The Inter-Play of Inside and Outside Clothes Storage for Small Living Space

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ABSTRACT

Many women in smaller living space area (20-40 square meters room) have found their 'storage space', especially wardrobe space too small to keep and organize their clothes. In particular, those who enjoy dressing need bigger wardrobes such as walk-in closet, but they cannot have it due to space limit. Therefore, this study aimed to find a design solution for these women to fulfill their needs in managing and organizing their clothes effectively. Twelve subjects were interviewed and observed at their residences on the type of general storage system they had and clothes organizing system and related activities and space such as temporary hanging, drying place, and washing and ironing area. Four patterns of clothes organization were categorized, due to space size (big and small) and organizing behaviors (just do it and enjoy): 1) just do it in big space, 2) just do it in small space, 3) enjoy in big space, and 4) enjoy in small space. Focusing on small space, observations led to create an opportunity classification for clothes organization system, with cooperation from a keen wardrobe design company, which thus resulted in identifying a potential opportunity, the 'semi-closed system' for clothes organizing. This system can help generate connectivity and continuity, using the idea of "inside and outside" wardrobe to increase the capacity of storing and organizing clothes. This solution also shows the significant ideas of eliminating 'the negative space' in front of a typical wardrobe, creating a smooth inter-play of storing clothes inside and outside the wardrobe and adjusting the proportion of wardrobe use, both inside and outside, to meet different requirements of different users efficiently.

KEYWORDS: small space management, small space design, cloth organization, wardrobe design user behavior study

1. INTRODUCTION

Background
Space limitation is an important issue for many aspects, especially in residence. Today, many women live in small residences, such as small houses, condominiums, and apartments. Sarich et al. (2017) presented that average size of studio type condominium in Bangkok is 27.56 square meters (min: 21 square meters, max: 38 square meters). In the next five years, studio type will be mainly designed to fit to 21 square meters or less.

The information from National Statistical Office, Thailand showed that, in 2007, there are about two million living alone people in Thailand. The number increased to 3.8 million in 2015. However, the information from thairath.com (2018), from 3.8 million people in 2015, there are about two million female and 1.8 million male. If only elders who are 60 years old up are considered, there are about 1.2 million elders living alone in Thailand. It is broadly recognized that the number of female living alone has been increasing significantly. The primary interviews showed that many women living in small space, less than 30 square meters always face the problem of storage space, especially wardrobe space.

Wardrobe
Wardrobe has been considered as important furniture especially for women. Industrial development makes clothes and dresses affordable; thus, women are able to have more clothes. The primary study showed that wardrobe is always a problem in terms of space limitation. The observation shows the unplanned space for clothes stored outside wardrobe. However, The Psychology of Clutter from closetamerican.net (2018) mentioned that having a closet that isn't as organized as you want can throw off your whole day. That is why many women mentioned that walk-in closet is good for accessibility and easier to organize. Since the concept of walk-in closet is open access and without doors, it should require room or big enough close space. Some interior designers suggested built-in shelves at some free space in the bedroom area and use floor-ceiling sliding doors to hide them for privacy reason.

Solution to Manage
Space efficiency is very important for small living spaces. Wardrobe furniture is a typical solution to help organize cloth storage. However, the concept of cloth organization should not be just only typical wardrobe furniture. In the small living space units today, most of them come with fully furnished concept. Furniture is especially designed to fit to its space and built-in. Many ideas of this kind of furniture and system are highly potential to be developed as a single piece of furniture. Combined ideas form typical furniture and built-in furniture should be emphasized.

2. DESIGN OPPORTUNITIES
2.1 Empathy

The literature presents complicated situations such as space efficiency and emotional issue of number of clothes and ways to organize them. User study was raised to be a key success to understand women and their emotional and functional issues of organizing clothes. The screening question helped the recruitment team to narrow down sampling to 12 lead users and extreme users who had faced hard problems of organizing clothes: 1) huge number of clothes, 2) extremely small space of cloth storage, 3) emotional-oriented collecting clothes, and 4) extreme rush to dressing. The team did in-depth interviews and site-observations with 12 females at their residences to ensure that all subjects show real situation of their room, cloth organization system, and are comfortable to mention the sensitive issues, such as underwears, and tasks of dressing. Only female researchers were allowed to interview and observe at their residences, bedroom, cloth storage, bathroom, storage, and dressing area.

