Beyond Japanese minimalistic versatility

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New type of chair with intercultural minimalistic
neutrality for contemporary practical needs

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Master of Arts Thesis
Product and Spatial Design

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Abstract

Due to advances in industrial development, we are now living in an extremely consumeristic world. Every day, large volumes of products are purchased while others are thrown away. At the same time, consumers expect products to add value to their lives beyond mere aesthetics and basic functionality. In particular, the market for mass-produced furniture has grown oversaturated in recent decades. Thus, it is very difficult for designers to make a product that is sufficiently different from what already exists. However, regardless of this state of excess, superficial novelty designs are cast into the limelight every year in Milan and throughout the world. Whenever I visit design fairs I have to question whether people truly need new chairs that appear only nominally different from what already exists. Are these products really improving the quality of our lives and do we still need new chair designs?

This Master's thesis approaches this question by studying the context rather than only looking at the problem from an aesthetic angle, applying the minimalistic thinking of Japanese product design. The methodology investigates the shared values in Japanese and Finnish culture in order to create a new seating product that is both relevant and meaningful in the context of contemporary furniture design.

The thesis first delves into the changing lifestyle in Japan over time and how this affected the development of modern furniture. In many cases, the Japanese brand of minimalistic design thinking is an effective method of finding solutions, because simplification is one way to improve user experience. This thesis aims to discover ways that neutrality in design can be utilised to create new value within product design in general and chair typologies in particular.

This thesis project attempts to find a new relationship between a chair and its end user. Furthermore, my intention is to make a product possessing characteristics that makes the user want to keep it for longer and with greater intimacy. Thus, this thesis explores the simplicity that comes from Japanese tradition, and its application to today's world and its myriad challenges. Even though the results may not be a perfectly formulated innovative design, the entire project can be seen as an experiment for a new chair typology rooted in the principles of Japanese minimalism.

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01 Introduction

1-1 Motivation

This project was an exploration for seeking new value in furniture design from the conceptual and practical view point.

In my prolonged career as an industrial designer of plastic commodity products in Japan, I was becoming interested in primitive functional objects made out of traditional materials such as ceramic tableware and wooden furniture. Thus I chose this Product and Spatial design master's program (PSD) as my major instead of choosing Collaborative and Industrial Design program (CoID). Arguably the CoID program would have been more directly applicable to my career as an industrial designer but curiosity towards the hands-on study of material and techniques overcame my ambivalence.

At present, the product development industry is changing dramatically and new materials and cutting-edge products are appearing and disappearing day by day. However, our body is not changing rapidly on a daily basis. Therefore I am interested in products that do not need to be changed often, and that are durable, even lasting for centuries. Since the beginning of my studies at Aalto university in the year 2015, I have been interested in the often subconscious sense of values in the design sphere of both countries, Japan and Finland. As many others have pointed out a common value, shared in both countries is simplicity. Another term that can be applied is minimalistic which includes both the physical and the conceptual dimensions. In some projects I have worked, I created a mixture of Finnish culture and minimalistic ideas, the personal sauna mat (fig.01) and personal picnic mat (fig.02) made out of wood, which are minimal furniture in a way because of their size or collapsibility which makes them easy to carry around. I came to realize that generally Japanese people tend to sit on the floor or very low, even in their own homes. While designing these products I came to realize that these designs should combine Japanese know-how, that I already had, with a Finnish influence. There has never been a time when I have found myself thinking: "does this fit with Japanese design?". Whether consciously or not, I always had been trying to design something new with minimalistic ideas. This thought was obviously shaped by my identity as a member of Japanese society as well as my professional 8-year-long experience working as an industrial designer in Japan before coming to Finland. After I left Japan, I took notice of the subconscious interest and affection towards those concepts that I had been having in my professional career. On the other hand, many designs from Finland are produced for many decades without major changes in specifications. Without doubt, there is a variety of underlying factors in Finnish design that explain its longevity. I try to add these factors into my own design.

fig.01

fig.02

The current furniture market is saturated by the large number of different chair designs. How many high quality chairs stand out and are bought from the deluge of cheap, mass-produced chairs. I believe that simplicity affects many different aspects of products, such as the environmental impact, mass-production, functionality and distribution. At the beginning of my project, my assumption was that if people had collapsible furniture of high quality, sufficient usability and pleasant style they would be more likely to keep their furniture and move to their next home with them, instead of the usual pattern of throwing the product away. My intention is not to demonize IKEA whose flat-pack design also has some significant advantages for the consumers, such as the reduction of distribution costs, and easier logistics. Nonetheless, in order to create timeless design that contributes to a sustainable society, it is critical to choose the right materials, as is the quality of the structure. To support this endeavour, both simplicity and collapsibility must be used in designing products. Through study projects in Aalto, I found that the minimalism behind Japanese simplicity could be universal, in the sense that the neutrality could be applied to my furniture design which would have real-life utility as well as being able to stand the test of time.

As a designer born in Japan, I decided to delve deeper into the history of my home country's design as well. Japan has long traditions of minimalism and sustainable design, and I expected a deeper understanding of these aspects of Japanese culture to help me gain insights into my research topic. Through this thesis project, I expect to find new value of neutrality in chair design, making a chair fit for purpose and improving the quality of life for a wide variety of different kinds of people in Japan. Achieving this could make people more likely to keep their chairs instead of disposing of the product after a short time. Certain factors are required for consumers to grow "attached" to their chairs. These include shape, quality, patina, collapsibility, among other things. I set out to gain a deeper understanding of these factors that would help the users have a positive user experience. Versatile usability encourages people to use the products longer and more often in their lives. Comprehensive experience of using a well-designed chair can improve the quality of the user's life, thus setting the product apart from competitors. Instead of needing different chairs for different situations, a chair of broad utility could be sufficient.

"More with less" *Richard Buckminster Fuller*

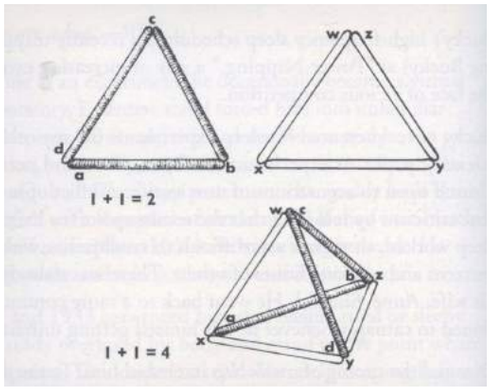


fig.03

1-2 Project objectives

A term that aptly describes our civilization is “throwawayism”. To mitigate this problem, I decided to try to rethink certain aspects of furniture design, and to propose new solutions in areas such as materials and structures. This could include new ways of using chairs by combining traditional design with new solutions. Japan has become a sedentary society. In addition to decreased leisure-time exercise, many jobs require employees to sit down for long periods of time every day. At the same time, interior styles vary and living environments are complicated in today’s Japan. Although a huge amount of furniture designs are already launched every year, it would be a good idea to make an effort to propose more long-lasting and irreplaceable chair design. This project explores these possibilities by designing a new kind of chair, and researches the factors that contribute to good chair design. As a product designer, I see this as a worthwhile project.

The overall objectives of this thesis are the following:

1, Research on the spatial and social context of a certain living environment, in particular the case in Japan, in order to create a valuable concept for chair design.

2, Proposal of a new chair design for complex conditions of the residential environment in Japan that demonstrates how the design can solve common problems facing the society of today’s Japan.

3, Developing my understanding of the practical product design process, which is needed for the design of products that are geared towards daily use. This requires deep understanding of manufacturing and structural reliability.

During the research and design period, I decided the key concept was to be “neutral”. How could neutral design be applied to improve the present situation that consumeristic and materialistic thinking dominate in the cramped and mixed cultural residential environment? After much deliberation, I focused on a new perspective of seating product design mostly targeted towards the modern Japanese residential environment. Prototypes will be created as well. The low chair was designed for people who prefer low posture sitting. It is a chair that can be used in both tatami and regular floor and which can be neutral, in other words not standing out in either environment. The entire process will give me competence and knowledge to develop a chair that carefully takes into consideration the human body, wooden material and other practical requirements.

1-3 Project structure overview

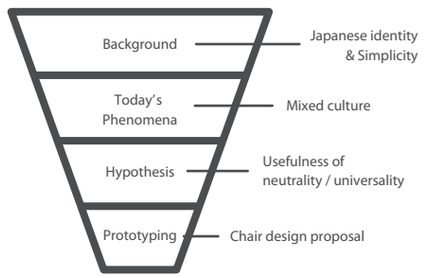
This thesis is production based and therefore the main focus was to design a chair to solve certain challenges posed by today's lifestyle and residential conditions. Knowledge pertaining to a variety of design techniques were applied in chair design to achieve optimal results. At the same time, research of today's cultural phenomena and interior design styles were taken into consideration in creating the design.

This thesis is roughly divided into three parts: The first part of the thesis examines the background of the topic, including historical information about Japanese houses. This part looks at examples of traditional Japanese culture that could act as inspiration to this project.

The second part will examine theoretical research of today's phenomena which will help to generate ideas for the final product. While consumerism has changed modern furniture, this part will explain my motivation in creating new design in the situation of today. By considering the living environment, the ideation process is explained both subjectively and objectively. This research presents both positive and negative aspects of history as well as recent products that are used in today's complicated situation in Japan. However, the main purpose of this section is to clarify the objective and to get a deep perspective for design which could answer the research question.

The third part will follow the actual design process which will mostly consist of prototyping as a production based report. The design process will implement the research of the previous parts. It will also discuss prototyping the final design of the chair. This is also dedicated to the documentation of the development process and the manufacturing issues. I familiarized myself with the development of chair design and its usability and constructing techniques. The focus will also be in designing and evaluating the shape by 1-1 scale mock-ups, as my design philosophy tends to be "think with my hands". Eventually, I expect practical prototypes to offer insight into improvements while solving unexpected problems.

These three parts will often overlap and influence one another, as insights from the research literature and theories support the creation process. The research is likely to offer inspiration to the design process, its form and materials. I worked on all three parts of the project in parallel which has also undoubtedly made them more intertwined. In a sense, theory and production will be in continuous interaction throughout the project, forming the story of the creative process.



02 Background

2-1 Where I grew up

I was born in a small town on the coast of northern tip of Kyoto prefecture in Japan, as the second son of elementary school teachers. Until my father passed away which happened when I was a sixth-grade student of elementary school, I spent my childhood in a typical household with relatively strict discipline. I grew up with two siblings, a brother four years older than me and a sister who is six years younger. The house is of traditional style with wooden structure and soil walls and is located in the middle of a fishing town by the Japan sea. Our dining room with kitchen had a wooden floor, and we had nearly every breakfast and dinner on a western style table and chairs. However, all the other rooms had tatami floors.

In retrospect, most of my memories of my parents' house are about the two rooms, shared bedroom and living room. I do not remember much about the room I stayed in as a child. Strictly speaking one of them is not a bedroom but a multi-purpose room.(fig.05) Looking back those rooms were extremely small. We slept all together parents and siblings in the same room pulling out the futons every night and placing them on the tatami floor. The size of the room was very small having an area of only 6 *Jyo* (*Jyo* is the unit of tatami, 1 *Jyo* = 90cm x 180cm approximately). Even so the small house had some spare rooms upstairs, since our parents did not allow us to have our own rooms before junior high school. Although my memories are not clear of this, when I became an elementary school student pulling out the futons for everyone in the family was one of my responsibilities. The room for sleeping was not big enough to accommodate a family of five, even three of them being children. As a consequence, every night most of the area of the tatami floor was covered with futons. The sides of this square room were four surfaces, three of them being a *shoji* (paper screen) or *fusuma* (a papered sliding door), and one an *oshi-ire* (closet). The *oshi-ire* stored everyone's futons, blankets and pillows. To some extent folding and putting the futons back into *oshi-ire* feels like a bad memory, as it was a chore that I was required to do against my own will. An interesting aspect of this room was its changeability. The room could be used for many purposes even during the same day. For example, it became a drawing room as a low table was brought in. Here we would gather around the low table and sit on *zabuton* (seat cushions). Among other things, as young children we would play in the same room before dinner. The softness of the tatami floor was well-suited for children playing. When all sliding doors are opened, the room became be very breathable so much so that even during the hottest time of the year in Japan the room felt comfortable enough for napping. These kind of rooms in traditional Japanese houses were intentionally designed for comfortable and flexible use for a variety purposes. During my childhood, I had never noticed the ingenious functionality and versatility of Japanese dwellings and I took them for granted. The ideas behind these design solutions were developed in the course of centuries, and they have made the lives of this island nation more comfortable and fulfilling.

