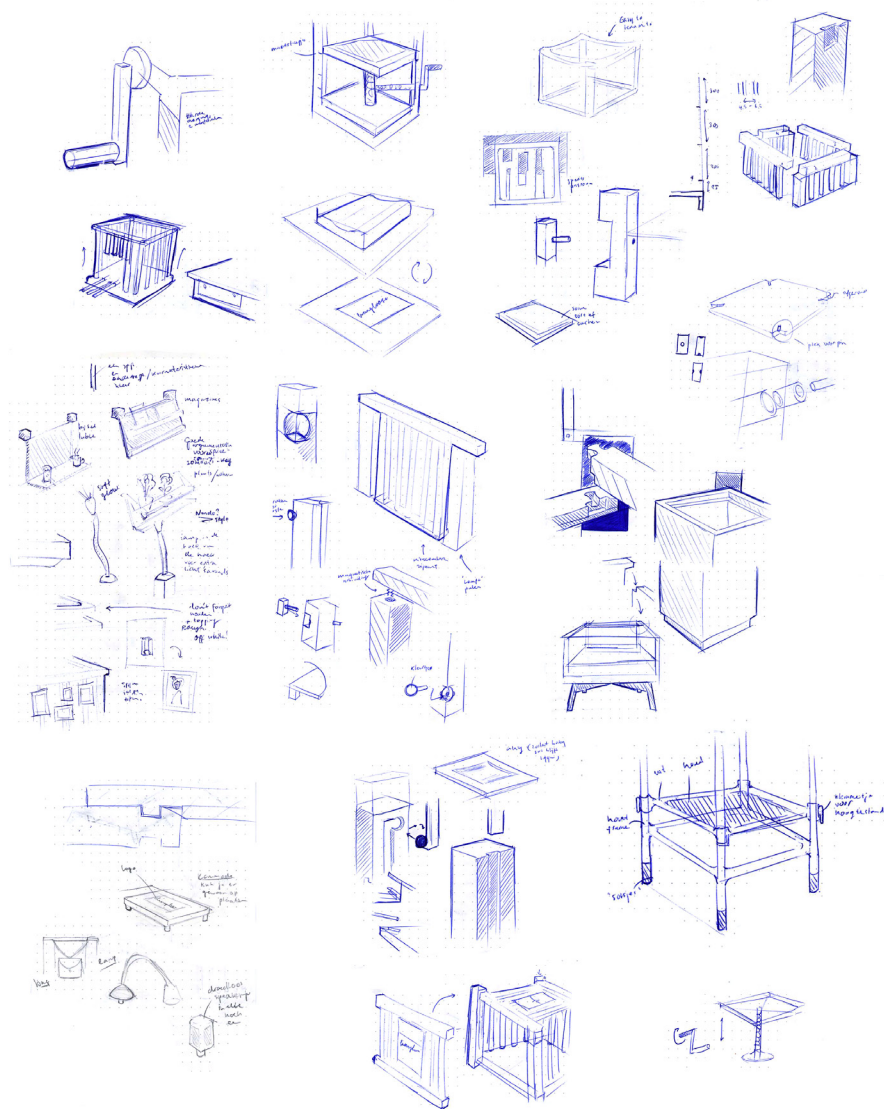


Figure 3.3: functional sketches

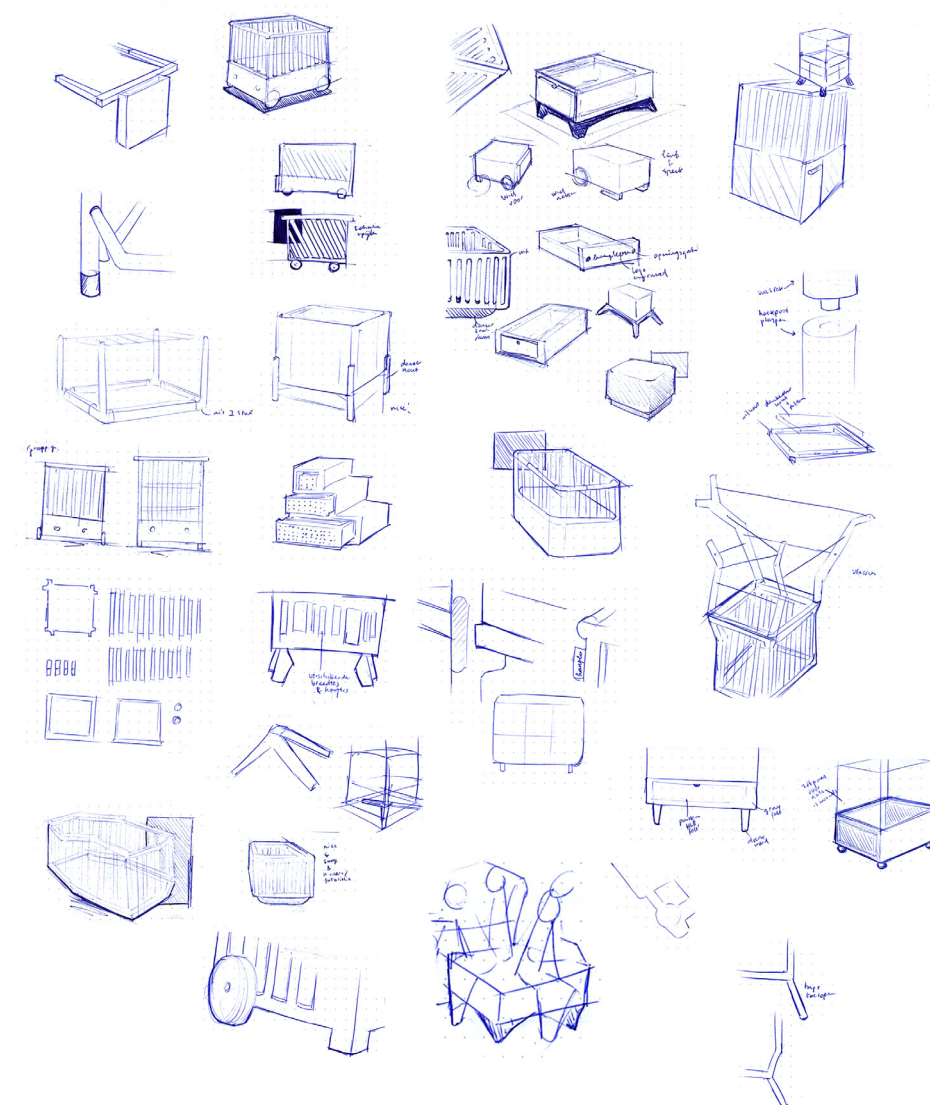


Figure 3.4: design sketches

Multi functional playpen for small spaces

To address the niche of consumers who have not much space available in their homes, a playpen with a lot of functions is offered. This way space is saved while still being able to make use of the playpen.

Luxury model

A result which came forward during the co-design sessions is the styling of the playpen. To differ from the conventional (old-fashioned) playpen a sleek luxury edition is offered in order to answer to the demand of a sleek design.

The ideas are this way clustered into demarcated concepts with clear purposes. In stead of just putting every element in one playpen, creating chaos. Of course, different elements could be exchanged or copied afterwards when they seem to be fitting more nicely on other concepts than on the one it is applied to. In section 3.3 the different concepts are further elaborated. When designing, the sketches made by the participants