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Yazar/Author
Bülent YILDIZ*

Makale Adı/Article Name

The Effect of Smart City Applications on Smart City Life Intention: The Moderating Role of Technology Anxiety**

Akıllı Şehir Uygulamalarının Akıllı Şehir Yaşam Niyetine Etkisi: Teknoloji Kaygısının Moderatör Rolü

ÖZ
Dünyada şehirlerde yaşayan insan nüfusu sürekli artmaktadır. Artan nüfusun bir sonucu olarak şehir hayatını kolaylaştırmak için dijital teknolojilerin kullanımı yaygınlaşmıştır. Özellikle yapay zekâ ve nesnelerin interneti teknolojilerinin şehirlere entegre edilmesiyle akıllı şehrin önemi artmıştır. Bu nedenle, bu çalışma akıllı şehir uygulamalarının yaşam niyeti üzerindeki etkisini ve teknoloji kaygısının bu etkiyi nasıl ılımlılaştırdığını incelemeyi amaçlamaktadır. Bu amaçla 386 kişiden anket yoluyla veri toplanmıştır. Veriler yapısal eşitlik modeli ile analiz edilmiştir. Analizler sonucunda akıllı kamu hizmeti, akıllı ulaşım ve akıllı çevrecilik uygulamalarının akıllı şehirlerde yaşama niyetini anlamlı şekilde pozitif yönde etkilediği tespit edilmiştir. Yapılan moderatör analizi sonucunda akıllı şehir uygulamalarının akıllı şehirlerde yaşama niyeti üzerindeki etkisinde teknoloji kaygısının moderatör rolü olduğu tespit edilmiştir. Araştırma bulgularına göre önerilerde bulunulmuştur.
Anahtar Kelimeler: Akıllı şehir, teknoloji kaygısı, sürdürülebilirlik.

ABSTRACT
The human population living in cities in the world is constantly increasing. As a result of the increasing population, the use of digital technologies has become widespread to facilitate city life. The importance of a smart city has increased mainly due to the integration of artificial intelligence and Internet of Things technologies into cities. Therefore, this study aims to examine the effect of smart city applications on life intention and how technology anxiety moderates this effect. For this purpose, data were collected from 386 people using a questionnaire. The data were analysed with a structural equation model. As a result of the analyses, it was determined that smart public service, smart transportation and smart environmentalism practices significantly positively affect the intention to live in smart cities. As a result of the moderator analysis, it was found that technology anxiety has a moderating role in the effect of smart city applications on the intention to live in smart cities. Suggestions were made according to the research findings.
Keywords: Smart city, technology anxiety, sustainability.

* Doç. Dr., Kastamonu Üniversitesi, İİBF İşletme, byildiz@kastamonu.edu.tr

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Introduction

The ever-increasing population and its penchant for city life pose insurmountable problems that cities must continually solve. Cities face increasing energy and environmental constraints, the necessity to sustainably grow their economies indefinitely, and inadequate social and physical infrastructures (Martins et al., 2021). Air pollution, rising poverty and crime rates, and health crises deleteriously impact city life during a pandemic (Sassen and Kourtit, 2021). Buildings, infrastructure, and energy resources are in high demand in metropolitan areas due to the increasing population in smart cities. The transition to a low-carbon society and the delivery of sustainable energy systems are two of the biggest challenges that city authorities confront (Bachanek et al., 2021). With this background, smart cities are all the rage, and people are working to switch to a smart city environment. On the other hand, this change has its challenges. According to Lai et al. (2020), smart cities rely on an information technology infrastructure built on standards. This infrastructure must accommodate new technologies like enhanced sensors, measurement and analytical tools, and AI-driven solutions. Energy and urban infrastructure must use efficient technologies and renewable energy sources (Bachanek et al., 2021). For this reason, knowing the history, setting, and substance of modern urban dynamics is crucial (Sassen and Kourtit, 2021). As a result, the greatest minds in business, economics, law, technology, and social research must work together to determine the societal effects of smart cities before they can be built or improved (Tantau and Shanta, 2021).

The Smart City Council asserts that ICTs improve urban livability, operability, and sustainability. Various sensors and other devices are responsible for collecting data and information, which is then communicated across wired or wireless networks and later processed for both present and future applications. To ensure the well-being of their residents in every aspect, these urban centres are meticulously designed to be environmentally friendly (Sabory et al., 2021).

For a smart city to be successful, its citizens must embrace and use smart solutions that improve decision-making and encourage behavioural change. These solutions should improve the daily lives of residents, as they are the ones who will be using them (Szpilko, 2020).

Governments and enterprises must thoroughly understand the psychological and perceptual aspects of technological acceptance, particularly during the initial phases of adoption, to create suitable smart city services and technologies. Still, additional study is required to understand the smart city phenomenon in these settings fully. The importance of studying how people utilise smart city services is growing in the eyes of researchers and industry professionals alike (Lytras et al., 2021).

Smart cities are essential to facilitating urban life, contributing to ecological balance, and improving city dwellers' living standards. However, the use of advanced technology is required to realise these. Therefore, the attitude of city residents towards technology should be addressed. Although smart cities will facilitate the lives of citizens, the willingness of individuals with high technology anxiety to live in smart cities will differ from individuals with low anxiety.

