

## “Development in various multipurpose furniture’s by using space saving approach”

Dhiraj V. Astonkar<sup>1</sup>, Dr.Sanjay M. Kherde<sup>2</sup>

*1. Final Year M.E. Mech.Engg.(CAD-CAM),Dr.Sau Kamaltai Gawai Institute of Engg. & Technology,Darapur,Amravati.*

*2. Professor-Principal, Dr.Sau Kamaltai Gawai Institute of Engg. & Technology,Darapur,Amravati.*

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### Abstract

In India majority of Indian middle class populations are living in small flats and homes this is mostly because of their economy scale as well as the lack of space availability for living. But in the present scenario furniture occupies a majority of the space in the home. Moreover, high population density leads many other problems such as high gap between rich and poor, high energy cost and house price. These are common problem in now days. Space saving furniture is one of the options to solve these problems.

In this paper, we will introduce the innovation designs, the hard wares, the application and future development, cost & price and the important market of transformable space saving furniture. This paper will help people to understand the importance and the potential value of transformable multipurpose space saving seating arrangements in different places.

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### Introduction

#### 1. Background

For centuries, furniture is made for the same purposes. Desks, tables and workbenches provide space for work and dining. Chests, cabinets and cases are built for storage. Sofas, chairs, beds and benches are made for resting. Today we have furniture for every imaginable situation from a baby’s high chair to steel office desk. They range from soft, pillow-like upholstered sofas to sleek tables of metal and glass.

Furniture is built to make people live easier and more comfortable. The furniture industry divides them into various board groups. One way of grouping furniture is according to where and how it used. Furniture that is used at home makes up another large group and can be classified by its style.

In today home furnishing products, there are available many type of space saving furniture like table and chair can be fold using wide in the market. Sofa bed is one of the spaces saving furniture. Sofa bed is a piece of furniture which it can be used as both a sofa and a bed. This wonderful flexibility of sofas convertible into beds have proved of great help those who live in small apartment and worried about the accommodation of extra guest for sleep over. They can easily be converted into beds at nights and after its purpose served it can be rearranged back to sofa. They are not difficult to be arranged and rearranged as they are flexible and comfortable enough to handle.

#### 2. Problem Statement

Furniture can be defined as a class of designed objects which provides utility functions

such as sleeping, supporting, service and sanitation. In the present scenario the furniture has become a style substance in each and every home. The family members give almost care for the selection of their furniture and now it is a product considered to be a form of decorative art. In olden times the furniture's are made up of wood and related items but now a lot of development and now the furniture's are made including different material, plastic etc.

All types of seating arrangements and tables have some advantage and disadvantage. The customer buys the seating arrangements and tables according to their requirements like study table, dining table, office table etc. The choice of furniture material affects the look surrounding and load capacity.

Space saving seating arrangements and tables are occupy some area so, foldable as well as movable are easily transported from one place to another and used in variety of outdoor conditions. It is also convenient to provide seating arrangements and tables that may be reduced to small size for ease of carrying and storage.

The concepts more modular and flexible design of seating arrangements should be folded and can be easily stored. Multipurpose rotating seating arrangements is great for dining or use as a serving table.

### Design

There are many kinds of classic transformable space saving furniture designs from which customers might choose. In general, these include space saving beds and tables, and other space saving furniture. Space saving beds and tables have more functional properties than

any other types of furniture because they are the most frequently used furnishings. These furniture types are useful for conserving a room's space. In this report, we are going to focus on beds, tables and chairs as examples.

### Space Saving Chair

The space saving chair has become very popular in recent years. The main function of this kind of chair is that it saves space when not in use. Such chairs are very useful for people who are in a habit of inviting friends to visit their homes. The one in Figure is a very new product designed by Dripta Roy, which he calls the "Magic Chair". These chairs can be assembled by fitting their parts together. However, only the back of the saving chair is made of wood because the other materials it utilizes are easier to assemble. In addition to its functional advantage, the space saving chair is less costly than a regular one.

