The Impact of Environmental Design Elements on Corporate Site Selection of Information Industry Companies in the Metaverse

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Abstract
As the metaverse grows into a new kind of shared and personal space, companies in Türkiye's information industry are turning to virtual offices to better support employees working in hybrid setups. This study looks at what drives these companies to choose certain locations in the metaverse, with a special focus on how environmental and urban design can make these digital workspaces more appealing and effective. Using an online survey and correlation analysis, the research identifies key design features that impact corporate preferences. It aims to bridge theory and practice in metaverse platform design and contributes to the literature by revealing environmental design elements unique to virtual environments, which may align with or diverge from those in the physical world.

Keywords: Metaverse, Environmental Design, Site Selection, Information Industry

Introduction

In recent years, the rapid advancement of technology and digitalization has led to radical changes in the business world. Information industry companies are experiencing a significant transformation from the physical world to digital environments. An important reflection of this transformation has emerged with the development of virtual universes such as the metaverse. The metaverse is a concept that offers a digital environment independent of the physical world, shaped by the combination of virtual reality (VR), augmented reality (AR), blockchain and other digital technologies. This new environment has the potential to reshape both working methods and corporate location strategies for companies.

Virtual offices and workspaces in the metaverse are drawing attention as an alternative that can replace or complement physical offices. Information industry companies, especially those operating in the technology and service sectors, have begun to adopt hybrid strategies that combine physical and virtual forms of doing business in digital spaces such as the metaverse. This situation brings about a transformation that affects not only business processes but also corporate layout planning, design approaches and environmental factors.

Many companies take environmental design elements into consideration when designing virtual offices and workspaces, aiming to increase employee productivity, strengthen interaction, and contribute to sustainability goals in workplaces in the metaverse. In this context, moving environmental design beyond the physical world is becoming an important factor guiding corporate location choices in the metaverse.

The purpose of this study is to examine the environmental design elements that information industry companies take into consideration when choosing locations in metaverse environments and the effects of these elements on the companies' corporate strategies. Environmental design aims to provide a sustainable and interaction-oriented environment that meets not only the aesthetic or functional needs of virtual workplaces in the metaverse, but also the psychological and social needs of employees. In this process, the impact of environmental design elements is of great importance in understanding the shaping power of the metaverse on the future business practices of companies.

Urban design implementation tools are divided into three levels. At the first level, there are physical tools that create designs and are developed in the form of design controls, including design programs, design principles,

design plans and design guidelines. The second level addresses the entrepreneurial process and financing, while the third level addresses management tools. Design guidelines, which are part of project implementation tools in urban design, provide a conceptual framework that urban designers, urban planners, municipalities and other urban management bodies should use to organize physical spatial changes caused by urban development and to guide new urban renewal projects and activities. The purpose of design guidelines can also be defined as the systematization of social and physical programs and design expressions related to problematic urban areas (Karaman, 1992).

Founded by Ronald L. Mace in 1989 and named The Centre for Universal Design at North Carolina State University in 1996, the centre published seven principles in 1997, consisting of "egalitarian use," "flexibility in use," "simple and intuitive use," "perceivable information," "tolerance for error," "low physical strength requirement," and "appropriate size and space for approach and use," in order to make the concept of "universal design" understandable and to make recommendations (Story, Mueller, & Mace, 1998).

In their study on urban design quality frameworks, Nase et al. (2015) examined and compared the design frameworks of Kevin Lynch (1981), Bentley et al. (1985), Jacobs and Appleyard (1987), Tibbalds (1992), Congress for the New Urbanism (1996), CABE and DETR (2000), Llewellyn-Davies (2000), Barnett (2003), and Savills (2007) and conducted a frequency analysis based on a score of 1-9 for the concepts under the titles of character visual scope, spatial relationship, building design quality, adaptation and flexibility, mixed use, movement and accessibility, density, design for society/public benefit, social mix, user participation, sustainability, and management in the context of design frameworks.

• According to Lynch, the conceptual infrastructure components of urban design are control, suitability, feeling, liveliness, access,
• According to Bentley, personalization, durability, richness, noticeability, variety, permeability, visual suitability,
• According to Jacobs and Appleyard, identity, control society and public life, urban self-confidence, imagination and pleasure, liveability, originality and meaning, access to opportunities, an environment that appeals to everyone,
• According to Tibbalds, addressing and consulting all segments of society, being long-term and adapting, human scale, incomprehensibility, pleasure and visual pleasure, avoiding very large-scale changes, spaces before structures, visually noticeable environments, combining uses, freedom to roam, learning from the past and respecting the context,
• According to the New Urbanism Congress, cities and districts shaped by community organizations, pedestrian and transit-oriented design, physically defined public spaces, diversity in use and population, universal accessibility, commemorating local history, climate, ecology and building practices,
• According to CABE and DETR, it has been implemented through the eight characteristics of urban form: compatibility, character, continuity and preservation, public space quality, visibility, diversity, ease of movement,
• According to Llewellyn and Davies, it has been managed investment-design for change, work with the landscape, mixed forms, places suitable for people, mixed uses, establish connections, enrich the existing.

Character visual scope, **spatial relationship**, **mixed use** and **design for community/public benefit** ranked first with 9 points each, **building design quality** and **movement and accessibility** ranked second with 8 points each, and **sustainability** ranked third with 7 points.

As a result of the literature review, it is revealed that the studies conducted mostly address urban design parameters in terms of urban quality. As a result, urban planning and urban design are disciplines that complement each other. While urban planning shapes the city with large-scale strategic decisions, urban design implements these decisions in a human-centred, aesthetic and functional manner. This interaction between the two fields ensures that cities are more liveable, sustainable and aesthetically pleasing.

Developments in the real estate market are directly affected by various elements of urban planning. The balanced planning of different usage areas in the city – such as mixed-use projects, commercial areas and residential areas – positively affects real estate values by increasing economic activities in the region (Ferm and Jones, 2016). Mixed-use projects increase economic vitality by providing not only residential areas but also commercial, office and social areas in the city, and this creates more attractive opportunities for investors (Duany, 2000). The urban planning process requires the development of appropriate strategies to establish a balance between supply and demand. Overbuilding or lack of infrastructure in cities can lead to a decrease in real estate values and a decrease in the quality of life.

A comprehensive classification of the value created in the built environment is provided by Macmillan (2006), who identifies six different types of value. **Exchange value** views the built environment product as a commodity to be traded, whose commercial value is measured by the price the market is prepared to pay. **Use value** considers the contribution to organisational outcomes such as productivity, profitability, competitiveness and repeat business. **Image value** arises from the built environment's contribution to corporate identity, prestige, vision and reputation; it demonstrates commitment to design excellence or innovation, openness or being part of the brand image. **Social value** arises when the built environment creates or enhances opportunities for positive social interaction, strengthens social identity and civic pride, increases safety and reduces vandalism and crime. **Environmental value** is created through the application of the principles of adaptability and/or flexibility, durability and low maintenance, and a whole-life cost approach. **Cultural value** relates to the concepts of context and sense of place and may involve consideration of rather abstract issues such as symbolism, inspiration and aesthetics.

Metaverse, Urban Design, Real Estate Relationship

Planning, design and real estate have undergone a major transformation with technological advances. Digital technologies, big data analytics, artificial intelligence and automation have made urban planning and design processes more efficient and harmonious. The information industry is a sector that includes the processes of information production, processing, storage, distribution and consumption and plays a central role in economic structures. This industry can be defined as a rapidly growing and transforming area with the increasing integration of digital technologies and information processing tools (Drucker, 2012).

With the developments in information and communication technologies, the virtual world is becoming a broader expression of our personal and collective space, and a two-way shaping is emerging. This situation reveals the uncertain area between a person's physical existence, their actions in the physical environment, and their virtual identity (and actions) in digital networks (Ulubaş Hamurcu & Terzi, 2022). Until the twenty-first century, the transformations experienced in technology have greatly affected both the city and urban life. Growing and developing cities are turning to smart applications to offer quality life opportunities to the public, increase the level of efficiency, expand the level of sustainability, facilitate urban life, and find innovative solutions to problems. In this process, the use of technology instead of traditional methods is very important (Terzi & Ocakçı, 2017).

The concept of the metaverse has emerged as a reflection of the historical and technological developments explained above and as a response to this area of uncertainty in the transformation of spatial areas from physical to digital. In general, the Metaverse is considered a fully immersive, hyper spatiotemporal, and self-sustaining shared virtual space that blends the physical, human, and digital worlds. The Metaverse is a virtual platform where one can immerse themselves in a three-dimensional digital space through avatars and NFTs, a type of cryptocurrency derived from blockchain-based smart contracts, by bringing real and virtual environments into interaction (Mystakidis, 2022).

The Metaverse platform today offers users opportunities in various areas such as attending concerts, watching

movies, communicating, visiting museums, playing games, and attending meetings and trainings in three-dimensional environments using virtual reality, augmented reality or mixed reality tools (Arvas, 2022). Today's important metaverse platforms and their basic features are shown in Figure 1.

Decentraland	Blockchain-based virtual world. Users can buy, build, and trade digital land. All assets are tokenized on the Ethereum blockchain.
The Sandbox	A platform focused on digital games and virtual property. Users can create, sell, and trade in-game assets. Blockchain-based.
Roblox	A platform for creating and playing games, popular among young users. Users can design their own games and hold social events.
Meta Horizon Worlds	Metaverse platform of Meta (formerly Facebook). Provides social interaction, games and participation in virtual events. Provides three-dimensional interaction and virtual life experience.
Somnium Space	Virtual reality focused metaverse platform. Users can buy virtual real estate, host events, and trade.
Cryptovoxels	Blockchain-based, low-resolution virtual world. Users can create digital art galleries and trade.

Figure 1: Important Metaverse Platforms and Their Basic Features

In the coming years, as service provision becomes more widespread in the Metaverse, social interactions and knowledge increase, and opportunities are unlimited, people will help increase liveability by using their resources for purposes such as personal development, health, and social development (Allam et al., 2022). As examples of developments in the private sector, Nike has created its own digital universe for virtual products that can be purchased in the Metaverse, Disney has begun work on creating a theme park, and Gucci has begun selling its own NFTs (Wise, 2023). In addition, Samsung has brought its Samsung 837 concept from New York City to the metaverse, and fashion chain Forever 21 has opened a branch in the virtual universe (Tekin, 2022).

