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FURNITURE DESIGN FOR KITEEN HUONEKALUTEHDAS OY

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Abstract

The current thesis focuses on the design process and creation of a concept for bedroom furniture items in cooperation with the Finnish company Kiteen Huonekalutehdas Oy. The aim of this thesis is to design a concept that would appeal both to the target market and to the company. Due to the reason that Kiteen Huonekalutehdas Oy is expanding its sales to Russia, Russian customers appear to be a selected target group for this project.

In order to support the concept with a theoretical background, various materials were studied. As a result, the thesis discusses product design aspects and its aesthetics-related issues, briefly describes furniture market and manufacturing in Russia, and finally represents different interior styles that appear to be a basis both for quantitative research and concept creation. Additionally, matters such as measurements, proportions, material and stability were explored in order to get an understanding on the technical side involved in bed design.

The quantitative research in the form of an online questionnaire was conducted in order to define the target group and to recognize customer's needs. The results helped to determine the aspects that should be applied to the concept. Moreover, it gave an idea on the company's possibilities of entering the selected market. The thesis results in a concept suggestion that might be developed further into a real product.

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Appendix 1 Questionnaire

1 INTRODUCTION

The aim of this thesis is to present the design process of a product concept for the Finnish company Kiteen Huonekalutehdas Oy. The company specializes in producing bedroom furniture which is made of birch; therefore, it was decided that this project should focus on having a concept suggestion of a product such as a bed as the final outcome.

The main market where the company operates is Finland, although there is an attempt to expand the sales to the Russian market as well. Thus, the purpose of this thesis is to design a product which would be attractive for Russian customers as well as fitting into the manufacturing process and style of the company. The concept is going to be based on the preferences of the target group. Therefore, the result should match the purpose of this project, in order for the product to enter the Russian market in the future successfully.

The product design process comprises various stages, where 'research' or 'analysis' of the background information appears to be a solid basis for establishing the grounds of the concept. Rodgers and Milton (2011, 58) state that one of the easiest ways to find out what people think about a product is by simply asking them, i.e. by interviewing them. Questionnaires and surveys are other ways of effectively gathering responses from a lot of people, as well as they can be helpful in determining the special characteristics of a customer rather quickly. (Rodgers & Milton 2011, 58-59.) As it is important to conduct at least one of the research types, a quantitative one (questionnaire) is going to be used in order to gather information as the basis for the design concept.

Since the 'Russian market' carries a broad meaning it is important to mention that the target of the current research aims at the European part of Russia, especially such cities as Moscow, St. Petersburg, and Russian Karelia as the designer has more possibilities of reaching these areas. Moreover, it is essential to define the target group which would buy products similar to those of Kiteen Huonekalutehdas in terms of price and material, thus giving a more realistic overview of the market, and possibilities for creating a successful product. Furthermore, current trends and the existing products on the market

should be taken into account.

Due to the agreement, the designer is expected to present sketches and 3D models of the final design. It is of a great importance to take into consideration what the process behind designing it is, how ergonomics play a vital role in furniture design, and, finally, even if the material is provided by the company, and does not appear to be a choice of a designer, it is necessary to learn about this material and its qualities.

Due to the reason that there is no possibility to travel to Russia during the project, and as a result the market research as well as customer-orientated research is going to be held through online tools, it might bring certain limitations to the scope of the project. Moreover, due to the diversity of options presented on the Russian furniture market, it might be difficult to create a design that would be attractive for the majority of customers. The designer's subjective view and tastes might affect the design process. The company's opinions will be taken into consideration, which as well might contradict the offered concepts.

As stated before, the purpose of this thesis is to design products that would satisfy both the company and the customer. On the other hand, this project also gives the possibility for the designer to learn more about the furniture design process, as well as providing valuable experience of working with a client, which will be an essential part of the professional life.

1.1 Starting point

The idea for this project was born during participation in a sustainable development course at Karelia University of Applied Sciences. The company Kiteen Huonekalutehdas Oy was presented to students as an example of a sustainable manufacturer, because they use local and natural material (birch) and provide workplaces for people living in a small town. It is of a great importance to support local businesses as they help to create a more sustainable future. Moreover, the company specializes in furniture design, which is one of the main fields where the designer would prefer to work as a professional after graduation.

As was already mentioned the company is expanding its sales to markets outside Finland, and Russia is one of them. Due to the designer's nationality (which makes it easier to reach and understand Russian customers), it was decided that she would study the Russian market and design a bed that would be appealing for Russians. Additionally, the company gave freedom regarding the possible bed designs, although they still asked to not go far away from what they can produce. If for some reason the company likes the suggested designs but they think that it would not work for the Russian market, there is a possibility to produce it for the Finnish one.

The Finnish company Kiteen Huonekalutehdas has existed since 1990, although it kept the traditions of a previous factory which started already in 1920. It is a family business that produces furniture which is made and designed in Finland. The product range is designed mainly for Finnish customers. They use birch as the main material for production. The company believes that their furniture can be described as “Finnish, natural and individual.” (Kiteen Huonekalutehdas Oy 2015.)

Overall, the designer is looking forward to participate in the current project as it is her first experience of working for a real client in the furniture manufacturing field. Even though the designer has a Russian background and presumably should know the furniture market there well enough, there is still a lot to discover about the current situation. Additionally, this project gives the possibility to provide the company with expanded knowledge about the potential market.

1.2 Framework

Rodgers and Milton (2011, 14) state that the design process of a product usually begins with an idea and ends with the production of a physical object. Also it is usually conducted by individuals cooperating with each other and working in a team. (Rodgers & Milton 2011, 14.) In their book Rodgers and Milton (2011, 14) have referred to designers as a group of individuals working in a team. This could be questioned as it is important to make sure that customers are viewed as team members of a design process because their opinions are of a great value to the final result.

The framework of this thesis (Figure 1) reflects the relation between various components involved in the design process which influence the final result. Meanwhile, the importance of the consumer, trends and market research is emphasized thoroughly; such matters as the connection between designer, company and all of the mentioned above target areas of analysis should be interwoven into the structure.

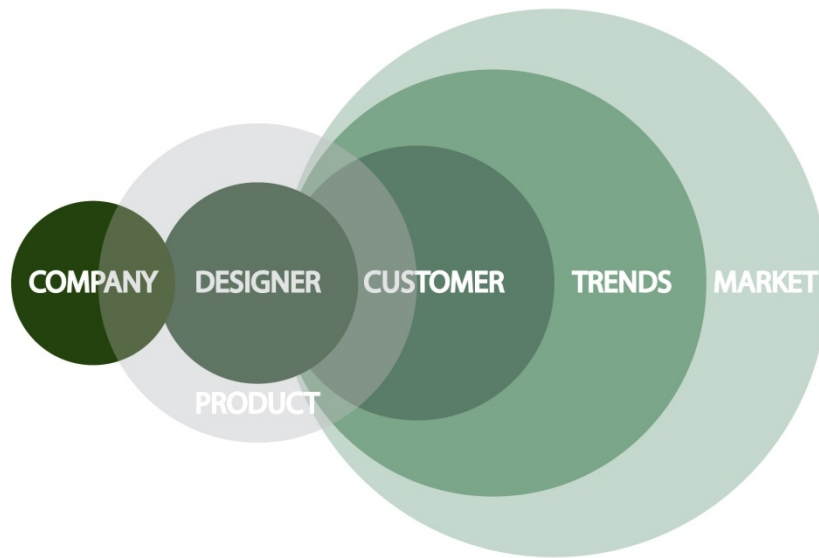


Figure 1. Thesis framework.

According to the framework this thesis is based on (Figure 1), the designer appears to be a linking element in the project. It is the designer's responsibility to overview the current Russian market, which consists of the trends that affect customers' opinions, as well as to find out the demands and to create a concept that would be regarded as a suitable one in the company's opinion. The successful interconnection between these areas emerges in a possible product orientated for the Russian market for the company.

1.3 Research methods

As stated before, the purpose of this project is to create a design that would be appealing to a selected target group, and as a result would create a possibility for entering the market successfully. Therefore, in order to get good results, various steps are going to be done in order to achieve it (Figure 2).

First of all, it is important to define what actually product design is, how to create a product and what can be considered as a good one. Therefore, various sources on the matter are going to be reviewed in order to consider different opinions and to take them into account when designing a bed.