Another interesting room in my parents' house is the living room where my siblings and I gathered to watch TV programs together after dinner. This tatami room is quite small, only 4.5 *Jyo*. In the middle of the room there is a *Hori-kotatsu* (*Hori* =a lowered area, *Kotatsu* = small table with an electric heater underneath and covered by a quilt) (fig.04), which is a built-in heater situated in the dug area on the ground level. *Hori-kotatsu* is an effective heater in the winter. In the warmer months, the quilt was removed and it served as a table with built-in chairs. Since traditional houses in Japan have a wooden structure and soil walls they are very

cold during the winter. Thus *kotatsu* was a crucial invention improving the quality of life of the inhabitants. Even though they feel quite mundane for many Japanese people, neatly geometrical tatami rooms are designed carefully and systematically, and can be used for many purposes. One's identity and perceptions are typically formed by early experiences of childhood and adolescence. Moving to Europe helped me notice special characteristics of the Japanese residential environment, some to which I had previously not paid attention.

fig.04

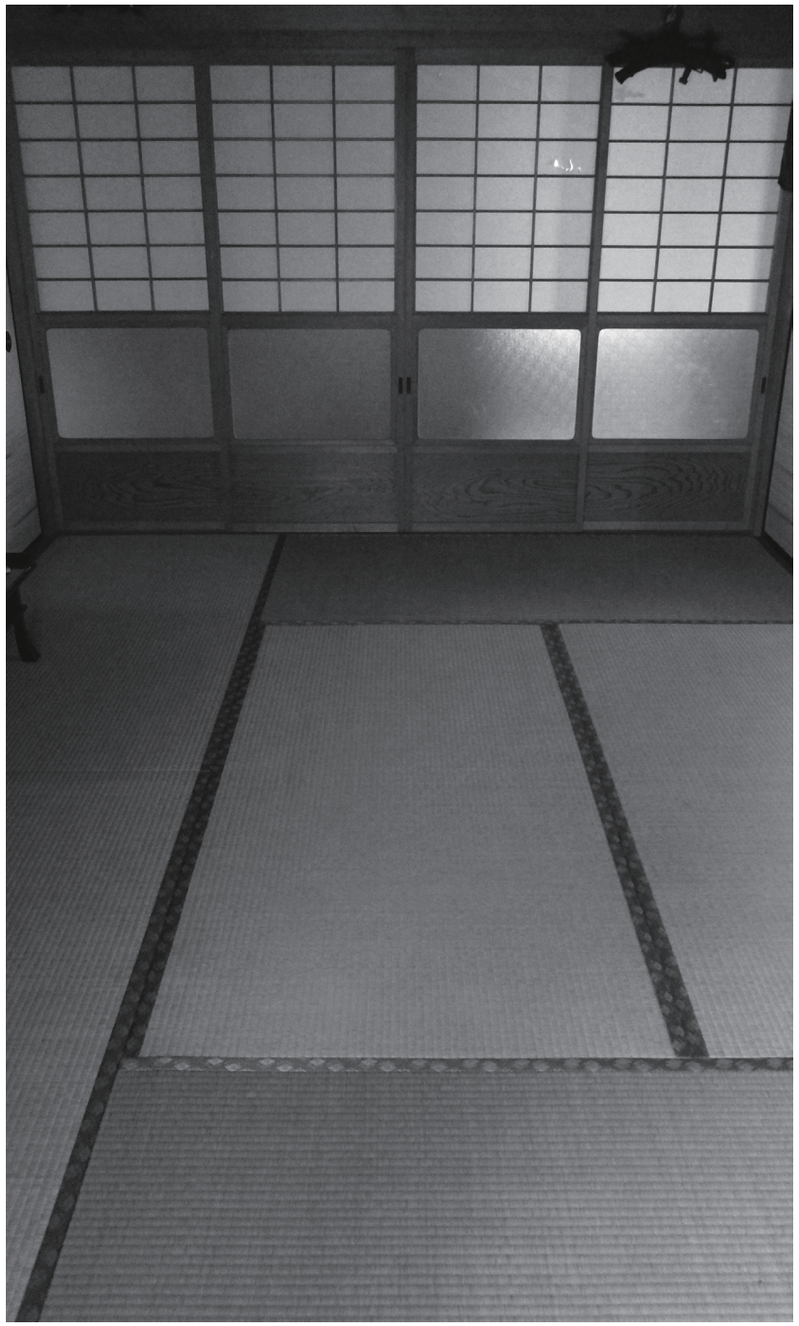


fig.05

2-2 Minimalism in Japan

"Even in Asia, the international simplicity of the Japanese culture and the tension generated by an object placed all alone in an empty space are unique. Any example of ornamentation or decoration from another Asian region will reveal dense, elaborate details. On the opposite end of the scale is the Japanese concept of contentment with simplicity and emptiness "

Kenya Hara
(Designing design, 2007, P.306)

Japanese graphic designer, Kenya Hara explains about the uniqueness of Japanese aesthetics. Nowadays, it seems that there has been some societal phenomena in Japan. That is how graphic designer Kenya Hara describes the uniqueness of Japanese aesthetics. This simplistic approach has taken different forms in today's society.

Some of the terms about organizing and lifestyle, which are popular for ordinary people recently are "minimalist" and "*Dan-sha-ri*". The word "minimalist" which describes a person who aims to reduce his or her personal belongings and live with the bare minimum of objects. This kind of a life style has become popular recently in Japan. "*Dan-sha-ri*" means the action to throw the unnecessary belongings away, in particular that intensive cleaning activity to become a minimalist. They try to realize an easygoing lifestyle, choosing to keep only the most necessary objects. They try to avoid the deluge of mass production and consumption. [1]

Underlying these phenomena is the fact most Japanese people live in large cities, and are unable to buy spacious houses. As a result, most Japanese people have learnt to limit the amount of objects in their homes. As mentioned before, tatami (and the space on which it lies) has broad utility due to its universality. Tatami has played an important role in Japanese life, and it can be seen as an example of ancient Japanese minimalism stemming from the wisdom of day-to-day life.

In addition to spatial design, the concept of minimalism can be seen in various other traditional crafts. For instance, *Furoshiki* (fig.06) is a piece of fabric that is used for wrapping, carrying, gifting, hiding, bundling and protecting. Depending on the need at hand, the form can be changed flexibly. Following the arrival of western bags, use of *furoshiki* has decreased. The traditional fabric can transform and wrap around things adapting to the size and shape of content. In addition, it is foldable and thus becomes extremely small and lightweight when it is not needed. In recent years, it has become valued again for its universality and thus as a contribution for the efforts against environmental problems.

Another example is *oryoki* (fig.07), which is a set of nested bowls for the personal use of Buddhist monks. It normally consists of lacquered ware in five different sizes made with black Urushi. Urushi is lacquer extract from a poisonous tree of East Asia. Its sap is used to produce a hard brownish-black lacquer. Ascetic monks are allowed to possess only Buddhist priest's stole and the *oryoki* bowls. These items are considered the only necessities for a Buddhist monk. *Oryoki* sets of superior quality are carefully hand-made and thus are expensive. However, the advantages can be seen to outweigh the cost. They are lightweight and compact as well as durable. With proper maintenance, *oryoki* sets can be used for an entire lifetime.

Kimono is a traditional Japanese costume which can be used even if the wearer's body size fluctuates. Furthermore, *kimono* can be re-tailored and are often passed down from generation to generation. *Soba-choko* is a small cup that was used originally for dipping soba noodles, but it is also used for a variety of side menus, desserts and soups.

Those are just some examples, however Japanese simplicity has a lot of common things. In particular, the versatility does not rely on the user possessing multiple products. Japan has a long history of simplistic design that supports the philosophy of minimalism in which one chooses to keep the belongings that one loves the most, and keeps using those items for as long as possible.

fig.06

fig.07

2-3 Sense of value toward nature in Japanese culture

"Characteristics of Japanese culture is that it is based on the aesthetics of nature, which means that in the very basis of Japanese view of the world there are deep feelings of reverence, adoration, appreciation, and enjoyment regarding the beauty of nature, yet also feelings of awe and fear towards mysterious and powerful force of nature. The Japanese mind has been open to nature in a spontaneous manner, nature and man have always been inseparable parts of the whole"

Sonja Servomaa
(Beauty in the pine, 2007, P.39)

Living in cramped houses and tatami rooms, Japanese people have become accustomed to live life with fewer belongings and compact products. The Japanese have found ways of making their houses comfortable. This knowledge is passed down from generation to generation.

When it comes to the background of Japanese minimalism, influence came down from the arts and cultures of China (Song dynasty). An aesthetic and composition emphasising negative space, known as Wabi-Sabi, were made with influences of the art of Southern Song(1127-1279 B.C). The Song art expressed Zen buddhism and it was affected by the humid and misty climate of the area. Zen is considered to be the representative of the Japanese spiritual world, and a source of simplicity. It has influenced such traditions as *kadou* (art of flower arrangement), *sadou* (tea ceremony) and *haiku* (a Japanese poem with seventeen syllables), all relatively well-known in the West as well. Underlying all the mentioned art forms (*kado, sado* and *haiku*), is the pursuit to present the subtleties of nature that the practitioners of this art intend to convey and to share with other people. This pursuit can even become a competition among hobbyists and professionals of these arts. In other words, at the essence of these arts is the intention of connecting the human consciousness to nature.

Generally speaking, it tends to be said that the Japanese and the Finnish have a common sense of value which is an intimacy for nature, and yet despite the apparent similarity, at its core this aspect of both cultures are quite different. Japan experiences severe natural disasters, such as typhoons and earthquakes that has caused frequent difficulties for the country's inhabitants. Catching the subtle changes in the surrounding weather and natural phenomena has been crucial for survival. Despite all this, the surrounding oceans and the diversity brought about by the four seasons has acted as inspiration for Japan's art. Japanese has 185 different words and expressions to describe rain, and the four seasons are further divided into 24 sub-seasons, each with distinct natural phenomena. These numbers demonstrate the sensitivity towards nature that ancient Japanese people had. The wildly changing nature creates a sharp distinction between the usual days and the unusual days.

The way people relate with nature in Japan tends to be "created nature". In other words, Japanese ancestors had designed their relationship with nature while Finnish people respect the nature as it is and preserve, share and treat it with respect. The nature and climate of this island nation has greatly affected architecture, and in a larger sense, the living environmental. Rainy weather forced the eaves of the house longer, and that made the backs of the rooms darker. This sensitivity towards seeing beauty in darkness has formed Japanese distinctive aesthetic. The composition of living space, and use of material, as well as architecture were not shaped without effects from the world of nature. The sensibility that caused the culture of "sitting down" and taking one's shoes off is likely derived from the Japanese climate. This has also caused Japanese people to pay meticulous attention to details. An important figure of Japanese interior design, Shigeru Uchida states in his portfolio, "When people living in a region covered by forests quietly sit down on the ground and observe the natural phenomena, think why, and associate their ideas, the whole attitude is that of paying attention to the minute and finest details. It is also an attitude of finding beauty hidden in minute details." and he continues "The manner of being one with nature in the gentle flow of time is felt by listening to the songs of the insects in the garden, appreciating the changing seasons and admiring the glories of nature, flowers, birds, scenery and the moon." (Uchida, P106) This sensibility has had a large and a direct influence on Japanese design.

fig.08

fig.09

2-4 Tatami -associated seating culture-

The Japanese home is a strictly shoe-free zone. Shoes are placed near the entrance, since Japanese people consider home as a sacred area. This custom has strongly influenced our culture. Most parts of Japanese houses apart from the entrance are built slightly higher. The entrance and the other parts are divided by one or two steps. This is a typical characteristic of a house in the monsoon region, called "*taka-yuka* (elevated floor) style architecture". The height of the floor varies, and the layer of void space between the ground and floor provides breathability. Floors in most of the rooms in Japanese traditional houses are tatami. Tatami is a traditional material for floor commonly used in Japan and the most famous feature of Japanese houses. The word "Tatami" can even be found in English dictionaries. It is not imported culture from China but original unique culture of Japan, and it has been used since ancient times.

Origin

The word tatami originally meant "folded and piled". In ancient times, people sat on thin sheets folded and piled on the floor. The word tatami comes from the verb *tatamu* (to fold) as the sheets used in ancient times were folded and put on the corner when they were not used. The oldest preserved tatami is called *Goshou-no-tatami*, and it is from the *Nara* era (710-794 B.C.). Emperor *Shoumu* used it as a sheet for his wooden bed, which means that there was a bed that was made 1260 years ago. (fig.10) After the beginning of the *Heian* era (794-1185 B.C.), the common tatami thickened. The standard of the size was defined, and it came close to the style of today's tatami. At that time, thicker tatami (approximately 70mm thick) was expensive so that only aristocracy could afford to use it. It was a status symbol. Until the end of *Heian* era, tatami was used as cushions on floor boards. In the *Muromachi* era (1336-1573 B.C.), a new kind of tatami style appeared and it was called *Shoin-dukuri*. This style was characterized by the use of lots of tatami on the whole floor of the room. The *Ginkakuji* temple (fig.11) in Kyoto is the best example of this style that we can still see today.