The metaverse provides a synchronous platform for urban governance as it allows for the digital delivery of urban services and assets. Augmented reality, virtual reality, mixed reality, the internet of things (IoT), digital twins, and blockchain are the key technologies that are vital to the meta database, and cities are benefiting from these technologies in many areas of use (Aksu & Ercoşkun, 2022). For example, cities such as Orlando, Las Vegas, and Boston already have virtual replicas that allow local governments to envision and consider various scenarios, such as the impacts of planned land uses and new roads. Such efforts can be positively complemented by the meta database, where urban planners, developers, managers, and other stakeholders have equal opportunities to interact and collaborate in the digital realm while creating plans and finding solutions to various urban problems (Allam et al., 2022).

The basis of the urban metaverse is the merging of the consumer metaverse and industrial metaverse visions. From a general perspective, it can be said that the urban metaverse has the following main characteristics (Dienhart et al., 2025):

• Digital twins: virtual copies of physical objects, processes and systems in the city. These digital twins are constantly updated and interact with each other in a virtual environment.
• Real time and progression over time: an important aspect of the urban metaverse is that time in the virtual world progresses in parallel with the physical world (continuity). This can happen in real time or at regular intervals, depending on the usage scenario.
• Immersion: virtual reality (VR) and augmented reality (AR) technologies provide an immersive experience by allowing users to be fully immersed in the virtual environment.
• Interactivity: citizens, local governments and companies can interact in the virtual environment, perform simulations with objects and systems and make data-driven decisions.

The processes of creating virtual cities in the Metaverse have taken the concept of digital twins one step further, and in June 2022, DEIP Metaverse City opened a space in the metaverse for architects, urban planners and artists from all over the world to develop a creative virtual city industry. DEIP Metaverse City consists of a three-story exhibition area, a labyrinth of dozens of intersecting streets, tunnels and a square with an amphitheatre (Kashiripoor, 2023) as shown in Figure 2.

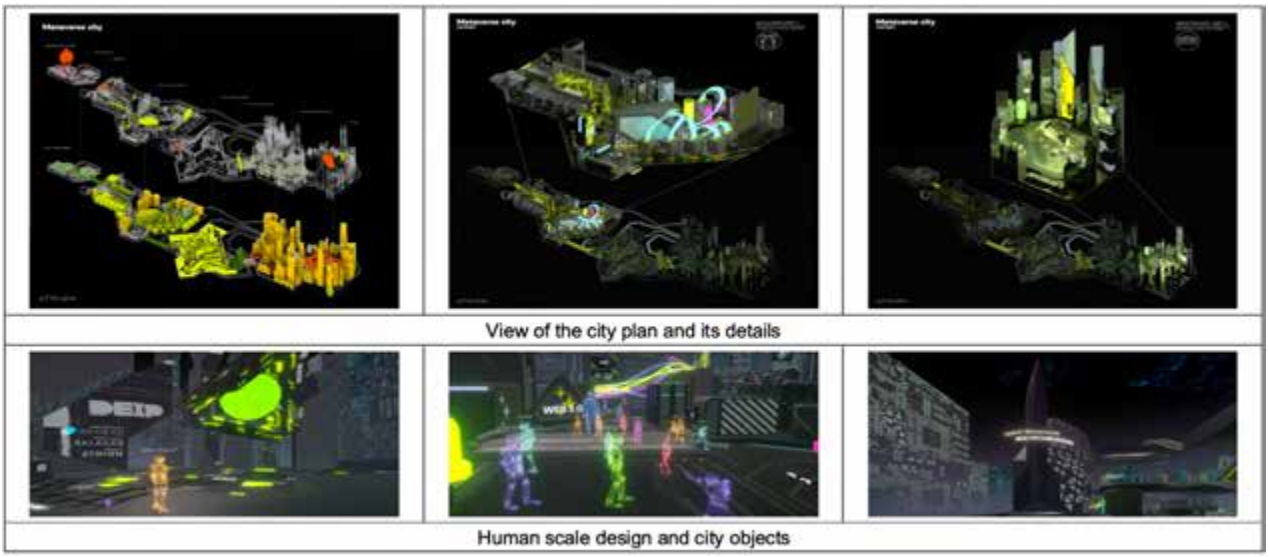

Figure 2: DEIP Metaverse City (Kashiripoor, 2023)

Liberland Metaverse, a major urban scale metaverse application, is a joint venture between four organisations: Liberland (client), Zaha Hadid Architects (design), Mytaverse (technology) and ArchAgenda (management). Liberland is a political initiative that aims to create a free micro-nation on a small, arid and disputed seven square kilometre area on the Danube River between Croatia and Serbia. Liberland, a city construction project by transferring a real-life space to the metaverse environment, has a decentralized financial structure-based approach and aims to reflect Web3 details representatively on space in the context of urban design. Figure 3 shows the urban design of Liberland located on the banks of the Danube River, while Figure 4 shows the effects of Web3 reflections on urban design as representations of the structures located in the city centre of Liberland.

Figure 3: Liberland Metaverse – Zaha Hadid Architects – 2022

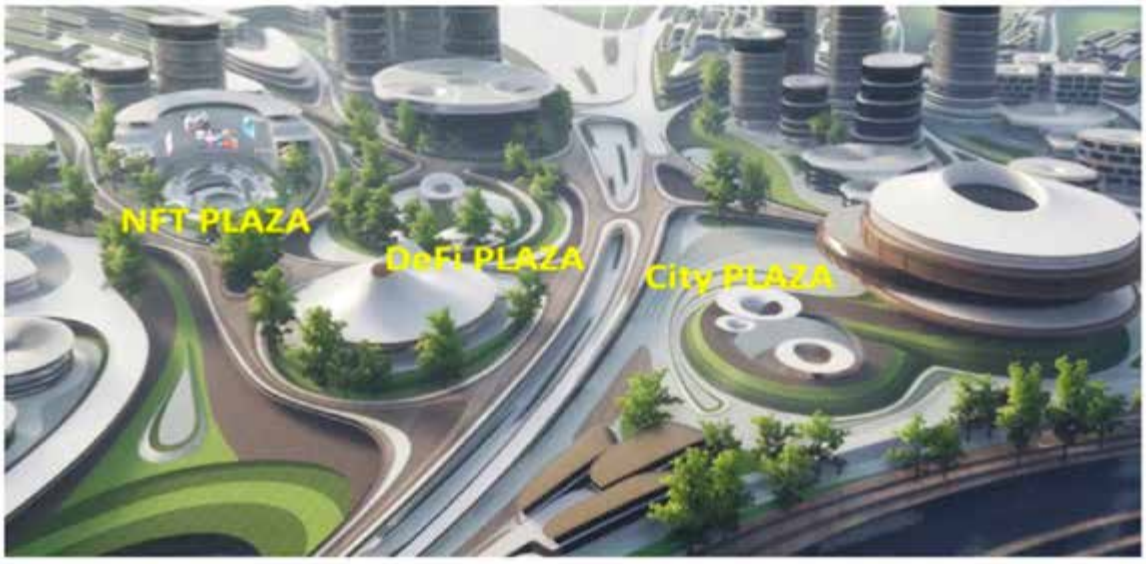

Figure 4: Naming Structures with Web3 Terms in the Liberland Metaverse Environment

Real estate activities in the metaverse provide people with a place and opportunity to connect with people in remote locations around the world. Developers can monetize their virtual properties to advertise services, host events, and provide unique visitor experiences. Like physical land, real estate can also be rented. Therefore, investing in metaverse real estate can be profitable for key players in the architecture-engineering-construction (AEC) industry. The expected market size data for the real estate sector in the entire metaverse between 2022-2030 is shared in Figure 5.

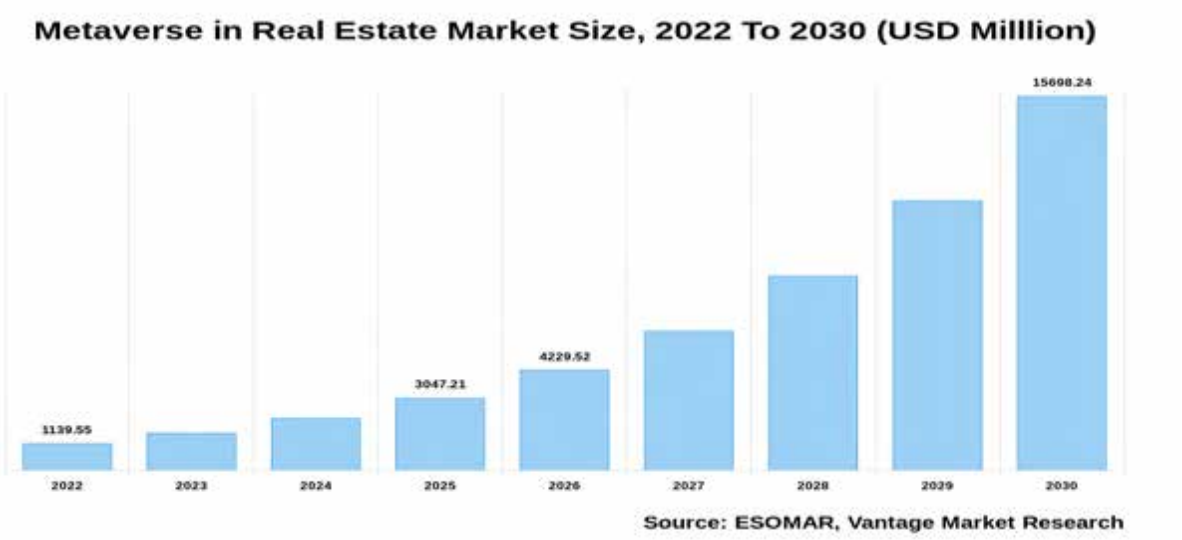

Figure 5: Expected Market Size of the Real Estate Sector in the Metaverse Between 2022-2030 (values are in millions of dollars)

The most important benefit of metaverse real estate is that it compensates for the lack of space in the physical world. For example, if an office lacks physical meeting spaces, employers can create conference rooms and event rooms in the metaverse. The metaverse also provides a seamless collaboration experience that allows people living in different parts of the world to communicate with each other. The value of location in the metaverse depends on the environmental conditions around the property rather than the travel distance (Güven & Ercan, 2022).