Reviewing the information on the furniture market and interior styles that are popular nowadays in Russia via online sources gives a solid basis for understanding the current situation. Acquiring this knowledge helps to understand the trends on the market and as a result will influence the decisions on the final outcome.

Based on the theoretical background as well as on personal considerations, the survey is going to be conducted in order to get to know the customer. The results will help in designing a concept as they will provide the information on what the target group prefers. The main idea is to create a survey that would not be too long but still includes the questions that the designer considers important and relevant to the project. Also, it is essential to create such a questionnaire that attracts the participants so that it provides more chances that more people will complete it.

Based on the results of the quantitative research and theoretical knowledge, the design concept is going to be created. As it is also important to take into consideration the opinion of the company, various concepts are going to be created and presented to them in order to choose one that looks the most appealing. After comments and suggestions by the company, the final design will be created.

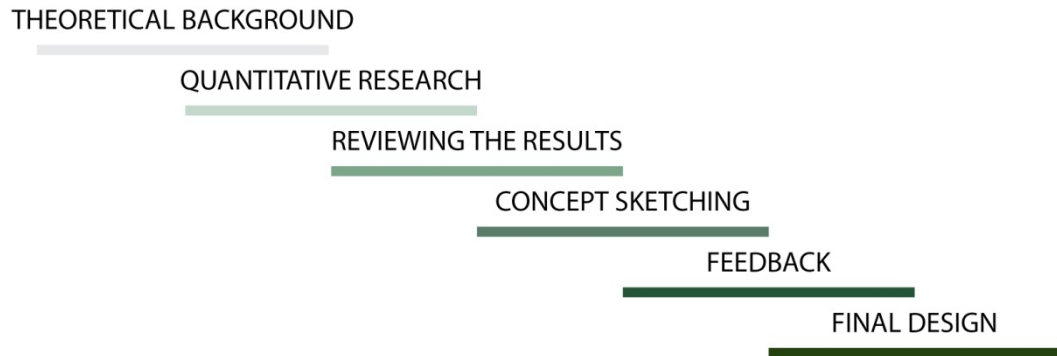


Figure 2. Action plan.

2 PRODUCT DESIGN

In order for one to start designing a product, it is important to ask what product design actually is. According to Rodgers (2011) product design covers a large number of spheres, from lightning and furniture to environmental objects and industrial design. Also, no matter whether it is a razor or vase design, it is all about making the quality of life better. Furthermore, product design is a tool via which businesses have the possibility to make sure that the products they create and sell to the customers are needed and attractive. (Rodgers 2011, 6.) Chitale and Gupta (2011, 1) seem to share a similar opinion on the definition of product design, as they state that it “aims at fulfilling human needs.” Which, indisputably, means that its goal is to improve the quality of the world we live in.

Once answering the previous question on the definition of the product design, the next one arises, i.e. what actually the means are through which this quality is enriched. Pile (1979, 10) brings an interesting discussion in his book around the statement which was made by the American architect, Louis Sullivan (although Pile also states that Sullivan borrowed this concept from the earlier sculptor and writer Horatio Greenough). Sullivan said that form follows function, which appears to be a fundament for a good design. Since usually this statement is used as form should follow function, Pile gives an example on how this statement fails with everyday objects such as chairs and beds. He says that it is more difficult to imagine a chair on which it is impossible to sit at all,

rather than a chair with a form that prevents a person from enjoying the comfort of the chair. (Pile 1979, 10.) The arguments of Sullivan and Pile can be agreed or disagreed with, but what is obvious in this case is that both form and function play an important role in good design, and moreover they are inseparably interconnected.

What about the aesthetic side of design? Does it contribute into the action of life's quality improvement? This question can be possibly answered with one opinion of Shea (1973), who offers an example of furniture pieces that stay uniquely ageless. Shea (1973) says that quite many traditional pieces of furniture are still used for interiors, whereas such items as refrigerators or cell-phones are replaced rather quickly nowadays. On the other hand Shea (1973) admits that it does not mean that the furniture design does not tend to improve; throughout the history each period and each style presented its own special characteristics, as well as designers who were motivated to create something better, both functionally and aesthetically (Shea 1973, 3). Pile (1979) in a way supports this view as he says that it is wrong to assume that all furniture designs are good as long as they flatter some audience. Within any style or period it is possible to find both better and worse designs, whether its Victorian style or contemporary one. (Pile 1979, 12.) Nevertheless, it is still not clear whether aesthetics are a part of life's quality improvement or it is just a matter of personal taste and preferences.

Interestingly enough, Pile (1979) brings on a curious discussion, where he considers the statement of Vitruvius, who was the Roman architectural writer and known through his translator Sir Henry Wotton:

Good architecture (and by extension, good design) results from the qualities “commodity, firmness and delight” which closely match the modern concepts of function, structure, and aesthetics and continue to serve as a well-stated summary of the values which have enough independence to be recognizable separately as characteristics of any object (Wotton 1624 cited in Pile 1979, 13-14).

Pile (1979) thinks that the third value 'delight' or 'aesthetics' as we call it nowadays, can be misinterpreted in some way. For example, the piece of furniture that is exhibited in the museum of modern art can arouse various feelings among visitors, as on one hand it might present aesthetic beauty, and on the other hand it might seem to be a type of 'ridiculous' item that an average person would not want to place into his/her home (Pile 1979, 15). Pile (1979) suggests that 'delight' is not an objects' feature, but rather a human's reaction to the object via senses:

Every designer, in attempting to solve practical problems by inventing new forms for useful artifacts, is inevitably creating forms that other people will see, interpret, and try to understand. He or she is thus communicating personal ideas about the object being developed and also, to some degree his ideas about what human life and human civilization is or should be. This aspect of design is its “third dimension,” beyond utilitarian function and satisfactory structure. It is an aspect that can be considered “aesthetic” if we understand that term to mean more than superficial liking. As in the fine arts, likability is only an incidental quality of a work while the communication of meaning. Thought, and point of view is the essential element of worth. (Pile 1979, 15.)

This means that 'aesthetics' is more than just liking or disliking certain object; it is a way of communication (Pile 1979, 15). With that being stated, it is essential to take into account this third element along with form and function in order to design a valuable piece of furniture that would appeal to the selected audience.

3 FURNITURE DESIGN IN RUSSIA

3.1 Russian furniture market

Nowadays, the Russian furniture market is very diverse, because it offers a wide range of products of different styles, materials and manufacturers. The furniture industry in Russia consists of small and medium businesses that can be found in any city and they usually concentrate on individual orders, as well as big enterprises which produce furniture in large quantities. Furthermore, Russians have an opportunity to buy the furniture produced by foreign companies which is available in many shops. (Vproizvodstvo 2015.)

It is estimated that in Russia there are in total around 3,500 businesses related to furniture industry, where 500 of them are medium and large ones. However, Russian furniture production is not higher than 0.57% of the world's furniture industry. Many countries which do not have as many forests as Russia does produce more furniture. (Znaytovar 2015.)

According to the Russian magazine Vproizvodstvo the possibility of the development of the Russian furniture market is rather high although the interest for furniture among Russians is still rather low compared to European countries. On the other hand,

according to the results of the consulting agency Intesco Research Group, the market of wooden furniture has increased since 2010. This could be due to the increases of house building and of the population's income. More expensive furniture imported from other countries is more demanded in Moscow and St. Petersburg, while in other regions, domestic producers are more popular. (Vproizvodstvo 2015.) This thesis research was conducted in 2014, and as it is well-known, Russia is currently going through a phase of crisis which definitely does and will affect the industry, as well the choices and sales. This magazine also states that Russians do not look at the country of producer (like it was before when Russians always tended to buy imported products), but more so at the quality and material. (Vproizvodstvo 2015.) The quantitative research will help to understand whether some of the earlier presented information is relevant or could be argued with.

3.2 Interior styles

As already mentioned, a Russian customer is able to choose furniture from a variety of styles and materials. Style can be defined as “a particular manner or technique by which something is done, created, or performed.” (Merriam-Webster 2015.) Since a piece of furniture appears to be a part of the interior, it is important to define the interior styles that are presented nowadays and the ones which are more popular among Russian customers.

