

# **Designing Multipurpose Furniture for the Residence**

**By  
P.Arthi  
(16PIR001)**

**A thesis submitted to the  
Avinashilingam Institute for Home Science and  
Higher Education for Women  
Coimbatore - 641043**

***In partial fulfilment of the requirements for the Degree of*  
Master of Science in Interior Design and  
Resource Management**

**April 2018**

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**Certified as a Bonafide Research work**

  
**Signature of the  
Guide**

  
**Signature of the  
Head of the Department**

## ACKNOWLEDGEMENT

First and foremost, praises and thanks to **God**, the **Almighty**, for his showers of blessings and perseverance that he has been bestowed upon me during this research work, and indeed, throughout my life.

The investigator owes her reverential gratitude to the Founder and the Former Chancellor of Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore. **Dr. (Thiru.) T.S.Avinashilingam** and Former Chancellor **Hon Colonel Padmashri Dr.(Tmt.) Rajammal P.Devadas** for their wishes and blessings.

The researcher expresses her thanks to Former Chancellor **Dr. (Mr.)Thiru.T.S.K. Meenakshisundaram**, Present Chancellor **Padmashri Dr.P.R.Krishnakumar**, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore, for providing the facilities for the conduct of the study in this esteemed Institution.

The researcher acknowledges her gratitude to **Dr. (Tmt) Premavathy Vijayan**, Vice Chancellor, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore, for being the central inspiration.

It is an honor for the researcher to thank **Dr. (Tmt) Kowsalya**, Registrar, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore, for her kind help extended throughout the period of the study.

The investigator is immensely thankful to **Dr.(Tmt).N.Vasugi**, Dean Faculty of Home Science, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore, for the encouragement and support for the study.

The researcher also indebted to **Dr.(Tmt) S.Visalakshi Rajeswari**, Professor and Head, Department of Resource Management, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore, for her immense support for carrying the research.

The investigator owes her deepest gratitude to her caring and loving guide **Dr.B.Loganayaki**, Assistant Professor (SS), Department of Resource Management, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore, for her encouragement, interest, guidance with suggestions and help rendered throughout the period of the research work and to complete it successfully.

The investigator expresses her profound thanks to all the **Faculty Members** of the Department of Resource Management, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore, for their everlasting blessing help, encouragement and support.

It is a privilege to express her gratitude to her **Family and Friends** for their sustain support, criticism, ideas and valuable suggestions in the completion of studies.

***“No duty is more urgent than that of returning thanks”***

- **James Allen**

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## I. INTRODUCTION

***“Furniture is meant to be used and enjoyed”***

***-Natalie Morales***

Interior design is a multifaceted profession in which creative and technical solutions are applied within a structure to achieve a built interior environments and home lifestyle enhancement. The interior design process follows a systematic and coordinated methodology, including research, analysis and integration of knowledge into the creative process, whereby the needs and resources of the client are satisfied to produce an interior space that fulfils the project goals. (Botham, 2011)

According to Gupta, (1994) Interior decoration is not to have a few beautiful or trendy objects in the house. It is doing up an interior thoughtfully giving due attention to colour, furniture, accessories, space, style, lighting and functional aspects, it is in a short thoughtful arrangement and a methodical selection of things that create an aesthetic atmosphere in an interior.

In India majority of Indian middle class populations are living in small flats and homes 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 problems now a day. Space saving furniture is one of the options to solve these problems.

While designing space a lot of money is being spent to create a balance between beauty and functionality. With the exception of certain monumental spaces, such as lobbies, circulation area and ceremonial interiors, almost all interior require furniture. Furniture is designed to make people live easier and more comfortable. (<https://expandfurniture.com>)

Nafie(2007) considers furniture as an industrial or craft based design to support human activities. Interior designers use existing furniture or new ones in type of readymade, custom-designed, or built in. Every furniture is made

with user needs and function in mind. Function determines to analyse how the space will be used and what activities will take place at the space marks the programming phase of interior design where furniture involved. Furniture and furnishings add beauty to the home. Stylized furniture gives the home an envious look. Furniture can be a product of artistic design and is considered as a form of decorative art. Furniture takes various forms like cupboards, cabinets, beds, sofa, chair, and list goes on. They are used for storage purpose or for decorative and comfort purposes. Furniture is the most important aspect of decorating the interior and exterior. Choose comfortable furniture that truly shows the personality within the space, mix and match the furniture is also decoration to the home. Most of them spend more time in sitting on the furniture so it should be well designed and more comfortable (Sarkar, 2009).

Hence ergonomically designed furniture is often ordered to an individual specification to help support the task at hand. This often includes an intelligent mechanism designed by fully adjustable arms, seat height adjustment and inflatable lumbar support (Chakravorthy, 2007).

Smardzewski(2015) indicates that furniture is objects of applied arts intended for mobile and permanent furnishing of residential interiors. Among other things it serves for storage, work, eating, sitting, lying down, sleeping and relaxing. Furniture is a collection of articles, often of different features, but with a similar aesthetic form. They are made through the implementation of a specially determined design work, in which goal might be for example, furniture for the dining room, in a flat, residence or hotel. Furniture contains both individual furniture pieces and furniture suites. It may have a different purposes and different aesthetic and structural forms.

A room that has great furnishings is undoubtedly worthy of attention and praise. A well designed room that has the right furniture will have a great visual impression to many guests, and is comfortable venue as well. True enough there are no generic qualities in terms of colour, fabric and lighting that will determine the class of different furniture. The visual value of any furniture is subjective to whether or not its style and other qualities. But despite the fact that it is almost impossible to pinpoint the best furniture that

would suit everyone's taste, there are certain characteristics that one can look out for searching good furniture. ([www.furniture-barn.co.uk](http://www.furniture-barn.co.uk))

Seetharaman and Pannu(2015) envisages that furniture is the nucleus around which the entire decorating scheme resolves. Accessories, soft furnishings, wall hangings, foot mats and floor coverings are planned and selected only after the furniture items for a room are finalized. A scantily furnished room will appear empty and barren. When a person enters a room, it is the furniture arrangements that makes an impression and extends warm and friendly add to its ornamental value. The foremost relevance of furniture is its function or utility. Furniture in a room reflects a great deal about the occupants. What choose to live with, will reflect our educational, ethnic, social and economic background, besides indicating age and cultural arrangement. The furniture we select, its quality and style, the harmony and its overall effect transmits this subtle information. It gives clues to where to stand at a given moment of our lives. It speaks silently about how we think. Careful preliminary plans of orderly arrangement are necessary for the creation of beautiful, comfortable rooms. So it is the interior designer who constructs the space with furniture and other accessory items.

Most of us, at sometime or the other, feel that they suffer from a lack of space in homes, yet here are probably parts of the house or a flat that are rarely seen. At certain times, some corners and alcoves that are dark or awkwardly placed are not utilized fully. On the other hand, there seems to be a clutter everywhere, that a house, whatever a size, does not create an impression of space. Therefore, the importance of space as an element of art has been fully recognized, more so in the organisation of space as basic in modern architecture and in interior decoration. Every one of us is conscious of space. A sense of beauty of space makes us feel the need for large undecorated walls and floors which bound space without disturbing its effect. Some people use less furniture on floors and a few accessories/ pictures on walls because the uncovered empty silent spaces help in appreciating space.

On the contrary, complete coverage of space would lead to overcrowding and the emphasis of beauty of objects used in these areas would be the last in the process. The element, space can be used

successfully to increase the size of the room visually and to quiet feeling of rest and beauty. Large unadorned openings, black and white effects of rooms, encourage the eye to explore the distance beyond. Hence, a feeling of spaciousness is created by the way we decorated and the way we arrange the furniture in it. For example, light colours, low furniture, reflective images and well planned storage, all contribute to a feeling of extra spaciousness. (Ziegfeld,1993). Different activities have different spatial requirements, so that the more space they have and more things can do with it. The availability of space also increases the possibilities for functional differentiation and furniture re- arrangement.

Inview of Chaudhari, (2011) all of us love to have a lot of space; it is indeed a luxury to both designer and client. Unfortunately, many people must live in the compact houses, tight spaces, and high density conditions of today's housing market, where space is at a premium. Even under these conditions, with the amount of (floor) space held constant, it is still possible to maximize choices by increasing the amount of usable space through design. Additional space saving techniques and general issues involved in the use of space are very vital. Furthermore, space use should be planned carefully so that incompatibility activities are not located in adjacent areas.

In case of wide open spaces, light and airy atmosphere, first it create a feeling of largeness of the room, eliminate the shadows that tend to slice a room up into smaller spaces. Work on lighting the room with a soft, even light. Avoid ceiling lights as they tend to enlarge the room. Keep the surfaces free of heavy textures, smoother surfaces tend to reflect more light and make the room feel longer. Selection and placement of furniture in a room is crucial in defining the space. Keep the largest pieces against the walls whenever possible. Choose furniture colours that are same or similar to those selected for the walls and floors (Sarkar, 2009).

A living space become increasingly limited due to soaring real estate price. Consumers are seeking simple ways to maximize space without compromising on design or convenience. This requires creative and clever ways to maximize the space without compromising on quality. Space saving furniture shows how much space a well deigned home product or piece of

furniture can save. Range of high quality and functional space saving furniture would completely change the way of plan and use the home interior ([www.prontpanels.com](http://www.prontpanels.com)).

The purpose of multifunctional furniture is not multifunctional at all, but for most of the time this furniture is simply modular or all purpose or is completely removed from its original function. Certain furniture are able to fulfil two functions three, four or more. Many Built in furniture units appear extremely practical, seldom are they true to term multifunctional. This also applies to system furniture or is furniture based on the building block concept inherently such that it can fulfil various functions. Example, Cupboard elements can be used to transform a small shelving unit into a large one, but it essentially remains an item of furniture used for storage alone, not sitting, reading or sleeping ([www.lcove.com](http://www.lcove.com)).

Furniture designed for modern living is keyed to simple beauty, utility and convenience. The three pieces of furniture achieve these aims to a high degree and in the matter of utility go far beyond them. For example, the sectional chair with its movable arms may be used in four ways the left arm down, the right arm down, both arms down or both arms up depending on how the wish is to arrange. And two or three can be placed together to make a sectional piece of room arrangement, Sharma, 2013. He also added that as a unit of multiple use design, the table is unsurpassed. With the legs folded, it is a low coffee table of smart appearance. When the legs are extended and one segment of the top is used, it becomes a fine utility or card table. And when the two segments of the top are spread out it, serves as a dining table. The outstanding feature of the table is the fact that through all these changes it maintains its lines of simple beauty, a rare thing in any convertible piece of furniture.

Olark (2016) opines that furniture designs have become more innovative to accommodate small living spaces. It can be a multitask within the space as well. Multifunctional furniture has become the standard in home design. With so many options, it's hard to know which one is right for space. The most common options for multifunctional furniture for small spaces, with some incredible innovations mixed in.

Transforming furniture is a broad category inclusive of any piece that does the work of two or more types of items. This can range from something as simple as a sofa or wall bed to transforming tables that fold up into shelving when not in use. Living in a small space shouldn't have to mean feeling cramped. Multifunctional transforming furniture is a smarter way to live more comfortably in a condo, apartment, town home, or single family home. At Resource Furniture, it gives the solutions for any space and inventory includes transforming beds, tables, sofas and a range of other products which have both stylish good looks and smart engineering. Designed for sophistication but built for functionality, our transforming furniture is an ideal choice for anyone that needs more space. ([www.resourcefurniture.com](http://www.resourcefurniture.com))

Space is limited, so it needs to be well utilised. It is therefore important to know how to make the best use of the available space. Multipurpose or multifunctional table can be used for dining, studying, sewing, cutting vegetables etc. A sofa cum bed used for sitting during the day and opened out to form a bed at night. The furniture can be chosen which can be used for storage as well, e.g. box type beds or divans storage trunk or wooden box may be covered with a mattress and thick bedspread. This way it can be used for seating.

The space above and below window or above a door, can be used for storage. Lofts for storing things can be made above the doors or windows. Wall cupboard which do not take up any floor space can be made for storing things, that are better than ordinary cupboards. For a house with single room one end of the room can have a cooking platform and space for storage of related items (Mullick, 2005).

The increasing space problem leads to construction of small and affordable houses; thereby space saving furniture has become a necessity. Hence an attempt is made in this research study on “**Designing Multipurpose Furniture for the Residence**” with the following objectives: To

- Perform market survey to acquire knowledge on the availability of different multipurpose furniture.
- Conduct household survey to know the multipurpose furniture used in the residential areas.
- Plan showing the multipurpose furniture.

## II. REVIEW OF LITERATURE

*“Furniture will fill a space full of memories and a heart full of love”*

- *T. Hincks*

The review of literature pertaining to the study on “**Designing Multipurpose Furniture for the Residence**” is discussed under the following headings.

- A. History and development of furniture
- B. Need and importance of multipurpose furniture
- C. Factors considered while selecting and arranging the furniture
- D. Recent trends in materials used for furniture
- E. Space saving modern furniture and studies conducted

### **A. History and Development of Furniture**

The development of civilization presents a fascinating approach to the history of furniture. Throughout the ages, homes have represented a way of life that determines the decorative modes. A brief history of the furniture design will give an idea about its gradual evolution from the scratch to the present form.

In the medieval times, furniture hardly existed in the western world. The precious little that did exist was more or less identical in all countries. Medieval castles were stone fortresses which were mainly for protecting from the enemy rather than for occupant’s comfort. Initially that flat surface of the bark of a cut tree was used by people either as a seat or a table. A typical household inventory included a few simple chests (with no drawers), stools and sette benches. Tables consisted of huge boards temporarily laid across trestle bases and dismantled after meals. Chairs were stiff- backed, not upholstered, and consequently uncomfortable.

Furniture is defined as movable equipment that is created to make a person office or home suitable and comfortable for living or working. Furniture can be used for storage, seating or sleeping. Furniture forms evolved gradually, it started standing on legs, accommodated hinged doors and finally arrived the drawer. However, the furniture was still massive, heavy and

immobile. Then came the Renaissance which marked the beginning of an architectural and decorative style called Baroque. It added little to furniture comfort and changed the face of furniture. Court style gradually filtered down to the provinces, first to the homes of the country nobility and finally to the public at large.