As a result of the literature review, it is revealed that the studies conducted mostly address urban design elements in terms of urban quality. After the process of associating these elements in the literature with strategies for increasing real estate value in urban space, urban design, regional identity, mixed uses, open spaces, building heights and appearances, spatial relationship, sustainability, visual and morphological concepts have become the most associated keywords as environmental design elements. The correlation of the keywords encountered regarding urban design/environmental design elements in the urban design literature review and the parameters suggested by Tiesdall and Adams for increasing real estate value in urban space strategies has been objectively interpreted because of the readings. Accordingly, **urban design, regional identity, mixed uses, open spaces, building heights and appearances, spatial relationship, sustainability, visual** and **morphological** concepts have become the most associated keywords as environmental design elements.

This study, which is addressed with theoretical and practical frameworks, aims to reveal which elements can determine the institutional location selection decisions of information industry companies in Türkiye on the metaverse platform and how added value can be created with urban/environmental design tools. Another aspect that makes this study unique is that it aims to reveal how environmental design elements that overlap with environmental design elements in the real (physical) world or completely different and new environmental design elements find a counterpart in the metaverse world. The research questions for this study are listed below.

Research Questions:
1- How do urban and environmental design elements affect the location selection decisions of companies and institutions operating in the Information Industry for their offices to be established in the metaverse?

2- Which urban and environmental design elements are most important for companies for the offices or facilities they will establish in the metaverse?
3- Are there other design elements that do not appear in the physical world or are not important but may affect the location selection decisions of information industry companies in the metaverse?

Methodology

The study aims to identify the factors influencing corporate site selection decisions of information industry companies in Türkiye within metaverse platforms and to explore how urban/environmental design tools can create added value. The structure of the study is concentrated on the relationship between the "metaverse and urban design" with also "real estate and urban design" through remarkable subtopics which have emerged as the key terms most frequently associated with environmental design elements such as regional identity, mixed uses, open spaces, building heights and appearances, spatial relationships, sustainability, visual and morphological concepts.

The method of this study involves an online survey application based on key elements encountered in literature review and other environmental design elements predicted in light of urban planning/urban design formation, to determine which environmental design factors influence corporate site selection decisions of information industry companies in the Metaverse.

This survey study aims to determine the general thoughts of the owners or authorized managers of companies and institutions operating in the information industry in Türkiye on institutional location selection in the metaverse environment and which environmental design elements they give importance to in location selection.

In total 26 respondents from information industry in Türkiye who represent their companies/institutions at executive level responded the online survey between December 2024 – May 2025 period. Based on the survey results, the relationships and importance evaluation of environmental design elements were conducted using correlation analysis in the SPSS software.

In the survey study, a scale application was made by selecting elements corresponding to the metaverse world from the table of corporate location selection determinants in the physical world (Figure 6) compiled from previous literature studies in Ramantswana's doctoral thesis (2019) titled "Determinants of headquarters location and site selection for companies listed on the Johannesburg Stock Exchange".

Table 2.2: Determinants/factors of location

Country	Author	Human resource (skilled labour force)	Labour costs (wage/salary/benefits)	Access to markets, customers, clients, services, and suppliers and information	Favourable sector-specific regulation	Government policies, tax and regulatory environment	Quality infrastructure (telecommunication and transport)	Political risk	Business environment	Economic incentives/favourable financial environment	Availability and cost of support services for employees housing	Same industry specialisation/ agglomeration of same sector	Location of Management/Executive
Klein et al., 2013	South Africa			x		x	x						
Davis & Henderson, 2004	US			x								x	
Lovely et al., 2005	US	x											
Lunnan et al., 2011	Norway			x				x	x				
Klier & Testa, 2002	US	x	x						x				
Wang et al., 2011	China			x	x				x				
Laamanen et al., 2012	Europe	x				x							x
Bel & Fageda, 2008	Europe	x	x	x		x				x			
Strauss-Kahn & Vives , 2009	US		x	x		x	x		x	x		x	
Luiz & Radebe (2016)	South Africa	x		x		x	x	x	x	x			
Coeurderoy & Verbeke, 2016	Multinational								x				
Meyer & Benito, 2016	Multinational	x		x		x		x	x			x	x
Baaij et al., 2004	Multinational								x				
Benito et al., 2002	Finland							x					
Birkinshaw et al., 2006	Sweden			x									
Egger et al., 2013	Multinational					x	x						
Laamanen et al., 2012;	Europe					x							
Holt et al., 2008	Europe & Asian Pacific	x	x	x	x	x	x		x	x	x		
Turok, 2013		x					x				x		

Figure 6: Determinants Affecting Location Selection Literature Review (Ramantswana, 2019)

Findings

Based on the initial findings of the pilot survey (with 26 respondents), environmental elements within the accessibility cluster have a more significant impact on the corporate site selection decisions of companies or institutions operating in the information industry compared to the urban space design elements cluster and building design cluster. It can be said that the dominance of this result is largely because the survey was conducted in Türkiye, particularly reflecting the responses of company representatives based in Istanbul. This is because Istanbul is a metropolitan city where traffic and accessibility issues are particularly pronounced. Therefore, environmental design elements within the accessibility cluster have become the most prominent criterion even when making site selection decisions in the Metaverse.

The average rating of level of knowledge about virtual/crypto investment instruments on a scale of 1: very little to 5: very much is **3.35** among the respondents whereas the level of knowledge about the concept of the Metaverse is rated **3.00** on average. Respondents are slightly more knowledgeable about crypto investment instruments compared to the Metaverse. However, the knowledge levels for both topics are around the mid-range, indicating that while there is a growing awareness, a deep understanding has not yet been achieved.

Demographic distribution of the respondents are 20 male (77%) and 6 female (23%). Among the survey participants, 14 are university graduates (55%), 8 hold a master's degree (30%), and 4 have a doctoral degree (15%). Of the institutions represented by the participants, 11 were established before the year 2000 (42%), 2 between 2000 and 2010 (8%), 7 between 2011 and 2020 (27%), and 6 after 2020 (23%). Out of these institutions 24 have a physical office as their headquarters. Additionally, half of these institutions have branch offices, while the other half are managed solely from their headquarters. Among the institutions where the survey participants work, 6 have between 1 and 10 employees (23%), 8 have between 11 and 100 (31%), 7 have between 101 and 1,000 (27%), and 5 have more than 1,000 employees (19%). The institutions with more than 1,000 employees have an extensive branch network across Türkiye. According to the 23 respondents, the average age of employees across all institutions is approximately **36.65 years**. The distribution of employees per age groups is detailed in Figure 7. Baby Boomers mostly

fall into the Lowest category (73%) with none in the Highest. Millennials (Generation Y) stand out with the highest percentages in Highest (35%) and High (38%), and no one in the Lowest category. Generation Z is more divided, with significant portions in both High (38%) and Lowest (38%) categories. This suggests a strong upward trend for Millennials compared to older generations, while Generation Z shows more polarization.

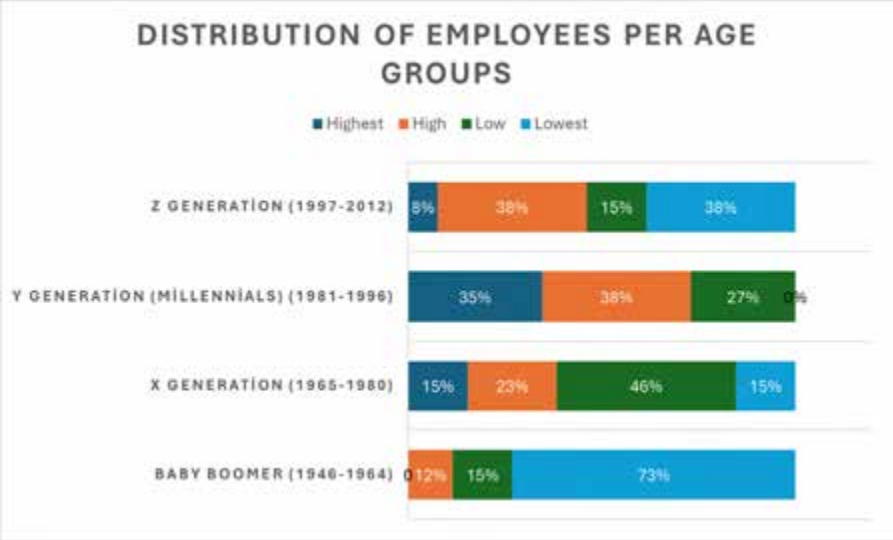

Figure 7: Distribution of Employees Per Age Groups

Institutions are nearly evenly divided between classic, independent buildings and large-scale, corporate-style plazas, with a noticeable move toward smaller or virtual spaces. This diversity reflects varying operational styles, from traditional roots to agile, modern models. Figure 8 depicts the distribution of central offices location types. Two most common office types are detached building with garden and plaza (higher than 10 floors), each with 27% - showing a split between traditional standalone buildings and modern high-rises. About 19% operate from small business centres (1–5 floors), reflecting a preference for mid-sized, cost-efficient office spaces. Virtual offices (8%) and apartments (8%) remain in the minority but still represent a shift toward flexible or unconventional setups. Only 12% are in 6–10 floor business centres, suggesting these are less favoured, possibly due to cost or practicality.

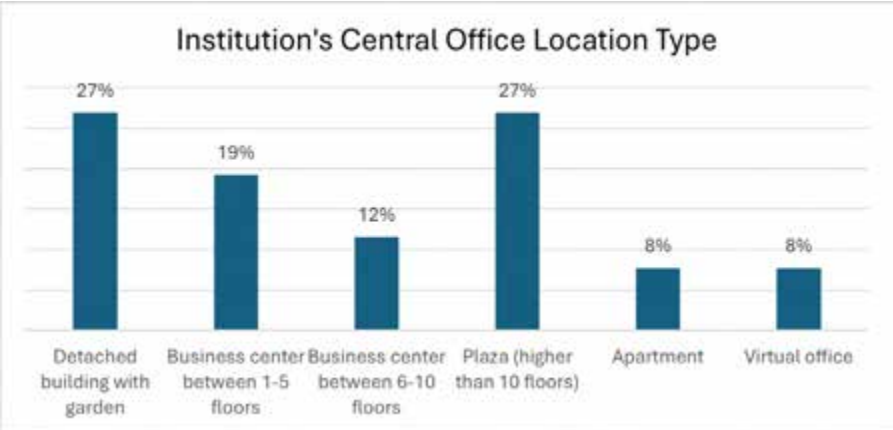

Figure 8: Distribution of Institution's Central Office Location Type

The respondents were asked to rate the importance of various environmental elements that affect the location selection of their current institution's physical head office under three main categories: accessibility factors, elements of urban space design, and elements of building design. Figure 9 provides the rating of each factor with a heat-map analysis.

