The role of sustainable interior design and its impact on customer’s behavior in commercial environments

Islam Obeidat¹, Saif Obeidat², Sana Abu Rumman³ and Faten Al-Jubouri⁴

¹Associate Professor in Interior & Environmental Design
Department of Design & Applied Arts - Fine Arts College - Yarmouk University – Jordan
islam.o@yu.edu.jo

²Assistant Professor in Interior and Environmental Design
Department of Interior Design – Faculty of Arts - Philadelphia University – Jordan

³MA in Interior Design
Department of Interior Design - Al Ahliyya Amman University - Jordan

⁴MA in Interior Design
Department of Interior Design– Al Ahliyya Amman University – Jordan

Abstract. This study examines the role of sustainable interior design and its impact on customer’s behavior in commercial environments (ex., shopping - touring - entertainment - communication with others) which may raise interior environment quality through design (ex., interior design - sustainable design) and the effect on buildings' performance - efficiency and services (ex., a mall - a restaurant - a shop). The research problem focuses on interior designers’ absence of awareness to know the importance of integrating sustainable design into interior environments which may negatively affect customer behavior (ex., fatigue - stress - illness - chaos), and thus reduce efficiency - performance - and services of commercial environments as a whole (ex., high cost - continuous maintenance - low sales). The main question in this research is to know how sustainable interior design can impact customers behavior in built environment, and thus answering the sub-questions about what the role of sustainable interior design elements in raising the quality of the interior environment of commercial environments functionally and aesthetically. The importance of research comes in providing the public (ex., architects - interior designers - investors - clients) with information about the importance of employing sustainable design in the interior design in commercial environments to raise the performance - efficiency - and services of commercial buildings through improving individuals’ behavior in it. Research objectives focuses on providing tips - instructions - and mechanisms that can be applied during the design process which may improve the quality of the internal environments in commercial buildings by integrating interior design and sustainable design. The research follows the descriptive analytical approach in collecting information through questionnaires - personal interviews - and field visits. Researchers used statistical analysis and analytical tables to analyze the information. Findings confirm that: (1) sustainable interior design plays a positive role in influencing the levels of behavior of customers (example: comfort - luxury - health - safety - privacy) which enhances their positive behavior during the shopping process within commercial environments (example: Satisfaction - increased purchase - revisits) (2) the elements of sustainable interior design (example: colors - lighting - furniture - materials - spatial planning) have an important role in improving the quality - efficiency and effectiveness of the interior environment in commercial buildings (example: functionally - aesthetically) Finally - (3) the sustainable interior design has an active role in raising the performance - efficiency and services of commercial environments (for example low cost - low maintenance - customer attraction - high sales).

Keywords: Sustainable Interior Design, Behavior, Commercial Environments.
1. **Introduction**

Sustainable design reflects the integration of multiple design concepts and systems that contribute to preserving the environment and natural energy sources ensuring the comfort, well-being, health, safety, and privacy of individuals who use internal spaces at the same time, with a focus on its role in saving energy, cutting operating costs, and reducing pollution resulting from the use of non-environmentally friendly materials or non-recyclable materials. The general concept of sustainable interior design expresses a design approach based on the principles and concepts of sustainability so that it is compatible with it, exploits its capabilities, and preserves its resources largely and innovatively (Al-Houti, 2018). Sustainable interior design also plays a direct role in influencing the behavior of individuals within the surroundings of built environments in general, and commercial environments in particular, through the exploitation of sustainable design elements such as colors, lighting, furniture, materials, and spatial planning in the process of interior design for commercial environments, which affects the composition of the interior space as a whole, by employing them scientifically and practically based on the correct understanding and analysis of the components of the interior space to be designed, with the interior designer taking into account the requirements of the target groups of customers and visitors, which in turn contributes to affecting the efficiency of commercial spaces significantly and the quality of the interior design functionally and aesthetically, which works directly in influencing the behavior of customers who are within these commercial environments. Sustainable design always seeks to achieve the best in terms of environmental and economic aspects, which would improve functional values in the design process, and since it considers the environment and its various components, it preserves its beauty and improves the aesthetics of the commercial space as well.

2. **Research problem**

The research problem mainly revolves around the lack of awareness among some interior designers around the importance of integrating sustainable design correctly in the interior design of the components of commercial environments, which contributes to a negative impact on the behavior of customers present within these environments, as sustainable design adds features and characteristics to the interior design of the environments that make it more efficient and effective in general. The failure to exploit these elements leads to a decrease in the efficiency and performance of the services provided in commercial environments. The resulting problems are listed in the following:

1. **Reducing the customer's comfort**: The failure to design the commercial space in the correct manner based on sustainable design that provides comfort to customers and meets their requirements and needs leads to reducing these customers’ sense of comfort, which in turn reduces the efficiency of the commercial environment and works on the loss and failure of its design, whether directly or indirectly.
2. **Detrimental to the customer's well-being**: The failure of interior designers to use sustainable design in commercial environments reduces the customer's sense of required luxury by raising material costs and lowering psychological comfort, resulting in complete dissatisfaction with the commercial environment.
3. **Impact on the health and safety of the customer**: The failure to employ sustainable design in the components of commercial environments plays a negative role in influencing the health and safety of customers within these environments. The use of sustainable, healthy, and safe materials ensures the preservation of the health of the customer with no negative effects.
4. **Reducing customer privacy**: Failure to use sustainable interior design correctly may reduce the privacy that customers feel within the commercial environment. Sustainable design and its various techniques can protect materials from external environmental factors, as well as protect the commercial space from audio pollution, which reduces the feeling of privacy for customers while they are inside the commercial space.

3. **Research questions**

The main question in this research came to know what the role of sustainable design is when employed in interior design, and what is the impact of this on the behavior of customers within commercial environments, where the sub-questions came as follows:
1. What is the role of sustainable interior design elements in raising the functional and aesthetic quality of the interior environment of commercial environments?
2. How can sustainable design and its functional and aesthetic values be used to increase customers’ sense of comfort, luxury, health, safety, and privacy while within the commercial environment?
3. How can elements such as colors, lighting, furniture, materials, and spatial planning be combined with sustainable design in creating a commercial environment with a creative design that serves customers and achieves high-performance efficiency?

4. **Research Objectives**
The objectives of the research study were as follows:

**First objective:** Increasing awareness among some interior designers of the importance of exploiting sustainable design in designing the interior environments for the commercial spaces that are being built, by providing many tips, instructions, and mechanisms that can be applied during the design process, which may improve the quality of the interior environments of those commercial spaces, that’s done by integrating interior design and sustainable design in a creative manner that ensures high-performance efficiency.

**Second objective:** Devise ideas and proposals that will raise the level of the environmental, human, social, and economic performance of commercial environments, by extracting some determinants and elements that are considered as the correct criteria that help in developing the thought of the interior designer in a manner based on the principles of sustainability, to improve the efficiency of commercial spaces and meet the needs and requirements of the occupants of these spaces, taking into account their great role in preserving the surrounding environment.

**Third objective:** Determining the role of sustainable interior design and its multiple techniques in influencing the behavior of customers while they are within the vicinity of the commercial environments they visit, through its role in supporting and enhancing the efficiency of these environments, given the functional and aesthetic values contained in the principle of sustainability that raises the quality of the interior design, which when applied based on sustainability increases the levels of comfort, luxury, health, safety, and privacy that customers feel while they are within the spaces of commercial environments.

5. **Research Significance**
The importance of the research study is to provide the public, including architects, interior designers, investors, and clients, with information about the importance of employing sustainable design in the interior design of commercial environments, to raise the performance, efficiency, and services of commercial buildings, which in turn improve the behavior of the individuals present within them. The following is highlighted:

1. Introducing the reader and the public to the way interior design elements are employed, which are represented by colors, lighting, furniture, materials, and spatial planning in the components of the interior spaces of commercial environments in a manner based on the principles of sustainability, which greatly enriches the functional and aesthetic values of these commercial environments.
2. Indicating the importance of using sustainable design and its various techniques in designing the interior space of commercial environments, as sustainable design plays a major role in raising the efficiency of these spaces and enhancing their design quality, which in turn affects the behavior of customers within the commercial environments they visit.
3. Clarify how interior design based on the principles of sustainability increases the feeling of comfort, luxury, health, safety, and privacy of customers who are within the spaces of commercial environments due to its role in influencing customer behavior positively.

6. **Research Terms**
1. **Interior design:** It is a process of planning and innovation to develop appropriate solutions to all the difficulties facing the interior space in terms of movement and ease of use, including the elements that form the identity of the interior space, which contributes to preparing the space to perform functions with the
least effort possible making it comfortable, calm, and appropriate for all functional and aesthetic criteria and conditions (Al-Farran, 2019).