In this era, with the emergence of tatami rooms Japanese people started to use the traditional sitting style *seiza* (sit on the knee). From *Azuchi-Momoyama* era (1573-1603 B.C.) to *Edo* era (1603-1868 B.C.), *Sadou* (Japanese art of tea ceremony) was developed. In this era, the layout of tatami changed according to the position of the fire pit. After the middle of the *Edo* era in the countryside tatami was starting to become popular in the houses of ordinary people as well. Originally, wild rushes were used as the material for tatami. In the *Edo* era the first professional *igusa* (rushes) growers started to emerge, and as a result, tatami became more affordable for the ordinary people. The prevalence of tea ceremony and *seiza* popularized tatami toward the end of the 17th century. In the postwar period of high economic growth Western lifestyle started to spread more into Japanese households. The traditional way of sitting in traditional Japanese style rooms was replaced by sitting on sofas and chairs. Even after carpets became popular, the basic style of a room was a tatami room. Since the 1990's, more and more people refrained from purchases and the maintenance of tatami rooms in order to reduce the costs. In addition to tatami, Japanese style rooms require other items such as *shoji* (paper screen), that can become quite expensive.

Recently however, more and more people are taking into consideration the

coldness and the disturbing echo effect of wooden floors. As a result, many are considering the positive aspects of tatami again. Currently, the use of a thin piece of tatami-mat, similar to that of *Heian* era, is gaining popularity. As the quality of tatami increases, it becomes more popular. [2]

fig.10

fig.11

Structure and material

Tatami consists of three parts, *tatami-omote (omote)*, *toko* and *heri*.

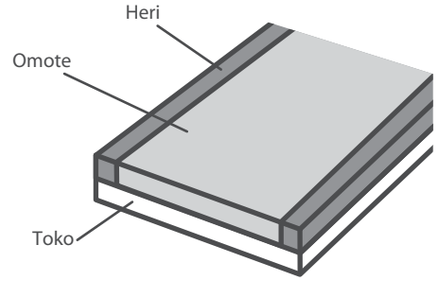
Setting up tatami begins by wrapping the *toko* (surface of a plate-like material) with sheets of knitted rushes called *omote*. The edge is sewn with strip-shaped textile in order to attach *omote* on *toko* as well as acting as decoration. [3]

Omote

Hearing the word tatami many Japanese people are reminded of the pleasant smell of rushes and its unique texture. *Tatami-omote(omote)* is basically made from rushes.
Nowadays, 30-40% of tatami is imported from China, while the rest is produced in western Japan. 10% of manufacturing is in Hiroshima and Okayama and they are high quality. They are made with double the amount of warp string compared with regular ones.
Cotton or hemp are used as warp string. Natural materials are still commonly being used but recently wood pulp, plastics and synthetic resins are also being used for making the sheet with embossed tatami texture as *omote*. Over time, tatami gets worn out and the tatami industry recommends users to turn it inside out or to replace the *omote*.

Toko

Toko is the base for the *omote*. Traditionally manufactured *toko* is a board made from strongly pressed dried paddy straw, which is 50mm thickness. Byproducts from rice production were used for making *toko* economically. However the material possesses an appropriate amount of elasticity, rich moisture, function of humidity conditioning and air cleaning. The cheap option would be synthetic fiber. In the post-war period, new materials were introduced because of the difficulty of purchasing traditional materials and the difficulty of manufacturing. In addition, the high weight of the tatami created challenges as did problems with pest insects and molds. During this time, new types of polystyrene foam and insulation board were introduced to the market. And they proved to be superior to the traditional materials because they were lightweight and affordable. Further benefits were soundproofing in between upstairs and downstairs. Recently, there is also a special type of steel toko used for heating floors.



Heri

Heri is a thin cloth strip made of hemp, cotton or synthetic fiber that is sewn to the edges of the tatami as a decorative border. Generally, when the *toko* is wrapped with *omote*, *heri* is sewn to *toko* to hide the cut edge and fix the *omote* to *toko*. 80% of *heri* are decorated with a pattern.

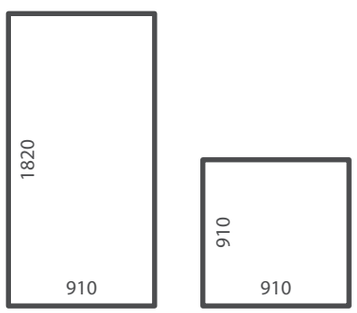
By absorbing, retaining and releasing moisture tatami makes the room environment warm in the winter while it keeps it cool in the summer. Tatami is flameproof and improves the air quality of the room by absorbing carbon dioxide. The smell of rushes relaxes the body and mind and its elasticity comfortably stimulates people's feet. Tatami has acoustic absorption properties that softens the noise. One of the pleasant experiences in my parent's house is napping time on tatami mats.

Size

Since the number of tatami indicates the size of the room in Japan, measurement of tatami is important and they have become standard modules. There are certain aspect ratio, rectangle and square, *Ichi-Jyo* (regular size, 1:2) and *Han-Jyo* (Half size, 1:1) respectively, but the rectangle type is commonly used more. Although the basic size is about 910mm x 1820mm, the size is not certain since recently it is common to make the tatami built-to-order according to the size of the room.

Tatami is generally approximately 60mm thick but the length and width vary slightly, depending on the area in Japan. These differences were created by the changes of rods for measuring when the nationwide land survey for arable field took place during *Azuchi-Momoyama* era and *Edo* era.

Also there were two different systems for building a house, *Tatami-wari* (dividing based on the measurement of tatami) or *Hashira-wari* (dividing based on the distance of pillars). These two systems cause slight differences in the sizes of tatami. *Hashira-wari* is considered a modernistic system because of the efficiency of carpenter's work. Since a house is not produced in a factory but is built on site, every room possesses tiny differences and are therefore not accurate rectangles in many cases. Consequently one has to put each tatami exactly on the same place after cleaning the tatami.



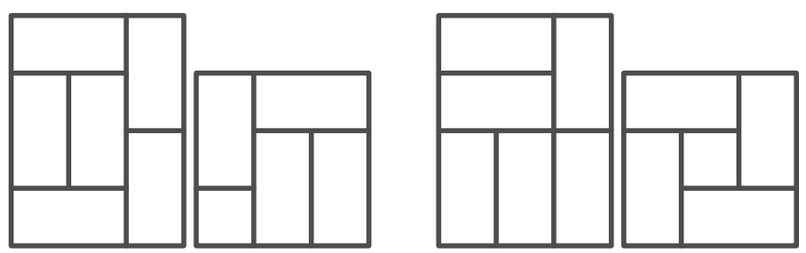
1-Jō Han-Jō

*jō is a unit for tatami

Layout

There are several ways of setting tatami into a floor. After the *Edo* era, the most common arrangements are roughly divided into two types, *Shugi-jiki* (T-shaped formation) and *Bushugi-jiki* (cross-shaped formation). The former is used for private houses today. In order to avoid having the corners of four pieces of tatami together, the edge of the tatami are placed at right angles to each other, intersecting in a T-shape. The latter style is used in larger spaces, such as temples and in the halls of Japanese-style hotels known as *Ryokan*. With the cross-shaped style, the tatami are laid out parallel to each other. When omens were perceived or funerals were held, *Bushugi-jiki* was used. The crossroad made by edges of tatami were believed to cause fortune and misfortune.

In the past, tatami were precious items and used sparingly. For much of the year, they were stored vertically in piles. Only at special occasions, such as marriages and funerals, tatami were used, and arranged according to the situation. Nowadays, no one changes the formation of the tatami depending on the events. Up until several decades ago, Japanese homes were comprised entirely of *Washitsu* (Japanese-style room) with tatami floors. Tatami is well-suited to the local climate and is comfortable, which are good reasons for having it in one's house. As people in Japan take off their shoes at the entrance of houses, their bare (or socked) feet can enjoy the cozy feeling of tatami.



Shugi-jiki Bushugi-jiki

2-5 Mixed culture and current situation

As explained previously, traditional Japanese dwellings are interesting for their materials, and their use of space as well as for their versatility. The *Meiji* era brought influence from the West into housing choices as well. Western style homes started to appear in traditional Japanese residential areas. Chairs were also introduced. Some room layouts combined elements from both the East and the West. At a certain period, proponents of exclusive devotion to Japanese style criticized the approaches that combined mixed Eastern and Western styles. People who utilized mixed styles typically did so for practical reasons. Many proponents of purely Western styles came to reassess the advantages of the Eastern traditions, even if they did not return to using them anymore. The history of room arrangement in Japan has been swinging between East and West much like a pendulum. Behind these transitions there has certainly been other factors involved as well, such as the national housing agenda, the trials of architects, changes in family and lifestyle, and urban congestion among others.

Therefore, the history of the Western style chair is relatively short in Japan. "Introduced during the Meiji Restoration of 1868, it slowly gained popularity among the upper classes while designers figured out ways of adapting this intrinsically Western piece of furniture to the Japanese lifestyle."(Hagiwara, P40) Western style has not only changed the Japanese living environment. It has brought many new traditions and influences as well. For example, many wedding ceremonies are celebrated in the Western style in a chapel, despite the fact that the couple are rarely Christians. Funerals, on the other hand, are still held in the traditional Buddhist way in temples. Whenever misfortunes and accidents happen to Japanese people, they often believe it to be a reaction to their previous behaviour. Therefore many Japanese pray to a variety of gods and Buddha that is believed to encompass everyone all the time. This thought is inherited from Shinto which is one of the original polytheistic religions of Japan. It is based on the idea of *yaoyorozu no kami*, whose literal meaning is eight million gods. Traditionally Japanese people often felt the gods and other divine creatures in the natural phenomena, and in all things existing in the universe. Still today many Japanese feel the sacred presence of the gods, and believe the deities to be watching and supervising them all the time. These beliefs may feel strange to the religious people of the West.

Even though my parents' house was built approximately twenty five years after the war, the house was mostly designed in a way that was quite Japanese except the dining room. Looking back, one of the reasons for this may be that my father was an archaeologist and had been studying ancient burial mounds in the area close-by. Probably he felt an intimate connection for old objects and traditions. I wish he were still alive so that I could ask him about the concept of the house. Evidently, my cultural background was a complicated mixture of different traditions. Even today, as in Finland and in the case of my parents' house, many old houses have not been demolished and are still in use in Japan.

In today's houses, interior design and its materials reflect both historical tradition and contemporary realities. Undoubtedly the amount of wooden houses and apartments with a traditional tatami room are in decline. However, every year there is still a large number of new houses being built with at least one tatami room. Japanese interior designer, Shigeru Uchida says "In spite of the fact that globalization is occurring at such a ferocious pace, there are 'cultures that are not lost'. The essence of a culture, in fact, lies in the succession of culture that are not lost, and they are firmly creating the nature of space of today." (Uchida, P109) After leaving my parents' home for college at the age of 18, I moved five times before coming to Finland. Much of this time, for six years, I spent living in a tatami apartment in the center of Tokyo. Many of the younger generation prefer to live in tatami room apartments because of the comfort and pleasant atmosphere associated with tatami when they chill out in low posture. One interesting reason is also that many young people like to nourish this beautiful tradition. Even in Japanese homes that do not have tatami it is surprisingly common to sit on the floor, using rugs and carpets as softeners. Those who possess sofas on a wooden floor may use a traditional low table and use the front side of the sofa as a backrest while sitting on the floor. The popularity of mixed styles has existed for a number of decades and has created new interior styles. "While foreigners living in Japan are still drawn to the gracious rituals of the past, and the young trend setters appear to turn their backs on everything that came before, there now seems to be a stronger effort toward making peace between the two attitudes - and creating what can be called the new Japanese style." (Suzanne Slesin, Stafford Cliff & Daniel Rozensztroch, P3) All in all, the mixture of cultures has made the Japanese living room unique, and this has resulted in the creation of novel products and ways of using furniture.

fig.12
Example of a typical mixed-culture interior in a Japanese house

"Currently, there may not be as many tatami rooms in urban homes as before, but the custom of sitting down on the floor and taking one's shoes off are still predominant. Compared to the advances in recent technology, changes in such habits of life-style seems remarkably small."

