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FDRE TECHNICAL & VOCATIONAL  
TRAINING INSTITUTE

School of Graduate Studies

Department of Wood Technology

M.Sc. Thesis

On

Investigating the User Satisfaction of Kitchen Cabinets Used by  
Households Living in Condominiums in Addis Ababa.

*In Partial Fulfillment of the Requirements for the Degree of Master of  
Science in Wood Technology*

By

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July, 20/2024

Addis Ababa,

ETHIOPIA

## APPROVAL SHEET I

This is to certify that the thesis entitled “**Investigating the User Satisfaction of Kitchen Cabinets Used by Households Living in Condominiums in Addis Ababa.**” submitted in partial fulfillment of the requirements for the degree of Master of Science with specialization in Wood Technology of the graduate program of the Department of Wood Technology of the Federal Technical and Vocational, Education and Training Institute is a record of original research carried out by **Tesfaye Kora Nigru**, under my supervision. Therefore, I recommended it be accepted as fulfilling the thesis requirements.

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## APPROVAL SHEET II

We, the undersigned, members of the board of examiners of the final open defense by **Tesfaye Kora** have read and evaluated the thesis entitled “**Investigating the User Satisfaction of Kitchen Cabinets Used by Households Living in Condominiums in Addis Ababa.**” This is, therefore, to certify that the thesis has been accepted in partial fulfillment of the requirements for the Degree of Master of Science in wood Technology.

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### DECLARATION III

I hereby declare that the work which is being presented in this thesis **entitled “Investigating the User Satisfaction of Kitchen Cabinets Used by Households Living in Condominiums in Addis Ababa”** is my own original work carried out under the supervision of Dr. Anteneh Tesfaye. All references used for this thesis are properly acknowledged.

Tesfaye Kora

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## ACKNOWLEDGMENT

I would like to express my sincere gratitude to my principal advisor, Dr. Anteneh Tesfaye, for his unlimited support, direction, advice, and patience with me from the beginning to this stage of the thesis. His invaluable insights and encouragement have been instrumental in shaping this research. A special thanks goes to the residents and officials at Bole Gerji site, Gofa Mebrat Hail, and Lideta Berhan site for their willingness to participate in this research and provide the necessary data. Your contributions have significantly enriched the quality of this thesis. Finally, I would like to express my deepest gratitude to my family for their unwavering support, understanding, and patience. Your belief in me has been my greatest motivation. To everyone who helped me during the thesis work, whether directly or indirectly, your contributions have been invaluable. Thank you.

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## ABSTRACT

This study explores user satisfaction with kitchen cabinets among condominium residents in Addis Ababa, Ethiopia. By employing a mixed-methods approach, the research aimed to comprehensively assess various cabinet attributes such as design, functionality, durability, and ease of use, and their impact on overall user satisfaction. The study utilized quantitative surveys and qualitative in-depth interviews to collect data. The raw data obtained through the questionnaires was checked, categorized, structured, and grouped in a table according to the main features or factors, in line with the Kano model. ANOVA (Analysis of Variance) was conducted to examine variations in user satisfaction across kitchen cabinet attributes, including design, size, layout, materials used, storage capacity, functionality, and ease of use. These variations were analyzed based on factors such as wealth group, gender, age, and level of education. The findings reveal significant dissatisfaction among participants, primarily due to the cabinets' lack of durability, inefficient functionality, and aesthetic incompatibility with existing kitchen decor. The Kano model was employed to categorize these attributes into must-be, one-dimensional, and attractive factors, providing a nuanced understanding of user preferences and expectations. Key insights included the critical need for durable materials, improved storage solutions, and user-friendly designs that enhance aesthetic appeal and usability. The study's findings offer valuable implications for manufacturers, designers, and policymakers. They emphasize the importance of incorporating user feedback into the design process to develop kitchen cabinets that better meet the needs of condominium residents in Addis Ababa. By addressing the identified issues of durability, functionality, and aesthetics, manufacturers can create products that align more closely with user preferences and expectations. The findings highlight the need for improvements in cabinet design, materials, and functionality to enhance user satisfaction and meet the evolving needs of condominium residents. By incorporating these insights, manufacturers and designers can contribute to the development of more satisfactory and user-centric kitchen cabinet solutions in the context of Addis Ababa's condominium housing.

*Keywords: Kitchen cabinets, User satisfaction, Condominiums, Design, Functionality, Addis*

*Ababa*

# CHAPTER ONE

## 1. INTRODUCTION

### 1.1 Background of the Study

‘Consumer/users satisfaction’ is defined as user’s post usage response based on user’s expectations and influenced by affect aroused during the consumption experience, (*Demir & Erbuğ, 2006*).

User’s satisfaction is the most common form of market research in business-to-business markets and is often connected to quality and production measurement, rather than as straight marketing-based research. It is essential that an organization has the will to actually make improvement changes before embarking on a user satisfaction measurement exercise; otherwise it will simply annoy its users by taking their time to collect information, then not doing anything with it, (*Grigoroudis & Siskos, 2010*).

User satisfaction has roots in two ideas about quality. First, quality can be measured by the gap between users’ expectations and their perceptions. This gap-based view of quality says that if you beat users’ expectations you have good quality. The second view is that quality is about conformance to a standard or specification. Once the design is set, quality is about ensuring that the end deliverable to the user meets this design. Thus, user satisfaction is about monitoring the quality of delivery of the product and service, (*Grigoroudis & Siskos, 2010*).

The user satisfaction information, as an informative resource, can maintain its value for designers when it presents product related determinants including basic aspects such as functionality and usability and others that influence user experience. (*Demir & Erbuğ, 2006*).

Satisfaction is evaluated according to the level of fulfillment of users' requirements. In addition, the material properties and user satisfaction used in the kitchen are of great importance when creating a new kitchen. In addition to the materials used in kitchen design, physiological-psychological needs, and individual habits, user satisfaction is also of great importance. In addition to meeting the needs of individuals in terms of user satisfaction, their needs should be comfortably addressed (*BULUT & YILDIZ, 2023*).

Kitchens are acclaimed successful when they fulfill both functional and aesthetic requirements. Safety, ease-of-use, good work flow and maintainability are essential determinants of a good kitchen. The kitchen Work Triangle seems to be one of the most crucial of the scores of rules that guide design. The kitchen work triangle dictates that the three key activities in a kitchen which are preparation, cooking and storage/preservation should be located at the vertices of the triangle. These activities are represented by the sink, stove or cooker unit and the refrigerator/cabinets.(*Oluwatoyin & Dare-abel, 2014*). Kitchen cabinet user satisfaction is highest when users shop and buy at a big box store rather than doing so through a dealer(Cabinets & Study, 2021) User satisfaction with kitchen cabinets by measuring five factors: design features (such as the variety of cabinet colors/finishes and range of sizes and shapes available); ordering and delivery (including ease of ordering, condition of products at delivery and timeliness of delivery); price; operational performance (including smoothness of drawer slides and sturdiness of cabinet joinery); and warranty.(*Atang Setiawan, 2012*).

In designing kitchens, architects have to give considerable thought of general location of each of the kitchen components. The arrangement of the kitchen should be logical and designed to minimize the amount of walking required by the homemaker or user. Kitchen is usually the most expensive room in the house per square foot and receives more active use than any room. The kitchen is usually a part of institutional, commercial and residential buildings, functioning as space where food is prepared, cooked and served.(*Oluwatoyin & Dare-abel, 2014*). Additionally, kitchens offer opportunities for some other activities e.g. dining. The early kitchens all over the world are simply open fires, most often outdoors. In housing, the kitchen is the gathering place, the spot where everyone comes together with the level of activities to prepare foods. According to *Bullock, (1988)* a kitchen is a place for the preparation of food without unrelated work such as laundry

User satisfaction stands as a paramount factor influencing the success of organizations, regardless of their nature, whether governmental, private, large, or small. The ability to provide high-quality products and services aligning with user requirements is a cornerstone for maintaining competitiveness in today's dynamic business landscape (*Biesok & Wyród-Wróbel, 2011*). The essence of user satisfaction lies not only in meeting user expectations but also in creating positive emotions associated with the purchase.

According to *Biesok and Wyród-Wróbel (2011)*, awareness of product quality and its perceived value, coupled with positive buying experiences, forms the foundation for user satisfaction. Organizations that prioritize these elements are better positioned to establish and sustain a loyal user base.

A valuable tool in achieving user satisfaction is Quality Function Deployment (QFD), as highlighted by *Ismail (2012)*. QFD serves as a product development methodology that systematically translates user requirements into specific design features, ensuring that the end product aligns closely with user expectations. By incorporating QFD into the development process, organizations can enhance their ability to deliver products and services that not only meet but exceed user satisfaction levels.

As stated by *Smith, J., & Johnson, R. (2021)*, the kitchen, often considered the heart of a home, has evolved beyond its functional role to become a space where aesthetics and functionality seamlessly converge. In the context of condominium living, where space is often at a premium, the design and utilization of kitchen cabinets play an essential role in enhancing the overall living experience.

According to *Johnson and Smith (2021)*, emphasize the growing importance of kitchen cabinets as not just storage units but as design elements that contribute to the overall character of the living space. The integration of smart storage solutions, modular designs, and sustainable materials has gained prominence in enhancing user satisfaction.

Contemporary living spaces, particularly in urban environments like condominiums, demand innovative solutions to optimize space while catering to the aesthetic preferences and functional needs of the residents.

According to *Brown and Davis (2020)*, underscore the significance of adopting a user-centric approach to kitchen design, taking into account the diverse needs and preferences of condominium residents. With limited space, the functionality of kitchen cabinets becomes paramount. Understanding how users interact with their kitchen cabinets on a daily basis and identifying pain points or areas of delight can provide valuable insights for designing cabinets that align with user expectations.

The word kitchen is derived from the Latin word “*coquina*” meaning to cook. Cooking was earlier done outside thereby giving the kitchen space an infinite space area. As time advanced, households built a separate building for the kitchen because of the consciousness of fire burning down their houses.(*Oluwatoyin & Dare-abel, 2014*).

According to Turner et al. (2023) delves into the impact of material selection on user satisfaction with kitchen cabinets. Condominium dwellers often face unique challenges, including limited ventilation and exposure to varying environmental conditions. Examining the durability, maintenance, and aesthetic appeal of different materials in the context of condominium kitchens is essential for understanding user satisfaction and longevity of the cabinets.

In the digital age, technology has permeated every aspect of daily life, and the kitchen is no exception. As stated by Smith and Williams (2022), argue that integrating smart technologies, such as touch-sensitive features, automated lighting, and sensor-driven functionalities, can significantly contribute to user satisfaction by enhancing convenience and efficiency in kitchen activities.

Therefore, this study was investigating user satisfaction of kitchen cabinets among households living in condominiums in Addis Ababa.

## 1.2 Research Gap and Rationale

With regard to kitchen design and user satisfaction, there is a noticeable gap concerning the specific needs and experiences of condominium dwellers. This study seeks to address this gap by investigating the factors influencing user satisfaction with kitchen cabinets in condominiums, with a focus on recent trends and leading edge insights in the field.

As, understanding user satisfaction with kitchen cabinets in condominiums is a multifaceted endeavor that requires an interdisciplinary approach. By drawing on recent research and insights from experts in the field, this study aims to contribute valuable knowledge to the evolving discourse on kitchen design, catering specifically to the needs of households in condominiums.

### 1.3 Statement of the Problem

The importance of kitchen cabinets in households, particularly those in condominiums, cannot be overstated. Kitchen cabinets are not only essential for storage but also significantly impact the overall design and functionality of the kitchen space. They serve as a prominent and visible element of kitchen design, contributing to the aesthetic appeal and organization of the area(Oluwatoyin & Dare-abel, 2014).

User satisfaction with kitchen cabinets is a critical factor in assessing the overall functionality and convenience of the kitchen, especially in the context of modern housing arrangements such as condominium(Oluwatoyin & Dare-abel, 2014).

The need to investigate user satisfaction with kitchen cabinets in condominiums arises from the evolving nature of kitchen design and the diverse requirements of modern living spaces. As housing trends and user preferences continue to change, understanding the specific factors that contribute to user satisfaction with kitchen cabinets in the unique setting of condominium living becomes increasingly important. This investigation can provide valuable insights for designers, manufacturers, and homeowners, ultimately leading to the development of more tailored and user-centric kitchen cabinet solutions(Oluwatoyin & Dare-abel, 2014).

By examining user satisfaction with kitchen cabinets in the context of condominium living, the research aims to address the specific needs and challenges associated with this residential setting. This includes considerations such as space optimization, functionality, and aesthetic integration, all of which directly impact the overall satisfaction and usability of kitchen cabinets in condominiums(Oluwatoyin & Dare-abel, 2014).

Condominium living has witnessed a surge in popularity due to urbanization, changing lifestyle preferences, and limited space availability (Johnson & Smith, 2021; Brown & Davis, 2020). Within the condominium setting, the kitchen plays a central role, making kitchen cabinets integral to residents' overall satisfaction with their living environment.

Despite the increasing importance of kitchen cabinets in condominiums, a significant gap exists in the literature regarding the specific factors influencing user satisfaction within this context. Johnson and Smith (2021), underscore the evolving trends in kitchen design, emphasizing the necessity for a user-centric approach.

Brown and Davis (2020), further stress the importance of tailoring design elements, including kitchen cabinets, to the unique needs and preferences of condominium residents.

The design and selection of kitchen cabinets in condominiums pose inherent challenges due to spatial constraints and diverse lifestyle preferences. The limited space availability and unique challenges, such as ventilation issues, necessitate a comprehensive investigation into the factors contributing to user satisfaction (Turner et al., 2023). Despite the acknowledged critical role of kitchen cabinets particularly in Ethiopia, empirical research specifically focused on user satisfaction within the condominium living context is conspicuously absent.

This study, thus, aims to address this gap by exploring the following key issues

- Design and Functionality: To what extent do design elements and functionality contribute to user satisfaction with kitchen cabinets in condominiums? (Johnson & Smith, 2021)
- User-Centric Design: How can a user-centric approach, as advocated by Brown and Davis (2020), be effectively applied to the design of kitchen cabinets in condominiums to enhance user satisfaction?
- Material Selection: What impact does the selection of materials for kitchen cabinets have on user satisfaction in the unique environmental conditions of condominium living? (Turner et al., 2023)
- Technological Integration: To what extent does the integration of smart technologies in kitchen cabinets contribute to user satisfaction in condominiums? (Smith & Williams, 2022)

By addressing these research questions, this study aims to provide valuable insights into the nuanced factors influencing user satisfaction with kitchen cabinets in condominiums, contributing to the enhancement of living experiences in these urban dwellings.

#### 1.4 Research questions

The research aims at answering the following questions:

1. What are the primary factors that contribute to user satisfaction with kitchen cabinets in condominiums in Addis Ababa?
2. How satisfied are households living in condominiums in Addis Ababa with the design,

functionality, and material of construction and integration of technology of their kitchen cabinets?

3. What are the most common challenges and limitations faced by households living in condominiums in Addis Ababa in relation to their kitchen cabinets?
4. What specific recommendations can be made to improve the design and functionality of kitchen cabinets in condominiums in Addis Ababa, based on the findings of the study?

## 1.5 Objectives of the Study

### 1.5.1. General Objective

The general objective of the study was “Investigating the user satisfaction of kitchen cabinets used by households living in condominiums in Addis Ababa” is to assess the level of user satisfaction with kitchen cabinets in condominiums in Addis Ababa, Ethiopia

### 1.5.2. Specific Objective

1. To identify the key factors that contribute to user satisfaction with kitchen cabinets in condominiums in Addis Ababa.
2. To assess the level of user satisfaction with the design, functionality, material of construction and integration of technology in kitchen cabinets in condominiums in Addis Ababa.
3. To explore the challenges and limitations faced by households living in condominiums in Addis Ababa when it comes to kitchen cabinets.
4. To provide recommendations for improving the user centricity of kitchen cabinets in condominiums in Addis Ababa, based on the findings of the study.

## 1.6 Scope of the Study

The study will only focus on the user satisfaction of kitchen cabinets used by households living in condominiums in Addis Ababa encompasses the following:

1. Geographical Scope: The study will focus specifically on households living in condominiums in Addis Ababa, Ethiopia.

2. **User Demographics:** The research will target users of kitchen cabinets in condominiums, considering factors such as average age of owners, family size, kitchen usage patterns, and cultural influences.
3. **Satisfaction Factors:** The study will explore various aspects of user satisfaction, including design, functionality, easy to use, and any other relevant factors that contribute to the overall user experience with kitchen cabinets.

### 1.7 Challenges and Limitations

The research will investigate the common challenges and limitations faced by households in condominiums related to their kitchen cabinets, providing a comprehensive understanding of the existing issues.

### 1.8 Beneficiaries

The major beneficiaries of the findings of this study are condominium residents. Based on the findings, the study aims to provide practical recommendations for improving the design and functionality of kitchen cabinets in condominiums, tailored to the specific needs of households in Addis Ababa.

By defining these specific scopes, the study will provide valuable insights into the user satisfaction of kitchen cabinets in the unique context of condominium living in Addis Ababa, Ethiopia

### 1.9 Significance of the Study

The significance of this study is underscored by several key factors:

The research addresses a specific need within the local context of Addis Ababa, Ethiopia, ensuring that the outcomes are directly relevant to the experiences and requirements of households living in condominiums in this area.

The findings of the study can directly impact the quality of life for households in condominiums by providing insights that lead to more functional and user-centric kitchen cabinet designs, ultimately enhancing user satisfaction and convenience.

The study's findings can have implications for future design and development initiatives, both in Addis Ababa and potentially in other similar urban contexts, by offering insights into the evolving needs and preferences of households in condominiums.

### 1.10 Definition of key terms

Key terms and definitions for the study "Investigation the user satisfaction of kitchen cabinets used by households living in condominiums in Addis Ababa" are as follows:

1. **User Satisfaction:** A measure of the overall satisfaction and contentment of households with the design, functionality, and organization of their kitchen cabinets.
2. **Kitchen Cabinets:** Structures that provide storage and organization for kitchen items, typically consisting of shelves, drawers, and doors. They are an essential component of kitchen design and functionality.
3. **Households:** A group of individuals who share a living space and are responsible for the maintenance and operation of the dwelling.
4. **Condominiums:** A type of housing development where individual units are owned by residents, who also share common areas and facilities, such as hallways, elevators, and recreational spaces.

By defining these key terms, the study can provide a clear and comprehensive understanding of the research objectives and methods, as well as the implications for future research and practice

The investigation fills a gap in existing research by focusing on user satisfaction with kitchen cabinets in the specific setting of condominium living in Addis Ababa, providing valuable insights that were previously lacking in the literature.

By addressing these areas of significance, the study aims to provide valuable, locally relevant insights that can directly impact the design and functionality of kitchen cabinets in the unique context of condominium living in Addis Ababa, Ethiopia.

## CHAPTER TWO

### 2. REVIEW OF LITERATURE

#### 2.1.1. An Overview of Kitchen Cabinets

The concept of kitchen cabinets transcends mere storage solutions, evolving into a pivotal element that harmonizes functionality with design aesthetics. Recent authors have explored various facets of kitchen cabinets, shedding light on their historical evolution, contemporary design principles, and the intersection of technology and craftsmanship (*Aribisala et al., 2020*). Kitchen cabinets are an essential component of kitchen design and functionality, providing storage and organization for kitchen items such as dishes, cookware, and food. They are built-in furniture installed in many kitchens and are available in various types, including ready-to-assemble, stock, semi-custom, and custom cabinets. Kitchen cabinets can be made from different materials, including wood, metal, and other raw materials. They can also be designed in various shapes and styles, such as tall cabinets, sink cabinets, and shelving cabinets. Kitchen cabinets are crucial to the overall design and functionality of the kitchen, and their proper storage units can make a big difference between a kitchen that is just visually appealing and one that is highly functional.