of the co-creation sessions and the program of requirements are used as a guide. Other functionalities which are not included in the sketches are emerged during the development of the concept into 3D CAD models. Legislation on the design of the playpen narrow down certain design possibilities like the height of the bottom plate, the space between the balusters, the dimension of holes and crevasses. By taking these restrictions are taken into account, a guaranteed safe design is created.

3.3. Product proposal

The designs discussed in the previous section are elaborated below. In talks with HLB, came forward that HLB could profit from the furniture style that is defined by the proposed concepts. Product renders are thus done to clarify the aesthetics of the playpens. Corresponding descriptions explain functionalities that are offered. Because of the importance of the concepts, all images are shown here, in stead of in the appendix.

3.3.1. Multi functional playpen for small spaces



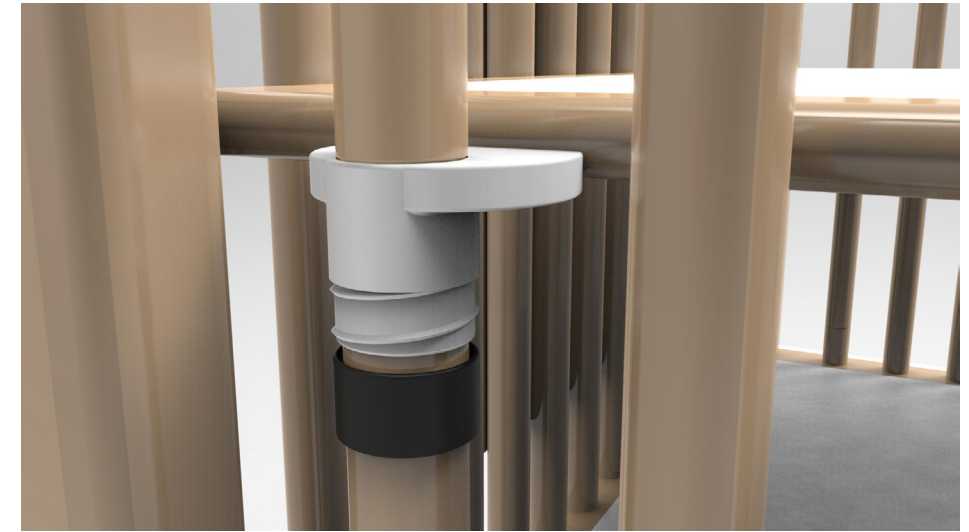
3D view of the first concept.