Shigeru Uchida
(Shigeru Uchida with Ikuyo Mitsuhashi, 2003, P.109)

2-6 Related products

In the West, chairs have not made big changes to the culture for centuries. Many masterpieces of furniture design were produced around the middle of the 20th century. In Japan, however, the change has been relatively recent and dramatic.

The Japanese traditional furniture industry started around 450 years ago, initially with the production of furnishing goods such as small tables and space dividers. After the *Edo* era (1603-1868 B.C.), living standards of ordinary people increased. At the same time, the production of storage furniture began. They were mostly used for clothes and other small objects. Modern production methods, involving painting and decoration techniques were developed during the *Meiji* era (1868-1912 B.C.). At the same time, Western culture and furnitures were imported to the country. Tables and chairs that mixed Western and Japanese style were produced with minor modifications for the typical Japanese body type and lifestyle. With the advent of western culture to Japan after World War II, many styles and tools entered the Japanese culture. Some chairs were designed with adaptations for tatami rooms, while more and more normal-height chairs were produced. Adapting to the diversified lifestyle with more and more foreign influences, unique seating products were introduced to the Japanese market. Undoubtedly the preference for most Japanese people who like to relax by sitting on the floor is linked to genetically inherited traits.

The following are several examples of popular seating from the last few decades.

Zaisu

One of the most popular pieces of furniture for tatami floor is the legless chair (*zaisu* in Japanese), which is normally made of a piece of plywood or wooden structure without legs. They are commonly used with *zabuton* (traditional cushion). If you go to a Japanese traditional inn or a hot spring resort, you can find them around low dinner tables in tatami floor rooms.
One of the biggest disadvantages of tatami is its short lifespan. Unlike regular wooden floors, typically tatami does not last for many decades and is worn out easily, although, with proper maintenance, tatami can be used for as much as twenty years. Furniture specifically designed for tatami is used rather than normal chairs and tables. Normally, the contact area of *zaisu* to the ground is not four legs like a chair so that tatami wear would be reduced, even with people sitting on the chair numerous times.

fig.13

Zaisu
(with cushion, reclining function and fabric cover)

The cushioned legless chair which can recline is also a popular product these days, equalling the popularity of *zaisu*. It is also similar to *zaisu* but it is usually not made out of wood. The structure is normally manufactured using metal with a reclining function. Since the fabric cover usually contains sponges, the chair is relatively comfortable even when sitting on it for long periods of time. This product was originally not intended to be used only in tatami rooms, but is commonly used in both tatami and regular floors in Japan. I found it curious that many of my friends used this type of chair and low table with *kotatsu* (small table with an electric heater underneath and covered by a quilt) when I was in Tokyo, even though those rooms were not tatami rooms. A rug was put on the floor in order to cover the cold surface.

fig.14

Cushion sofa

In the year 2002, Japanese household goods company MUJI invented a remarkable new piece of furniture, a “beads sofa”. The product has an interesting name: “Karada ni fit suru sofa” (body-fitting sofa). It is a sofa with tiny beads inside a bouncy fabric. It is for one person, and can be transformed according to the user’s body type. Using different types of fabric in the cover, soft part and hard part, enables the sofa to be used in two ways at two different heights. Even when it is out of use, the shape does not collapse in this way. In the year 2013, the sofa suddenly gained a lot of publicity on the internet. As a result, the sofa was imported into countries such as China, Singapore and the US. In Europe, a big cushion with similar characteristics, became popular. It is called “Fat boy”. There are some in the Aalto University campus. In addition to it its comfort, MUJI beads sofa is versatile with its possibility for height adjustments and different fabric covers. These factors have been key to its success. [4]

fig.15

In addition to the popular seating products above, there are other special products designed mostly for Japanese style living rooms, that have recently become successful and popular. Some of the designers are well-known, while some are less famous. Some of these interesting designs have given inspiration to my chair. Below are some examples of recent works.

The Teiza-isu

1960, Junzo Sakakura Architecture Institute (designer; Daisaku Choh) oak/fabric, Tendo Co.,Ltd.
This chair is a perfect example of unique Japanese adaptation of a Western concept in furniture design. In the 60's, domestic life in Japan still centered around low tables on woven tatami mats. "Choh realized that normal chair legs could easily damage fragile tatami, so he fashioned the leg portions from light plywood laminate in longitudinal plate form, thus spreading the load through increased contact between the legs and the mat." (Hagiwara, P40) Another unique feature of the chair is that it is possible to use it in both common sitting styles for tatami floor: *seiza* (legs tucked straight back under the body); or *agura* (crossed legs).

fig.16

Spoke Chair

1963, Kappei Toyoguchi, oak/fabric, Tendo Co.,Ltd.
Kappei Toyoguchi modified the Windsor chair which is from England into a distinctly Japanese product. Wide seat (W81cm x D68cm) allows the user to sit on it flexibly; in the *agura* and in side sitting style that are both comfortable for Asian people. The seat is relatively low (34cm) which makes it easier to catch the eye of the person who is sitting on ground level. Most importantly, the lowness offers remarkable comfort. [5]

fig.17

Butterfly Stool

1956, Sori Yanagi, plywood(rosewood/maple), Tendo Co.,Ltd.
Butterfly Stool is a simple plywood stool, which was originally intended for use on tatami mats. It won top prize at the Milan Triennale, and the following year was acquired to the permanent collection of MOMA. It is one of the most iconic furniture pieces from Japan. "He had long been intrigued by the thought of using bent plywood in his designs, and was greatly stimulated into developing in his idea after meeting the designer Charles Eames and seeing his bent plywood chairs." (Hagiwara, P15) Its simplicity and beauty became a reference point of Japanese design over the decades.

fig.18

Rope Chair

1952, Riki Watanabe, Oak/Rope , Yokoyama Kogyo
Rope Chair is a representative work of Riki Watanabe. This wide and slightly tilted seat is comfortable for both lying and resting. The chair was created based on a deep relationship and understanding of Japanese residential environment. It is supposed to be used with *zabuton* (a Japanese sitting cushion) as a cushion which was common among households at that time and that makes this chair accessible for the Japanese who were not familiar with chairs. As an integrated design of Japanese lifestyle and Western culture, the Rope chair was highly esteemed.

fig.19

Torii Stool

1956, Riki Watanabe, Rattan, Yamakawa Rattan Co., Ltd.
Rattan was commonly used in furnitures in Japanese houses in this period. In my parents' house, there were even rattan closets as well as a cradle made from rattan. The thick rod-like shape was bent for the frame and thinner strings of rattan were used for binding the parts and making the surface by weaving. The style is friendly-looking and has a good harmony with tatami mats.

fig.20

Kaniza Chair

1997, Yuji Mitsuno and Fumiaki Goto, Wood/Fabric, SEEDS
Designed for the elderly, this chair was created by one of the leaders in the field of universal design, Yuji Mitsuno. The height of the seat is 22 cm and its long curved leg is gentle for tatami. The armrest part extends to the inside more than the chair's leg. This prevents the chair from falling down when children play with it. The chair is designed especially for the elderly and children.

fig.21

Other example of low seating

Chairless

2010, Alejandro Aravena, Batch-dyed polyamide/elastic band/leather, Vitra
"Chairless" is an extreme example of a "minimal" chair design.
The loop-shaped textile strap wraps around the user's back and knees to relieve tension while sitting on the floor. "Chairless" is ultra-light, portable and foldable, and therefore easily fits into a pocket. "Chairless is based on a sitting strap commonly used by the Ayoreo Indians. The nomadic tribe living in the Gran Chaco region (border region between Paraguay and Bolivia) has employed similar textile straps as a sitting aid for as long as anyone can remember." [6]

fig.22

Tumppi

1999, Simo Heikkilä, Birch plywood/Woollen fabric , Avarte Oy
Though rare, low chair are found in Finnish design as well.
The company's brochure states that "Tumppi offers you a different way of sitting for work, for leisure, for rest…". Seat height is 24cm at the front side of seat. It is one of the only low chairs in Nordic designs I could find.
Tumppi series consists of upholstered chairs, unupholstered chairs and folding tables on wheels.

fig.23

740 stacking units

1977, Dieter Rams, Polystyrol, Vitsoe
Renowned German product designer Dieter Rams designed these multi-purpose stacking units. This ingenious series of chairs and tables was influenced by Japanese sitting mats. Each unit consists of two equal parts (both 35cm diameter, 11cm in height) glued together. "The multi-use concept with its perfected technical solutions, the discretion in terms of expression and the semantic neutrality make it difficult to classify this system in the usual category of chair-and-table programs." (Burkhardt, P123)

fig.24

Some of these products are popular and have sufficient functionality. However, looking at it now in 2017, all of them seem to compromise on certain areas, in usability, in price or in aesthetic qualities. If the form follows functions which are required in ordinary life, the shape of the furniture could be different according to the purpose. The piece of furniture should be in harmony with the surroundings while addressing the needs of diversity. I have nothing but respect for the great works above, but new designs that fit modern lifestyles and the environment should also be created. In particular, ideas for usability in tatami rooms was considered carefully for my chair design.

03 Situation today

3-1 Tiny house and nomadic life

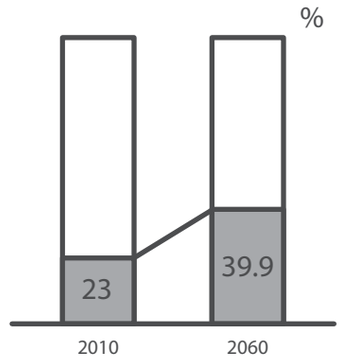
"At 1076 square feet (100 square meters), the average home in Tokyo is quite small. Yet many couples and even families of three or four happily make do with less, especially in Tokyo, where conditions are so extreme that small apartments or tiny houses are often the only choices. By contrast, the average single family home in United States contains about 2200 square feet (204 square meters) and houses two to three people."

Naomi Pollock
(Modern Japanese House, 2005, P.13)

We are now living in a sedentary society, with many of us working in occupations that require a lot of sitting. Meanwhile people are doing less exercise. Thus, in a sense, seating products are more crucial than ever before. On the other hand, there is a greater diversity of working styles than ever before. Many tasks can be carried out remotely with computers, with the prevalence of internet-based communication. With a population of 37 million people, Tokyo ranks as the most populous metropolitan area in the world. Centralization has become a big social issue in Japan. As Pollock describes, it has become difficult for ordinary people to afford a residence of decent quality. On the other hand, for many of the younger generation in Tokyo it has become quite natural to move often as their lifestyle and circumstances change. Calling them nomads may be an exaggeration in most cases, but there is an increasing tendency to organize one's belongings so that they are easily movable, while living by minimalistic ideas and decreasing the amount of products in one's life. Many people seek pleasure by shopping, sometimes to the point of compulsive buying disorder. Answering to this demand, in Japan as well there are now many shops that sell cheap, low-quality products such as "100 yen shop" (1 euro = around 130 yen / August 2017). There are also furniture brands that sell cheap furniture such as IKEA which is very popular especially among the younger generation. I am not saying that affordable products are necessarily bad and they can, in fact, significantly improve the quality of our lives. Nonetheless it is also a fact that people see IKEA in a negative light mainly for its quality. If they had compact and collapsible furniture of high quality, sufficient usability and suitable style, they would be more likely to bring it to their next home without disposing of the product. Undoubtedly the price is also important. Flat-pack design, IKEA products being a well-known example of this, they also have considerable advantages for the consumers, such as the reduction of price due to lower distribution costs. Collapsibility facilitates the carrying of the products.

"The demand for collapsibility in furniture is created by either an intermittent need or a changing location of need." Danish designer Per Mollerup states and continues "The Latin name for furniture, mobilia. expresses its mobile character, which may be enhanced by collapsibility" (Mollerup, P174) Being foldable, stackable, easy to assemble and collapsible are all valuable possibilities for functional objects, in particular for furniture designs. These are all functions that can be included in developing a chair for "nomads" as well as for people who live in tiny houses.

fig.25
Some Japanese houses
are extremely small



The ratio of the elderly
(over 65 years old) in Japan

3-2 Aging society

Aging society, with a declining birth rate and a growing proportion of elderly people (over 65 years old), has been a problem in Japan for a long time. The working-age (15-64 years old) part of the population reached its peak in 1995, with a decline beginning after that. The total population has already started declining. According to the estimate of the Japanese government released in 2012, total population is expected to fall to 116 million in 2030, and to 90 million in 2048. The report expects the working-age of the population to fall from the current 63.8% to 50.9% by 2060. On the other side, the elderly population will rise from 29 million in 2010 to 38 million in 2042, taking a downward turn to 34 million in 2060. As a result of this population aging rate, the ratio of elderly people to total population is anticipated to be 39.9% in 2060 from 23.0% in 2010. That is to say, one person per 2.5 people would be aged 65 or over in 2060.

