Article

Post-Pandemic Retail Design: Human Relationships with Nature and Customer Loyalty—A Case of the Grand Bazaar Tehran

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Abstract: This article examines how human relationships with nature in the design of the Tehran Grand Bazaar can impact customer loyalty, and how this impact has been affected by the recent pandemic. As one of the most popular retail settings of the ancient Silk Road, the Grand Bazaar has a long history of micro-scale retailing and customer loyalty. This article reviews international guidelines of sustainable design using content analysis, identifying the most frequent guidelines related to human relationships with nature. It then defines customer loyalty in terms of various important non-financial measures of micro-scale retailing. The present article describes the development and collection of a structured survey conducted before the pandemic (March 2019), during the pandemic (March 2021), and after the pandemic (March 2023). The analysis shows a moderate to high relationship between sustainable design elements of the Bazaar (in terms of human relationships with nature) and customer loyalty before the COVID-19 pandemic. While this relationship fell to a moderate level in the middle of the pandemic, it rose dramatically to 89% by the end of the third year when governments eased public health and safety protocols. The results reveal that by adapting sustainable strategies that enhance human relationships with nature, designers and stakeholders can create post-pandemic retail settings that generate high customer loyalty.

Keywords: public retail; post-pandemic design; grand bazaar; sustainable design; customer loyalty; Tehran

1. Introduction

The recent pandemic has stimulated research on adaptation measures for public space design necessitated by social distancing safety protocols [1,2]. Public buildings have been a focus of interest, and consideration of adaptation measures for retail settings, in particular, dramatically increased during the COVID-19 outbreak [3].

The pandemic alerted the public to the risks of enclosed retail settings. Two factors that could mitigate public concern are that (1) naturally ventilated spaces are highly effective in preventing airborne transmission of pathogens [4,5], and (2) raised humidity and natural light can help protect the human immune system against infection [6]. These two factors are central to human relationships with nature associated with the design of built environments generally. In particular, such factors could help form a new perspective on retail space design in the post-pandemic world.

As an internationally recognized indoor retail setting, the Tehran Grand Bazaar has a documented history of maintaining customer loyalty by adapting itself to the times through its design [7–9]. The current study examines this adaptation during the COVID-19 pandemic by evaluating the human relationship with nature in the Bazaar's design and its effect on customer loyalty.

The Grand Bazaar, situated in central Tehran, serves as a vital public space within the city's dense urban landscape. It plays host to various social, religious, and at times, political gatherings for the people of Tehran. As an architectural heritage of Iran, the Grand

Bazaar boasts a rich history spanning over 400 years [10]. Developed over centuries, it is characterized by its four main entrance gates situated in four historical streets: 15th Khordad Street in the north, Molavi Street in the south, Kayyam Street in the west, and Mustafa Khomeini Street in the east. With its verdant open and semi-open spaces, the Bazaar serves as a popular hub for public gatherings and stands as the city's foremost retail destination.

The Bazaar's connectivity with the broader cityscape draws individuals from across Tehran and its environs. People frequent the Bazaar on a weekly or monthly basis not only for shopping purposes but also for socializing and unwinding in its natural green areas.

The Tehran Grand Bazaar features seven entrances, each accompanied by a gathering space. Among these, the most notable is the Sabzeh-Meydan Entrance situated in Green Square. Other significant public gathering areas within the bazaar include *Chai-houses*, *Zour-khaneh* (Sports Centers), *Caravanserai* (Guest Houses), as well as Public Baths and Mosques (see Figure 1).
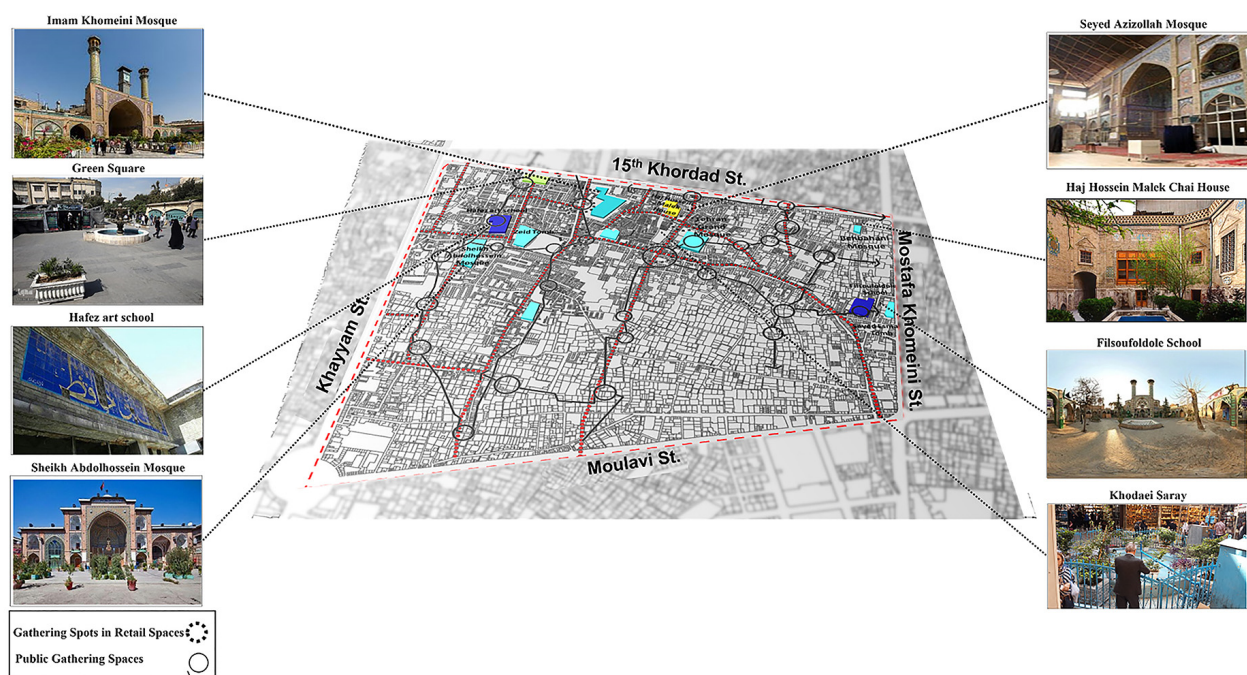

Figure 1. Introducing the studied case: the Grand Bazaar of Tehran—public buildings and spaces (source: map recreated from https://map.tehran.ir/, accessed on 25 January 2024).

The popularity of the Grand Bazaar stems from the quality of its retail spaces, encompassing the economic activity associated with each space and its socio-cultural potentials [11]. Various functional areas, including guest houses, religious spaces, restaurants, and green spaces, serve as indispensable attractions within the Bazaar (see Figure 1). The Grand Bazaar's remarkable architectural design, featuring arches, labyrinthine corridors, and traditional ventilation systems, has established it as a prominent heritage site within Tehran [12] (p. 25). Tehran's primary transit system ensures accessibility to the Bazaar area from the city and its suburbs.

Spanning twenty square kilometers and boasting 7 entrances, this massive historic structure accommodates over 311 *Rasteh*, which are the main retail corridors offering a wide array of specialized goods, shops, or services. Additionally, it houses the *Charsoq*, which consists of an indoor intersection of retail corridors creating an octagonal retail center with a low-height circular dome (Charsoq means intersection), 180 *Saray* (markets), 5 *Timcheh* (the joining points of several Saray, also serving as grand markets and gathering spaces), numerous *Dalan* serving as side-path retail corridors commonly used for delivery purposes

by retailers, and hundreds of *Hojreh* (stores) selling various types of goods in the Iranian market. Figure 2 illustrates some of the significant retail spaces within the Grand Bazaar.

Figure 2. Significant retail spaces, entrances, and corridors (source: maps recreated from https://map.tehran.ir/, accessed on 25 January 2024).