The playpen can be totally disassembled, so storing is made possible. This functionality is also favorable for storage in warehouses, to save storing space.



Side walls can be placed in the inlays of the under part. Assembling is easily done and a sturdy construction is realized. The sturdiness could be enhanced with magnetic strips.



Couplers support the bottom plate. The black ring can be screwed onto the white upper part in order to lock the height. Right bottom plate heights are engraved in the balusters the couplers are on. This way heights of 30 and 60 centimeters from the upper rim can be easily set, but also heights in between; the coupler is not bound to any height on the baluster.



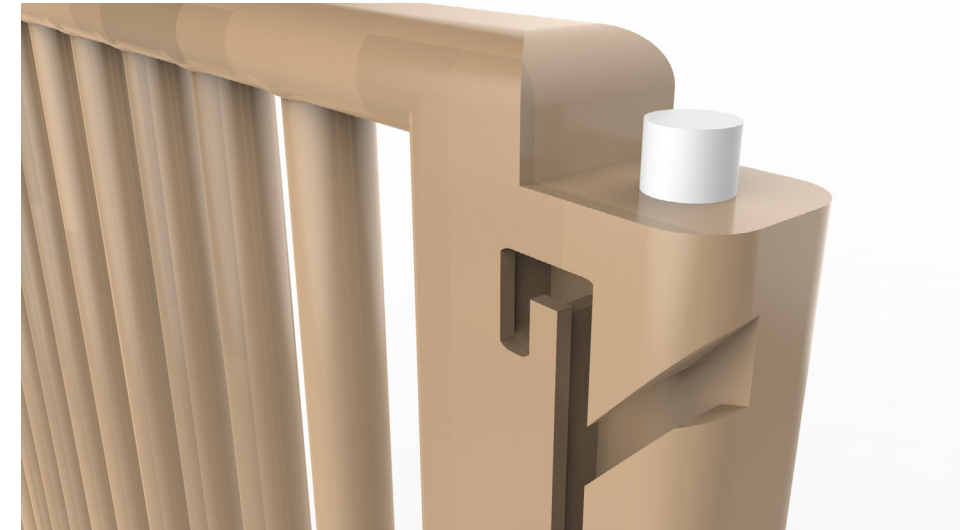
Thanks to the large drawer in the bottom of the playpen the entire upper part including walls and bottom plate can be stored. Four puzzle part can be taken out of the drawer and then placed on top of the bottom part, creating a pouf, as is to be seen on the next page. When the baby is not using the playpen too intensively anymore, one of the sides could be used as a staircase fence. Even when only one side is removed and is used as a fence, the playpen could still be functioning as a personal playing area for the child.



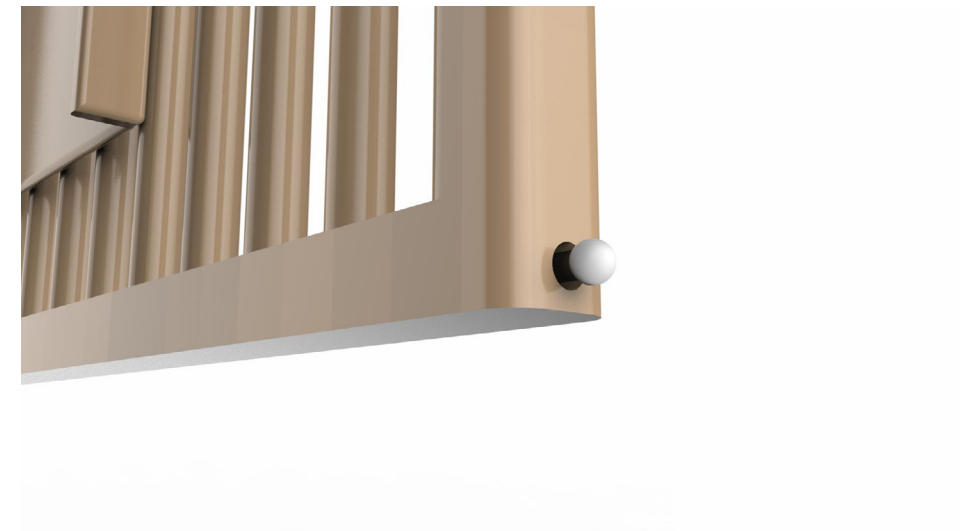
The pouf created is an ideal solution for small homes. More guests can be invited because of the increased sitting surface. Also, clearing up the playpen eases the mind, it gives a sense of clearance.