Group Name	Environmental Element	Rating				
		1	2	3	4	5
Accessibility	Ease of access by public transportation	8%	0%	23%	31%	38%
	Ease of access by private vehicle	4%	4%	15%	31%	46%
	Access to parking	4%	4%	8%	15%	69%
	Access to recreational areas (urban green areas, parks, etc.)	8%	15%	31%	19%	27%
	Access to food and beverage facilities	4%	4%	31%	38%	23%
	Proximity to customer offices/locations	12%	8%	23%	46%	12%
	Access to public areas (squares, streets, etc.)	15%	12%	38%	23%	12%
	Affordability of rental costs	4%	4%	23%	42%	27%
	Located in a prestigious area of the city	8%	8%	12%	42%	31%
Elements of Urban Space Design	Livability and liveliness	4%	8%	23%	38%	27%
	Safe spaces	0%	12%	4%	35%	50%
	Diversity and flexibility	4%	8%	19%	50%	19%
	Density (people, vehicles, structural density)	8%	8%	19%	38%	27%
	Urban furniture (benches, street lighting, stops, waste collection units, flower pots, etc.)	23%	4%	27%	27%	19%
	Urban art (sculptures, murals, performing arts, etc.)	31%	0%	38%	15%	15%
	Necessary-sufficient office space size	4%	4%	4%	58%	31%
Elements of Building Design	Building - environment - street relationship	8%	4%	23%	42%	23%
	Urban form and building type	8%	8%	12%	38%	35%
	Space scale	4%	4%	15%	38%	38%
	Natural light and ventilation	4%	4%	19%	23%	50%
	Architectural identity and details	19%	0%	15%	31%	35%
	Material (types of materials used in the building)	12%	0%	12%	38%	38%

Figure 9: Current Office Location Selection Environmental Factors Heat Map

Figure 10 shows the distribution of ratings for each element affecting respondents' current office location selection. Institutions prioritize **functionality, safety, and accessibility**, especially for accessibility. While aesthetics and design quality are appreciated, decorative urban elements like public art rank lower. The findings reflect a preference for **practical, secure, and well-designed spaces** that support comfort and efficiency. **Access to parking** (69%) and **ease of access by private vehicle** (46%) are highly valued, showing the strong importance of car-friendly environments. **Safe spaces** (50%) and **natural light & ventilation** (50%) are also top priorities, emphasizing **safety and healthy work environments**. **Sufficient office space** (31% rated 5, 58% rated 4) stands out as a critical functional need. Architectural identity and building materials both receive 35%–38% 5-star ratings, suggesting **aesthetic and construction quality matter**. On the other hand, **urban art** (31% rated it only 1) and **urban furniture** scored lower, indicating these elements are **less critical** in office location or building evaluations. **Proximity to customer offices** and **access to public areas** are considered **less decisive**, possibly due to remote work trends.

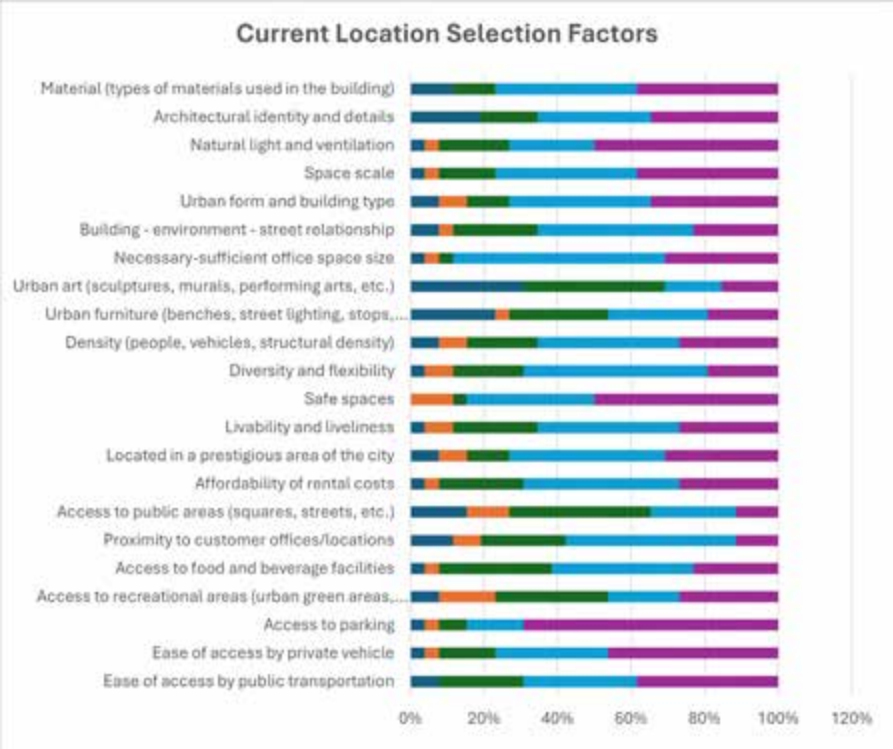

Figure 10: Distribution of Ratings for Each Element Affecting Respondents' Current Office Location Selection

Correlation analysis of ratings for each element affecting respondents' current office location selection is depicted in Figure 11. There is an **exceptionally strong correlation (0.99)** indicating that respondents ranking areas with better **access to public transportation** often also rank better **natural light and ventilation**. There is a very high correlation **(0.97)** between **access by private vehicle** and **natural light and ventilation**. The high correlation between **access by private vehicle** and **access by public transportation (0.95)** shows that areas with good access to one type of transportation often have similar importance to the other. This might point to areas that are centrally located or well-connected, where urban planners ensure that both private and public transportation options are available to accommodate various needs. A very high correlation between **building-environment relationship** and **natural light and ventilation (0.94)** suggests that buildings designed to complement their surroundings tend to also benefit from optimal natural light and airflow. This likely indicates that spaces with a strong connection between the building and its environment are intentionally designed to maximize comfort, taking advantage of environmental factors like sunlight and breeze. The strong correlation between **access to parking** and **ease of access by private vehicle (0.89)** suggests that locations with better access to private vehicles tend to have more parking available. The positive correlation between **urban art** and **architectural identity (0.85)** indicates that places with a stronger architectural identity often include significant artistic elements, such as sculptures or murals. This is because both urban art and architectural details contribute to the overall aesthetic and cultural richness of an area, and they are often planned together as part of a cohesive urban design strategy. **Urban art** contributes positively to **liveability** and **liveliness (0.72)**, suggesting that spaces with more urban art tend to be considered more vibrant and liveable.

These observations illustrate the strong interconnections between various design elements and their impact on accessibility, environmental quality, and the overall urban experience. For instance, **transportation access** (both public and private) is strongly linked to **natural light** and **ventilation**, while the **relationship between buildings and their environment** has a notable influence on both aesthetic and functional qualities. Similarly, the presence

of **urban art** often enhances **liveability**, suggesting a clear link between creative urban design and the vibrancy of a space.

Under virtual working experience section of the survey, majority of the respondents (81%, n: 20) confirmed that their organization have a remote (virtual/hybrid) working principle in place. Naturally, the year 2020 shows a spike of remote work implementation year due to COVID-19 restrictions experienced (Figure 12).

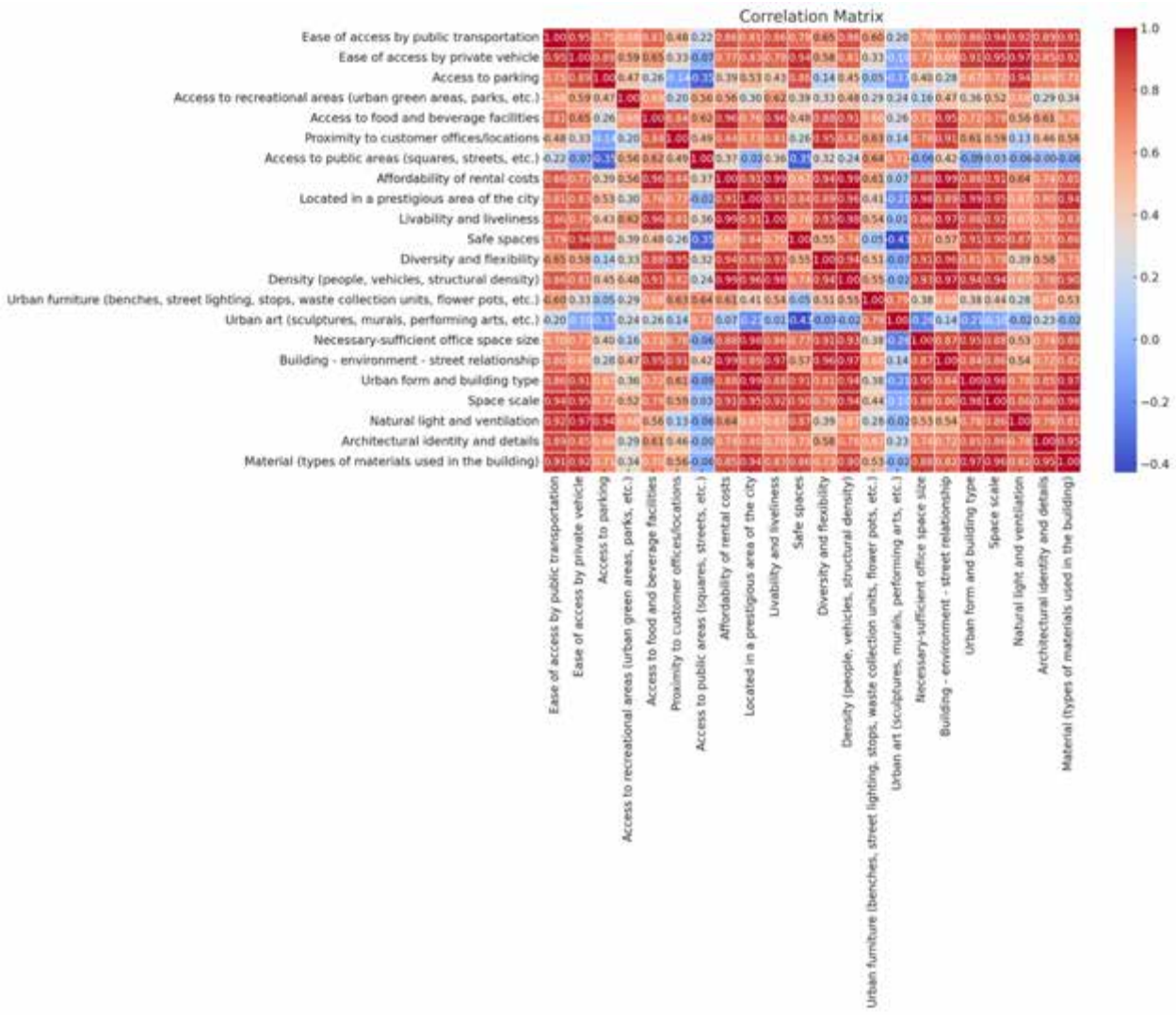

Figure 11: Correlation Analysis of Ratings for Each Element affecting Respondents' Current Office Location Selection