One remarkable feature of the bazaar area is that all stores within the retail corridors are connected by a centralized arched roof, yet they are distinguished in each corridor by the nature of their businesses [13,14]. The arched-like ceilings on the crossways known as *Timcheh*, with their decorative portals, plant designs, fantastic exposed brick decorations, and use of natural ornaments, create a magnificent set of entrances to the bazaar's markets [15]. The historical evolution of the city resulted in the bazaar area being predominantly a linear structure, with its spatial elements arranged around its central axis [16,17]. The mercantile and service complex is divided into retail corridors comprising rows of shops, each corridor named either after their specialty or the industrial goods that they sell [17].

2. Materials and Methods

By using the popular Grand Bazaar area as a case study, this article employs an exploratory sequential mixed-method approach to investigate the concept of sustainable design in retail space. The research involved qualitative content analysis, systematic direct

observation, and quantitative questionnaires to explore how sustainable design of a retail setting influences customer loyalty.

The qualitative content analysis began with a comprehensive literature review to define sustainable design variables in terms of human relationships with nature. These defined variables were then employed in a systematic direct observation to assess human relationships with nature in various retail spaces within the bazaar. Initially conducted before the pandemic in March 2019 from 10 a.m. to 3 p.m., when daylight is adequate, this observation was later repeated and reviewed in March 2023 from 10 a.m. to 3 p.m. to identify and rectify any potential errors.

A discourse analysis was also conducted to review the literature on customer loyalty, focusing on identifying the most influential non-financial measures of micro-scale marketing and retailing based on the frequency of their citations from 1999 to 2019. These measures were then utilized in the study's first questionnaire survey. In December 2022, the measures were revisited to be used in the 2023 survey, ensuring that they were current and appropriate. This review aimed to verify and update the measures as needed. It is worth noting that no significant changes were observed in the citation frequency of measures between 2019 and 2022.

Next, a questionnaire survey was developed and collected at three different times: before the COVID-19 pandemic in March 2019, during the pandemic in March 2021, and after the pandemic in March 2023. The questionnaire was structured based on the defined sustainable design variables, customer loyalty measures, and our general understanding of the local environment.

The Cochran method was employed to determine a sample size of 120 participants, considering the size and characteristics of the community. Participants were randomly selected adults who frequented various spaces within the bazaar on a daily basis, thus being intimately familiar with this public retail setting. This included adults who work in the bazaar, reside in the surrounding areas, or visit the bazaar regularly. Based on a sample size of 120 new participants for each survey collection, the analysis utilizes data for 360 participants in all.

The structured questionnaire survey was used to assess the relationship between sustainable design variables (in terms of human relationships with nature) and customer loyalty variables for the Grand Bazaar of Tehran.

Finally, the research process concluded with a comparative evaluation to determine the priorities of sustainable retail space design in the post-pandemic world based on customer loyalty.

Given the gradual evolution of the COVID-19 pandemic and its lasting implications for the design of public built environments, researchers and designers are actively seeking necessary preparation and adaptation measures for post-pandemic public settings. By combining discourse analysis with extensive fieldwork at the Grand Bazaar of Tehran, this article aims to elucidate how the sustainable design of retail settings, particularly in terms of human relationships with nature, impacts customer loyalty, and to evaluate how this relationship has been influenced by the COVID-19 pandemic.

2.1. Framing Customer Loyalty in the Context of Post-Pandemic Sustainable Design of Public Retail Settings

The human relationship with nature has long been intertwined with sustainable design and development. Becker, in his book "Sustainability Ethics and Sustainability Research", highlights human relationships with nature as one of the most comprehensive relationships within sustainable relations [18]. In his research, Becker delineates ecology, economy, and social aspects of sustainable development as subsets of triple sustainable relations, which include human relations with nature, contemporaries, and future generations [18].

Architecture, as one of the most influential implementation tools of sustainable development, has consistently been at the forefront of realizing sustainability priorities through sustainable design strategies [19]. Bazaars, serving as public retail settings, were among the

most frequented public spaces prior to the COVID-19 pandemic, renowned for their role in retail and leisure [20]. Within their designated spaces, retail public settings engage in a two-sided relationship with their consumers [21], thus making them particularly susceptible to global crises such as the recent pandemic.

As the world collectively addresses the aftermath of the COVID-19 crisis, the retail industry is grappling with the issue of customer loyalty. The surge in online shopping and the rapid digitalization of businesses during the pandemic have significantly reduced everyday interactions in public retail settings [22,23]. Early research into the pandemic indicates that this decline in interest in in-store shopping is reshaping customer loyalty dynamics. Interestingly, brand loyalty appears to be the least affected by the widespread adoption of digital platforms [24].

Responding to customer expectations during the pandemic, many brands have shifted to online commerce, facilitating easier customer acquisition and retention [22]. However, this transition has also contributed to a decrease in foot traffic in public retail settings, which have traditionally offered in-store retailing services for centuries [1,2,25]. Nevertheless, recent studies conducted in the later stages of the pandemic indicate a strong inclination among customers to support their local businesses and remain loyal to their local public retail settings [26]. Given these conflicting trends, it is crucial to understand the impact of the COVID-19 pandemic on the direction of customer loyalty.

Human relationships with nature have undergone significant shifts in perception over the past few years. While this relationship has long been a focal point in socio-environmental science and interdisciplinary research [27,28], its heightened importance as an everyday essential of urban life has become increasingly evident and irreplaceable during the pandemic. The indiscriminate disposal of waste, resulting from rapid urbanization in cities before the COVID-19 pandemic, limited people's exposure to nature and its healing powers during this crisis. Rapid urbanization reduced access to nature through open urban settings or semi-open built environments, consequently amplifying environmental stresses associated with population density in closed public settings. But, despite the challenges posed by urbanization to people's relationships with nature, recent studies demonstrate that connecting with nature was profoundly effective in enhancing people's wellbeing during the pandemic [29–32].

Human relationships with nature have always been effective in reducing stress, increasing concentration, and promoting positive mental states [33,34]. However, it was during the COVID-19 pandemic that people realized, more than ever, the extent to which their relationships with nature can contribute to their wellbeing [35,36]. Research indicates that public settings incorporating nature within their enclosed spaces are more likely to enhance consumer health and wellness [37–39], thus presenting opportunities for retailers to foster customer loyalty during a time when wellbeing considerations have become paramount in the use of enclosed retail settings [4].

The significance of green indoor spaces and semi-open designs in public settings has been underscored by rapid urbanization, the scarcity of green spaces, adverse climatic conditions, and global pandemics [40,41]. Reintroducing nature within the built environment can thus be regarded as a significant enhancement to public retail settings in the post-pandemic world.

2.1.1. Variables of Customer Loyalty in Micro-Scale Retailing

International research on public retail settings has traditionally focused primarily on marketing and retail aspects of design [42]. However, there is a growing need to understand customer behavior in retail spaces, particularly in light of the semantic shift in consumer perception and behavior during the pandemic. Customer loyalty is recognized as an important behavioral measure within the consumer realm, offering a non-financial approach to assessing marketing performance [43–45]. Over the past three decades, this measure has been frequently cited in the marketing and consumer behavior literature [44,46–60]. A review of the relevant literature also indicates that other customer behavioral measures,

such as Customer Complaint, Customer Profitability, and Customer Trust, are significantly influenced by loyalty [56,61–64].