3.2.1 Classical style

According to online interior magazines, classical style is appreciated among Russians. It is considered to be a 'safe' option because it is never out of fashion and time. The classical style creates a unique atmosphere of chic and luxury. It is based on the forms of antiquity; thus it is always can be regarded as an example of ideal beauty. (IQInterior 2015.) The distinctive elements of a space in this style are mainly “...columns, niches and arches which are decorated with fretworks, friezes and piers.” The walls can be covered with fabric wallpaper with floral ornaments, carpet tapestries and silk panels. It is also common for this interior to use light pastel colours with natural fabrics.

Moreover, in order to create the feeling of cosiness and solemnity at the same time, drapery with soft pillows are used. Massive but at the same time dainty furniture from an expensive type of wood is usually used (Picture 1). (IQInterior 2015.)

If one wants to create an interior in a proper classical style, big financial investment is required. (IQInterior 2015.) On the other hand, it might be questionable whether everyone who wants to duplicate the classical style at home needs to use the most expensive materials and furniture. As nowadays the market is full of a variety of products and materials of different prices, it should be possible to create this style by following its rules and using cheaper options. Gibbs (2005) states that throughout history, classical decorative ornaments have been changed to more simple versions. Thus, only proportions which were the main fundament onto which the classical style was based continued to be used in the same way. Therefore, even though people immediately start imagining the ornamental elements when talking about the classical style, the main principle of it remains to be the usage of right proportions rather than expensive materials. (Gibbs 2005, 68.)



Picture 1. Interior in classical style. (foto-remonta.ru 2015).

3.2.2 Neoclassical style

For the ones who think that the classical style is too conservative, the neoclassical style is an option. It maintains the elegance of the classical style by achieving it through modern materials. The interior in the neoclassical style is also finished in light colours. The furniture has less decorative elements and it is not as massive as e.g. a classical bed. A bedroom in this style is more logical and functional with a more schematic décor. (IQInterior 2015.) As neoclassicism is an alternative to the classical style, it could be also considered to be that 'cheaper' option as it was already mentioned before. The neoclassical style does not require as many luxurious elements as the classical one does. Therefore, it is most probable that the neoclassical style is more popular and demanded among Russians than the classical (Picture 2).



Picture 2. Interior in neoclassical style. (foto-remonta.ru 2015).

3.2.3 Contemporary style

The contemporary style comes out as another option to choose from because it is the style of nowadays. The main idea of this style is to achieve comfort and practicality through functionality and simple shapes (Picture 3). Therefore, such interior lacks “strongly expressed details” which could get all the attention. As solely modern materials are applied, glass, plastic, and metal can easily be used for the interior. (IQInterior 2015.) The book *Practical Arts 3* (Rosario Claridad Cruz 2000, 114) supports the previous definition by stating that, “it emphasizes functionalism,” and that the main feature that characterizes the contemporary style is the deliberate non-usage of decorative elements. Indeed, this style can be spotted in many Russian houses, as it is the contrary of what was used in previous decades (starting in the eighties) and still can be seen in the homes of older generations. In the Soviet eighties and the beginning of the nineties it was popular to have a huge wardrobe of dark brown colour which was placed along one wall in the room. On the other walls, carpets were usually hanged. With the collapse of the Soviet Union, people got the possibility to travel abroad and to see what exists in other countries. That was the time of changes for the Russian interiors as well. People became tired of the dark brown colours used in the interior and started to like more brighter tones and lighter coloured furniture.



Picture 3. Interior in contemporary style. (foto-remonta.ru 2015).

3.2.4 Scandinavian style

The Scandinavian style is rather new for Russians and not as widely used as it is in Finland and Scandinavian countries, but still becoming rather popular lately. (Salon 2015.) Since the company Kiteen Huonekalutehdas Oy produces the furniture of this style it is important to define it as well. The Scandinavian interior looks very modern and represents naturalness (Picture 4). Every object in the interior has its function. The ecological materials create the feeling of freshness and lightness. The wood of lighter colours with natural fabrics are usually used. (IQInterior 2015.) However, bright colours which are often used in authentic patterns that are well-known around the world also appear in Scandinavian interiors. (Salon 2015.) IKEA represents the Scandinavian style and nowadays can be regarded as a popular place for buying furniture among Russians.



Picture 4. Interior in Scandinavian style. (foto-remonta.ru 2015).

3.2.5 Russian style

The style that is usually not regarded as one appears to be quite relevant to the current topic as it is called Russian. The status debate is due to the fact that it is not often used. In any case, it might be interesting to learn about its special characteristics, as it shows the cultural traditions of the country. Usually interiors in this style represent the traditional Russian *izba*, which is a house in the countryside and also the place where Russians started to live already since the Middle Ages. This style can be recognized easily as it uses traditional Russian patterns and such typical objects as *matryoshka*, samovar and wooden kitchenware for decoration. The bedroom in the Russian style usually has a wooden bed and a dowel chest, and all of the furniture is decorated with wooden carving. (IQInterior 2015.) As mentioned earlier, it is hard to name this style as a separate one, but it is also possible to spot the elements of it in many Russian homes. A lot of Russians have the typical items at home, either a bed cover, a tablecloth or a towel which have traditional patterns (Picture 5).



Picture 5. Interior in Russian style. (www.pinterest.com 2015).

3.2.6 High-tech

Finally, the style that was born already in the sixties but still looks like it is the style of the future is called high-tech. Again, it is not as common to decorate interiors in this style in Russia, but there is more growing interest for it. The main idea is to use no decoration at all. Secondly, it has very clean surfaces with minimum furniture in a spacious room. The colours do not matter, but the place should be illuminated very well (Picture 6). (IQInterior 2015.) It seems that it is possible to use this style freely in the interior for having more comfortable living by making it a bit more down-to-earth. In any case, high-tech represents the era of technologies, and thus is getting more attention over time.



Picture 6. Interior in high-tech style. (foto-remonta.ru 2015).

Of course, more interior styles can be added to the list, as there is a great variety of those. Classical/neoclassical and contemporary seem to be dominant when talking about Russian interiors. On the other hand, when analyzing the styles, it is noticeable that the interior style does not particularly define the rules for the furniture. This means that sometimes similar pieces can be partly two different styles, as, for example, it happens with contemporary and Scandinavian. Of course, it is impossible to imagine a huge luxurious bed with a lot of décor elements in a contemporary interior, but a bed with less decoration and smooth lines for sure would fit into it. Thus, when it comes to bed design in terms of its looks, one should concentrate on the number of décor elements that are either used a lot, a bit or not at all.

4 QUANTITATIVE RESEARCH

Typically, the aim of product design research is to ask, observe, think, and learn (with objectivity) from people who interact on a day-to-day basis with products, spaces, and systems (Rodgers 2011, 56-57). Therefore, a survey of 15 questions was constructed in

order to learn the preferences of Russian customers which would help in the design process.

In total 261 participants took part in the survey. 182 (69.7%) were women, and 79 (30.3%) men. When looking at the age range of the participants, 80.1% of them were between 18-29 years old, 12.6% of the ages 30-39, 3.5% were 40-49 years old, 7 (2.7%) persons were of the age 50-60, and finally, only 3 (1.2%) participants were older than 60 years. 140 (53.6%) participants were employed, 109 (41.8%) were students, only 6 (2.3%) were unemployed and 6 (2.3%) were already retired. Out of 261 participants 134 were from Petrozavodsk, 60 from St. Petersburg and 28 from Moscow. Other people who participated in the survey were from 19 different cities which are located in the European part of Russia. Nine participants marked their current place of living outside of Russia.

The fifth question asked, “what do you consider first when buying a bed?” Respondents were given five options to choose from: price, material, style, quality and producer. As can be seen from Figure 3, 90 (34.5%) participants chose quality and 90 (34.5%) preferred style. This supports the opinion that was mentioned earlier in the online magazine Vproizvodstvo.