The eighteenth century is considered as great age of furniture making both in England and in France. Design reached a degree of excellence. This century dawned with the graceful Queen Anne style (1702- 1714) and reached its maturity and waned with the elegant Georgian styles that has become better known by names of its cabinet makers Chippendale (1718-79), Thomas Sheraton (1715-1806) and George Hepplewhite (1770-1786). During this time trade was flourishing and hence a greater number of people got exposed to better furniture with bigger homes. The furniture then was evolving from heavy, rigid, block like forms into objects of great refinement and beauty. Shown in Figure 1.

The concept of furniture first developed as early as 3100-2500B.C. the first items created for household use were made of stone, as wood was not readily available during the Neolithic time period. Dressers, cupboards and beds were amongst the first forms of furniture. the dresser was said to be the most important piece of furniture in the beginning, as they faced the entrance of each house in the Neolithic society often displayed carved artwork of symbolic objects. Over the years especially in modern years, the concept of functional furniture in households exploded while keeping the artwork aspect that was displayed in the Neolithic period .This has made way of pieces in the culture that are both functional to everyday lives but also a form of artwork that are pleasant to look at the basic design. Most furniture has reminded the same for the most part though material and stability has become stronger and longer lasting with more of a focus on comfort and luxury in the modern lives. Chairs have become designed as more than just a place to sit, but as a place to relax with items such as recliners and rocking features. Beds are designed to comfort as to sleep instead of providing the mere basics to keep from lying upon the ground. The design change in furniture, in a way, shows the

evolution of our society from mere survival to lives of luxury and privilege. (Xiao, 2010)

**Neolithic period-** The Neolithic period (approximately 5,500-2,500 B.C), gave the world first documented instances of furniture being used in ancient times; Orkney, Scotland is where stone dressers and cupboards originated for the purposes of storage.

**The classical world-** From the 9<sup>th</sup>- 8<sup>th</sup> century B.C, in Ancient Egypt and Greece, the most popular forms of furniture were beds found within tombs of queens and pharaohs to rest their deceased bodies upon, as well as chairs and wooden headrests in lieu of pillows for common Ancient Egyptians.

**Early modern Europe-** Furniture from 500-1500AD was designed in European. Chairs were popular for seating and were often made of heavy oak with exquisite artistic designs.

**19<sup>th</sup> century-** Between the years of 1801-1900, 19<sup>th</sup> century furniture was very artistic and detailed. Gothic styles were popular and chairs often had fancy cut-out designs. The intricate designed chairs were often used by the wealthy at dinners.

**Early North American-** Early North American furniture dates to the early 20<sup>th</sup> century in America; furniture was more basic and made of necessity versus fancy artistic and detailed designs, basic dressers for storage and simplistic chairs and stools for sitting, were often made of woods such as cherry or walnut as they were easily bent with a steaming process.

**Modernism-** In post world war II (1945 & after) simple, sleek furniture designs were influenced by artists and designers with roots in Germany, France, Spain and Japan. Chairs representing basic seating needs in combination with artistic designs became very popular in this modern era.

**Ecodesign-** Ecodesign can be traced back to the 1920's in America, when people become somewhat aware of the toll some materials can take on the environment through its popularity did not blossom until the 1960's furniture. In Ecodesign is increasingly popular in modern days as it uses resources that are quickly grown and replaced such as bamboo. Bamboo tables (kitchen

tables as well as simple coffee tables) are popular examples of Ecodesign furniture used for holding items, without draining earth's resources.

**Contemporary-** Contemporary furniture refers to all modern or recent furniture designs (from 1970's onward) from all over the world. Aluminium and iron furniture are popular materials used in sleek and geometric contemporary designs. Iron kitchen/dining room tables are amongst the most popular styles.(Hombostel,1991)

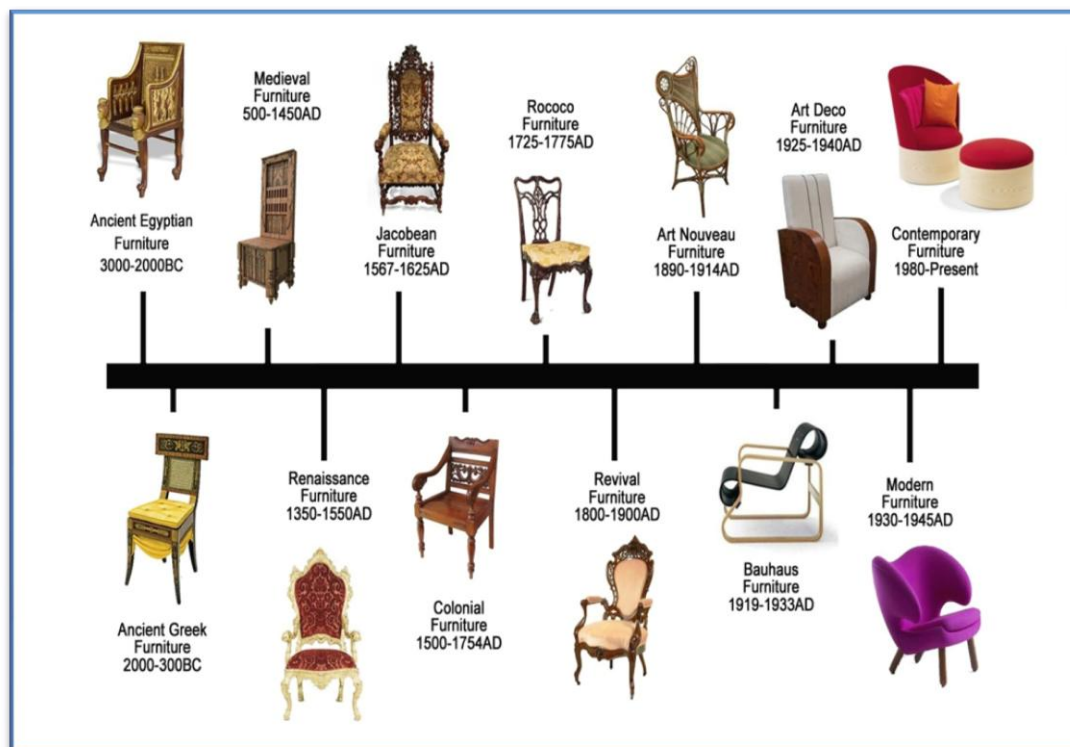
### Use of materials and furniture style at various periods.

S.NO	Period	Materials	Style
1.	1100-1660	Oak	Romanesque
2.	1660-1714	Walnut	Gothic
3.	1714-1760	Mahogany, Walnut, Lacquered Gilded & painted wood,	Renaissance late Renaissance baroque (Louis IV William & Mary, Queen Anne)
4.	1760-1830	satinwood, Mahogany, painted& Lacquered. Hepplewhite, Sheraton	Baroque Rococo
5.	1830-1900	Rosewood, Oak, Mahogany, Satinwood, Plywood.	(Chippendale, Louis XV Classical Revival
6.	1900-1970	Rosewood, Teak, Oak, Mahogany, Plywood and Plastics.	Louis XVI Victorian, Art Nouveau
7.	1971-2000	Pure wood, plywood, moulded plastics recycled wood of agricultural waste.	Victorian, classic and contemporary  Conventional/traditional, period contemporary, Eclectic.

After the turn of the century, furniture design declined. Novelty and oddity held sway; consequently, much of the furniture is less refined and more vulgar than the designs of the previous century. The style of our times is truly international. It reflects the advances achieved since the eighteenth century, when furniture was painstakingly made by hand, and the nineteenth century, when machines took over the task, to the twentieth century where new materials and technology have altered our production methods and our whole way of life.

New principles and new materials have led to the creation of new stylistic forms. A design movement is an outgrowth of the changing social, economic and technological climate of a given period of time; if it is to have a lasting effect, it must epitomize the moment. Otherwise, a fad will result, like a plant placed in shallow soil which withers at the first hint of harsh conditions (Seetharaman and Pannu, 2015).

Furniture is the mass noun for the movable objects which may support the human body (seating furniture and beds), provide storage, or hold objects on horizontal surfaces above the ground. Storage furniture (which often makes use of doors, drawers and shelves) is used to hold or contain smaller objects such as clothes, tools, books, and household goods. Furniture can be a product of artistic design and is considered a form of decorative art. In addition to furniture functional role, it can serve a symbolic or religious purpose. Domestic furniture works to create, in conjunction with furnishings such as clocks and lighting, comfortable and convenient interior spaces. Furniture can be made from many materials including metal, plastic and wood. Furniture made of a variety of woodworking joints which often reflect the local culture (Sarkar, 2009).



**Figure 1: History of Furniture Design**

Before the 19<sup>th</sup> century, furniture design was often elaborate and ornate but not necessarily functional. The advent of modern design provided more economical methods of constructing furniture, along with new, more flexible materials. Designers of modern furniture were looking for new materials with which to construct their pieces. Gone were the days of sculptured wood, a new era of steel, molded plywood and plastics arrived. Just as a frame of reference, Charles and Eames (2015) used molded plywood in many of their famous design.

Furniture design has been a part of the human experiences since beginning of history. Evidence of furniture survives from as far back as the Neolithic period in the form of paintings, wall murals discovered at Pompeii, sculpture and examples have also been excavated in Egyptian pyramids and found in tombs. These notes will track the main advancements, developments, styles and materials in furniture design highlighting the features of each period, the materials used and show images of some of the most significant pieces of furniture ever designed (Benedetto, 2011).

## **B. Need and Importance Of Multipurpose Furniture**

Each and every room in the house has certain furniture requirements without which the house and the rooms give a sense of being incomplete. Therefore, one should exercise caution while selecting furniture. Furniture is an expensive item and bought after careful analysis of one's budget and requirement, and so, it is not possible to change it frequently (Seetharaman and Pannu, 2005).

According to Rivers and Umney (2003) the importance of furniture as an indicator of the way people live has been recognised by many social historians as well as those interested in furniture. This recognition has led to a distinction between historians of antiques and decorative arts, and those who take a material culture approach. In addition to this the historical events and circumstances which influenced art and design, the economic, religious, and intellectual climatic had an effect on the way furniture was designed.

Folding furniture serves various functions. These days the cost of living just seems to be increasing, making the need for space saving furniture even

greater. A minimalistic approach is being adopted across the globe. This makes the stay comfortable. From folding beds to folding chairs and tables, furniture has the unique ability to transform rooms into convertible ones within the home. When folding furniture is not in use, can store it in attic, basement or in the corridor. Folding chairs are the best for daily use. It can be used in various rooms according to the available space. A house is not a frame without a table. Folding tables helps in several ways without having to sacrifice modern comfort; they are usually light in weight and transportable. Compactness, mobility and variability are other advantages possessed by folding tables. There are several types of folding beds including futons, guest's bed and hideaway beds that can also be used during outings and camping trips (Nair, 2016).

Jacobs, (2015) opines that furniture takes up the majority space and helps to make the home felt lived in, completing and welcome. When choosing furniture for the living and dining room, it's important to pick timeless, functional pieces that fit the space and budget. First choose from contemporary and modern, traditional or a bit of both in a unique mix.

Importance of furniture based on its types is discussed below:

### **Chairs:**

Chairs have changed greatly throughout history. There are many different types of chairs depending on its usage. For example, Dining table chair, folding chairs, lawn chairs, etc.,

### **Love seat**

A love seat is a smaller version of a couch that can seat two people comfortably. It is known as a love seat due to popularity during the Victorian era when it is used by courting couples who wished to keep their conversation private enough without being in each other personal space.

### **Couch**

A couch or sofa is long piece of furniture designed to seat multiple people while providing both back arm support.

## **Ottoman**

Ottomans are padded foot stools that are usually are shaped in a box-like fashion. They are often placed at the end of chairs, love seats or even sofas/ couches for added leg support. Many ottomans today have a place for storing blankets, pillows, etc.,

## **Recliner**

A recliner is a chair that is often upholstered and padded for maximum comfort. Recliners have the ability to lean backwards and usually feature a built in footrest that extends from the front of the chair for optimum relaxation.

## **Watchman's chair**

This chair was developed with a forward slant, versus a reclining slant, to provide comfortable seating. It was not comfortable enough to fall asleep in while men were on guard and keeping a look-out for potential danger

## **Coffee table**

Coffee table is low tables that are usually placed in front of a sofa or love seat. The purpose of coffee table is for beverages, food or a place to set one's feet after a long day

## **Desks**

Desks are essentially tables with flat surfaces but they have drawers and a place for an individual to sit. Desks were designed to provide a person with the most efficient means of storing office supplies and paper work while still being able to sit at the desk and work.

## **Table**

Tables have flat surfaces with legs that provide stability so that items are able to steadily be placed upon it.

## **End table**

An end table refers to a very small table that is placed at the end of a sofa or love seat and is often used to hold lamps, decorative pieces or drinks.

## Bed

A bed is made up of a mattress and frame. A bed is used for people looking to rest or sleep in a complete horizontal position. Today some beds have the ability to change lumbar support with the touch of a button. (Mendelson, 2007).

Importance of multipurpose furniture as expressed by Yudina (2015)

- **Stretch your housing budget further:** Too often, city dwellers have to trade location for size, or vice versa. In many ways, smart furniture is an investment in extra real estate.
- **Reduce clutter:** products are designed for any one that appreciates minimalism in the home. Enjoy true, open concept living with furniture that folds up when not in use.
- **Enjoy greater flexibility:** imagine if the spare room could be a home office one day and a yoga studio the next, for this multifunctional furniture makes it easy to change around a room for various purposes, so it gives freedom and flexibility to always have the space.
- **Minimize your impact:** smaller spaces are better for the environment, not to mention cheaper to heat and cool. Too often, people think they need a larger home to live the way they want to have space saving furniture.

Utilizing furniture that gives a greater amount of floor space can help make sure that can remain comfortable even in a studio or loft size apartment. Some of the space saving furniture is available, including foldable tables which mean to enjoy in a dining area that converts back into the living area. Joubert, (2015) Multipurpose stacking chairs are made from high durable molded plastic and metal legs. According to Ownes, (2014) the below mentioned are need to have multipurpose furniture

- **Design versatility:** Multipurpose stacking chairs can be created to suit the needs, whether need a specific seat size, a taller back or even a especially contoured back.