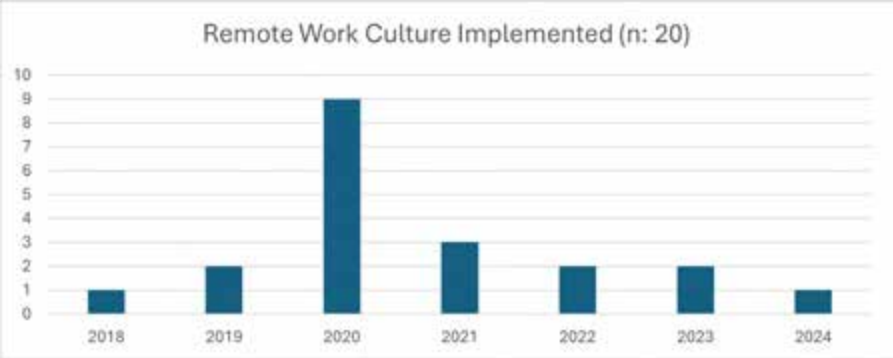

Figure 12: Remote/Hybrid Work Culture Implementation Year

Continuously, hybrid/remote work has been widely accepted among the information industry institutions. The dominant hybrid working trend is **2–3 days in the office**, often combined with **employee autonomy**. Organizations are clearly leaning toward **flexible**, **balanced setups** that maintain both collaboration and remote work benefits. Most common model preferred is 2 days a week (8 responses) suggesting a balanced hybrid approach (Figure 13).

Figure 13: Employee Office Days

There is general awareness and growing concern about the future of work, but not yet a fully mature or widespread focus. The **average rating of 3.65** indicates a moderately high level of interest and awareness regarding **future working conditions**. While it is not at the maximum, the score suggests that most respondents recognize the importance of evolving work models as this is strongly supported by 96% of the respondents that they plan to integrate new technologies into their working conditions in the future but there may still be room for deeper engagement or knowledge development. Rating of adapting technologies is shown in Figure 14 as a heat map and in Figure 15 with distribution.

	Rating				
	1	2	3	4	5
Virtual office work and meeting platforms (Microsoft Teams, Zoom, etc.)	4%	0%	12%	31%	54%
Virtual reality / augmented reality glasses	23%	8%	35%	23%	12%
Digital twin office (digital twin of your current office)	12%	15%	42%	19%	12%
Metaverse office	15%	15%	42%	12%	15%

Figure 14: Rating Heat Map of Adapting Technologies

The data indicate that traditional virtual meeting platforms like Microsoft Teams and Zoom are highly favoured, with most respondents giving top ratings. Emerging technologies such as virtual reality (VR)/augmented reality (AR) glasses, digital twin offices, and metaverse offices receive more mixed and moderate ratings, reflecting uncertainty and varying acceptance levels. This suggests that while virtual meeting tools are well-established and widely accepted, newer immersive technologies are still in the early stages of adoption and evaluation.

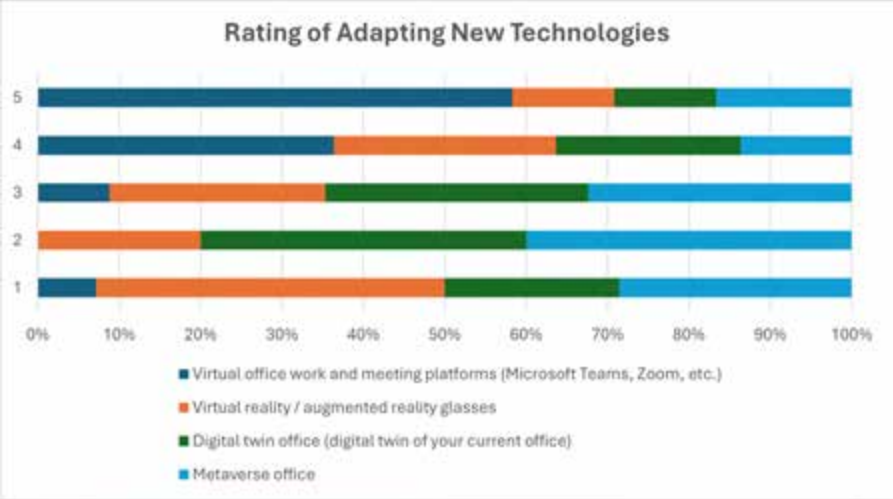

Figure 15: Rating Distribution of Adapting Technologies

Correlation matrix for adapting various technologies is shown in Figure 16. There is a slightly negative correlation between **virtual office work platforms** (such as Microsoft Teams and Zoom) and **virtual reality/augmented reality glasses (-0.19)**. This suggests that these two technologies are somewhat independent in usage, with some users favouring traditional virtual meeting platforms, while others may prefer immersive technologies like AR/VR. Also, there is a slightly negative correlation between **virtual office platforms** and **digital twin offices (-0.22)**. This could suggest that people who prefer traditional virtual office platforms may not be as interested in digital twin technology, which is a more advanced and immersive concept. As with the previous observation, the negative value is small, showing only a weak association. Similarly, there is a slightly negative correlation with **virtual office platforms** and **metaverse offices (-0.24)**. The metaverse office is a more futuristic concept, so it might appeal to different user segments compared to more established platforms like Microsoft Teams and Zoom. A strong positive correlation exists between **virtual reality/augmented reality glasses** and **digital twin offices (0.78)**. This suggests that users who engage with AR/VR technologies are likely to also be interested in digital twin offices. Both technologies share immersive, 3D modelling characteristics, and this correlation indicates that users interested in one may also gravitate toward the other. There is a strong positive correlation between **AR/VR glasses** and **metaverse offices (0.71)**. This makes sense because both involve immersive virtual environments. Users who engage with AR/VR technology are more likely to be interested in virtual worlds like the metaverse, which are designed to provide rich, interactive, and 3D virtual experiences. The very strong positive correlation between **digital twin offices** and **metaverse offices (0.93)** suggests that these two concepts are closely linked. Both are cutting-edge virtual environments, and users interested in digital twin technology (which replicates real-world offices in a digital format) are also highly likely to be interested in metaverse offices (virtual workspaces that provide immersive experiences). This indicates a shared interest in next-generation virtual environments. The correlation matrix shows that the virtual office work and meeting platforms have weak negative correlations with the more advanced technologies (AR/VR glasses, digital twin offices, and metaverse offices). These technologies, while related to the digital workplace, represent different levels of immersion and technological advancement. In contrast, **virtual reality/augmented reality glasses**, **digital twin offices**, and **metaverse offices** show strong positive correlations with each other, signalling a shared trend toward more immersive and futuristic work environments.