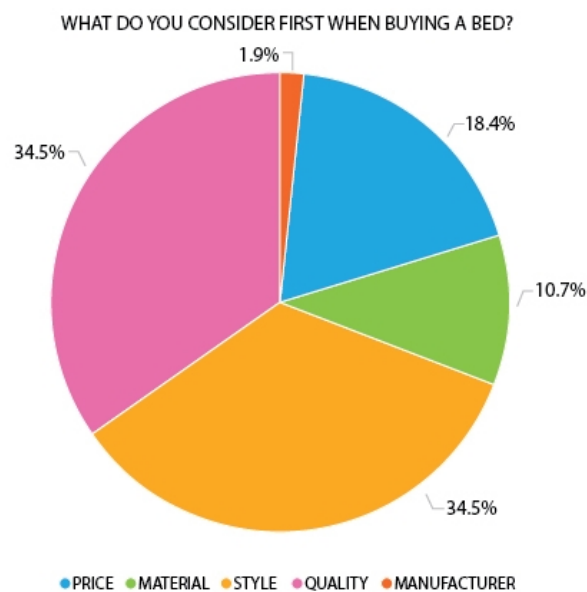


Figure 3. What do you consider first when buying a bed?

In the sixth question people were asked whether they preferred a domestic or a foreign producer. It turned out that 72.8% of participants chose a foreign producer. These results seem to be not so good for the Russian manufacturing industry, but it gives possibilities for foreign producers. In the next question, the participants were asked whether they would be ready to pay more for a bed made from natural material, and 72.0% said yes.

When asking about the price and how much a person is ready to spend on a double bed (the price does not include the mattress), 37.6% of respondents chose between 10,000-20,000 rubles, which at the current rate (1 euro equals around 55 rubles) is 180-360 euro. Again, the value of ruble and the current crisis should be taken into account when evaluating such information. Previously, the euro was equal to 45 rubles, which means that people were ready to spend 220-450 euro on a bed.

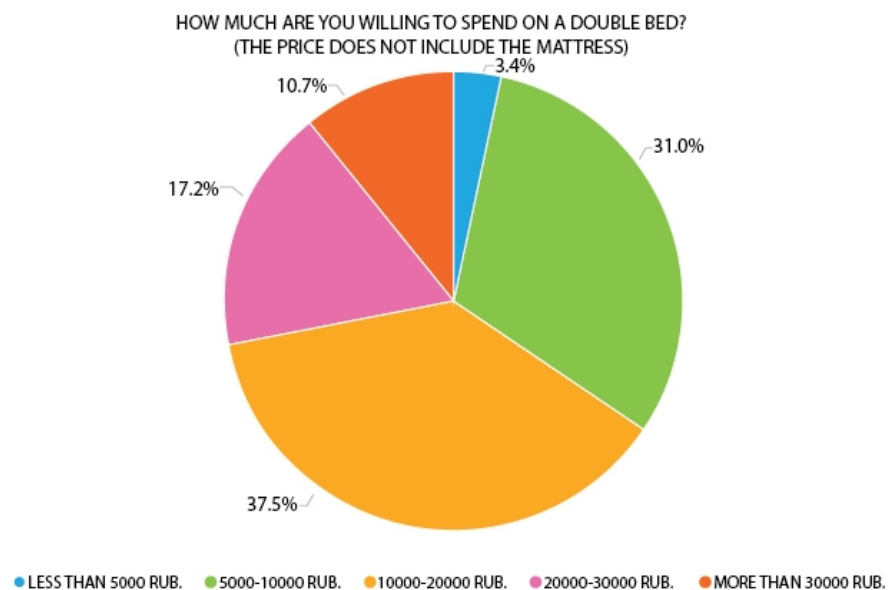


Figure 4. How much are you willing to spend on a double bed? (the price does not include the mattress).

In the ninth question the designer wanted to find out which interior people would prefer more for their own rooms. The main idea was to present four interiors of different styles but at the same time having all of them in light and white colours, so that people would pay more attention to the type of interior and decorations that are used rather than to the colour variations. The four chosen styles were classical, Scandinavian, contemporary and high-tech. Almost half of the participants (47.5%) chose a room in the contemporary style.

After that again the participants were asked to choose the interior that looks more appealing to them. This time the four interiors of the same styles as in the previous question were presented, but in darker colours. According to the results, the interior in contemporary style was in favour with 44.4% of votes.

Then the participants were given six beds of various types to choose from. The bed which was the simplest one and had no elements received 102 (39.1%) votes (Figure 5).

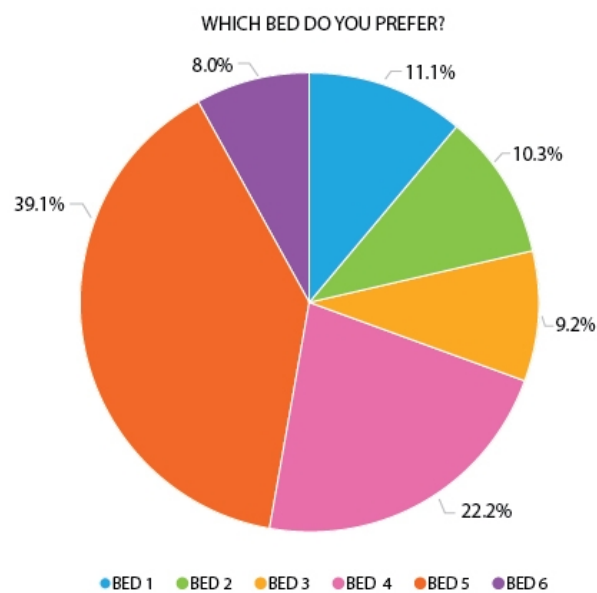


Figure 5. Which bed do you prefer?

Since most Russians live in apartments, there is a need for using space efficiently. Therefore, the participants were asked whether they prefer to have a bed that has drawers or not. As expected (from personal knowledge) 63.6% chose the option with the drawers.

The tenth question was meant to understand what type of bed Russians prefer: wooden, metal or soft one with fabric. 130 (49.8%) participants chose a soft one, although it should be added that the wooden bed was chosen by 43.3%.

In the next question, the participants were offered eight colors for beds. Again, they were asked to choose the one which they prefer the most. The given colours were white, birch, bleached oak, nut, cherry, grey-brown, stained beech, and black. According to the results, the bleached oak was the most popular one as it received 32.2% of votes. 21.8%

chose white colour for the bed. These results show that Russians do not prefer darker brown colours when talking about furniture. Also, as most of the participants were aged 18-29 years, it indicates that the younger generation wants a fresher ambient for home.

Finally, the participants were asked whether or not they were going to buy a bed any time soon. 61.3% answered with a no, which can be due to the current financial situation in Russia.

Overall, the results just give some kind of idea in which direction one could go when designing a bed for the market. It is obvious that in order to get a more realistic picture, more people should participate in the survey. Also it would be better to involve more people from older generations, as in this survey mainly younger people participated. Moreover, it should be taken into account that the answers for the question about the interiors might have been different if other interiors of the same style were put into a survey.

Definitely, these results made it clear that the contemporary and Scandinavian styles are in favour. Thus Kiteen Huonekalutehdas has the possibilities to enter the market successfully with the style they offer.

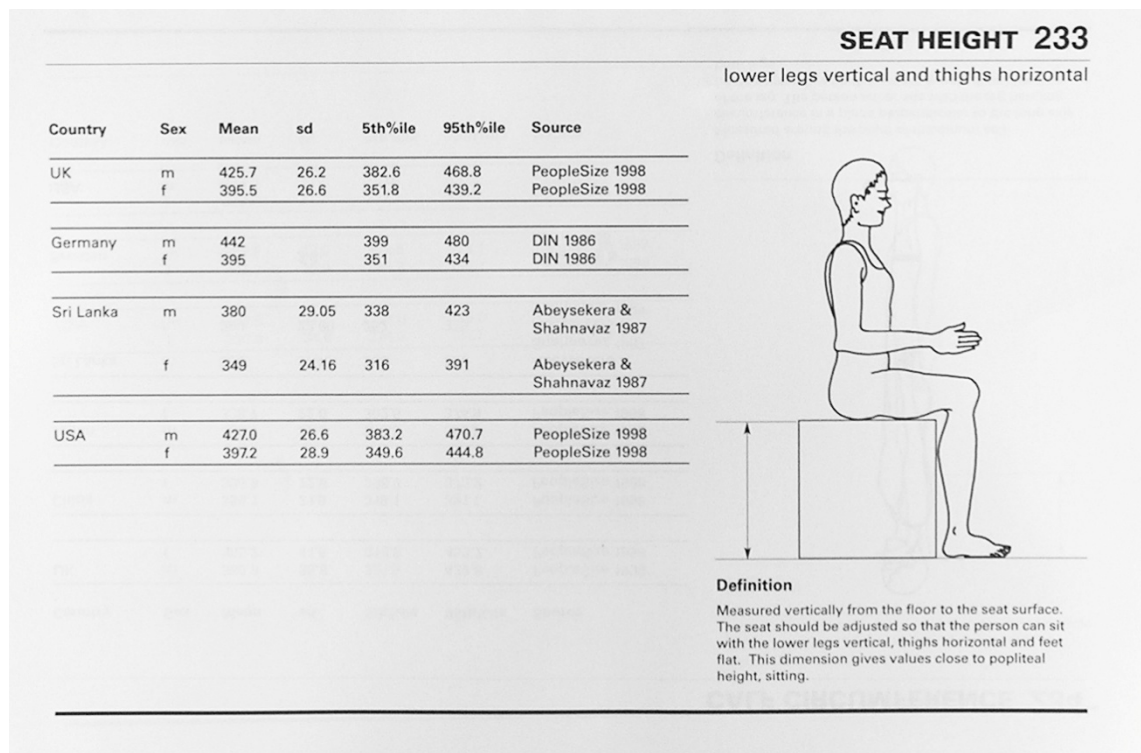
The results of the survey also give an idea about the target group for Kiteen Huonekalutehdas Oy in Russia. When looking at the results of each age group, it can be seen that the age does not define the tastes of people. This means that in every age group there are people who prefer the furniture of contemporary style, but the aim is to reach the people who would pay for bedroom furniture which is made from natural material.