The designs of space saving furniture pieces not only make them transformable and space saving but are also aesthetically pleasing and resemble works of art. Transformable space saving furniture is a revolution in furniture design. Since transformable space saving furniture is new, it possesses much room for innovation in both its design and on the future market.

### Different Types of Design:

#### Capsule Shape Seating Arrangements:

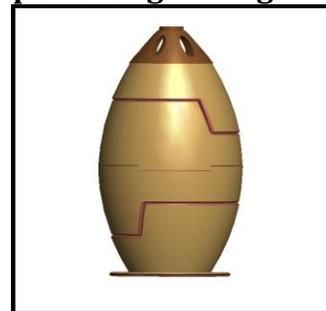


Fig.01 Assembly of Capsule Shape Seating Arrangements

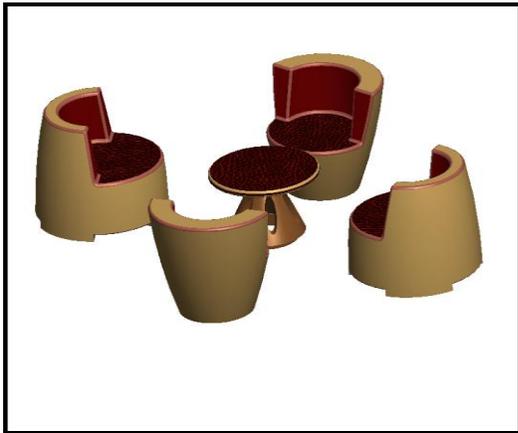


Fig. 02 Disassembly of Capsule Shape Seating Arrangements

**Foldable Armchair Seating Arrangements:**



Fig.05 Assembly of Foldable Armchair Seating Arrangements

**Rounded Movable Seating Arrangements:**

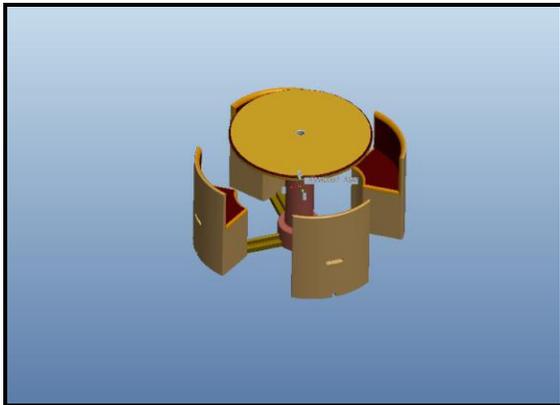


Fig.03 Assembly of Rounded Movable Seating Arrangements



Fig.06 Assembly of Unfoldable Armchair Seating Arrangements

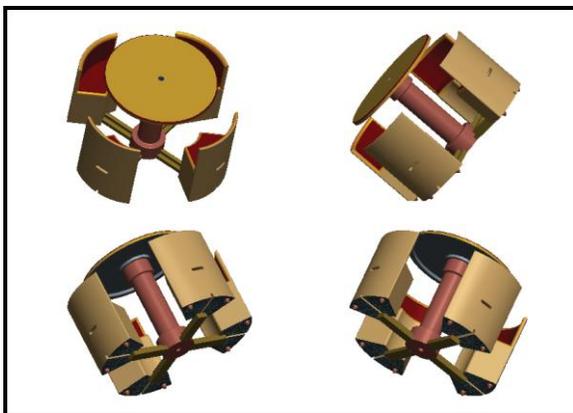


Fig.04 Assembly of Rounded Movable Seating Arrangements in different View

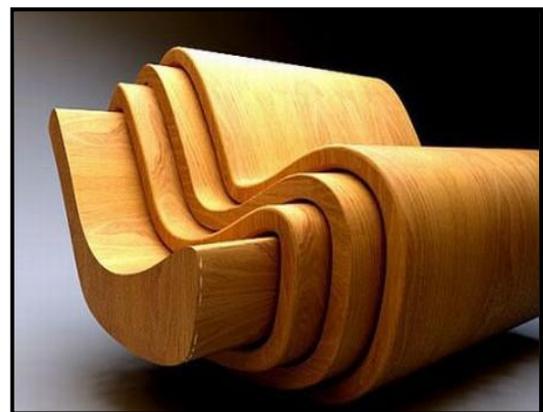


Fig.07 Space saving chair

### Space Saving Tables

Tables have a variety of functions. People usually choose tables that fit the size of their dining rooms. However, sometimes a table may not be large enough to entertain extra guests, or take up too much space for small families or in small apartments. Space saving tables can solve this problem due to their transformable features. In Figure depicts a space saving table that can be utilized as a lamp table when it is not needed, and can also be used as a large dining room table when guests are visiting. This table has five extension stages and can be extended up to 9.5 feet long. The main impact of this design is its space saving ability when it is not in use and its provision of a large entertaining space when the owner needs a dining room table. Figure shows the fully extended version of a transformable space saving table. It has a very nice design for people who live in apartments. It is also a choice for people who already have regular dining room tables but do not often receive guests.

Figure shows another type of space saving table which can be changed to a billiard table from a dining room table. This is a classic design of dual-function furniture. However, since a large space is required to play billiards, this table may be not suitable for people living in apartments. This design is very fashion able which makes it attractive to young people. It can also form a part of a house's décor.



Fig.08 Space saving table



Fig.09 Extended Space saving table



Fig.10 A dinning table can turned into billiards table