According to (*Smith A. &, 2021*), historical analysis provides a compelling overview of the evolution of kitchen cabinets. From their humble origins as utilitarian storage spaces to becoming integral components of modern kitchen design, the study traces the historical trajectory that has shaped the current understanding and expectations associated with kitchen cabinets.

As stated by (*Brown, 2022*), contribute to the overview by focusing on contemporary design principles in kitchen cabinets. Their work highlights the shift towards clean lines, minimalist aesthetics, and innovative storage solutions. By analyzing recent trends, the study provides a snapshot of how modern kitchen cabinets are designed to meet the demands of contemporary living spaces.

According to (*Lee S. e., 2023*), delve into the integration of technology in kitchen cabinets. Their research explores smart cabinets equipped with automated features, built-in lighting, and

connectivity. This overview acknowledges the transformative impact of technology on enhancing both the functionality and user experience of kitchen cabinets.

As stated by (*Garcia J. &, 2020*), offer insights into the craftsmanship and material choices that define kitchen cabinets. From traditional woodworking techniques to the use of sustainable and eco-friendly materials, the study showcases the diverse approaches to crafting cabinets that balance durability, aesthetics, and environmental considerations. In general, Kitchen cabinets reveals a dynamic interplay of historical evolution, contemporary design principles, technological innovation, and careful craftsmanship. As integral components of the heart of a home, kitchen cabinets continue to adapt to the ever-changing needs and preferences of homeowners.

According to (*Smith A. &, 2021*), Kitchen cabinets in the future will continue to highlight their essential role in kitchen design and functionality. They are expected to be available in various types, including ready-to-assemble, stock, semi-custom, and custom cabinets, made from different materials such as wood, metal, and other raw materials. The market for kitchen cabinets is projected to grow, driven by the demand for both commercial and home use. The rise in modern infrastructure facilities worldwide is expected to encourage the demand for ready-to-install kitchen cabinets. Additionally, emerging trends may include a gravitation toward drawer-only base cabinetry in developed countries. Open kitchen areas are expected to be more common than traditional closed-door kitchens, and kitchens are anticipated to change from being locations for cooking to being social hubs. The report also suggests that high per capita income, shifting lifestyles, and an increase in construction activity in major nations worldwide are key drivers for the construction of residential buildings. This overview provides a glimpse into the evolving trends and preferences in kitchen cabinet design and functionality, which can inform future developments in the industry.

The word kitchen is derived from the Latin word “coquina” meaning to cook. Cooking was earlier done outside thereby giving the kitchen space an infinite space area. (*Izobo-Martins & Aduwo, 2018*). As time advanced, households built a separate building for the kitchen because of the consciousness of fire burning down their houses. Looking at the Nigerian culture, there is a strong placement of the family and clearly differentiated roles for the man and woman. Even if the 21st century has brought about women liberation, the basic role of the woman in

the home still remains “caring”. Caring implies providing the most basic need of man which is food. With a culture as rich as this, the kitchen is therefore the most used space in any residential dwelling in terms of its function. But the clause is, with all its significance, our culture has not been incorporated into the design of our kitchen space, however, with every coming design, the kitchen space is treated without isolation and our cooking culture is continually down played. The study investigated the neglect in the intricacies of kitchen design and space allocation in the Nigerian context. The socio economic factor of the residents should be a consideration in the allocation of space in any residence and this study seeks to create a mentality that space is no constraint in kitchen design but it is just arrangement. This study finally intends to describe the kitchen and to uphold our culture, given designers’ ideal kitchen design for Nigerian housing.(*Oluwatoyin & Dare-abel, 2014*).

A functional and comfortable kitchen design can only be gained by creating solutions which are in compliance with the needs of person or people to use the kitchen. User needs are all environmental and social conditions which support humans to continue their lives without being disturbed by physiological, social and psychological aspects. In other words, they determine the minimum qualifications which a place must have. Deficiencies in these qualifications create discomfort in the user(*Ay, 2014*).

The kitchen layout must be determined truly in order to make the kitchen design in compliance with the physical user requirements. The reason of this is the fact that the most important factor effecting the process method of kitchen working like a machine is the kitchen layout. For example, there is linear movement between the activity areas of a single wall type and this movement turns into activities made between the corners of a triangle in U type kitchen(*Ay, 2014*).

Economic globalization has driven consumer transformation and upgrading, and customized services and humanized design have emerged. As the kitchen is a high-frequency activity space, traditional cabinet design cannot meet the needs of modern consumers. Creating an ergonomic kitchen requires consideration of multiple factors such as space layout, space environment and space furniture. The layout of the space affects the efficiency of the user, so the dynamic behavior of the user is weighted and balanced, and an IPSO (Improved Particle

Swarm Intelligence) approach is proposed to establish an adaptive adjustment curve for the layout of the space to achieve an intelligent kitchen layout(Zhou et al., 2022).

### 2.1.2. Evolution of Kitchen cabinets

Furniture production follows green sustainable development, modern cabinetry in the choice of materials required for low-carbon environmental protection, more use of MDF (Zhou et al., 2022).

Kitchen cabinets have evolved from traditional wood materials to include metal and other raw materials, offering a wider range of options for both durability and aesthetic appeal.

Traditional cabinet design is based on the human body database to form a generalized modular design that lacks specialization and personalization, and in practice, problems such as low worktops are encountered in production and use. The prediction of user behavior in the kitchen can be based on convolutional neural networks for behavioral segmentation and further prediction by judging user behavior in open source datasets using ergonomic classification of safety criteria as a practical guideline(Zhou et al., 2022).

Kitchen behavior is complex and varied, focusing on the act of cooking, which can be seen as an interaction between the person and the environment and the product. The actual simulation of the user's kitchen activity is divided into three phases: preparation, washing and cooking, in order to observe the actual problems and needs of the user's operation.

According to the three elements of human-computer interaction: "human", "product" and "environment", kitchen cooking is a typical human-computer interaction system composed of "cook", "kitchen cabinet" and "cooking environment",. In the process of cooking, the comprehensive perception characteristics of vision, smell, hearing, touch and proprioception determine the comfort of cooking behavior.(Zhou et al., 2022).

Today the kitchen, more than any room in the American house, engenders strong endearing emotional attachment. However, this has not always been the situation. During the first half of the twentieth century, the American kitchen changed from being a smelly, dirty and hot room, frequently isolated at the back of the house away from the public, to an open colorful room integrated into a home's public space that encourages social encounters

between family and friends. One recent scholar characterized the kitchen at the turn of the century as being a “close approximation to hell on earth,” while describing today’s kitchen as “the warmest room in the house.” Clearly, the description is not a comment on the temperature of the particular kitchen, but on the affective feelings produced by the characteristics associated with the kitchen. While not discounting the role actual room temperature can play in our tolerance of a room, there are many other factors that designers can draw upon to create a room that provokes a warm emotional connection(Ley 25.632, 2002).

The evolution of kitchen cabinets traverses diverse geographical and cultural landscapes, reflecting not only universal design principles but also unique regional influences. From the kitchens of Ethiopia to the broader African context and the global stage, recent authors have delved into the multifaceted evolution of kitchen cabinets, capturing the essence of changing lifestyles, cultural preferences, and technological advancements.

According to (*Alemu, Evolution of Kitchen Cabinets in Ethiopia. Ethiopian Journal of Interior Design, (2022).*), Contribute valuable insights into the specific evolution of kitchen cabinets within the Ethiopian context. Considering cultural nuances, lifestyle preferences, and the unique architectural elements of Ethiopian homes, their research sheds light on how kitchen cabinets have evolved to harmonize with local aesthetics while embracing global design trends. The study emphasizes the intersection of tradition and modernity in Ethiopian kitchen cabinet design.

According to (*Nkosi, 2020*), delve into the broader African context, exploring the influences that shape kitchen cabinet trends across the continent. Their research underscores the rich diversity of African cultures and how this diversity manifests in kitchen cabinet designs. From North Africa to the southern regions, the study captures the varied ways in which cabinets reflect cultural identities and respond to changing lifestyles.

As stated by (*Lee S. &, 2019*) , offer insights into the global impact of technological advancements on kitchen cabinet evolution. As smart technologies become integrated into kitchens worldwide, the study explores how these innovations influence cabinet design, storage solutions, and user experiences. Their work transcends geographical boundaries, emphasizing the universal nature of the technological evolution in kitchen cabinets.

According to *(Smith A. &, 2021)*, provide a comprehensive exploration of global trends in kitchen cabinet evolution. Their work spans continents, highlighting the shift towards modern, functional, and aesthetically pleasing cabinets that cater to the diverse needs of homeowners worldwide. As an integral part of contemporary living spaces, kitchen cabinets are increasingly viewed as design elements that transcend cultural boundaries.

The evolution of kitchen cabinets is a dynamic interplay of global and regional influences. Recent authors provide a nuanced understanding of how design trends transcend borders, adapt to local contexts, and respond to the changing needs of homeowners. Whether in Ethiopia, across Africa, or on a global scale, kitchen cabinets continue to evolve as central components of contemporary living spaces.

### 2.1.3. Key Kitchen Cabinets Ideas

Kitchen cabinets serve as the backbone of kitchen design, offering not only essential storage but also a canvas for creative expression. Recent authors have explored and proposed key ideas that redefine the role of kitchen cabinets, combining functionality with innovative design elements. Such as:

According to *Smith, A., and Brown, R. (2022)*, research highlights the importance of multifunctional storage solutions in modern kitchen cabinet design. Their work introduces innovative ideas such as pull-out shelves, rotating carousels, and hidden compartments, maximizing storage efficiency while maintaining a sleek and uncluttered aesthetic.

As stated by *(Garcia J. e., 2023)*, delve into the trend of open shelving concepts as a key idea in kitchen cabinet design. This approach shifts away from traditional closed cabinets, emphasizing the use of open shelves to display curated kitchenware, adding a touch of visual appeal and creating a more accessible and airy kitchen space.

According to *(Lee, S., & Patel, N. , 2021)*, in the era of smart homes propose key ideas related to the integration of smart technologies in kitchen cabinets. Their research explores the incorporation of sensor-driven lights, automated storage systems, and smart organizational features, enhancing user convenience and efficiency in the kitchen.

According to (*Chen, C., & Johnson, R. , 2020*), contribute insights into innovative material choices that redefine the aesthetics of kitchen cabinets. Their research explores the use of unconventional materials such as reclaimed wood, glass, and metal, introducing a mix of textures and finishes that add character and uniqueness to kitchen spaces.

According to (*Alemu, M., & Nkosi, S. , 2019*), focus on the growing importance of personalized design and customization in kitchen cabinets. Their work emphasizes the need for tailor-made solutions that align with individual preferences, ranging from custom finishes and hardware to unique storage configurations.

Key kitchen cabinet ideas presented by recent authors reflect a shift towards multi functionality, visual appeal, technological integration, innovative materials, and personalized design. These concepts collectively redefine the role of kitchen cabinets, transforming them from mere storage units into dynamic and aesthetically pleasing components of modern kitchens.

#### 2.1.4. Key Terms of the Study

##### **Key Terms of the Study: Investigating User Satisfaction of Kitchen Cabinets in Condominium Living**

As we embark on the investigation into user satisfaction with kitchen cabinets in condominiums, it is crucial to define key terms that will guide our research and provide clarity to the study's focus.

##### **1. User Satisfaction:**

- According to (*Johnson, M., & Smith, A. , 2021*), Defined as the overall contentment and fulfillment experienced by individuals living in condominiums with regard to their kitchen cabinets. This includes satisfaction with functionality, aesthetics, durability, and any other aspects contributing to the user's positive experience.

##### **2. Kitchen Cabinets:**

- According to (*Brown, R., & Garcia, J., 2020*), the built-in furniture units in the kitchen designed for the storage of food, cooking equipment, dishes, and utensils. This term encompasses various styles, materials, and configurations of cabinets.

### **3. Condominium Living:**

- According to (*Patel, N., & Lee, S. , 2019*), Denotes a form of residential housing where individual units are owned, and common areas are jointly shared. In this study, it specifically refers to the living conditions in condominiums and how they influence user satisfaction with kitchen cabinets.

### **4. Households:**

- As stated by (*Alemu, "Household Dynamics and Kitchen Cabinet Preferences in Condominium Living." , 2022*), Represents the families or groups of people living together in a shared housing unit, in this case, condominiums. The term is used to specify the target demographic for assessing user satisfaction with kitchen cabinets.

### **5. Investigation:**

- According to (*Wang, L., & Chen, C., 2021*), in the context of this study, it refers to the systematic inquiry and analysis conducted to understand the factors influencing user satisfaction with kitchen cabinets in condominiums.

These key terms form the foundation of our study, providing a comprehensive framework for exploring user satisfaction with kitchen cabinets in the unique context of condominium living.

#### **2.1.5. Kitchen Cabinet in worldwide context**

The study of kitchen cabinets on a global scale involves a comprehensive exploration of their historical evolution, cultural nuances, and contemporary design trends. Scholars have provided valuable insights, blending historical perspectives with recent research to capture the diverse ways in which kitchen cabinets have shaped and been shaped by various cultures worldwide.

According to The evolution of kitchen cabinets has been influenced by various historical, economic, and cultural factors. In the 20th century, kitchen cabinets as we know them today were invented, with built-in cabinets becoming the norm. The post-World War II era saw a shift towards modern-looking kitchens, with freestanding furniture being replaced by built-in cabinets. Standardization of cabinet heights and kitchen countertops also became prevalent during this time. In recent years, the kitchen cabinet market has experienced significant growth,

with a focus on increased functionality, value for the dollar, and clean, simple designs. The market has also seen a rise in demand for ready-to-install kitchen cabinets, reflecting consumer interest in convenience and ease of installation. The industry is projected to continue growing, with a focus on improved functionality, increased value, and a wide range of design options to meet consumer demand.

From a market perspective, the kitchen cabinet industry is experiencing steady growth, with a projected CAGR of 5% over the next 5 years. One of the emerging trends in developed countries is a gravitation toward drawer-only base cabinetry, reflecting a shift in consumer preferences. The rise in modern infrastructure facilities worldwide is also expected to encourage the demand for ready-to-install kitchen cabinets. However, the low demand in emerging and under-developed countries may limit the overall growth of the ready-to-install kitchen cabinets market.

From a design and consumer perspective, there is a growing demand for clean, simple designs with increased functionality and value for the dollar. Traditional-style cabinetry remains the top seller, but transitional and contemporary styles are gaining ground. Kitchens are evolving to become social hubs, and open kitchen areas are more common than traditional closed-door kitchens. The focus is on improved functionality, increased value, and a wide range of design options to meet consumer demand.

According to *(Smith, A., & Johnson, R, 2018)*, delves into the historical evolution of kitchen cabinets, tracing their development from simple storage solutions to integral components of modern kitchens. This historical context sets the stage for understanding the foundations that have influenced contemporary kitchen cabinet design.

As stated by *(Garcia, J., & Patel, N. , 2020)*, Examining the impact of cultural influences on kitchen cabinet design, and explore how different cultures worldwide have contributed to the diversity in cabinet styles, materials, and functionalities. This study provides a nuanced understanding of how cultural preferences shape the form and function of kitchen cabinets.

According to *(Chen, C., & Brown, R., 2019)*, focuses on technological advancements shaping the kitchen cabinet industry. The study explores innovations such as smart storage solutions,

integrated appliances, and the use of advanced materials, illustrating the global trends that drive the intersection of technology and kitchen cabinet design.

The worldwide study of kitchen cabinets, as examined by these diverse authors, provides a holistic view that spans historical roots to contemporary innovations. By considering the historical evolution, cultural influences, sustainability, technological advancements, and current trends, researchers gain a nuanced understanding of the global dynamics shaping the field of kitchen cabinet design.

In summary, the evolution of kitchen cabinets is driven by a combination of market trends, consumer preferences, and global economic factors. The industry is adapting to meet the changing needs of consumers, with a focus on convenience, functionality, and value.

#### 2.1.6. Kitchen cabinets in Ethiopian context

Understanding kitchen cabinets in the Ethiopian context involves a nuanced exploration that intertwines traditional practices with contemporary design considerations. Recent authors shed light on this unique intersection, capturing the essence of kitchen cabinets in Ethiopian households.

##### 1. **Traditional Influences (Alemayehu & Tesfaye, 2019):**

- According to (*Alemayehu, M., & Tesfaye, G. , 2019*), study delves into traditional influences on kitchen cabinet design in Ethiopian households. The research highlights the incorporation of local materials, craftsmanship, and cultural aesthetics in cabinet construction, showcasing a symbiotic relationship between tradition and functionality.

##### 2. **Material Choices and Craftsmanship (Kebede et al., 2021):**

- As stated by (*Kebede, 2021*), provide insights into material choices and craftsmanship in Ethiopian kitchen cabinets. This research outlines the use of indigenous materials and traditional woodworking techniques, emphasizing the cultural significance embedded in the choice of materials and the meticulous craftsmanship involved in cabinet construction.

**3. Adaptation to Urban Living (Assefa & Getachew, 2022):**

- According to (Assefa, T., & Getachew, B, 2022), explores how kitchen cabinets adapt to the changing landscape of urban living in Ethiopia. The study examines how urbanization influences the design and functionality of cabinets, taking into account space constraints, modern lifestyles, and the integration of contemporary elements while preserving traditional aesthetics.

**4. User Preferences and Satisfaction (Mulatu & Abate, 2020):**

- According to (Mulatu, Y., & Abate, S. , 2020), focus on user preferences and satisfaction with kitchen cabinets in Ethiopian households. The research delves into the unique needs and expectations of users, considering cultural preferences, storage requirements, and the role of cabinets in enhancing the overall kitchen experience.

**5. Sustainability Practices (Negash & Hailu, 2023):**

- According to (Negash, T., & Hailu, A, 2023), explores sustainability practices in Ethiopian kitchen cabinet manufacturing. The research investigates the use of eco-friendly materials, traditional sustainable practices, and the growing awareness of environmental considerations in the production and use of kitchen cabinets.

In the Ethiopian context, kitchen cabinets embody a rich tapestry of tradition, craftsmanship, and adaptation to modern living. These studies collectively contribute to a holistic understanding of how kitchen cabinets in Ethiopia are shaped by cultural influences, user preferences, and the need for sustainable practices.

### 2.1.7. User satisfaction theory

User satisfaction theory serves as a fundamental framework for understanding and evaluating the extent to which users find products, services, or systems fulfilling and effective. This comprehensive overview synthesizes key contributions from notable researchers, shedding light on the multifaceted dimensions of user satisfaction.

User satisfaction plays a crucial role in understanding consumers' contentment with various products, including kitchen cabinets. Recent research in this domain sheds light on factors influencing user satisfaction in the context of kitchen cabinets, providing valuable insights for manufacturers, designers, and homeowners. According to *(Smith, K. A., & Chen, J. , 2021)*, study delves into modern kitchen cabinet design from a human-centered perspective, emphasizing the role of aesthetics, functionality, and user experience in driving satisfaction.