5 TECHNICAL ISSUES

5.1 Measurements

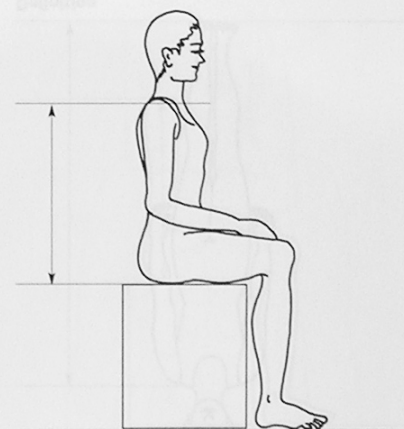
When designing a piece of furniture, it is always important to consider the rules of ergonomics and anthropometry. These rules will help to create a product that would be comfortable to use.

Ergonomics is considered to be a discipline that regards the interactions of a human being with the environment, as well as utilizing specific rules and methods in order to create a better and more comfortable living for people. In turn, anthropometry deals with the measurements of a body. (Dul & Weerdmeester 2008, 1.) These sciences give a designer the dimensions that can be used for furniture that would correspond to the body measurements of an average person (Pictures 7 & 8). Of course, when designing for example a chair for an individual, it would be wise to take his/her measurements into account if they differ from average ones. (Jackson & Day 1989, 40.)



Picture 7. Seat height. (Peebles & Norris 2015, 233).

SHOULDER HEIGHT 59						
(acromion), sitting						
Country	Sex	Mean	sd	5th%ile	95th%ile	Source
UK	m	609.5	31.4	557.9	661.1	PeopleSize 1998
	f	572.7	30.2	523.0	622.4	PeopleSize 1998
Brazil	m	595	29	550	645	Pheasant 1996
China	m	588.6	33.0	534.3	643.0	PeopleSize 1998
	f	545.8	27.6	500.4	591.2	PeopleSize 1998
France	m	620		570	671	Rebiffe et al. 1981-82
	f	581		535	624	Rebiffe et al. 1981-82
Germany	m	610		561	655	DIN 198
	f	585		538	631	DIN 1986
Japan	m	593.2	27.7	547.7	638.7	PeopleSize 1998
	f	551.0	23.7	512.0	589.9	PeopleSize 1998
Poland	m			540	650	PKN 1988
	f			504	607	PKN 1988
Sweden	m	600	34	545	655	Pheasant 1996
	f	575	30	525	625	Pheasant 1996
Netherlands	m	620	31	570	670	Pheasant 1996
	f	565	30	515	615	Pheasant 1996
USA	m	611.3	31.8	558.9	663.7	PeopleSize 1998
	f	575.1	32.9	520.9	629.2	PeopleSize 1998



Definition

Measured vertically from the seat surface to the bony tip of the shoulder (acromion). The person sits erect, looking straight ahead, hands in lap. The feet are either unsupported or supported at a level that ensures the thighs are horizontal.

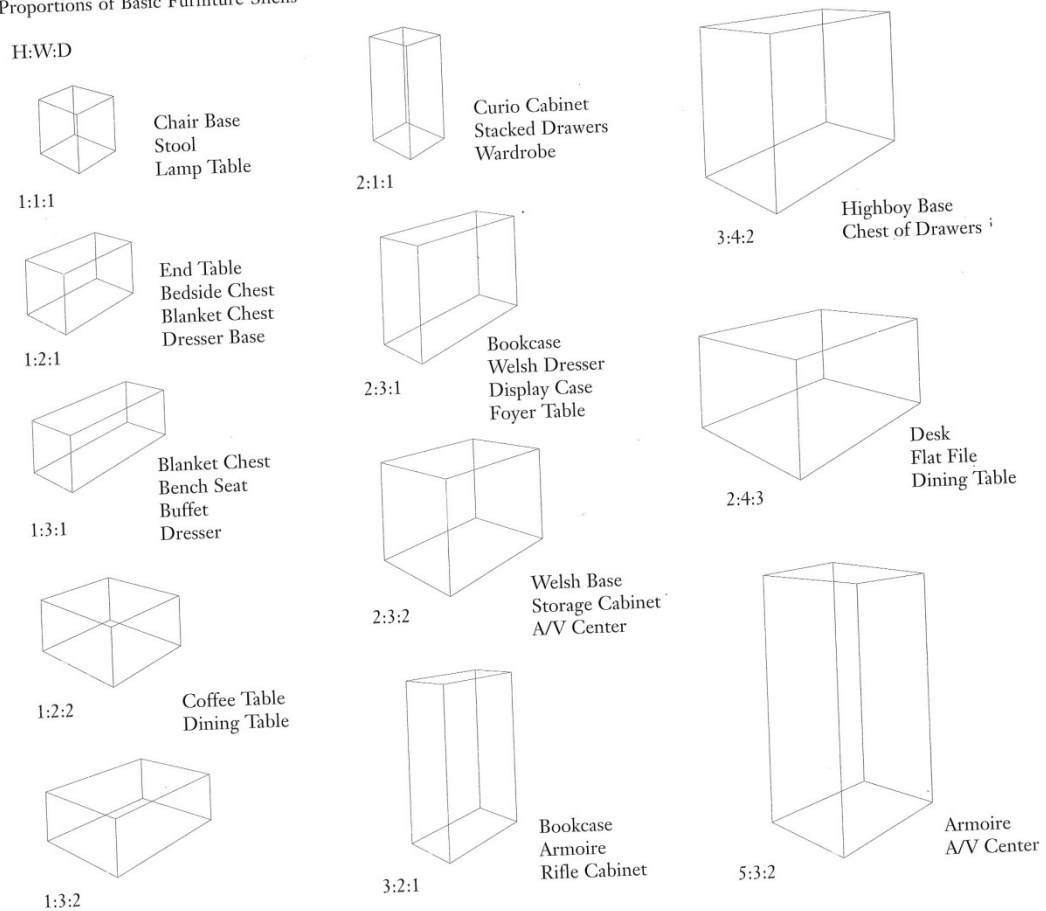
Picture 8. Shoulder height. (Source: Peebles & Norris 2015, 59).

5.2 Proportions

Despite the measurements of a human body that should be taken into consideration while designing furniture, matters such as proportions should be regarded as well. When the right proportions are applied, the piece of furniture looks more balanced.

One of the methods that could be used while designing furniture is the Golden Section Proportions. The Golden Section Proportions are considered to be 'eye-pleasing ratios' and have been used by artists and architects already many centuries ago. Also, it is possible to use already existing proportions of standard furniture shells which could be a good basis for designing a more complex piece (Picture 9). (Graves 1997, 91-96.)

FIGURE 3-6
Proportions of Basic Furniture Shells



Picture 9. Proportions of basic furniture shells. (Graves 1997, 92).