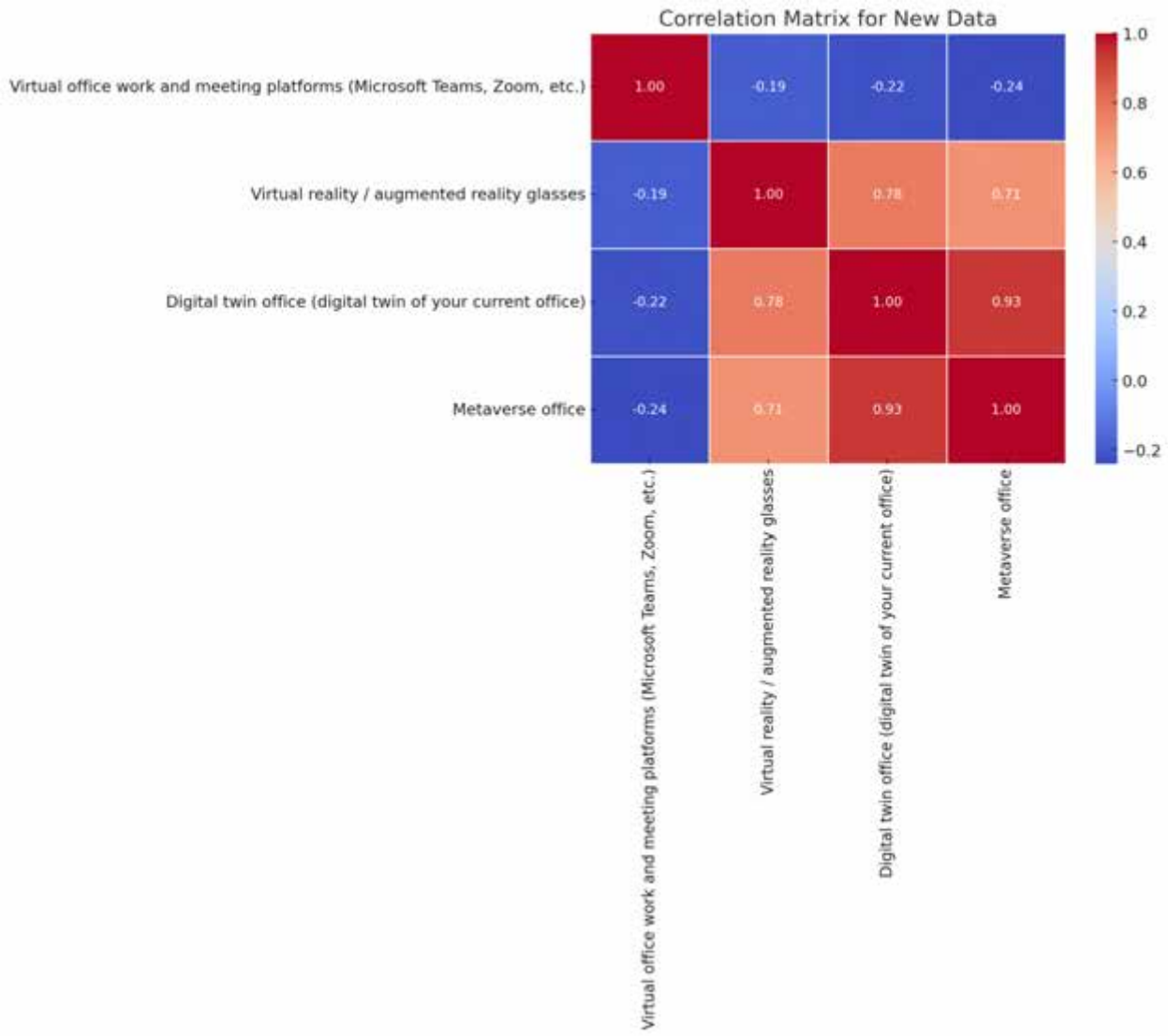

Figure 16: Correlation Matrix for Adapting Various Technologies

While understanding the virtual real estate investment details of the respondents, great majority (88%) responded that they have not invested in this area yet. The rest (12%) have invested in that area individually. No response is received regarding investment on virtual real estate on institutional level. On the other hand, 19% indicated that they plan to create an office in the metaverse environment for their institution. This highlights that there is a slight room for institutional metaverse office development opportunity with the existing trend. When analysing further to better understand the room size, respondents were asked in how many years they were planning to create an office in the metaverse (Figure 17). While majority just like their virtual real estate investment trend are not planning to create an office in the metaverse yet, about 16% aims to create metaverse office in the long term (8 years and beyond). In contrary, 20% of the respondents are supporting creation of metaverse office for their institution with the next 5 years. This situation sheds light on the fact that there will be a tendency to adapt to the metaverse concept over time.

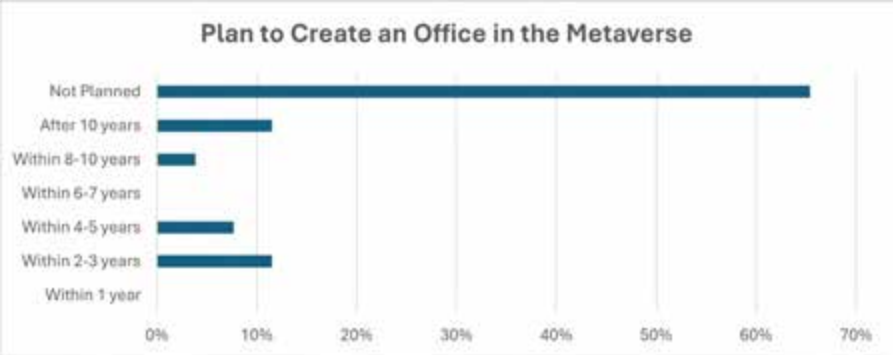

Figure 17: Respondents Tendency to Create an Office in the Metaverse

When asked how much they would invest to create a metaverse office, 21 out of 26 respondents who participated in the survey were reluctant to invest, while 60% of the respondents who found it appropriate to invest in metaverse office levelled the value at 20,000 USD.

Considering an office that can be created in the metaverse environment, the building where the office is located and the immediate surroundings of this building, respondents were requested to rate all of the elements shown in Figure 18.

	Rating				
	1	2	3	4	5
Ages and requirements of current employees	0%	12%	8%	50%	31%
Ages and requirements of new employees joining your organization	0%	12%	0%	54%	35%
Increasing employee experience	0%	4%	8%	54%	35%
Access to a talented workforce	0%	8%	4%	54%	35%
Inter-organizational competition	4%	8%	15%	42%	31%
Access to new markets	4%	12%	4%	35%	46%
Political risks	8%	8%	23%	35%	27%
Creating in-house events	8%	4%	12%	46%	31%
Locating in a prestigious area of the city	15%	8%	8%	38%	31%
Location costs	4%	8%	12%	35%	42%
Necessary-sufficient space size	4%	8%	15%	46%	27%
Time savings due to elimination of transportation (traffic-free)	4%	4%	0%	42%	0.5
Changeable/adaptable interior (architectural) design experience	4%	0%	15%	54%	27%
Changeable/adaptable exterior (urban) design experience	4%	0%	15%	54%	27%
Savings in operational (OPEX) and capital (CAPEX) investments	0%	4%	8%	27%	62%

Figure 18: Rating Heat Map of Elements Affecting Metaverse Office Creation

62% of respondents rated **savings in OPEX & CAPEX** as a top priority (5) - the highest among all factors. **Location costs** also received strong importance with **42%** scoring it 5. For both **current and new employees**, over **85%** rated **ages and requirements** at **level 4 or 5**, indicating a high focus on aligning workplace dynamics with workforce demographics. **Access to talented workforce** and **employee experience** both saw **89%** rating them as important to very important. **Changeable/adaptable architectural and urban designs** are valued, with **over 80%** rating these elements as 4 or 5, highlighting a demand for **agility and adaptability in workspace design**. Surprisingly, **time savings due to elimination of transportation** had very low importance (only 0.5% rated it 5). This suggests organizations may **undervalue the benefits of commute-free options**, possibly due to hybrid or on-site work preferences. 46% rated **access to new markets** as top priority, making it one of the most decisive external factors influencing organizational decisions. Cost and Efficiency are top priorities, workforce and talent are central concerns, flexible design matters, timesaving through reduced commute is overlooked, and market expansion is a key strategic driver. Figure 19 shows the rating distribution of elements in an office created in the metaverse.

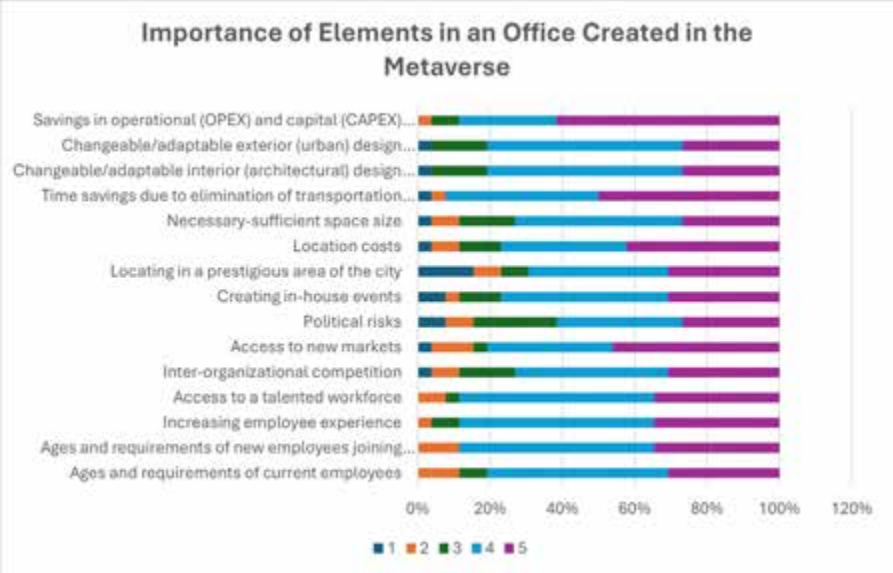

Figure 19: Rating Distribution of Elements in an Office Created in the Metaverse

Figure 20 details the correlation analysis of elements in an office created in the metaverse. There is an extremely strong positive correlation between **the ages and requirements of current employees and new employees joining the organization (0.99)**. This suggests that the age profiles and needs of new employees are very similar to those of current employees, indicating that the organization might be attracting employees with similar needs and characteristics. Similarly, **age and requirements of employees** are strongly linked to efforts in **increasing employee experience (0.99)**. This implies that understanding the demographic and professional needs of employees can play a critical role in improving their overall experience in the organization. There is also a very strong correlation between **ages and requirements of current employees and access to a talented workforce (0.99)**. The strong correlation here suggests that as the **age and requirements of employees** This could indicate that organizations are able to attract talent that aligns well with their current employee base and requirements. A very strong correlation exists between **increasing employee experience** and **access to a talented workforce (0.99)**, indicating that efforts to improve the employee experience are often associated with a higher ability to access top talent. A high correlation suggests that organizations focused on **improving employee experience** are also likely to be actively engaging in **inter-organizational competition (0.99)**. The drive to enhance the employee experience may be a strategic effort to stay competitive in a crowded market for talent. **Political risks** show a moderate correlation with **inter-organizational competition (0.85)**, indicating that the external political environment can have an impact on how organizations position themselves competitively. The moderate positive correlation **(0.72)** suggests that organizations engaged in **inter-organizational competition** may also be more likely to focus on **savings in operational (OPEX) and capital (CAPEX) investments**. This implies that staying competitive may drive organizations to optimize their costs and make more efficient investments.

Figure 21 evaluates how respondents value various urban space and architectural factors on a 1 to 5 importance scale. The most highly rated factor is **necessary-sufficient office space size** with **65%** marking it as level 4 and **19%** as level 5 — showing a clear priority on **having the right amount of space**. **Location costs** also remain a top concern (81% rating it 4 or 5), confirming **cost-efficiency** as a major driver, as seen in the previous table. **Safe spaces** scored very high, with **73%** of responses at levels 4 and 5. Safety continues to be a **non-negotiable baseline for workplace liveability**. **Liveability and liveliness** received mixed responses, with only 23% rating it as top importance, suggesting that **vibrancy** is seen as nice-to-have, not essential. Factors like **urban form, architectural identity,** and **building–environment–street relationship** scored fairly strong (50–65% at levels 4 or 5), indicating an appreciation for cohesive urban and architectural design, though not as pressing as cost or safety. Overall, there is a consistent emphasis on functional and contextual elements of office location and design, especially those tied to comfort, cost, and prestige.