Product development for the elderly has increased significantly and the demand for products with universal design is rising. Considering that one in four of the whole population is elderly, failing to take them into account in product development is now unthinkable. When I visited a small island in a rural area in Japan, I was surprised to see an old woman using a plastic stool, normally used for taking baths, on a tatami floor. While tatami is a very popular interior element for the older generation, for many it poses difficulties especially in the moments of standing up and sitting down. Although the main target of my chair is not the elderly, it would be wonderful to make the chair universal, supporting easier sitting down and standing up. [7]

3-3 Cultural intersections in design

As previous chapters explained, many traditional designs and ideas in Japan have the unique characteristic of minimal aesthetic. On the other hand, Finnish designs also have a history of simple beauty inspired by severe and beautiful natural phenomena. Designers in Finland have paid close attention to the properties of natural materials. Over the course of history, designers in both countries have received inspiration from nature, and formed their designs in many cases into remarkably simple shapes.

Both Japan and Finland have stayed relatively isolated as countries because of their special locations and historical backgrounds. Isolation causes much of the original culture and regional characteristics to remain intact or only slightly modified. One of the great Japanese industrial designers and the founder of GK design group Kenji Ekuan has detailed knowledge of Finnish design, and stated the following in a large exhibition about Scandinavian design in Tokyo: "Many similarities are often cited between Japanese and Scandinavian designs, for instance the effective use of material, meticulous finish, and the expression of the simplified form." (Ekuan, P21) In post-war Japan, there has been attempts of creating designs that combine internationality and locality, similar to that of Scandinavia. That is to say, the aim was to have modern design with Japanese qualities included.

Recently, one of the representative brands from Finland, Iittala have been having interesting projects in which they combine their Iittala philosophy with Asian culture. One of them is a collaboration with Issey Miyake, the Japanese apparel brand in the spring of 2016.(fig.26) They launched 40 items, including home and fashion items made of fabric material as well as ceramic and glass tableware which Iittala has been manufacturing for a long time. They have expanded their ranges and demonstrated the possibility of coordinating with another company to create products for more areas of life than previously. Another project of interest is Teema Tiimi series (fig.27) from January 2017, which is a collection of additional items to their iconic Teema series. Coming into the concept of original Teema, simple and multifunctional Tiimi offers new styles and sizes which goes well with Asian style dining. At the same time Iittala is bringing some Asian flair to Finnish dinner tables. The name of the collection, Tiimi comes from the Finnish word meaning team as the creative process was a team effort between the Iittala design team and young designers all originating from East Asia; Japan, Korea, China and Taiwan. [8] Iittala is one of the Finnish brands which have enjoyed having tremendous popularity in Japan, with this project seeming more likely to target the Asian market. Nevertheless, those projects multiply the common value we share between Asia and Finland in order to create new expressions in design. Although it must be pointed out that the projects are still new and the business results are yet to be seen. These projects are without a doubt noteworthy and may usher in a new trend of combining different cultures and styles in the product design domain.

fig.26

fig.27

3-4 Affection for aged products

Japanese has an interesting word "*mottainai*" which means the spirit that we want to make the most of things instead of throwing them away. It is a concept that many Japanese have been sharing subconsciously for a long time. In the past, people strove to use their personal belongings as long as they could by recycling or reusing it and by trying to reduce the amount of waste that they produced. However, there is an increasing amount of people who purchase cheap objects and throw them away each time that they move. It appears that they have forgot the spirit of "*mottainai*". Despite Japan possessing the spirit of *mottainai*, second hand culture is in fact more common in Finland. This surprised me when I came to Finland. Flea markets and second-hand shops are popular and finding treasures among the junk has been one of my favorite pastimes here in Finland. Related to this, the Artek 2nd cycle project is a special kind of a second-hand shop. Artek is the most well-known Finnish furniture company. It was founded in 1935 by, among others, the Finnish architect, Alvar Aalto. Recently they started to collect old Artek furniture and other masterpieces of classic furniture and sell them at a large store, more like a storage sale. Their shop in Helsinki almost resembles a retrospective museum of Finnish furniture design. It has gained the admiration of not only collectors but other Finns as well. They appreciate their rarity value as the origins of great design as well as the patina of the older furniture.

Professor of Philosophy at the Rhode Island School of Design, Yuriko Saito points out that "the aesthetic experience of an aged object is derived from the associated thoughts and images concerning the object's origin, its historical development, its longevity, and events and activities that brought about changes." (Saito, P181) She also stresses the importance of material used for the product. "Despite these various ways in which material and objects age and our diverse reaction to them, we do seem to share some consistent responses concerning which material "age well" and which do not." (Saito, P177)

Users can develop an affection towards well-designed furniture. This is more likely to happen if the furniture is wooden. When brands and designs are of high quality this significantly increases the chances that the consumer will keep the product, take care of it, and pass them to the next generation. The 2nd cycle project has raised awareness to this matter, and showed its possibilities. Products made with good quality material with sufficient durability will help to make them long-lasting. All designers that have this view must be conscious about sustainability as well.

"aesthetic pleasure in aged objects is also derived from the analogy between our transience and notion of impermanence triggered by the aging."

Yuriko Saito
(everyday aesthetics, 2007, P184)

3-5 Philosophy behind the emptiness

MUJI (Mujirushi Ryohin) is now one of the most influential Japanese brands and has released ingenious products with simple aesthetics for almost four decades. Their concept is a prime example of traditional Japanese culture. Their simplicity has a slightly different character from Western simplicity. It is the simple form that gives users the freedom to develop their own way of handling an object. It is this depth that they call emptiness. MUJI lets users and their particular lifestyle determine how they will use a product. Their products and philosophy have clearly influenced to a large extent other Japanese designers as well.

Before coming to Finland, I worked for a company in Japan as an industrial designer. In this job, I worked on a few projects with MUJI. Through working with them, my design approach was definitely influenced to some extent by their philosophy, which is the dedication for minimal design. Although they started off with the slogan, "Lower priced for a Reason," their focus was not merely on the price, but also on the quality. In a longer form, the main concept of the brand is "optimal value for modern lifestyle while facing the real world with its challenges concerning the environment and limited resources". MUJI is mainly engaged in the production of household products, "emphasising the brand's concepts such as the ability to be recycled, extremely simple exterior and minimal wastage." (Yangjun, P9) *Mujirushi* means "no brand" and *muji* means "plane, unpatterned" in Japanese. Some people consider those MUJI products as boring and plain in a negative sense. Nevertheless, with their extreme simplicity and versatility, most of their products have been popular for a long time in Japan and overseas as a successful international brand.

Creative director of MUJI, Kazuko Koike says the following about the company's approach to design. "As a contribution to our modern life, MUJI advocates the use of those qualities that are integral to Japanese aesthetics: being Essential, Minimal and Anonymous. (Yangjun, P115) A member of the advisory board, Kenya Hara expresses the concept of the company as follows. "Muji is an enormously large, empty vessel that accepts the sensitivities of anyone and everyone." (Yangjun, P117)

MUJI was "born" quite naturally with worldviews typical to Japan, that is simplicity that is open to anything and anyone into the creative process, and thus adapting to the needs of a variety of situations. At some point, MUJI started to call their simpleness "emptiness". Hara also considers the cultural originality of the company to be stemming from the home country with its geographical position on the eastern tip of Asia. (fig.28) If you take Eurasia and tilt it 90 degrees, the Japanese archipelago resembles the bottom of a pinball machine. "In the map, Japan is situated precisely in the ball catch, where all the balls that missed the holes accumulate." and he continues "Nothing exists below Japan; it is situated on the abyss that is the Pacific Ocean, where it catches all the arriving cultures and institutions."(Hara, P306) Thus Japan can be seen as a unique location where contributions from all cultures are accepted.

Hara's insightful viewpoint has made me understand the international simplicity that is present in the Japanese culture, and the adjacent emptiness, that have both created a natural context over the centuries. Hara's narrative has, in part, inspired me to proceed with my design projects which could have universality as neutral style.

"Ideally, specific subtraction or omission leads to the exposure of the object's essence, through the search for the optimal shape and optimal material, screening out the egoism of the creator and the designer. The product then would not be due to omission but to ultimate design."

Kenya Hara
(Designing design, 2007, P.237)

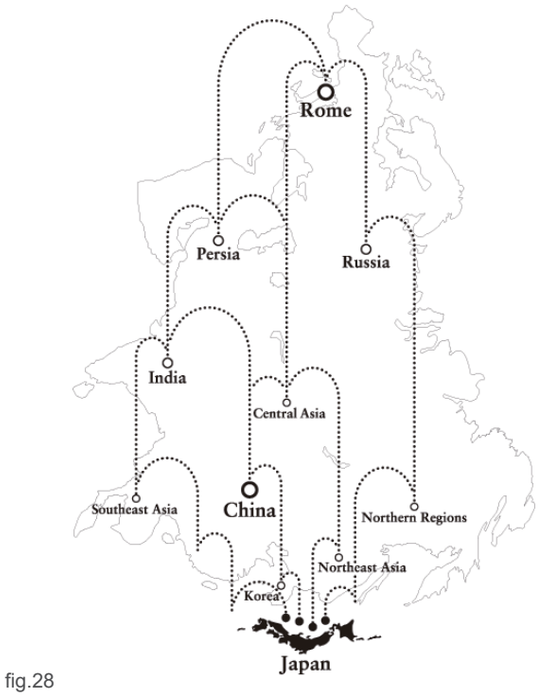


fig.28

04 Concept for the new typology of a chair -Neutrality and local endemism-

I decided to make this proposal for a new chair because I believe that a chair with versatile utility could support the users in various situations. Taking into account research, my own experiences and considerations of the concept, I chose the following important requirements for the chair.

Must

- Gentle for tatami mat
In order to avoid strain on tatami, a wide touch point is needed.

- Stackable into at least 3-4 stacks
For moving, transporting or temporary use, stackability would be a significant advantage.

- Material mainly wood
Wooden furniture often looks pleasant even as it ages.

- Regular-chair looking
It should not resemble a collapsible chair such as a camping or a director's chair. Otherwise the style would not be suitable for residential environment.

Preferable

- Include armrest (longer is better)
To make the chair more comfortable armrests would be helpful. Longer armrests help users to stand up.

- Lightweight and compact
In order to facilitate moving and handling, I intend to make the chair small in size and lightweight.

- Affordable cost
Making the design affordable will attract ordinary people to buy it.

In addition to the requirements above, neutrality and endemism have been central considerations, in both practical and conceptual aspects. These were chosen to achieve versatile functionality and preferable design.

"I think it is right for well-designed products to be as neutral and open as possible, leaving room for the self-expression of those using the products."

Dieter Rams
(François Burkhardt and Inez Franksen, Design: Dieter Rams &, 1981, P.186)

4-1 Handy and neutral presence as versatility

The chair is designed to have a neutral feeling. This aims to avoid the problem of throwawayism. Since the design is intended for both tatami room and regular floors, the styling should be considered carefully. Also the size and height of the seat should be taken into consideration for this new chair typology.

Naoto Fukasawa, a Japanese product designer who has been working for MUJI for a long time, in his presentation in 2014, described the effort of designing appliances in the context of recent developments in technology. Fukasawa asks us to imagine human life conceptually, so that there is a variety of products between humans and walls. According to Fukasawa's idea, products either go closer to the wall or close to the human body. TV used to be a huge object next to the wall, while now we can hold it on the palm of our hand. Similarly a telephone has inevitably approached the side of the human body. Thus, an appliance such as a physical block which used to be between the wall and the body will disappear permanently. [9] Reading about Fukasawa's idea, I ask myself "what if that concept could be applied to a chair?"

Well-known Danish designer, Per Mollerup expresses "A piece of furniture is a tool. By elevation and separation, it extends the capacity of the human body. Stools, chairs, beds and sofas are extra legs that raise man's body and offer him repose above ground level." (Mollerup, P174) In addition to this, a piece of furniture also could be considered as an extension of the environment. When you go for picnic, for instance, a log or a rock on the ground could be the best available chair in the situation even though it might not be especially comfortable. In a sense, the furniture that naturally exists in the environment without making any noise would have the optimal presence. British designers, Industrial facility states "what we really want to do is to concentrate on creating a landscape of products rather than isolated objects" (Industrial Facility, P150) Even though the chair I had been working on is not regular or normal, the design was aimed to be as modest as possible. Dieter Rams, a legendary German product designer, states "I want to make things that recede into background. They should actually be as little "visible" as possible". (Burkhardt P205)

For the new chair typology, which is between a conventional raised chair and *zaisu* (legless chair), what it would look like if there were an archetype of this category? To answer this question, I examined numerous existing chairs such as those described in the previous chapter. Based on the requirements that I chose for the design, the chair was intended to be long-life design, drawing inspiration from the timeless chair designs from Finland. I tried to avoid making the chair conspicuous, and aimed to make it normal-looking, resembling a normal lounge chair as much as possible. Although it is quite challenging, normality of this unusual chair was also examined in this project.