Researchers spent about two hours in subjects' residences. Field data collection could be divided into three parts: 1) interview, 2) observation, and 3) demonstration. Interview focused on the subjects' daily activities on both weekdays and weekends, ways to use, cleaning and taking care of clothes, and the challenges they encounter in organizing clothes in their residences. During the interviews, subjects were requested to do the activities and tasks related to what they explained. All tasks were carefully observed by the field researchers. For some special and significant tasks found during observations, subjects were requested to demonstrate again. In some demonstrations, conditions or additional factors were added to the situation. For example, a 35 year old subject, who has well organized her large number of clothes and accessories, was asked to take in-out her folded clothes from the 55 centimeters depth shelves in wardrobe. It was to confirm the way she used her two hands and her lap to carry and hold folded clothes scanning the cloth she needed in the back layer of set of folded clothes.

The following steps were followed systematically in the data collection. Firstly, rapport was set by getting to know the subjects prior to the interview and observation. When they mentioned difficult task, individually-invented techniques, and adapted tools, they were asked to demonstrate it with the real clothes, tools, and situations for observation. Observation helped the team to understand their tasks. During observations, subjects were asked sometimes to demonstrate tasks again with additional conditions. It was mainly to confirm and explore significant issues or factors of their tasks or solution.
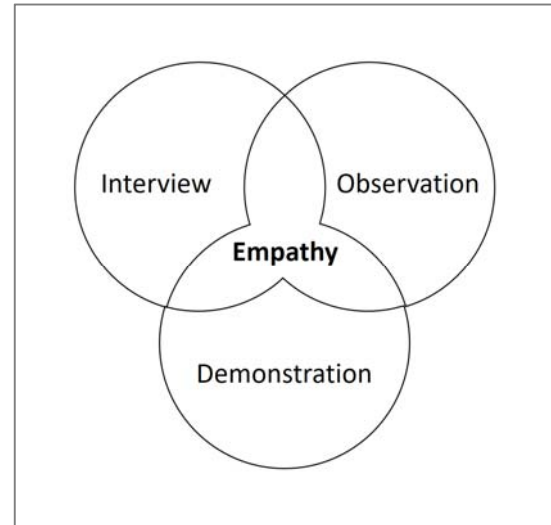

Fig 1. The systematic framework of data collection process

2.2 Classification

From the field study, it has been found that cloth organization system is related to perspective on clothes. Subjects who just put clothes into their wardrobe did not care much about cloth organization. They did not feel that they needed to organize their clothes by colors, types of clothes, types of fabric, or frequency of use. Subjects who emotionally dressed and take care of their clothes presented many techniques to organize and protect their clothes. Liez (2018), a civil engineer, mentioned that it is the dream of women to have their own walk-in closet to keep all clothes, bags, shoes, and jewelries. In this area, all things should be well organized in a single space. Otherwise, messy homes leave people feeling anxious, helpless, and overwhelmed (Sherrie, 2018). Walk-in closet basically is very efficient in term of organization but it requires big space or room. That is why it is a dream for women who enjoy dressing and taking care of clothes to organize their wardrobe.

An important element of walk-in closet system is having no door. Built-in shelves and hanger bars play major role for storing clothes. Users can easily scan and take in/out their clothes. The space in front of shelves is always available since there is no door to obstruct their space. Subject A showed her own technique of setting up wardrobes and cabinets at the corner in front of her bathroom which seems to serve as a walk-in closet. However, mix of wardrobe and cabinets cannot completely deliver a sense of walk-in closet because of its doors. She said she cannot freely move and dress around obstructing doors.

On the other hand, Subject B who does not have enough wardrobe space for her clothes shared that she had accidentally found the solution to keep her underwear by using a carry-on size suitcase which was located next to her wardrobe. She mentioned that the size of her suitcase perfectly fits for her underwear and the fabric lining inside the suitcase provides special care

for her underwear. Whereas, Subject A created the best position to keep her underwear well in the drawers provided in the wardrobe.

Another subject (C), who is 20 years old and a student, did not care much to organize her clothes. She generally wears student uniform during weekdays and basic clothes such as t-shirts and jeans. "I just take them and wear them," she said. She always keeps open the doors of her wardrobe located in front of her bathroom as it cannot be seen directly from the common area in the room. She feels convenient to access her clothes with the an open wardrobe. Similarly, Subject D always keeps her wardrobe's doors open. The purpose is to use the door handles for hanging her jackets. The hanger bars installed at the back side of her wardrobe's doors are for hanging her clothes, especially her pajamas, and sometimes, for drying her towels. Many times, she gets difficulty to open the doors because there are a lot of clothes hanged on them. While the swing door is used as hanger bars by some people, two of the subjects (E and F) feel uncomfortable to access storage space behind the overlapping space of sliding doors of cabinet and wardrobe. Subject F normally uses vertical steam iron and sets space for ironing in front of her wardrobe. She also uses shelves, handles, and hanger bar of wardrobe for ironing.