Therefore, this study investigated the moderating role of technology anxiety in the effect of smart city applications on the intention to live in a smart city.

1. Theoretical Framework

This section explains the concept of smart city, smart public services, smart transport and smart environmentalism applications (sustainability) concepts from smart city applications about technology concerns.

1.1. Smart City Concept

The idea of a "smart city" (Sabory et al., 2021) developed in the late 1980s after the smart growth movement. Although there isn't a universally agreed-upon definition of "smart city" just yet, it's evident that these cities use ICTs to boost service quality, citizen happiness, sustainability, and economic growth (Patrão et al., 2020). To optimise city subsystems and provide inhabitants with new service options, the core idea of a smart city is to integrate services across them (Agbali et al., 2019). According to the European Commission, "smart cities" are metropolitan areas that use technology to improve the administration and efficiency of their built environments. In a smart city, according to the Commission's definition (Martins et al., 2021), digital and communications technologies improve the efficiency of conventional networks and services for the benefit of both people and companies.

The term "smart city" is frequently used in conjunction with the idea of a sustainable or eco-city, which seeks to enhance or decrease the price of city services. Reconciling technical advancements with the economic, social, and environmental concerns of future cities is the fundamental goal of smart cities. Improving people's standard of living without impacting negatively the environment is the goal (Campisi et al., 2021). Thus, according to Sabory et al. (2021), the smart city is a concept of how cities will evolve.

Efforts to expand smart cities are digitising and integrating more facilities and services, increasing the usage of collaboration tools and automated service management platforms, improving current infrastructures, and making cities more appealing and secure for residents and visitors alike. Smart city applications have numerous benefits, including the ability to ease the shift from in-person to online service delivery, lessen the impact of disasters like pandemics, and more (Patrão et al., 2020).

Technology by itself does not make for intelligent urban design (Szpilko, 2020). The use of ICT for greater resource utilisation and decreased emissions is just the beginning of what a smart city has to offer. More efficient building lighting and heating systems, better water supply, and smarter urban transit networks are all on the horizon. Meeting the requirements of an older population, safer public areas, and more engaged and responsive city administration are all outcomes (Martins et al., 2021). With technology serving as a fulcrum, the smart city has a people-first approach that prioritises their needs. Infrastructure and technological solutions should benefit the people who live and work there. Every individual's unique traits and skills are the foundation of a contemporary city (Szpilko, 2020).

Using ICT elements to enhance urban services' rapid and efficient delivery is central to the smart city concept. In particular, it is associated with cutting-edge technology like AI, the IoT, big data, robots, etc. (Sukhwani et al., 2020). High-quality ICTs and other physical infrastructures are essential to support more robust smart city practices. So, recent efforts to define smart cities have focused on smart city connectivity and integrating the massive amounts of data generated by physical and networked devices, thanks to the advancements in ICTs (Myeong et al., 2021). Furthermore, it is believed that the successful development of smart cities depends heavily on the extensive usage of ICTs (Papova and Zagulova, 2022). Thanks to technological innovations like RFID, sensors, and the Internet of Things (IoT), it is much easier for objects to communicate with one another. As a result, transportation is now more intelligent (Agbali et al., 2019). In addition, smart cities can use blockchain technology to solve several issues with infrastructure (Treiblmaier et al., 2020). There may be a disconnect between the environmental, social, and economic components, all of which can contribute to these problems.

1.2. Smart Government

To enhance the quality of life for the growing urban population, it is believed that smart cities should incorporate distant, intelligent, and efficient healthcare systems (Agbali et al., 2019). IoT has revolutionised healthcare by allowing hospitals to detect and control things and monitor patients through sensors remotely (Guo et al., 2018). Several security and privacy concerns arise when new technologies for smart health and mobile health are implemented in smart cities. Additional measures to guarantee confidentiality and safety should be implemented (Agbali et al., 2019).

When the state intervenes in a high-quality and efficient manner to meet the needs of its citizens, this is known as smart governance. Regarding e-government practices, particularly public participation, governance is a crucial component. Because they suggest more citizen-centred governance, e-government efforts are joint in many nations. E-government introduces novel concepts like openness, responsibility, and public engagement in evaluating governmental efficacy through the lens of the information society (Alderete, 2021). The principal responsibility of the public administration in a smart city is to instil trust in the achievement of smart city goals through the availability of transparent data, sustained dedication, targeted policies, and strong leadership. To guarantee confidence, blockchain technology is suggested for use. When it comes to electronic governance, the increased secrecy that blockchain technology provides is ideal. Technological considerations can result in more privacy and security, intelligent individuals' trust, and public affairs engagement (Treiblmaier et al., 2020). Every smart city initiative impacts the way people live. People must agree to change their ways of living or working together by adopting smart behaviours to succeed (Georgiadis et al., 2021).