Customer loyalty in micro-scale retailing is initially defined as a behavior that motivates customers to repeatedly purchase the same product over an extended period [63]. This behavioral measure represents a crucial aspect of financial success, particularly when customers engage in repeat purchases or services. Consequently, customer loyalty has long been recognized as a strategic objective for retailers seeking to enhance their performance and space layout [52,53,56,65,66]. Bruni (2014) offers a more comprehensive definition of loyalty, describing it as a deeply held commitment to consistently repurchase a preferred product or service, thereby exhibiting repetitive patronage of the same brand or retail setting despite situational influences that may prompt switching behavior [67]. Pimentel (2016) further emphasizes the role of retail settings in evaluating customer loyalty, questioning the simplistic behavioral definition and recognizing that customer loyalty may be spurious if based solely on switching costs or misleading if customers are merely brand loyal [68]. From this perspective, customer intention to remain loyal to a retailer in a specific retail setting is driven by a complex system of positive relationships between customers and the retail environment and its retailers. Thus, customer loyalty can be understood as a multifaceted phenomenon rooted in customers' positive associations with a particular retail setting and its retailers.

Earlier marketing research integrated various aspects of loyalty and developed a behavioral intentions package comprising four factors: loyalty, propensity to switch, willingness to pay more, and external response to service problems [69,70]. Customer loyalty was primarily indicated by an intention to engage in a diverse set of behaviors signaling a desire to maintain a relationship with the retailer, including positive word-of-mouth recommendations and repeat purchases. However, some scholars and practitioners later argued that complex marketing measurements were unnecessary to gauge customer loyalty. Notably, Pimentel (2016) suggested that the only metric a retailer needs is the customers' intention to recommend their store or retail setting to others [68,71]. Over the past decade, customer loyalty has been measured not only based on repeat purchase frequency or volume, but also on intentions to repurchase the same product or from the same store, intention to recommend the product, service, or store to others, and the likelihood of switching and increasing purchases from the same store or retail setting [52–54,63,68,72].

Table 1 shows the variables of customer loyalty used in a review of 23 relevant works since 1999. The frequency percentages of variables are calculated in accordance with the number of works that use or apply each variable ("*" indicates a variable used in a work). Thus, Overall Satisfaction and Customer Trust can be recognized as the most important variables of customer loyalty based on experts' opinions (frequency percentages of 82.60% and 78.30%). Further, Likelihood to Recommend, with a frequency of 73.80%, is followed by Branding Awareness and Likelihood to Purchase More Expensive Offerings (65.10% and 60.70%) as the third, fourth, and fifth most cited variables in the studied research. Overall, it can be noted that based on a comprehensive literature review, the most recognized variables of customer loyalty in micro-scale markets include Overall Satisfaction (82.60%), Customer Trust (78.30%), Likelihood to Recommend (73.80%), Branding Awareness (65.10%), Likelihood to Purchase More Expensive Offerings (60.70%), Likelihood to Increase the Frequency of Purchasing (52.20%), Customer Complaints (39.10%), Likelihood to Continue Purchasing the Same Products and Services (39.10%), and finally, Customer Lifetime Value (30.30%).

Table 1. Customer loyalty variables applicable to micro-scale markets in recent research (Source: authors). Note: "*" indicates a customer loyalty variable (column) used in a work (row).

Customer Loyalty Variables	Dwidienawati et al. (2022) [61]	Ozkan et al. (2022) [46]	Ewanlen (2022) [48]	Zeren & Kara (2021) [62]	Ltifi et al. (2021) [47]	Raza et al. (2020) [49]	Kwan et al. (2019) [50]	Mintz & Currim (2017) [63]	Pimentel (2016) [68]	Decrop et al. (2014) [51]	Frösen et al. (2013) [53]	Theodosiou et al. (2012) [54]	Sychrová (2013) [52]	Pimenta da Gama (2011) [56]	Morgan et al. (2019) [44]	Farris et al. (2010) [57]	Nwokah (2009) [58]	Eusebio et al. (2006) [60]	Jiménez et al. (2006) [59]	Martensen & G. (2006) [71]	Barwise & Farley (2004) [66]	Ambler (2000) [64]	Davidson (1999) [69]	Frequency Percentage
Overall Satisfaction	*	*	*	*		*	*	*	*	*	*	*	*		*	*	*	*	*	*		*		82.60%
Branding Awareness	*	*	*		*	*	*	*		*		*			*		*	*	*	*		*		65.10%
Likelihood to increase frequency of purchasing	*	*		*		*		*			*	*		*	*		*		*	*				52.20%
Customers Complaints		*	*					*	*		*				*				*	*		*		39.10%
Customer Lifetime Value				*				*				*	*	*						*			*	30.30%

Table 1. *Cont.*

Customer Loyalty Variables	Dwidienawati et al. (2022) [61]	Ozkan et al. (2022) [46]	Ewanlen (2022) [48]	Zeren & Kara (2021) [62]	Ltifi et al. (2021) [47]	Raza et al. (2020) [49]	Kwan et al. (2019) [50]	Mintz & Currim (2017) [63]	Pimentel (2016) [68]	Decrop et al. (2014) [51]	Frösén et al. (2013) [53]	Theodosiou et al. (2012) [54]	Sychrová (2013) [52]	Pimenta da Gama (2011) [56]	Morgan et al. (2019) [44]	Farris et al. (2010) [57]	Nwokah (2009) [58]	Eusebio et al. (2006) [60]	Jiménez et al. (2006) [59]	Martensen & G. (2006) [71]	Barwise & Farley (2004) [66]	Ambler (2000) [64]	Davidson (1999) [69]	Frequency Percentage
Likelihood to purchase more		*	*	*	*	*	*	*		*		*		*		*			*		*		*	60.70%
Likelihood to recommend	*	*	*	*		*	*	*	*		*	*	*		*	*	*		*		*	*		73.80%
Customer Trust		*	*	*		*	*	*	*	*		*	*	*		*	*	*	*		*	*	*	78.30%
Likelihood to continue purchasing		*					*		*		*	*				*	*				*	*		39.10%

2.1.2. Sustainable Design Variables related to Human Relationships with Nature

The concept of sustainable development initially divided its concerns into three separate approaches: environmental sustainability, focusing on maintaining the quality of life and the environment while conducting economic activities; social sustainability, striving to ensure human rights and equity with respect to cultural diversity, race, and religion; and economic sustainability, aiming to maintain the natural, social, and human capital required for income and living standards [73,74].

However, more recent research describes the notion of sustainable development based on three more comprehensive conceptual aspects: the concept of development, the concept of need, and the concept of future generations. In essence, sustainable design has adopted a more comprehensive approach, addressing socio-economic development in line with ecological constraints, redistributing resources to ensure a high quality of life for all, and ensuring the quality of life for future generations by considering the long-term usage of resources. These concepts are guided by triple sustainable relations, which imply a balance between the three pillars of sustainability previously approached separately as environmental, social, and economic concerns [18,75,76].

Sustainable relations, including human relationships with nature, contemporaries, and future generations, have been recognized in the sustainability literature as early as the 1970s and 1980s when the concept of sustainable development was evolving and forming the theoretical foundations of sustainable design [18,77,78]. One of the most comprehensive attempts to incorporate all triple sustainable relations into a set of statements was the 1992 Hannover Principles for Sustainable Design, comprising nine principles designed to guide thoughtful consideration of environmental impact and overall societal effects [73]. Originally formulated for planning Expo 2000 in Hanover, these principles were later recognized for their inclusiveness in addressing all concerns of sustainable development based on sustainable relations, rather than categorizing them into the previously distinct approaches of environmental, social, and economic sustainability.

While concerns about sustainable design have long been present, significant developments in analyzing a building's impacts on the environment have only been applied in practice in the last two decades [79]. Professionals such as architects and urban designers are now approaching projects with a heightened consideration for sustainability and environmental protection in response to global climate change. These "sustainable" architects and designers aim to safeguard the environment by selecting eco-friendly building materials and employing sustainable construction practices [79–81]. Recent trends in sustainable development have shifted toward establishing objectives and adopting a comprehensive methodology for assessing a broad range of environmental impacts caused by individual buildings or groups of buildings [82].