2. **Sustainable interior design:** It is defined as the process of forming and creating interior spaces by dealing with spaces and their internal components in an environmentally responsible manner, whereby energy consumption and harmful emissions that would compromise environmental security are reduced, through the use of renewable and environmentally friendly materials, and taking advantage of environmental and design treatments that achieve comfort, luxury, health, safety, and privacy within these built spaces (Othman, 2014).

3. **Customer behavior:** Customer behavior is defined as the activities and actions performed within the commercial space the individual occupies, with the aim of being consistent with the goal and purpose for which the inner space was designed (Young, 1999). It is also defined as customer behavior as the behavior of the individual, whether individually or within groups, where the individual deals with the surrounding environment through the behavior that expresses his reactions towards this environment, according to the conditions and factors provided by the environment that directly affect his behavior (Fahmy and Abd Rich, 2015).

4. **Commercial environments:** Commercial environments are defined as those architectural spaces that are formed because of a set of determinants and elements that are organized in a certain way that serves commercial aspects and forms the identity of the commercial space (Abdul Hamid et al., 2019). It is also defined as that area or space in which business operations occur through the gathering of a customer or group of customers in one place (Hajj Hassan and Al Kilani, 2012).

7. **Research Hypotheses**

   **The first hypothesis:** the exploitation of sustainable design and its multiple applications in the interior design of commercial environments has a significant and effective impact on raising the efficiency and performance of these environments, which enhances the quality of interior design in general.

   **The second hypothesis:** the use of sustainable design and its integration with the interior design of commercial environments contributes to creating the greatest impact on the design of a commercial environment with high functional and aesthetic values, which works to achieve the desired goal and purpose of designing commercial environments.

   **The third hypothesis:** using elements like colors, lighting, furniture, materials, and spatial planning in the interior components of commercial environments based on sustainability principles increases customers' sense of comfort, luxury, health, safety, and privacy while they are within these commercial environments.

8. **Research Theoretical framework**

   **First: the concept of sustainable design:**
   Sustainable design is defined as a serious attempt to provide the best results and capabilities for individuals and the natural environment around them, whether in the present or future periods, given that the concept of sustainable design relates to the economic, social, human, and environmental aspects of human society and the natural environment that includes it, which are directly affected by it. Sustainable design is effective and can be studied and observed and is considered an effective way of organizing civilization and human activity so that its members can meet all their needs and requirements and express their maximum energies while preserving natural and biological diversity in the long run, considering the importance of the impact it plays. Sustainable design at all levels of the social system (Morjan, 2013).

   **Second: the concept of interior design:**
   Interior design is one of the finest fields of knowledge and the most expressive of style and coexistence of individuals with their internal environments and their association with them, as it expresses a cultural and cognitive product that describes the requirements, needs, and meanings that a person seeks to achieve through his world. By resorting to the field of design, the interior and its various elements and their exploitation as a means contribute to the manifestation of ideas with functional and aesthetic meanings and highlight them through the different built spaces (Lfta and Kazem, 2019). Interior design is also known as a science concerned with the study and analysis of architectural spaces and spaces that constitute the internal
components of many environments that are being designed and created, through the interior designer's resort to developing many solutions and suggestions that can be exploited scientifically and practically that work to enhance and support performance interior space aesthetic and function in a style that bears a creative character and high technical skill (Abu Zaarour, 2013).

Third: the concept of commercial environments:
Commercial environments are defined as those places and spaces which sales and purchases are made by sellers and customers (Herz Allah, 2014). Commercial environments are also defined as a set of spaces that include several shops, centers, and commercial places gathered in one place which may have one activity or have multiple activities (Maqdisi, 2015). In the architectural field and dimension, commercial environments are defined as those spaces that are formed because of employing a set of elements, determinants, and conditions that are organized in a certain way based on analysis, study, and correct understanding of the needs and requirements of individuals from sellers and customers coming to purchase, these elements are employed within a space of a certain type of business environment (Abdul Hamid et al., 2019). Commercial environments have been defined in the modern concept as organizations that are prepared by sellers and customers, to create opportunities for sales or purchases and the exchange of services and production elements. To ensure the success of business operations and the efficiency of the environment in which they are carried out, security and privacy are required (Abdel-Tawab and others, 2021).

Fourth: sustainable design in commercial environments and customer behavior:
The built spaces based on the principles and foundations of sustainability are among the modern intellectual trends that are concerned with the relationship between the built commercial space and its surrounding environment, whether this environment is a natural or an industrial environment that is being created and configured, as the human problem with the natural environment revolves around the necessity of giving nature and its elements permanence and continuity as a basic source of life (Abd al-Tawab and others, 2021). so, it was necessary to work on creating sustainable internal spaces based on foundations that ensure that the design of the environment is in a manner that respects the environment and reduces energy consumption. This came by employing the characteristics of sustainable interior design in the architectural design treatments of the interior spaces of commercial environments, with the aim of developing the ability of the interior design of these environments to adapt to the environmental factors and conditions that ensure the possibility of positive environmental coexistence that provides individuals (sellers and customers) with a sense of comfort, luxury, health, security, and privacy that they need while they are within these environments, which contributes in influencing their behavior positively. The preferred results of the exploitation of sustainable design in the internal components of commercial environments, achieve a number of environmental goals such as reducing environmental pollution, by relying on the use of sustainable technologies that are not harmful to the environment, in addition to achieving sustainable design some design goals that concern and aim at the sustainability of the site and respect for the relationship of space with the surrounding environment while enhancing the quality of the interior environment and creating aesthetic formations within the architectural space characterized by rhythm and color consistency. Sustainable design in commercial environments aims to achieve a number of social goals that guarantee the principle of community participation which motivates the local community to make decisions and assume responsibility towards nature and its elements, this matter contributes to the creation and formation of a commercial space characterized by high performance efficiency, which in turn guarantees the quality of the interior design and the effectiveness of the functional and aesthetic values, which plays a direct role in influencing the behavior of customers in a positive way that can be studied and observed.

9. Previous studies
The first study: This research study was conducted by researcher Dina Eskandar in 2021, under the title: "The Role of Sustainable Interior Design Strategies in Increasing Occupant Comfort in Commercial Spaces", where the researcher found that commercial environments are an effective mechanism towards achieving beneficial results which contribute to promoting environmental sustainability at the present time, so that commercial environments must balance and combine comprehensively all three principles, which
include sustainable design, resource economy and life cycle design, and integrate them with each other in a scientific and practical manner based on correct understanding and analysis, so that they are used in the design, construction, operation, maintenance, recycling and reuse of architectural resources in commercial environments. These principles constitute an integrated conceptual framework for sustainable interior design, and this contributes to the formation and creation of a healthy commercial space that positively and effectively affects the behavior of individuals, strategies of sustainable interior design achieves a number of positive results that enhance the comfort, well-being, health, safety and privacy of each of the employees and customers, by improving the efficiency of interior environments by using sustainable interior design solutions and various design elements that include colors, lighting, furniture, materials, and spatial planning, which enhances public relations, marketing opportunities and customer satisfaction, and finally, contributes to creating a kind of functional and aesthetic harmony between the environment commercial environment and its natural surroundings, in line with the increasing demand of customers to provide sustainable environments continuously. The results of the research study came to clarify the following:

1. Commercial spaces that ignore the customers' need for sustainable interior environments creates a feeling of discomfort and satisfaction with the efficiency and performance of these environments, which contributes to their failure, either directly or indirectly.
2. The sustainable interior design contributes significantly to reducing costs within the commercial spaces, through using renewable and recyclable resources and materials, which in turn reduces the economic cost to the seller and thus reduces it to customers and consumers.
3. Exploiting and applying interior design elements in accordance with the principles of sustainability contributes to creating a high functional and aesthetic quality within the commercial space, which contributes to individuals' sense of comfort, well-being, health, safety, and privacy that they need, in addition to its role in improving employee productivity.

The second study: This research study was conducted by researcher Walid Rasmi in 2019, under the title: “The Impact of Sustainable Design on the Interior Architecture of Commercial Stores”, where the researcher found that the world is in urgent need to strengthen the approach to sustainability, especially within the spaces and architectural facilities in general. Sustainable interior design seeks to reach a facility with a civilized approach based on preserving the natural environment and its various resources, and this matter is not achieved through the architect or structural engineer only, but a large part of it falls on the shoulders of the interior designer. The idea of sustainable buildings starts from choosing the site and then constructing the building to the design, and this concept includes the external systems of the environments, structure of the internal architecture, and the elements of the internal furnishing of the space, linking them to the commercial tasks required to achieve its purpose, so the designer of the interior architecture expresses a key factor in the implementation of this thought as a realization of sustainable design standards, and works on the employment of various interior design elements such as colors, lighting, furniture, materials, and spatial planning, and tries to achieve the principle of sustainability through these valuable design elements within the spaces and components of commercial environments, this matter highlights the role of the interior designer through the extent of his understanding of the importance of sustainability criteria and their relationship to the design of the commercial store, including the terms and standards it contains, and what is appropriate or suitable for displaying products, and the extent of compatibility between the application of those standards and the strategies of marketing for commercial companies, and raw materials that are preferred to be used in sustainable facilities. The results of the research study came to clarify the following:

1. The impact of sustainable design on the components of the interior architecture of shops and commercial environments requires a scientific and practical study and thus familiarity with environmental design standards, then studying the impact of these elements on the interior architecture of shops and the behavior of individuals, to ensure behind a commercial environment with high quality values functionally and aesthetically.
2. The interior designer must work on a good study and analysis of the location of the commercial environment, and the surrounding internal and external factors, with the aim of reaching the maximum possible benefit from the surrounding environment and avoiding and overcoming its negatives, which works to raise the efficiency of commercial environments significantly.
3. Sustainable design creates an environmental balance by relying on construction systems and building materials that can be reused to reduce the depletion of natural resources, as they meet the needs of individuals without compromising the general capacity of these resources, with the aim of preserving them for future generations.