A side table can be added to one of the sides of the playpen. This way the playpen is has not got the function of playpen anymore, it had become part of the living room furniture and part of the conversation on the couch.



On the inside of two of four sides there is an inlay which enables the front side to slide up, down and out of the mechanism, when it needs to be stored. Also, the white cylinder sticking out allows the sides to be mechanically connected.



Sliding through the mechanism discussed above is done by a ball, which can be pressed in and out of the construction using the same mechanism as often found in ball point pens. When pressed in, it is ready for storing. When pressed out, it can be slid into the inlay shown above and let the side serve as a playpen side, or as a changing table even (see: next page).



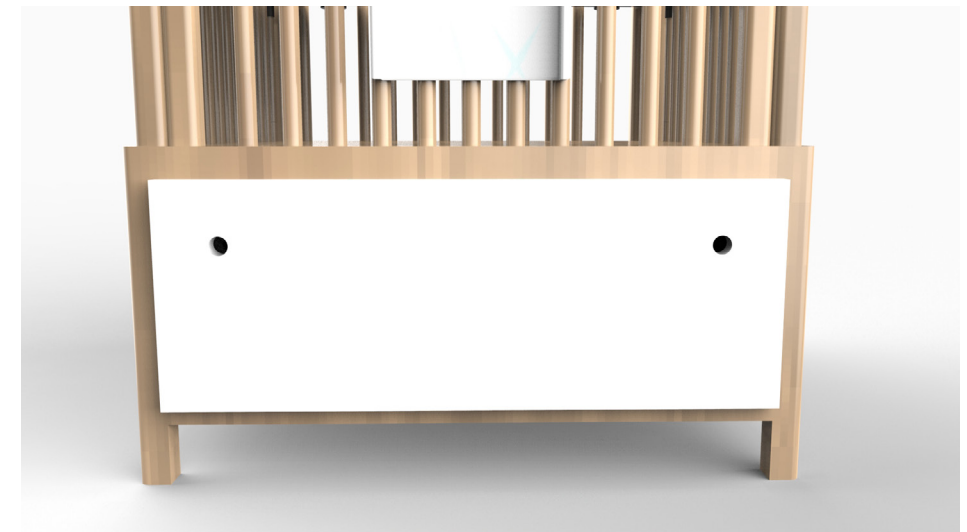
The front side can be slid upwards, creating an opening under the bottom plate. Most of the time the baby is using the playpen this space remains unused. Until now, because storing can be done easily by sliding the wall upwards.



Moreover, when the front is tilted forward, it is transformed into a changing table. There is no need for mothers to walk up and down stairs in order to change the baby. The side can be tilted up and then forward, the baby can be taken out and placed on top of the specially added changing table. Complementary goods such as cushions, diapers and blankets can be stored either in the space underneath the bottom plate or in the large drawer.



In order to prevent the front wall from sliding down, an inlay on the top of two side walls is made. This way the changing table is positioned safely. Also, because of the slight angle the changing table obtains, the baby is faced to the parent more when it is being changed, improving the interaction between parent and baby.



The holes in the front of the drawer are designed to intuitively open the drawer in an easy manner; when pulled with one hand to your left and one hand to your right, the drawer opens more easy than when there would have been one hole in the middle.