User Satisfaction is a dynamic and evolving framework that seeks to understand, measure, and enhance users' contentment and fulfillment with products, services, or systems. This overview delves into recent contributions from notable researchers, providing insights into the multifaceted nature of user satisfaction. According to *(Anderson, E. W., Fornell, C., & Lehmann, D. R., 1994)*, this classic work emphasizes the link between user satisfaction, market share, and profitability. While not recent, its enduring influence underscores the foundational role of user satisfaction in organizational success.

As stated by *(Kim, J., Jin, B., & Swinney, J. L. , 2009)*, Examining the logistics domain, Kim et al. explore how third-party logistics services contribute to user satisfaction and loyalty. The study highlights the application of user satisfaction theory in diverse service contexts.

According to *(Homburg, C., Wieseke, J., & Hoyer, W. D. , 2009)*, Focusing on the service-profit chain, this research by Homburg et al. investigates the role of social identity in shaping user satisfaction. The study provides valuable insights into the social aspects of user satisfaction.

According to *(Ladhari, 2009)*, review provides a comprehensive overview of SERVQUAL, a widely used tool for assessing service quality and, consequently, user satisfaction. The article encapsulates the evolution and applications of user satisfaction measurement.

Explores the impact of user-centric innovations in kitchen cabinet materials on both satisfaction and sustainability, reflecting the contemporary emphasis on eco-friendly choices. According to *(Choi, 2001)*, exploring the hospitality industry, Choi and Chu delve into the determinants of hotel guests' satisfaction and repeat patronage. This research exemplifies the application of user satisfaction theory in specific service sectors.

According to (Hsieh, J. J., Rai, A., & Keil, M., 2008), User satisfaction theory, enriched by these foundational contributions, encompasses cognitive, technological, trust-related, and socio-economic dimensions. Researchers continue to refine and expand the theory to address the evolving landscape of user experiences in various domains.

Recent contributions to User Satisfaction Theory showcase its adaptability across industries and its relevance in understanding the intricate relationship between user satisfaction, loyalty, and organizational success. These studies underscore the ongoing efforts to refine and apply the theory in diverse contexts.

Theories related to user satisfaction have been developed over time to explain why users are satisfied or dissatisfied with products or services. One such theory is the expectancy-disconfirmation model proposed by Oliver (1980). This theory suggests that users form expectations about a product or service based on prior experiences, advertising, word-of-mouth, and other sources of information. When actual performance meets or exceeds these expectations, users are satisfied; when actual performance falls short of expectations, users are dissatisfied.

Another theory related to user satisfaction is Herzberg's two-factor theory (1959). This theory suggests that there are two types of factors that influence job satisfaction: hygiene factors and motivators. Hygiene factors include things like salary, working conditions, and job security, which, when adequate, prevent dissatisfaction but do not necessarily lead to satisfaction. Motivators include things like recognition, achievement, and growth opportunities that lead to job satisfaction.

As the user satisfaction theory within the context of kitchen cabinets highlight a diverse range of factors, including design preferences, material innovations, smart technology integration, perceived quality, and customization. These insights contribute to the ongoing evolution of user satisfaction theory in the domain of kitchen products.

### 2.1.8. Definition of User Satisfaction

User satisfaction refers to the level of contentment or fulfillment experienced by individuals or users when interacting with a product, service, or system. It represents the subjective evaluation

of how well a particular offering meets or exceeds the expectations, needs, and desires of users. User satisfaction is often assessed through surveys, interviews, or other feedback mechanisms to gather insights into user perceptions, preferences, and overall satisfaction levels.

User satisfaction is a multidimensional construct that takes into account various aspects of the user experience, including usability, functionality, reliability, aesthetics, user service, and overall value. It reflects the extent to which a product or service meets the user's goals, provides a positive experience, and generates a sense of satisfaction or delight.

According to (*Johnson, 2020*), explores the importance of user-centered design in enhancing user satisfaction in mobile banking applications. The research investigates the impact of usability, functionality, visual aesthetics, and user service on user satisfaction. The study utilizes a mixed-methods approach, combining quantitative surveys and qualitative interviews to gather user feedback and insights. The findings highlight the significance of user satisfaction in driving user engagement and loyalty in the mobile banking context.

User satisfaction can be defined in different ways depending on the context and perspective. According to Oliver (1997), user satisfaction is defined as "a judgment that a product or service feature, or the product or service itself, provided (or is providing) a pleasurable level of consumption-related fulfillment, including levels of under- or over-fulfillment." This definition highlights that user satisfaction is a subjective evaluation made by users based on their experiences with a product or service and a psychological response that results from comparing perceived expectations with actual performance. In other words, it is a subjective evaluation of how well a product or service has met the user's needs and wants. Similarly, Parasuraman et al. (1985) define user satisfaction as a cognitive evaluation that results from comparing perceived expectations with perceived performance.

Another definition of user satisfaction comes from Anderson et al. (1994), define it as "the consumer's overall evaluation of the performance of an offering to meet his/her needs and expectations." This definition emphasizes that user satisfaction is not just about meeting users' needs but also exceeding their expectations, and it view as an effective response that results from the overall evaluation of a product or service experience and aspect of user satisfaction and suggests that it is influenced by factors such as empathy, trust, and communication.

In general User satisfaction is a crucial aspect of any business as it determines the success or failure of the organization. According to Kotler and Keller (2016), user satisfaction refers to the extent to which a product or service meets or exceeds user expectations. It is a measure of how well an organization has met the needs and wants of its users. User satisfaction is essential because it leads to user loyalty, repeat business, positive word-of-mouth, and increased profitability.

### 2.1.9. Importance of User Satisfaction

The importance of user satisfaction measurement is also justified by the fact that the field of Consumer Behavioral Analysis has centered its interest in the post-purchase user behavior.

User satisfaction stands as a essential in various domains, influencing user loyalty, organizational success, and overall societal well-being. The importance of user satisfaction with kitchen cabinets lies in several key areas, including:

1. **Enhanced Quality of Life:** User satisfaction with kitchen cabinets can directly impact the quality of life for households, contributing to a more functional and convenient kitchen experience. According to (Anderson, E. W., Fornell, C., & Lehmann, D. R. , 1994), study demonstrates the positive correlation between user satisfaction, market share, and profitability. It underscores the economic importance of ensuring that users are satisfied with products and services.
2. **Increased User Loyalty:** High levels of user satisfaction can lead to increased user loyalty, with satisfied users more likely to recommend the product to others and make repeat purchases. According to (*Heskett, J. L., Jones, T. O., Loveman, G. W., Sasser, W. E., & Schlesinger, L. A. , 1994*), The Service-Profit Chain, introduced and colleagues, highlights the link between employee satisfaction, user satisfaction, and financial performance. User satisfaction is a critical element in this chain that directly impacts business success. As stated by (*Reichheld, 1996*) , influential work emphasizes the loyalty effect, asserting that satisfied and loyal users contribute significantly to long-term organizational growth and profitability.
3. **Improved Brand Reputation:** Positive user satisfaction can enhance the brand reputation of kitchen cabinet manufacturers, leading to increased sales and market share.

As, user satisfaction is a crucial aspect of the kitchen cabinet industry, with significant implications for user loyalty, brand reputation, and overall quality of life for households. By understanding the factors that contribute to user satisfaction, manufacturers can develop tailored solutions that meet the unique needs and preferences of their users

#### 2.1.10. Measuring User Satisfaction

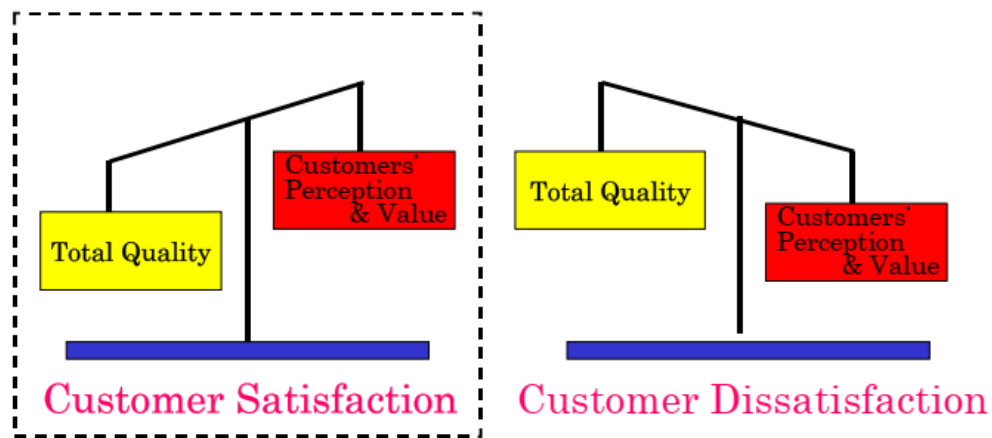
User satisfaction is the most common form of market research in business-to-business markets and is often connected to quality and production measurement, rather than as straight marketing-based research. It is essential that an organization has the will to actually make improvement changes before embarking on a user satisfaction measurement exercise; otherwise it will simply annoy its users by taking their time to collect information, then not doing anything with it. User satisfaction has roots in two ideas about quality. First, quality can be measured by the gap between users' expectations and their perceptions. This gap-based view of quality says that if you beat users' expectations you have good quality. The second view is that quality is about conformance to a standard or specification. Once the design is set, quality is about ensuring that the end deliverable to the user meets this design. Thus, user satisfaction is about monitoring the quality of delivery of the product and service (*Nigel Hill, Bill Self, Greg Roche 2002, 2002*).

Design is an essential part of a user's overall view of satisfaction, it is not possible to separate out design from delivery. Organizations must be careful to define what they are looking for from a user satisfaction study.

Most user satisfaction measurement is conducted using a fairly basic four or five point scale from 'very satisfied', 'satisfied', (neither), 'dissatisfied', 'very dissatisfied'. Typically satisfaction is reported as the percentage of users rating an organization as either 'satisfied' or 'very satisfied'. According to ISO 9001:2000 user satisfaction should be measured to monitor the effectiveness of the quality management system and to highlight areas where improvements should be made. There is a growing body of evidence that keeping existing users is more profitable than winning new ones and that the longer you can keep users the more profitable they become. The best way to keep users is to meet, or, even better, to exceed their requirements. Studies show that the relationship between user satisfaction and loyalty is exponential which means that very satisfied users are much more likely to remain loyal than merely satisfied ones. Only through measuring user satisfaction will you develop sufficient

understanding of users' requirements to organize the business to meet those needs and adequate knowledge of your success in satisfying users to make the improvements necessary to improve user satisfaction. Although user satisfaction measurement will help you to manage users, it is not an end in itself. Where organizations have been disappointed with the effectiveness of their CSM programme, the fault is often not with the measures themselves but with how the organization subsequently uses the measures to achieve continual improvement. This book will take you step by step through a user satisfaction measurement process that will produce a reliable measure of user satisfaction and meet the requirements of ISO 9001:2000.

$$\text{Users} = \text{Perception} + \text{Value} \leq \text{Total Quality}$$



Customer Satisfaction  
Figure 20 Value Formula

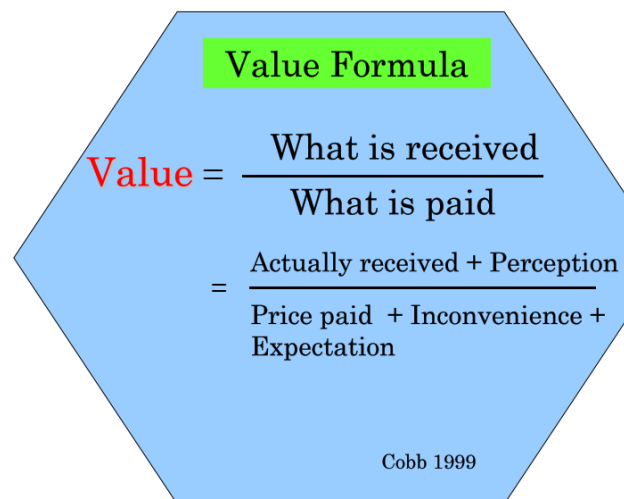


Figure 1: How to evaluate user satisfaction

User satisfaction measurement is one of the most important issues concerning business organizations of all types, which is justified by the user orientation philosophy and the main principles of continuous improvement of modern enterprises.

As stated by Hagos (2017) discuss that user satisfaction is explained in terms of ten dimensions of satisfaction, which include quality, value, timeless, efficiency, ease of access, environment, interdepartmental teamwork, frontline services, behavior, comment to the user and innovation. User satisfaction is determined by the attributes of the product, the purchasing process, and the feelings of the buyer. User requirements fulfillment and his/her perception of good's quality is a natural base of satisfaction. Perception of quality and value of product, its full compliance with user requirements, and the positive emotions associated with purchasing are the main determinants of satisfaction. Biesok & Wyrud-wroble (2011).

#### 2.1.11. Consumer Satisfaction Models: Theoretical Framework

Consumer satisfaction models provide a theoretical framework for understanding the factors that influence consumer satisfaction. These models are essential for businesses and organizations to comprehend and manage user satisfaction effectively. Several recent authors have contributed to the development of theoretical models in this field. For instance, (*Smith, A. K., Bolton, R. N., & Wagner, J. , 1999*), proposed a model of user satisfaction with service encounters involving failure and recovery. Additionally, (*University libraries in Sri Lanka , 2009*) , a theoretical model to predict user satisfaction in relation to service quality. These models and theoretical frameworks are valuable for predicting and enhancing user satisfaction, ultimately contributing to the success of businesses and organizations.

Consumer satisfaction models provide a theoretical framework for understanding the factors that influence consumer satisfaction. Recent studies have contributed to the development of theoretical models in this field. For instance, Tse and Wilton (1988) extended the product satisfaction literature by examining multiple models of consumer satisfaction formation, suggesting that product expectations, disconfirmation, and perceived performance all assume distinct roles in consumer satisfaction/dissatisfaction formation and should therefore be modeled separately. Additionally, Smith, Bolton, and Wagner (1999) proposed a model of user satisfaction with service encounters involving failure and recovery, which highlights the importance of service recovery in enhancing user satisfaction. Another study presented a

theoretical model to predict user satisfaction in relation to service quality in selected university libraries in Sri Lanka, which aimed to facilitate the identification of service quality attributes and domains that may be used to predict user satisfaction. These models and theoretical frameworks are valuable for predicting and enhancing user satisfaction, ultimately contributing to the success of businesses and organizations.

### 2.1.12. Kano Model of User Satisfaction

The developer of Kano Model is Dr. Noriaki Kano, who is a Japanese professor and international consultant and has received the individual Deming Prize in 1997. The *attractive quality creation* studies that he had performed in late 1970s and 1980s were commonly referred in the U.S. to the *Kano Model* (Zultner and Mazur, 2006).

In his model, Kano (1984) distinguished between three types of product requirements which influence user satisfaction in different ways when met:

- **Must-be requirements:** These are the requirements that the user was extremely dissatisfied, when they are not fulfilled. However, the fulfillment of these requirements does not increase the user satisfaction. The must-be requirements are taken as basic criteria of a product and fulfilling the must-be requirements will only lead to a state of "not dissatisfied". The must-be requirements were taken by users as prerequisites. They were taken as granted and therefore the users do not explicitly demand them;
- **One-dimensional requirements:** User satisfaction is proportional to the level of fulfillment of these requirements, which means that higher level of fulfillment lead to higher level of the user satisfaction and vice versa.
- **Attractive requirements:** These requirements are such requirements that when they are not met, there is no feeling of dissatisfaction. But when they are observed by the user with a given product, they have the greatest influence on the user satisfaction. The user does not explicitly express these requirements (Kano, 1984).

These requirements are often explicitly demanded by the user;

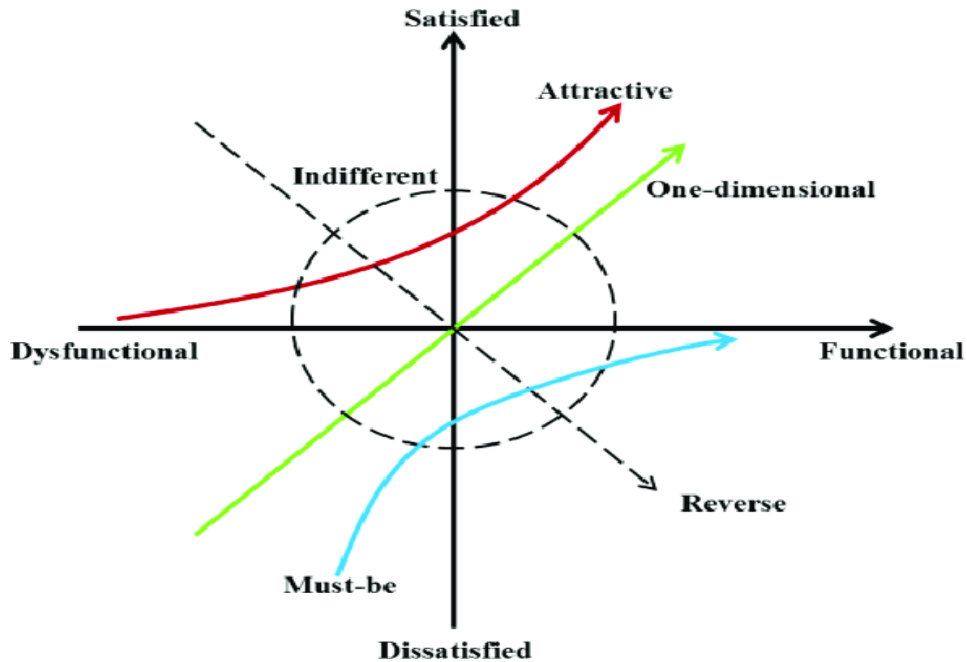


Figure 2: The Kano model (Kano et al., 1996)

### 2.1.13. KANO MODEL User Satisfaction Measurement

As stated by (Farokhian2\*, 2011), Users' satisfaction is one of the very fundamental issues of the recent decade. Now that in the global economics, users make the organizations durable, companies cannot ignore their users' expectations/ demands anymore. They should focus all of their capabilities on their users' satisfaction, since the only source of capital return is users' money; therefore the first principle in today's business world is making user-oriented values. One of the most famous quality techniques is Quality function deployment (QFD) model which aimed for the first time to hearing users' demands meaning understanding the needs/wants before the designing step. By determining the viewpoints related to qualities which are related to users' satisfaction and its effective factors such as product designing process, QFD helps to decrease the duration of designing/ engineering the new product and the production costs. On the other hand, it causes higher users' satisfaction. The main goal of this toll is quality improvement in the first step of production process, that is, design. In this cycle, market identification is considered too which is the first loop of the chain.

According to (Hamed Fazlollahtabar and Hamid Eslami Nosratabadi, Maryam Rezaie, Islamic Azad University, Iran, 2012), The user satisfaction model of KANO is a combination of quality

management and marketing technique to be used for measuring client happiness and fulfillment. KANO's model of user satisfaction distinguishes six categories of quality attributes given. According to (*School of Industrial Engineering, Islamic Azad University, South Tehran Branch and Tehran, Iran, 2017*), Kano integration and QFD is based on the Kano model of CS, and therefore acquires the user needs by using QFD. Products and services with good quality in order to resolve user expectations and satisfaction levels should be increased by this method. The model is used to design and develop innovative products by using the Kano model then the method of QFD is proposed. Kano model help to project team members to diagnose a variety of user needs to understand the basic needs of creative reach. The careful analysis of user needs in the QFD process used to work through the product managers and team projects for creation and understanding of the work process of a new product or new version of a product. The results of the analysis according to the Kano model and QFD between users' needs and technical correlation matrix has significant positive effects on product quality and innovation in an attractive manner for users in producing product.