**The third study:** This research study was conducted by researchers Shamael Ibrahim and Lina Kazem in 2018, under the title: "Sustainable Design and its Health Benefits in Office Spaces." where the researchers found that the individuals relationship with their sustainable environment is vital to what they feel while being in these environments, and that’s through the role that sustainable design plays in influencing the amount and level of their physical and psychological performance and the way they interact with others while they are inside the built spaces, so designing spaces according to the foundations and standards of sustainability is a necessity of the current era, thanks to that great role, sustainable interior design creates new opportunities to use designs for spaces that enhance individuals’ sense of comfort, well-being, health, safety and privacy in their built environments. When providing sustainable environments that support natural elements, physical and psychological health aspects of employees and customers are greatly supported which enhance the process their production, creativity, and innovation, and contribute to the success of institutions and companies significantly and effectively, this also raises the efficiency of the functional and aesthetic values of these environments. The results of the research study came to clarify the following:

1. Sustainable interior design plays a major role in raising the level of individuals’ general performance and their effectiveness while they are within the space of the interior spaces, thanks to the characteristics it provides, which achieve a kind of comfort, luxury, health, safety, and privacy for these individuals.
2. Sustainable interior design contributes to treating the physical and psychological health of both employees and customers in the built spaces, which contributes to the success of these spaces and gives them a special character characterized by creativity and design uniqueness.
3. The sustainable interior design enhances the level of production, creativity, and innovation within the built spaces, by supporting and enhancing the quality of the functional and aesthetic values that these spaces enjoy greatly.

**Fourth study:** The researcher Salem Al-Marri conducted this research study in 2018, under the title: "Sustainable Architectural Design as an Entrance to Meet the Social and Psychological Needs of the User", where the researcher found that sustainable architectural design constitutes an important approach towards meeting the psychological, social, economic, and human needs of individuals, due to its great role that contributes to preserving the environment and its natural resources, which give these resources continuity, and takes into account the social and psychological variables and the material aspects stemming from human behavior, as it is the duty of the interior designer to be aware and familiar with the nature of the requirements and needs of individuals and their behavior within the architectural space, regardless of the goal and purpose for which this space was designed, with the aim of creating many successful creative architectural designs. From this standpoint, it becomes clear the necessity and importance of integrating sustainable design into interior design, with the aim of meeting the social, psychological, economic, and human variables for the individual users, where sustainable development represents a new opportunity towards diversity and economic growth, and to clarify how to rationalize the consumption of non-renewable natural resources, in order to reach a sustainable world that achieves the highest levels of comfort, health, and safety for individuals, and greatly guarantees the efficiency of architectural spaces. The results of the research study came to clarify the following:

1. Sustainable interior design mainly seeks to reduce the environmental damage resulting from the use of non-renewable materials and resources, by preserving the various sources of life and employing recyclable materials in the various interior architectural spaces.
2. The path followed by sustainable interior design is considered one of the most comprehensive and efficient paths, due to its great role in solving many design and architectural problems that have emerged in abundance recently.
10. Research Methodology

The methodology used in this research is the descriptive analytical method, where the researchers distributed a number of questionnaires to a random group of individuals within commercial environments (restaurants, malls, shops) within the city of Irbid, where the questionnaire included questions about the opinion of individuals about the role of sustainable interior design in improving and developing the quality of the interior design of commercial environments in terms of functionality and aesthetics, by employing elements such as colors, lighting, furniture, materials, and spatial planning in a sustainable manner that contributes to affecting their comfort, well-being, health, safety, and privacy while they are within the commercial space environment. A questionnaire was made for this study with the intent of analyzing it statistically based on the individuals’ answers to the questionnaire questions asked to them (200 questionnaires), the questionnaire was presented to several professionals and specialists in the field of interior design at the Department of Design and Applied Arts in Yarmouk University, with the aim of measuring the power of the questions presented to individuals. Based on the results and observations, the shortcomings of the questionnaire were addressed, modified, and distributed to a sample of individuals. Finally, the results were later analyzed, and recommendations were made for this research study. Several personal interviews were also conducted with a group of 30 specialized professors working in Jordanian universities (Yarmouk, Science and Technology), 15 from Yarmouk University, 15 from the University of Science and Technology. Taking on their opinion regarding the subject of sustainable interior design in commercial environments, and its impact on the behavior of customers located within these environments, and its impact on the comfort, well-being, health, safety, and privacy of these customers. Personal interviews were held with professors working in Jordanian universities in their personal offices after setting an appropriate date with them, their answers to the questions put to them were recorded on a notebook designated for this purpose.

10.1. Study Samples:

The questionnaire was designed with the aim of enriching and providing the research with information that would enhance its scientific value. The questionnaire included the data form for individuals, and (5) parts that include the impact of sustainable design elements on the comfort, well-being, health, safety, and privacy of customers. (200) questionnaires were distributed and were given to a group of clients in many commercial environments in the city of Irbid, the questionnaire was presented to several persons specialized in the field of interior design, (10) people to be specific, to measure the content of the questionnaire in terms of clarity, honesty, and objectivity in the questions, and based on the results, the questionnaire has addressed its shortcomings. Several interviews were conducted, and some notes were recorded, focusing on studying the impact of interior design elements based on the principle of sustainability, such as: colors, lighting, furniture, materials, and spatial planning and their impact on the behavior of customers in commercial environments.

10.2. Study Tools:

First: the questionnaire

The researchers made, tested, and evaluated the questionnaire according to the following steps:

- Questionnaire questions were written, tables were designed, and divided into multiple areas, in line with the research problem, its objectives, importance, and assumptions as an initial draft.
- The language of the questionnaire was reviewed by 4 language auditors, who corrected the spelling, and grammatical errors of the questionnaire’s paragraphs and questions, if any.
- Then the questionnaire was sent to five academic specialists who have knowledge and experience in the subject of designing questionnaires for scientific research and the field of interior design.
- After, the questionnaire was reviewed and audited in its initial form, according to the observations, amendments, and advice of specialized academics.
- Then the questionnaire was tested on a random sample (30 people from interior design students who were not in the sample of the past study) to measure the accuracy, and length of the questionnaire questions, by using an evaluation form attached to the questionnaire and asking them to fill it out.
Finally, the questionnaire was modified after reviewing the complete notes from the questionnaire evaluation forms and coming up with the questionnaire in its final form for distribution use.

The results of the statistical analysis showed that the value of Cronbach's alpha coefficient was high for each domain, as it ranged between (0.81 - 0.94), while all items of the questionnaire amounted to (0.91). Similarly, the value of honesty is high for each domain, ranging between (0.80-0.94), while the difference in the questionnaire items for each domain reaches (0.91), which means that the degree of reliability is high and statistically significant.

Second: Personal Interviews:
The researchers developed, tested, and evaluated personal interview questions according to the following steps:
- The language of the interview questions was reviewed by the same four language proofreaders who modified the questionnaire, where they modified the spelling, linguistic, and grammatical errors of the interview questions.
- Then the interview questions were sent to the same people who modified the questionnaire, as they compared the interview questions with the questionnaire questions to indicate the level of convergence in both fields, and then wrote the necessary modifications to the interview questions in their final form.
- Then the personal interview questions were tested by using them on a sample different from the research sample (3 persons of interior designers working in private offices in the field of interior design without the study sample) to measure the accuracy, clarity, length, and complexity of the questions inside the interviews, through dialogue after conducting each experimental interview.
- Finally, personal interview questions have been modified after reviewing the full notes and coming up with the final version of the questions to be asked to a sample of specialists.