### Space Saving Beds

Space saving bed can be divided into two categories, regular beds and bunk beds. A regular space saving bed might be a shelf; desk; or combined bed and desk, in which the desk portion is capable of being transformed into a bed. The bed size can be various depending on the customer's request. Figure gives an example of a shelf, a desk and a single bed. Figure shows how the desk mode of the piece, employed for study or working at home, can be transformed into a queen sized bed when the owner wishes to sleep. One of the most important parts of this design is that the furniture's owners do not need to move items from the desk when transforming it into a bed, as shown in Figure. This design helps owners to utilize the furniture efficiently and expediently. The most important function of this design is that it increases the available space of the room as compared with when the room houses a regular bed and desk. This kind of design is very helpful for people who live in small apartments, and it is also a good choice for small guest rooms.

Bunk beds are designed mainly for school dormitories or families who have more than one child. This kind of bed is usually formed from two single size beds and a ladder. As shown in Figure, both beds can be incorporated into a frame, so that more space is made available for the children to use or play in. The ladder can easily be folded kept on the top bed when folding the bed back into the frame. The bed is also very easy to open out, so that children can do so by themselves. This design is a good choice for families, who live in apartments, in cases where each child does not have his/her own room.



Figure11. Space saving furniture: A desk and a bed



Figure12. Feature of the Design



Figure13. Bunk Bed

### Space Saving Mechanisms

In the red circle of Figure 14 is one of the examples of special mechanism that have been used on transformable space saving furniture.

This type of mechanism is mounted on the sides of bed frames in order to connect the shelf and bed frame. The specialty of this mechanism is the items on the shelf can be remaining in place when the shelf is moved up or down. The shelf can also be used as legs when the bed is in use, as it shows in figure 15.



Figure14. Space saving mechanism



Figure15. Space saving mechanism

Transformable space saving table comes in many different designs. This system is mainly sustained by a sliding system which makes it possible for the table to be extended and pulled back. The sliding system is usually hidden under or within the table, so that the table still possesses a clean appearance. Figure 11 is an example of a sliding system. In order to make the table extend as far as possible, the designer combines together numerous sliding pieces. The table in Figure 11 can be extended from 17 inches to a maximum of 115 inches. This provides many options for the length of the table.