According to Kano models, people expect that the produced goods satisfy three types of their fundamental needs, that is, fundamental, performance and encouraging needs. Kano et al suggested that in design planning, companies should identify their users' operation and different forms of their demands and then improve the manufactured goods with perform.

As per study made by (*Desai, 2015*), Kano pointed out on how it is important to find each attribute performance impacts on satisfaction. Also he said that all product or service attributes have same role in satisfying user (users) needs. Kano developed foundation for an approach on "Attractive Quality Creation" which is commonly referred as the "Kano Model" and then challenged traditional User Satisfaction Models that "More is better", i.e. the more someone can perform on each service attribute the more he or she satisfies the users (users). Explained the way Kano model introduced the theory of attractive quality, which proposed several perceived quality attributes on the basis of the relationship between the degrees of fulfilment of a quality attribute and user satisfaction with the quality attribute. This model has been extensively applied as a useful tool for understanding the users' needs and meeting their satisfactions.

## 2.1. Conceptual Frame Work

The conceptual framework for the "user satisfaction of kitchen cabinets used by households living in condominiums in Addis Ababa" can be structured around various dimensions that influence user satisfaction. These dimensions may include the design of the kitchen cabinets, the functionality and organization they offer, the quality of materials used, and the overall user experience. As stated by JD, US (2021), Kitchen Cabinets Satisfaction provide valuable insights into the determinants of user satisfaction with kitchen cabinets, which can inform the conceptual framework.

In this context, the independent variables may encompass factors such as the design, material quality, and functionality of the kitchen cabinets, while the dependent variable would be the user satisfaction with the cabinets. The relationship between these independent and dependent variables can be explored using regression models, as demonstrated in studies on factors affecting user satisfaction.

By integrating insights from existing research and industry studies, the conceptual framework for the user satisfaction of kitchen cabinets can provide a comprehensive understanding of the factors that contribute to user satisfaction in the specific context of households living in condominiums. This, in turn, can inform the development of tailored solutions that meet the unique needs and preferences of users in this setting.

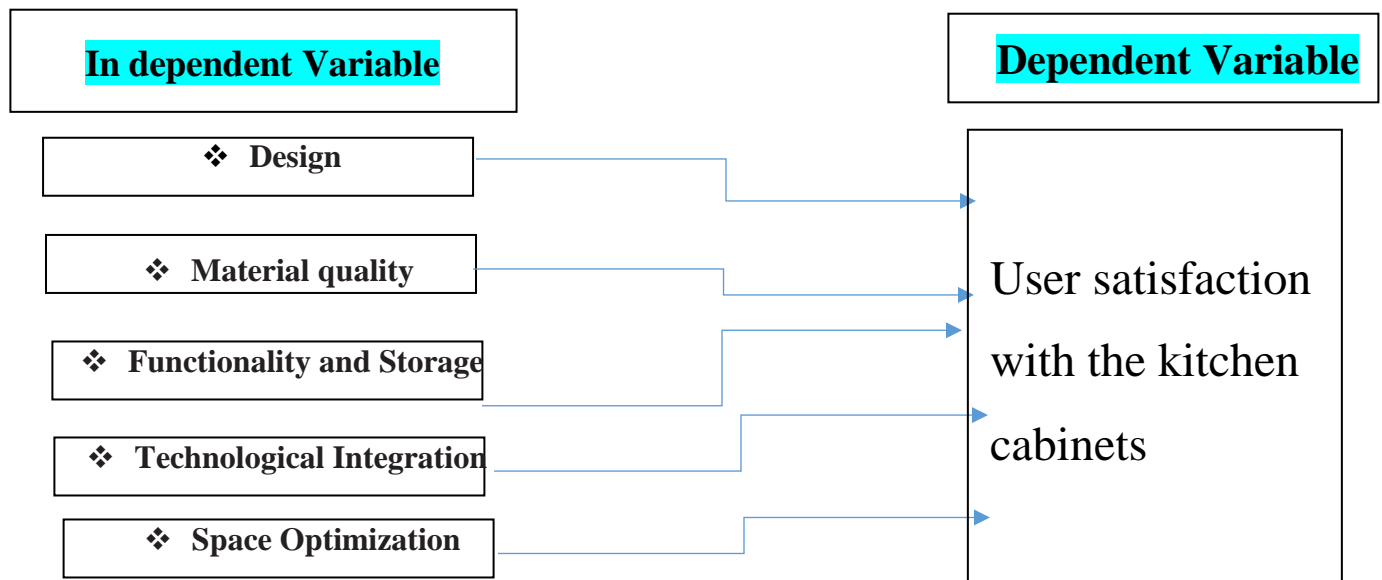


Figure 3. Conceptual Frame Work

## CHAPTER THREE

### 3. RESEARCH METHODOLOGY

#### 3.1. Study Area

The study is conducted in the Addis Ababa sub-cities of Bole, Lideta, and Nefas Silk Lafto. Addis Ababa, the capital and largest city of Ethiopia, is located on a well-watered plateau surrounded by hills and mountains in the geographic center of the country. Addis Ababa is a multicultural city with a mix of different ethnic groups and cultures. The major ethnic groups residing in the city include Oromo, Amhara, Gurage, Tigray, and various others. The city also attracts a significant number of international residents and expatriates.

The nation's capital and principal center of commerce is Addis Ababa. With 3,384,569 people overall, Addis Ababa is the largest city in the nation in terms of population, according to the 2007 census. The city's population is estimated to be around 5,703,628 in 2024, with a growth rate of 4.45% annually. Addis Ababa is known for its rich cultural heritage and diverse traditions. The city is a melting pot of different cultures and traditions from various regions of Ethiopia. It hosts numerous cultural events, festivals, and celebrations throughout the year, showcasing the vibrant Ethiopian culture. Addis Ababa's economy is diverse, with trade, commerce, manufacturing, and tourism playing significant roles.

Bole, Lideta, and Nefas Silk Lafto are sub-cities within Addis Ababa and have varying household economics based on their location, infrastructure, and demographics. These areas have a mix of residential, commercial, and industrial sectors. Bole, in particular, is known for its bustling commercial activities and is home to the Bole International Airport, making it a major economic hub. Lideta and Nefas Silk Lafto also have their own commercial centers and residential areas.

Addis Ababa is located between latitudes  $8^{\circ} 55'$  and  $9^{\circ} 5'$  North and longitudes  $38^{\circ} 40'$  and  $38^{\circ} 50'$  East. It is located 2400 meters above sea level and has an average temperature of  $16^{\circ}\text{C}$ . The city is the focus of the study since it consumes the most timber in Ethiopia and is home to the majority of the nation's furniture businesses.

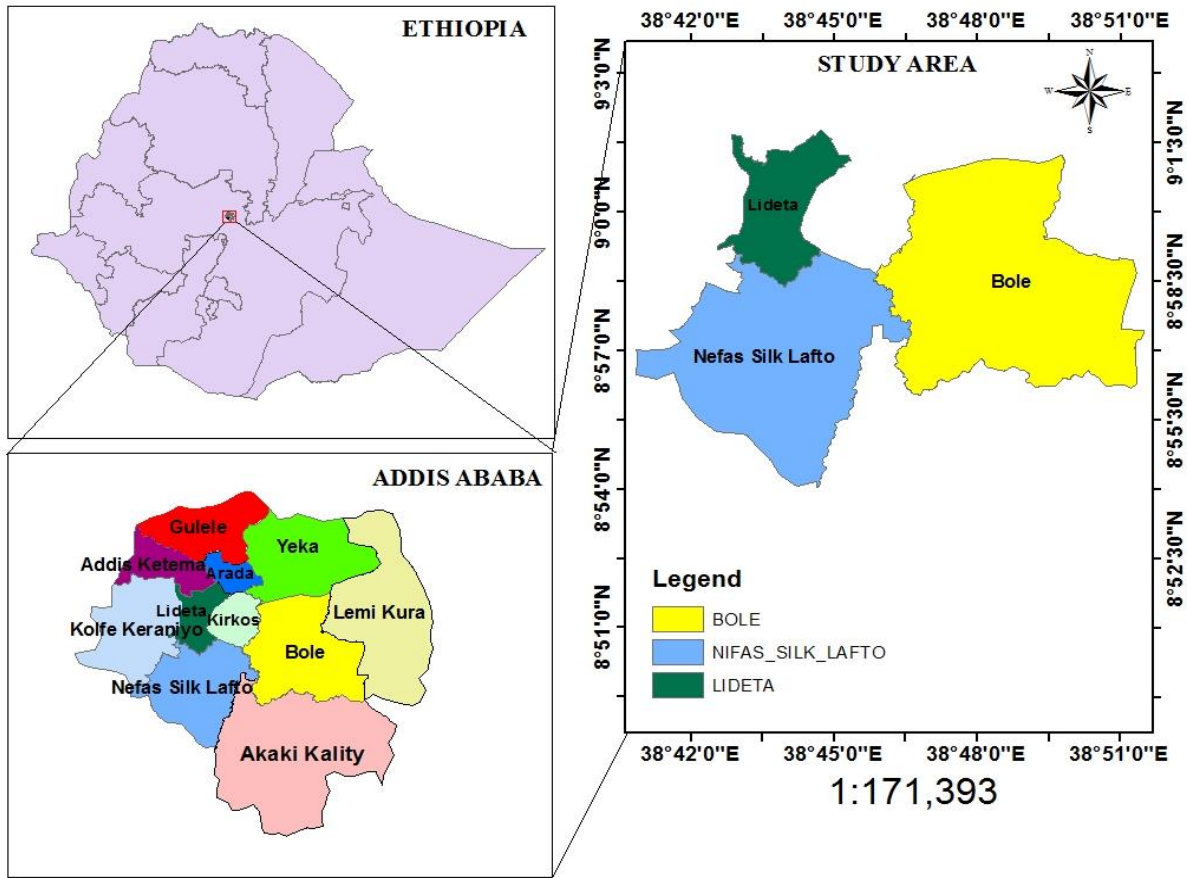


Figure 4: Study Area

### 3.2. Research design and research approach

The study uses a mixed-methods research methodology, combining a descriptive survey design with qualitative data collection methods. The study used a self-administered questionnaire to collect quantitative data on user satisfaction with various aspects of kitchen cabinets, such as design, functionality, material quality, and user experience. The questionnaire was distributed to a stratified random sample of households living in condominiums in Addis Ababa.

### 3.3. Population, Sample Size and Sampling Procedure

#### 3.4.1. Target Population

In this study, "Investigating the user satisfaction of kitchen cabinets used by households living in condominiums in Addis Ababa," the target sample population was 300 households living in condominiums in the Addis Ababa sub-cities of Bole, Lideta, and Nefas Silk Lafto.

### 3.4.2. Sample size determination

The sample size is determined based on the population size and the level of precision required for the study. A sample size of 300 is considered sufficient to provide accurate and reliable results for the study. Addis Ababa city, with sub-cities selected based on criteria such as social, cultural, and demographic representativeness, and the high number of households living in condominiums, is chosen for the study. In 2024, the Addis Ababa city administration restructured the former 11 sub-cities. Since the target population for this study is a survey, the researcher gathers data from households living in condominiums in Addis Ababa. The selected condominium sites in each sub-city include 100 respondents from each: Bole in Gerji site, Lideta in berhan site, and Nefas Silk Lafto in Gofa Mebrat Hail condominiums site. The sample size for households living in condominiums is 300 households overall.

This researcher used simplified formula provided by Yamane, (1967) to determine the required sample size at 95% confidence level, degree of variability = 0.5.

$$n = \frac{N}{1 + N * (e)^2}$$

Where:

n = Desired sample size

N = Total population size

e = Accepted error limit (0.05) on the basis of 95 percent degrees of confidences put into decimal form

$$n = \frac{N}{(1 + N) * (e)^2}$$

$$n = \frac{1,200}{(1 + 1,200) * (0.05)^2}$$

$$n=300$$

According to the information provided, some condominium sites in Addis Ababa can have more than 6,000 households living in a single site. For this research, the researcher selected a sample of households living in condominiums located in the Bole sub-city at the Gerji site, the Lideta sub-city at the berhan site, and the Nefas Silk Lafto sub-city at the Gofa Mebrat Hail condominium site in Addis Ababa.

The researcher used simple random sampling to select the respondents. This involved obtaining the active lists of households living in condominiums in Addis Ababa from the condominium site managers. The selected sample included 100 respondents from each of the following sites: Bole Gerji site, Gofa Mebrat Hail and Lideta berhan site.

Site name	Size of population	Samples
Lideta berhan site	420	100
Bole Gerji	430	100
Gofa Mebrat Hail	350	100
	1,200	300

Table 1stratification of respondents for the study

### 3.3.1. Sampling techniques

The study employs the stratified random sampling technique. This technique involves dividing the population into homogeneous strata based on specific characteristics, such as location or income level, and then randomly selecting a sample from each stratum. This method ensures that the sample is representative of the population and provides accurate results. The strata are based on the location of the condominiums, such as the different sub-cities in Addis Ababa. The sample size of 300 is randomly selected from each stratum to ensure that the sample is representative of the population. By using stratified random sampling, the study ensures that the sample is diverse and representative of the target population, providing accurate and reliable

results for the investigation of user satisfaction with kitchen cabinets used by households living in condominiums in Addis Ababa.

### 3.4. Measurements

#### 3.5.1. Expectation

Respondents were asked to indicate the level of importance (used as a proxy for prior expectations) about the kitchen cabinet product attributes (i.e., design, space optimization, functionality, and aesthetic integration), all of which directly impact the overall satisfaction and usability of kitchen cabinets in condominiums. The variety of cabinet colors/finishes and range of sizes and shapes available; smoothness of drawer slides and strength of cabinet joinery); and also considered when assessing user satisfaction.

Durability of kitchen cabinets was explained by the serviceability (long service time) of the products. Although finishing involves a long process ranging from surface preparation to application of surface coloring and coating, only visual evaluations of appearances such as surface texture, grain patterns, and color of the furniture products were considered in this study. Design details were evaluated based on shape, size, style, dimensional accuracy, and workmanship.

Users were asked to rate the kitchen cabinet product attributes (design, size, layout, materials used, storage capacity, functionality, ease of use, and organization options). The rating was done on the importance of each kitchen cabinet product attribute.

User satisfaction for the assigned kitchen cabinet product was assessed based on fundamental, performance, and exciting attributes according to the Kano model. This section primarily analyzes user satisfaction with the kitchen cabinet product to identify users' desires and problems through the following steps:

1. Identification of Potential Users' Needs and Expectations
2. Development of the 'Kano-questionnaire' based on the Needs and Expectations Listed in the First Step
3. Administering the Kano Survey

#### 4. Interpretation and Evaluation of the Survey Results

Assessing user satisfaction for the assigned kitchen cabinets product based on the Kano model involves understanding the different attribute categories (fundamental, performance, and exciting) and analyzing the measurements and expectations of users. Here is a step-by-step guide on how user satisfaction is assessed using the Kano model:

##### 1. Identify the Attribute Categories

- **Functional Question:** What would you feel if music or video features are **available** in the apps? Answers: “I like it”; “It must be that way”; “I am neutral”; “I can live with it”; “I dislike it”.
- **Dysfunctional Question:** What would you feel if music or video features are **not available** in the apps? Answers: “I like it”; “It must be that way”; “I am neutral”; “I can live with it”; “I dislike it”.

The answers given to functional and dysfunctional questions related to the presentation of different features are then analyzed into answers to the quality category.

By combining the two answers from the paired question, the app's features can be classified as in Table

##### 2. Gather User Feedback and Measurements

- User feedback is collected through methods such as surveys, interviews, or observation.
- Measurements used to assess user satisfaction for each attribute are determined. For example, a Kano questionnaire, satisfaction ratings, or qualitative descriptions.

For example, if the user answers the functional questions, namely "I like it" and dysfunctional questions as “I am neutral”, then the app's feature being questioned is categorized in the "A" or Attractive category

##### 3. Categorize Attributes

- User feedback is reviewed and each attribute is categorized into one of the Kano categories (fundamental, performance, or exciting).
- The user's expressed satisfaction or dissatisfaction with each attribute and its impact on overall satisfaction is considered.

#### 4. Analyze Expectations

- User expectations for each attribute are analyzed. This is done by comparing user feedback to the measurements established in step 2.
- Attributes where user expectations are met, exceeded, or not fulfilled are identified.

#### 5. Assess User Satisfaction

- Based on the Kano model, user satisfaction for each attribute category is assessed:
  - **Fundamental Attributes:** Fulfilling fundamental attributes avoids dissatisfaction, but they don't necessarily lead to high satisfaction.
  - **Performance Attributes:** Higher performance in these attributes leads to higher satisfaction levels.
  - **Exciting Attributes:** Meeting or exceeding expectations in exciting attributes creates a positive effect on satisfaction.

#### 6. Summarize the Assessment

- A summary of user satisfaction for the assigned kitchen cabinets product based on the Kano model is provided.
- The overall satisfaction level for each attribute category (fundamental, performance, exciting) is described based on user expectations and measurements.

The original Kano model considered only two non-linear types of requirements: attractive and must-be. On the other hand, the linearity of the relationship between the (un)fulfillment of a requirement and (dis)satisfaction was explained by a third type of requirement: the so-called one-dimensional requirement (Kano et al. 1984). Later, two more types of requirements were added to the model: reverse and indifferent requirements. Reverse requirements are requirements whose fulfillment causes dissatisfaction in users: this is something that users do

not want. Indifferent requirements are requirements whose fulfillment or unfulfillment does not influence satisfaction or dissatisfaction of users. The last, sixth requirement added to the Kano model is the so-called questionable requirement. This is a controversial or illogical response from respondents, and, in general, this category is not considered valid, or it is recommended to better understand the grounds for such a response.

Thus, the currently valid Kano model consists of the following six categories (Madzík 2018):

- ‘Must-be’ (M): requirements not expressed by the user. Should be met automatically but meeting only these requirements does not lead to satisfaction of the user. This type of requirements presents a certain minimal level of a product or service that must be reached by the organization.
- ‘One-dimensional’ (O): one-dimensional requirements increase satisfaction in a linear way and are usually explicitly expressed by the user. These requirements are of the “standard type”: the user is able to define them even before using the product or service.
- ‘Attractive’ (A): these requirements potentially increase satisfaction but are difficult to identify because they are latent: they tend to fill the user with enthusiasm and exponentially increase his/her satisfaction. They usually amount to a small fraction of the price of a product and their function is to amaze the user.
- ‘Indifferent’ (I): one is not able to state whether these requirements increase or decrease the perceived quality. This type shows a high rate of identification, which was shown in several empirical studies (Lee et al. 2011).
- ‘Reverse’ (R): requirements the user does not want, and if the product meets them, user satisfaction decreases. It may be that some functions/attributes of the product or service go against what the user wants and expects.
- ‘Questionable’ (Q): requirements that the user probably does not understand (he/she states that he/she would be very satisfied if the requirement is met, but also if it is not met). Most studies do not list this category of requirements, since it is not used in subsequent reasoning. Fulfilling these requirements leads to more than proportional satisfaction. If they are not met, however, there is no feeling of dissatisfaction.