Since the 1990s, sustainable design has gained prominence, with the introduction of environmental assessment methods such as the Building Research Establishment Environmental Assessment Method (BREEAM), which was the first building scoring system in the UK [83]. Subsequent to BREEAM, various evaluation systems have been introduced worldwide, each tailored to the specific requirements of its region [18].

Throughout the construction, occupation, renovation, or demolition processes, buildings consume significant energy, water resources, and raw materials. The debate surrounding CO_2 emissions from buildings and their impact on climate change has also gained global attention. Additionally, buildings indirectly affect their surroundings through waste production and the release of harmful emissions.

These facts prompted the development of green building guidelines and rating systems aimed at reducing the environmental impact of buildings through sustainable design [84,85]. These guidelines and rating systems serve as technical instruments for evaluating the environmental impacts of buildings and construction projects. Currently, globally recognized guidelines and rating systems for sustainable architecture include LEED (USA, Canada, Mexico, Brazil, and India), Green Star (Australia, South Africa, and New Zealand), BEAM, Green Globes (USA and Canada), Living Building Challenge, Green Building, DGNB, HQE,

Promise, Protocollo Itaca, SPIN, Minenergie, TGBRS, CASBEE, Pearl Rating System for Estidama, and Nebers.

Architects are currently striving to minimize the harmful effects of buildings on human health and the environment by implementing sustainable architectural approaches, conducting environmental impact assessments, and adhering to globally recognized guidelines and rating systems. This collective effort aims to improve human relationships with nature through sustainable design.

Overall, sustainability is a broad concept that reflects the resilience of the environment to human actions. It is often measured by sustainability rating systems. For this research, six relevant rating systems have been selected based on their comprehensiveness, responsiveness, and credibility [86]. These rating systems include LEED, BREEAM, Green Globes, Green Mark, The Pearl Rating System, and the Living Building Challenge.

To clarify the role of each guideline in realizing sustainable priorities, the sustainable design principles of the Hannover Principles were studied and categorized based on sustainable relations. The principles that apply to human relationships with nature were selected for this study. Additionally, the international guidelines of sustainable architecture from each of the aforementioned rating systems were categorized based on human relationships with nature, focusing on the selected sustainable design principles of Hannover. This categorization highlights common considerations and solutions between each guideline and principle, which guided the extraction of relevant indicators of sustainable design.

The extraction process of two sustainable design indicators, namely, Responsiveness and Locality, is presented in Table 2. This process was conducted in detail for all design principles and international guidelines and resulted in the extraction of 11 indicators: Responsiveness, Optimized Consumption, Visual Quality, Vernacularism, Vitality, Flexibility, Knowledge and Innovation, Decarbonization, Equity, Integration, and Locality.

Table 2. Sustainable design indicators suggested by various architectural guidelines (Source: authors).

Suggested Indicators	Applied Guidelines of Sustainable Architecture						Hannover Principles			
	LEED (USA)	BREAM (UK)	Green Mark	Green Globe (USA)	The Pearl Rating System (UAE)	Living Building Challenge (USA)	Rely on natural energy flows	Eliminate the concept of waste	Insist on rights of humanity and nature to co-exist in a healthy, supportive, diverse and sustainable condition	
Responsiveness	certified wood Renewable energies Sustainable products and material	Renewable energies Sustainable forest products Timber for construction	Renewable energies Solar roof anchors and roof layouts Provisions for solar system	Renewable energies Green roof Durable and low maintenance material	Renewable energies Rapidly renewable material utilizing wood	Advanced renewable energy systems Sustainable forest production				
Locality	Local/Regional material Embodied energy and life cycle	Following surrounded land-use pattern Regional manufactured material	Preserving cultural heritage Valuing regional and local priorities	Naturalized landscaping Local material Respecting local context	Local vegetation Habitat restoration Regional material	Local characteristics and outdoor amenity Local character and environment				

The Delphi method was employed to validate the extracted sustainable design indicators using a 9-point Likert scale questionnaire with an expert panel consisting of 15 members. The panel included sustainable design experts in the fields of architecture and urban planning. The validation process comprised two phases. The first phase involved revising or deleting indicators receiving scores lower than 4.5 points from the expert panel. The second phase involved a review of the context, interpretation of the indicators, and an explanation of the strengths and weaknesses of the indicators.

As a result, the mean and median scores of the final sustainable indicators significantly improved. These indicators were approved by the expert panel. The following finalized 9 sustainable design indicators emerged from this process: Responsiveness, Opti-

mized Consumption, Visual Quality, Vitality and Flexibility, Knowledge and Innovation, Decarbonization, Equity, Integration, and Locality.

2.2. Notes from the Field: Survey and Analysis

Recognizing the vast area of approximately twenty square kilometers, with retail corridors spanning over ten kilometers, and over 200,000 stores visited by more than 2 million customers per day, this article required a more focused approach. Therefore, the main historical zone of the Bazaar was selected for study, providing a representative region for this study (Figure 3). The selected section encompasses significant public and retail spaces within the Grand Bazaar area of Tehran, ranging from 15 Khordad Street to the north, Mesgarha Street to the west, Ali Abadi Street to the south, and Masjed Jame Street to the east. As depicted in Figure 4, key public gathering and retail spaces within the selected section include hundreds of stores within the retail corridors and markets, as well as the indoor space of the *Grand Charsoq*, the *Jelokhan* (open yards) of *Seyyed Azizollah* and *Imam Khomeini* Mosque, the four retail corridors of *Masjed Jame Rasteh, Mesgarha Rasteh, Charsoq Rasteh*, and *Beinalharamen Rasteh*, the markets of *Khodaei Saray, Haj Hasan Saray*, and *Haj Zaman Saray* including their side corridors *(Dalan)*, and the grand market of *Mola Ali Kani Timche*.

Figure 3. The focus of this study: Historical zone—significant public and retail spaces (source: https://map.tehran.ir/, accessed on 25 January 2024).
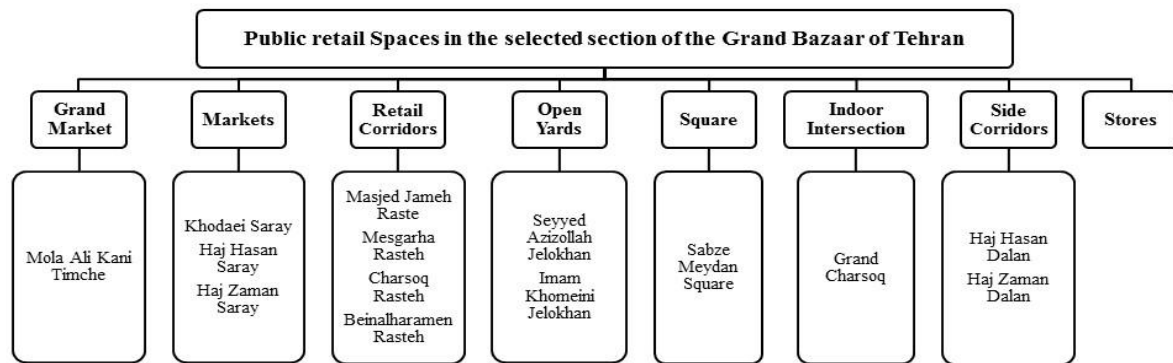
Figure 4. Focal retail spaces selected for fieldwork observation (source: authors).

2.2.1. Direct Observation

Using the sustainable design indicators of human relationships with nature, the fieldwork process commenced with direct and systematic observation. An observation checklist was designed to encompass these indicators, facilitating the categorization of the results for the main retail spaces in the selected section of the Grand Bazaar of Tehran (Figure 4).

In this part of the research, the first author directly observed the variables of sustainable design in the selected regions of the Grand Bazaar area. Since direct observation is recognized as essential for a fieldwork evaluation of theoretical findings [87], the purpose of this observation was to investigate the incorporation of the defined sustainable design variables in the bazaar. Three of the studied spaces (which illustrate human relationships with nature) are illustrated in Figure 5.