Of course, first of all the generally accepted sizes of height, length and width should be applied for a bed frame and headboard. After that, the proportions could be used while designing a bed frame in order to achieve a proportional and harmonious part.

5.3 Material

The main material that is used for the furniture by Kiteen Huonekalutehdas Oy is birch (solid wood). Therefore, it is useful to study briefly the properties of this material.

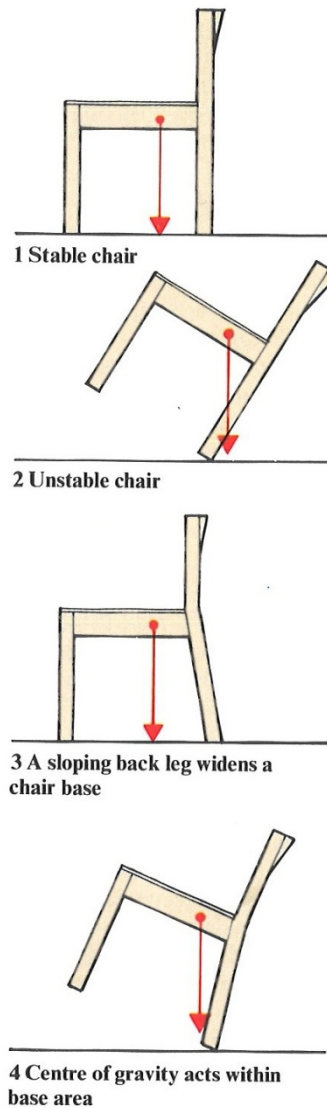
Birch is considered to be a rather “soft type of wood, but still it is quite wear-resistant. Birch wood holds lacquer coating rather well, as well as it can be easily imitated to look like a valuable tree species.” (Volodina 2014.) Even though the texture of birch wood is neutral, still the knots can be spotted, which make the wood very appealing. It is easy to

paint birch wood, which makes it possible to have variations of different colours. The firmness and stability of it is average, and techniques such as cutting and whetting can be easily applied when processing it. (Volodina 2014.)

Overall, birch timber is widely used for furniture making because its properties result in good quality. Even though it can be easily painted (which is a plus) as stated Volodina (2014), the light colour of it is looking naturally beautiful and brings more value to the wood.

5.4 Stability

Another factor that should be also taken into account while designing the visual elements of furniture is stability. For example, a chair is in a stable position when the centre of its gravity stays in the area of the four points (which are the points where legs touch the floor). If a person leans back while sitting on a chair, the centre of gravity can be moved outside the area of four points, which make it possible to fall. That is why in many chairs, the back legs are put into an inclined position, so that if it is leaned on, it will remain stable (Picture 10). (Jackson & Day 1989, 42.)



Picture 10. Chair stability. (Source: Jackson & Day 1989, 42.)

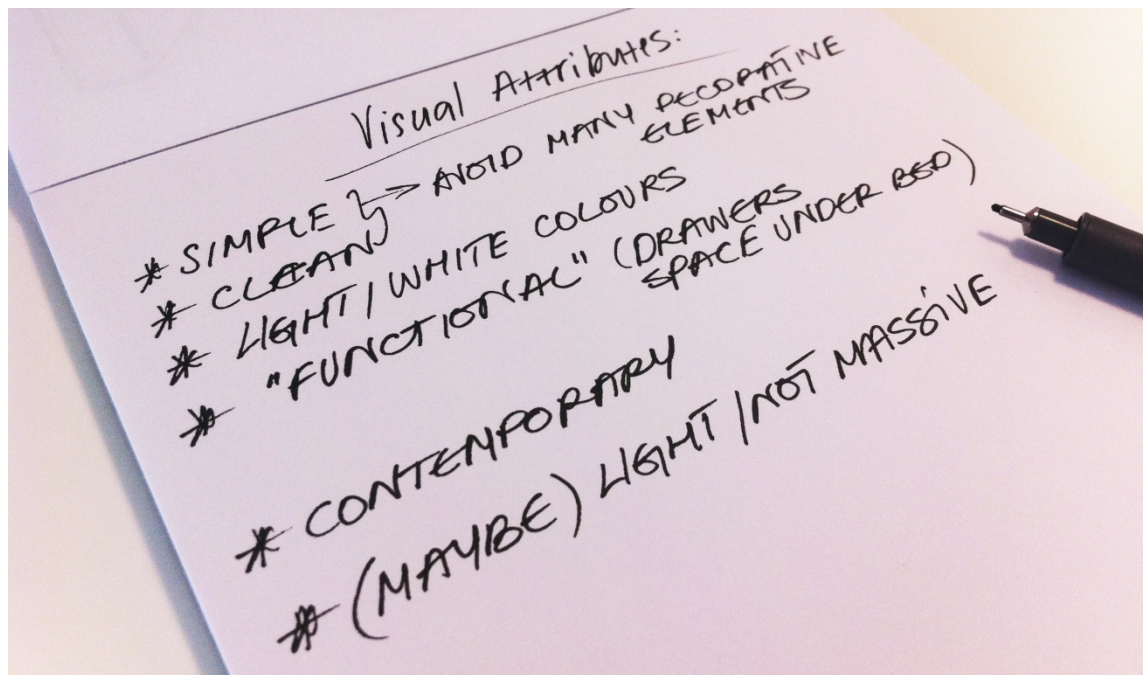
When considering these rules for a bed, the most important thing to remember is to place the legs in the right spot in order to create a maximum area for gravity. This means that the wisest thing to do is to place the legs next to the corners of the frame as close as possible.

6 DESIGN PROCESS

“Designing in three dimensions requires the ability to visualize how an object will eventually look before you actually make it. The design process is never easy and if you are working with unfamiliar forms or materials it becomes even more complex than usual.” (Jackson & Day 1989, 39.) Therefore, in order to design a product, a bed in this case, it is important to start the process by using ideation methods and putting the ideas onto a piece of paper.

6.1 Idea creation

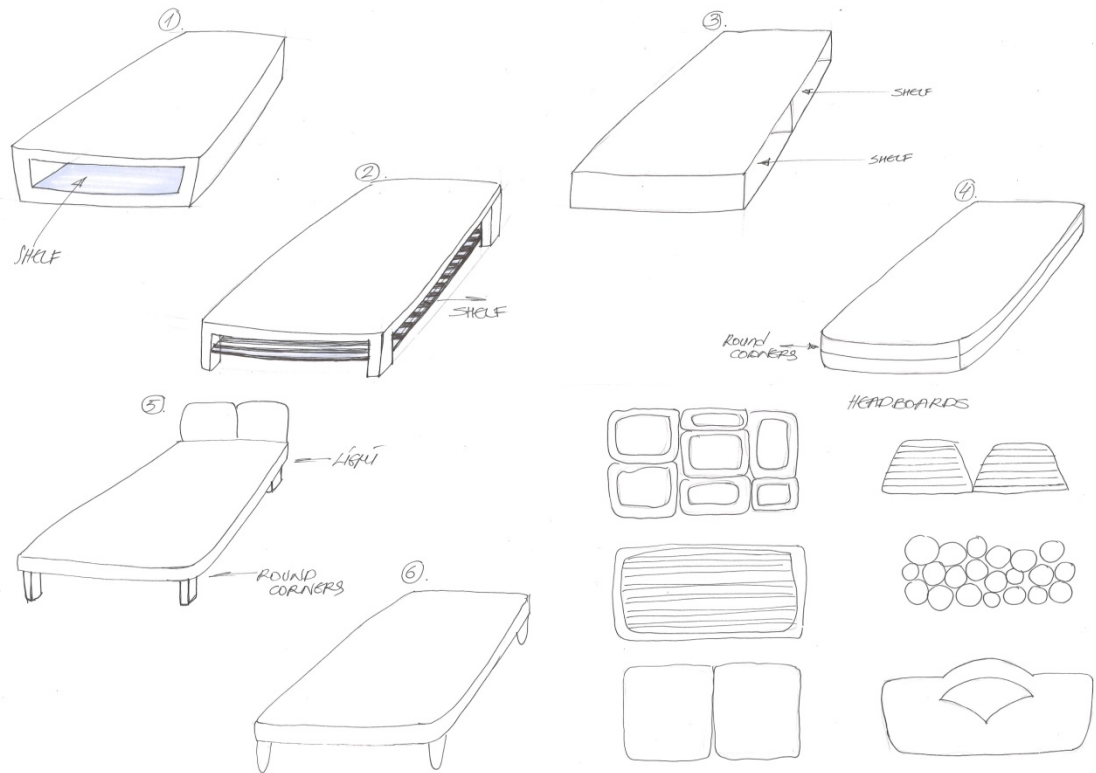
One of the ideation methods that can be used as a starting point in the design process is attribute listing. It is considered to be “... a specific idea-finding technique” in which one first of all needs to consider the main characteristics of the product. The second step would be to think of the ways how these traits can be improved, and, finally, the changes should be put into sketches, which eventually should be compared between each other in order to find the best solution. (Rodgers 2011, 80.) Since current design processes concentrate mainly on the aesthetic side of the bed frame, the designer has decided to change this 'attribute' listing into 'visual attributes'. Therefore, the outcomes of the survey are going to be written down in order to see which shapes and colours were the most popular among the participants (Picture 11). The designer has decided to go with a design that would be in a simple contemporary style, because it will both satisfy the customer and fit into the style of the company.