The advantages of classifying user requirements by means of the Kano method are very clear:

- Priorities for product development. It is, for example, not very useful to invest in improving must-be requirements which are already at a satisfactory level but better to improve one-dimensional or attractive requirements as they have a greater influence on perceived product quality and consequently on the user's level of satisfaction.
- Product requirements are better understood: The product criteria which have the greatest influence on the user's satisfaction can be identified. Classifying product requirements into must-be, one dimensional and attractive dimensions can be used to focus on.
- Kano's model of user satisfaction can be optimally combined with quality function deployment. A prerequisite is identifying user needs, their hierarchy and priorities. Kano's model is used to establish the importance of individual product features for the user's satisfaction and thus it creates the optimal prerequisite for process oriented product development activities.
- Kano's method provides valuable help in trade-off situations in the product development stage. If two product requirements cannot be met simultaneously due to technical or financial reasons, the criterion can be identified which has the greatest influence on user satisfaction.
- Must-be, one-dimensional and attractive requirements differ, as a rule, in the utility expectations of different user segments. From this starting point, user-tailored solutions for special problems can be elaborated which guarantee an optimal level of satisfaction in the different user segments.
- Discovering and fulfilling attractive requirements creates a wide range of possibilities for differentiation. A product which merely satisfies the must-be and one-dimensional requirements is perceived as average and therefore interchangeable.

To create a Kano survey summary table for assigned product's attributes, I would follow these steps:

1. **Identify the Attributes:** List down all the attributes that were included in the Kano survey for the assigned product.

2. **Collect Data:** Gather the survey responses for each attribute. These responses typically include the classifications: Must-Be (M), One-Dimensional (O), Attractive (A), Indifferent (I), Reverse (R), and Questionable (Q).
3. **Count Frequencies:** Count the absolute frequency of each classification for each attribute. Additionally, you can calculate the relative frequency by dividing the absolute frequency of each classification by the total number of responses for that attribute.
4. **Fill in the Table:** Create a table with the following columns: Attributes, M, O, A, I, R, Q. List each attribute in the first column and fill in the corresponding absolute or relative frequencies for each classification in the respective columns.

Results of the Kano survey need to be summarized using the following Table

Products Attributes	Absolute frequency count or relative frequency					
	M	O	A	I	R	Q
1.						
2.						
3.						
4. ....						

*Table 2: Kano survey summary table for assigned product's attributes*

Frequency of responses for each of the features of the assigned product should be summarized and expressed as percentages (*A=Attractive, O=Performance or one dimensional, M=Must-be, I=Indifferent, R=Rejected/ Reversed, Q=questionable*). The features are expected to have higher share of frequencies of occurrences in *A, O or M* based on which was classified as Attractive, Performance or Must-be.

Advantages of Kano Analysis include saving time and money, identifying priority areas for feature improvement, grouping best features for development, and increasing user satisfaction. However, the method requires knowing potential features beforehand and may lead to lengthy surveys if many features are tested

The Kano method is a powerful tool for understanding user needs, evaluating product features, and creating a roadmap for product development. It can be applied at any stage of a product's life cycle and helps align product features with market demands, ultimately leading to higher user satisfaction and a competitive edge in the market

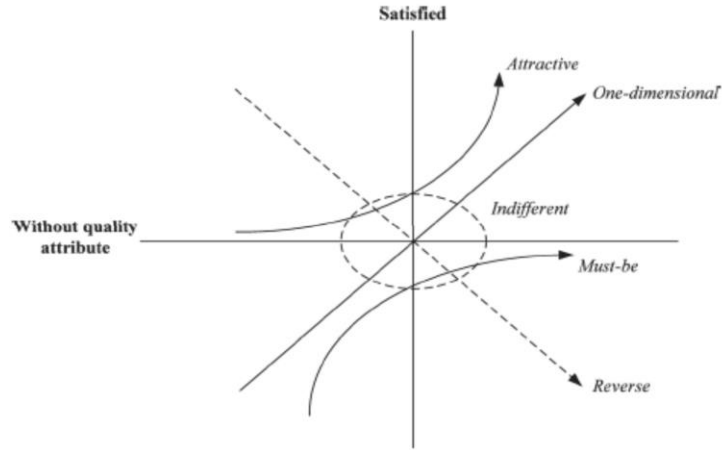


Figure 5: Two-dimensional quality model of Kano

### 3.5.2. Product performance

Respondents were asked to assess the kitchen cabinets product attributes as used in the measurement of expectations. The question was prepared to measure the performance of the products after using the kitchen cabinets and asked the users how satisfied they are with its performance regarding the design, size, layout, materials used, storage capacity, functionality, ease of use, and organization options.

### 3.5.3. Expectation Fulfillment

Expectation fulfillment is measured as a ratio of relative importance attached to a particular attribute at purchase and the level of performance judged after consumption as described in Kizito et al. (2012). To measure scores for expectation fulfillment, respondents were required to have completed all items intended to measure the two test items (the importance and satisfaction) on the kitchen cabinets product attributes (i.e., design, size, layout, materials used, storage capacity, functionality, ease of use, and organization options).

The expectation and performance evaluation measured can be given using the following formula:

From the users' responses, users' satisfaction coefficients are calculated as the extent of satisfaction and dissatisfaction.

$$\text{Extent of satisfaction} = \frac{A + O}{A + O + M + I}$$

$$\text{Extent of dissatisfaction} = \frac{O + M}{(A + O + M + I) * (-1)}$$

Quality improvement index (QI) will also be calculated for furniture attributes:

$$QI = \text{Relative Importance} * (\text{Evaluation of own furniture} - \text{evaluation of known brand})$$

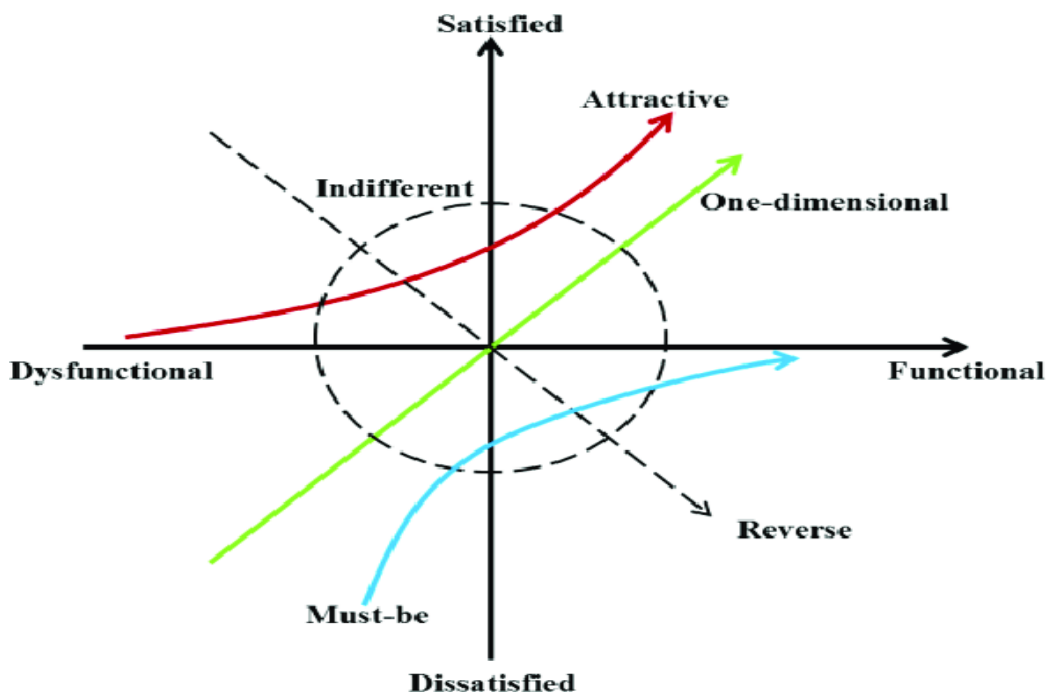


Figure 6: two-dimensional quality model of Kano

Fig below: Presents a graphical illustration of the two-dimensional quality model of Kano. The expectation fulfillment scores of each kitchen cabinets product attribute (design, size, layout, materials used, storage capacity, functionality, ease of use, and organization options) are stated based on percentages and ranked in decreasing order. This ranking is based on whether user expectations of the product attributes are met or not. If the score is equal to or greater than 80%, consumer expectations are judged as met or exceeded. If the score is below 80%, expectations are not met, as stated by Grigoroudis and Siskos (2010) and Kizito (2009). According to these sources, the level of expectation is met when an approximate threshold of 80% is achieved.

### 3.5.4. User Perception on Quality of Kitchen Cabinets

**Table 2.** Kano Evaluation Table

User Requirements		Dysfunctional (Negative Question)				
		I Like it	It must be that way	I am neutral	I can live with it	I dislike it
<b>Functional (Positive Question)</b>	I like it	<b>Q</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>O</b>
	It must be that way	<b>R</b>	<b>I</b>	<b>I</b>	<b>I</b>	<b>M</b>
	I am neutral	<b>R</b>	<b>I</b>	<b>I</b>	<b>I</b>	<b>M</b>
	I can live with it	<b>R</b>	<b>I</b>	<b>I</b>	<b>I</b>	<b>M</b>
	I dislike it	<b>R</b>	<b>R</b>	<b>R</b>	<b>R</b>	<b>Q</b>

Must-be requirement (M), One-dimensional requirement (O), Attractive requirement (A), Indifferent requirement (I), Reverse requirement (R), Questionable requirement (Q)

The quality of kitchen cabinets product attributes (i.e., design, size, layout, materials used, storage capacity, functionality, ease of use, and materials used options) is measured to assess the perception of users on the quality of kitchen cabinets produced by micro and small furniture industries.

*Table 3: KANO Method Evaluation Table*

### 3.5.5. Kano Method Assessment

This stage implements the calculation of better and worse values. Better value indicates the improvement level of user satisfaction on the availability of A&O feature. Meanwhile, worse indicates the decline of user satisfaction on the unavailability of O&M feature. Using the Kano questionnaire (Bandyopadhyay, 2015; Salehzadeh et al., 2015a, b), information about user’s expectations of the desired requirements of product/service is collected, and then evaluated by the Kano evaluation table (Table I). SI indicates to what extent an attribute of product/service influences user satisfaction, and dissatisfaction index (DI) indicates to what extent the lack of attention to an attribute results in dissatisfaction (Chen and Chen, 2015; Huang et al., 2015).

The following is the formulation to calculate better and worse:

$$Better = \frac{A + O}{A + O + M + I} \dots\dots\dots(1)$$

$$Worse = \frac{O + M}{(A + O + M + I) * (-1)} \dots\dots\dots(1)$$

Or

$$SI = \frac{A+O}{A+O+M+I}$$

$$DI = \frac{M+O}{(A+O+M+I)*(-1)}$$

### 3.5.6. Overall Satisfaction

The overall satisfaction of users is quantified by summing across the satisfaction scores of the respondents within the socioeconomic factors for each product attribute (design, size, layout, materials used, storage capacity, functionality, ease of use, and organization options) and then dividing by the number of valid responses.

### 3.5. Data Sources

Primary and secondary data sources are used for this research work. The primary sources are selected from structured surveys among the households living in condominiums in Addis Ababa to directly gather information. In addition, some secondary sources such as journals, official documents, seminar papers, different report papers (monthly, quarterly, and yearly), and websites are also consulted.

### 3.6. Data Gathering Tools

The data gathering tools for this study are the user satisfaction of kitchen cabinets used by households living in condominiums in Addis Ababa, which can include the following:

Both quantitative and qualitative data are used in the study, and the right data gathering tools are required. Questionnaires, interviews, and document analysis are used as the data collection tools. Based on the fundamental inquiries from the study, the literature review, and the theories of kitchen cabinets, such as design, functionality, material quality, installation, and user experience.

Interviews are conducted with a purposive sample of households living in condominiums in Addis Ababa to gain in-depth insights into their experiences and satisfaction with the kitchen cabinets. The interviews are conducted using a semi-structured format to allow for flexibility and exploration of specific topics.

Focus groups are conducted with a purposive sample of households living in condominiums in Addis Ababa to gather insights into the factors that contribute to user satisfaction with kitchen cabinets. The focus groups are conducted in a group setting to encourage discussion and interaction among participants.

Academic research papers related to housing and living conditions in Addis Ababa are reviewed to provide relevant background information for the study.

Reports from the Addis Ababa City Government or other relevant government bodies that contain data on housing and living conditions in condominiums are accessed.

By utilizing a combination of data gathering tools, the study ensures a comprehensive and well-rounded approach to understanding the user satisfaction of kitchen cabinets used by households living in condominiums in Addis Ababa. The structured survey questionnaire provides quantitative data, while interviews and focus groups provide qualitative data, allowing for a more in-depth exploration of the topic.

### 3.7. Data Collection Procedures

The data collection procedures for this study, focusing on user satisfaction with kitchen cabinets used by households living in condominiums in Addis Ababa, involved a mixed-methods approach, incorporating both quantitative and qualitative data collection methods. The following procedures were employed:

A structured survey questionnaire was administered to a stratified random sample of 300 households living in condominiums in Addis Ababa. The questionnaire gathered quantitative data on user satisfaction with various aspects of kitchen cabinets, such as design, functionality, material quality, installation, and user experience based on a carefully prepared Kano questionnaire.

In-depth interviews were conducted with a purposive sample of residents to gain qualitative insights into their experiences and satisfaction with the kitchen cabinets. The interviews were semi-structured to allow for open-ended exploration of specific topics related to user satisfaction.

Focus group discussions were organized with a purposive sample of residents to gather additional qualitative data on the factors that contribute to user satisfaction with kitchen cabinets. The focus groups encouraged interactive discussions among participants, providing rich insights into their experiences.

By employing a combination of structured surveys, interviews, and focus groups, the study ensured a comprehensive and well-rounded approach to understanding the user satisfaction of kitchen cabinets used by households living in condominiums in Addis Ababa. These data collection procedures allowed for the exploration of both quantitative and qualitative aspects of the topic, ultimately contributing to the accuracy and credibility of the study's findings.

### 3.8. Data Analysis Methods

Separate analyses were performed on the raw data that was gathered verbally and statistically. In order to examine the raw data collected through the questionnaire, it was checked, categorized, structured, and grouped in a table according to its features or factors in line with the Kano model. The issues were clarified through necessary discussion and interpretation based on the findings of the analysis. Data gathered through structured questionnaire was processed using SPSS and analyzed using descriptive statistics (frequency, percentage, mean and standard deviation) and inferential statistics (correlation and regression analysis) based on Equations (1) and (2) as well as summarized in Kano tables. Moreover, thematic analysis was used to analyze qualitative data gathered using interviews.

Initially, the sample was collected from 300 respondents, and samples were valid. The descriptive statistics such as percentages, means, frequency distribution, and standard deviations of collected data were summarized in Kano tables and graphs using Excel and SPSS, version 25 software package.

The same software package was used to implement ANOVA. ANOVA was used to carry out and look at variations of user satisfaction across Kitchen Cabinets product attributes, i.e.,

design, size, layout, materials used, storage capacity, functionality, and ease of use, based on wealth group, gender, age, and level of education.

## CHAPTER FOUR

### 4. RESULTS

In this chapter the major findings of the study are presented in two sections. The first section deals with summary of socioeconomic characteristics of the respondents. The second section presents KANO Evaluation results, Users Satisfaction Coefficients Diagram and ANOVA of Pairs of user satisfaction and user dissatisfaction with socio-demographic characteristics of respondents (gender, age, marital status, Family size, home ownership and education level) of respondents so as to assess the overall user's satisfaction.

#### 4.1. Socio-Demographic characteristics of respondents

*Table 3: socio demographic characteristics*

<b>Factor</b>	<b>Frequency Count</b>	<b>Percentage (%)</b>
<b>Gender</b>		
Male	108	36.0
Female	192	64.0
<b>Total</b>	300	100.0
<b>Age (years)</b>		
≤ 18	2	0.7
19-35	194	64.7
36-45	100	33.3
46 -55	4	1.3
<b>Total</b>	300	100.0
<b>Marital status</b>		
Single	99	33.0

<b>Factor</b>	<b>Frequency Count</b>	<b>Percentage (%)</b>
Married	197	65.7
Divorced	2	.7
Widowed	2	.7
<b>Total</b>	300	100.0
<b>Family size</b>		
1 – 5	300	100.0
<b>Total</b>	300	100.0
<b>Home ownership</b>		
Rented	191	63.7
Own home	109	36.3
<b>Total</b>	300	100.0
<b>Educational background</b>		
secondary & preparatory (9-12)	6	2.0
TVET certificate & other certificate	6	2.0
TVET & other diploma	93	31.0
University graduate (1st degree, MSc, PhD)	195	65.0
<b>Total</b>	300	100.0
<b>Year of Living in the condominium</b>		
less than 1 year	87	29.0
1-3 years	179	59.7
4-6 years	16	5.3

<b>Factor</b>	<b>Frequency Count</b>	<b>Percentage (%)</b>
7-10years	10	3.3
more than 10 years	8	2.7
Total	300	100.0
use your kitchen cabinets on a daily basis		
rarely	8	2.7
regularly	4	1.3
frequently	6	2.0
always	282	94.0
Total	300	100.0

According to table 3, a total of 300 subjects were surveyed, and most of them were used for this study. Among the respondents, 36.0% are categorized as "male," representing 108 individuals, and the majority of respondents (64.0%) are categorized as "female," with a total of 192 individuals.

The age groups were categorized as "less than or equal to 18," "19-35," "36-45," and "46-55." The majority of respondents (64.7%) fall into the age group of "19-35," which represents the largest segment of the sample. The second-largest age group was "36-45," consisting of 33.3% of the respondents. The age group "less than or equal to 18" has the smallest percentage of respondents, accounting for only 0.7%. There are very few respondents (1.3%) in the age group "46-55." The cumulative percentages show that the first two age groups, "less than or equal to 18" and "19-35," together account for 65.3% of the respondents.

The marital status of respondent "single": This category represented 33.0% of the total respondents. Out of the 300 respondents, 99 individuals are single. "Married": The majority of respondents, 65.7%, fall into the "married" category. This group consists of 197 individuals.

"Divorced": This category accounts for a very small percentage, with only 0.7% of the respondents falling into this category. There are two individuals who identify as divorced.

"Widowed": Similar to the "divorced" category, the "widowed" category also represents a small percentage of respondents, with 0.7%. There are two individuals who are widowed.

With regard to family size, Category "1-5": The family size of all 300 respondents belonged to this category. The "frequency" column reveals that every respondent has a family size ranging from 1 to 5. In the "Percent" column, it is indicated that 100% of the respondents fall within this category, signifying that the entire sample of 300 respondents has a family size between 1 and 5.

Respondents were categorized based on their home ownership status as renting or owning a home. The majority of respondents "rented": This category represented 63.7% of the total respondents. Out of the 300 respondents, 191 individuals indicated that they are renting their homes, and the remaining respondents, 36.3%, fell into the "own home" category. This group consisted of 109 individuals who stated that they own their homes.

Respondents with educational level of "secondary and preparatory (9–12)" represented 2.0% of the total respondents. Out of the 300 respondents, six individuals completed secondary and preparatory education (grades 9–12). "TVET certificate & other certificate": Similarly, this category also represented 2.0% of the total respondents, with 6 individuals holding TVET (Technical and Vocational Education and Training) certificates or other types of certificates. "TVET and other diplomas": This category accounted for 31.0% of the respondents. Out of the 300 respondents, 93 individuals have completed TVET programs or hold other diplomas and "University graduate (1st degree, MSc, PhD)": The majority of respondents, 65.0%, fell into this category. This group consisted of 195 individuals who have attained a university degree, including bachelor's (1st degree), master's (MSc), or doctoral (PhD) degrees.