Figure 5. Three studied spaces that illustrate human relationships with nature. Left: central open yard of Haj Zaman Saray. Middle: use of brick walls and dome shape ceiling with skylights in Masjed Jameh retail corridor. Right: local patterns and calligraphy on ceramic tiles of Mesgarha entrance. (Source: first author, 2019.)

The systematic observation was first conducted in February 2019 from 10 a.m. to 3 p.m. and reviewed to recheck and edit for possible errors in March 2023. The first author completed the checklist and assigned points to each of the sustainable design variables in *Timcheh* (grand market), *Saray* (markets), *stores, open yards, squares, Charsoq* (indoor intersections), retail corridors, and side corridors of the Grand Bazaar of Tehran using a 9-point Likert scoring system. The calculated average scores are considered the final score of each variable in this observation.

Through direct observation of the selected section in this study, it becomes evident that the sustainable variable of Optimized Consumption is largely achieved through natural ventilation and adequate daylighting within the interior spaces of the bazaar (see Figure 5, left and central images). These design strategies help to reduce fossil fuel consumption

and minimize heat load on the outer surfaces of the bazaar. The prevalent use of brick and ceramic materials, known for their high insulation properties, further contributes to reducing heat load and supports the realization of Responsiveness and Locality in the design, as these materials are locally sourced and durable and require minimal maintenance.

The orientation of the buildings, ranging from 150° southeast to 210° southwest, positions the selected section of the Tehran Grand Bazaar to benefit from the prevailing winds in Tehran, facilitating natural ventilation through the entrances and skylights of the retail corridors, markets, and indoor intersections. These design features align with international sustainable design guidelines, particularly our identified sustainable design indicators Optimized Consumption, Responsiveness, Knowledge and Innovation, and Decarbonization.

The observations indicate that these sustainable strategies are often observed in the semi-open and open retail spaces of the bazaar, such as the indoor intersection of the *Grand Charsoq*, the grand market of *Mola Ali Kani Timcheh*, and the semi-open retail corridors. The dome-shaped ceilings of these spaces not only reduce heat gain during summers (when the solar direction is more vertical) but also minimize interior heat loss in winters, consequently decreasing the reliance on mechanical heating and cooling systems, thus contributing to Decarbonization, Responsiveness, and Optimized Consumption within the bazaar's design.

The landscaping of the *Seyyed Azizollah* and *Imam Khomeini* open yards, as well as the *Sabzeh Meydan* square, is meticulously planned to harmonize with the natural flow of surface water. Central pools are strategically positioned to store stormwater, providing irrigation for the yard's vegetation while also cooling the airflow during the summer months (see Figure 6, right image). This integration of open yards with closed retail spaces creates an inviting semi-open retail setting that offers customers access to fresh air, natural light, and scenic views, fostering an active urban environment within the bazaar complex. These strategies, along with the use of local vegetation, contribute significantly to incorporating Visual Quality, Vitality and Flexibility, Integration, and Locality into the sustainable design of the bazaar.

Figure 6. Two studied spaces that illustrate human relationships with nature. Left: stone flooring of pedestrian pathways in bazaar complex as active urban environment. Right: local vegetation and central pools of Seyyed Azizollah open yard. (Source: first author, 2019.).

Furthermore, the design elements reflect the local context, evident in the patterns of the ceramic tiles and bricks used in the entrance gates (see Figure 5, right image), the indoor intersection of the *Grand Charsoq*, and the grand market of *Mola Ali Kani Timcheh*. The layout of the bazaar's retail corridors is tailored to suit the local climate and prevailing winds, incorporating features such as skylights for natural ventilation and light. The use of locally sourced materials and the incorporation of various beautiful local items offered within the stores further help to realize Locality in the retail corridors of *Masjed Jame Rasteh*, *Mesgarha Rasteh*, *Charsoq Rasteh*, and *Beinalharamen Rasteh*.

The bazaar's modular design incorporates large polygon intersections as central hubs connecting several linear retail corridors and markets, along with open yards positioned

in front or within the enclosed and semi-open retail spaces. These design elements result in multifunctional spaces that can accommodate various cultural, charitable, financial, or temporary storage activities. These strategies significantly contribute realizing the variable Vitality and Flexibility, as evidenced by spaces like *Seyyed Azizollah* and *Imam Khomeini* open yards, *Sabzeh Meydan* square, and the *Grand Charsoq* indoor intersection.

Each retail corridor is distinguished by the type of goods that it offers, yet they are all strategically positioned with specific entrances and linked to the *Charsoq* indoor intersection. This layout allows customers to navigate through different routes based on their specific product preferences, enhancing the overall customer experience and aiding in product discovery. Such features promote Integration, Locality, and generally, integrity of design.

The pedestrian passageways within the bazaar, covered with stone flooring, not only enhance the walking experience for customers but also signify the prohibition of vehicles within the complex (see Figure 6, left image), contributing to the realization of the Decarbonization variable. Additionally, the utilization of renewable energy sources, along with local and sustainable materials like brick and ceramic tiles, minimizes construction and demolition waste, further supporting decarbonization efforts. Furthermore, underground storage areas are employed to cool the space, with minimal energy consumption, reducing reliance on refrigeration systems that emit ozone-depleting gases. These sustainable practices are particularly evident in spaces like the *Seyyed Azizollah* and *Imam Khomeini* open yards, the *Charsoq* indoor intersection, and *Sabzeh Meydan* square.

Moreover, the design of stores within the bazaar fosters Knowledge and Innovation. The flexible layout of these stores allows for distinct areas for product preparation and display within a single modular space. Customers have the opportunity to witness the manufacturing process of goods, engage with artisans, and gain insights into the products that they are purchasing. This experiential approach enhances customer engagement and promotes a deeper understanding of the products, contributing to the overall success and sustainability of the bazaar.

2.2.2. Survey Questionnaire

People visit the Grand Bazaar of Tehran for various purposes, including shopping, exploring tourist attractions, or simply socializing. The Cochran formula was used to help determine a suitable number of responses for this study. The calculation resulted in the need for 120 completed questionnaires from participants in the selected section of the bazaar at each point in time of data collection. The questionnaires were designed based on research variables that we selected (in Sections 2.1.1 and 2.1.2) to assess the impact of sustainable design indicators (in terms of human relationships with nature) on the loyalty of the bazaar's customers (see Supplementary Materials, File S1). Surveys were conducted at three different time points: before the pandemic in March 2019, during the pandemic in March 2021 (when participant experiences were influenced by safety and health protocols), and after the pandemic in March 2023.

Initially, a pilot survey with a sample of 30 participants was completed to analyze the questionnaire's validity using Cronbach's alpha. The evaluation yielded a reliability test result of 0.902 for the alpha value, which was deemed acceptable as it exceeded the minimum threshold. Subsequently, the questionnaires were distributed first in March 2019, coinciding with one of the busiest months at Tehran Grand Bazaar, during peak hours (10 a.m. to 3 p.m.) on Saturdays, Tuesdays, and Thursdays. The survey was repeated in March 2021 amid the pandemic and again after the pandemic in March 2023. Participants included adults who worked in the bazaar, shopped from the bazaar daily, or lived in the surrounding residential areas, necessitating daily passage through the bazaar. Any additional comments provided by respondents were noted and analyzed alongside the quantitative questionnaire responses.

The reliability and validity of the gathered data at each time point were separately analyzed after each survey using the Kaiser–Meyer–Olkin Measure of Sampling Adequacy (KMO) and the Bartlett test of sphericity. The Bartlett test results were evaluated as

'significant' in all three surveys, and the KMO Measure of Sampling Adequacy was assessed as 'meritorious', with values of 0.865 for the 2019 survey, 0.731 for the 2021 survey, and 0.869 for the 2023 survey (see Supplementary Materials, File S2). These test results support the validity and reliability of the conducted questionnaire surveys.