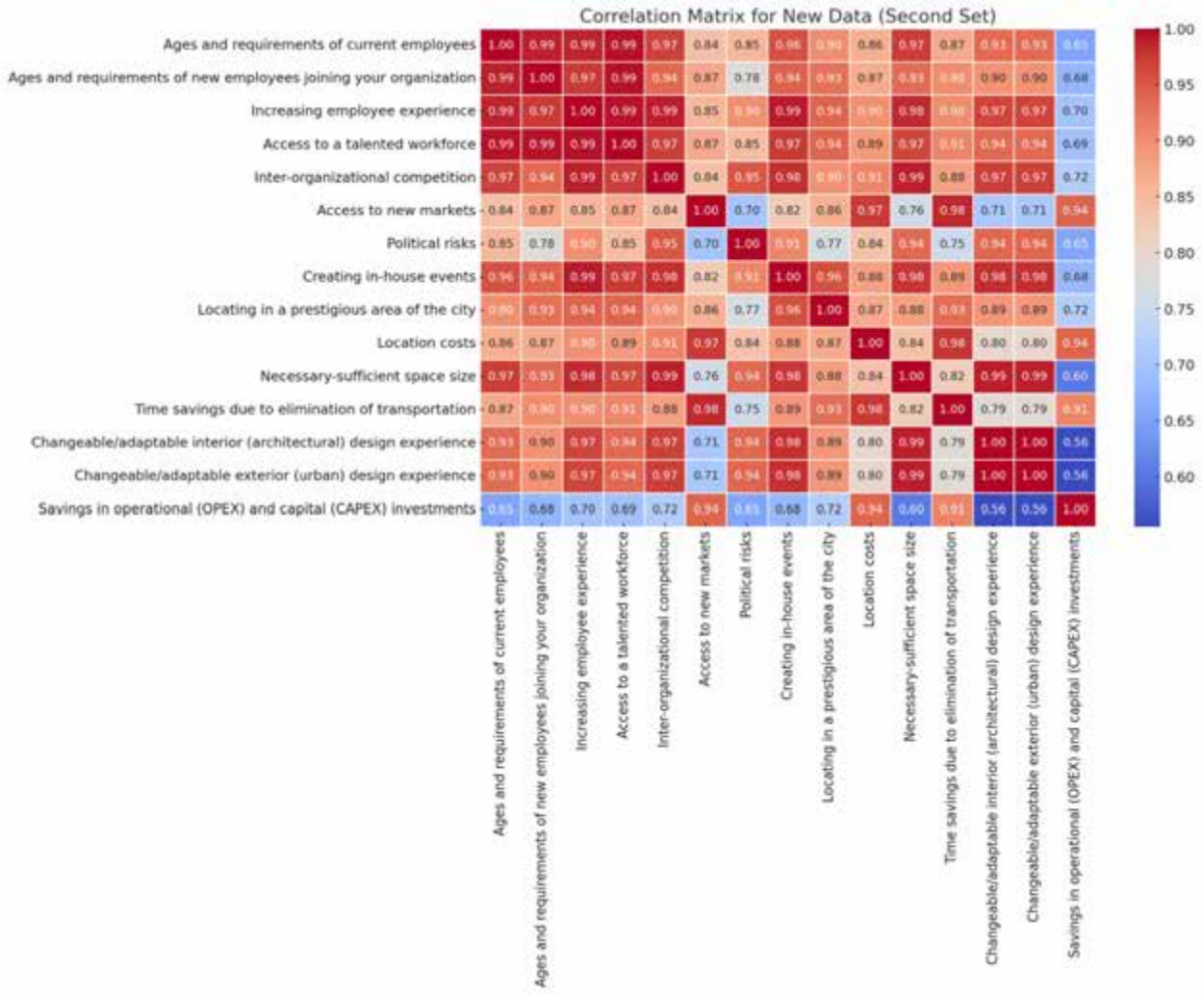

Figure 20: Correlation Matrix of Elements in an Office Created in the Metaverse

		Rating				
		1	2	3	4	5
Elements of Urban Space Design	Livability and liveliness	15%	4%	12%	46%	23%
	Safe spaces	12%	4%	12%	38%	35%
	Diversity and flexibility	12%	4%	19%	46%	19%
	Located in a prestigious area of the city	12%	0%	15%	31%	42%
	Necessary-sufficient office space size	4%	4%	8%	65%	19%
	Location costs	4%	4%	12%	46%	35%
	Density (people, vehicles, structural density)	8%	0%	19%	58%	15%
	Urban furniture (benches, street lighting, bus stops, waste collection units, flower pots, etc.)	12%	8%	23%	50%	8%
	Urban art (sculptures, murals, performing arts, etc.)	23%	4%	19%	42%	12%
Elements of Building Design	Building - environment - street relationship	12%	8%	19%	35%	27%
	Urban form and building type	12%	8%	15%	46%	19%
	Space scale	8%	4%	15%	54%	19%
	Natural light and ventilation	15%	12%	12%	46%	15%
	Architectural identity and details	8%	19%	8%	38%	27%
	Material (types of materials used in the building)	12%	8%	15%	50%	15%

Figure 21: Rating Heat Map of Urban Space and Building Design Elements

Figure 22 shows the distribution of urban space and building design elements influencing motivation of office selection in the metaverse ratings. Companies/institutions are prioritizing space efficiency, safety, and cost-ef-

fectiveness over aesthetic or cultural features of urban environments. While design cohesion and architectural quality are appreciated, factors like public art and urban furniture are seen as luxuries rather than necessities. The high importance given to prestigious location reveals a continued reliance on brand signalling and status value in workplace positioning.

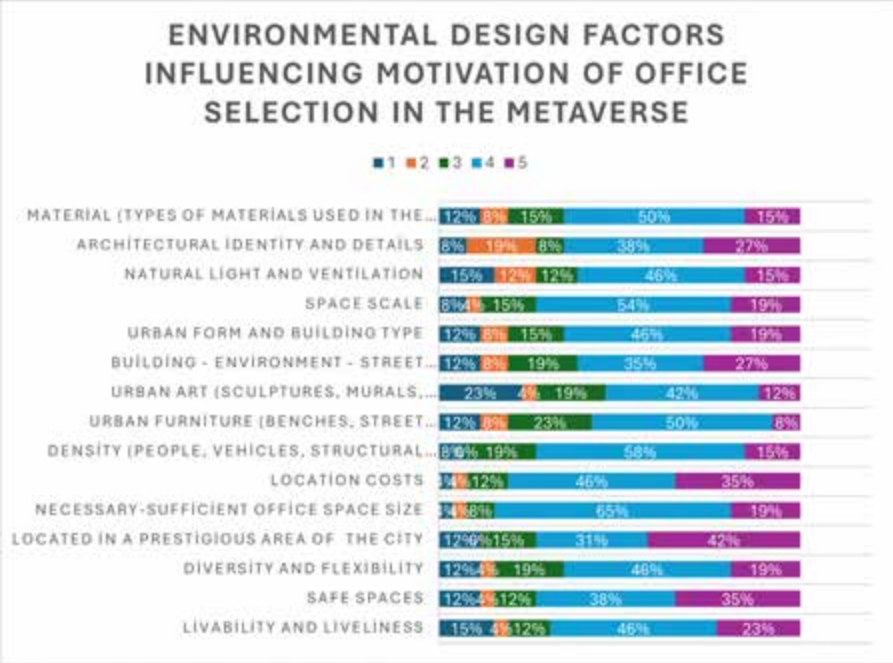

Figure 22: Environmental Design Factors Influencing Motivation of Office Selection in the Metaverse

Figure 23 depicts the correlation matrix regarding environmental design factors influencing motivation of office selection in the metaverse. The almost perfect correlation between **space scale** and **office space size (0.99)** highlights that larger office spaces tend to have a more expansive layout, offering employees more room to move, work, and collaborate. There is a very strong correlation between **natural light and ventilation** and **office space size (0.98)**. Larger office spaces tend to be designed with better natural lighting and airflow, contributing to a healthier and more comfortable work environment. The strong correlation between **urban furniture** and **density (0.97)** suggests that in densely populated areas, there is a greater need for urban furniture such as benches, street lighting, and bus stops. The high correlation between **liveability and liveliness** and **diversity and flexibility (0.96)** indicates that areas with a more diverse and flexible environment are perceived as more liveable and lively. There is a very high correlation between **diversity and flexibility** and **office space size (0.96)**. This is likely because flexible spaces require more room to accommodate different types of work styles and activities, offering employees the freedom to choose their work environment. **Urban art** contributes significantly to the **liveability and liveliness** of an area **(0.94)**. The correlation suggests that areas with more art installations (e.g. murals, sculptures) are perceived as more vibrant and engaging, enhancing the overall quality of life in urban environments. The strong correlation between **safe spaces** and **location in a prestigious area** (0.93) suggests that people tend to feel safer in prestigious areas. This could be due to better infrastructure, more surveillance, and generally lower crime rates in such locations. This relationship highlights how security and location prestige are interconnected in urban planning.