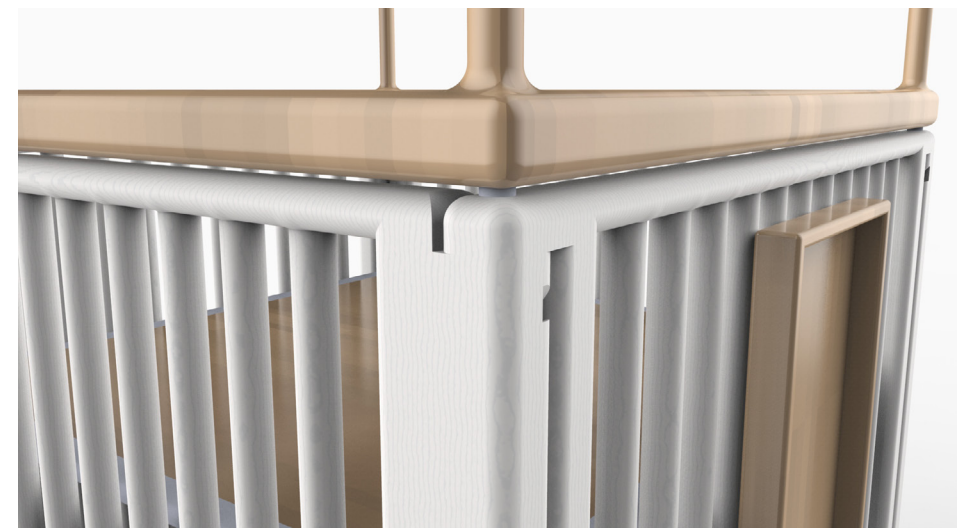
In order to add even more functionality, a lamp is designed which can be placed on any corner of the playpen, thanks to the holes on each corner.



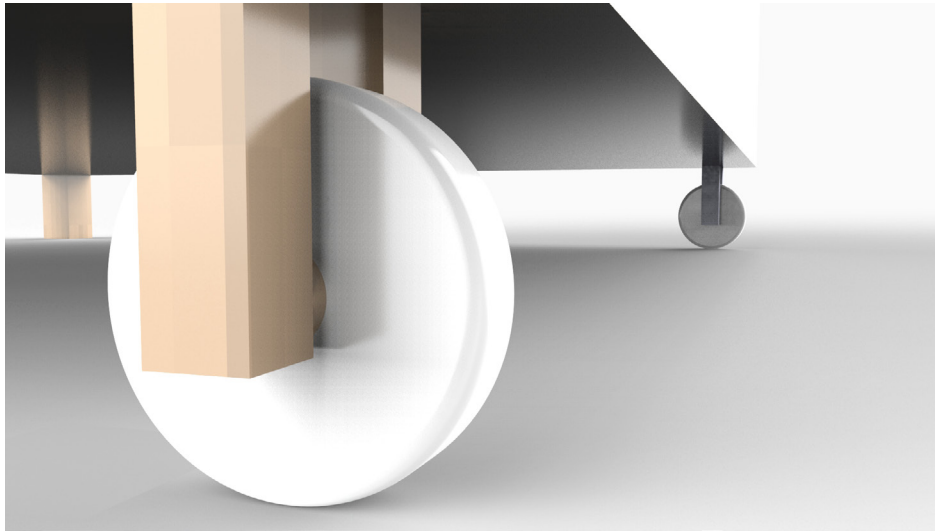
When placed in the corner of the room, the lamp can give a nice soft glow, creating a warm atmosphere. Also, the bottom plate should be made of a soft and washable material, in order to increase the comfort of the baby. This material should be rough enough to keep any playmats from shifting onto the bottom plate.



In order to save even more space, a clotheshorse can be added on top of the playpen. Assuming clothing will not drip anymore when tumbled in the laundry machine, this makes for a nice use of space. Also, babies like to watch to what happens above them, they might even like (fresh smelling) clothes. Of course the clotheshorse can also be used when no baby is placed in the playpen.



Thanks to the holes in the corners of the playpen the clotheshorse can be placed on the playpen nice and sturdy.



Wheels are added to address the need of a movable playpen. On the other side legs are used, so that the playpen will be steady standing when it is positioned. When lifting the side of the legs, the playpen can be rolled to the desired spot.

3.3.2. The luxury playpen

Styling of the playpen is found to be an important asset, looking at all results gathered so far. This concept focuses on a playpen which has a no-nonsense design, while using high finished materials. An organic shape is desired as well, and is implemented in this playpen. Pictures and explanations are found on the next pages.



