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20078721

ARCH 384: Competition Elective

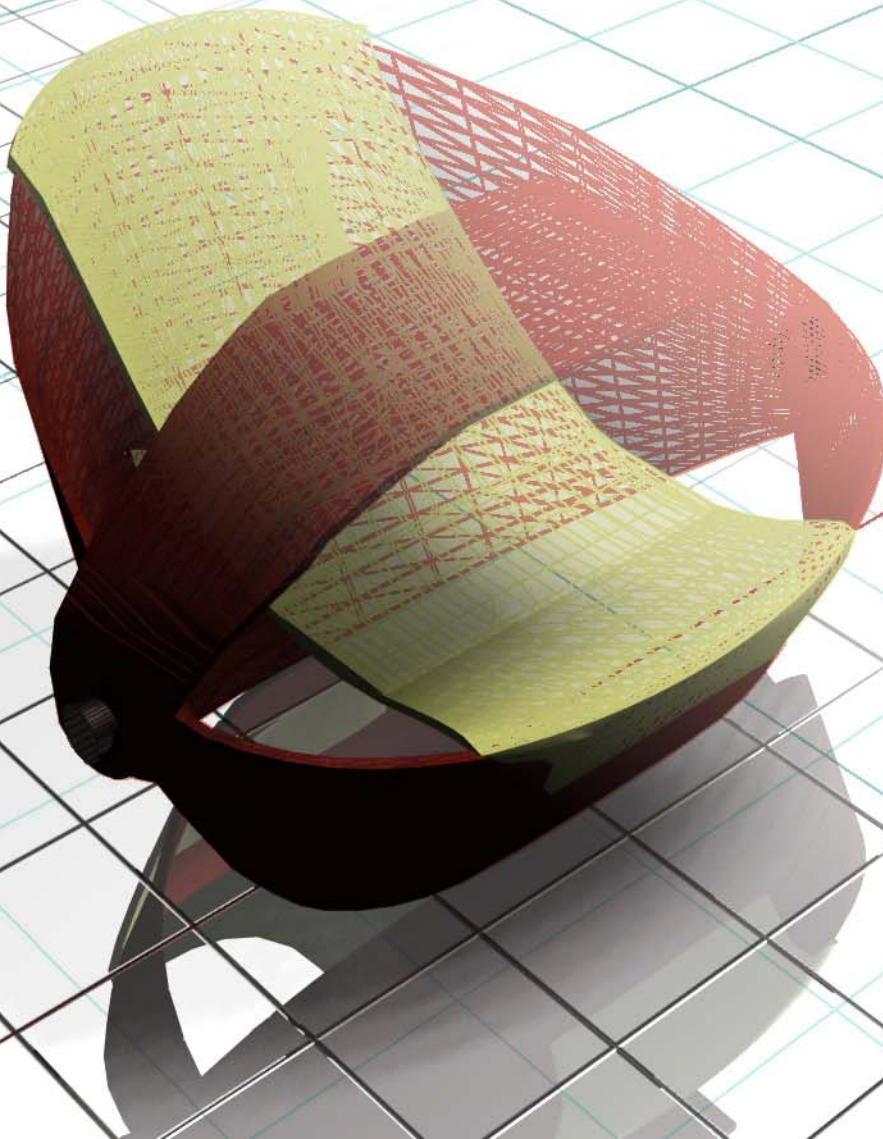
HOTSEAT 2

METROPOLIS



Research Essay:

Design Process
for a multifunctional chair



University of Waterloo
School of Architecture
Spring 2006

A Chair: The Design Process for a Multifunctional Chair

As simple as the question to “design a chair” may appear it is indeed limitless. Thankfully, these questions are also usually accompanied with more specific demands, in this case, three outlines: a course problem statement, the design competition criteria, and my own interpretation of the question. It is with these three components that I have given shape to a project.

The first addresses mainly the question of typology. It is the influence of what we know and use that affects what we design. In some cases it begins to establish their identity, but at times, also restricts our creative interpretation. Too often design bases itself on established rules that are functional and convenient to address a problems resolution. I have used this tool as a research for a variety of possible solutions from which I can extract positive and negative aspects.