Picture 11. A list of visual attributes.

6.2 Sketching

In order to get some kind of ideas and inspiration, different online sources with beds were overviewed. As it is rather hard to come up with an entirely new looking design of a bed, the main concern was to avoid copying the designs that were seen. Therefore, a general overview of the designs was performed. Certain elements and parts that seemed to be interesting were remembered in order to develop and incorporate them into sketches. The products of the company were also checked, as it gave an idea of what could be changed or added, as well as offering designs that the company does not have. The fact that more than half the participants chose a bed with drawers should be taken into consideration, therefore few options with drawers should be suggested in which it would be possible to store things under the bed. However, during the sketching process the designer got a comment from the company that they would like to have a bed that is light and has round corners. This also helped when working on certain concepts (Picture 12).



Picture 12. Sketching ideas.

6.3 3D models

As a result of sketching, ten concepts were created and drawn in a 3D programme. Since sketching is fast, it is a convenient method for the designer when putting an idea into real life. 3D models are more visual and thus give a more realistic look of a final product rather than a sketch. 3D models were created in order to present them to the company.

In the first model, the aim was to play around with the space under the bed. The idea was to avoid having a drawer, but instead to create an open space where things could be stored. The shelf would go only halfway through the bed, so that it would be easier to reach the whole surface while cleaning. The problem with this model is that it requires a lot of material, thus increasing the costs and the final price. Also, this type of bed would be rather difficult to move and relocate (Picture 13).



Picture 13. Model 1.

In the second model, the space under the bed was the main focus again. The main idea was to have a shelf under the mattress where it would be possible to put, for example, a bed cover for the night time. On the other hand it might be rather impractical, as during the day time that space would be empty. And most probably if someone wants to keep other things there on a regular basis, they would want it not to be seen (Picture 14).



Picture 14. Model 2.

This model was inspired by the classical shapes. The curvy and smooth lines remind of classical forms, but the lack of extensive décor elements keep the bed rather simple, thus allowing it to become a part of a contemporary interior (Picture 15).



Picture 15. Model 3.

The fourth model was influenced by the most chosen bed among participants in the survey. Even though it is very basic and simple, it attracts many people because it can become a part of a teenager's room, as well as of a person from older generation. One thing that can be disliked about this model is the closed space. It prevents cleaning the floor under it and it does not provide any storage (Picture 16).



Picture 16. Model 4.

The next six models are proposals of a light, easy to move bed with rounded corners. Basically, the intention was to play around with the legs that would best suit the rounded corners and using simple shapes for creating a head of a bed (Pictures 17-22).



Picture 17. Model 5.



Picture 18. Model 6.



Picture 19. Model 7.



Picture 20. Model 8.



Picture 21. Model 9.



Picture 22. Model 10.

The ten models were shown to the company in order to get feedback and see if there were any models that interested the company and could maybe be developed. It turned out to be that the last 2 models (Pictures 21 & 22) were the most interesting ones for the company, and therefore developed more.

As a result of the development, two more concepts were created. Both of them included new material which is fabric. The idea is to create a headboard that would be soft and thus more comfortable while being used (Picture 23, 24).



Picture 23. Model 11.



Picture 24. Model 12.

After receiving more comments on the models, more changes were made and improved. As a result a final design was created as a suggestion for the company that could be worked on more.

7 FINAL DESIGN

The suggestion of a final concept includes a bed in which the visual appearance was created in order to present certain features. The design intends to represent the

contemporary style through the usage of simple shapes and clean lines. The concept aims at completing the task which was stated at the beginning of the project.

As requested by the company the model has round edges, which also brings a safety aspect because sharp angles could be considered more dangerous. The legs of this certain shape are used as they fit better the round corners of the bed frame and therefore the appearance of bed looks more unified. Also, the legs (with proper construction inside) should provide enough stability for the upper parts. The headboard repeats the shape of the legs which again adds more to a balanced and united form. In order for the headboard not to be shallow, two wide planks were added (Picture 25).



Picture 25. Final model.

The planks have two 'missions' where one of them is a decorative element, and the other provides support for a soft cover that can be attached to the planks with the help of velcro straps. The aim of a detachable pillow is to bring the comfort trait to the headboard, because even if regular pillows are being used, the back of a body can touch the not so comfortable wooden planks. The reason why this pillow is removable is, first of all, because it does not complicate the manufacturing process for the company. These pillows can be produced separately. Also, it allows for the possibility to take it off and clean or wash it. The pillow is created as one piece that covers the whole surface of the planks (not two separate smaller pillows for each person), as it makes it possible to lean on it while sitting in the middle of the bed (Pictures 26-28). The colour of the bed is preferably natural wood or white as these colours were the most popular ones according

to the results of the survey. Suggestions for material for the pillow can vary, and therefore, could be discussed later with the company.



Picture 26. Final model with 'futon' pillow.

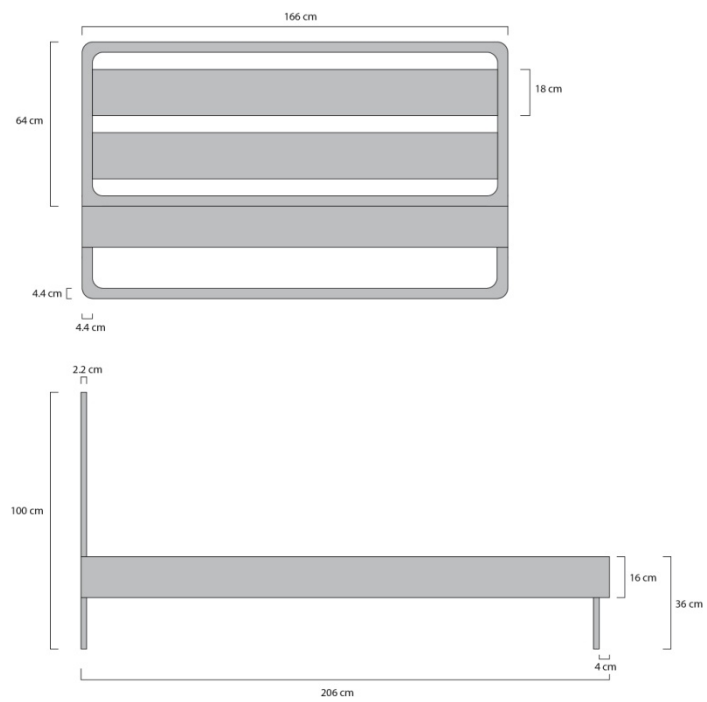


Picture 27. Profile view.



Picture 28. Example of velcro straps being used on a bed.

The bed has a standard mattress size of 160*200 cm. Measurements such as the height of the bed frame and headboard are used according to the measurements of other beds that are produced by the company and the anthropometric data which was shown before. The height of the bed frame is 36 cm, which means that depending on the thickness of the mattress the height is going to be increased, thus providing good height for sitting. The height of the headboard is 64 cm, which provides space behind the back when sitting on a bed while reading or watching TV, for example (Picture 29).



Picture 29. Measurements.



Picture 30. Final concept with decorative elements.



Picture 31. Final concept with decorative elements (side view).



Picture 32. Example of an interior.



Picture 33. Example of an interior (side view).