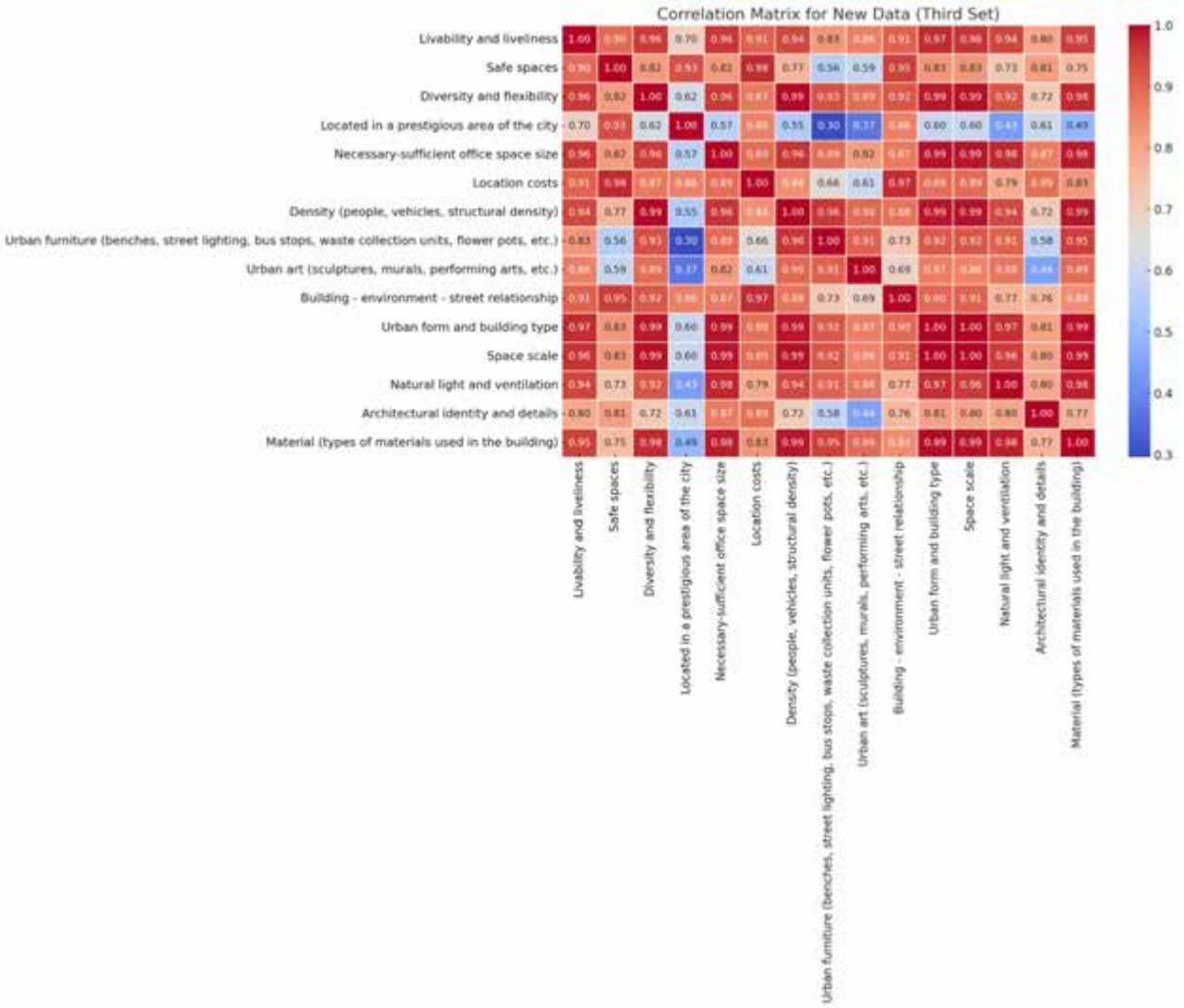

Figure 23: Correlation Matrix Regarding Environmental Design Factors Influencing Motivation of Office Selection in the Metaverse

Discussion and Conclusion

This study aimed to connect established theoretical frameworks of environmental and urban design with the evolving practice of corporate site selection within metaverse environments, with a particular focus on Türkiye's information industry. By aligning empirical findings with insights from existing literature, this research provides a valuable foundation for identifying and understanding the environmental design elements most likely to influence the creation of effective and engaging future metaverse workspaces.

The literature review highlighted key environmental and urban design elements traditionally associated with high-quality urban environments and value creation in real estate. When comparing these well-established concepts to the findings of this study, several noteworthy parallels and divergences emerge:

• **Accessibility** remains a fundamental concern in both the physical and virtual domains. In the survey, access to talented workforce, location costs, and flexibility in architectural/urban design were among the most influential factors shaping metaverse office selection. Similarly, in physical environments, accessibility and location quality are core drivers of real estate value and user satisfaction.

• **Safety** and **comfort-related elements** such as safe spaces and natural light & ventilation scored highly in both current office and metaverse-oriented responses. This suggests that even in virtual environments, companies value perceptions of security and comfort, mirroring psychological needs that underpin design principles in the physical world.

• **Architectural identity**, **building-environment-street relationship**, and **spatial relationships**—elements frequently emphasized in physical urban design frameworks—also emerged as relevant in metaverse considerations. Respondents valued cohesive, adaptable, and visually engaging virtual environments, signalling a continued importance of spatial and aesthetic coherence even when freed from physical constraints.

• **Diversity and flexibility**, a recurring theme in physical urban design literature (mixed-use spaces, flexible environments), was highly correlated with perceptions of liveability and employee experience in metaverse environments. This underscores the necessity of creating adaptable virtual spaces that cater to varied organizational needs and dynamic user preferences.

Conversely, several differences between the two domains were apparent:

• While **public art** and **urban furniture** are traditionally seen as important contributors to public life and identity in physical spaces, they were deprioritized in metaverse site selection. Respondents generally rated these elements lower in importance for virtual offices, possibly reflecting the current lack of mature design standards for virtual public realms and a stronger focus on functional and operational drivers at this stage of metaverse evolution.

• **Time savings from eliminating transportation**, a frequently cited benefit of remote and virtual work, was surprisingly undervalued by respondents. This indicates that while the metaverse reduces physical commute needs, organizations may still prioritize in-office experiences or hybrid models, diminishing the perceived importance of this particular advantage.

• The metaverse introduced new, distinct drivers of site selection not directly paralleled in traditional urban design literature. These include **OPEX & CAPEX savings** and **access to new markets**, both of which scored highly in respondent ratings. The virtual realm enables cost efficiencies and global market reach that are difficult to achieve in purely physical settings, marking a strategic shift in corporate priorities.

The **correlation analyses** further revealed critical interdependencies:

• Strong correlations between **employee experience**, **workforce access**, and **spatial/architectural flexibility** suggest that organizations view virtual office design as a key lever for talent attraction and retention—an emerging theme that aligns with evolving workforce expectations for hybrid and flexible work environments.

• The nearly perfect correlation between **space scale** and **necessary-sufficient office space size** highlights a persistent emphasis on spatial adequacy and comfort, even in virtual settings where physical limitations are less constraining.

• The close relationship between **urban form**, **architectural identity**, and **prestigious location** in metaverse decisions mirrors the symbolic and branding roles of corporate real estate in physical cities, demonstrating that virtual offices must similarly contribute to organizational image and culture.

This study has several limitations that must be acknowledged. First, it was conducted with a relatively small sample of 26 executive-level respondents, all from the information industry in Türkiye. The results, while indicative, cannot yet be generalized across different industries or geographies. Additionally, participants' varying levels of familiarity with the metaverse may have influenced their responses, particularly in relation to more advanced

technologies and design elements. Future studies should aim to expand the respondent pool to include a broader and more diverse set of industries and international contexts.

In conclusion, this research provides early evidence that **environmental design elements remain highly relevant in corporate site selection for metaverse offices**, but with important adaptations:

• **Accessibility**, **safety**, **architectural identity**, **spatial coherence**, and **employee experience** emerge as key priorities, paralleling traditional urban design concerns.

• **Cost efficiency** and **market access** are elevated drivers in metaverse contexts, reflecting new strategic opportunities offered by virtual environments.

• Elements tied to traditional public space design (urban art, furniture) currently play a lesser role but may gain relevance as virtual public realms evolve.

An important outcome of this study is the identification of a core set of environmental design elements that companies value when considering future metaverse office investments. Specifically, **flexible architectural/urban designs, natural light & ventilation, safe spaces, space adequacy, location costs, and workforce-related factors** are poised to be the most influential in shaping corporate location strategies in the metaverse.

Looking ahead, the next stage of this research will involve developing a **metaverse-based test environment** that simulates these identified environmental design elements. Companies will be invited to experience and interact with this environment, followed by a **post-survey study** to capture new insights and validate the practical relevance of these design factors. This iterative process aims to refine both academic understanding and practical design guidelines for building effective and engaging corporate spaces in the evolving metaverse landscape.

Appendices

Appendix 1: Online Survey Study Flow-chart

Acknowledgements
This study was prepared within the scope of the doctoral thesis titled "The Impact of Environmental Design Elements on Corporate Site Selection of Information Industry Companies in the Metaverse" by the first author and supervised by the second author at the Department of Urban and Regional Planning at Istanbul Technical University.

References

Aksu, N.S. and Ercoşkun, Ö.Y., 2022. Kentlerde dijital dönüşüm ve metaverse. EKSEN Dokuz Eylül Üniversitesi Mimarlık Fakültesi Dergisi, 3(2), pp.108-122.

Allam, Z., Sharifi, A., Bibri, S.E., Jones, D.S. and Krogstie, J., 2022. The metaverse as a virtual form of smart cities: Opportunities and challenges for environmental, economic, and social sustainability in urban futures. Smart Cities, 5(3), pp.771-801.

Arvas, İ.S., 2022. Gutenberg galaksisinden meta evrenine: üçüncü kuşak internet, web 3.0. AJIT-e: Academic Journal of Information Technology, 13(48), pp.53-71.

Dienhart, C., Kaufhold, L. and Piller, F.T., Urban Metaverse: Die Smart City im Industrial Metaverse.

Duany, A., Plater-Zyberk, E. and Speck, J., 2000. Suburban nation: The rise of sprawl and the decline of the American dream. Macmillan.

Güven, İ. and Ercan, T., 2022, August. Determining factors of virtual land value: The case of decentraland. In International Technology and Design Symposium.

Karaman, A., 1992. Kentsel Tasarımda Çevresel Bütünlük ve Süreklilik, 1. Kentsel tasarım ve uygulamalar Sempozyumu, Bildiriler Kitabı, Mayıs, 92, pp.63-72.

Kashiripour, M.M., 2023. Metaverse city: definition and direction development for urban planning and architecture. Bulletin of Brest State Technical University, (3(132)), pp.2–10.

Macmillan, S., 2006. Added value of good design. Building research & information, 34(3), pp.257-271.Drucker, P. (2012). Post-capitalist society. Routledge.

Mystakidis, S., 2022. Metaverse. Encyclopedia, 2(1), pp.486-497.

Nase, I., Berry, J. and Adair, A., 2015. Urban design quality and real estate value: in search of a methodological framework. Journal of Urban Design, 20(5), pp.563-581.Ferm, J., & Jones, E. (2016). Mixed-use 'regeneration' of employment land in the post-industrial city: Challenges and realities in London. European Planning Studies, 24(10), 1913-1936.

Story, M.F., Mueller, J.L. and Mace, R.L., 1998. The universal design file: Designing for people of all ages and abilities. Tekin, Z., 2022. Metaverse 101: Paralel Evren. Scala Yayıncılık.

Terzi, F. and Ocakçı, M., 2017. Kentlerin geleceği: akıllı kentler. İTÜ Vakfı Dergisi, 77, pp.10-13.

Ulubaş Hamurcu, A. and Terzi, F., 2022. Socio-technological factors and changing urban spaces. Space and Culture, 25(4), pp.553-564.

Ramantswana, T., 2019. Determinants of headquarters location and site selection for corporations listed on the Johannesburg stock exchange (Doctoral dissertation).

Wise, J. (2023) Metaverse statistics, facts & market size data for 2023. [Online] available at: https://earthweb.com/metaverse-statistics/