Secondly, the competition establishes a simple set of criteria. It asks, in order of importance based on their graphic representation of these elements, that the chair be: aesthetically pleasing, environmentally conscious, technologically relevant, sustainable, progressive, accessible and to incorporate wood in material usage. These guidelines provide an initial direction but at the same time, do not establish any definite restriction, which permits the design to be completely open ended.

Finally this addresses the issue of finding an answer to the question. With a base set of parameters it is necessary to initiate design ideas. I chose to impose another inquiry to this problem, one that is based on a personal need, specifically at the time of the competition, but that also addresses the issues stated above.

As students living a nomadic life, it is often necessary to establish yourself in a new place with the bare minimum. This is sometimes limited to your clothes and a bed. Finding some storage space is generally easy and less critical (several milk crates can provide ample storage room). This leaves one necessity, the need for a place to work, or simply read a book. With a laptop as the main accessory for students, it is possible to work almost anywhere, in any position, but when obligated to work for several hours at a time, a comfortable workstation is essential. With limited space, a desk/chair combination seems like a logical answer.

The research into this specific typology addresses all the different guidelines. Through identifying and analysing precedents while addressing the competition criteria it will inform the conclusion of the research by the design of a chair.

PRECEDENTS

There are several typological precedents that address the chair as a complete workspace. This often consists of a chair that is adaptable in some way. Some particularly interesting examples date as far back as the early eighteenth century and were very commonly used by famous writers and philosophers. They were more common as personalized objects rather than an institutionalized type.



Napoleon's sloping desk



Voltaire's armchair in which he died



Mark Twain's arm chair

The different types can be separated into a number of categories. These chairs are often characterized as transformer chairs¹ because they can be adapted for different uses. Their base classification depends on their general nature: they can be of a permanent form that can be used in different ways, the chair can change to adapt to a different use or it can be composed of different component that can be arranged in a variety of ways. Within these major categories there are a number of types, each with a specific function that has certain limitations.

¹ from <http://www.designboom.com/history/transformer.html>

Chairs with writing arms

These chairs generally consist of a tablet on the writing side of the chair. Their form is fairly typical and has been adapted to a variety of styles. The only significantly different example shown here is adapted to a lounger chair, but has the disadvantage of the tablet not extending in front of the user. These are all rather conventional.



Reading back chair

It is used to sit normally in the forward position, but that can also be use in the opposite direction where the chest rest against the backrest with a tablet located on the backside of it. Several of the more modern examples are further simplified and appear more like a stool. The major disadvantage of this type, is the lack of support while in the working position and not very attentive to ergonomics.



Document holder

These are holding devices that are permanently attached or that can be adapted to several chairs. Such a device is very practical as it can be small and possibly adaptable to any chair, even lounging chairs. Unfortunately, it acts mainly as a document holder rather than a working surface as it is not entirely stable.



Chair Table

This is a chair which the backrest folds down to become a table, providing two functions for one piece of furniture. The major problem is that these chairs can usually only be in one position at a time, which makes them less effective on their own, but serve as a good example of transformability.



A desk chair combo

Similarly to the writing tablet, a desk and chair are joined together in a permanent state. These are very popular in school and institutions as they are very practical, it provides good support and a large stable working surface. Because of the environment in which they are used, their form is often rather rigid. They are also often more concerned with economics and practicality rather than aesthetics.



Storage Chair

These chairs double as a storage device using the seat as a lid, drawers or shelves. They make practical use of the wasted space below the seat.



Within the numerous types and examples shown above, several trends can be noticed. The more modern examples are often simplified and therefore more elegant but in a way less concerned with the practicality of the chair. In several instances the older chairs actually provide more than one of the uses stated above.

Within these designs, there are also two types of approaches. Many of them are conventional in their form and are adapted for a particular function and style. They are often very similar to their predecessors, and sometimes lack further development because of the convenience and cost effectiveness of the design. On the other hand there are more inventive solutions. These designs often generate new hybrid forms that address a more diverse set of concerns which may include adaptability, storage or transportability, sustainability, the integration of technology and the relevance of a chair in a specific environment. Several design competitions address these issues an interesting collection of ideas and approaches, but most of these remain at the experimental stages².