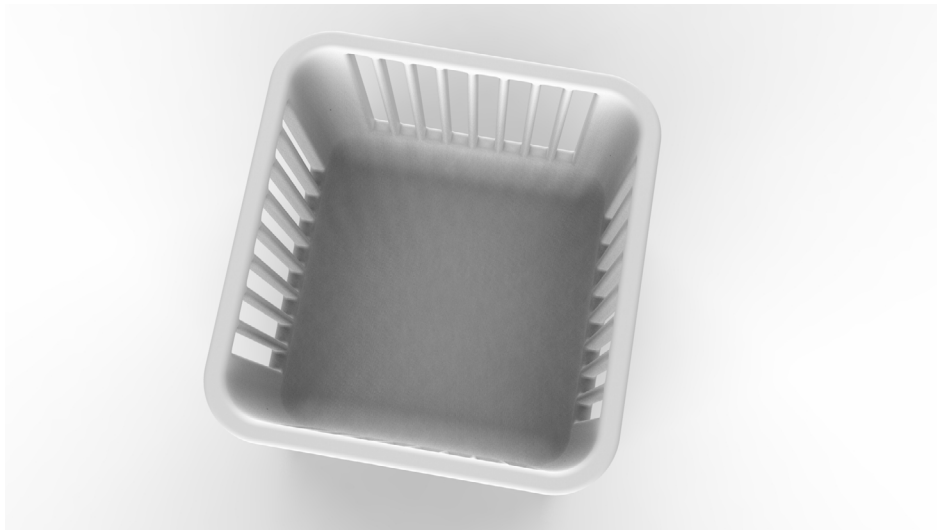
The luxury playpen is made of black walnut legs, with a white wooden uni-colour body. The legs stick out just a little, suggesting that the body is resting on a sturdy construction.



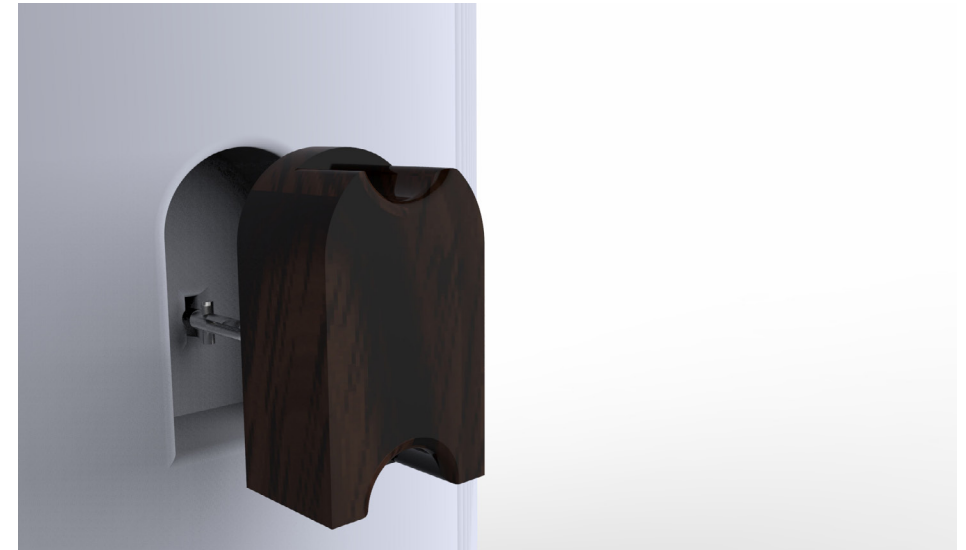
Almost everything is rounded off, to provide safety for the baby and address an organic look and feel. The light sides provide a sense of openness.



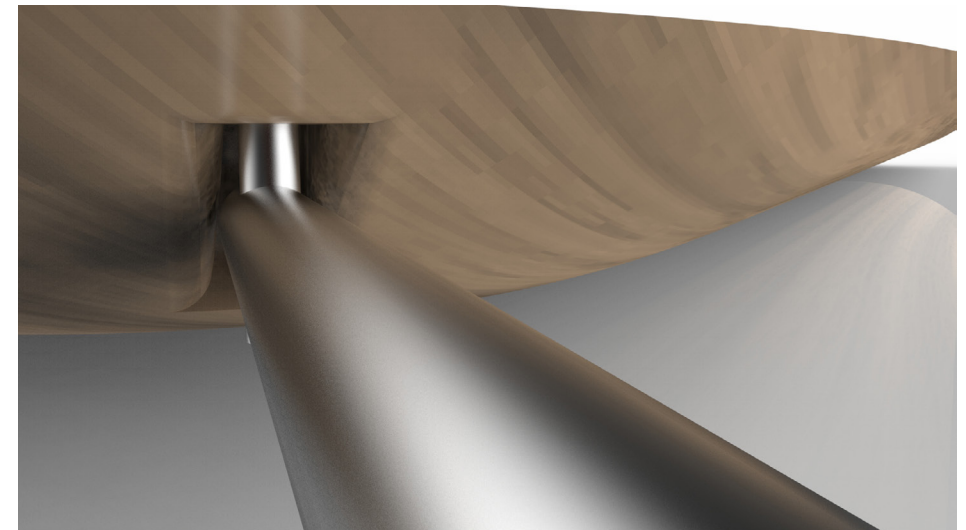
To enhance safety even more, the balusters are rounded off in every direction; not only the balusters are round, but also the connecting parts in between.