### Example for Multipurpose Stacking chair

- **Adaptable of different settings:** Multipurpose banquet chairs can be easily used in many different settings.
- **Encourages good posture:** Although multipurpose chairs do not have cushioning, they are exceedingly comfortable. The contours of the seat shape and back encourage the user to sit with good posture, which reduces the pressure and increases comfort.
- **Durable:** Multipurpose chairs are engineered to be able to withstand heavy use. Frequent movement, repeated stacking, lengthy storage and transportation. In fact, they are some of the most durable chairs, with heavy duty materials used in the chairs, including high density polypropylene and strong carbon tubing.
- **Convenience to store:** stackable chairs have a naturally small footprint, and they can be easily stacked several chairs high for storage. Each stack of chairs takes up very little space, which makes them much easier for storing.
- **Easy to clean:** Multipurpose seating was created to be easy to maintain without any special chemicals

### C. Factors Considered in Selection and Arrangement of Furniture

The right choice of furniture goes a long way by creating with comfortable, classy and charming appeal. When looking for furniture ranges that suits the style and make sure that it is a perfect blend of function and luxury. Besides selection, the placement of furniture should also be given careful thought. Even less expensive furniture items if arranged in an artistic

manner, may look attractive or vice versa. Arrangement of furniture should be such that it does not interfere with the family's day to day household activities. While arranging the furniture, the aesthetic consideration as well as the functional activity centers should be kept in mind. The furniture arrangements for different rooms are different, as their functions differ in many ways (excellaglobal.com).

Lewis and Segner (1992) point out that plan one or more center of interest by grouping furniture around the fire place, a window with a view, a beautiful picture or a large and attractive piece of furniture such as sofa or a chest. Balance the weight of such a grouping on the opposite wall with a wall hanging, a patterned paper or other furniture arrangement. An unfurnished room is better than the overcrowded one. Clear traffic lanes from door to door are essential so that people passing through the room will not bump into furniture or have to walk around it. The key to successful furniture arrangements is careful planning.

When the tentative budget for furnishings has been made, and the type of furnishing has been decided upon, the interesting step is planning the furniture and its arrangements. Balance is the basis of good furniture arrangement. Each of the four sides of the room should be equally heavy to produce a feeling of equilibrium, opposite walls in particular should balance well. Each wall, too should be balanced with equal height on each half, the height part should be at the centre, (Rutt, 1961). The furniture arrangement in different areas of a residence is discussed below:

- **Living room**

A living room is also called a lounge room or sitting room, is in a residential house or apartment for relaxing and socializing. Such a room is sometimes called a front room when it is near the main entrance or at the front of the house. Furniture should be arranged that the living room has a centre of interest. The centre of interest may be a fireplace, a sofa or any other distinctive piece of furniture. A secondary centre of interest is also desirable, particularly in a large room. (<https://en.wikipedia.org>)

Decide the focus of the room before arranging the furniture in the room. Use the focus as the central point of the room. Arrange furniture around the feature or place furniture opposite each other to create balance in the room. Make the arrangement of the furniture in a way will help divide the room into a living area and a dining space. Side tables should be at least as tall as the arm of the chairs or sofa. This will ensure that serving is easy when arranging furniture provide enough space for moving around the room. (www.indobase.com)

The size of the living room and the furniture arrangements within such spaces vary dramatically, depending on the size of dwelling, the economic status and lifestyle of the user, and the relationship of the room to other areas of the dwelling. Planning consideration should include adequate floor and wall space for furniture groupings, separation of traffic ways from centers of activity and ease of access of furniture and windows. When the living room is combined with the dining area, the dining area should be offset into an above or be clearly identified as an entire itself (Chiara and Paneco, 2001).

- **Entrance hall**

As per Pannu (2015) the entrance hall is a transition between the exterior and interior of the house. It is an important place because it gives the first and the last impression of the home to the person arriving or leaving. Pair of things are sometimes used to give a formal effect. As a hall should not invite one to linger on pictures and very comfortable chairs are usually out of place in it.

### **Bedroom**

The bedroom may contain beside the bed, a dressing table, chest of drawers, chairs, bedsidess tables, bookshelves, writing desks etc. A very flexible arrangement is necessary for comfort in a bedroom, as the furniture should be readily movable to suit changing conditions. For example, a study table in a bedroom should not be away from the window or in a dark corner. (Seetharaman, 2005).

Wendy (1995) also says that, this arrangement works well in rooms with many doors and windows. It also helps up grouping, furniture that placed

around the perimeter often results its arrangements that are too far apart. Place small tables next to each side of the bed to create balance. For a sitting area, position tables at each sofa or between matching chairs. Create traffic options in tight quarters with diagonal furniture placements. This also helps the room appear large and more complex.

Planning the bedroom layout does not come instinctively for everyone. Just like a good sense of direction is not given, spatial organization can be a tricky skill to master. Achieving the perfect bedroom layout is easier said than done but, with a few basic rules, can optimize the bedroom furniture to create the ideal room. (bellelap.com)

- **Dining room:**

According to Mullick, (2005) furniture and decor should be adapted to the size. Expandable tables folding chairs may be stored to eliminate the crowding of too many chairs in a limited space. A side board provides storage space in a dining area. Table and chairs should be so set, so as to interfere least with traffic.

For maximum efficiency, the dining area should be immediately adjacent to the kitchen, serving area, and the dish return area. Dining area is used for many activities including dining, class room, play area, etc., and the furniture should be designed for moving and compact storage (Dennis, 2008).

Crochet (2012) indicates that placement of arm chairs on either side of a sideboard or hutch. If in the use of drop leaf table, place it along a window or wall. However, with the changing trends, the dining table can be placed anywhere in the dining room along with the chairs comfortably. The dining area in the living room might, when necessary, be isolated by a sliding curtain on wall tracks or by a screen that rolls up vertically or by a low bookshelf partition, or by some other device. The style, scale and arrangement of dining furniture should fit the dimensions of the room and enhance the desired mood.

Arranging the dining room as a separate from or as dining area in a larger room, placement of furniture can make a big difference, it should be welcoming guest for eating. Keep the focus on ease and comfort that the

family and guests will enjoy the result. Thinking about dining room furniture arrangements does not mean only calculating dimensions, it also means evaluating the available space. When faced with an empty room and looking for great design options, the challenge is finding the best way to organize the space according to the available characteristics. The dimensions and shape of a room almost always dictate what the optimal layout for the most important furniture is going to be ([homeguides.sfgate.com](http://homeguides.sfgate.com)).

Furniture whether, meant for home or office furniture, takes the majority of space. It enhances the standard of the living by increasing the comfortable space. In the process of choosing furniture, it is very important to pick functional and timeless pieces that can easily fit in the space and also according to their budgets. Choose from the modern and stylish as well the traditional furniture. This will help to have some variety in the house, which can be very fun and interesting at times.



**Living room furnished with upholstery sofa and built in cupboards**



**Bedroom beautified by bunk beds, storage units**



**A well finished Dining room with folding chair and pulling table**

**Plate1: Multipurpose furniture in different areas**

Like arrangement, selection and specification of furniture and furnishings is an important job duty of interior designers. This is known as FF&E (Furniture, Fixtures and Equipment) during which interior designers make furniture selections and provide a detailed written description of the selected items called specification. A furniture selection, the users and activities are considered first. Interior designers focus on the purpose of the furniture, the need for adjustability, flexibility, finish requirements, durability and size. They accommodate emotional, social or cultural values of their clients. Because, furniture arrangement is an expression of personal styles as much as function-driven. A house is considered to be well-finished only when it is suitably arranged with appropriate furniture items. All rooms which are equipped with a large number of furniture need not necessarily be called functional. However, the final decision and selection of a specific furniture item should be made only after analyzing the following factors in detail:

- **Furniture increase the quality of the life:**

Furniture surely can improve the grade of the life. This is done by increasing the productivity, quality of the work and also the focus. Some important note has been stated below:

- Furniture contributes a lot in improving the visual appearance of the household.
- It helps in making the work environment more positive.
- The furniture that is placed in an office can supply copious organization space and can also be very functional
- Furniture can provide a variety of features and colour options. This relies on existing mood and the colours that the household members like.

- **Comfort:**

The most important consideration while selecting a piece of furniture is comfort. The livability of a home depends largely on its comfortable furniture items and furnishings. The ready-made furniture available in the market is according to certain standard measurement. The weight of furniture and its

mobility are the other features that also affect comfort of the seated person. Some very light chairs or stools that can be moved easily are needed in living rooms. The most mobile and useful lawn and porch chairs and tables have wheels in place of back legs. Thus it is not necessary that furniture which are costly to be comfortable, but it must be designed to fit the body and make the user to feel comfortable. (Gura, 2013)

- **Cost**

Furniture is a significant investment and so need to spend wisely. It is important to determine the budget beforehand and accordingly explore options (Shruthi, 2017). The important factor of purchasing furniture is the cost. The cost should be reasonable and affordable altogether within the limits of the available funds.

- **Sustainability**

The furniture is selected on the basis of nature of job performed on them or the purpose for which they are required. It would be better if the furniture is adaptable to multiple usages.

- **Saves spaces and Hygiene**

Furniture should be selected in such a way that it doesn't occupy much floor space. It should be easy to clean. Furniture and functionality work together in the space planning phase of interior design. By definition, space planning is the allocation and division of interior space for the client's needs and activities. Furniture is an essential part of space planning where maximum usage is considered in the placement and arrangement of furniture. also space planning involves circulation. Circulation means leaving enough space for the human flow. For the best utilization of space, furniture is placed to allow free movement. This makes the space around furniture as important as its arrangement. Thus furniture works as a functional and circulatory element in interior design (Denyer, 2014).

- **Expressiveness**

The theme of the home or room limits the choice of furniture, the kind of wood and the shape of the article, the style and colour. All elements that help to create the mood or expressiveness desired.

- **Beauty**

Good design is somewhat scarce. One general rule to follow as a guide in the selection of furniture is the plainer things are better. Whether furnishings have beauty and character depends on an entirely subjective appraisal, because individuals vary so markedly in their taste.

- **Utility**

The first test of a piece of furniture is utility. Unless article is useful it should not be given space in the home. Sometimes double purposes make furniture more valuable. (Karcng, 1951)

**Points to remember while purchasing the furniture: (Pillai, 2013)**

- ✓ Only required furniture should be purchased and its cost should be within reasonable limits.
- ✓ Multipurpose use should be considered while planning the purchase of furniture
- ✓ The furniture should use the space economically
- ✓ The design of the furniture should be aimed at maximum comfort and convenience to the user.
- ✓ The top of the table will be adequate to work with.
- ✓ The drawers should slide in and out smoothly
- ✓ As far as possible the table should be designed to avoid unnecessary movements, like bending, stooping, standing, twisting
- ✓ The edges of the furniture should be rounded off
- ✓ The back of the chair should be adjustable and of the saddle seat type
- ✓ The furniture should be adaptable, simple, durable and good task.

## D. Recent Trends in Materials Used for Furniture



Throughout 2017 people will display a more conscientious approach to consumerism, choosing high quality solutions and natural materials instead of other low-cost and mass produced options. The pairing of metals with raw, natural materials such as cork, wood, clay will be widely used. ([www.delighfull.eu](http://www.delighfull.eu))

Charlotte and Peter (1999) opines that due to Changing trends in the choice of building materials now days, people are gaining more knowledge about eco-friendly lifestyle. They are realizing that eco-friendly materials are much better and safer as compared to the synthetic and energy intensive materials. Though use of synthetic materials gives a very stylish and trendy look to the place, they are not eco-friendly. The trend is definitely away from the older classical looks, associated with bygone grandeur and towards more contemporary styling. Fabric is more textured and interesting, with graphics, florals and interesting weaves and patterns to the fore.

Furniture is made by many ways from a great variety of materials. Although a variety of materials is used for specific details, the primary structure of most furniture is based on these families of materials like wood, metal, plastics, glass and upholstered furniture. (Pile, 1995)

- **Wood**

Wood is an incredibly versatile and popular furniture material. Not only are there plenty of types to choose from, but wood is also a renewable and sustainable organic resource. Furniture has been used since ancient times, and the materials used in its creation are traditionally reflected in the type of trees found in the area. As the global trade has grown, furniture made from wood of all varieties can now be found just about anywhere in the world. Wood remains in high demand and value, especially as artificial and inorganic materials are introduced into the furniture manufacturing process.

Wood of all materials man has used for making contemporary furniture a classical furniture, wood has always been the most popular, in spite of the difficulties involved both in working it and in preserving it against the ravages of time and termites. Many other products, natural or manufactured, have been employed to embellish wood and some have briefly challenged its supremacy. Nevertheless a widespread and deep-rooted preference for wood as a furniture material constantly reasserts itself. Country craftsman went on using certain timbers long after they had ceased to be fashionable in the cities making out of solid oak for instance, designs that were being executed in walnut or mahogany veneers by the master cabinet makers in the great centers of production (Peter 1999).

- **Natural wood**

Every piece of furniture at lifestyle furniture is totally unique as they are handmade right from the beginning. Every piece of furniture have different markings and imperfections as they are completely natural due to the stunning appearance of the grain in each piece of furniture. the charm and appeal of solid wood furniture i its totally natural look and rustic feel which ensures the piece of furniture will be a great addition to any home.

Natural imperfections are part and parcel of solid wood furniture, here is a list of experience with handmade solid wood furniture. (Plate:2)

## **Graining**

The grains in each piece of wood may vary in colour. It is completely natural and happens during the tree maturing process. If the grain patterns are thicker and clear in a piece of furniture, it means that particular piece of wood was relatively old and nature.

## **Knotting**

This is one of the most common occurrences in natural wood. The knots can vary from shape, size and colour which can make a piece of furniture extremely stunning.

## **Staining**

Staining is very common in Sheesham wood, it is the natural staining of the grains within the wood and can add a lot of character within a piece of furniture.

## **Natural markings**

These types of marking can look a lot like water marks which are completely random markings within the wood.

## **Medullary rays**

As a natural product, the colour and grain of oak can vary from one piece to another. Medullary rays is a natural occurring also referred to as pith rays or wood rays, a characteristic found in most woods but most striking in hard woods such as oak and will add character, beauty and uniqueness to the furniture.

Medullary rays are sometimes mistaken for damaged repaired or water marked wood but are in fact a natural feature of the timber and a sign that what have to bought is real wood that will last for many years (Luo, 2009).