Respondents based on the number of years they have been living in a condominium, "less than 1 year": This category represented 29.0% of the total respondents. Out of the 300 respondents, 87 individuals have been living in a condominium for less than 1 year, "1-3 years": The majority of respondents, 59.7%, fall into this category. This group consists of 179 individuals who have

been living in a condominium for 1 to 3 years, "4-6 years." This category accounts for 5.3% of the respondents. 16 individuals have been living in a condominium for 4 to 6 years. "7-10 years": approximately 3.3% of the respondents fall into this category. There are 10 individuals who have been living in a condominium for 7 to 10 years and "more than 10 years." The smallest category represents 2.7% of the total respondents. There are 8 individuals who have been living in a condominium for more than 10 years.

Respondents based on their using kitchen cabinets on a daily basis, "rarely": This category represented 2.7% of the total respondents. Out of the 300 respondents, 8 individuals reported rarely using their kitchen cabinets on a daily basis, "regularly": The "regularly" category represented 1.3% of the respondents. There are 4 individuals who reported using their kitchen cabinets on a daily basis, "frequently": This category accounted for 2.0% of the respondents. There are 6 individuals who reported using their kitchen cabinets frequently on a daily basis and "always." The majority of respondents, 94.0%, fell into this category. This group consists of 282 individuals who reported always using their kitchen cabinets on a daily basis.

A total of 300 filled questionnaires were received from respondents. Table 3 below shows the result according to the “Blauth Formula” and user satisfaction coefficient.

Table 4: KANO Evaluation results

Number of features apps	Kano Category							Blauth Formula		Users Satisfaction Coefficient	
	M	O	A	I	R	Q	Category	O+A+M	I+R+Q	User Satisfaction	Users Dissatisfaction
										$(A+O)/(A+O+M+I)$	$(O+M)/(A+O+M+I)*(-1)$
1	188	16	95	0	0	1	M	299	1	0.371	-0.684
2	188	16	95	0	0	1	M	299	1	0.371	-0.684
3	188	16	95	0	0	1	M	299	1	0.371	-0.684
4	188	16	95	0	0	1	M	299	1	0.371	-0.685
5	188	16	95	0	0	1	M	299	1	0.371	-0.685

6	<b>284</b>	8	6	2	0	0	<b>M</b>	298	2	0.047	-0.982
7	<b>208</b>	90	1	1	0	0	<b>M</b>	299	1	0.303	-0.998
8	<b>188</b>	16	95	0	0	1	<b>M</b>	299	1	0.371	-0.684
9	18	93	<b>183</b>	6	0	0	<b>A</b>	294	6	0.920	-0.378
10	<b>188</b>	16	95	0	0	1	<b>M</b>	299	1	0.371	-0.684
11	<b>188</b>	16	95	0	0	1	<b>M</b>	299	1	0.371	-0.683
12	<b>188</b>	16	95	0	0	1	<b>M</b>	299	1	0.371	-0.683
13	<b>37</b>	4	<b>259</b>	0	0	0	<b>A</b>	300	0	0.877	-0.137
14	<b>37</b>	4	<b>259</b>	0	0	0	<b>A</b>	300	0	0.877	-0.137
15	<b>37</b>	4	<b>259</b>	0	0	0	<b>A</b>	300	0	0.877	-0.137
16	<b>37</b>	4	<b>259</b>	0	0	0	<b>A</b>	300	0	0.877	-0.137
17	32	35	<b>133</b>	67	22	11	<b>A</b>	200	100	0.629	-0.336
18	33	23	<b>143</b>	17	80	4	<b>A</b>	199	101	0.769	-0.282
19	42	16	85	23	<b>112</b>	22	<b>R</b>	143	157	0.608	-0.406
20	<b>115</b>	11	86	13	70	5	<b>M</b>	212	88	0.431	-0.595
21	34	27	<b>141</b>	28	63	7	<b>A</b>	202	98	0.730	-0.303
22	41	21	<b>138</b>	6	93	1	<b>A</b>	200	100	0.772	-0.311
23	33	30	<b>116</b>	37	61	23	<b>A</b>	179	121	0.676	-0.353
24	46	31	<b>89</b>	31	81	22	<b>A</b>	166	134	0.609	-0.465
25	40	36	<b>153</b>	6	62	3	<b>A</b>	229	71	0.804	-0.332
26	32	21	<b>122</b>	44	61	20	<b>A</b>	175	125	0.653	-0.303

27	24	28	<b>166</b>	25	49	8	<b>A</b>	218	82	0.798	-0.239
28	26	28	<b>181</b>	6	55	4	<b>A</b>	235	65	0.867	-0.230
29	17	39	<b>200</b>	34	9	1	<b>A</b>	256	44	0.824	-0.219
30	24	33	<b>188</b>	22	30	3	<b>A</b>	245	55	0.828	-0.233
31	47	25	<b>101</b>	24	82	21	<b>A</b>	173	127	0.640	-0.417
32	33	19	<b>138</b>	20	81	9	<b>A</b>	190	110	0.748	-0.274
33	36	16	<b>127</b>	10	106	5	<b>A</b>	179	121	0.757	-0.291
34	25	31	<b>173</b>	9	60	2	<b>A</b>	229	71	0.857	-0.245
35	32	28	<b>139</b>	20	68	13	<b>A</b>	199	101	0.763	-0.302
36	32	30	<b>149</b>	12	72	5	<b>A</b>	211	89	0.803	-0.294
37	31	24	<b>134</b>	31	66	14	<b>A</b>	189	111	0.718	-0.291
38	27	27	<b>159</b>	20	61	6	<b>A</b>	213	87	0.798	-0.254
39	26	29	<b>153</b>	29	54	9	<b>A</b>	208	92	0.768	-0.265
40	31	25	<b>148</b>	21	60	15	<b>A</b>	204	96	0.769	-0.275
41	61	27	<b>141</b>	28	37	6	<b>A</b>	229	71	0.654	-0.384

Note: **Kano Category** (**A**=Attractive, **O**=Performance or one dimensional, **M**=Must- be, **I**=Indifferent, **R**=Rejected/ Reversed, **Q**=questionable).

According to Table 4: KANO Evaluation results , The table presents the results of the KANO Evaluation for user satisfaction with kitchen cabinets, based on the Blauth Formula and user satisfaction coefficients, obtained from 300 filled questionnaires.

The features are categorized into five KANO categories: Must-be (M), One-dimensional (O), Attractive (A), Indifferent (I), and Reversed (R). The Blauth Formula calculates the combined satisfaction for Must-be, One-dimensional, and Attractive features  $[(A+O)/(A+O+M+I)]$ , while the dissatisfaction is computed for Must-be, One-dimensional, and Reversed features  $[(O+M)/(A+O+M+I)*(-1)]$ .

Must-be features, such as durability and basic functionality (features 1 to 8, 10, 11, and 12), are essential for meeting minimum user expectations, with consistent user satisfaction coefficients around 0.371 and dissatisfaction coefficients around -0.684 to -0.685.

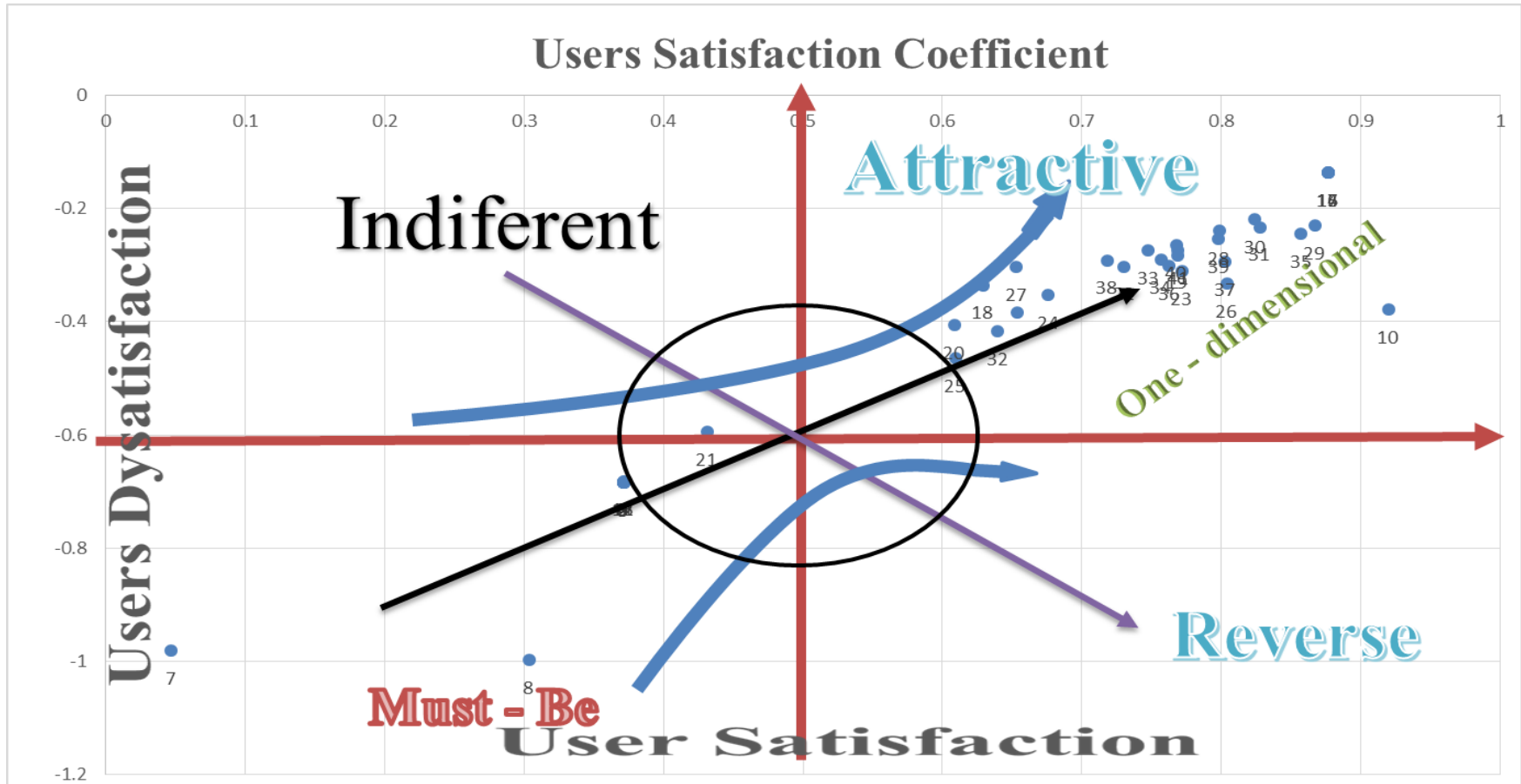
Attractive features (features 9 and 13 to 41) provide satisfaction when fulfilled but do not cause dissatisfaction when absent. These features have high satisfaction coefficients (ranging from 0.608 to 0.877) and lower dissatisfaction coefficients, indicating their value in enhancing user experience.

The Reversed feature (feature 19) may cause dissatisfaction when present, with a satisfaction coefficient of 0.608 and a dissatisfaction coefficient of -0.406, suggesting users might prefer this feature to be absent.

As, features with high satisfaction coefficients (0.8 and above), such as 9, 13 to 18, and 25 to 30, significantly contribute to user satisfaction. Conversely, features with high dissatisfaction coefficients (around -0.7 and above), particularly Must-be features such as 1 to 8, 10, 11, and 12, highlight the necessity of these features in meeting user expectations and avoiding dissatisfaction.

The data underscores the importance of addressing both Must-be and Attractive features to enhance overall user satisfaction with kitchen cabinets. While Must-be features are crucial for meeting basic expectations, Attractive features offer opportunities to delight users and differentiate products in the market.

Figure 7; Users Satisfaction Coefficients Diagram



According to **Figure 7**, The Users Satisfaction Coefficients Diagram shows the relationship between user satisfaction and user dissatisfaction for different Kano model categories.

The diagram indicates that features classified as Indifferent have a user satisfaction coefficient close to 0 and a user dissatisfaction coefficient also close to 0, suggesting that these features do not significantly impact user satisfaction or dissatisfaction.

The Must-be features showed a low user satisfaction coefficient but a high user dissatisfaction coefficient, meaning that the presence of these features does not greatly increase user satisfaction, but their absence can significantly decrease user satisfaction.

In contrast, Attractive features had a high user satisfaction coefficient but a low user dissatisfaction coefficient. This implies that the presence of Attractive features can significantly increase user satisfaction, whereas their absence does not greatly impact user dissatisfaction.

The diagram also shows the Reverse category, which has a negative user satisfaction coefficient and a positive user dissatisfaction coefficient. This suggests that the presence of Reverse features can actually decrease user satisfaction, whereas their absence can increase user satisfaction.

As, the diagram provides a visual representation of how different Kano model categories impact user satisfaction and dissatisfaction, which can inform product development and feature prioritization strategies.

According to **Figure 7**, The Users Satisfaction Coefficients Diagram shows the relationship between user satisfaction and user dissatisfaction for different Kano model categories.

The diagram indicates that The Attractive features in the Kano model provide satisfaction when present but do not cause dissatisfaction when absent. In the Users Satisfaction Coefficients Diagram (Figure 6), these features are characterized by high user satisfaction coefficients and relatively low user dissatisfaction coefficients. These features tend to be located in the upper right quadrant of the diagram, indicating their strong contribution to user satisfaction. Features with high satisfaction coefficients, such as 13, 25, 28, 29, and 30, fall into this category. These features significantly enhance the user experience and are highly valued by users when present.

The diagram also shows One-dimensional features, also known as Performance features, are directly proportional to user satisfaction; the better these features are implemented, the higher the user satisfaction. In Figure 6, these features are spread along a diagonal line from the bottom left to the top right. Features such as 38, 33, and 34 display characteristics of one-dimensional features. These features improve user satisfaction linearly and are important for overall performance.

According to The Coefficients diagram shown on *Figure 7*, Must-be features are the basic requirements that users expect. If these features are absent, users will be highly dissatisfied, but their presence does not significantly increase satisfaction. These features are typically found in the lower left quadrant of the diagram. Features such as 7 and 8 are Must-be features, showing low satisfaction coefficients but high dissatisfaction coefficients. Ensuring the presence of these features is crucial to avoid user dissatisfaction.

As The Coefficients diagram to Figure 7, Indifferent features neither increase satisfaction when present nor cause dissatisfaction when absent. These features are generally located near the origin of the diagram, indicating minimal impact on user satisfaction. Features such as 21 and 32 are examples of indifferent features. These features are not significant drivers of user satisfaction and can be considered lower priority in design and implementation.

According to The Coefficients diagram shown on *Figure 7*, Reverse features, also known as Rejected features, cause dissatisfaction when present and satisfaction when absent. In the diagram, these features are situated in the lower right quadrant. Feature 19, for example, is categorized as a Reverse feature. This suggests that users prefer this feature to be absent as its presence negatively impacts their satisfaction.

The diagram also shows the Reverse category, which has a negative user satisfaction coefficient and a positive user dissatisfaction coefficient. This suggests that the presence of Reverse features can actually decrease user satisfaction, whereas their absence can increase user satisfaction.

As The Users Satisfaction Coefficients Diagram (Figure 7) effectively categorizes the features of kitchen cabinets in condominiums in Addis Ababa using the Kano model. Attractive features significantly boost user satisfaction, one-dimensional features enhance performance linearly, Must-be features are essential to meet basic user expectations, indifferent features have minimal impact, and reverse features should be avoided to prevent user dissatisfaction. By focusing on these categorizations, designers and manufacturers can prioritize feature implementations to maximize user satisfaction and improve the overall user experience.

Table 5; ANOVA

<b>ANOVA</b>						
		Sum of Squares	df	Mean Square	F	Sig.
The design of the kitchen cabinets is visually appealing.	Between Groups	37.109	2	18.555	132.514	.000
	Within Groups	41.446	296	.140		
	Total	78.555	298			
The kitchen cabinets provide ample storage space.	Between Groups	14.614	2	7.307	62.955	.000
	Within Groups	34.356	296	.116		
	Total	48.970	298			
The materials used for the kitchen cabinets are of poor quality.	Between Groups	74.091	2	37.046	95.776	.000
	Within Groups	114.879	297	.387		
	Total	188.970	299			
The kitchen cabinets are difficult to operate and use.	Between Groups	120.070	2	60.035	125.287	.000
	Within Groups	142.317	297	.479		
	Total	262.387	299			
Overall, I am satisfied with the kitchen cabinets.	Between Groups	3.404	2	1.702	1.187	.307
	Within Groups	425.983	297	1.434		
	Total	429.387	299			
I am very satisfied with the kitchen cabinets.	Between Groups	8.316	2	4.158	2.168	.116
	Within Groups	567.731	296	1.918		
	Total	576.047	298			

Based on the ANOVA table provided, here is the explanation of the "Within Groups" and the groups in the analysis:

- The design of the kitchen cabinets is visually appealing.

Between Groups: This represents the variation in the "visually appealing" scores between the different groups or factors being compared (likely different types of kitchen cabinets or different user groups).

Within Groups: This represents the variation in the "visually appealing" scores within each individual group or factor. In other words, this is the variation among the individual responses within each group.

The total variation is partitioned into the variation between the groups and the variation within the groups.

- The kitchen cabinets provide ample storage space.

This ANOVA table follows the same structure as the first one, with the "Between Groups" representing the variation in "ample storage space" scores between the different groups, and the "Within Groups" representing the variation within each group.

- The materials used for the kitchen cabinets are of poor quality.

Again, the "Between Groups" represents the variation in "poor quality" scores between the different groups, and the "Within Groups" represents the variation within each group.

The kitchen cabinets are difficult to operate and use.

The interpretation is the same as the previous examples, with the "Between Groups" capturing the variation in "difficult to operate" scores between groups, and the "Within Groups" capturing the variation within each group.

- Overall, I am satisfied with the kitchen cabinets.

For this measure of overall satisfaction, the "Between Groups" represents the variation in satisfaction scores between the different groups, and the "Within Groups" represents the variation in satisfaction scores within each group.

- I am very satisfied with the kitchen cabinets.

This follows the same interpretation as the previous satisfaction measure, with the "Between Groups" capturing the variation in "very satisfied" scores between groups, and the "Within Groups" capturing the variation within each group.

As , the "Within Groups" term represents the variation in the dependent variable (e.g., cabinet design, storage, quality, usability, satisfaction) within each of the groups or factors being compared. This is in contrast to the "Between Groups" term, which captures the variation in the dependent variable between the different groups or factors.

According to Table 5; The ANOVA analysis presented in the table provides insights into the perceptions and satisfaction levels of users regarding the kitchen cabinets.

The first row of the table examines the visual appeal of the kitchen cabinets. The results show a significant difference between groups ( $F(2, 296) = 132.514, p < .001$ ), indicating that users have varying perceptions of the visual appeal of the cabinets. This suggests that the design of the kitchen cabinets has a significant impact on users' satisfaction.