"There are better ways to design than putting a big effort into making something look special. Special is generally less useful than normal, and less rewarding in the long term. Special things demands attention for the wrong reasons, interrupting potentially good atmosphere with their awkward presence."

Jasper Morrison
(Naoto Fukasawa & Jasper Morrison, Super Normal, 2007, P.29)

4-2 Importance of collapsibility

Collapsibility (nestability, foldability, stackability) could be one of the factors for making minimal design. Existing stackable chairs and foldable chairs were designed meticulously, taking into account efficiency (easy to handle etc) for the distribution system and the retailers, obviously in addition to the users.

Collapsibility and portability can be used in minimalistic design and those features are commonly seen in Japanese design, likely stemming from cultural traditions. "in Japan, to be able to store away or bring out objects, they need to be convenient for moving, and designs that have a folding feature are common and popular" (Uchida, P108) He explains the reason for that is the objects have to be brought out for particular seasons and occasions, and immediately put away when it is over. Even though the collapsibility is not always necessarily needed, that function can impress users as a handy feature from time to time.

For this chair, collapsibility is considered as a critical function in order to avoid the situation that the volume of the chair would annoy the user and therefore the chair would be disposed of in the next move or even while handling it in an everyday situation. Looking back at the chairs I have possessed, most of my chairs and stools have been stackable. These were seats such as Mariolina by Enzo Mari, Seven chair by Arne Jacobsen, Elephant stool by Sori Yanagi, Stacking stool by Isamu Kenmochi. Personally, I very much enjoy collapsibility, not only because of its usefulness in minifying furniture, but also because of the presence of this functional possibility. Per Mollerup explains the importance of collapsibility as follows.

"Very often any number of generic products will satisfy a buyer's primary requirement, but one in particular will most successfully fulfil a secondary requirement. Collapsibility may never be the most important function of a tool, but it is often the decisive factor when the buyer makes a choice"

Per Mollerup
(Collapsibles, 2001, P.20)

4-3 Design language -Friendliness beyond functionality-

Accessibility and the relationship with the object are considered and applied as suitable design language for the chair. Fukasawa described the design process when he designed kitchen appliances. "If we made a diagram of the products between human and wall, we could see what is interesting. If the wall is defined as square, the objects become round as they become closer to the human. In other words, if you knew the position where the product should be, the shape would be naturally defined." [9] In this way, if a piece of furniture is formulated in this theory, the style of the shape would be in-between round and square. The design of the chair could be part of the environment, but also a kind of a tool for the human's body. It seemed to me that a rounded square shape might be the best design language to make a suitable atmosphere for this chair.

In addition to the design decisions between round and square form, the following aspects as in-between concept were also considered: organic and geometric design language, industrial and craft techniques and Asian and Nordic feelings of materials.

As the most basic elements, "line and surface" are consciously defined for the parts of the chair, surface as a comfortable receiver of the body and line as a simplest structure. The continuous rod-like shape is like a handrail implemented on the back of the backrest for handling as one of the user-friendly characteristics with easy accessibility so that the user could carry it by hand easily. This design language resembles rattan furniture such as Torii stool, which can be found in traditional Japanese rooms as well as in old Finnish interior designs. Furthermore, the rounded frame is gentle for tatami as well as for the human body.

Pleasantness to user's eyes and body was the biggest consideration for the design since a chair is a tool that users touch with different parts of their body at different times. To make a welcoming mood is important and some radiuses and curves are added on the design for this reason. As a result of these decisions, the chair should evoke a feeling of relaxation.

4-4 Applying Finnish design

"In the 1950s Finnish design was acknowledged internationally as democratic, super-functional and affordable. Nowadays, I don't think it differs very much from the globally accepted 'common western' style. Design is not a nationality-driven thing. It's an 'added value'-driven business, regardless of where the designer or the company comes from"

Timo Ripatti
(Dorothea Gundtoft, NEW NORDIC DESIGN, 2015, P.186)

As Ripatti stated, it may be true that there are no longer clear distinctions between the designs of different Western nationalities. On the other hand, old Finnish designs have strong identities and Japanese people would likely appreciate experiencing some of their characteristics. Adding my interpretations of the Finnish-design atmosphere could give my design some pleasant features. In order to create timeless and long-life design, I wanted to add, in one way or another, some of the feeling and essence of Finnish masterpieces into my design. Already over the course of decades, numerous Finnish masterpieces have been sold in Japan, and the popularity of Nordic design and its style has remained a constant in Japan. In this project, the in-between style of Japan and Finland was examined.

At the same time, the requirements for less material and durability are nearly incompatible. Similarly, a high level of simplicity and comfortable usability would also be difficult to achieve both at the same time. After numerous sketches and mock-ups, the inspiration from Finnish designs, especially Alvar Aalto's chair for Artek No.31 (fig.29) are referred to in the shape and material for the seat part. This application could be one rational solution for the structure of my design since the lack of structural rigidity was a problem for me at the time.

The technique of using laminated veneers for the seat part and for the structure has been common starting from Alvar Aalto's numerous pioneering works in the 1930s. In the following years, Charles Eames invented molded plywood chairs with three-dimensional surfaces, and after World War II many designers internationally adopted the technique into their work. Not merely Aalto's chair, but many other Finnish masterpieces manage to contain at the same time simplicity as well as strong identities with iconic shapes. This combination could be one of the marks of timeless designs. I aimed at similar timeless design while avoiding to make an effort to create something special-looking. Instead of trying to find a new aesthetic, I tried to combine existing common but beautiful shapes. Combining the Japanese and Finnish aesthetic could be a new modern interpretation as a style for this project, even though the material and techniques are very conventional. Reasonable price for mass production and lightweight construction were also important factors, so these techniques and materials were utilized to achieve those.

"There is only one rule that holds fast in architecture: build naturally. Don't do anything stilted, don't do anything unnecessary. Everything that is superfluous becomes ugly with time."

Alvar Aalto
(Markku Lahti, Alvar Aalto, 2007, P.9)

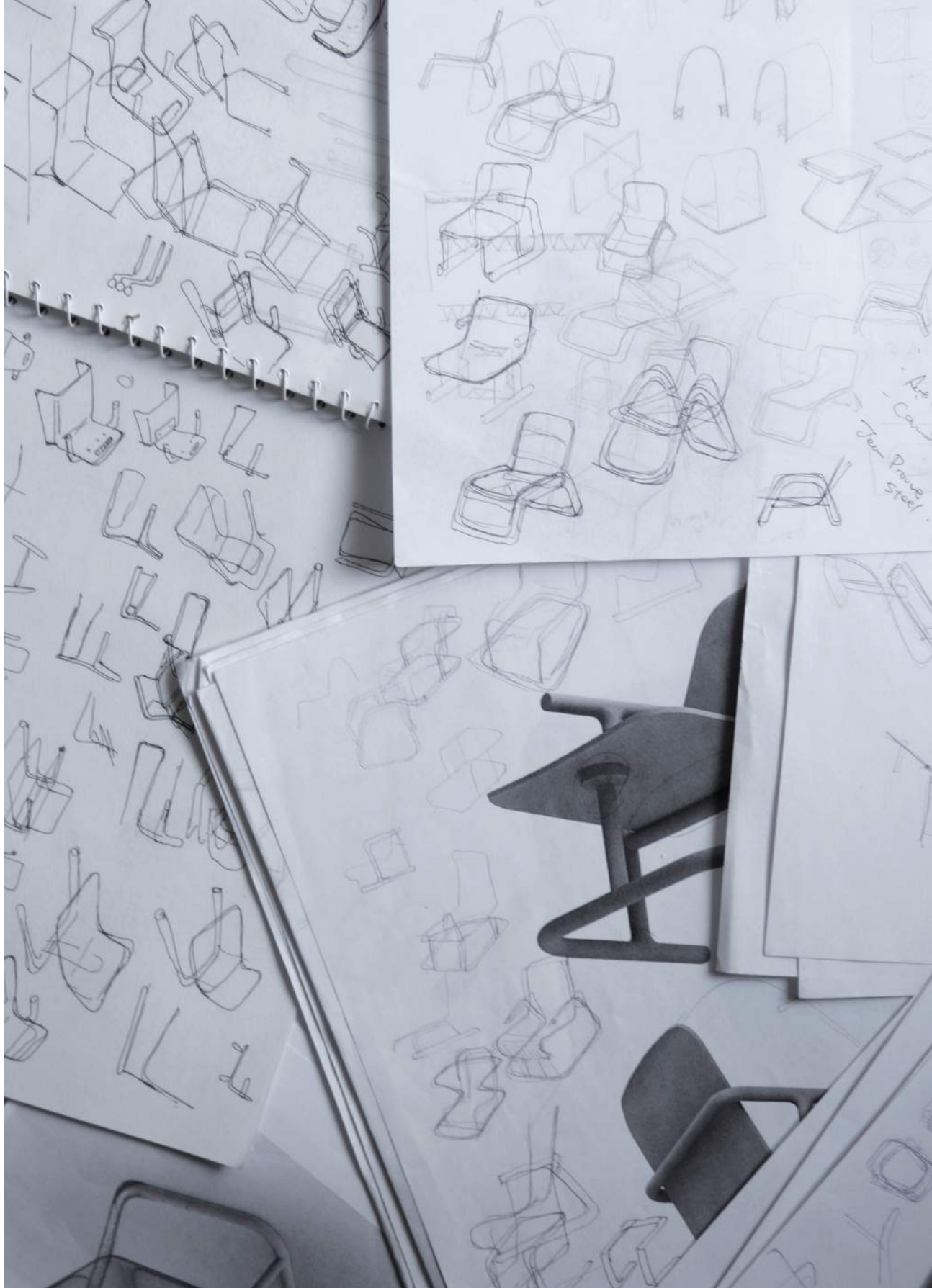
fig.29

05 Design process

"Furniture, like structures, is not just to be seen. The most important conditions a piece of furniture must meet are convenience in use in daily life and appropriateness for its intended use, based on the way people actually live. The materials must suit the purpose, be handled without waste, and be used to create a rational and durable structure. Moreover, the work should be pleasing to the human user - light in weight, smooth to the touch, beautiful in appearance, and richly fresh and innovative. It should also be inexpensive. These important qualities are utterly essential in contemporary home furnishing."

Riki Watanabe
(Innovating in modern living, 2006, P.14)

To test my hypothesis, I prepared the design process by doing research on existing products, in particular in the chair design domain, that have similarities with the ideas that I was considering for my own chair. After short research I began ideation and sketching. Based on the research I compiled a few hypotheses to get a glimpse of my thesis project, and I showed the ideas to my friends and teachers. In parallel with this design process, I had considered the idea of utilizing small chairs while doing two different seating products in other study projects. I spent a long time contemplating about a furniture piece that would be relevant for the contemporary conditions of Japan, considering the example of a typical, small household. Apart from the obvious requirement such as comfort in sitting periods that can extend even a few hours, I realized that the appearance and feeling associated with it should be nonchalant in the context of different environment it was placed in. Like existing *zaisu*, the chair could be cushioned or hard, and it could be with or without arms.



5-1 Ergonomics

We are now living in a sedentary society with most of us living a sedentary lifestyle. Many occupations require workers to sit down much of the time, and people do very little exercise. Even in freetime, many common activities (such as visiting a friend's home, sitting in a bar, reading, watching television, surfing in the internet) can be done while sitting. A chair should be comfortable in a variety of situations in life. An example of a chair targeted towards active work is a high stool. It is possible to sit on a stool of this sort, half-sitting, half-leaning, and a user can rapidly transfer into standing posture. This sort of design is used mainly in occupations where the workers work much of the time in a standing position. A chair with a wider seat which can be sat on relatively deeply with the user's upper body upright would be good for light work, while a chair that can support the user's back would be appropriate for longer stints of desk works.