**Graining**



**Sap markings**



**Knotting**



**Staining**



**Natural markings**



**Medullary rays**

**Plate: 2 Design and variety of solid wood material**

- **Artificial wood**

There are multiple types of artificial wood; the most common include chipboard, plywood and medium-density fibreboard (MDF). Because plywood sheets are very strong, they are often used in furniture structure and then covered with upholstery or encased in laminated or a veneer. Chipboard is just what it sounds like- boards made of actual wood chips. Similar to plywood, this artificial wood is often used to build the furniture structure, and then covered with a laminate or wood veneer for a classy aesthetic. MDF is made from compressed powdered wood. MDF is soft and pliable, making it easy to sand and finish. (Mainpath, 2017). A wooden centre- table in living room is a great way to bring this material into the home. Besides being functional, the aesthetic is gorgeous (Wendy, 1995).

- **Metals**

As furniture material, metal appears in parts and as primary materials for every Producer. In all metal furniture, the connections are crucial, joints may be welded or mechanical, and that is held together with screws, nuts and bolts (Morton, 1953).

Metal furniture is satisfactory in many aspects. It is highly utilitarian for fireproof, durable weight and light weight, dry artificial heat does not affect. Various types of metal that can be used such as iron; aluminium and stainless steel are suitable for furniture. It is attractive and gives a contemporary look to the home. One of the chief alternatives to wood as a constructional material for contemporary furniture is metal and various metals have also provided valuable accessories to wooden furniture. It is perhaps significant that while mention will be made of bronze chairs and modern dining tables. Their importance today can hardly be exaggerated, especially in the field of furniture made for stacking in public rooms.

- **Plastics**

The most interesting innovation in furniture material for centuries is plastics. Plastic furniture is almost perfect as it is practically not easily breakable and scratch proof (Pile, 1995).

Plastic furniture is becoming more popular over time, as it comes in a vast array of options and makes mass produced furniture a simple task. It can be molded into any form, and it's lightweight and cheap to manufacture. Often see it as the material for simple furniture pieces, outdoor furniture, or for reusable commercial purposes. Plastic is naturally water resistant, but less durable than other materials (such as wood), its value comes from its affordability and versatility.

- **Steel**

Steel is a very common material used in furniture manufacturing. It can be formed into any shape, and also common choice for manufacturing foldable chairs and tables. It is used very extensively for modern interior furnishings involving metal. Many hinges, slides, supports and body pieces are composed of stainless. It has a high tensile strength, allowing it to be applied using hollow tubes, reducing weight and increasing user accessibility. ([https:// googleweblight.com](https://googleweblight.com))

- **Leather**

Leather is an expensive, but timeless material used in furniture creation. It's comfortable, pliable and classic often used to upholster couches and chairs. Vinyl sometimes used in place of leather, as a great economical option for furniture, especially in family and dining room.

In the 16<sup>th</sup> century the finest European leatherwork was produced in Spain, mainly in the region of Cordoba. Elaborately tooled and coloured and displaying a strong Islamic influence on furniture styles resulting from the Moorish occupation of Spain. It become famous all over Europe. After the middle of the 17<sup>th</sup> century, equally fine leatherwork came to be produced in the low countries. It was applied to sofa frames, chests and screens with brass or iron nails. Leather is a softer forms such as morocco was used, in combination with a webbing foundation and a stuffing of horsehair, for the seats of dining chairs in the English style.

- **Fabric**

Fabric is one of the most widely used materials in furniture manufacturing, from natural fibers to synthetic ones. Fabric can be found in just about any colour or texture. As demand increases for new and improved resources, the materials used in furniture manufacturing have become increasingly diverse and innovative. (Mainpath, 2017)

- **Glass**

Glass that has been heated and rapidly cooled is much more structurally durable than regular glass; it can be bent curved to create unique pieces of furniture. Glass provides a beautiful and minimalistic way to create furniture that is classy, transparent and easily cleaned. Similar to the glass look, acrylic materials are also finding their way into popularity and are up to 17 times strong and half as thick as their glass counterparts. (Prentice, 2010)

For many years, the top surfaces of the tables and chests were protected with glass, but that idea of a protective glass top has become rather old fashioned. But it is also likely that it may come into fashion once again. Glass has instead branched out into more glamorous role home furnishings. A wide range of glass furniture is available in the market.

- **Upholstery**

This is a technique using a variety of materials to create softness in seating and recycling furniture. Upholstery can range from a thin pad added to a hard seating surface to a complex construction that provides excellent comfort. Since a covering of fabric, leather or plastic usually conceals all upholstery construction, its techniques and quality are hard to evaluate. (googleweblight.com) upholstery means any covering for a sofa, a chair, a Diwan or a stool. It is usually of cloth though often leather and rexine are used, it can either be permanently fixed or be in the form of loose covers. Upholstery can be made from an endless variety of textiles, depending on the decor, the colours and the textures chosen. They can be of anything from Jute, khadi and cotton to velvet or raw silk (googleweblight.com).



**Upholstery**



**Glass**



**Wood**



**Leather**



**Plastic**



**Metal**

**Plate 3: Materials used for Furniture**

## **E. Space Saving Modern Furniture and Its Studies**

The home should be comfortable place to live, no matter in size. Resource furniture offers range of creative solutions for studio apartments, micro homes and other compact living spaces. Ideal for everyone from students to upscale urban professionals, space saving furniture is smart, stylish and forward thinking. (Plate:4)

### **Smart furniture for all stages of life:**

- **City –dwelling professionals**

Living in dense urban area often means residing in a small space, whether its micro apartment or town home. However, a small apartment should not have to mean living with tiny, uncomfortable furniture. Maximize the space and get more out where to live with a wall bed, a folding table or other great products from resource furniture.

- **Growing families**

Parents who want their children to experience the culture and diversity of growing up in the city can make apartment living easier with the smart furniture choices, which include wall bunk beds and other space-saving kids bedroom furniture folds away when not in use, freeing up the floor space making it easier to resist the urge to trade the big city for spacious suburban life.

- **Retirees**

As at the stage of old age their needs change, it's natural to want to downsize. Moving to a smaller home from the larger one raised from children it can be a big adjustment, but it doesn't have to mean giving up the comfort and convenience. Furniture is ideal for the modern retiree. Easy to use and designed for active lifestyles, the products make it easy to entertain friends and family in a small space. Check out the full selection of space saving tables and chairs, living room furniture and more. ([resource furniture.com](http://resourcefurniture.com))



**Space saving tables**



**Space saving essentials**



**Queen space saving wall beds**



**Twin space saving wall beds**

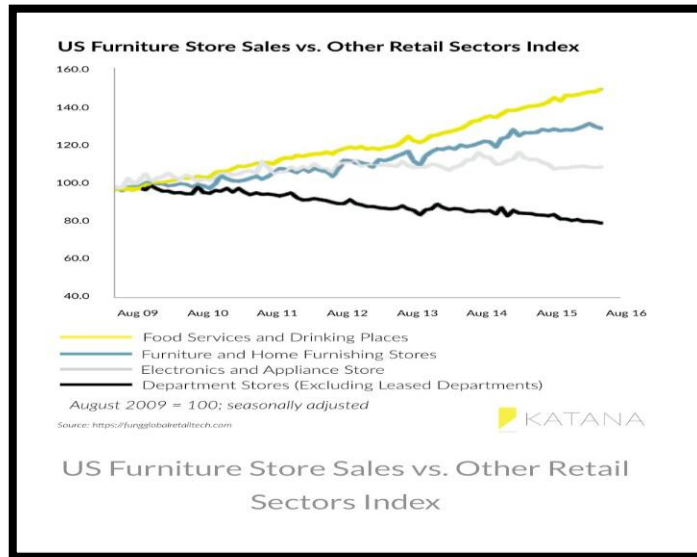
**Plate: 4 Space Saving Furniture**

## **Studies Related to Furniture**

The country furniture industry is projected to cross USD32 billion by year 2019. The country furniture market is expected to grow at a rapid pace due to rising disposable income, expanding middle class and growing number of urban households. In addition, the anticipated rise in tourism and hospitality sectors is also expected to spur the furniture demand in the country 2019. Uttar Pradesh, Kerala, Punjab, West Bengal and Andhra Pradesh are the major suppliers of wood, which is the most widely used raw material in the country furniture market. Home furniture market is expected to witness fastest growth over the next five years, followed by office and institutional segments. Major organised players such as Godrej interior, Durian, Wipro, Evok and Nilkamal are expected to outperform during the next five years due to their diverse product range, expanding distribution network and exclusive outlets. Indian Furniture Industry at a glance 2016-2017.

## **The state of the furniture industry trends and reports for 2017**

According to Byrne(2017) in his case study highlighted the furniture and home furnishing industry in a series of upcoming blogs posts, reports. According to CIT, the furniture industry in the United States is continuing superior sales performance in the bedroom and the dining room furnishing departments. The furniture vertical is performing twice as well as the overall economy, growing at rate of 6 to 7 percent. The US furniture sector has been steadily growing since 2009, indexing 146.9 in august 2016. Supported by a macroeconomic environment, furniture sales are projected to rise as home sales and home furnishing expenditures increase. Furniture ecommerce is growing fast in the US. However, there is still a gap between online product research and online furniture purchase. Many consumers prefer to research online but purchase in-store.



### Trends and challenges for 2017

According to (Trigkas. M, 2017) function, technology, quality, delivery these four things appear to be some of the biggest issues facing furniture retailers, according to interviews with Home Furnishings Association members across the nation. The world of home furnishings is changing to meet the ever evolving demands of consumers.

Staying on top of changing consumer trends and demands will be critical for furniture retailers in 2017. Nye recommends consistent market attendance, as well as involvement with a buying group. “Engle furniture attends April and October high point markets and January Las Vegas market to directly educate ourselves on industry trends.

### Challenges and Trends Facing Furniture Manufactures In 2018:

According to Brand 2017 with the growth of millennial consumers buying furniture, so furniture manufactures are moderately optimistic about the steady increase of new furniture sales in the upcoming years. The national association of realtors forecasts existing home sales growth of 4% of the residential property market in 2018, which could in turn, have a positive impact on the moderate furniture industry.

#### Trend 1: More people renting

According to new research center report, 36.6% of household heads rented their home in 2016, the highest since 1965. Rising home prices, apprehension from the burst housing bubbles, rising students debts, and the

delay of millennial to get married or start their own families do some of the reasons own a home.

### **The challenges and opportunities**

Renters are likely to look for more affordable furniture options in the same manner as landlords will optimise for most cost- effective furnishings for their home rentals, with a growing number renting furnishings rather than outright buying them. A growing trend also is leading toward consumers shopping for smaller furniture to fit the rental homes or apartments where space may be at a premium. To turn this challenge into opportunity, furniture manufactures may want to add more items for their inventory of inexpensive, streamlined or multipurpose furniture to suit these smaller living spaces, as multifunctional furniture is rapidly gaining popularity.

### **Trend 2: Single person households are increasing**

24% of households are single person households, according to 2016 statistic data. Single person households are expected to increase over 15 years, according to 2015 article by Deloitte insights. And smaller households are opting to live in apartments or smaller homes, an increase in availability of more modular, space-saving and multifunctional furniture and furniture for storage.

### **The challenges and opportunities**

Furniture manufactures should take this both a challenge an opportunity to create new designs as addition to their portfolio of offerings, further promoting their brand.

### **Trend 3: Different generations have different lifestyles**

The bulk of the furniture market is composed of millennial. With lower disposable income and higher levels of debt, tend to delay the decision to start a household- which poses a potential problem because they represented 37% of the furniture and bedding market in 2014. They also have different shopping habits (more online centric) than other generations and tend to prioritize more sustainable product purchases.

### **The challenges and opportunities**

The generational demographic of consumers calls for furniture manufactures to diversify their products to cater to the specific needs of each group. While this may mean additional investment on new design and innovation, it also creates new possibilities for additional revenue sources and a motivation to embrace more sustainable processes and resources.

### **Trend 4: online retailing**

Online retailing has been around for sometime but it will continue to be a preferred buying channel for millennial in particular. With the instant access to catalogs idea what they want.

### **The challenges and opportunities**

Online retailers have taken away a good portion of the market share of brick and mortar retailers. Not all is lost for store owners if they start embracing online and mobile technology and deploy them in their physical stores. For manufactures, the increase in online shopping means an opportunity to sell to online retailers that are not limited to a physical geographic area. Multifunctional furniture that converts or includes hidden storage. And a furniture manufacture has designed smart furniture that is able to monitor and record health-related data, such blood pressure, breathing and body temperature.