The collection of types and hybrid designs exposes the multiple uses possible as well as the disadvantages for the specific types. It is therefore necessary to identify the specific needs that correspond to the design intentions and accept which elements are not a necessity. Within these elements there is a compromise to be made.

² see examples at http://www.designboom.com/aerobics/transformer_results.html

DESIGN RESEARCH

Given the design competitions objectives, certain initial decisions have to be made. The Hotseat 2 competition organized by OFS has its own set of rules, which help highlight certain aspects that become more prominent in the development of the project. First and foremost it must be aesthetically pleasing in order to be marketable and appealing to a wide audience. In order to be environmentally conscious, the materials will consist of certified wood and recycled fabrics, both readily available materials. Finally it should be technologically relevant by simply providing a tablet large enough to accommodate a laptop computer.

Through the uses identified above in the different typologies, I've explored the design of a chair, its function and its form. These explorations have allowed me to identify certain objectives for the chair in order to make it as functional and comfortable as possible. These elements have been established based on the needs of a student with a limited amount of furniture and therefore the chair should be highly adaptable to his/her needs. These desires include that the chair should be multifunctional; it should include a working surface and storage space that is not obstructive when the chair is being used in different ways. The approach for the design should go beyond the adaptation of a conventional chair and therefore the chair should have a unique appealing form. Meanwhile its numerous uses should be clearly legible, so it can be used properly without questions. Lastly, the chair should offer a high level of comfort, which involves a change in seating position based on the intended use. These elements are all very important in creating a sense of place within your personal environment. A chair can easily be functional but it often lacks in promoting its own use through visual, functional and comfortable appeal. It is by taking these elements into consideration that the chair, while serving specific purposes can become a space in itself.

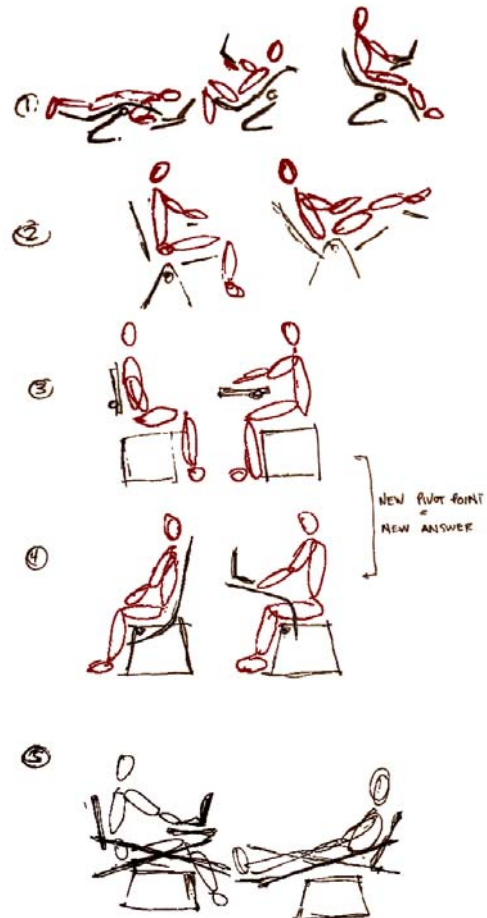
DESIGN APPROACH

WORKING VS LOUNGING

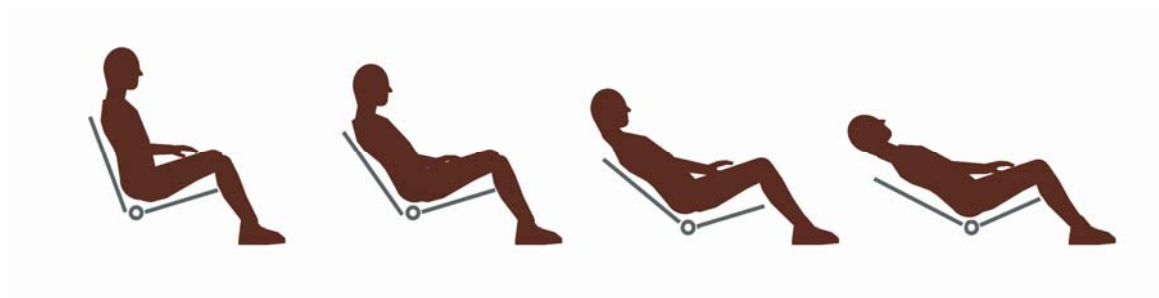


The design begins with questioning several possible ways to resolve the objectives stated above. Because of the large number of elements that should compose the final result, the most important elements are first highlighted. The first objective to be resolved as it will have the most impact on the form of the chair is its dual use, a chair to a lounge and a chair to work.