The second row focuses on the storage space provided by the kitchen cabinets. The ANOVA results reveal a significant difference between groups ( $F(2, 296) = 62.955, p < .001$ ). This suggests that users' perceptions of the storage capacity of the cabinets vary, and this factor plays a crucial role in their overall satisfaction.

The third row examines the quality of the materials used for the kitchen cabinets. The analysis indicates a significant difference between groups ( $F(2, 297) = 95.776, p < .001$ ). This finding suggests that the quality of the materials used in the cabinets is an important factor in users' perceptions and satisfaction.

The fourth row explores the ease of operation and use of the kitchen cabinets. The ANOVA results demonstrate a significant difference between groups ( $F(2, 297) = 125.287, p < .001$ ). This suggests that the usability and functionality of the cabinets have a considerable impact on users' overall satisfaction.

Interestingly, the last two rows of the table show no significant differences between groups for overall satisfaction ( $F(2, 297) = 1.187, p = .307$ ) and very satisfied ( $F(2, 296) = 2.168, p = .116$ ) with the kitchen cabinets. This indicates that while specific aspects of the cabinets, such as visual appeal, storage space, material quality, and ease of use, may vary in users' perceptions,

the overall satisfaction with the kitchen cabinets does not differ significantly between the groups.

These findings highlight the importance of understanding and addressing the various factors that contribute to users' perceptions and satisfaction with kitchen cabinets. By focusing on improving the design, storage capacity, material quality, and usability of the cabinets, manufacturers and designers can enhance the overall user experience and satisfaction.

## CHAPTER FIVE

### 5. DISCUSSION AND INTERPRETATION OF THE RESULTS

#### 5.1. Introduction

This study aimed to achieve four specific objectives: identifying the key factors contributing to user satisfaction with kitchen cabinets in condominiums in Addis Ababa; assessing user satisfaction levels regarding design, functionality, material of construction, and technology integration; exploring the challenges and limitations faced by households; and providing recommendations for improving the user centricity of kitchen cabinets based on the findings. Results obtained in attaining each of the objectives are presented in subsequent sections.

#### 5.2. Socio-Demographic Characteristics of Respondents

The socio-demographic characteristics of the respondents offer valuable context for understanding the study's results. The majority of respondents were female (64%), while males constituted 36%, reflecting perhaps a greater involvement of females in kitchen-related issues. Age-wise, a significant portion of respondents were aged 19-35 years (64.7%), followed by those aged 36-45 years (33.3%). This younger demographic may indicate a trend of younger families or individuals living in condominiums.

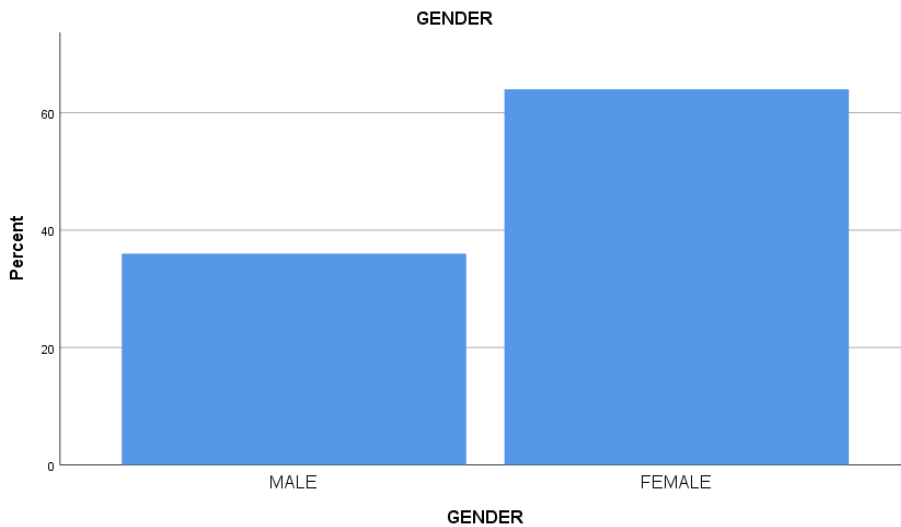
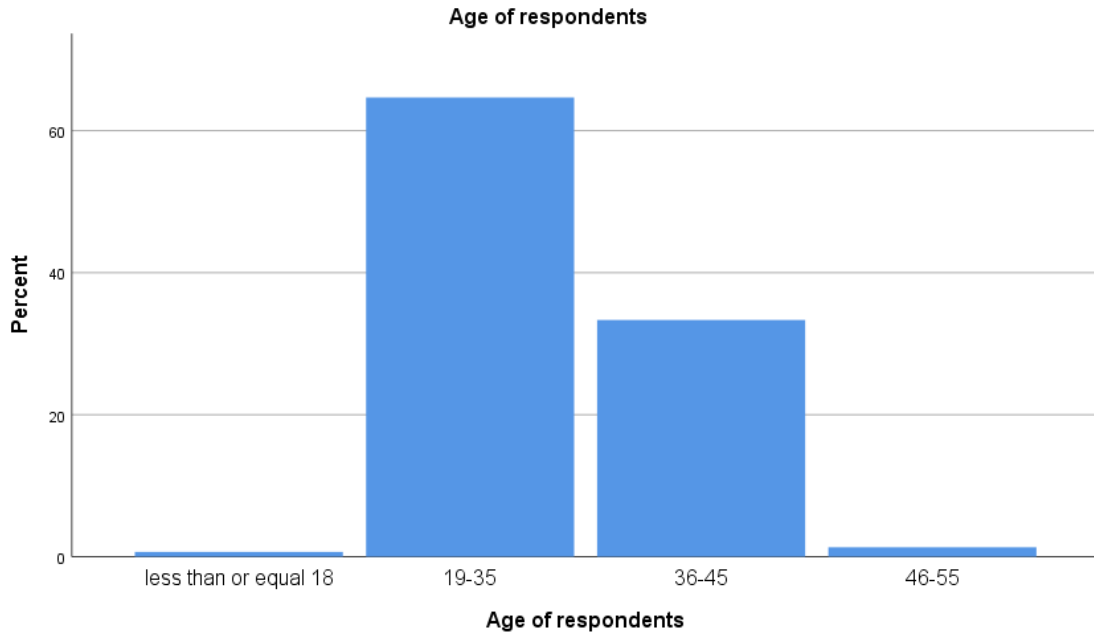


Figure 8 age of respondents and genders

Most respondents were married (65.7%), with singles making up 33%, suggesting that family needs influence decisions regarding kitchen cabinets. All respondents reported family sizes between 1-5 members, indicating that small to medium-sized families are the typical residents of these condominiums. Home ownership data showed that a larger portion of respondents

rented their homes (63.7%) compared to those who owned them (36.3%), which could influence satisfaction levels due to differences in customization freedom.

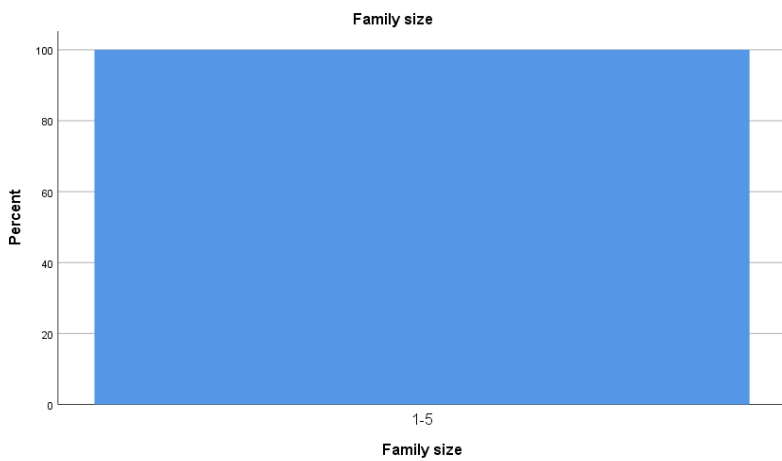
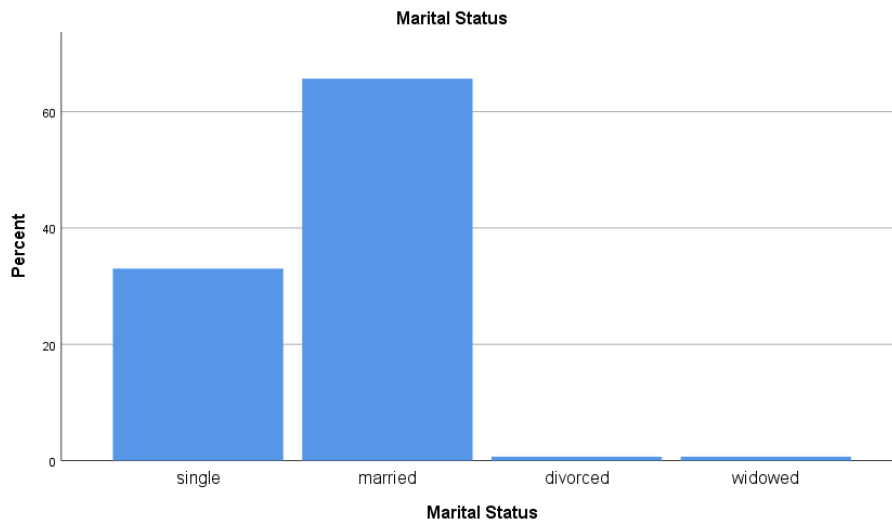
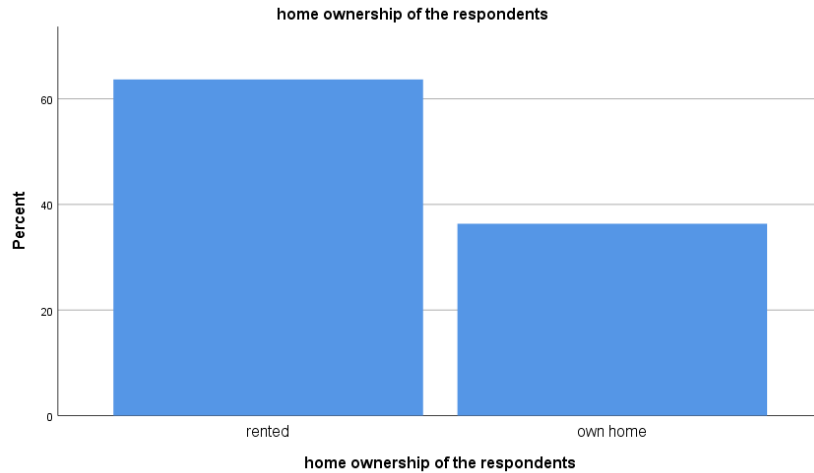


Figure 9 marital status and family size



As The educational background of respondents was mostly university graduates (65%), indicating a relatively high level of education, potentially correlating with higher expectations for kitchen cabinet features and quality. Regarding the duration of residence, the majority had lived in their condominium for 1-3 years (59.7%), followed by those who lived there for less than a year (29%), suggesting that their satisfaction and expectations might be influenced as they adapt to their new living environment. Finally, a vast majority of respondents (94%) reported always using their kitchen cabinets, underscoring the importance and frequent utilization of these cabinets in daily life.

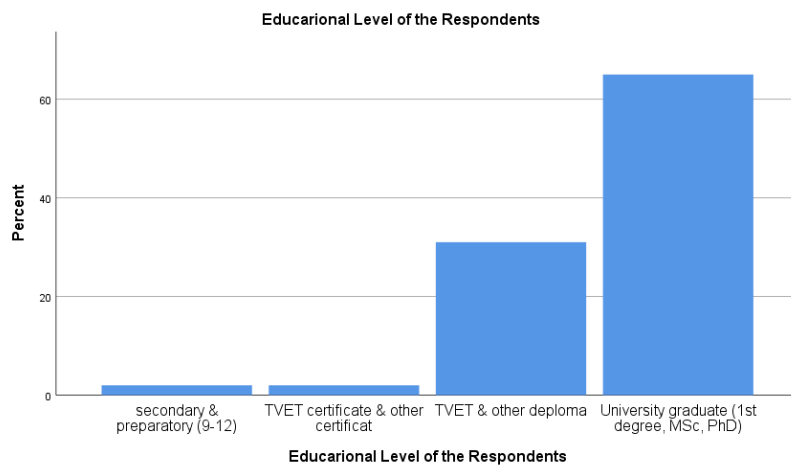


Figure 10 educational level of the respondents

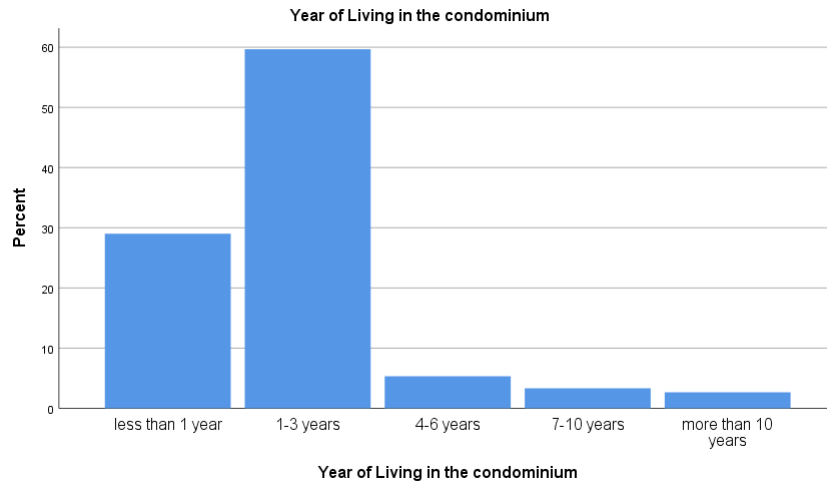


Figure 11 year of living in the condominium



Figure 12 use of the kitchen cabinets

The socio-demographic data provides a foundational understanding that helps interpret the results of the study's specific objectives. The high usage of kitchen cabinets (94% always use) highlights the importance of factors such as durability, ease of use, and functionality. The younger, educated families suggest a demand for modern, well-designed, and possibly technology-integrated cabinets. Given the high frequency of usage, both design and functionality are crucial for satisfaction, and any shortcomings could significantly impact overall satisfaction due to the cabinets' integral role in daily routines.

Challenges identified include the potential limitations renters (63.7%) might face in customizing and personalizing their kitchen cabinets, potentially leading to lower satisfaction levels compared to homeowners. Additionally, the newer residents (less than 3 years) might still be adjusting to their cabinets, influencing their perceptions and satisfaction levels.

To enhance user satisfaction, the focus should be on ensuring that kitchen cabinets are durable, functional, and easy to use. For renters, offering modular or customizable solutions could address some of their limitations. Incorporating modern designs and technology that appeal to the educated, younger demographic would likely improve satisfaction. Given the high usage of cabinets, regular maintenance and upgrades could also help maintain user satisfaction over time.

The socio-demographic characteristics highlight the importance of kitchen cabinets in the daily lives of condominium residents in Addis Ababa. The data suggests that while functionality and design are critical, addressing the specific needs and challenges of renters and newer residents can significantly enhance user satisfaction. By focusing on durable, modern, and customizable solutions, manufacturers and designers can better meet the expectations of this diverse and dynamic user base.

### 5.3. KANO Evaluation and Interpretation of the Results

The data collected from 300 respondents regarding the user satisfaction with kitchen cabinets in condominiums in Addis Ababa has been analyzed using the Kano model and the Blauth Formula. Here, we will discuss and interpret the results shown in Table 3.

According to the results, the data collected from 300 respondents regarding user satisfaction with kitchen cabinets in condominiums in Addis Ababa was analyzed using the Kano model and the Blauth Formula. The Kano model categorizes features into Must-be (M), One-dimensional (O), Attractive (A), Indifferent (I), and Reverse (R) categories, while user satisfaction and dissatisfaction coefficients help assess each feature's contribution to user satisfaction.

As Key insights reveal that Must-be (M) features, such as features 1, 2, 3, 4, 5, 6, 7, 8, 10, 11, and 12, are essential for basic functionality and meeting minimum user expectations. These features have consistent user satisfaction coefficients of 0.371 and dissatisfaction coefficients around -0.684. Attractive (A) features, such as features 9, 13, 14, 15, 16, 17, 18, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, and 41, provide satisfaction when fulfilled but do not cause dissatisfaction when absent. These features have high satisfaction coefficients (e.g., feature 13 with 0.877) and lower dissatisfaction coefficients, indicating their value in enhancing user experience. Feature 19, categorized as Reverse (R), and might cause dissatisfaction when present, with a satisfaction coefficient of 0.608 and a dissatisfaction coefficient of -0.406, suggesting users might prefer this feature to be absent.

Assessing the level of user satisfaction using the Blauth Formula, it is evident that features with high satisfaction coefficients (0.8 and above), such as 9, 13, 14, 15, 16, 25, 28, 29, and 30, significantly contribute to user satisfaction. On the other hand, features with high dissatisfaction coefficients (around -0.7 and above), particularly Must-be features such as 1, 2, 3, 4, 5, and 10, highlight the necessity of these features in meeting user expectations and avoiding dissatisfaction.

Challenges and limitations identified include the fact that while Must-be features are critical, they have lower satisfaction coefficients compared to Attractive features. This indicates that users expect these features to be present, but their fulfillment does not significantly enhance satisfaction, whereas their absence greatly affects user experience. Ensuring the presence of Must-be features is crucial, but focusing solely on these will not significantly improve overall satisfaction. Attractive features offer more opportunities for increasing user satisfaction but must be balanced against Must-be requirements to avoid dissatisfaction.

Based on these findings, recommendations for improving user satisfaction with kitchen cabinets in condominiums in Addis Ababa include focusing on Must-be features to avoid dissatisfaction, investing in Attractive features to boost overall user satisfaction, avoiding features categorized as Reverse, and adopting a balanced approach that ensures Must-be features while progressively incorporating Attractive features based on user preferences and trends. By addressing these

recommendations, the user centricity of kitchen cabinets in Addis Ababa condominiums can be significantly improved, leading to higher user satisfaction and a better overall user experience.

#### 5.4. Users Satisfaction Coefficients Diagram

The study set out to achieve four specific objectives: identify the key factors contributing to user satisfaction with kitchen cabinets in condominiums in Addis Ababa; assess user satisfaction levels regarding the design, functionality, material of construction, and integration of technology in these cabinets; explore the challenges and limitations faced by households living in condominiums; and provide recommendations for improving the user centricity of kitchen cabinets based on the study's findings.

According to the Figure 6, the Users Satisfaction Coefficients Diagram, categorizes various features of kitchen cabinets based on user satisfaction and dissatisfaction. The diagram is divided into five sections: Must-Be, One-Dimensional, Attractive, Indifferent, and Reverse. Each section helps in understanding how different features influence user satisfaction.

The Must-Be features are fundamental and expected. Their absence leads to significant dissatisfaction, but their presence does not significantly increase satisfaction. One-Dimensional features lead to increased satisfaction when present and decreased satisfaction when absent. Attractive features are not expected but can greatly enhance satisfaction when present. Indifferent features do not significantly impact satisfaction or dissatisfaction. Reverse features cause dissatisfaction when present and satisfaction when absent.

The diagram provides insights into the impact of various kitchen cabinet features on user satisfaction. Based on the responses from 300 filled questionnaires, several key points emerge.

Must-Be features, such as durability and basic functionality, are critical. Their absence can lead to high dissatisfaction, highlighting their importance. Ensuring these features are always present can prevent significant user dissatisfaction. One-Dimensional features, including ease of use, storage capacity, and aesthetic appeal, significantly affect user satisfaction. Enhancing these aspects can directly improve user satisfaction.