### III. RESEARCH DESIGN

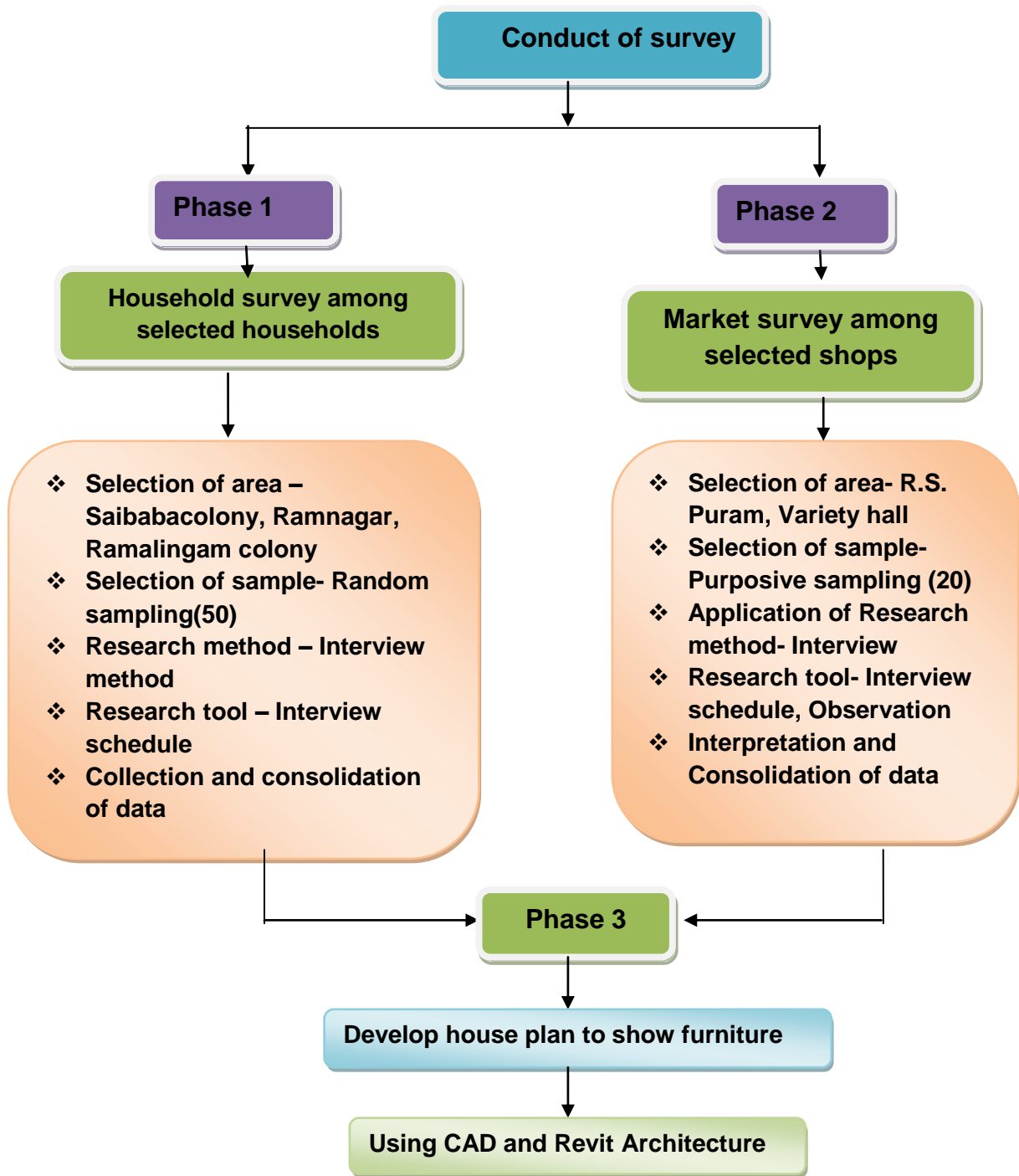
Research is an inquiry of system to describe, explain, predict and control the observed phenomenon. Research involves two methods they are inductive and deductive methods (Babbie, 1998). In inductive methods they analyze the observed phenomenon and identify the general principles, structures, or processes underlying the phenomenon to be observed. In deductive methods verify the hypothesized principles through observations.

The methodology is the general research strategy that gives the outline in which the research is to be undertaken among other things. These methods, described in the methodology, define the means or modes of data collection or sometimes gives a specific result is to be calculated. Methodology does not define specific methods, even though much attention is given to the nature and kinds of processes to be followed in a particular procedure or to attain an objective. (Irny and Rose, 2005) The procedure for the research study entitled “**Designing Multipurpose Furniture for the Residence**” which includes three strategies is presented below:

**Phase 1:** Household survey

**Phase 2:** Market survey

**Phase 3:** Plan showing the multipurpose furniture



**Figure 2: Indicate a Flowchart of the Study Conducted**

## **Phase 1: Household survey**

Mukul, (2013) defined that survey research is "the collection of information from a sample of individuals through their responses to questions". Survey research may contain a variety of data collection methods with the most common questionnaires and interviews. (Kothari, 2015). A household survey was conducted to find out the information on availability of furniture in the residence, and other required details for this study.

### **Selection of the study area**

Coimbatore also known as Kovai, is a major city in the Indian state of Tamil Nadu. Coimbatore is the second largest city (by area and population) in the state (after Chennai) and the 16th largest urban agglomeration in India and it is the 93rd fastest growing city in the world. It has more than 25,000 small, medium and large industries with the primary industries being engineering and textiles. Coimbatore is called the "Manchester of South India" due to its extensive textile industry, fed by the surrounding cotton fields.

Coimbatore is the leading suppliers in the field of wood; in this modern world wood plays an important role in interior field. All different types of woods have unique signature marks that can help in easy identification of the type. Both hardwoods and softwoods are used in furniture manufacturing, and each has their own specific uses. High quality wood will have been air dried to rid it of its moisture. Apart from wood new materials are also available in market for the construction of furniture like glass, metals and plastics ([www.Wikipedia.org](http://www.Wikipedia.org)).



**Figure 3: selection of Area**

Furniture is designed to make the people live easier and comfortable. The people are affordable to buy new furniture especially the multipurpose to enhance the beauty of their residence and save space. Hence to study the furniture used in residential areas such as Saibabacolony, Ramnagar and Ramalingam colony were selected for household survey due to the convenience, easy accessibility and desired information gained by the investigator while conducting the study. Residential development also seems to be faster in these areas. (Cauvery, 2014)

### **Selection of sample**

Sample is a small part of anything or one of a number intended to show the quality, style or nature of the whole specimen, (Bower, 2016). Based on simple random technique, fifty houses were selected from three different areas. Simple random sampling is the basic sampling technique. Coimbatore district is selected to study from a larger group of population. Each individual is chosen entirely by chance and each member of the population has an equal chance of being included in the sample. Every possible sample of a given size has the same chance of selection. (<http://www.stat.yale.edu>.) The family had good knowledge about the materials used for furniture and the recent trends of furniture available in market.

## **Selection of research method and tool**

The interview method selected for this study denotes a social situation between two persons. The psychological process involved requiring both individuals are mutually responded though the social research. Purpose of the interview call for a varied response from the two parties concerned.”(Palmer, 2006).

A personal interview, also called as a face to face survey helps to gather data through direct usable interaction between the interviewer and interviewee. Hence investigator framed the schedule to gather the relevant information. As far as data collection tools are concerned, research which involves the use of semi-structured questionnaire, which was used as an interview guide for the researcher. Some questions for addressing the subject objective must be prepared, for the researcher to guide the interviewee towards the satisfaction of research aim and objectives. (Langkos, 2015) Interview schedule was prepared to obtain the data to elicit the information on availability of furniture in the residence.

## **Collection and consolidation of data:**

Data collection is the systematic approach of gathering and measuring information from a variety of sources to get a complete and accurate picture of an area of interest. Data collection enables a person or organization to answer relevant questions, evaluate outcomes and make predictions about future probabilities and trends. (Rouse, 2008). According to Paneerselvam (2004), data are the basic input in decision making process. The needed data were collected from the selected households through personal interviewing.

Data consolidation refers to multiple sources into a single destination, from the collection and integration of the data. During this process, different data sources are put together, or consolidated, into a single data store. (<https://www.techopedia.com>). The consolidation of data was been tabulated (Jain, 2000), Tabulation is the process of summarizing the data and displaying the same in compact form of statistical table. (Mahlrapal, 2010), the purpose of this consolidation is to simplify the presentation and facilitating the project.

Thus tabulated data are analysed, discussed and presented in the result and discussion.

Ethical clearance (AUW/IHEC/RM-17-18/XPD/02) was obtained before selecting the sample and conduct of the study is enclosed in Appendix – IV.



**Plate 5: Households Surveyed**

### **Phase 2: Market Survey**

Market research describes the gathering and analysis of market data, such as customer preferences, trends in the market prices and the presence of competing products. A market survey can describe any study that gathers information directly from the customers by asking those questions about their preferences and experience. The purpose of a market survey is to provide business managers with insight about their target customers, such as how much money they spend on their certain types of products in the form of competing products (Hamel, 2008). Survey was conducted among the shops in order to obtain the information on the innovative materials and also the space saving furniture mainly used for multiple uses. It also includes the following steps.

1. Selection of area
2. Selection of sample
3. Application of research method and tool
4. Interpretation and consolidation of data.

### **Selection of area**

The shops located in R.S. Puram and Variety hall was selected for the market survey. The shops in these areas are popularly known for furniture. These areas were selected due to easy approachability, nearness, less time consumption, trendy materials and availability of all furniture brands in these shops.

### **Selection of sample**

According to Crossman (2017), sample selection is a very important but sometimes underestimated of a research study. Purposive sample is a non-probability sample that is selected based on characteristics of a population and the objective of the study. Purposive sampling is also known as judgmental, selective or subjective sampling. This sampling techniques which helps the researcher relies on her or his own judgement when choosing the shops to collect required details. Based on purposive sampling method twenty shops were selected in Coimbatore district.

### **Application of Research method**

Interview method was adopted by the investigator for market survey using an interview schedule. It is a face to face technique with the respondent for collecting the data, information or opinion that specially involves a series of questions. It is a much reliable source of information that the interviewer cannot record the statements of interviewee speaks, but he can observe the body language, expressions and other reactions related to the questions. This enables the interviewer to conclude the result easily. (Naresha, 2002).

### **Formulation of Research tool**

According to Pasin (1996), Questions are prepared for collecting details on availability of materials and space saving furniture. Hence an interview schedule was framed for the survey is presented in (Appendix II) Observation is a systematic data collection approach to examine their verbal and non verbal behaviour as they occur in variety of context. The method of data collection is difficult to obtain relevant information through self respect

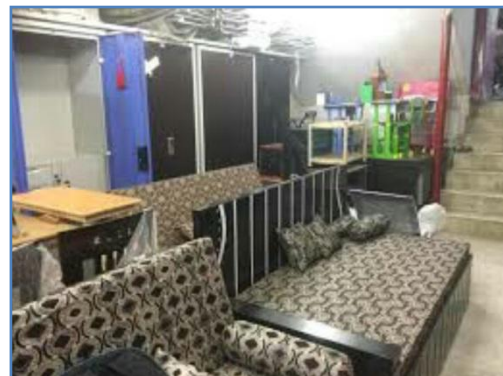
because subjects are unable to communicate or provide sufficient detailed information. Through the observation method one can save the time and energy and get more information from the owner.

### **Interpretation and consolidation of data**

According to Nafie (2007), data is one of the most important aspects in any research. Through this the interviewer asks the questions one by one and filled up the schedule with the respondent. After evaluating the data next step is to organise it into a meaningful form. This process is called grouping of facts or synthesis the data. The grouping of data was tabulated. Thus the tabulated data were analysed, discussed and presented under chapter IV- Results and Discussion.



**Newly arrived coffee table**



**Portable cupboards and storage units**

### **Plate: 6 Furniture in the surveyed shops**

#### **Phase: 3 Plan showing the multipurpose furniture**

CAD and Autodesk Revit were used for showing multipurpose furniture of the residence using Computer Aided Design (CAD) is a translation of tool which became global language and allows communication between the professions and construction industry. The use of CAD, the interior space has reduced the complexity attached with the projects. One can easily visualize the future furniture after completion. It allows the user to visualize all the furniture aspects from different angles and make people to understand how to arrange the furniture by saving the space. (Astonkar, 2014)

According to Ray, (2012) Autodesk Revit is building information and modelling software for architects, landscape architects, structural engineers, interior designers and contractors. It allows the user to design the building and structure and its components in 3D, annotate the model with 2D drafting elements and access building information from the building model database. And it is also useful for modelling the furniture and arrangement of furniture in different way in a particular room. Revit Parametric Modelling is a significant tool for conceptual design. With Revit software, architectural designers can quickly sketch a rough layout of the floor plan or make changes to the standard set of building designs and instantly let their future homes. 3D design views gives designers to try out different design ideas and guide their design decisions at early stage (Coorey, 2017).

## IV RESULTS AND DISCUSSION

*“The saws are sawing wood, but wood is also sawing the saws...*

*The sawn into boards is fashioned into furniture.*

- *Liu Shahe*

The outcome of the study on “**Designing Multipurpose Furniture for the Residence**”, are discussed under the following stages.

Phase 1: Household survey

Phase 2: Market survey

Phase 3: Plan showing the multipurpose furniture

### **Phase 1: Outcome of Household survey**

This stage present the data received from the selected 50 households under the following topics:

- A. General family background
- B. Details of the house
- C. Details of the furniture in the residence
- D. Reason for purchasing the specific material

#### **A. General Family Background**

Now a days furniture plays an important role in the residence. Without any arrangement of furniture the house will not be fulfilled. Purchasing and arranging the furniture differ from person to person based on age, education, occupation, income and religion. Furniture for families is a non- profit. By making smart renovation choices, getting rid of unnecessary items and choosing the furniture that performs multiple functions, the space transformed into a beautiful home, Friedlander (2015). The information on family background is depicted in Table.1.

**Table 1: Family Background of the Respondents**

Details of the family	Total	
	No:50	%
<b>Age in years</b>		
0-20	4	8
21-40	25	50
41-60	16	32
61-80	3	6
80 and above	2	4
<b>Educational status</b>		
Pre-school	2	4
High School	2	4
College	10	20
Diploma	11	22
Professionals	25	50
<b>Family type</b>		
Joint family	12	24
Nuclear family	38	76

From the above table it is obvious that nearly 50 percent of respondents were in the age group of 21-40 years, during this age they make many decisions. Whereas 32 percent of them belonged to 41-60 years considered to be the developmental stage. 8 percent were under the age of 0-20 years. Only 6 percent and 4 percent were under the age group of 61-80 and above 80 years. Regarding to the education of selected respondents, college and professional category was found to be 20 percent and 50 percent respectively, but 30 percent had education at the higher secondary level, pre-school and diploma respectively. Seventy six percent of surveyed families followed nuclear family system in comparison to 24 percent of joint families. The divergence towards nuclear families has been reasoned to be the result of industrialization and subsequent urbanization (Hilpern, 2017).

The joint family is a large multigenerational unit, all living under the same tool. For a large family needs plenty of room for people to move about, place the furniture such that all pathways and corridors around are unobstructed, allowing for free movement. This will let young children run and play freely and aged parents navigate rooms without mishaps, Archana (2017), Planning for the nuclear family or joint family, furniture arrangement of a space needs consideration.

Special function could consist of the consideration of the small children in the house that required less furniture to be average in the middle of the room. Despite all priority of the life style of a space, when minimum space available, it is vital to open up the space to create more available square footage.

**Table 2: Occupation and Income of the Respondents**

Details	Total	
	No:50	%
<b>Occupational status</b>		
Business	23	46
Advocate	3	6
Teacher	7	14
Agriculture	4	8
Bank officer	5	10
Running Hostel	3	6
<b>Monthly Income (in Rs.)</b>		
Below 30,000	6	12
30,001-60,000	8	16
60,001-90,000	10	20
90,001-1,25,000	15	30
1,25,001-1,50,000	7	14
Above 1,50,000	4	8

Table 2 illustrate the occupation and monthly income of the family. Approximately 46 percent of the families were doing business, followed by 14

percent teaching profession, 10 percent bank officer, eight percent agriculture. Six percent of the families major occupation was found to be advocate and running hostel. Through these occupation, they could earn an amount of Rs. 30,000- 60,000 and 60,000-90,000 by 16 percent and 20 percent respectively. 30 percent of the families were able to earn around Rs. 90,000-1, 25,000 and above 1, 50,000 by eight percent.