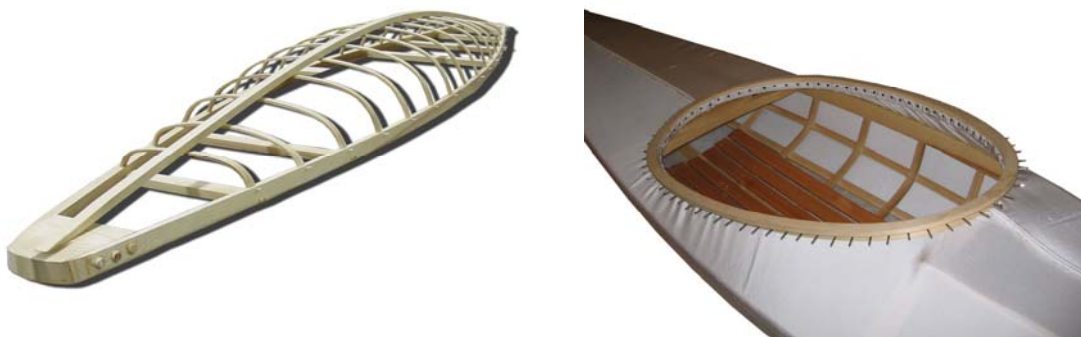
The design begun with this objective; to create a comfortable chair that can be used in different ways, to either relax, surf the net or to do some work. From this idea, there are 2 major components the seat and the work surface. To achieve these possible transformations, I explored a variety of sitting/working arrangements. To make this change from one function to the next there are two possible changes, either the chair alters its position, or the occupant changes his, and a third is the combination of both. These initial sketches help identify certain problems that have to be avoided. (1) The chairs transformation can compromise the chairs comfort. (2) The moving parts can become overly complicated. (3) The chair is too easily identifiable as a typical tablet or desk chair.



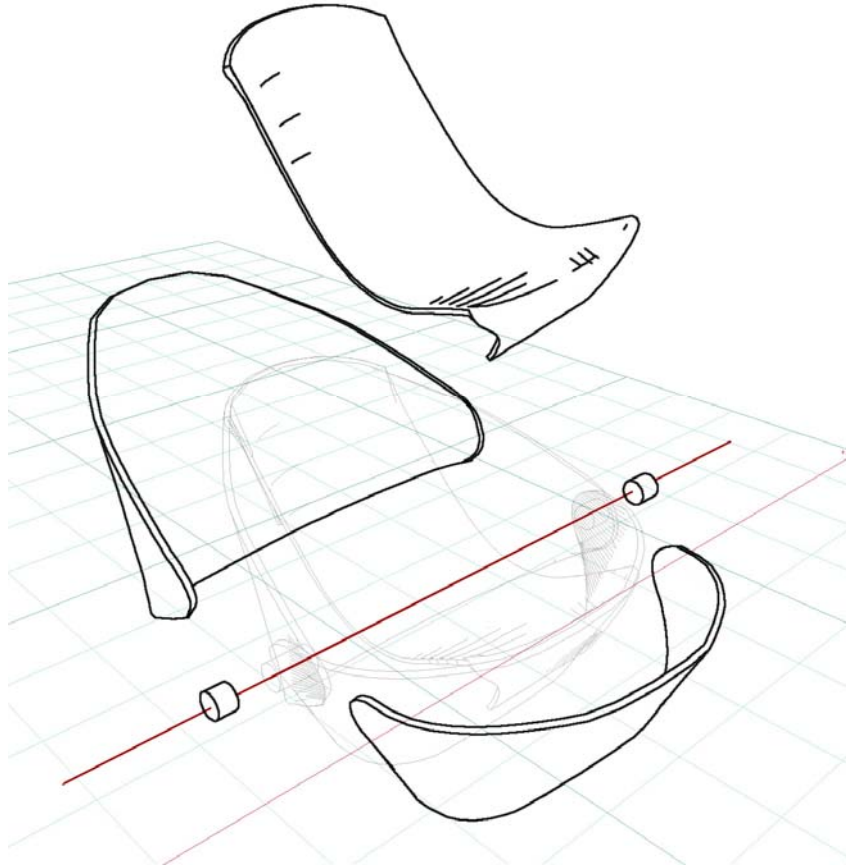
Of the sketches presented, I found the second to be the most appealing because of its simplicity but comfortable allure. The other sketches are either overly complicated or too simple and somewhat rigid. The major difference between these examples is in fact the hinge point from where the transformation can occur. This hinge point identifies the way in which the chair can be transformed as well as how it may alter the seating position.