When the baby starts to move (at 3-4 months) more, the level of the bottom plate is lowered normally. With this design, the bottom plate can just be removed, for the bottom of the playpen is also rounded off in every direction. It has the right height to the upper rim. Round bottom corners provide a safe fall might the baby tumble inside the playpen.



In order to support the bottom plate on its highest level, special inserts are designed. By the key-shaped pin and round insert shape, it can only be inserted in one way, preventing any errors. The walnut and high finish aluminum gives a sense of quality.



When placed in the side of the body, the pin can grab on to the of the bottom plate and so be secured. The pin grabs on to the bottom plate because of a small hole inside the bottom plate. This makes sure no one can just grab the inserts and pull them out. The bottom plate is to be lifted first before retrieved the insert from the bottom plate and body.



When the bottom plate is to be removed when the baby starts moving, it can be stored in the bottom of the playpen. Simply lift the body from the walnut structure and place the bottom plate in the bottom of the playpen and put the body back onto the structure.

CHAPTER FOUR

CONCLUSIONS AND RECOMMENDATIONS

4.1. Conclusions

The original goal of this thesis is to develop a redesign of the playpen, adjusted to the needs of the users in the playpen market, through co-creation. At the same time, an overview of the foreign playpen market is desired, for possible implementation abroad.

After having gone through the execution of this thesis, a lot of results are gathered and formed. From the need of a redesign there is done market research, co-creation sessions are held and the creation of the actual redesigns have taken place. In short, the thesis has resulted in the redesign of the playpen, adjusted to the needs of the user, through co-creation, thus stating a positive remark on the thesis. The implementation of the playpen abroad is discussed in the next section (4.2).

The exact usefulness of the redesigns is not clear yet, something which is to be expected when doing virtual product proposals and not ready-to-assemble products. Exact specifications concerning materials used, stiffness and strength tests, ergonomics and technical functionality could be evaluated in the future.

Currently HLB is busy launching their first product, which suggest that the realization of one of the playpen concepts would be happening in a more future-like time frame. This implicates that there is plenty of time to make certain adjustments, improvements and run tests, might HLB want to carry through with the launch of a new playpen. As mentioned in section 3.3, HLB indicated that they could profit from the furniture style that is defined by the proposed concepts. This means they could directly profit from the results of this thesis.

4.2. Recommendations

Firstly, it is most recommended to execute the thesis at the location of the company. The communication is much clearer, easier and more frequent when people of the company are around. This helps keeping the researcher focused and objective-oriented. It is experienced as difficult to keep focus on the main targets, which aspects still need to be done and which level of quality and quantity is to be expected. When executing such a thesis on one's own, every direction has to be primarily steered by a single person, risking taking a detour. So the risk on a detour is only increased when not executing the thesis at the company's office. In this case it was not possible to execute the thesis at HLB's office, for they have no fixed office where to be working from; they meet at fixed periods of time at different locations (flex spots so to say) and thus having regularities concerning locations and meeting frequencies. The way this thesis is executed was found to be most feasible for this situation, which is at an office in the Gallery at the University of Twente, while keeping contact with the company through scheduled physical meetings, Skype, e-mail and telephone. An execution positioned at the office of the company should be made mandatory, for it is very instructive to be in the environment of a company and getting a taste of how things actually go in the world of business.

Next, it is suggested to write all information and findings not only down, but also directly in report-format. The text written down does not have to be perfect at the first attempt, but it saves a lot of time of formatting all text afterwards. Also, information and motivations are more clear at the exact

moment of discovery than they are in hindsight. However, some information is only to be viewed when the big picture is obtained, so writing down at once would not be convenient. Still it is recommended in order to keep track of a complete process and content. This does not mean however that this entire thesis is written down in hindsight. On the contrary, information is written down at the time of discovery, that is why it is so much recommended.

Concerning the content of the thesis, a number of aspects are recommended to improve any follow-up processes. A realization has taken place concerning the preparation of a questionnaire, especially when it is plotted abroad: communication is far less clear than it is in the researcher's own country. Even while communication media is widely available, the barrier of distance remains tough to overcome. Also, a questionnaire is not perfect on the first go, even when it is evaluated by a few people first. Only by putting the questionnaire to practice it can be tested and then improved and subsequently be plotted again. A thesis covering a time-span of twelve weeks is found to be far too short to generate and test a reliable and functioning questionnaire and then giving a sufficient amount of respondents the time to fill out the questionnaire. Moreover, in reality there is even less time available, for first a research needs to be done before feasible questions can be formulated in the first place.