3. Results

3.1. Qualitative outcomes

Two sets of variables, Customer Loyalty and Sustainable Design, are identified in this study (see Sections 2.1.1 and 2.1.2). The qualitative content analysis yielded nine indicators of sustainable design concerning human relationships with nature: Optimized Consumption, Visual Quality, Vitality and Flexibility, Knowledge and Innovation, Decarbonization, Equity, Integration, and Locality. Additionally, an analysis of the frequency of the most cited customer loyalty variables identified highly recognized variables of customer loyalty over the last two decades to be Overall Satisfaction, Brand Awareness, Likelihood to Increase the Frequency of Purchases, Likelihood to Purchase More, Likelihood to Recommend, and Customer Trust. These variables were cited in more than 50% of the relevant literature reviewed from 1999 to 2022.

We begin with a qualitative approach to investigate the implementation of these sustainable design variables in various parts of the bazaar through systematic direct observation by the first author. The assigned scores range from 1 to 9, with 1 representing the lowest and 9 representing the highest score.

The results of this observation (Table 3) reveal Responsiveness as the sustainable design variable with the highest average score (7.52) in the selected section of Tehran Grand Bazaar. This is mostly due to the climate-responsive design of the bazaar's semi-open spaces, particularly in markets and retail corridors. The second highest rated indicator is Locality, with an average score of 6.92, which is mostly noticed in the *Grand Charsoq* (grand indoor intersection), the grand market of *Mola Ali Kani*, and the central open yards within the bazaar complex. Decarbonization and Vitality and Flexibility both stand tied for third and fourth place followed by Visual Quality, which is also mostly noted in the design of the open spaces of the bazaar. The indicators of Integration (5.65) and Equity (5.77) have a lower average score than other sustainable design indicators (but still above 5, which is the midpoint of the Likert scale).

Table 3. Sustainable indicator scores for different types of retailing and gathering spaces. (Source: authors, 2019.)

Sustainability Relation	Sustainable Design Indicators	Retail and Gathering Spaces of the Bazaar									Total average
		Grand Market	Markets	Stores	Open Yards	Squares	Indoor Intersection	Side Corridors	Semi-Open Retail Corridors	Covered Retail Corridors	
Human relation with nature	Optimized Consumption	6.5	6.45	7	8.5	7.5	7.5	5.87	5.16	6.87	6.81
	Integration	4.71	5.27	5.28	8.71	7.14	5.14	4.96	4.47	5.24	5.65
	Decarbonization	5.5	6.41	7.83	8.33	7.66	7.66	5.91	5.94	6.31	6.83
	Locality	7.25	6.47	6.25	8.5	5.75	7.25	6.75	7.08	7.03	6.92
	Responsiveness	7	8	8	7	7.1	7	7.5	8.12	8	7.52
	Knowledge and Innovation	7	6.1	7	8	8	8	3.75	4.33	6	6.46
	Visual quality	5.66	6	7	8.66	7.83	7.16	6	6.27	6.39	6.77
	Vitality and Flexibility	5.5	6.41	7.83	8.33	7.66	7.66	5.91	5.95	6.31	6.83
	Equity	5.5	6.35	5.5	8.5	8	4.75	3.5	4.66	5.24	5.77

Table 3 also reveals that sustainable design indicators of human relationships with nature are high for the open yards of the bazaar, with a score of 8.71 for Integration, 8.66 for Visual Quality, 8.50 for Optimized Consumption, Locality, and, Equity, and 8.33 for Vitality and Flexibility and Decarbonization. Semi-open retail corridors, with a score of 8.12 for Responsiveness, stand in second place, followed by markets, stores, and covered retail corridors with a score of 8.00. Squares have a high score of 8.00 for Equity. The lowest scores are for side corridors, with 3.75 for Knowledge and Innovation and 3.50 for Equity. Overall, the systematic direct observation suggests a moderate to high average score for human relationships with nature in the design of the studied section of the Tehran Grand Bazaar.

These qualitative results lay the groundwork for our structured questionnaire described below.

3.2. Survey of Perceived Relationships between Sustainable Design and Customer Loyalty Items

We constructed a structured questionnaire (see Supplementary Materials, File S1) to examine the perceived relationship between the nine identified sustainable design items (Section 2.1.2) and the six identified customer loyalty items (Section 2.1.1). We surveyed 120 participants in three different time periods, March 2019, March 2021, and March 2023 (see Section 2), yielding data from 360 participants in total. Figure 7 shows the averaged perceived relationship of the survey participants between each sustainable design variable and each customer loyalty variable for each of the three different time periods.
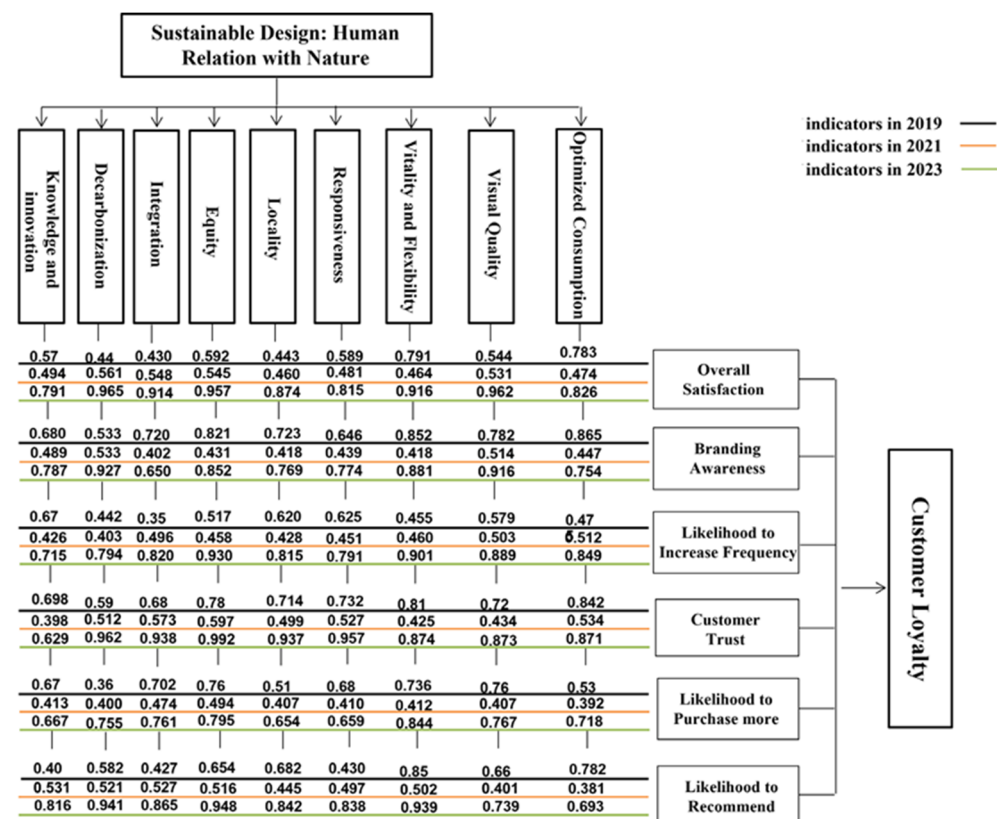
Sustainable Design: Human Relation with Nature