While interviews and observations with the wardrobe users show variety of attitudes, behaviors, and techniques to take care of their clothes, size of space was considered as significant criteria for cloth organization. Today, multipurpose space plays an important role in space management in studio type condominium and apartment. Typically, there is around 60-90 centimeters space in front of wardrobes for circulation and wardrobe accessibility. Swing doors of wardrobes, which give full accessibility for users, now become an obstruction when users dress and scan their clothes.
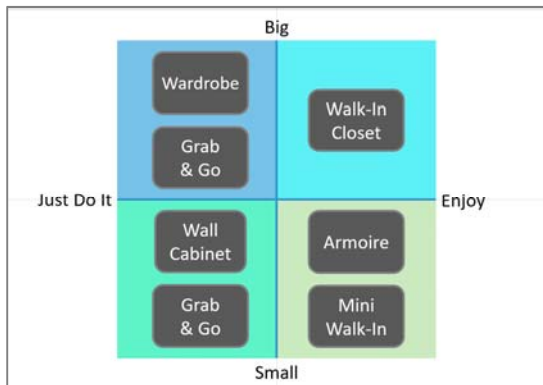

Fig 2. The opportunity classification

In classifying design opportunities, there are four patterns of clothes organization categorized due to space size (big or small) and organizing behaviors (just do it and enjoy): 1) just do it in big space, 2) just do it in small space, 3) enjoy in big space, and 4) enjoy in small space.

This classification is indicated in the expert review by interior architects in the team. Interior designers and furniture companies are keen on wardrobe design and

production. They mentioned that typical wardrobe would meet the requirement of people who "just do it in big space" while walk-in closet is perfectly fit to those who want to "enjoy in big space". The group of "just do it in small space" could be typically found in dormitories of students. Considering the potential of small living space criteria in the future, many successful women with high income prefer to stay alone in the condominium or service apartment. Cloth organization system for "enjoy in small space" would be highly potential for commercialization.

3. OPPORTUNITY IDENTIFICATION

Walk-in closet will not fit to small living spaces, such as studio type rooms or even one bedroom type rooms. This reason leads to the idea of cloth organization for women living in a small space yet they want to enjoy organizing clothes and dressing.

Cloth organization for this case should be available for users with limited space. There should not be any obstructions when users access or interact with their clothes. The idea of open access should be highly considered and developed. Expert review supports this point yet in the furniture industry in Thailand, there has not been any concrete solution for this segment.

Inter-Play Space

When users access their wardrobe, they have to keep getting in/out wardrobe for searching, picking, and dressing. The idea of multipurpose space is not fit to small spaces because all spaces should be utilized as multipurpose. The concept of separating spaces or rooms by using curtains was mentioned to replace the wardrobe's doors. Curtain should deliver convenience and comfort for one hand operation. When users interact with wardrobe, comparing with the wardrobe with typical doors, curtain concept is much smoother to be inter-played for both inside and outside spaces of wardrobe. It also creates a new way of connectivity for tasks done inside and outside of wardrobe.

Curtain needs less operation space than swing doors and it gives better scene than sliding doors. This idea also helps reduce the inaccessible space inside the wardrobe. This concept also enhances better accessibility in front of the wardrobe and it is more convenient to move the curtain.

Semi-Close System

The prototype of wardrobe with full curtain door shows a sense of semi-close system. Users can easily close the wardrobe by closing the curtain and fully open it when they need to access the wardrobe. Fully opening gives the sense of walk-in closet. Users can see everything in the wardrobe in a single shot. They can easily search, pick, and dress without any obstruction.

Fig 3. Curtain concept for semi-closed wardrobe

Fully opening the curtain concept also gives full access for users. When it is open, the prototype shows a sense of walk-in closet. It is not only a fully accessible hanging system but shelves and drawers are easy to interact as well. These benefits meet the requirements of universal design.