With this major point established, I proceeded to developing a framework to support the various seating position. I chose fabric as a comfortable and adaptable material that would provide the necessary flexibility. Using principle encountered while working with the same materials on a different project I developed a structure for the chair. My experience of building a kayak helped me organize the components of the chair and its structure. In the structure of the kayak shown below, the bent pieces of wood (ribs and gunwales) are tied back to a rigid frame which gives it its primary strength and shape. The fabric provides the necessary tensile strength to keep the frame together.



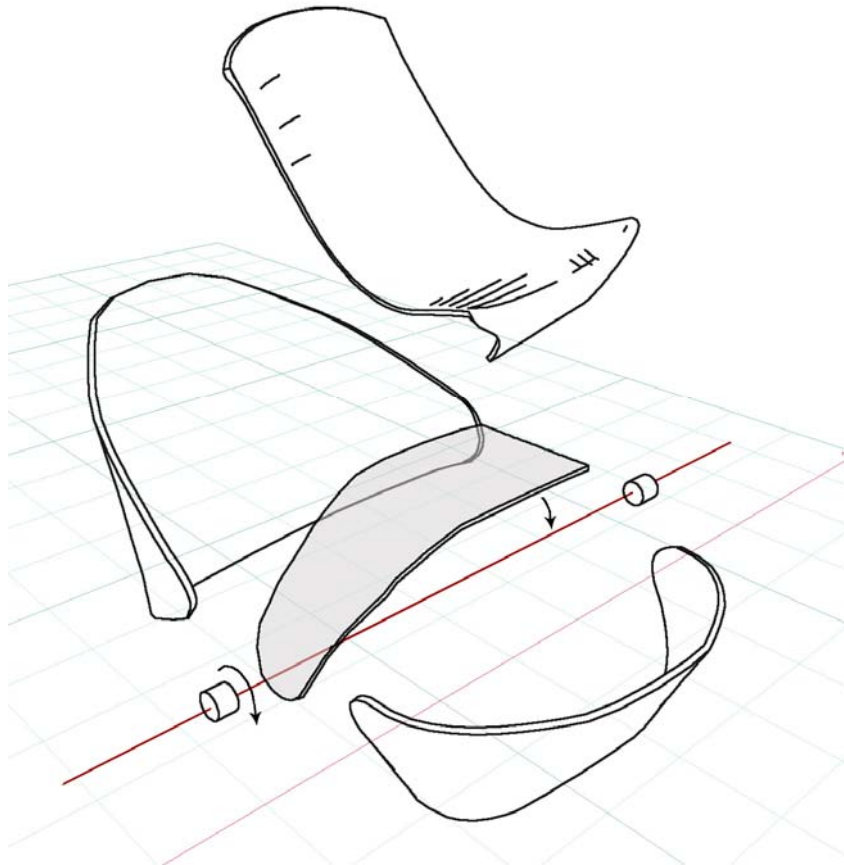
Using these principles, I've elaborated a plan for the chair, where two bent pieces of wood creating the front and back supports, which are joined together at the hinge point. The fabric, while doubling as a seat, holds the front and back pieces together.



By simply adjusting the length of the fabric at the back of the chair, it modifies the seats position and a pin locks it into place.