indicators in 2019 ——
indicators in 2021 ——
indicators in 2023 ——

	Knowledge and innovation	Decarbonization	Integration	Equity	Locality	Responsiveness	Vitality and Flexibility	Visual Quality	Optimized Consumption
Overall Satisfaction (2019)	0.57	0.44	0.430	0.592	0.443	0.589	0.791	0.544	0.783
(2021)	0.494	0.561	0.548	0.545	0.460	0.481	0.464	0.531	0.474
(2023)	0.791	0.965	0.914	0.957	0.874	0.815	0.916	0.962	0.826
Branding Awareness (2019)	0.680	0.533	0.720	0.821	0.723	0.646	0.852	0.782	0.865
(2021)	0.489	0.533	0.402	0.431	0.418	0.439	0.418	0.514	0.447
(2023)	0.787	0.927	0.650	0.852	0.769	0.774	0.881	0.916	0.754
Likelihood to Increase Frequency (2019)	0.67	0.442	0.35	0.517	0.620	0.625	0.455	0.579	0.47
(2021)	0.426	0.403	0.496	0.458	0.428	0.451	0.460	0.503	0.512
(2023)	0.715	0.794	0.820	0.930	0.815	0.791	0.901	0.889	0.849
Customer Trust (2019)	0.698	0.59	0.68	0.78	0.714	0.732	0.81	0.72	0.842
(2021)	0.398	0.512	0.573	0.597	0.499	0.527	0.425	0.434	0.534
(2023)	0.629	0.962	0.938	0.992	0.937	0.957	0.874	0.873	0.871
Likelihood to Purchase more (2019)	0.67	0.36	0.702	0.76	0.51	0.68	0.736	0.76	0.53
(2021)	0.413	0.400	0.474	0.494	0.407	0.410	0.412	0.407	0.392
(2023)	0.667	0.755	0.761	0.795	0.654	0.659	0.844	0.767	0.718
Likelihood to Recommend (2019)	0.40	0.582	0.427	0.654	0.682	0.430	0.85	0.66	0.782
(2021)	0.531	0.521	0.527	0.516	0.445	0.497	0.502	0.401	0.381
(2023)	0.816	0.941	0.865	0.948	0.842	0.838	0.939	0.739	0.693

Customer Loyalty

Figure 7. Average perceived relationships between sustainable design items and customer loyalty items for the Grand Bazaar of Tehran before the pandemic in March 2019, during the pandemic in March 2021, and after the pandemic in March 2023. (Source: authors.)

The results reveal that before the COVID-19 pandemic, the highest relationship (0.865) was between Optimized Consumption of the bazaar's sustainable design and Branding Awareness of customers. Optimized Consumption drops to the lowest level with Likelihood to Recommend (0.381) and Likelihood to Purchase More (0.392) during the pandemic.

Branding Awareness also falls to have one of the weakest relationships with Integration of the bazaar's sustainable design (0.650) during the final days of the pandemic in March 2023. While Likelihood to Purchase More remains least affected by the bazaar's sustainable design in relation to Locality (0.654) in 2023, Decarbonization rises from being the least effective in relation to Likelihood to Purchase More (0.360) before the pandemic to being the third most effective sustainable design indicator in relation to Overall Satisfaction of customers (0.561) during the pandemic, and in relation to Customer Trust (0.962) after the pandemic. In a clear change in customer perception of loyalty during the pandemic, Customer Trust becomes one of the most recognized variables of customer loyalty by having both the strongest relationship with Equity (0.597) and Integration (0.573), and the weakest relationship with Knowledge and Innovation (0.398) during the COVID-19 pandemic. Customer Trust and Equity emerged as the strongest relationship (0.992) after the pandemic. The second strongest relationship in 2023 was between Decarbonization and Overall Satisfaction (0.965), followed by Decarbonization and Overall Satisfaction (0.962), and Visual Quality and Overall Satisfaction (0.962).

4. Discussion

The research results indicate that the Grand Bazaar of Tehran, as an active retail space which actualizes human relationships with nature through its sustainable design, has a positive effect on the loyalty of its customers. The assessed customer loyalty variables are significantly influenced by the sustainable design of the bazaar in all three surveys conducted before, during, and after the COVID-19 pandemic. We consider 0.70 as a strong relation, 0.3 to 0.69 as moderate, and less than 0.29 as weak.

Figure 8 illustrates that prior to the COVID-19 pandemic, there was a notably high proportion of strong relationships between the two sets of studied variables, amounting to 42%. Additionally, 57% of the variables exhibited moderate relationships, with no instances of weak relationships among the sustainable design and customer loyalty variables in the examined retail setting.

In 2021, however, the number of moderate relationships increased to 100%. And then, in March 2023, the number of strong relationships increased to 89%, with only 11% of the variables exhibiting a moderate relationship. No weak relationships were observed in either the 2021 or 2023 surveys. These results suggest that customer attitudes were affected by the pandemic, perhaps due to heightened public awareness of environmental concerns and appreciation of the bazaar's sustainable design.

The research results show that among customer loyalty variables, Customer Trust was the variable most positively affected over the course of the pandemic. Of the customer loyalty variables, Customer Trust was most related to three of the sustainable design variables (R, D, and KI) in 2019; five (OC, R, L, E, and I) in 2021; and six (OC, R, L, E, I, and D) in 2023. On the other hand, Branding Awareness was the variable most negatively affected. Of the customer loyalty variables, Brand Awareness was most related to five of the sustainable design variables (OC, VC, VF, E, and I) in 2019, but none (0) in 2021 and 2023.

The research findings reveal that among the nine sustainable design variables focusing on human relationships with nature, Equity emerges with a relationship of 99%, making it the variable most related with Customer Trust (or any customer loyalty variable) after the COVID-19 pandemic. Prior to the pandemic, Equity was less related to the customer loyalty measures. This suggests that while functional aspects of the bazaar, such as retailing and leisure, were most effective in enhancing customer loyalty before the pandemic, Equity has become a significant driver of customer loyalty since the pandemic began.

Field observations further indicate that Equity is one of the most implemented sustainable design variables in the bazaar's open spaces, including the open yards and the square in the study's selected section. Recognizing that Responsiveness and Locality are the variables with the highest average scores across various main spaces of the bazaar (in Table 3), which also demonstrate the second (96%) and third (94%) strongest relationship with customer loyalty variables in the 2023 survey (see Figure 8), it can be inferred that