Attractive features, like advanced technology integration and innovative design elements, delight users when present but do not cause dissatisfaction when absent. Introducing such features can significantly boost user satisfaction and differentiate the product. Indifferent features do not have a significant impact on satisfaction or dissatisfaction, allowing for better resource allocation by focusing less on these aspects. Reverse features decrease satisfaction when present, so identifying and minimizing or eliminating these aspects is crucial to prevent user dissatisfaction.

The socio-demographic characteristics of the respondents provide additional context. Most respondents were female (64%) and aged between 19-35 years (64.7%), suggesting a younger, possibly more tech-savvy demographic with higher expectations for modern, well-designed, and functional kitchen cabinets. Additionally, 65% of respondents had a university education, indicating a demand for high-quality and innovative features.

Challenges faced by renters (63.7%) in customizing their kitchen cabinets highlight the need for flexible and adaptable designs. The frequent use of kitchen cabinets (94% always use) underscores the importance of ensuring durability and ease of use, as these factors directly impact daily life.

Based on the findings, several recommendations can be made to improve the user centricity of kitchen cabinets in condominiums in Addis Ababa. Firstly, ensure all Must-Be features are present to prevent significant dissatisfaction by guaranteeing basic functionality, durability, and essential storage needs. Secondly, focus on enhancing One-Dimensional features like ease of use, storage capacity, and aesthetic appeal to increase user satisfaction.

Thirdly, incorporate Attractive features such as innovative designs and technology integrations that can delight users and differentiate the product. Fourthly, minimize resources allocated to Indifferent features, as they do not significantly impact user satisfaction. Lastly, identify and reduce Reverse features that cause dissatisfaction when present.

By addressing these areas, manufacturers and designers can better meet the expectations of the diverse and dynamic user base, ultimately enhancing the overall user experience with kitchen cabinets in condominiums.

## 5.5. ANOVA Results Interpretation

The study was conducted with four specific objectives in mind. Firstly, it aimed to identify the key factors contributing to user satisfaction with kitchen cabinets in condominiums in Addis Ababa. Secondly, it sought to assess the level of user satisfaction with various aspects such as design, functionality, material of construction, and the integration of technology in these kitchen cabinets. Thirdly, it aimed to explore the challenges and limitations faced by households living in condominiums when it comes to kitchen cabinets. Finally, it intended to provide recommendations for improving the user centricity of kitchen cabinets based on the findings of the study.

### **ANOVA Results Interpretation**

#### **Table 5: ANOVA Results**

The ANOVA table evaluates the differences in user satisfaction across various aspects of kitchen cabinets. The significant F-values and associated p-values (Sig.) for most items indicate considerable differences in user satisfaction among different groups.

#### 5.5.1. The design of the kitchen cabinets is visually appealing.

The ANOVA results for the visual appeal of kitchen cabinets show a significant difference ( $p < .001$ ) among different groups. The Sum of Squares between groups is 37.109, with a Mean Square of 18.555, and an F-value of 132.514. This indicates that the design element is crucial for user satisfaction, with varying preferences for visual appeal across different demographic groups.

#### 5.5.2. The kitchen cabinets provide ample storage space.

For the storage space provided by the kitchen cabinets, the significant F-value ( $p < .001$ ) suggests notable differences in user satisfaction across different groups. The Sum of Squares between groups is 14.614, with a Mean Square of 7.307, and an F-value of 62.955. Adequate storage is a critical factor influencing overall satisfaction with kitchen cabinets.

### 5.5.3. The materials used for the kitchen cabinets are of poor quality.

The ANOVA results show a significant difference ( $p < .001$ ) in perceptions of material quality used in the kitchen cabinets. The Sum of Squares between groups is 74.091, with a Mean Square of 37.046, and an F-value of 95.776. This implies that material quality is a significant factor affecting user satisfaction and should be a primary focus for improvement.

### 5.5.4. The kitchen cabinets are difficult to operate and use.

The results indicate a highly significant difference ( $p < .001$ ) in user experiences regarding the operability and ease of use of the kitchen cabinets. The Sum of Squares between groups is 120.070, with a Mean Square of 60.035, and an F-value of 125.287. Ease of use is a critical factor for user satisfaction.

### 5.5.5. Overall, I am satisfied with the kitchen cabinets.

The ANOVA results for overall satisfaction with the kitchen cabinets show no significant difference ( $p > .05$ ) across groups. The Sum of Squares between groups is 3.404, with a Mean Square of 1.702, and an F-value of 1.187. This may suggest that overall satisfaction is influenced by a combination of factors, making it less sensitive to individual group differences.

### 5.5.6. I am very satisfied with the kitchen cabinets.

For the statement "I am very satisfied with the kitchen cabinets," the results show no significant difference ( $p > .05$ ) among different groups. The Sum of Squares between groups is 8.316, with a Mean Square of 4.158, and an F-value of 2.168. This might indicate that extreme positive satisfaction levels are consistent across different demographic segments.

The analysis reveals that specific aspects like the visual appeal, storage space, material quality, and ease of use significantly affect user satisfaction with kitchen cabinets in Addis Ababa condominiums. These factors demonstrate significant differences in satisfaction levels among different user groups, underscoring the need to address these elements to enhance overall user satisfaction.

However, the overall and very high satisfaction levels did not show significant differences across groups, suggesting that while specific factors have a notable impact, a holistic approach that considers all critical aspects is necessary to achieve higher user satisfaction.

To improve user satisfaction with kitchen cabinets in condominiums in Addis Ababa, the following recommendations are made:

1. **Design Appeal:** Focus on enhancing the visual appeal of kitchen cabinets to cater to diverse aesthetic preferences.
2. **Storage Optimization:** Ensure ample and efficient storage solutions to meet the varying needs of households.
3. **Material Quality:** Use high-quality materials to improve durability and user perception of the cabinets.
4. **Ease of Use:** Design cabinets that are easy to operate, ensuring that all user demographics can use them comfortably.
5. **Holistic Improvement:** Address all critical aspects comprehensively to enhance overall user satisfaction.

By focusing on these key areas, the design and functionality of kitchen cabinets in Addis Ababa condominiums can be significantly improved, leading to higher user satisfaction.

## CHAPTER SIX

### 6. Conclusion and Recommendations

#### 6.1. Conclusion

The analysis of data collected from 300 respondents revealed new insights into user satisfaction with kitchen cabinets in Addis Ababa regarding their satisfaction with kitchen cabinets in condominiums, revealing several critical insights.

Firstly, a significant majority of the respondents were female (64%), and the predominant age group was 19–35 years old (64.7%), indicating a youthful and likely more tech-savvy demographic. Marital status also played a role, with 65.7% of respondents being married. All respondents had family sizes ranging from 1 to 5 members.

The survey data shows that most respondents rent their homes (63.7%), and the majority have lived in a condominium for 1-3 years (59.7%). Educationally, a substantial portion of respondents (65%) held a university degree, indicating a highly educated sample group.

In terms of kitchen cabinet usage, an overwhelming 94% of respondents reported always using their kitchen cabinets on a daily basis, highlighting the importance of these features in daily life.

The KANO model analysis of user satisfaction with kitchen cabinets indicates that Must-be features, such as durability and basic functionality, are essential for meeting user expectations, but their presence does not significantly increase satisfaction. However, their absence greatly impacts dissatisfaction. Attractive features, such as innovative designs and advanced technology, significantly boost user satisfaction when present but do not cause dissatisfaction when absent. One-dimensional features enhance performance linearly and include ease of use, storage capacity, and aesthetic appeal. Indifferent features, like those that neither increase satisfaction nor cause dissatisfaction, have minimal impact, while Reverse features negatively affect user satisfaction when present.

The ANOVA analysis further underscores the importance of design, storage space, material quality, and ease of use in determining user satisfaction. Significant differences were found in user satisfaction related to these aspects across different groups. Interestingly, overall satisfaction did not differ significantly between groups, indicating that while specific factors may vary in importance, the overall sentiment towards the kitchen cabinets remains relatively uniform.

The analysis of data collected from 300 respondents revealed new insights into user satisfaction with kitchen cabinets. Key factors contributing to satisfaction included visual appeal, storage capacity, material quality, and ease of use. The ANOVA results indicated that these factors significantly influence user satisfaction, with notable differences across different user groups.

## 6.2. Recommendations

Based on the study's findings, the following recommendations are proposed to improve user satisfaction with kitchen cabinets in condominiums in Addis Ababa:

1. **Focus on Must-be Features:** Ensure that basic functionalities such as durability, sufficient storage, and ease of use are consistently met to prevent dissatisfaction. These features are fundamental and their absence can lead to significant user dissatisfaction.
2. **Enhance Attractive Features:** Invest in innovative design elements and technology integrations that can significantly boost user satisfaction. Features such as modern aesthetics, smart storage solutions, and tech-friendly cabinets can differentiate products in the market.
3. **Optimize One-dimensional Features:** Improve the performance-related aspects like storage capacity, usability, and visual appeal, as these factors directly enhance user satisfaction. Tailoring these features to meet the specific needs of the younger, educated demographic can lead to better user experiences.

4. **Minimize Indifferent Features:** Allocate fewer resources to features that do not significantly impact user satisfaction or dissatisfaction. This allows for better focus and investment in areas that matter more to users.
5. **Eliminate Reverse Features:** Identify and avoid features that cause dissatisfaction when present. Understanding user preferences and eliminating unwanted features can prevent negative user experiences.
6. **Design Considerations for Renters:** Given that a majority of respondents are renters, consider designing kitchen cabinets that are adaptable and easy to customize. This flexibility can cater to the needs of renters who may face restrictions in making permanent changes.
7. **Continuous Feedback and Improvement:** Implement mechanisms to gather ongoing user feedback to stay updated on changing preferences and emerging trends. Regularly updating and refining kitchen cabinet designs based on user feedback can ensure sustained user satisfaction.

Manufacturers and designers can greatly enhance the user-centricity of kitchen cabinets in Addis Ababa condominiums by concentrating on these suggestions, which will increase user happiness and improve the user experience overall.

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FDRE TECHNICAL & VOCATIONAL  
TRAINING INSTITUTE

**School of Graduate Studies**  
**Department of WOOD TECHNOLOGY**  
**Questionnaire to be completed by households living in condominiums in**  
**Addis Ababa**

**Dear survey respondents,**

My name is Tesfaye Kora, I am currently studying for my Master's Degree/ Wood Technology at Federal Technical and Vocational Education and Training Institute. I am currently doing my research thesis to be able to complete my Course. I am specializing in Wood Technology options and will therefore to Investigation the user satisfaction of kitchen cabinets used by households living in condominiums in Addis Ababa.

You have been identified as one of the people that could be of assistance with the research and thus request your participation in the research. Essentially; you was required to complete a questionnaire. You will remain anonymous and your responses was treated with the utmost confidentiality. Your response is vital to the outcome of the study. The research is going to be carried out based on your responses and other relevant information that could support it. Your cooperation to respond honestly is very important to this study because it represents in the sample. Please answer all the questions. Space is provided at the end of the questionnaire for you to add any other comments and suggestions. Your information was used only for research purposes and the responses was kept confidential. Thank you in advance for your kind cooperation and dedication for sparing 15 minutes from your precious time to participate in this study.

Sincerely yours,

Tesfaye kora (Email:tesfakora8@gmail.com)

## Appendix I; kitchen cabinets User Satisfaction Survey Questionnaire

A survey questionnaire based on the Quality Function Deployment (QFD) integrated with the Kano Model format for the study of user satisfaction of kitchen cabinets used by households living in condominiums:

### 1. Address (Optional Part)

1.1. Name of respondent \_\_\_\_\_

1.1.1. Phone number \_\_\_\_\_

1.1.2. Town \_\_\_\_\_

1.1.3. Sub city (werda) \_\_\_\_\_

1.1.4. Other name \_\_\_\_\_

### 1.1.5. Condominium Location

#### Part one; - Demographic Information

#### 1. Gender

A, Male

B, Female

c) Prefer not to say

#### 2. Age of respondents

A,  $\leq 18$

D, 46\_\_55

B, 19 - 35

E, above 56

C, 36 - 45

#### 3. Marital status:

A, Single

B, Married

C, Divorced

D, Widowed

#### 4. Family size;

A, 1-5

B. 6-10

C,>10

#### 5. Home ownership of the respondents

A, Rented

B, Own home

6. Educational levels of the respondents:

**A**, No formal education

**D**, TVET Certificate and other certificate

**B**, Primary & junior (1-8 grades)

**E**, TVET and other diploma

**C**, Secondary & preparatory (9-12)

**F**, University graduate (1<sup>st</sup> degree, MSc, PhD)

7. How long have you been living in the condominium?

<b>Year of Living in the condominium?</b>	<b>Response</b>
Less than 1 year	
1-3 years	
4-6 years	
7-10 years	
More than 10 years	

## Section 2: Kano Model Analysis

8. How often do you use your kitchen cabinets on a daily basis?

<b>use your kitchen cabinets on a daily basis</b>	<b>Response</b>
Rarely	
Occasionally	
Regularly	
Frequently	
Always	

Please rate your satisfaction with each kitchen cabinet feature using the Kano Model categories. From number 8 – 13. Use the scale below:

a tick mark (√) in the appropriate block

- ‘Must-be’ (M): requirements not expressed by the user. Should be met automatically but meeting only these requirements does not lead to satisfaction of the user.
- One-dimensional’ (O): one-dimensional requirements increase satisfaction in a linear way and are usually explicitly expressed by the user.
- ‘Attractive’ (A): these requirements potentially increase satisfaction but are difficult to identify because they are latent: they tend to fill the user with enthusiasm and exponentially increase his/her satisfaction.

- ‘Indifferent’ (I): one is not able to state whether these requirements increase or decrease the perceived quality.
- ‘Reverse’ (R): requirements the user does not want, and if the product meets them, user satisfaction decreases.
- ‘Questionable’ (Q): requirements that the user probably does not understand (he/she states that he/she would be very satisfied if the requirement is met, but also if it is not met).

## 9. Design

Products attributes	Absolute frequency count or relative frequency					
	M	O	A	I	R	Q
Aesthetically pleasing design						
Ergonomic design						
Space-saving design						
Other (please specify)						

## 10. Storage Capacity

Products attributes	Absolute frequency count or relative frequency					
	M	O	A	I	R	Q
Sufficient storage space						
Adjustable shelves						
Efficient Storage Capacity						
Other (please specify)						

## 11. Materials Used

Products attributes	Absolute frequency count or relative frequency					
	M	O	A	I	R	Q
High-quality materials						
Durable construction						
Eco-friendly materials						
Other (please specify)						

12. Functionality

Products attributes	Absolute frequency count or relative frequency					
	M	O	A	I	R	Q
Smooth drawer operation						
Easy access to items						
Soft-close doors and drawers						
Other (please specify)						

13. Ease of Use'

Products attributes	Absolute frequency count or relative frequency					
	M	O	A	I	R	Q
User-friendly interface						
Easy-to-reach heights						
Convenient handles and knobs						
Other (please specify)						

Section 3: Overall Satisfaction

Please rate your overall satisfaction with the kitchen cabinets:

14. Overall Satisfaction

Satisfaction Level	Response
Highly Satisfied	
Satisfied	
Neutral	
Dissatisfied	

Section 4: Additional Feedback

15. Please provide any additional comments or suggestions for improving the user satisfaction of kitchen cabinets in condominiums.

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### User's satisfaction

This part of the questionnaire is composed on Kano questionnaire items used to measure your level of user satisfaction of kitchen cabinets used by households living in condominiums. Use the five point's Kano questionnaire given below to appropriately answer the questions that follow by ticking (√) accordingly.

**1= I like it that way, 2= It must be that way, 3= I am neutral 4= I can live with it that way, 5= I dislike it**

### Functional form of the Kano questionnaire

S/NO	Dimensions	Questions	1	2	3	4	5
1	Design	The design of the kitchen cabinets is visually appealing.					
		The design of the kitchen cabinets complements the overall kitchen decor.					
		The design of the kitchen cabinets is modern and trendy.					
		The design of the kitchen cabinets is aesthetically pleasing.					
		The design of the kitchen cabinets enhances the overall kitchen ambiance.					
2	Functionality	The kitchen cabinets provide ample storage space.					
		The kitchen cabinets are well-organized and efficient.					
		The kitchen cabinets have convenient shelving and compartments.					
		The kitchen cabinets offer ease of access to stored items.					
		The kitchen cabinets have functional features that simplify kitchen tasks.					
3	Durability	The materials used for the kitchen cabinets are of poor quality.					
		The kitchen cabinets are prone to damage and wear.					
		The kitchen cabinets are made of durable and long-lasting materials.					
		The kitchen cabinets can withstand daily use and maintain their quality.					

		The kitchen cabinets are built to last and resist wear and tear.					
4	Ease of Use	The kitchen cabinets are difficult to operate and use.					
		It is challenging to find and retrieve items from the kitchen cabinets.					
		The kitchen cabinets have user-friendly features and mechanisms.					
		It is easy to organize and access items stored in the kitchen cabinets.					
		The kitchen cabinets are designed for effortless use and convenience.					
5	Overall Satisfaction	Overall, I am satisfied with the kitchen cabinets.					
		I am generally pleased with the performance of the kitchen cabinets.					
		I have a neutral opinion about the kitchen cabinets.					
		I am satisfied with the kitchen cabinets.					
		I am very satisfied with the kitchen cabinets.					

### Dysfunctional form of the Kano questionnaire

S/NO	Dimensions	Questions	1	2	3	4	5
1	Design	The design of the kitchen cabinets is not visually appealing.					
		The design of the kitchen cabinets does not complement the overall kitchen decor.					
		The design of the kitchen cabinets is not modern and trendy.					
		The design of the kitchen cabinets is not aesthetically pleasing.					
		The design of the kitchen cabinets does not enhance the overall kitchen ambiance.					
		The kitchen cabinets do not provide ample storage space.					
		The kitchen cabinets are not well-organized and efficient.					
		The kitchen cabinets do not have convenient shelving and compartments.					

2	Functionality	The kitchen cabinets do not offer ease of access to stored items.					
		The kitchen cabinets have functional features that simplify kitchen tasks.					
3	Durability	The materials used for the kitchen cabinets are not of poor quality.					
		The kitchen cabinets are not prone to damage and wear.					
		The kitchen cabinets are not made of durable and long-lasting materials.					
		The kitchen cabinets cannot withstand daily use and maintain their quality.					
		The kitchen cabinets are not built to last and resist wear and tear.					
4	Ease of Use	The kitchen cabinets are not difficult to operate and use.					
		It is not challenging to find and retrieve items from the kitchen cabinets.					
		The kitchen cabinets do not have user-friendly features and mechanisms.					
		It is not easy to organize and access items stored in the kitchen cabinets.					
		The kitchen cabinets are not designed for effortless use and convenience.					
5	Overall Satisfaction	Overall, I am not satisfied with the kitchen cabinets.					
		I am not generally pleased with the performance of the kitchen cabinets.					
		I do not have a neutral opinion about the kitchen cabinets.					
		I am not satisfied with the kitchen cabinets.					
		I am not very satisfied with the kitchen cabinets.					

**THANKS YOU IN ADVANCE FOR YOUR COOPERATIONS**

*Thank you for taking the time to complete our survey. Your feedback is invaluable. If you have any further comments or concerns, please feel free to contact us.*

*Sincerely,*