### Style of the house

Interior furniture design that has a traditional style can be applied perfectly in a house interior that has a modern concept. Traditional interior furniture can be arranged in a modern style so as to create a perfect design of modern interior that uses traditional furniture style. Nearly 20 percent of the selected residences were traditional in nature, 30 percent of the houses were contemporary and 50 percent were modern house, constructed within 4 years. 75 percent of the family members constructed their houses by themselves with their own plan and by architects. 20 percent of them purchased their houses.

### B. Details of the house

Details of the house include the nature of ownership, selection of area, plinth area, number of rooms, interior finishes, the total area of the house, carpet area of the house, year of construction and size of the rooms, collection of furniture, domestic appliances, accessories and lighting fixtures for furnishing a dwelling.

**Table 3: Total Area and Carpet Area of the House**

Total area (sq.ft)	Carpet area (sq.ft)	Total	
		No:50	%
Below 1,000	Below 700	11	22
1,000-2,000	700-1400	18	36
2,000-3,000	1400-2100	13	26
Above 3,000	Above 2100	8	16

From the above table it could be inferred that, 36 percent and 26 percent of the respondents utilized the total area of 1,000 to 2,000 sq.ft and 2,000 to 3,000 sq.ft for their house construction. Above 2100 sq.ft was utilized among the 16 percent of surveyed families. The year on which the house constructed is given in the Table 4.

**Table 4: Year of Construction**

Year of construction	Total	
	No:50	%
2010-2011	15	30
2012-2013	20	40
2014-2015	10	20
2016 and above	5	10

The houses constructed from 2010 and above was noticed among the surveyed families. During these period of construction people might have more awareness about multipurpose space saving furniture and knowledge about other recent furniture. Among these houses 40 percent and 30 percent were constructed during 2012-2013 and 2010-2013. Only 10 percent of them have constructed very recently, 2016 onwards,

**Table 5: Size of the Room**

Type of room	Size of the room	Total	
	(sq.ft)	No:50	%
Living room	160	17	34
	256	20	40
	320	13	26
Kitchen	110	15	30
	100	25	50
	160	10	20
Master bedroom	160	17	34
	110	22	44
	176	11	22
Additional bedroom	110	10	20
	80	18	36
	121	22	44
Dining room	160	16	32
	80	15	30
	100	19	38
Pooja room	36	21	42
	30	18	36
	24	11	22

The size of the dining room was noticed as 80sqft, 100sq.ft and 160sq.ft, among 30, 32 and 38 percent respectively. For the houses with 80sq.ft area, they had partition from living and dining, so as to remove it when need arises. Size of the room will vary based on the activities performed by the inmates. It also depends upon the designer who lives in the house. Many houses have large room with specialized functions and small rooms for other activities. They may include a living area used for sleeping, eating. The size of the living room among the 40 percent of the surveyed families was 256 sq.ft against 160 sq.ft for 34 percent of the families. Nearly 50 percent planned their kitchen with 100 sq.ft area. As it was very compact space was utilized to

the maximum by providing built in cupboards, modular units. Around 50 percent of the families planned kitchen area of 100sqft.

Dining room size varied from 80-160 sq.ft based on the income group. For those who have limited space but interested to have the dining table, it is suggested to have wall mounted table which will conserve the space when not in use. If the area is below the standard size. Wise planning is very important for arranging the furniture. Nearly 44 percent of the families utilized 110 sq.ft area for their master bedroom and the same sq.ft area was planned for additional bedroom by 20 percent of the families. Whereas 176 sq.ft area was planned for master bedroom by 22 percent of them. When master bedroom is compared with additional bedroom, there is difference in size of the room for master bedroom (110-176 sq.ft), when compared to additional bedroom (80-121- sq.ft)

Whatever may be the size of bedroom room, rest relaxation and privacy is of primary importance. For a compact size of bedroom, one can purchase bed-cum storage to conserve floor space.

Minimum area was utilized for Pooja room 24-36 sq.ft as majority of them planned in a wall space or used portable unit as a space saving technique.

### **C. Details of Furniture in the Residence**

In residential building a room whether intended for a bed room or kitchen or drawing room, the architect should take into account the furniture position of all types likely to be accommodated, so that the doors, windows and circulation space do not prevent from placing of sufficient number of pieces. Details on information gathered during survey include materials used for furniture construction, amount spent for purchase the furniture, space saving furniture for different areas. Table.6 projects the furniture materials used in different rooms.

**Table 6: Furniture Materials used in Different Rooms**

Type of room	Materials	Total	
		No: 50	%*
Living room	Wood	40	80
	Metal	10	20
	Plastic	20	40
	Upholstery	10	20
	Glass	12	24
	Cane	5	10
Dining room	Wood	40	80
	Plastic	10	20
Bedroom	Wood	40	80
	Metal	5	10
	Cane	5	10
Entrance	Wood	15	30
	Metal	15	30
	Plastic	10	20
	Cane	10	20

**(\*) - Multiple responses**

From the above table it is noticed that the common type of furniture materials used for different rooms were found to be wood (both natural and manmade). In living room majority of, 80 percent used wood and plastic by 40 percent. As plastic furniture is portable, light in weight and variety of colours available, one can also choose and arrange according to the colour scheme. Remaining 20 and 10 percent used upholstery, metal and cane furniture. For the bedroom, 80 percent of them preferred wood material for its natural and aesthetic appeal. Another 20 percent used cane and metal as furniture material. Entrance is the important area for welcoming the guests. For this room people mostly wanted to furnish with wooden and metal seated materials.

**Table 7: Amount Spent for the Furniture in Different Rooms**

Types of room	Amount spend	Total	
		No:50	%
Living room	10,000-20,000	12	24
	20,001-30,000	15	30
	30,001-40,000	10	20
	40,001 and above	13	26
Dining room	10,000-20,000	15	30
	20,001-30,000	17	34
	30,001-40,000	10	20
	40,001 and above	8	16
Bedroom	10,000-20,000	14	28
	20,001-30,000	10	20
	30,001-40,000	15	30
	40,001 and above	11	22
Entrance	1,000-5000	30	60
	6,000-10,000	15	30
	Above 10,000	5	10

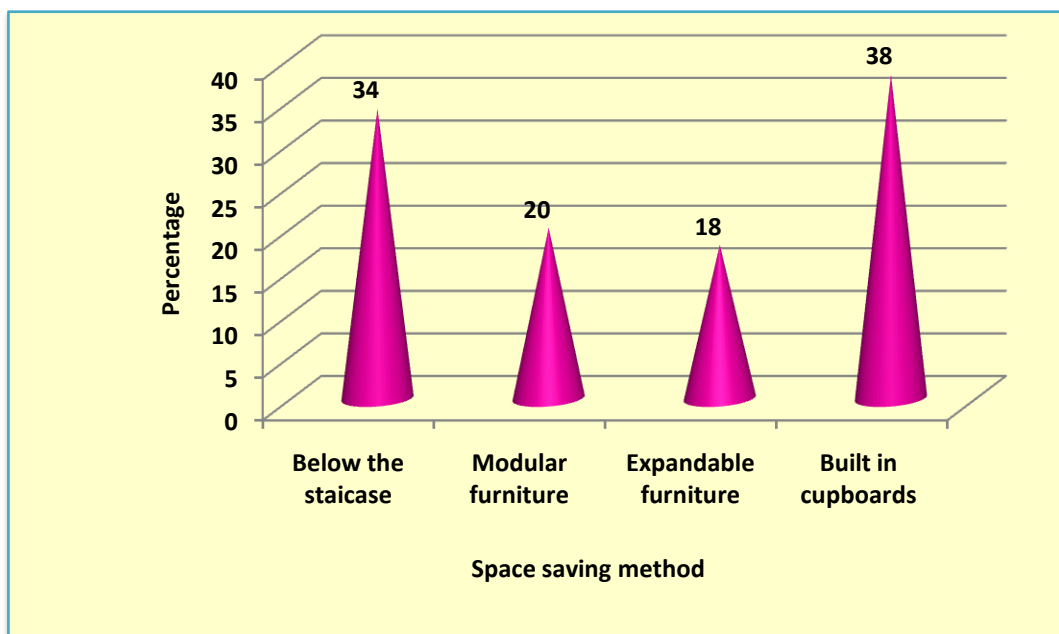
Table7 indicates the amount spent for furniture in different rooms. Thirty percent of the surveyed household spent Rs.20,000-30,000 for living room, whereas the same amount was spent for dining room. Cost involved for dining room was Rs.20,000-30,000, for 34 percent. But only 16 percent were able to spent an amount of Rs.40,000 and above. For bedroom nearly 48 percent should spent Rs. 10,000 to 30,000. Majority of 60 percent of the surveyed families spent only 1,000 - 5,000 for the entrance area by placing metal and cane chair etc., other than this 6,000 to 10,000 by 30 percent of families was also observed for the entrance in the above table.

**Table 8: Space Saving Method Followed**

Space saving method	Total	
	No:50	%*
Below the staircase	17	34
Modular furniture	10	20
Expandable furniture	9	18
Built in cupboards	19	38

**(\*) – Multiple responses**

As multifunctional furniture gives more available spaces to the home, nearly 38 percent of the families need space saving furniture in the form of built in cupboards. Also 34 percent of the houses would like to utilize the wall area at the maximum possible. The space below the staircase was used for arranging furniture, placement of TV, built in or portable unit for planning decorative and functional accessories. Modular and expandable furniture were considered as space saving method by 20 percent and 18 percent respectively.



**Figure: 4 Space Saving Method for Furniture**



**Space saving essentials**



**Portable cupboard**



**Pooja room combined with storage**

### **Plate 7: Furniture in Surveyed Houses**

#### **Selection of furniture**

Furniture selection is the major role for the family members. 40 percent of the surveyed households expressed quality as the main criteria for selection of furniture, whereas 42 percent said that the selection of furniture is according to the price of the product. The remaining 16 percent had given priority for the design of the product.

**Table 9: Person responsible to choose the furniture**

Person responsible	Total	
	No:50	% *
The head of the family	20	40
Housewife/homemaker	45	90
Daughter/son	40	80
Interior designer/architect	35	70
Friends/relatives	15	30

**(\*) – Multiple responses**

For the majority of 90 and 80 percent of families, housewives, daughters and sons were responsible for selection of furniture, in order to emphasize their house. Followed by this 70 percent and 40 percent of the furniture selection was done by interior designers and architects and also head of the family. Only 30 percent relied on friends and relatives.

### **Purchase habits**

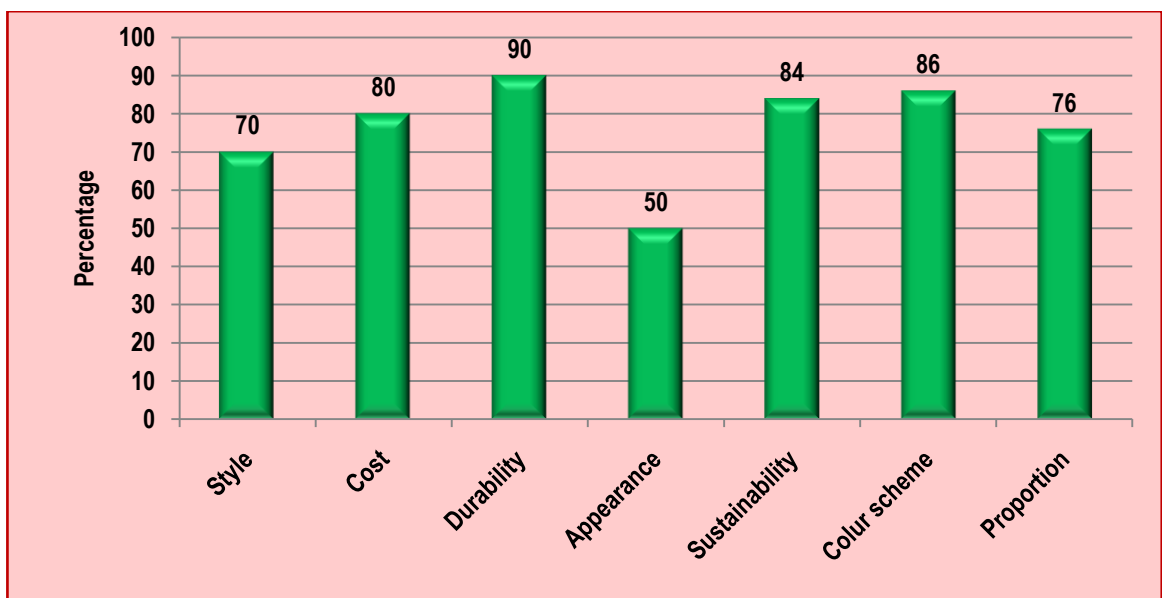
In these modern days e-purchasing is found to be common among 69 percent as it is less stress full, hassle free shopping, cost effective. Various offers, discount, new trends in furniture and proper space planning and no pressure to buy are the other reasons. When compared to online purchase the respondents were satisfied with direct purchase by visiting the shops in person for purchase of furniture. In this case they can visualize the product and compare the colour, guarantee, warranty, price for different brand. Majority of housewives, 96 percent were satisfied only if they visit the shops in person for purchase of furniture.

**Table 10: Factors considered in selection of furniture**

Factors	Total	
	NO: 50	%*
Style	35	70
Cost	40	80
Space conservation	45	90
Durability	25	50
Appearance	30	60
Sustainability	42	84
Colour scheme	43	86
Proportion	38	76

(\*)- multiple responses

Among the surveyed houses, the family members were selecting their furniture according to the above mentioned factors. Majority of 90 percent preferred to select the furniture based on space conservation. Whereas 80 and 70 percent selected according to the cost and style because cost is an important factor of purchasing furniture. But 50 and 60 percent of the people selected according to the appearance and durability. .



**Figure 5: Factors Considered In Selection of Furniture**

The type of maintenance for the furniture is presented in Table 11.