Third: Notes on similar cases:
Three examples of similarity cases of commercial environments were studied and analyzed where the principle of sustainability was applied in their internal spaces through the interior design process, which was characterized by a scientific and practical method based on the correct sustainable design standards and foundations. In these examples and cases, elements represented in colors, lighting, furniture and materials, spatial planning in each of the ceilings, walls, and floors were used, then the researchers analyzed these examples and cases in a precise manner in line with the goal and purpose of this research study, where this was done by looking at some photographs and reliable sites that describe these commercial environments that embody the elements of interior design based on the principles of sustainability affect the behavior of customers who are within these environments. Cases and examples were read and studied with recording some information and notes related to them on a notebook allocated by researchers for this purpose, such as: The Commercial Environment website, the year of its establishment, the nature of the environment (mall, restaurant, shop), how sustainable interior design affects the efficiency of commercial environments, and the quality of the functional and aesthetic values in them, in order to prove the validity of the information being studied by the researchers. Finally, these cases and examples were documented by some photographs for the sake of credibility in the analysis and study.

10.3. Data collection
The information in this research study was collected by distributing questionnaires randomly to several customers in some commercial environments (mall, restaurant, shop) within the city of Irbid. The researchers then asked them to fill out the questionnaire according to their viewpoint and information regarding the role of sustainable interior design and its impact on their comfort, well-being, health, safety, and privacy while they are in the spaces of these commercial environments. The questionnaires were collected by researchers for study and analysis later. As for the personal interviews, they were held inside the offices of the specialists in their workplaces after setting an appropriate date with them, with the aim of obtaining their opinion about the role of sustainable design in influencing the behavior of customers within commercial environments, where questions were asked and answers, and notes were taken by a notebook for this research purpose.
11. Research Results Analysis
The data collected from the questionnaire was statistically analyzed by (Spss), personal interviews and observations collected by researchers and conducted with a few specialists by unpacking, coding, and tabulating the information in special tables designed by researchers, with the aim of coming up with the conclusion of this research study.

11.1. Analyzing the results of the questionnaire:
The questionnaire consists of 5 parts, each part consists of 5 questions about (comfort, well-being, health, safety, privacy).

Part One: (Colors, Comfort, Luxury, Health, Security and Privacy):

Table (1): Results of the effect of sustainable colors on the comfort, well-being, health, safety, and privacy of customers in commercial environments:

| #  | Question                                                                 | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
|----|--------------------------------------------------------------------------|------------------|----------|---------|-------|----------------|
| 1  | Colors based on the principles of sustainability play a role in making customers feel comfortable while they are in the spaces of commercial environments. | 15               | 35       | 20      | 50    | 80             |
| 2  | The colors used in commercial environments and applied on the principle of sustainability contribute to enhancing the feeling of customers in these environments of the desired luxury. | 3                | 30       | 27      | 43    | 97             |
| 3  | Sustainable colors used in commercial environments significantly improve the health and well-being of customers. | 10               | 5        | 24      | 96    | 65             |
| 4  | The way sustainable colors are used helps increase customer safety in commercial environments. | 13               | 31       | 33      | 91    | 32             |
| 5  | Sustainable colors increase customers' sense of privacy while they are in the spaces of commercial environments. | 17               | 28       | 36      | 71    | 48             |
The results of the analysis of the first part of the questionnaire were as follows (See Table: 1):

1st question: The questionnaire confirmed that colors based on the principles of sustainability in commercial environments play a major role in increasing the comfort rate of customers, and this was confirmed by (130) people through their answers to the questionnaire, meaning that the percentage of those who assert that the colors applied to the principle of sustainability Increase customer comfort (65%).

2nd question: The questionnaire explained that the colors used in commercial environments and applied based on sustainability enhance the level of well-being of customers, and this was confirmed by (140) people through their answers to the questionnaire presented to them, meaning that the percentage of those who assert that colors increase the level of well-being are (70%).

3rd question: (161) people confirmed through their answers to the questionnaire that sustainable colors used in commercial environments contribute to increasing the percentage of health that customers feel while they are within these environments, meaning that the percentage of those who confirm that colors increase health are (80.5 %).

4th question: (123) people confirmed that the interior designer’s use of colors in accordance with the principles of sustainability in commercial environments increases the customers’ sense of safety, meaning that the percentage of those who confirm that colors enhance the percentage of safety are (61.5%).

5th question: By answering the questionnaire submitted to customers in commercial environments, (119) people confirmed that sustainable colors contribute to enhancing the percentage of privacy they feel within these environments, meaning that the percentage of those who confirm that colors provide more privacy are 59.5 %).

Part Two: (Lighting, Comfort, Well-being, Health, Security, and Privacy):
Table (2): Results of the effect of sustainable lighting on the comfort, well-being, health, safety, and privacy of customers in commercial environments:

| # | Question                                                                 | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
|---|--------------------------------------------------------------------------|--------------------|----------|---------|-------|----------------|
| 1 | Sustainability-based lighting in commercial environments provides a sense of physical, psychological, and visual comfort to customers in these environments. | 12                 | 17       | 33      | 107   | 31             |
| 2 | Lighting used in commercial environments and implemented in accordance with sustainability standards plays a role in enhancing customers' sense of luxury while they are within the spaces of these environments. | 6                  | 21       | 29      | 98    | 46             |
| 3 | Sustainable lighting in commercial environments contributes to a significant and noticeable increase in the percentage of health that customers feel while in these environments. | 8                  | 26       | 54      | 79    | 33             |
| 4 | Sustainable lighting improves customers' sense of safety and security while in commercial environments. | 13                 | 17       | 37      | 91    | 42             |
| 5 | The way sustainable lighting is harnessed helps increase customers' sense of privacy while in commercial environments. | 17                 | 29       | 39      | 87    | 28             |

The results of the analysis of the first part of the questionnaire were as follows (See Table: 2):
1st question: The questionnaire showed that lighting based on the foundations and principles of sustainability within commercial environments contributes significantly to increasing the comfort that customers feel, and this was confirmed by (138) people through their answers to the questionnaire presented to them, meaning that the percentage of those who assert that lighting increases their comfort rate are (69%).

2nd question: The questionnaire confirmed that the lighting used in accordance with the sustainability criteria in commercial environments enhances the level of well-being of customers, and this was confirmed by (144) people through their answers to the questionnaire, meaning that the percentage of those who confirm that lighting increases the percentage of well-being are (72%).

3rd question: between (112) people, through their answers to the questionnaire, that the lighting used, based on the foundations of sustainability within commercial environments, contributes to increasing customers’ sense of health while they are in these environments, meaning that the percentage of those who confirm that lighting increases health are (56%).

4th question: (133) people found that using lighting in accordance with the principles of sustainability within commercial environments increases customers’ sense of safety while they are within these environments, meaning that the percentage of those who confirm that lighting enhances the safety rate is (66.5%).
5th question: (115) people, by answering the questionnaire, saw that lighting based on the principle of sustainability contributes greatly to enhancing the percentage of privacy that customers feel within these environments, meaning that the percentage of those who confirm that lighting provides a sense of privacy are (57.5%).

Part Three: (Furniture, Comfort, Luxury, Health, Security, and Privacy):

Table 3: The results of the impact of sustainable furniture on the comfort, well-being, health, safety, and privacy of customers in commercial environments:

| #  | Question                                                                 | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
|----|---------------------------------------------------------------------------|-------------------|----------|---------|-------|----------------|
| 1  | Furniture based on sustainability standards significantly and noticeably increases customers' sense of comfort while they are in the spaces of commercial environments. | 2                 | 13       | 20      | 113   | 52             |
| 2  | Furniture used in commercial environments and implemented based on the principle of sustainability improves customers' sense of well-being. | 9                 | 27       | 31      | 103   | 41             |
| 3  | The sustainable furniture used in the spaces of commercial environments effectively contributes to the health of the customers who are within these environments. | 14                | 28       | 50      | 72    | 36             |
| 4  | The way in which furniture is employed in a sustainable manner helps to increase the feeling of security for customers in commercial environments. | 27                | 13       | 34      | 79    | 47             |
| 5  | Furniture that is used in accordance with the determinants of sustainability plays a role in increasing customers' sense of privacy while they are within the spaces of commercial environments. | 19                | 35       | 46      | 69    | 31             |

The results of the analysis of the first part of the questionnaire were as follows (See Table: 3):

1st question: The questionnaire confirmed that the furniture used in commercial environments and based on the principle of sustainability plays a major role in increasing the comfort that customers feel while they are in these environments, and this was confirmed by (165) people through their answers to the questionnaire, meaning that the percentage of those who they confirm that furniture increases comfort (82.5%).
2nd question: The questionnaire showed that furniture used in commercial environments and applied based on sustainability enhances the level of well-being that customers feel, and this was confirmed by (144) people through their answers to the questionnaire presented to them, meaning that the percentage of those who assert that furniture increases their well-being percentage is (72%).

3rd question: (108) people came to support that sustainable furniture applied in commercial environments contributes to increasing the percentage of health that customers feel while they are within the spaces of these environments, meaning that the percentage of those who confirm that furniture increases health is (54%).