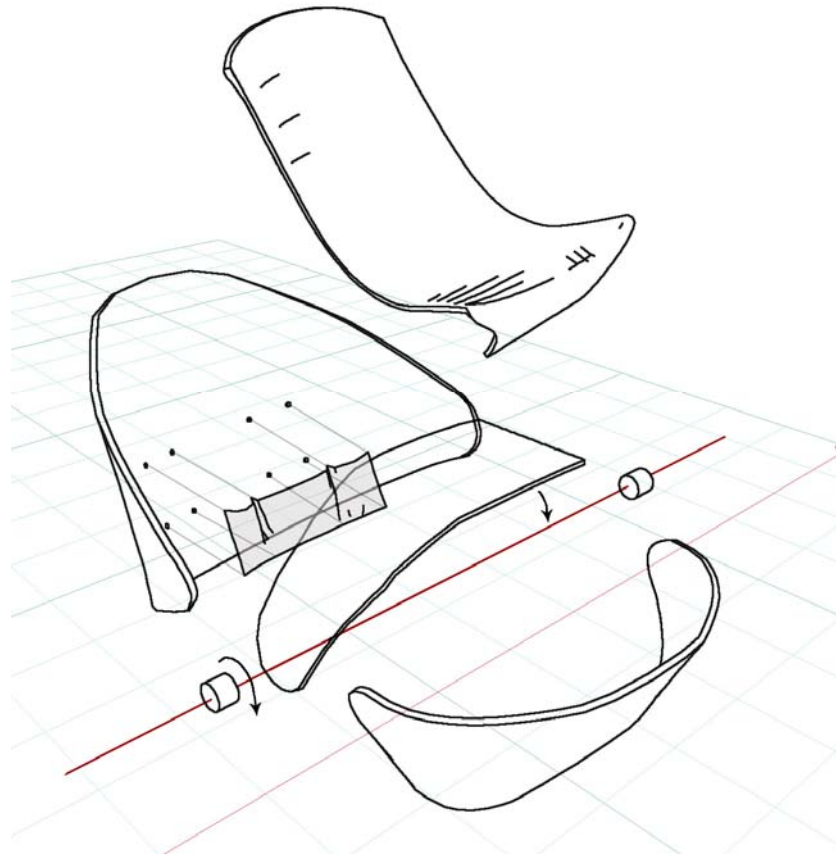
To preserve this simplicity, the tablet revolves around the same axis. By duplicating the form of the chairs front piece, the chair tablet does not become an eyesore. The tablet can remain in the upright position for any one the chairs arrangements.



With the increasing use of the laptop for multiple purposes, the different positions can accommodate the uses based on the comfort desired and the need for the keyboard. For instance the upright position is more suitable to do work (A), the middle position to browse the internet (B), and the laid back position to watch a movie (C).



The last component of the chair is a storage sleeve. This storage sleeve works in a similar fashion to a deck bag for a kayak. The storage is attached to the back of the chair with elastic cords. This adds another level of adaptability for the chair as the user can choose to rig the storage either to the inside, outside or even both surfaces of the back. This discrete storage compartment provides a place to tuck away books, paper work or computer components without being in the way and appearing messy while still accessible from a seated position.



CONCLUSION

The use of the typological research is a particularly useful as a problem solving tool. It helps identify the way things work and can expose different resolutions. The different types of transformer chairs have exposed several inventive possibilities for the use of a chair. The evolution of the design for these chairs gives out a significant amount of information about more than just the chairs function. These changes highlight significant functional, social and artistic changes. The design has evolved from a more functional approach to more modern designs where form and function are combined into a much more seamless object. The evolution is also an invitation to continually research and develop design questions. In the end, these elements have helped me design a chair that is suited to our modern needs. While being aesthetically pleasing, the chair is also highly functional and adaptable. Part of its success is achieved by resolving familiar issues in a clear functional way but breaking away from the conventional look of the tablet chair. In doing so it becomes appealing to a new public and not so restricted to the institutional use.