**Table 11: Maintenance of Furniture**

Materials	Type of maintenance	Total	
		No:50	%
Wood	Dusting	37	74
	Varnishing	17	34
	Lacquering	2	4
	Painting	5	10
Metal	Polishing	35	70
	Plating	26	52
	Painting	10	20
	Anodizing	5	10
Plastics	Polishing	25	50
	Enamelling	7	14
	Decorating	18	36
	Lacquering	10	20
	Self finishing	11	22
Glass	Cleaning	45	90
	Painting	6	12
	Decoration	3	6
	Traditional varnishing	1	2
	Sandblast Polishing	1	2
Upholstery	Renovating	17	34
	Dusting	25	50
	Changing fabrics	10	20

**(\*) – Multiple responses**

Once if the furniture is purchased, proper maintenance is more important. Only if good care is given for furniture, it will be looking good as long as possible, for example, leather furniture or upholstery. Therefore it is important to have the knowledge about the furniture , its textiles and qualities in order to maintain and take care. A glance at table 11 indicates that 74 percent of the respondents maintained the wooden furniture by dusting daily

which can be done after sweeping. Varnishing by 34 percent and painting of furniture by 10 percent was done to increase the longevity.

Regarding the maintenance of metal furniture, polishing (70 percent) and plating (52 percent) was carried out to maintain them in a good condition. Cleaning the glass surface with cleaning agent among 90 percent was the most common maintenance method. In case of upholstered furniture, renovated as new one among. 34 percent and dusting by 50 percent for its maintenance is followed. The reason expressed by surveyed families on selection of particular furniture is shown in Table 12.

**Table 12: Reason for Purchasing Specific Material**

Materials	Reason for purchasing	Total	
		No:50	%
Wood	Availability	8	16
	Gorgeous natural look	9	18
	Strength and durability	18	36
	Aesthetic appeal	15	30
	Eco friendly	10	20
Metal	Durability	12	24
	Good quality	17	34
	Unique designs	11	22
	Strong and unbreakable	17	34
	Heat resistance	1	2
Plastics	Reasonable cost	16	32
	Variety of colour	15	30
	Long lasting	7	14
	Light weight	21	42
	Attractive colour	8	16
Glass	Rich look	32	64
	Aesthetic appeal	14	28
	Easy to clean Highly	19	38
	resistance	2	4
	Durable	2	4

(\*) – Multiple responses

Strength and durability was the major reasons to prefer wooden material among 36 percent. Other reasons being aesthetic look 30 percent intricate carving 20 percent and eco friendly material (20 percent).

Thirty four percent and 24 percent were interested to purchase metal furniture due to its strength, durability and good quality. Plastic was chosen by 42 percent as it is light weight, but for 32 and 30 percent of the family members, it was found to be reasonable cost and variety of colour preference among 32 and 30 percent respectively were other reasons.

As glass has its own rich look due to its transparency, majority of (64 percent) were interested to buy such type of furniture. Easy to clean and its aesthetic appeal was expressed as other reasons for selecting glass materials

## **Phase 2: Outcome of Market survey**

The most important task of a marketer is to get the right product at the right place with the right price to the right person. Besides, it was also necessary to go back and find whether consumer is getting optimum satisfaction, so that the consumer remains loyal. These aspects made it imperative for the marketers to conduct marketing research. (Smirti Chand 2016). Sanjeevan (2009) states that market survey helps in how much money they spend on certain types of products, whether they are using competing products and their interest level for new products.

While doing survey different types of furniture available was observed among selected 20 shops. These shops were visited to study the details on establishment of shops, availability of furniture materials, multipurpose furniture, nature of purchase, source, reasons for purchase and new arrival of materials. The table below indicates the establishment of shops.

**Table: 13 Establishment of Shop**

Year	Total	
	N:20	%
0-10 years	5	25
11-20 years	6	30
21-30 years	4	20
31-40 years	3	15
<b>Customers visited</b>		
Residential	12	60
Commercial	3	15
Both	5	25
<b>Types of service</b>		
Exporter	9	45
Retailer	11	55
<b>Satisfaction regarding business</b>		
Highly satisfied	4	20
Satisfied	15	75
Not satisfied	1	5
<b>Details of the employees</b>		
2-5	7	35
6-9	8	40
Above 10	5	25

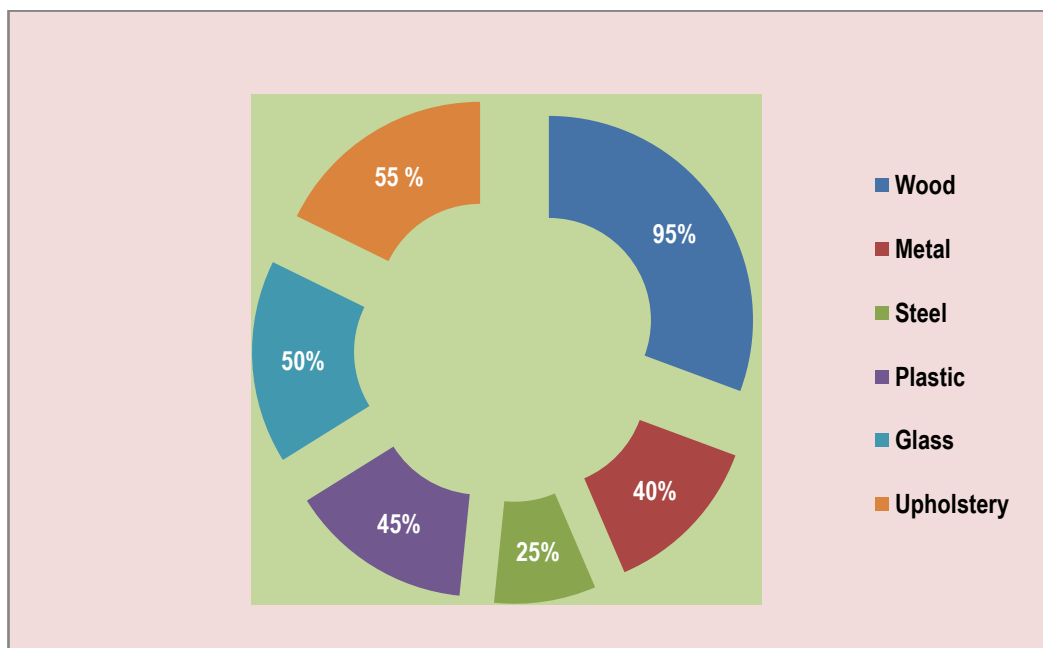
The findings of market survey revealed that 30 percent of shops were established between 11-20 years. Among other surveyed shops, 25 percent and 20 percent were started within 0-10 years and 21-30 years. Only 15 percent of surveyed shops were started before 40 years. Regarding the type of purchase made, around 60 percent of them purchased furniture for their own residence but 15 percent for their commercial use. The furniture was purchased on retail and wholesale basis. Also for exporting, the customers will purchase from the shops.

Regarding their business satisfaction, majority of 75 percent and 20 percent of the owners were highly satisfied. Other 5 percent of them were not satisfied on their business as they were unable to invest more finance for purchase of innovative furniture, hence planning to shift for another business. Forty percent of the shop owners employed 6-9 employees whereas 35 percent employed 2-5 employees and above 10 employees were appointed in 25 percent of the shops.

**Table: 14 Availability of Furniture Materials in Surveyed Shops**

Furniture materials	Total	
	No:20	%*
Wood	19	95
Metal	8	40
Steel	5	25
Plastic	9	45
Glass	10	50
Upholstery	11	55
Cane	2	10

(\*) - Multiple responses



**Figure 6: Furniture Materials**

The table 14 and figure 6 indicates that 95 percent of customers mostly preferred the wood materials because of natural, durable and long lasting qualities. From wood all furniture can be made for both commercial and residential building. Carpenters and cabinet makers also find wide use of wood in furniture. Upholstery (55 percent) and glass (50 percent) were available materials used for making furniture.

**Availability of multipurpose furniture in the shop:**

By way of multipurpose furniture arrangements customers can save their space in their home and save money. For this purpose space saving furniture is available in the shops. From the twenty shops surveyed, 90 percent of them did not have multipurpose furniture. But in 10percent of the shops the multipurpose furniture like sofa cum bed, portable cupboards, foldable furniture which helps the customers to save the space was available. The following table 15 will indicate the benefits of space saving furniture.

**Table 15: Benefits of Space Saving Furniture**

Benefits	Total	
	No:20	% *
Flexibility	14	70
Saves money	16	80
Easy to clean and maintain	12	60
Light weight and easy to handle	18	90
Moved around in the house	9	45
Assembled one below the other	10	50

**(\*) – Multiple responses**

As the population grows, the land around us becomes more valuable and less available. Before buying a house or apartment, it is important to do up a plan to ensure the most from the hard earned money. If the budget is the primary concern, this gives space saving ideas a good opportunity to maximize the limited area that one can afford. Hence when the shop owners were interviewed, it was understand that 75 percent of the customers expressed their satisfaction using space saving furniture. These furniture are

flexible, comfortable to handle, there by conserving a rooms space. Not only they save the space but also save money.

**Table 16: New Arrival of Furniture in the Shop**

New arrivals	Total	
	No:20	%*
Once in a year	12	60
Once in 6 months	3	15
Once in 3 months	6	30
Based on trend	10	50

**(\*) – Multiple responses**

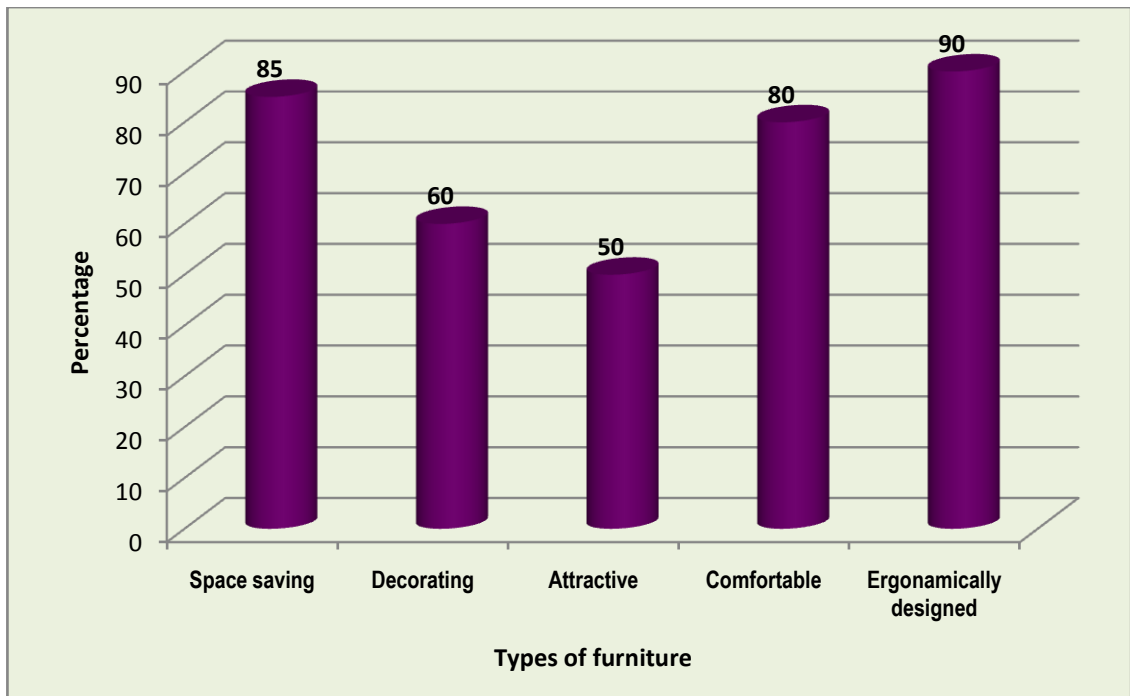
A glance at the table indicates that the innovative space saving arrival of furniture in surveyed shops were found to be once in a year in 60 percent of the shops. Based on the changing trend order was placed as and when the furniture is required

**Table: 17 Reason for Purchasing Different Styles of Furniture**

Reasons	Total	
	No:20	%*
Space saving	17	85
Decorating	12	60
Comfortable	16	80
Attractive	10	50
Ergonomically designed	18	90

**(\*) – Multiple responses**

In the recent years people are ready to spent money on furniture for attractive appearance along with its comfort. Hence from the above table and figure 7 it was found that 90 percent of them preferred ergonomically designed furniture for comfort. 85 percent were buying space saving furniture, whereas 50 and 60 percent of them used to buy decorative and attractive furniture respectively.



**Figure: 7 Types of Furniture Comfortable for the Customers**

### **Phase 3: Plan showing the Multipurpose Furniture**

Researcher developed two plans each for 1700sq.ft area. The reason for applying this particular measurement is that nearly 36 percent of the surveyed families were under the category of 1000-2000 sq.ft. (Figure 8 and Figure 9).

One is floor plan using Computer Aided Design and second is Revit Architecture showing the multipurpose furniture and its estimation. The cost for the furniture required for residence is based on the information collected from the surveyed shops and online (Appendix III).



Figure 8: Plan for 1700sq.ft using Computer Aided Design



**Figure 9: Plan for 1700 sq.ft, using Revit Architecture**

## V. SUMMARY AND CONCLUSION

In India majority of Indian middle class populations are living in small flats and homes mostly because of their economical status 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 problems now a days. Space saving furniture is one of the options to solve these problems. Furniture designs have become more innovative to accommodate small living spaces. It can be multitasking within the space as well. Multifunctional furniture has become the standard in home design.

Based on this concept, the investigator focused attention towards **“Designing Multipurpose Furniture for the Residence”** with the following objectives: To

- perform market survey to acquire knowledge on the availability of different multipurpose furniture.
- conduct household survey to know the multipurpose furniture used in the residential areas.
- plan showing the multipurpose furniture

The outcome of market survey, household survey and the plan for multipurpose furniture for the residence are summarized below:

### **Phase 1: Outcomes of the Household survey**

- ✓ Nearly 50 percent of respondents were in the age group of 21-40 years, during this age they make many decisions. Regarding the education of selected respondents, college and professional category was found to be 20 percent and 50 percent respectively.
- ✓ Approximately 46 percent of the families were doing business, followed by 14 percent teaching profession, 10 percent bank officer and 8 percent agriculture.