4th question: (126) of the people agreed that the interior designer’s resort to using furniture based on the principles of sustainability within commercial environments plays a role in increasing the customers’ sense of safety, meaning that the percentage of those who confirm that furniture enhances the safety rate is (63%).

5th question: By answering the questionnaire submitted to customers, (100) of them confirmed that sustainable furniture contributes to enhancing the percentage of privacy that they feel while they are inside the spaces of these environments, meaning that the percentage of those who confirm that furniture works to provide more privacy are (50%).

Fourth Part: (Material, Comfort, Luxury, Health, Security and Privacy):

Table (4): The results of the impact of sustainable materials on the comfort, luxury, health, safety, and privacy of customers in commercial environments:

| #  | Question                                                                 | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
|----|--------------------------------------------------------------------------|-------------------|----------|---------|-------|----------------|
| 1  | Sustainable materials play a role in increasing the comfort of customers while they are in the spaces of the commercial environment. | 12                | 23       | 55      | 89    | 21             |
| 2  | The materials used in commercial environments and applied in accordance with sustainability standards play a role in enhancing customers' sense of well-being. | 25                | 22       | 33      | 48    | 72             |
| 3  | Sustainable materials significantly and effectively improve the health of customers while in commercial environments. | 4                 | 10       | 26      | 109   | 51             |
| 4  | Sustainable materials contribute to creating a sense of security for customers while they are in the spaces of commercial environments. | 17                | 25       | 43      | 94    | 21             |
| 5  | Sustainable materials have a major role in increasing customers’ sense of privacy while they are in the spaces of commercial environments. | 25                | 32       | 45      | 62    | 36             |

The results of the analysis of the first part of the questionnaire were as follows (See Table: 4):

1st question: The questionnaire confirmed that the sustainable materials used in commercial environments contribute significantly to increasing the comfort that customers feel while they are
in these environments, and this was confirmed by (110) people through their answers to the questionnaire, meaning that the percentage of those who assert that the materials increase the comfort rate (55%).

2nd question: The questionnaire showed that the materials used in accordance with sustainability standards in commercial environments contribute to enhancing the level of well-being that customers feel while they are within these environments, and this was confirmed by (120) people through their answers to the questionnaire, meaning that the percentage of those who assert that materials increase their luxury rate (60%).

3rd question: (160) people found that sustainable materials applied in commercial environments contribute significantly to increasing customers' sense of health, meaning that the percentage of those who assert that materials increase health is (80%).

4th question: Among (115) people that the use of materials that consider the principles and foundations of sustainability within commercial environments significantly increases customers’ sense of safety, meaning that the percentage of those who confirm that materials enhance the safety rate is (57.5%).

5th question: (98) people, through their answers to the questionnaire presented to them, believed that sustainable materials contribute to enhancing the percentage of privacy that customers feel within commercial environments, meaning that the percentage of those who confirm that materials create an enhanced sense of privacy is (49%).

Part Five: (Space Planning, Comfort, Well-being, Health, Security, and Privacy):

Table (5): Results of the effect of spatial planning on the comfort, well-being, health, safety, and privacy of customers in commercial environments:

| # | Question                                                                 | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
|---|--------------------------------------------------------------------------|-------------------|----------|---------|-------|----------------|
| 1 | The spatial planning of commercial environments based on sustainability  | 29                | 13       | 28      | 74    | 56             |
|   | criteria contributes to increasing the comfort of customers while they are|                   |          |         |       |                |
|   | are in these environments.                                               |                   |          |         |       |                |
| 2 | Sub-planning based on the foundations of sustainability increases the    | 20                | 36       | 29      | 82    | 33             |
|   | customers' sense of well-being required while they are within the        |                   |          |         |       |                |
|   | spaces of the commercial environment.                                    |                   |          |         |       |                |
| 3 | Spatial planning that considers the determinants of sustainable design   | 21                | 39       | 42      | 71    | 49             |
|   | used in commercial spaces greatly improves customer health.              |                   |          |         |       |                |
| 4 | The way in which the interior spaces of commercial environments are      | 19                | 26       | 20      | 93    | 42             |
|   | planned plays a role in increasing the customers' sense of security      |                   |          |         |       |                |
|   | significantly and effectively.                                          |                   |          |         |       |                |
| 5 | A well-utilized and sustainable space planning helps to increase         | 72                | 32       | 42      | 74    | 25             |
|   | customers' sense of privacy while they are in the spaces of commercial   |                   |          |         |       |                |
|   | environments.                                                            |                   |          |         |       |                |
The results of the analysis of the first part of the questionnaire were as follows (See Table: 5):

1st question: the questionnaire came to confirm that spatial planning that considers the principles of sustainability in commercial environments plays a major role in increasing the comfort that customers feel while they are within these environments, and this was confirmed by (130) people through their answers to the questionnaire, meaning that the percentage of those who confirm that spatial planning increases comfort is (65%).

2nd question: the questionnaire confirmed that spatial planning based on the foundations of sustainability in commercial environments enhances the percentage of well-being that customers feel, and this was confirmed by (115) people through their answers to the questionnaire, meaning that the percentage of those who assert that spatial planning increases the percentage of customers well-being is (57.5%).

3rd question: (120) people explained that spatial planning, which takes sustainable design standards into consideration when designing commercial environments, contributes to increasing the percentage of health that customers feel while they are within these environments, meaning that the percentage of those who affirm that spatial planning increases the percentage of health that customers feel while they are within these environments is (60%).

4th question: Among (135) people, the use of spatial planning in a scientific and practical manner based on the principles of sustainability within commercial environments plays a major role in increasing customers' sense of safety, meaning that the percentage of those who confirm that spatial planning enhances the safety rate is (67.5%).

5th question: By answering the questionnaire questions submitted to customers, (99) of the people confirmed that sustainable spatial planning contributes to improving the percentage of privacy that customers feel, meaning that the percentage of those who confirm that spatial planning contributes to providing privacy is (49.5%).

11.2. Analyzing the results of personal interviews

Table (6): Analysis of the results of interviews with working professors and specialists in Jordanian universities (Yarmouk, Science and Technology):

| # | Question                                                                                                                   | Comfort | Well-Being | Health | Safety | Privacy |
|---|---------------------------------------------------------------------------------------------------------------------------|---------|------------|--------|--------|---------|
| 1 | In your opinion, as a specialist in the field of interior design, do the colors used in sustainable interior design play a role in influencing the comfort, luxury, health, safety, and privacy of customers located within the spaces of commercial environments? How can this be achieved through the interior design process for those environments? | 12      | 5          | 6      | 3      | 4       |
| 2 | In your opinion, as a specialist in the field of interior design, does lighting in sustainable interior design contribute to the level of comfort, luxury, health, safety, and privacy that customers feel while they are in commercial environments? And how can this be achieved? | 9       | 4          | 5      | 5      | 7       |
| 3 | In your opinion, as a specialist in the field of interior design, does furniture used in sustainable design provide a kind of comfort, | 9       | 8          | 6      | 3      | 3       |
In your opinion, as a specialist in the field of interior design, can materials be used in sustainable interior design to provide more comfort, luxury, health, safety, and privacy for customers while they are in commercial environments? How can it be achieved to play a role in enhancing the quality of functional and aesthetic values in those environments?

The results of the personal interviews analysis were as follows (See Table: 6):

1. The effect of colors in sustainable design on (comfort, luxury, health, security, and privacy) of customers in commercial environments, where the responses were as follows:

(12) specialists in the field of interior design confirmed that colors in sustainable design affect the amount of visual and psychological comfort that customers feel while they are within the spaces of commercial environments, due to the combination of these colors, which is considered harmless and repulsive to the eye, as found (5) From specialists, colors contribute to increasing customers' sense of well-being in a noticeable way, because colors with sustainable paint are characterized by the ability to retain their color more than industrial paints, which provides a kind of quality and color luxury for customers. (6) Specialists also explained that colors contribute to increasing customers' sense of health, thanks to the reduction of these colors from the volatile heat emissions resulting from traditional colors, which may harm customers and reduce their health, (3) specialists praised the role of sustainable color in notifying customers of more safety than other colors, as it is subject to many tests and consists mainly of water and non-toxic natural materials. Finally, (4) specialists emphasized the role of colors in increasing the percentage of privacy that customers feel in the commercial environment, as they work on customer prices with privacy that distinguishes the commercial environment from other environments, and thus enhances the general efficiency of these environments.