BIBLIOGRAPHY

Transformer Chairs (chairs to adapt to reading / writing / studying purposes)

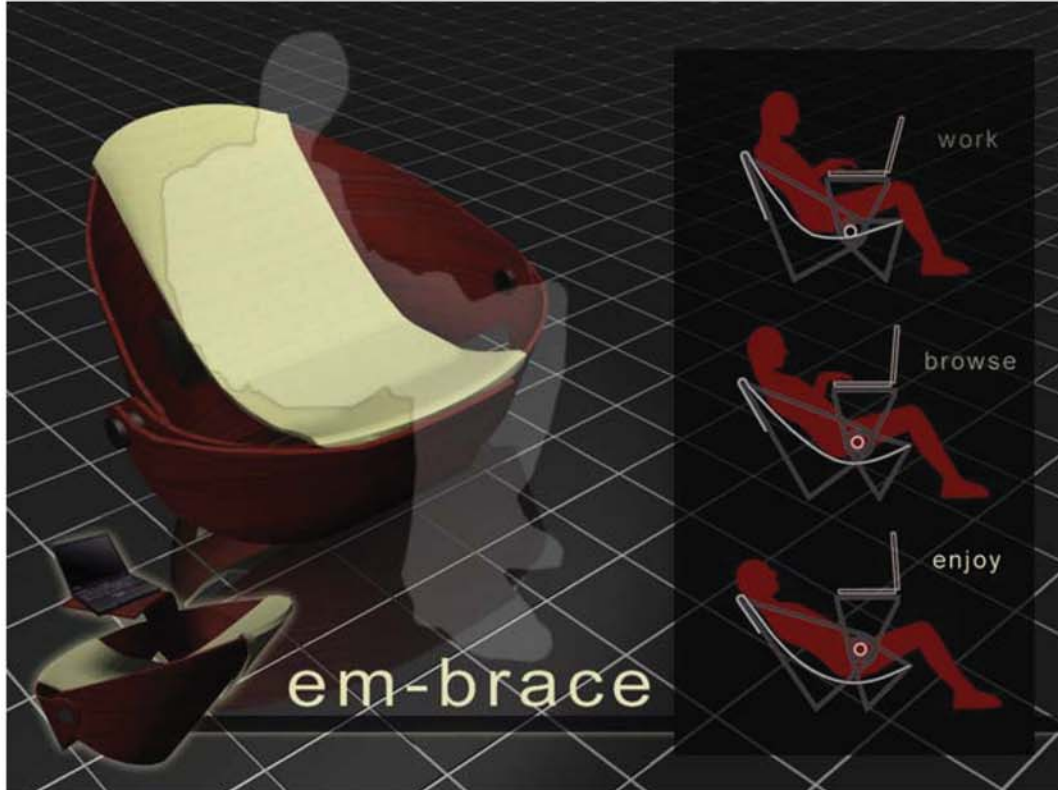
by Birgit Lohmann, 2006

<http://www.designboom.com/history/transformer.html>

All precedent IMAGES are form <http://www.designboom.com/history/transformer.html>

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Title: **em-brace**

By: **hbx63**

Application: **Lounge**

Description: **Em-brace is based on an interaction between its elements.**

2 pieces of plywood, a hinge joint, a fabric seat and its user create a simple form. The design is guided by the relationship between these components. The chair and its parts and most importantly, the chair and its user. For this reason, the chair is highly adaptable and practical. In a sense it is a writing arm chair, but in fact it appeals to a much wider audience. At the same time it is aware of the technology that surrounds it as well as its environment.

Accordingly, the chair's materials are carefully selected. It is built out of sustainable ply-wood and eco-friendly fabrics made from post-industrial materials such as soda bottles.

The layout allows for the chair to be used in a variety of different positions based on the user's preference and mood. The change requires a simple rotation of the front ply and hooking the fabric into the appropriate increment. To relax, read, work, browse, enjoy, the chair is suited to your desires.

The structure is 2 simple sheets of plywood bent into shape, connected at their extremity. A simple hinge allows movement, providing 3 different seating positions. At this hinge, a third piece creates a tablet that provides a working surface. Then, a sheet of fabric joins the front and back to create the seat. The fabric is attached in the front and can be hooked into different locations at the back. This creates a dynamic interactive structure between the chair and its user.

Em-brace your environment, em-brace yourself.

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