American industrial designer Henry Dreyfuss, whose design philosophy was based on applied common sense and scientific principles, made significant contributions to human factor analysis and consumer research. In his book "The measure of man & woman", he says the following about chairs. "People often have a favorite chair, but many people buy furniture mostly for the sake of appearance and later become dissatisfied with their choice." (Dreyfuss, P44) Even though this thesis project is not focused on the comfort and ergonomics of seating, adequate contentment as a living room chair is essential. Dreyfuss did not create the measurements for a low chair, yet some of his seating design principles were applied to my design as benchmarks at the beginning. In particular, I paid close attention to the following points: [10]

1. Armrest's height should be moderate, not too high nor too low. Wider distance of armrests give users a stiff neck, so that should be avoided.

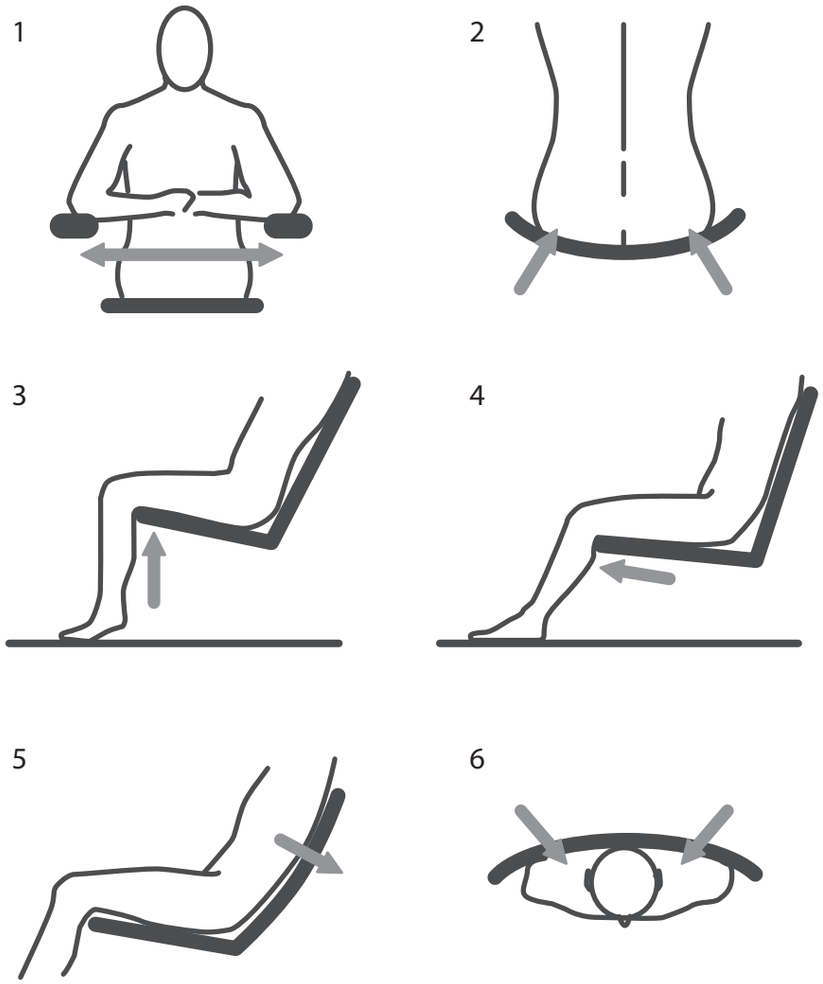
2. Seat should be hard and flat to a certain extent. Too soft and too curvy looks comfortable seemingly but actually does not create a comfortable feeling.

3. Excessively high seat causes pressure on the back of the thighs, which can cause circulatory deficit and decreased desire to use the chair. Obviously this should be avoided as well.

4. Seat should not be too deep because that prevents user's back from touching the backrest, while causing too much pressure to the back of the knee.

5. Supporting the back by the backrest is crucial. It helps to support back health of the user.

6. For shoulder support, a flat surface is better than a curvy one. A Curved surface would tighten the shoulders muscles and cause users to tire easily.



5-2 Height of the seat and user's perception

The biggest feature of this chair is its height, which is much lower than that of a usual chair. To make it usable both for *agura* (cross legged) and for stretch legged, the height and shape of the seat are defined carefully. Observations were made to help discover the optimal comfort of the seat part with an initial ergonomic mock-up with a video recording which examined ten tests subjects' behaviour while using a normal-height chair and this low chair. In addition, the angle and the position of the seat were tested. Different approaches for sitting were observed; how the test subjects stood up, and what was the natural posture for relaxation on the chair. After the trial, quick interviews were also made.

Many of the test subjects were relatively young, in their 20's and 30's. Although not a problem for them, they reckoned that it could be difficult for the elderly to stand up from the chair. Standing up from the sitting posture on a tatami mat is harder than standing up from a sitting posture on a chair. An important point of the design is to significantly reduce this inconvenience. Even though the chair was not designed especially for the elderly, the chair's convenience for all users can be an important additional feature, especially in Japan with its aging population. Based on the feedback, long armrests were implemented and optimal heights and angles were defined.

5-3 Material choices and structure

At the beginning of this project, the initial design had metal legs (fig.30) due to the efficient stackability and structural simplicity. Using thin and rigid steel rods was quite reasonable, in a practical sense, but I decided to not use them since this chair should fit many kinds of interior environment following the requirements of my concept. The design at the time of 2nd mock-up (fig.31) had a vertical pillar to fix the seat underneath the seat part, yet the vertical pillars were weak as a structure for supporting the seat.

After much deliberation, the seat surface was continued until the front leg part from the backrest as a piece of continuous plywood sheet. Only one beam was settled under the seat and it is fixed firmly by nuts and bolts so that the plywood veneer could provide comfortable flexibility for the backrest. The slightly curved surface of the seat and backrest are simple, yet provide adequate comfort. The frame parts of laminated wood are surprisingly stiff so that only one beam was added for the whole structure. Eventually, I decided to use two different kinds of laminated wood and one kind of solid wood as the main materials. These were chosen to achieve adequate durability, production feasibility and a possibility to have a pleasant patina in the aging process over the years.

With its floating structure, it becomes light on the eyes. In addition to this, thanks to its low height, the size is entirely compact, which is a valuable asset in the increasingly smaller houses in Japan. Longevity of the product is largely determined by the degree of delight that the user will get from the product. It is desirable that the users could bring products from place to place and pass it on from generation to generation.

"Authenticity and appropriate material are inviolable concepts that cannot be questioned."

Kaj Franck
(Päivi Jantunen, KAJ&FRANCK Designs & Impressions, 2011, P.152)

fig.30

fig.31

5-4 Styling and significant details

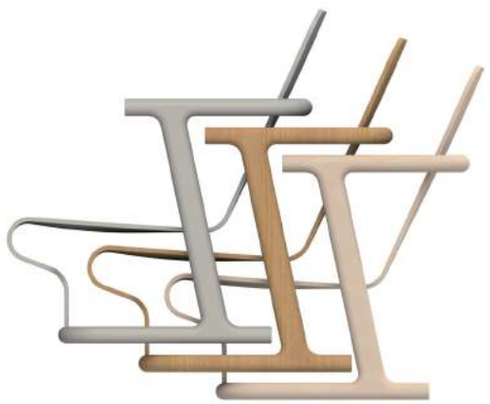
A series of lines and a surface were the minimal elements implemented for the styling.

The seat part continues from the front leg surface and further continues to the top of the backrest as a piece of plywood. This forms a very strong structure. The space under the front side of the seat has been consciously designed so that user's legs are free to be drawn inwards when they do *agura* (crossed legs) style sitting. Since the seat is fixed to the beam on the middle of structure, the flexible backrest can move slightly back and forth. The surface in contact with the user's body, in both backrest part and in seat part, have three-dimensional curves. The seat part has been installed meticulously to the beam.

The frame part mainly consists of 3 parts; the bottom leg, the armrest and joint pillars connecting them. The 30mm diameter cylindrical frame is gentle for tatami floor and for user's hands. The continuous bar between armrests which is situated on the back of the backrest allows handling when the user wants to carry it around even with one hand. Physically interacting with the chair by touching the seat surfaces and structure provides pleasantness as a friendly interface. While working one day with Naoto Fukasawa, he said to me: "Stylish design tends not to fit into everyday life. Somehow a design has softness and a cute atmosphere that will be loved for a long time." Later, I was surprised to hear the same story from a bamboo craftsman in Kyoto. Function leads form, but some charming points which attract the user at the unconscious level beyond the functionality are needed. Details significantly affect the atmosphere of the entire piece of furniture. Some smooth corners were added and those make the chair feel more friendly.

5-5 Solution for stackability

To make the chair stackable was one of biggest challenges during the entire design process since the design required long armrests, a comfortable seat and a wider contact area on the bottom than a regular four-leg chair. Having diagonal pillars on the sides and on a U-shape leg, enabled nesting (stacking) without losing usability and stability.



06 Prototyping / Technical part

The design process implemented the gathered perception and research, however I also studied the material usage for different parts by using my hands in studios, and discussing with tutors and workshop masters. According to this hands-on research, the method, material, color, shape and finishing of the final design is defined and finalized in this chair design. As soon as some sketches were drawn, prototype process began at a wood workshop.

First of all, basic angles of seat and back rest are defined by a 1:1 scale mock up. At the same time the height of the seat from the ground and general size of the chair was fixed by modifying the detail of the mock-up. Comfort of the seat surface and strength of material and structure were somewhat unpredictable, especially considering that I had limited previous experience with the material and shape of seats.

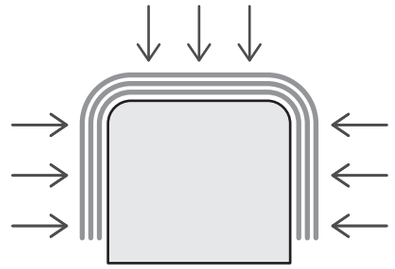
Wood is an organic material and often behaves in unforeseeable ways after molding and shaping. For instance, the resilience of the bended plywood seat varies widely depending on many factors such as the direction of the grain, amount of glue, total thickness, thickness of the pieces and so on. Fortunately, since I made the molds for lamination by myself instead of CNC processing, I could modify the molds quickly step by step after each trial.

Therefore the prototyping process required a long time with many trials, each time adding slight modifications to the shape of the molds and material sizes. After repeated trials, eventually the suitable shape of the molds and materials were decided for my chair. Regarding the styling, I had strived to make the appearance calm which would make the chair suitable for many interior styles, and pleasant for many tastes. Those thoughts helped me in decision making in matters related to style. The intensive mockup process had taken place for evaluation. The design and its feasibility was investigated with sketches and technical drawing back and forth.

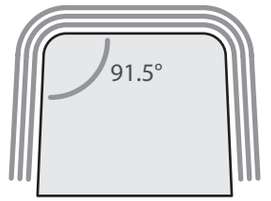
"to use your hands to make something and think while doing so"

Sori Yanagi
(Design in Everyday life, 2007, P.89)

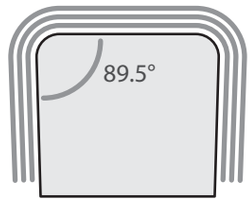
After finishing building the first prototype with birch, a critical problem with the lack of structural rigidity was discovered. During the project I got external advice, I talked to many people about the challenges I was facing, and showed my chair prototype to them. One of the people I met was Yoshimasa Yamada, Finland-based carpenter who has a wood workshop named UUP in Billnäs, near Fiskars village. He gave me a lot of insight about the entire design, tiny details and processing technique for my work from the point of view of a professional. In particular, the final idea for the details of structural modification was defined after meeting with him.



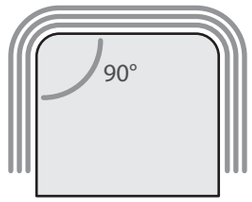
1st try

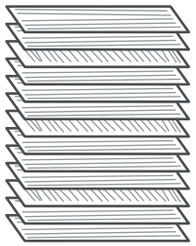


2nd try



3rd try





1st try

total 13pcs - 6.5mm

2nd try

total 13pcs - 8mm

3rd &
4th try

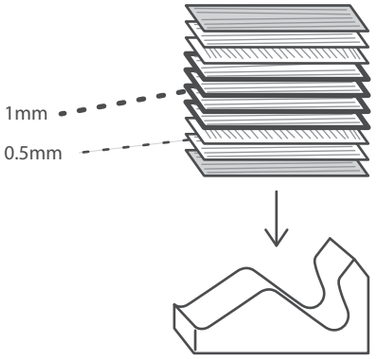
total 15pcs - 9mm

5th try

total 14pcs - 8mm

6th &
7th try

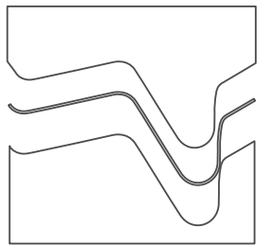
total 10pcs - 7mm



6-1 Ideas for mass-production

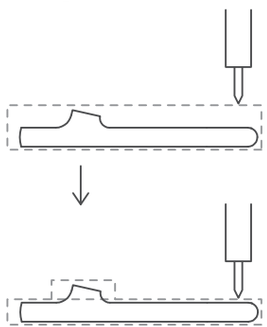
Double side molds for the plywood

Although the prototyping was done by a one-sided mold and a vacuum bag at Arabia campus, double-sided compression could be applied in the case of mass production in a factory. It was difficult to make accurate three-dimensional surfaces by using a one-sided mold which was hand-made. With the double-sided compression mold, an accurate result for lamination of curves and corner radii could be achieved.