since the onset of the COVID-19 pandemic, local climate-responsive strategies employed in the bazaar's semi-open spaces, along with closed spaces and open yards, have proven effective in enhancing the loyalty of the bazaar's customers. These strategies achieved this by providing ample indoor natural light and ventilation in the retail corridors and markets.
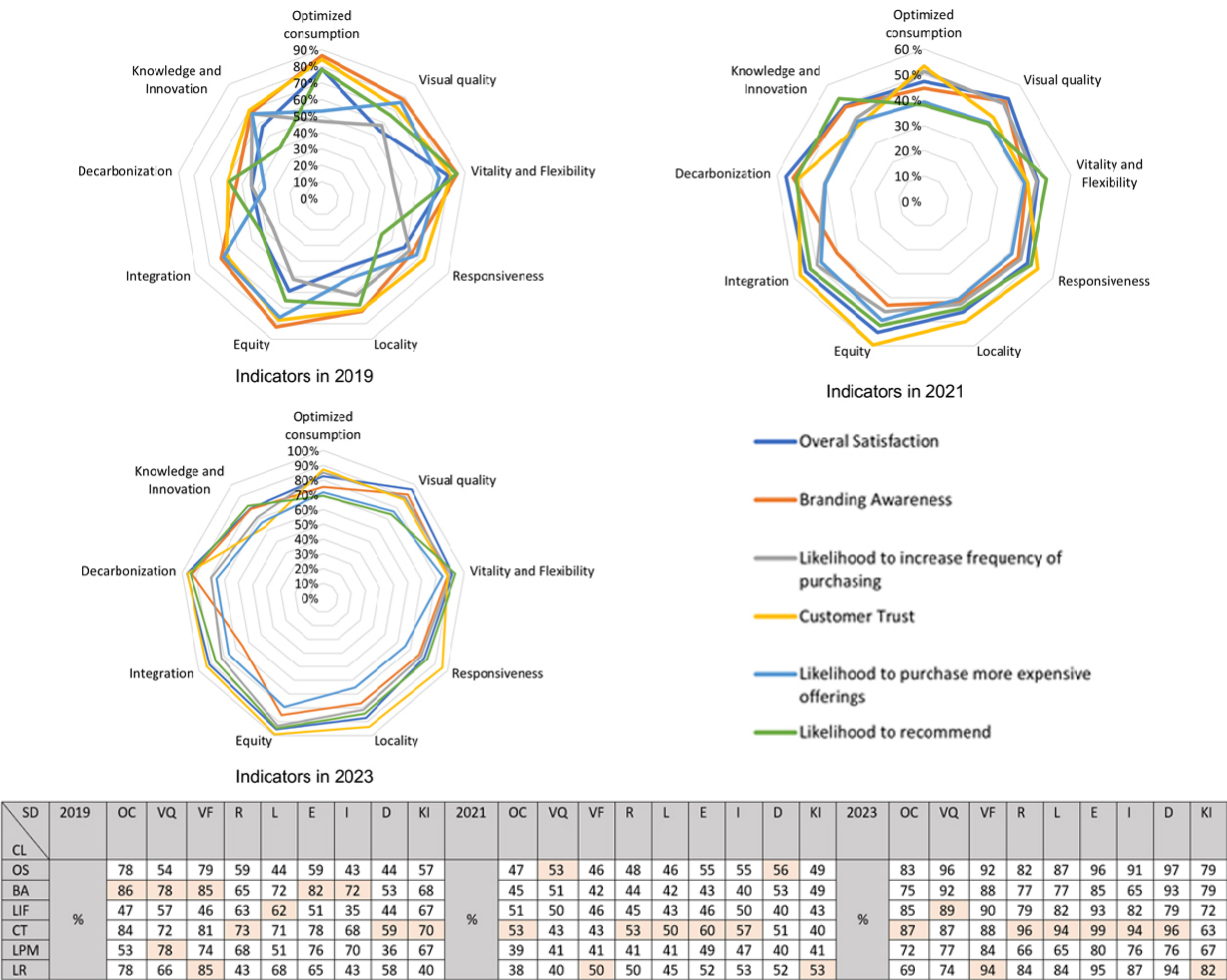

SD	2019	OC	VQ	VF	R	L	E	I	D	KI	2021	OC	VQ	VF	R	L	E	I	D	KI	2023	OC	VQ	VF	R	L	E	I	D	KI
CL																														
OS		78	54	79	59	44	59	43	44	57		47	53	46	48	46	55	55	56	49		83	96	92	82	87	96	91	97	79
BA		86	78	85	65	72	82	72	53	68		45	51	42	44	42	43	40	53	49		75	92	88	77	77	85	65	93	79
LIF	%	47	57	46	63	62	51	35	44	67	%	51	50	46	45	43	46	50	40	43	%	85	89	90	79	82	93	82	79	72
CT		84	72	81	73	71	78	68	59	70		53	43	43	53	50	60	57	51	40		87	87	88	96	94	99	94	96	63
LPM		53	78	74	68	51	76	70	36	67		39	41	41	41	41	49	47	40	41		72	77	84	66	65	80	76	76	67
LR		78	66	85	43	68	65	43	58	40		38	40	50	50	45	52	53	52	53		69	74	94	84	84	95	87	94	82

Figure 8. Radar charts showing the measured average relationships between sustainable design and customer loyalty items for the Grand Bazaar of Tehran. Top left: 2019 pre-pandemic analysis. Top right: 2021 pandemic analysis. Mid-left: analysis in 2023 after the pandemic. Bottom: a table of the relationships between the various items in percentage terms. (Source: authors.).

In addition to the significant impact of the bazaar's semi-open design on customer loyalty, strategies such as creating natural views by orienting openings toward central yards and the sky, implementing passive heating and cooling methods, utilizing local materials in exterior and interior spaces, and incorporating cultural patterns as the main decoration of the bazaar's entrance gates and gathering spaces can also influence customer loyalty to a lesser extent. The increasing relationships between the customer loyalty variables and the sustainable design variables in the Grand Bazaar of Tehran provides compelling evidence of the effect of the COVID-19 pandemic on public awareness of human relationships with nature in the design of public retail settings, and of the impacts of sustainable retail design on customer loyalty.

5. Conclusions

This case study focused on the Grand Bazaar of Tehran because of its popularity as a historical shopping and multifunctional center in an urban core that has been able to stay active and alive through different worldwide pandemics. This study identified the

impact on customer loyalty of human relationships with nature simulated through the Bazaar's sustainable design. Employing a mixed-method approach, this study employed a sequence of steps involving content analysis, the selection of relevant measures, direct observation, questionnaire design, survey collection, and analysis. The goal was to identify the sustainable design variables of public retail settings that have the greatest impact on customer loyalty.

Initially, a qualitative content analysis was conducted, based on reviews of the literature about customer loyalty and sustainable design, to define two sets of measurable variables for further evaluation. Subsequently, systematic direct observation was undertaken to understand the implementation of sustainable design variables in the studied case. The outcomes were then utilized in quantitative questionnaire surveys to analyze the effect of the Grand Bazaar's sustainable design (in terms of human relationships with nature) on customer loyalty.

This analysis includes studies of the relationship between sustainable design and customer loyalty variables at three different time points: 2019 (pre-pandemic), 2021 (during the pandemic), and 2023 (post-pandemic). The results point to Equity, Responsiveness, Locality, and Decarbonization as pivotal sustainable design variables that influence customer loyalty.

While Customer Trust was the customer loyalty variable most positively affected over the course of the pandemic, the research findings indicate a positive relationship between many of the sustainable design and customer loyalty variables across all three surveys. Notably, there is an overall moderate to strong relationship between the sustainable design and customer loyalty variables related to the Grand Bazaar before the pandemic, decreasing to a moderate level during the pandemic, and subsequently rising to a strong level after the pandemic. This trend suggests initial uncertainty followed by an increasing positive impact of sustainable design on customer loyalty over the course of the recent pandemic.

Looking forward in light of this study, we believe that new approaches to design are necessary to create sustainable public retail settings. The research findings suggest that design strategies emphasizing human relationships with nature, such as providing natural ventilation and daylight, orienting buildings to desirable wind exposure, and integrating open yards with closed and semi-open spaces, can have a high impact on customer loyalty. Additionally, utilizing these strategies alongside passive heating and cooling methods, use of local materials, and accommodation of cultural patterns can further influence customer loyalty.

This study contends that by prioritizing human relationships with nature in the sustainable design of public retail settings, a new paradigm for retail design can emerge, successfully adapting to pandemic restrictions and related concerns. The findings not only underscore the positive effect of sustainable retail design on customer loyalty but also identify specific design strategies that can be applied to post-pandemic retail settings to maximize customer loyalty.

We hasten to acknowledge the limitations of this interdisciplinary study. While this study focuses on investigating the effect of human relationships with nature in the bazaar's design on customer loyalty, there were factors beyond retail setting design that may have influenced customer loyalty during the pandemic. Retailers worldwide were challenged. Marketers changed their playbook. And the pandemic was a catalyst that left lasting changes in how we work, shop, and socialize. Furthermore, sustainable design is a multifaceted concept, and this study primarily examined variables related to human relationships with nature. Future research could explore other sustainability dimensions in design and their impact on customer loyalty or take a comprehensive approach to defining variables across all sustainability dimensions in post-pandemic retail settings.

In conclusion, the Grand Bazaar offers valuable insights, with its semi-open spaces, emphasis on natural lighting, and ventilation, providing a blueprint for design strategies that foster human relationships with nature. Perhaps lessons drawn from this case example may help inspire post-pandemic designers and stakeholders, encouraging them to incorporate these principles into the creation of appealing and sustainable retail spaces that cultivate strong customer loyalty.

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