- ✓ 30 percent of the families were able to earn around Rs. 90,000-1, 25,000 and above 1, 50,000 by eight percent.
- ✓ According to details of the families 36 percent and 26 percent of them utilized the total area of 1,000 to 2,000 sq.ft and 2,000 to 3,000 sq.ft for their house construction. Above 2100 sq.ft was utilized among the 16 percent of surveyed families.
- ✓ The size of the dining room was noticed as 80sqft, 100sq.ft and 160sq.ft, among 30, 32 and 38 percent respectively. The size of the living room among the 40 percent of the surveyed families was 256 sq.ft against 160 sq.ft for 34 percent of the families. Nearly 50 percent planned their kitchen with 100 sq.ft area.
- ✓ Dining room size varied from 80-160 sq.ft based on the income group. Nearly 44 percent of the families utilized 110 sq.ft area for their master bedroom and the same sq.ft area was planned for additional bedroom by 20 percent of the families. Whereas 176 sq.ft area was planned for master bedroom by 22 percent of them. When master bedroom is compared with additional bedroom, there is difference in size of the room for master bedroom (110-176 sq.ft), when compared to additional bedroom (80- 12- sq.ft)
- ✓ Minimum area was utilized for Pooja room 24-36 sq.ft as majority of them planned in a wall space or used portable unit as a space saving technique.
- ✓ In living room majority of 80 percent used wood and plastic by 40 percent. Remaining 20 and 10 percent used upholstery, metal and cane furniture. For the bedroom, 80 percent of them preferred wood material for its natural and aesthetic appeal. Another 20 percent used cane and metal as furniture material. For entrance people mostly wanted to furnish with wooden and metal seated furniture.
- ✓ As multifunctional furniture gives more available spaces to the home, nearly 38 percent of the families need space saving furniture in the form of built in cupboards. Also 34 percent of the houses

would like to utilize the wall area at the maximum possible. Modular and expandable furniture were considered as space saving method by 20 percent and 18 percent respectively.

- ✓ Furniture selection is the major role for the family members. 42 percent said that this selection of furniture is according to the price of the product.
- ✓ Majority of 90 percent preferred to select the furniture based on space saving because it is an essential part of space planning where maximum usage is considered in the placement and arrangement of furniture.
- ✓ 74 percent of the respondents maintained the wooden furniture by dusting daily which can be done after sweeping. Varnishing by 34 percent and painting of furniture by 10 percent was done to increase the longevity.
- ✓ Strength and durability was the major reason to prefer wooden material among 36 percent. Other reasons beign aesthetic look 30 percent, intricate carving 20 percent and eco- friendly material 20 percent.
- ✓ 95 percent of customers mostly preferred the wood materials because of natural, durable and long lasting qualities. From wood all furniture can be made for both commercial and residential building. Carpenters and cabinet makers find wide use of wood in furniture. Upholstery (55 percent) and glass (50 percent) were available materials used for making furniture.
- ✓ From the twenty shops surveyed 90 percent of them did not have multipurpose furniture. But in 10percent of the shops the multipurpose furniture were available as sofa cum bed, portable cupboards, foldable furniture which helps the customers to save the space.
- ✓ When the shop owners were interviewed, it was understand that 75 percent of the customers expressed their satisfaction using space saving furniture; these furniture are flexible, comfortable to handle,

there by conserving a rooms space. Not only they save the space but also saves money.

- ✓ New arrival of furniture in surveyed shops were found to be once in a year in 60 percent of the shops. Next is based on trends as and when the furniture is required orders are placed by 50 percent based on the changing trend.
- ✓ 90 percent of them preferred ergonomically designed furniture for comfort. 85 percent were purchasing space saving furniture, whereas 50 and 60 percent of them used to buy for decorative and attractive purpose respectively.
- ✓ Researcher developed two plans for 1700sq.ft area. One is floor plan using Computer Aided Design and second is Revit Architecture showing the multipurpose furniture and its cost made on the estimation for the furniture required is based on the information

## **Conclusion**

Now a day, people tend to move on 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 afford small apartments or condos. This provides a good opportunity for the development of transformable space saving furniture. This space saving furniture is an innovative product that has much opportunity for the future development and a huge potential market in metropolises.

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## APPENDIX I

### INTERVIEW SCHEDULE TO ELICIT INFORMATION ON AVAILABILITY OF FURNITURE IN THE RESIDENCE:

1. Name of the interviewer:
2. Name of the head of the family:
3. Contact address:
4. Contact Number:
5. E-mail ID:

#### A. GENERAL INFORMATION OF THE FAMILY:

S.NO	Relationship of the Head	Age in Years	Sex	Educational Qualification	Occupation	Monthly Income (Rs)

6. Type of family?
  - Nuclear
  - Joint
7. Describe your life space?
  - House
  - Apartment
8. Other source of income
  - Interest from savings and deposits
  - Mutual funds
  - Any other specify \_\_\_\_\_

**B. DETAILS OF THE HOUSE:**

9. Year of construction \_\_\_\_\_

10. Style of the house?

- Traditional
- Modern
- Contemporary

11. What is the nature of house?

- Constructed by self
- Purchased

12. Type of your house?

- Rent House
- Own house

13. Plinth area of the house in (sq.ft) \_\_\_\_\_

14. DETAILS OF THE ROOM:

<b>Nature of the room</b>	<b>No of rooms</b>	<b>Total area (sq. ft)</b>
Living room		
Bedroom		
Kitchen		
Dining room		
Bathroom		
Pooja room		
Entrance		

**C. DETAILS OF THE FURNITURE:**

<b>Nature of the room</b>	<b>Types of furniture</b>	<b>Materials used</b>	<b>Year of purchasing</b>	<b>Amount spent (Rs)</b>
Entrance				
Living room				
Dining room				
Bedroom				

15. Mention your purchase habit

- Online
- In store
  - a. Ready cash
  - b. Instalment

16. What type of furniture you like most?

- Contemporary
- Traditional
- Modern
- Modular
- Ergonomically designed

17. Which is the most significant point when you choose in furniture shop?

- Price of the produce
- Quality of the produce
- Design of the produce
- All the above

18. Who selected the furniture for the house?

- The head of the family
- House wife/ homemaker
- The daughters/ sons
- The interior designer/ architect
- Friends/relatives

19. Have you purchased any furniture recently?

- Yes
- No

If yes mention the year of purchase\_\_\_\_\_

20. What type of furniture take up the most space in your room?

\_\_\_\_\_

21. Did you done any remedial measures?

- Yes
- No

If yes specify the remedial measures:\_\_\_\_\_

22. Mention space saving method in arranging the furniture?

- Below the staircase
- Modular furniture
- Expandable table
- Built in cupboards
- Others (specify)

23. Maintenance of furniture

<b>Materials</b>	<b>Method</b>	<b>Duration</b>
Wood furniture	<input type="checkbox"/> Dusting <input type="checkbox"/> varnishing <input type="checkbox"/> Lacquering <input type="checkbox"/> Painting	<input type="checkbox"/> 0-7 days <input type="checkbox"/> 8-15 days <input type="checkbox"/> 16-20 days <input type="checkbox"/> a month
Metal furniture	<input type="checkbox"/> polishing <input type="checkbox"/> plating <input type="checkbox"/> painting <input type="checkbox"/> Anodizing	<input type="checkbox"/> 0-7 days <input type="checkbox"/> 8-15 days <input type="checkbox"/> 16-20 days <input type="checkbox"/> a month
Plastics furniture	<input type="checkbox"/> polishing <input type="checkbox"/> enameling <input type="checkbox"/> decorating <input type="checkbox"/> Lacquering <input type="checkbox"/> Self finishing	<input type="checkbox"/> 0-7 days <input type="checkbox"/> 8-15 days <input type="checkbox"/> 16-20 days <input type="checkbox"/> a month
Glass furniture	<input type="checkbox"/> cleaning <input type="checkbox"/> painting <input type="checkbox"/> Decorating <input type="checkbox"/> Traditional varnishing <input type="checkbox"/> Sandblast polishing	<input type="checkbox"/> 0-7 days <input type="checkbox"/> 8-15 days <input type="checkbox"/> 16-20 days <input type="checkbox"/> a month
Upholstery furniture	<input type="checkbox"/> Recycling <input type="checkbox"/> Dusting <input type="checkbox"/> Changing fabrics	<input type="checkbox"/> 0-7 days <input type="checkbox"/> 8-15 days <input type="checkbox"/> 16-20 days <input type="checkbox"/> a month

24. Give your reason for purchase of specific material?

Materials	Reasons
Wood	<input type="checkbox"/> availability <input type="checkbox"/> gorgeous natural look <input type="checkbox"/> strength and durability <input type="checkbox"/> aesthetic appeal <input type="checkbox"/> eco friendly
Metal	<input type="checkbox"/> durability <input type="checkbox"/> good quality <input type="checkbox"/> unique designs <input type="checkbox"/> strong and unbreakable <input type="checkbox"/> heat resistance
Plastics	<input type="checkbox"/> low cost <input type="checkbox"/> durable <input type="checkbox"/> long lasting <input type="checkbox"/> light weight <input type="checkbox"/> attractive colour
Glass	<input type="checkbox"/> rich look <input type="checkbox"/> aesthetic appeal <input type="checkbox"/> easy to clean <input type="checkbox"/> highly resistance <input type="checkbox"/> durable

## APPENDIX II

### MARKET SURVEY TO STUDY THE DETAILS ON FURNITURE:

#### A. GENERAL INFORMATION ABOUT THE SHOP:

1. Name of the interviewer:
2. Name of the shop:
3. Contact address:
4. Website for the shop:
5. Email ID:

#### B. SPECIFIC INFORMATION OF THE SHOP:

6. Year of establishment: \_\_\_\_\_
7. Number of sales person in the shop \_\_\_\_\_
8. Do you have any other branch?  
 Yes  
 No  
If yes give details \_\_\_\_\_
9. Did you provide any warranty and guarantee?  
 Yes  
 No  
If yes how? \_\_\_\_\_
10. Level of satisfaction regarding business?  
 Highly satisfied  
 Satisfied  
 Not satisfaction
11. What are the qualities you expert from your employees?  
 Marketing skills  
 Communication skills  
 Decision making  
 Positive outlook  
 Leadership  
 Time management

12. Which customer visits your shop?

- Residential
- Commercial
- Both

13. What is the nature of purchasing raw materials?

- Manufacture
- Retailer
- Wholesaler
- Both whole seller and retailer

**C. DETAILS OF FURNITURE IN THE SHOP:**

14. Do you have any multipurpose furniture is available in your shop?

- Yes
- No

If yes specify the furniture type\_\_\_\_\_

15. Is the customer has benefit of these type of space saving furniture in their home?

- Yes
- No

If yes why? \_\_\_\_\_

16. What type of furniture customers want to buy?

- Space saving furniture
- Decorating furniture
- Both
- Other type

If other specify the purpose\_\_\_\_\_

17. How often do you have new arrivals of furniture in your shop?

- Once in a year
- Once in 6 months
- Once in 3 months
- Based on trend

18. What is the most preferred style among your customer?

- Traditional
- Modern
- Contemporary

19. What type of furniture arrangement is done in your shop?
- Formal
  - Informal
  - Both
20. Did you display any specific area of furniture arrangement in your shop?
- Yes
  - No
- If yes what type areas?
- Living area
  - Dining area
  - Bedroom
  - If other, specify \_\_\_\_\_
21. Do you give any suggestion to your customer while selecting the furniture?
- Yes
  - No
- If yes what type of suggestion
- Durability
  - Nature of material
  - Recent trend
  - Space saving
  - If other, specify \_\_\_\_\_
22. Specify the furniture fast moving in your shop? \_\_\_\_\_
23. What are the types of furniture material available in the shop?
- Metal
  - Wood
  - Plastic
  - Glass
  - If others, specify \_\_\_\_\_

### APPENDIX III

#### COST ANALYSIS FOR MULTIPURPOSE FURNITURE (1700 SQ.FT)

<b>Types of room</b>	<b>Cost</b>
<b>Living room</b>	
TV unit with storage	16,000
Multipurpose tables	7,000
Convertible coffee table	4,490
Two sides convertible sofa	12,500
<b>Bedroom</b>	
Invisible bed folding wall mounted	6,000
Transforming chair into ladder	6,000
Chest of drawers	3,900
Wardrobe	4,000
Bunk beds	4,500
<b>Dining room</b>	
Nested table, with chair	7,000
<b>Entrance</b>	
Foldable Chair	3,000

**Total cost: 74,390**

**APPENDIX IV**  
**ETHICAL COMMITTEE CLEARANCE CERTIFICATE**

**INSTITUTIONAL HUMAN ETHICS COMMITTEE**



*Avinashilingam*

Institute for Home Science and Higher Education for Women

*University*

(Estd. u/s 3 of UGC Act 1956)

**Chairman**

Dr. S. Ramalingam  
Principal, PSG Institute  
of Medical Sciences  
& Research, Coimbatore

**Member Secretary**

Dr.S.Uma Mageshwari  
Associate Professor,  
Department of Food Service  
Management & Dietetics

**Members**

Dr. S. Kowsalya  
Dr.P.R.Padma  
Mr. K.Arulmoli (Legal Expert)  
Dr. N.S. Rohini  
Dr.A. Saraswathy  
Mrs. V. Mangayarkarasi  
Dr.Subhashini K. Sripathi  
Mrs. S. Radha Devi  
Dr.G.Victoria Naomi  
Dr. Judith Justin  
Dr.AnithaSubash

19<sup>th</sup> March 2018

To  
Ms. P. Aarthi  
Department of Resource Management  
Avinashilingam Institute for Home Science and  
Higher Education for Women  
Coimbatore – 641 043

Dear Aarthi,

Ref: Your proposal No. IHEC/17-18/RM/02 “Designing Multi-Purpose Furniture for the Residence” submitted for approval of the IHEC on 14<sup>th</sup> December.

The Institutional Human Ethics Committee of our University hereby grants approval to your research proposal No. IHEC/17-18/RM/02 “Designing Multi- Purpose Furniture for the Residence” submitted by you. The Approval number for the same is AUW/ IHEC/RM -17-18/XPD/02.

We wish you all the best in your research endeavours.

Regards,

*S. Uma Mageshwari*  
Dr.S.Uma Mageshwari  
Member Secretary