8 CONCLUSION

Due to the timetable, the current project ends at the stage of suggesting a design that could be used and developed further with the company. The project turned out to be more of a learning process, as the final result does include a ready made product.

Overall, the designer is satisfied with the results of the project, as the company regarded the concept as one that could be developed further. The project also taught various aspects. First of all, it helped to learn how to approach and understand a possible consumer through the means of quantitative research. Secondly, the designer learnt how to work with a client and how the time management should be handled.

The designer intended to learn more about studying the current market and trends but did not succeed so well at this. Going through interior styles helped to understand the visual aspects that could be applied for the designs, but it would have been more helpful to concentrate more specifically on the actual styles of furniture. As, for example, was mentioned before, some beds can fit both contemporary and Scandinavian styles. Therefore, it was more important to learn what those features were.

Since the design process concentrated more on the 'aesthetic' side of the bed design, technical issues were not studied deeply. Certain material on, for example, joints that could be used for beds were studied. However, at the moment such information could be irrelevant to be included into a thesis, as the project mainly focuses on the visual side.

Another aspect that was supposed to be included was the customer-oriented design. It is very important to learn from the customer what he or she prefers, and thus the interviews should have been conducted as well. Moreover, it would be more helpful to get feedback from the target group of the concepts that were created. It would give a more realistic understanding of which design would be more appealing to Russians. On the other hand, it should be mentioned that sometimes it is rather hard to consider customer's preference fully as company's restrictions might affect the final outcome.

What could have been definitely been improved was defining the target group more carefully. Due to the timetable and designer's possibilities, mainly the younger generation was reached, even though it would be more advantageous to involve people of various ages. In general, more people should have participated in the survey. 261 participants can only give an idea in which direction the designs could be developed, rather than providing an actual picture.

This particular project helped to understand that design is not always about new creative ideas that change the world radically. Design is a tool via which certain goals can be reached. As not every business wants and/or is ready to invest into new materials and new technologies, design helps to make changes within the given scope of activity.

Moreover, when working on bedroom furniture design it might be rather complicated to come up with shapes that have not existed before. Therefore, this project was also a challenge, as, of course, it is most probable that similar shapes to those of the final concept have been used many times, but still the designer had to learn the process of how to actually design a bed frame (the visual aspects of it) in order for it to look balanced and appealing.

The designer's educational background in design has helped in this final project. During the studies the designer has learnt the steps of a design process, and such knowledge

was applied to the project described above. When working on a similar project, one should always remember that design always has a process with various steps, and should never be chaotic in order to achieve satisfying results. Such an aspect should always be highlighted during the studying process. As much as design education prepares designers for working life, the projects with real clients provide more valuable experience, and a project such as this one appears to be a good example of it.

During this project such skills and knowledge were acquired which will help designer in her professional life in future. The current project ends at the stage of concept development; hopefully, it will continue with this concept becoming a real product.

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SURVEY
CUSTOMER'S FURNITURE DEMAND ANALYSIS

1. Gender:

- Male
- Female

2. Age:

- 18-29
- 30-39
- 40-49
- 50-59
- Older than 60

3. Occupation:

- Student
- Employed
- Unemployed
- Retired

4. Current place of living:

5. What do you consider first when buying a bed?

- Price
- Material
- Style
- Quality
- Manufacturer

6. Do you prefer domestic or foreign producer?

- Domestic
- Foreign

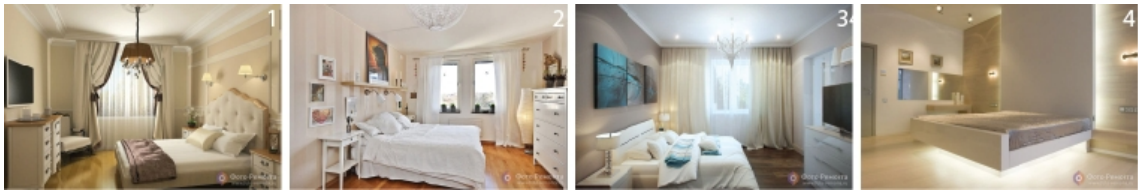
7. Would you be ready to pay more for a bed from natural material?

- Yes
- No

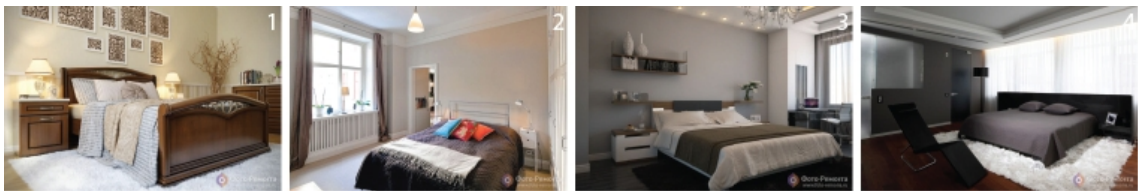
8. How much are you ready to spend on a two-persons bed? (the price does not include the mattress)

- Less than 5000 rubles
- 5000-10000 rubles
- 10000-20000 rubles
- 20000-30000 rubles
- More than 30000 rubles

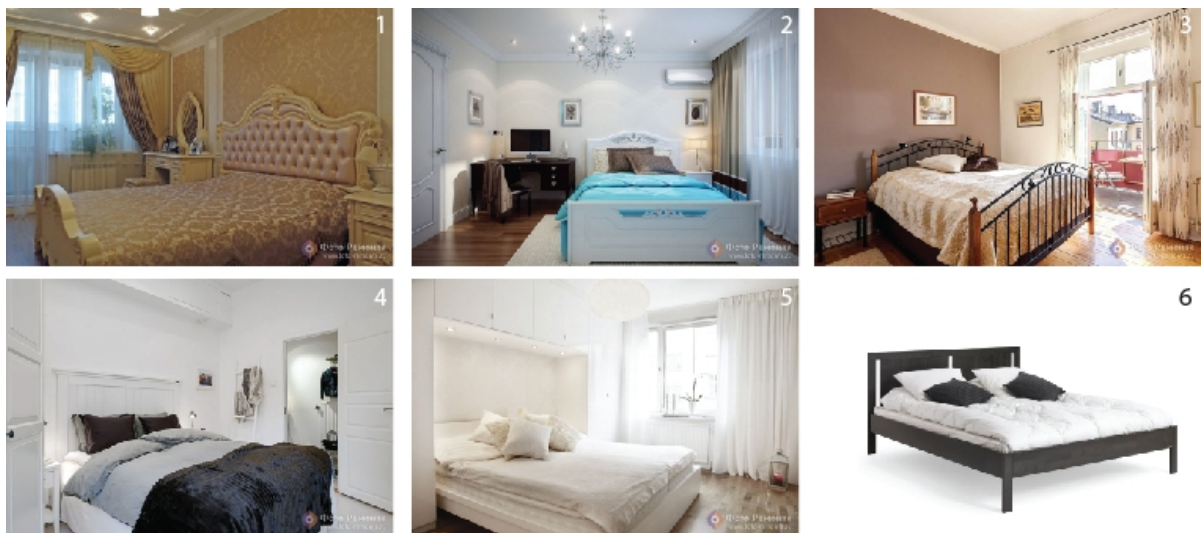
9. Which interior would you prefer for your own bedroom? (Pictures' sources: <http://foto-remonta.ru/>)



10. Which interior would you prefer for your own bedroom? (Pictures' sources: <http://foto-remonta.ru/>)



11. Which bed do you prefer? (Pictures' sources: <http://foto-remonta.ru/>, <http://kiteenhuonekalutehdas.fi/>)



12. Do you prefer a bed with drawers or not? (Pictures' sources: <http://ikea.com/>, <http://kiteenhuonekalutehdas.fi/>)

- With drawers
- Without drawers



13. Which bed do you prefer? (Pictures' sources: <http://kiteenhuonekalutehdas.fi/>, <http://ikea.com/>, <http://hoff.ru/>)

- Wooden
- Metal
- Soft



14. Which bed colour do you prefer? (Pictures' sources: <http://kiteenhuonekalutehdas.fi/>, <http://ikea.com/>, <http://hoff.ru/>)

1. White
2. Birch
3. Bleached oak
4. Nut
5. Cherry
6. Grey-brown
7. Stained beech
8. Black



15. Are you going to buy a bed any time soon?

- Yes
- No