2. The effect of lighting in sustainable design on (comfort, luxury, health, safety, and privacy) of customers in commercial environments, where the responses were as follows:

(9) specialists in the field of interior design asserted that natural and artificial lighting in sustainable design plays a role in influencing the amount of comfort that customers enjoy in commercial environments, due to its ability to spread within the spaces of commercial environments equally and comfortably to the eye, as it was found by (4) Specialists that lighting contributes to enhancing customers’ sense of well-being significantly, due to its ability to highlight the features of the commercial environment and the products offered in it, which provides a kind of luxury and visual pleasure that enhances the efficiency of these environments. (5) Specialists explained that lighting works to increase customers’ sense of health required within commercial environments, due to its role in reducing the heat emitted by other types of lighting, which may negatively affect customers, also (5) specialists have shown that sustainable lighting contributes to creating a sense of safety for...
customers in commercial environments, being suitable for the eye and creating safety and no harm. Finally, (7) specialists emphasized the role of lighting in increasing the percentage of privacy that customers feel in the commercial environment, as it works to attract attention to the spaces and exhibits of the commercial environment, making it an environment with an attractive and distinctive design from other environments.

3. The effect of furniture in sustainable design on (comfort, luxury, health, safety, and privacy) of customers in commercial environments, where the responses were as follows:

(9) specialists in the field of interior design found through the questions asked to them in the personal interviews that furniture in sustainable design contributes greatly to the customers’ sense of comfort while they are within the spaces of commercial environments, due to the way in which sustainable furniture is manufactured, which helps to provide comfort to the customer’s body and creates satisfaction with the efficiency and performance of the components of the commercial environment as a whole, as (8) specialists found that furniture plays a role in customers’ sense of well-being required in commercial environments, and (6) specialists explained that furniture contributes to maintaining the health of customers, through the materials used in its design, which consist of natural materials that do not pose a threat to the life and health of customers. (3) Specialists praised the role of furniture in maintaining safety in commercial environments, as it has several advantages such as moisture and slip resistance. Finally, (3) specialists emphasized the role of furniture in increasing the percentage of privacy that customers feel in commercial environments, using distinctive pieces of furniture that provide comfort, luxury, health, and safety together for customers, which make the commercial environment a distinct environment from other environments.

4. The effect of materials in sustainable design on (comfort, luxury, health, safety, and privacy) of customers in commercial environments, where the responses were as follows:

Based on the answers to the interview questions conducted with specialists in the field of interior design in Jordanian universities, (5) specialists found that materials in sustainable design play a role in creating a sense of comfort for customers while they are in the spaces of commercial environments, due to its composition that results in an integrated design from a functional and aesthetic point of view, which attracts the eye and provides it with the required visual comfort. (4) Specialists also found that the materials contribute to enhancing customers’ sense of well-being in the commercial environment, as they are materials that aim to comfort customers while preserving the environment and its multiple resources, while (9) specialists explained that raw materials contribute directly to increasing customers’ sense of health, due to their role in reducing harmful emissions that affect human health, whether during manufacture or installation. (8) Specialists praised the role of sustainable materials in improving the feeling of health. Customers are safe in commercial environments, because they are insulating materials made of natural materials that do not cause harm to the environment or humans. Finally, (4) specialists emphasized the role of materials in increasing the privacy that customers feel while they are within commercial environments, as they work to make these environments with a special design characterized by high performance efficiency and aesthetic quality.

5. The effect of spatial planning in sustainable design on (comfort, luxury, health, safety, and privacy) of customers in commercial environments, where the responses were as follows:

One of the specialists in the field of interior design, who was interviewed, believed that the correct spatial planning in sustainable design affects the comfort that customers feel while they are within the spaces of commercial environments, in addition to its role in creating a kind of kinetic and visual comfort that enhances functionality where the environment is greatly affected by employing green spaces within the interior spaces, and (5) specialists found that spatial planning increases the customers’ sense of well-being, due to its ability to create green spaces with sustainable design that enhances the functional and aesthetic values of the commercial space, as well as (6) specialists found that spatial planning plays a role in increasing customers’ sense of health, by employing sustainable elements in a scientific and practical manner that does not cause physical or
psychological harm to customers. (9) Specialists praised the role of spatial planning in increasing customers' sense of safety by distributing furniture and other materials in a safe manner that ensures the safety of customers. Finally, (9) Specialists emphasized the role of spatial planning in increasing the percentage of privacy that customers feel in the commercial environment.

11.3. Similar cases study

11.3.1. First case study: Melba Café:
Melba Café and Restaurant was designed by Tadcaster Hospitality in Mediapolis in the west of Singapore in 2016. The café was distinguished by the way in which the interior design elements were employed in its spaces, which had a mixture of sustainability, functional efficiency and aesthetics that provided customers with a dining experience that is very tasty and enjoyable (see Figure: 1).

Figure (1): The general design of the café

[Image of Melba Café]

The aim of the establishment of the café was to use the largest possible number of sustainable elements and products, with the aim of preserving the environment and raising awareness among customers and visitors of the importance of environmental issues and natural energy sources, so it was necessary to introduce colors with sustainable characteristics, to help reduce the level of employment of colors with harmful and volatile emissions. Australian designer Emma Maxwell drew inspiration from the landscape and green gardens facing the restaurant's large glass facade. Emma took inspiration from the natural Australians scenes to create the interior painting, such as the soft green color in furniture which takes inspiration from the tree leaves in the (Dandenong) in Singapore, while the gray and pink wall tiles reflect the color of the rock formations in the bands, this indicates that the design of the cafe put the concepts of sustainability in mind and creates visual comfort for customers. The design of the restaurant celebrates the colors of nature using distinctive pieces such as layers of recycled metal panels according to demand, to form a distinctive handmade ceiling in copper color that adds a kind of luxury and privacy to the commercial space (see Figure: 2).
Work has been done to distribute the interior lighting in a scientific and practical manner that ensures highlighting the aesthetic values inside the commercial cafe, so that it works to attract customers inside and creates a kind of visual luxury and privacy that makes this commercial environment a design characterized by high functional and aesthetic efficiency. Work has also been done to exploit the natural lighting significantly through the high-rise windows, which made the daylight pour evenly into the commercial space without direct exposure to sunlight that exhausts the eye and raises the temperatures inside the space. The lighting contributed to creating a psychologically comfortable atmosphere for customers, thanks to the role of natural light in giving customers comfort that affects their behavior positively and does not reduce their health and visual safety, taking into account the interior designer’s resort to employing LED lighting, which is characterized by its virtual length and ability to save energy compared to its counterparts from other types of lighting, which in turn reduces emissions from thermal energy, and contributes to reducing the consumption of air conditioners, thus reducing the consumption of non-renewable energy resources and reducing the total costs of the furnace commercial, which in the end ensures the preservation of the economic, human, and environmental needs of customers and respect for nature and its resources (see Figure: 3).

The use of sustainable, strong, and bold patterns in the design of the furniture pieces within the commercial space, where the interior furnishing made of earth texture emphasizes the
natural feel of the restaurant located in a green location. The interior furniture features with soft feminine curves create an inclusive and welcoming atmosphere for customers, giving them a kind of feeling of exclusivity and privacy while they are within the spaces of this commercial environment, while bold patterns create carefully balanced space touches with functional and aesthetic values that enhance the customers’ sense of the required luxury. The site has been overlooked on a green environment that decorates a series of cabin seats in the commercial space which contributes significantly to improving the psychology of customers and creating a kind of visual and physical comfort thanks to the features of the green environment and its role in maintaining the health and safety of both customers and the interior and exterior environment in which they are located (see Figure: 4).

Figure (4): The nature of sustainable furniture and the exploitation of green inside the cafe

www.cdn.habitusliving.com

With the aim of sustainability, preserving natural materials and resources, and exploiting them as efficiently and effectively as possible, which reduces material costs for both the employee and customers, almost everything in the commercial space had to be designed according to the principles and foundations of sustainable design, starting from obtaining old oak wood materials. The wood is recycled by specialized and skilled carpenters in Singapore, and reworked into large oak beams, which is characterized by an attractive modern design and shape that gives the cafe a kind of luxury and privacy required and creates a kind of comfort, health, and safety due to the nature of these materials that do not contain harmful and toxic substances that may affect customer behavior in a negative way. We have been working on the utilization and employment of recycled aluminum ceiling panels to order by the owner, by hiring local craftsmen to implement the project who are skilled in making recycled metal panels which reduced the material cost on the owner and by which they reduce it on the customers (see Figure: 5).
Figure (5): The use of recycled oak wood and aluminum in the cafe

www.images.squarespace-cdn.com

The spatial planning of the interior spaces in the café is distinguished by its large, flourishing concrete structure with transparent glass walls from floor to ceiling, which provides a kind of visual luxury and high aesthetic quality, and given that the acoustics inside the café are sharp and resonating, they may cause noise that causes tension and dissatisfaction. About the commercial environment, the interior designer resorted to achieving a major goal in the planning process, which is to focus all the senses of customers in their table space and on each other directly, and not on other customers who are talking loudly on the other side of the commercial space, which contributed to creating a kind of acoustic comfort for them. The interior space was designed with large openings for double doors, in view of the customers' demand and their desire to obtain as much clean air as possible inside the cafe spaces (see Figure: 6).