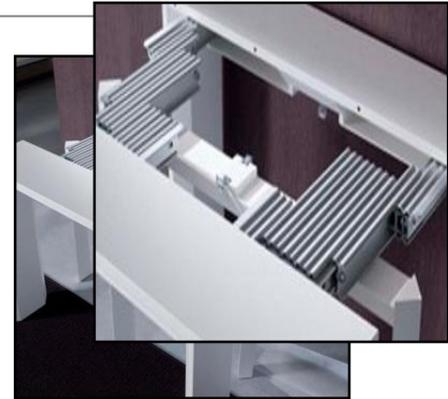


Figure16. Sliding Mechanism

### Applications and Future Development

Building designers can cooperate with transformable space saving furniture designers, so that the furniture will sufficiently fit the layout of the apartment and save even more space. It provides various functions and large spaces for a two-person occupancy house. This new design not only saves the house's energy, but also uses all the possible space of the home's limited area.

Transformable space saving furniture is one of the most important functions of this passive house design. Moveable wall structures; and transformable beds, sofas, desks and dining room tables; as well as hidden televisions and kitchenware make all of a home's space and furniture dual in function.

The main purpose of this design is to introduce an energy system innovation. However, transformable space saving furniture plays an important role in this energy saving house. This furniture makes it possible to design the smallest possible design the area of construction. The movable wall structure and the space saving bed and table are the key means by which two rooms can be easily transformed into

one. This saves initial costs, and the building's energy and space. This design is also very suitable for small area condos in large cities. It offers an excellent opportunity for the development of transformable space saving furniture.

### Cost and Price

Based on research, there are only a few companies which design and produce transformable space saving furniture. These products are not yet popular or known to the general public. The main reason for this is that the price of these products is too high for people who live in small apartments. The price range of a queen sized transformable bed with a bookshelf is from \$4,000 to 21,000 CAD, although a simple transformable sofa bed costs only around \$1,000 CAD. The huge price difference makes it difficult for these new products to be successful.

Resource Furniture, as an example, is one of the leading brands of this kind of furniture. The main material of their products is High Density Fiberboard (HDF), and all of their products are made in Italy. These are the main reasons that their products have a very high cost.

There are many options companies like Resource Furniture can choose for relocating their manufacture factory. China and South Asian countries, such as India and the Philippines, have relatively lower labor costs and land prices, along with more regulated markets than those of other developing countries.

### Important Markets

Urbanization is increasing very quickly in developing countries, including China, and even in developed countries, like the US. Increasingly more people tend to move to the big cities for their careers. This is a good opportunity for the development of transformable space saving furniture in these cities. The purchasing power of a city or country directly affects the market of transformable space saving furniture. Moreover, in depending on the function of transformable space saving furniture, the target market should be cities having a high population density. Population density is measured by dividing the population by the total area of a city, and shows how crowded a city is. A city's population density will affects its average living area, and the smaller the average living area, the better will be its market for transformable space saving furniture.

### Conclusion

Nowadays, people tend to move to metropolises for their greater employment opportunities and progressive lifestyles. This trend towards urbanization causes cities to have relatively less available free space, and also increases the price of their properties. People who live in large cities can only afford small apartments or condos. This provides a good opportunity for the development of transformable space saving furniture.

Transformable space saving furniture is an innovative product that has much opportunity for future development, and a huge potential market in metropolises. The designs of transformable space saving furniture can be

even more variable than those of the beds, tables and chairs on which I focused for this paper. Transformable space saving furniture provides small properties with greater space and multiple functions. Furthermore, transformable space saving furniture can be made more effective and efficient were its designers to cooperate with architects and engineers in its manufacture. Its designs could then be combined with the structures and layouts of buildings, so that the functions of both the furniture and buildings could be maximized. These kinds of innovative buildings could also save energy and lower the cost of living for people living in large cities.

In order to improve the future of transformable space furniture, its designers need to create more innovative ideas, and cooperating with architects and engineers is another way they might achieve success. Lowering overhead costs and furniture prices is another element for serious consideration.

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Final Year M.E. Mech. Engg.

(CAD-CAM),Dr.Sau Kamaltai

Gawai Institute of Engg. &

Technology,Darapur,Amravati.



2) Dr.Sanjay M. Kherde

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