For HLB, the results of the online questionnaire are useful in the following ways. By the results it is known that the playpen is a product/furniture that is familiar with at least one person per country in several countries all over the world and the playpen is desired by these persons. Most research before

buying is executed online, and then purchased in a physical store, 2nd hand store and online stores, a fact which confirms what they state in their business model (Voller, 2014, p.11). There is formed an estimated target price, which lies around 100-150 euro. An adjustable bottom plate, width and length, added corresponding toys and HD camera could be improvements on the playpen, as well as improvement of durability of sturdiness. In order to address a foreign target group, there could be added local touches to the design, like design elements frequently seen in that particular country.

4.3. Critical reflections

The results on the design, usability, quality of materials, durability and sturdiness of the playpen (section 1.4.2., online questionnaire) score better than average, thus suggesting that there is no need for a redesign or an improvement of the playpen in the first place. However, the same could be said of every product that is owned by people; they can hardly think of an improvement unless it is given to them. Unless of course, they are helped through a co-creation session and so come up with new ideas. The respondents of the online questionnaire were not actively involved in the co-creation process (they are part of co-creation in general however, by giving input through expressing their opinions on the playpen) and so not stimulated enough to come up with ideas and thus not particularly seeing any room for improvement. Still, to be not complaining about a product calls for a product that is well designed.

It is found to be hard to find sufficient information specifically focused on the playpen like their occupation in the market, sales information and profitability of the market. Also, the reliability of the market research is questioned, for no hard data was found (not every piece of information is available for free and HLB is a young company, sometimes lacking structures like fixed suppliers and sales data) to underpin real profitabilities discussed in the Porter's five forces section. Partly due to this fact, the fuzzy front end of this thesis was relatively long and so absorbing time which was planned for other activities. Information found should have been concluded more quickly

in stead of lingering around the same subjects for too long. In hindsight, the focus should have been on the co-creation part more in stead of on the introductory part.

The online questionnaires were not filled out carefully; a lot of the surveyed people did not respond at all, or left questions open. In hindsight the questionnaire should have consisted of less questions, in order to lower the threshold of filling out. Certain questions could have been more leading, more specific. Questions such as “what country are you from?” should have been “In what country did you raise your child(ren)?”. This way it would have been more clear if the answers were specifically aimed at that particular country. It is hard to direct the way the questionnaires are filled out. For the distances are so big, it is impossible to check how and when all the questionnaires are filled out, if they are filled out at all.

Having stated these aspects, the results of the questionnaires should be questioned. Are they reliable and useful to draw clear conclusions? Especially when respondent numbers are low (for example when $N=1$), the reliability drops instantly. The results are to be used in a general sense, so no hard conclusions can be drawn.

At the time of plotting the online questionnaire, the other part of the empirical research (the co-creation sessions) which is carried out here in the Netherlands is done as well, which makes it hard to keep track of all developments and results. Especially when a research is done by only one person. There was not enough time available to execute both parts of the empirical research properly. Because the co-creation sessions were a main part of the thesis, it gained more attention and careful execution.

Twelve weeks for the total execution (April 7th - June 26th) of the thesis is found to be very short, especially when the writing is to be done in English. This puts a real break on expressing thoughts and theory, on the typing and formatting speed.

It is also found to be hard to determine when the analysis phase is to be closed, it is a gray area. The focus is on designing and answering the main goal of the thesis, but this way the analysis hinders the way of accomplishing this goal. It is a choice when the analysis is to be closed, and that the designing part is to be started.

A tough area is the communication between the university, the company and the needs of the user (found through co-creation). The university demands a certain level of scientifically, while the company mainly desires to see results. These results can not always be obtained through a scientific method, resulting in a assignment which is nice to execute but not granted by the university. Finding a middle way and making concessions is found to be hard. The results from the co-creation sessions may sprout results which are not usable to the company, thus delivering disappointing conclusions. Sketching this situation, it is found impossible to satisfy every party involved.

As discussed in section 2.1., there is not a single toolkit that can be applied to every design problem. Thus it is hard to come up with a good functioning tool kits which will stimulate creative outcomes. There is made use of books and literature specifically focused on this subject, but no success are guaranteed beforehand. This makes it into a creative method, but also an uncertain one.

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