4. DISCUSSION

Understanding the need of women who love and enjoy dressing and organizing clothes, the result suggested that the proportion of areas in the room should be carefully designed. The idea of a multipurpose space might be fit to small space management because there is very small space. Furniture, in this case, should be designed to be able to blend in the space. It provides a variety of tasks and behaviors for users and it is influenced by technology, lifestyle, and background of users who live in small space today. The observation shows that people do not do single activity but various activities. Wardrobe might not be in the private area as bedroom; it might also be in the living area or close to the pantry as well. Many subjects from the interviews revealed that they always open their wardrobes when they iron their clothes. While ironing, they also do other activities such as watching television located at the cabinet next to wardrobes or chatting with persons in the living area.

Cloth organization is always an important issue for women. Many women spend a lot of time in front of their wardrobe. The interviews showed that they enjoy dressing, mix and match testing, and organizing clothes. The interviews explained that most women feel relaxed when they organize their clothes. This feeling could be compared to the feeling when they are cleaning or organizing collected items. They are also proud when they look at the organized clothes. This might confirm that although they live in a small space, they are able to enjoy dressing and cloth organization. It is coherent to what Eric Bunge , of nARCHITECTS (cited by Steven, 2016) mentioned, "We want to design humane apartments that may be small in footprints, but larger in every other sense" and it should be careful to consider the age factor. Dak Kopec, director of design for human health at Boston Architectural College and author of Environmental Psychology for Design. Presented that small space can be unhealthy for older people, who face different stress factors that can make tight living conditions a problem (cited by Jacoba, 2013).

To deal with small space design and management, the idea of curtain is borrowed from home decoration technique and built-in furniture. Curtain is quite flexible and efficient in terms of temporarily dividing space. When women are dressing, they need a larger space than wardrobe space. Sometimes, they need to put their clothes on the beds, tables, chairs, or somewhere around the wardrobe. With this reason, the space in front of the wardrobe is very important to do related tasks. Walk-in closet performs well in this situation.

The sense of space management is much more applicable in small space rather that large space (Jonas 2018). The concept to play with the inside and outside wardrobe was created to develop the sense of walk-in closet, which is usually appropriate to large space, to fit to small spaces. It is called mini-walk-in closet. Curtain plays a major role as a door instead of typical solid panel doors. With curtain, mini walk-in closet can help generate connectivity and continuity, using the idea of "inside and outside" wardrobe to increase the capacity of storing and organizing clothes. This solution also shows a better way to manage the space in front of the wardrobe. The 'negative space' is s changed to be the space creating smooth interplay of storing clothes inside and outside the wardrobe and adjusting the proportion of wardrobe use, both inside and outside, to meet different requirements of different users efficiently.

The fully accessible mini walk-in closet is not only to fulfill comfort to women. Curtain is a friendly design for one-hand operation when opening it. Users, such as elders and children, or users on wheel chair also gain the benefit from 'easy to access' concept since the shelves and hanger bars can be adjusted according to user needs. Some users might need taller space for hanging dresses while some users need more shelves for their folded clothes. Hanger bars might be installed at lower part position for children to easily pick up their clothes.

However, this study aims to understand users' behavior when they deal with cloth organization in small spaces. The experimental design above is not a solid solution for cloth organization design but it works to visualize the concept grounded from the result of the study. To apply this result to cloth organization design in commercialization, basic product design criteria such as usage, ergonomics, aesthetics, safety standard, materials, and manufacturing should be critically considered.

REFERENCES

Serich, Bussara, Teeradet, *The Relationship Between Unit Size and Price of Studio Type Condominium in Bangkok Metropolitan Area*, Academic Journal of Architecture, Vol 65, Chulalongkorn University, 2016

The *Psychology of Clutter: How a Custom Closet Can Reduce Stress*, http://www.closetamerican.net, 31 January 2018

Sherrie Bourg Carter Psy.D., *Why Mess Causes Stress: 8 Reason, 8 Remedies*, http://psychologytoday.com, 10 January 2018

Steven D'Souza, *Newyork turns to micro apartments to solve city's big housing problem*, http://www.cbc.ca, 10 April 2016

Jacoba Urist, *The Health Rists of Small Apartments, Living in tiny space can cause psychologyical problem.*, http://www.theatlantic.com, 29 December 2013

Jonas Bjertnes Jacobsen, *The needs of Living,* Department of Product Design, Norwegian University of Science and Technology, https://www.ntnu.no, 10 January 2018

Single Society in Thailand, https://www.thairath.co.th/content/626039, 27 May 2016