Figure (6): The spatial planning inside the cafe

www.encrypted-tbn0.gstatic.com

11.3.2. Second case study: ZNC Shopping Mall:
The shopping center (ZNC) was designed by the architecture firm Chapman-Taylor in Jiangsu Province, China in 2020, and covers an area of 110,000 square meters. The designing team were inspired by the city’s historic past considering its natural culture that respects the environment and its renewable resources and focuses on integrating its elements in a creative manner within the interior spaces in general, forming a unified visual image that embodies the culture and awareness of individuals of the importance of exploiting sustainability and its standards in the interior design process. The design uses some physical characteristics and colors of the coastal cities in the region, with the predominant white color that represents the waves of the sea, which creates a strong visual
effect that suggests the aesthetics of the natural environment and provides great visual comfort to the customers and occupants of this commercial environment (see Figure: 7).

![Figure 7: The use of sustainable colors inside the mall](www.chapmantaylor.com)

The interior design team resorted to exploiting natural lighting inside the commercial space in a manner characterized by high functionality and aesthetic, by designing openings in the ceiling of the mall in a regular manner that contributes to the spread of lighting in a moderate and not burdensome way to the eye, which creates a kind of comfort for customers. Work has been done on exploiting natural lighting and enhancing performance effectiveness through the exploitation of light colors and reflective surfaces that increase the amount of light scattered within the space and helps to transfer it more efficiently. This helps reduce the consumption of artificial lighting and limits the depletion of non-renewable resources that would raise the cost of the material on both the owner and customers, which creates a feeling of dissatisfaction with them. So, the design team resorted to the exploitation of sustainable lighting which greatly enhanced the efficiency of the commercial space and improved the behavior of customers in a positive, observable, and analytic manner (see Figure: 8).

![Figure 8: The use of natural lighting in the roof of the mall](www.malls.com)

The sustainable pieces of furniture were employed within the spaces of the mall in a great way that carries a functional and aesthetic character at the same time, through the design team resorting to the exploitation of pieces of furniture manufactured from recovered and recycled wood and then employing them inside the mall, which made it distinguished by its observance of the principles and foundations of sustainability. Significantly, it
contributed to preserving the natural environment and its multiple sources, this matter granted the commercial space functional efficiency and aesthetic quality that contributed to creating a kind of comfort for customers due to the low manufacturing and construction costs on the owner, and thus its impact on customers for sure, which in turn contributed to giving the commercial center a specificity that made it a destination for many customers thanks to the advantages it enjoys, which are based on sustainability criteria (see Figure: 9).

![Figure (9): the use of recycled wood inside the mall](www.chapmantaylor.com)

Work has been done to employ sustainable, environmentally friendly materials within the components of the mall, through the architectural team employing the two materials correctly, which resulted in an integrated and aesthetic design that attracts the eye and gives the commercial space sustainable properties of a functional and aesthetic character that distinguishes it from others and provides it with the kind of required privacy that makes it a destination for many customers, as sustainable materials undoubtedly affect the economic cost, energy, and the interior and exterior environment of the mall, which in turn affects the comfort of customers positively, due to the optimal use of materials and energy. The use of natural and environmentally friendly materials maintains the health and safety of customers, as the materials are natural and do not carry any side effects that may harm them, whether directly or indirectly (see Figure: 10).

![Figure (10): the use of sustainable materials inside the mall](www.chapmantaylor.com)

The interior space of the mall has been planned in a sustainable manner that makes it a self-sufficient space, by resorting to the use of plants and flowers and employing them within the spaces of the mall in a design style that creates an atmosphere of a sustainable nature that greatly enhances the effectiveness of functional and aesthetic values. Maintaining the purity of the air inside the mall and thus working with certainty to ensure comfort, health, and safety for the occupants of this center, and focusing on its large and effective ability to
absorb carbon dioxide, heat, and unwanted odors, and thus reduce the work of air conditioners and extractors inside the center, which contributes to effectively reduce energy consumption and preserve both the indoor and outdoor environment (see Figure: 11).

11.3.3. Third case: Puma Store:
The Puma Store was established in New York in the United States of America in 2012, on an area of 120,000 square meters. This was possible by the executive company (Co & Colkit) which was awarded in the subject of sustainability in the use of colors and paints with low organic emissions, which improve the air quality inside the commercial space significantly, to facilitate the process of recycling if it is worked on in the future. This contributed to giving the commercial space a functional and aesthetic quality that enhanced the efficiency of the space in general and positively improved the behavior of customers who are within these spaces, by providing them with a kind of comfort, luxury, health, safety, and privacy because of using environmentally friendly colors that do not cause any harm to individuals or the interior or exterior environment surrounding this space (see Figure: 12).

The interior designers resorted to the use of lighting units with a longitudinal effect, allowing the distribution of lighting at a certain angle, which in turn increases the amount of lighting inside the shop, and works to save energy significantly compared to the traditional distribution of lighting units. The designers also used LED and fluorescent lighting which does not emit heat that would cause inconvenience and dissatisfaction with customers, as this lighting provided a kind of feeling of comfort, well-being, health, safety, and privacy for customers located within the spaces of the
commercial store, this matter contributed to raising the general efficiency of the commercial environment and maintained non-renewable energy sources from consumption. Therefore, the executing company succeeded in creating a commercial environment that achieves the goal and purpose of sustainable interior design (see Figure: 13).

![Figure (13): the lateral LED lighting inside the store](www.retaildesignblog.com)

The executing company resorted to the use of recycled materials, furniture pieces and display units, which largely maintains the standards and foundations of sustainability and ensures the safety and quality of the interior and exterior environment, as the furniture and display units were manufactured through an energy-saving quantitative production system. Locally made wooden furniture was used in a larger way within the commercial space, which worked to reduce the general total cost on the executing company caused by the construction, manufacturing, and transportation operations, and thus reduced the cost to customers and created the feeling of satisfaction and comfort from this commercial space, taking into account the aesthetic quality that characterizes this environment, which creates the kind of comfort, luxury, and privacy required by customers (see Figure: 14).

![Figure (14): the use of wood furniture inside the store](www.cdn.homedit.com)

The company executing this shop relied on the exploitation of environmentally friendly and raw materials within its internal spaces, through the manufacture and employment of all furniture units, floors, ceilings, and walls within the commercial space. Using models that provide for energy consumption and its non-renewable resources as raw and natural materials that were manufactured locally were used. The use natural and renewable bamboo wood has contributed to reducing the transportation cost for the company and thus saving energy that is drained in the processes of manufacturing and transportation. This gave the commercial space the advantages of sustainability.
and preserving the environment and its resources, while preserving the health and safety of customers within its spaces, given that the materials used in it are natural materials that do not carry any side effects on customers and the environment (see Figure: 15).

Figure (15): the used materials inside the store

The executing company relied on distributing furniture units in a scientific, practical, and flexible way that allows customers and employees to easily move around the shop and allows customers and employees to easily deal with pieces of furniture, display units, and offered products that include selection and switching operations. Commercial spaces are movable, which facilitates the process of changing the distribution of products and ensures ease of transportation and movement according to needs and seasonal changes, this matter contributes to creating a kind of comfort for customers and thus improves their behavior in a positive way and gives the space a kind of privacy that distinguishes it from other spaces (see Figure: 16).

Figure (16): the use of spatial planning inside the store
12. Findings

Table (7): Research results analysis:

| #  | Finding                                                                 | Questionnaires | Interviews | Researcher’s Opinion |
|----|-------------------------------------------------------------------------|----------------|------------|----------------------|
| 1  | The spatial planning of commercial environments based on sustainability criteria contributes to increasing the comfort of customers while they are in these environments. | %75            | %82        | %86                  |
| 2  | Sub-planning based on the foundations of sustainability increases the customers’ sense of well-being required while they are within the spaces of the commercial environment. | %85            | %88        | %90                  |
| 3  | Spatial planning that considers the determinants of sustainable design used in commercial spaces greatly improves customer health. | %79            | %80        | %87                  |

Research findings came as follows (See Table: 7):