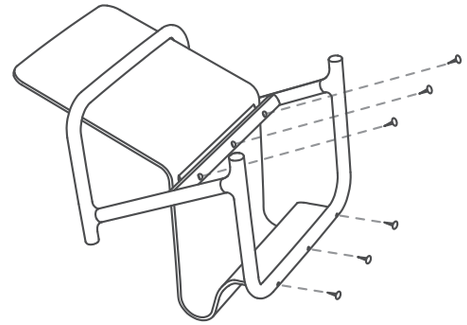
Common mold for lamination and CNC milling

The armrest part and leg part are manufactured by lamination and CNC milling, they have the same width and corner radii. The lengths are also almost same so that those conditions can make the material parts manufacturable by the same processes before CNC milling. In addition, in order to avoid the waste of material and milling time, two parts are glued together before milling.

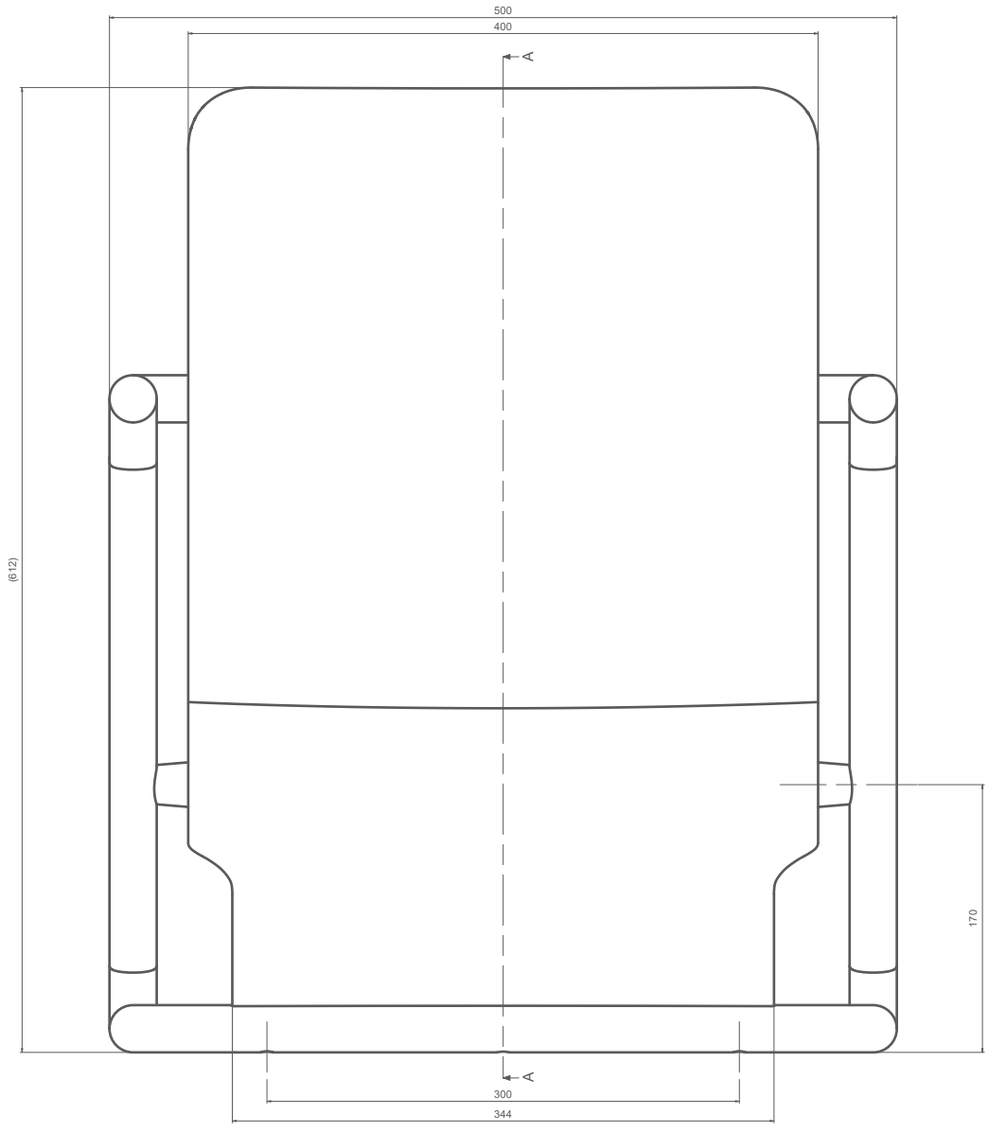


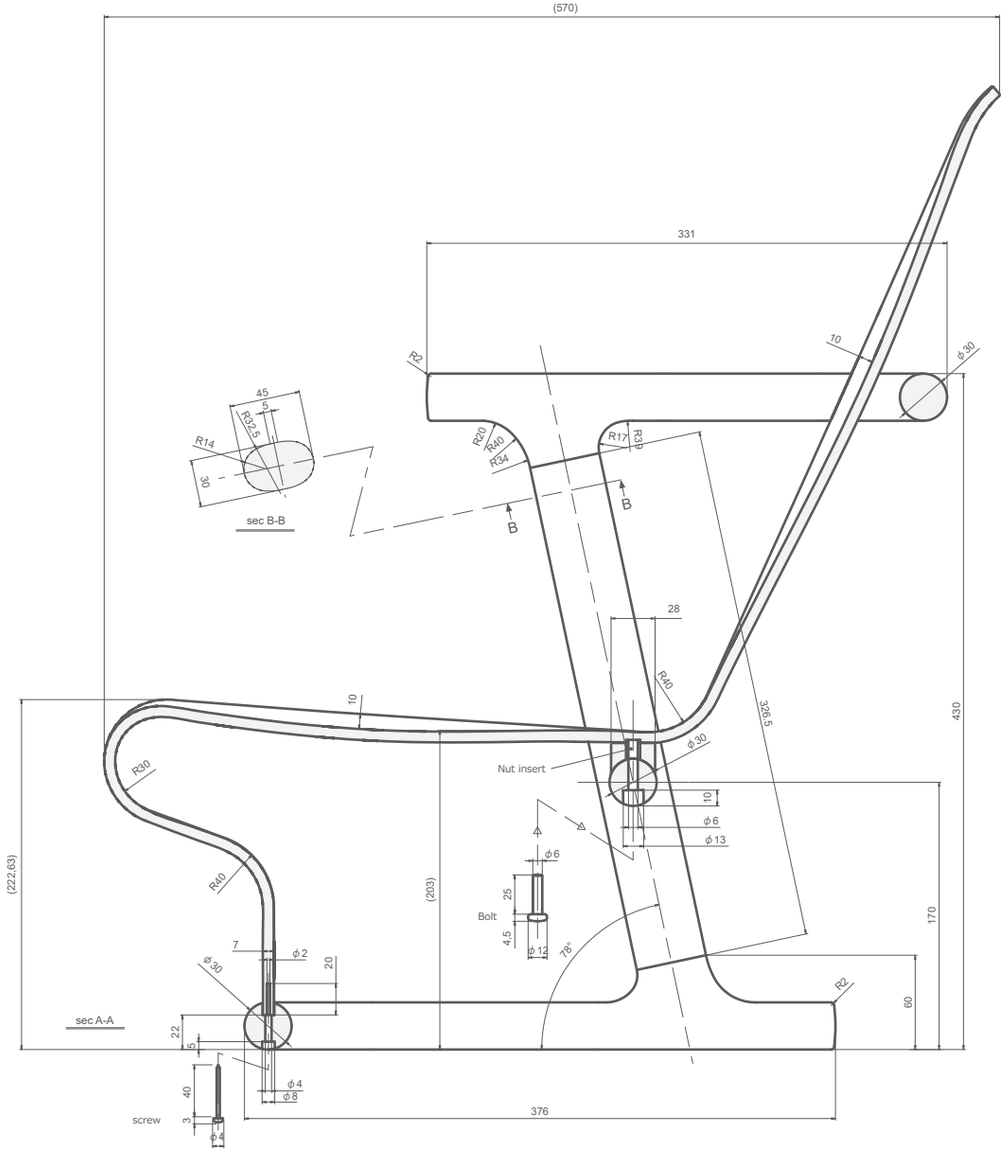
Bolt and screw

The seat and structure frame is connected by a set of bolts, nuts and screws which would require little assembling work. This structure will have the added benefit of allowing the workers to deal with finishing tasks, such as sanding and painting, at a separate time.



6-2 Technical drawing

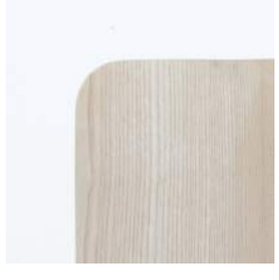




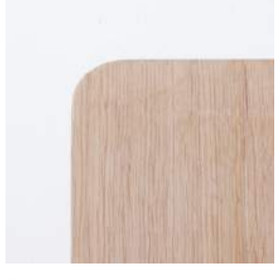
6-3 Material

Seat

Laminated veneer (Ash/Oak)
*All birch between the front and back surfaces



Ash



Oak

Frame

Laminated solid wood (Birch/Oak)

Birch

Oak

07 Conclusion -final thoughts-

Some important characteristics of product design are functionality, materiality, manufacturing process, as well as in logistical advantages and structural thinking. My proposal was to investigate how to integrate some of these into the design of one chair, in an attempt to contribute to the longevity and universality of the product in an oversaturated furniture market.

How can new designs create solutions for social problems? This has been a question that I have asked myself often during my career as a product designer. Despite the prevalence of disposable furniture, people should consider the possibility of using furniture for a long time. Finally, I suggested a design that users are more likely to keep even when moving to another home or changing the interior they like, which I believe is one way to reduce 'throwawayism'. In the present residential environment in Japan in particular, a chair design that could suit both tatami and regular floors must be functional. As a Japanese designer studying at Aalto University in Finland, I strived to apply elements of Finnish designs into my chair design, as well. Specifically, through using laminated wood in a rational manner as the main technique for production, thus mixing a Japanese identity with Nordic influence. This kind of style could be successful as many Japanese appreciate Nordic-style design. Product development that mixes typologies in this matter can be seen in several industries. At the same time, simplicity (found in both Finnish and Japanese cultures) is also applied in order to create a simple structure and understated form, eventually resulting in universal simplicity, despite the unique character of leg parts of the chair. Moreover, its lightness, durability, stackability and tactile quality encourage users to keep the chair for a long time. As a result of the integrations of the mentioned elements, I believe that the design could stand out among existing products and answer to the demands of the current, complicated environment of Japanese houses. It could be used as a lounge chair by people who prefer to live with a low-level seating even outside of Japan.

Although I cannot guarantee that everyone will like the design I have created and that the design would fit every kind of living environment, I believe it was worthwhile to attempt to find this kind of possibility in furniture design; a category that tends to be relatively conservative.

This exploration and prototyping stimulated me to consider many aspects of furniture design. First, there are still possibilities for finding new ways to design seating products. For instance, one of these possibilities is the idea that a design be deeply related to a specific cultural history.

Secondly, there are many aesthetic and functional changes that must be made because of the material used, often causing the end product to be considerably different from its initial concept. In the design process, this necessitates many difficult decisions regarding a product's aesthetic and functional properties. I am certain that the knowledge gained in this process will aide me in my future design career.

Thirdly, I found that I was affected by previous projects and my considerations had significant biases. These biases probably stem from my Japanese identity, which I believe is partly genetic and partly the result of growing up in a typical Japanese household. However, in many cases, designers should try to be objective, especially when designing for mass-production.

The entire project has been a fascinating exploration for me. In various ways, designers come across opportunities to challenge traditions. Culture influences design while design can work in the other direction, transforming culture. Designers are inevitably involved in people's lives through their creations, which significantly affect users' daily activities and the quality of their lives. Thus, designers have to bear responsibility and be conscious of the consequences of their new designs in the cultural context.

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