**1st finding:** The results of the research study confirmed that sustainable interior design plays a major role in influencing the amount of comfort, luxury, health, safety, and privacy that customers feel while they are within the spaces of the commercial environments they visit, which enhances their positive behavior and creates loyalty. The direction of these environments, makes them a continuous destination for them, as it provides them with the physical, psychological, and visual comfort they need, and their enjoyment of luxury, which is a constant requirement for them within the commercial spaces, taking into account the importance of sustainable interior design in maintaining the health and safety of customers significantly, because it is based on the principles and bases of employing materials and natural resources that do not pose a threat to their health and psyche to maintain the required environmental balance, which gives these customers a sense of uniqueness and privacy while being within these commercial spaces, and this was confirmed by the results of the answer to the questionnaire distributed to a number of customers within the environments. The commercial design achieved a rate of (75%), as the personal interviews that were conducted with specialists in the field of design, evaluation was carried out to confirm the validity of this result by an amount of (82%). From my point of view as a researcher, sustainable design has contributed to enhancing customers’ sense of comfort, well-being, health, safety and privacy by (86%), through the process of analysis and study conducted on a number of similar cases that clarified the role of sustainable design in promoting the positive behavior of customers while they are inside the centers and shops, making it a destination they visit on a permanent and continuous basis due to the benefit of exploiting the elements of sustainable design that saves them cost, enhances their health and safety, and preserves human, economic and environmental needs. They have (see picture: 17).
2nd finding: The results of the research study confirm that the elements of sustainable interior design, which are represented by colors, lighting, furniture, materials, and spatial planning, play an effective and important role in improving the efficiency and effectiveness of the interior environments of commercial spaces, due to their great ability to raise and improve the quality of functional and aesthetic values. This role was confirmed by the results of the questionnaire distributed to customers within some commercial environments in the city of Irbid, which achieved a percentage of (79%). Personal interviews confirmed the validity of this result by an amount of (80%). From my point of view as a researcher, the elements of sustainable interior design have contributed to raising the efficiency and general performance of the functional and aesthetic values of commercial spaces by an amount of (87%), due to the great role they contribute to creating an attractive interior design with a functional and aesthetic character that constitutes a visual dazzle and serves the functional aspects at the same time. The use of sustainable elements in interior design is produced through the employment of materials and natural resources that have advantages in the commercial space on the functional and aesthetic level, as it increases the general value and efficiency of the commercial space in which such materials are used, giving it a longer life span than other environments and a natural aesthetic character that is inspired by the beauty of nature, its colors, and its elements that are characterized by creating a kind of comfort and satisfaction in the human soul (see Figure: 18).

3rd finding: Research results confirm that the general impact of sustainable design on the interior architecture of shops requires a comprehensive and integrated study that is concerned with a deep understanding of the criteria and foundations upon which sustainable design is based on. This is also shown
in how the elements of sustainable environmental design are exploited within the commercial space, with the aim of reducing the consumption of non-renewable resources and energies, which have a high economic cost. It was confirmed by the results of answering the questionnaire, which achieved a percentage of (79%), and personal interviews which confirmed the validity of this result by an amount of (80%). From my point of view as a researcher, sustainable design contributed to raising the performance, efficiency, and services of commercial environments, and that’s by working to reduce cost and maintenance operations, in addition to attracting customers, which achieves high profits for these environments by an amount of (87%), it is proven important in creating internal spaces with a comprehensive and integrated system that aims to create a successful and distinguished commercial space in terms of performance, as it always seeks to find ways that would reduce the general cost and enhance the efficiency of the commercial space, and thus increase the total sales, and to come up with a healthy environment that considers and respects the environment creating a kind of satisfaction in customers (see Figure: 19).

![Figure (19): Exploitation of sustainable elements inside a commercial center, which was characterized by visual attraction and a reasonable construction cost](www.retaildesignblog.com)

13. **Design Project**

The idea of the project is to design a commercial store that provide the standards of sustainability and enhances the creation of net zero energy buildings to achieve an energy efficient building. The project goals are to create a net zero energy store which consume only as much energy as can be produced onsite through renewable resources over a specified time and to construct the commercial store with non-toxic finishes, materials, and surfaces, and utilize advanced fresh air systems (see Figure: 20-28). The design shows how can interior designers apply sustainable design in interior environment to reach high quality environment by using smart technologies used in this project are as following:

a) Interactive displays
b) Interactive floor (which harvests energy from pedestrian footsteps).

c) External facades made of silkscreened ceramic glass & chrome with strips of LED Light.
Figure (20): Ground floor plan for Sport shop (Researchers’ work)

Figure (21): Ground floor plan for Sport shop (Researchers’ work)

Figure (22): Color scheme for ground floor plan in Sport shop (Researchers’ work)
Figure (23): Color scheme for first floor plan in Sport shop (Researchers’ work)

Figure (24): Perspective for ground floor plan in Sport shop (Researchers’ work)

Figure (25): Perspective for ground floor plan in Sport shop (Researchers’ work)
Figure (26): Perspective for ground floor plan in Sport shop  
(Researchers’ work)

Figure (27): Perspective for first floor plan in Sport shop  
(Researchers’ work)

Figure (28): Perspective for first floor plan in Sport shop  
(Researchers’ work)
14. **Conclusion**

In reference to what has been studied, analyzed, and reached through this research study, it is necessary to seriously work on exploiting sustainable design more in the formation and creation of commercial architectural spaces, given that it is one of the important and main means that preserves natural energy sources that works to raise the efficiency of commercial spaces and the enhancement of their design quality significantly, as well as their impact on the effectiveness of functional and aesthetic values within these spaces, which in turn contributes to influencing individuals’ sense of comfort, well-being, health, safety, and privacy while they are within the spaces of commercial environments. Sustainable design works directly and effectively in raising the efficiency of these spaces and achieves a positive impact on the interior and exterior environment.

15. **Recommendations**

Based on what has been studied about the impact of sustainable design on customer behavior within commercial environments, this study recommends the following:

1. The necessity of moving towards sustainable thinking in the interior design of commercial environments and departing from the traditional character in designing these environments, given the importance of the sustainable dimension, which is one of the most effective influences on the efficiency of the environments and the behavior of their occupants.
2. Interior designers should work on creating and designing interior commercial environments with a conscious design that considers the principles and foundations of sustainable design, given its great role in maintaining the human, economic, social, environmental, and material needs of customers.
3. The importance of working on conducting and preparing more research and studies related to the role of sustainable interior design and its various elements in maintaining the efficiency of commercial environments and the quality of functional and aesthetic values in these environments.

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على أداء وكفاءة خدمات تلك المبانى التجارية (مثال: مول، مطعم، محل). يتمتع المشكلة النحوية في غياب وعي المصممين الداخليين عن أهمية دمج التصميم المستدام في التصميم الداخلي للبنية التجارية، مما قد يؤثر سلباً على سلوك العملاء (مثال: التعب، التوتر، الرش، الوضوء) داخل تلك المباني، وبالتالي يقلل من كفاءة أداء خدمات البنية التجارية كلها (مثال: الكفاءة العليا، الصيانة المستمرة، البيع المستمر). يدور التساؤل الرئيسي في هذا البحث حول مكانة ما هو دور التصميم المستدام عند توظيفه في التصميم الداخلي وما أثر ذلك على سلوك العملاء داخل البنية التجارية، وبالتالي الإجابة على الأسئلة الفرعية حول ما هو دور عناصر التصميم الداخلي المستدام في رفع جودة البنية الداخلي للبنية التجارية وظيفياً وجميلياً. تأتي أهمية البحث في تزويج الجمهور (المعماريين، المصممين الداخليين، المستثمرون، العملاء) بمعلومات عن أهمية توظيف التصميم المستدام في التصميم الداخلي للبنية التجارية في أجرة رفع سلوك وأداء وكفاءة خدمات البنية التجارية، ومن ثم التأكيد على تقديم نصائح وارشادات وألياف يمكن تعريفها أثناء العملية التصميمية مما قد يحسن من جودة البنية الداخلي للبنية التجارية من خلال دمج التصميم الداخلي والتصميم المستدام معًا، خذ البحث المنهج الوصفي التحليلي في جمع المعلومات من خلال الاستبان والمقابلات الشخصية والزيارات الميدانية، وتم تحليل المعلومات من خلال التحليل الإحصائي وبناء تصميم تصميم التحليلي. جادت نتائج البحث لتؤكد على ان (1) لعب التصميم الداخلي للتصميم المستدام دوراً إيجابياً في تأثير على مستوى سلوك عند العملاء (مثال: الراحة، الرفاهية، الصحة، الأنا، الخصوصية)، مما يعزز سلوك العملاء من خلال التساؤل عن الاستبان، زيادة الرضية، خلق البيئة الداخلية (مثال: الرضا، الراحة، الرغبة، التروح، الزائرين). (2) لعب التصميم الداخلي للتصميم المستدام دوراً إيجابياً في تأثير على مستوى سلوك عند العملاء (مثال: الراحة، الرفاهية، الصحة، الأخلاقية، الخصوصية)، مما يعزز سلوك العملاء من خلال التساؤل عن الاستبان، زيادة الرضية، خلق البيئة الداخلية (مثال: الرضا، الراحة، الرغبة، التروح، الزائرين). (3) التصميم الداخلي المستدام دوراً إيجابياً في رفع أداء وكفاءة خدمات البنية التجارية (مثال: الكفاءة، الصيانة، البيع المستمر، العملاء). الكلمات المفتاحية: التصميم الداخلي المستدام، البنية التجارية