For a smart city program to be a success, it is crucial that essential players from all areas and groups actively participate. Enabling a smart city requires e-governance, which involves including the public in the smart city effort and maintaining transparency in decision-making and implementation. Thus, many smart city initiatives revolve around citizen-centred governance (Agbali et al., 2019). The reason is that smart city systems (Lim et al., 2021; Vinod Kumar and Dahiya, 2017) can only function well if citizens actively engage with them.

Governments have the power to grow cities when they envision a purposeful future and craft policy tools to shape it. Consequently, the foundation of smart cities is establishing policy directives that foster innovation (Fialová et al., 2021).

1.3.Smart Transport

Exogenous tendencies in urban development intensify the difficulties the urban freight system faces. Efforts are being made by urban logistics providers to address these difficulties by developing suitable internal solutions that enhance sustainability, efficiency, and safety. Using electric vehicles to transport goods to consumers in cities is one way to lessen the impact of pollution on the environment (He and Haais, 2020). This highlights how crucial the idea of sustainable transportation is. A long-standing trend, sustainable transportation is a critical component of progress. Smart cities must integrate dependable transportation systems like never before to achieve sustainable development (Bamwesigye and Hlavackova, 2019).

Blockchain technology could improve smart city logistics and supply chain operations. Blockchain helps supply chain stakeholders regulate the movement of services and goods between network points, secure IoT devices, and facilitate due diligence. The future smart city relies on many micro-industries with efficient supply chains and dynamic commercial connections. Blockchain technology lets smart city users track purchases, improving happiness and trust (Treiblmaier et al., 2020).

Smart mobility is equally crucial for fostering the growth of smart cities. Environmental and economic considerations are essential, as are the requirements for advanced technology and intelligent individuals. Optimal traffic management and gathering public feedback on city liveability and shared transportation service quality are two primary uses of ICT in smart mobility (Alderete, 2021). When collected on a regular and timely basis, technologies allow for better data quality, which in turn improves traffic management. Technology has advanced so that we can more precisely follow routes, making drivers' lives easier and more productive. These and other technologies improve people's mobility in smart cities. Nevertheless, it takes work to implement these technologies. Effort and time are needed for high-level adoption (Popova and Zagulova, 2022).

Smart mobility aligns with the UN Sustainable Development Goals by ensuring local, national, and international accessibility, communications infrastructure, and sustainable and safe transport systems. ICT is used to organise urban mobility services in smart mobility. This allows for various information services, such as intelligent transport systems or mobility pattern algorithms. These information services can reduce air and noise pollution, traffic congestion, and travel expenses while improving safety (Rocha et al., 2021).

1.4.Smart Environment and Sustainability

On a worldwide scale, most urban areas use much energy. Modern cities undeniably cause the most significant amount of pollution and energy consumption. Water management, accessibility, and urban air pollution are three areas where the repercussions of human inaction will be most noticeable (Georgiadis et al., 2021).

The importance of sustainability is highlighted when considering factors such as fossil fuel scarcity, rising greenhouse gas emissions, and global warming (Tatntau and Șanta, 2021). Sustainability may not have an agreed-upon definition, but it is generally acknowledged that it takes a holistic approach to meeting human needs (Farmanbar et al., 2019).

When we replace inefficient technologies that rely on fossil fuels with ones that use electricity, we open the door to a world of energy savings in buildings, transportation, and industry. In addition to reducing the severity of climate change, increasing energy efficiency boosts economic growth, job creation, and overall social welfare (Martins et al., 2021). These days, smart power grid integration, energy storage, and solar power utilisation are all crucial (Farmanbar et al., 2019).

Clean, affordable, and efficient energy consumption is the primary goal of smart energy (Treiblmaier et al., 2020). Improving energy efficiency and incorporating renewable energy sources are both attainable goals with the help of numerous well-thought-out plans. Among these, there are smart meter installations that can virtually transmit consumption and production data, web or mobile application platforms that allow users to monitor their electricity usage over time, lighting savings through smart sensor systems, water boilers with adjustable temperature control systems integrated, and the conversion of the city's electricity grid to a smart grid (Sabory et al., 2021). Cities may save money on utilities like gas, water, and electricity with the help of smart city technologies. They can make intelligent system control possible and automate data storage for energy usage, contributing to greater energy efficiency. By optimising lighting, heating, or cooling in this manner, energy expenses are drastically reduced. As an example of how the system might help reduce energy use, it can only heat the space during the hours when it is regularly used. Innovative technology may also automatically optimise a building's electricity consumption by effectively regulating lighting and elevators. Additionally, it can aid in detecting water pipe breaches and reducing water use (Ptak, 2021).

Waste sorting and recycling, reduced energy consumption, and purchasing pre-owned items are all sustainable concepts that make up the smart environment (Alderete, 2021). A green and clean city is a goal of smart city planners. This philosophy tackles ecological concerns by embracing sustainable methods like renewable energy, preserving natural ecosystems, decreasing noise pollution, monitoring air quality, and minimising fuel emissions. The key here is the planned, ongoing growth of cities' natural resources while rationally conserving them. The fundamental requirements for attaining a clean and healthy city, particularly in the city centre, include tending to mature trees, adding different types of urban greenery, and increasing the biologically active space (Fialová et al., 2021). As a result of burning fossil fuels, atmospheric CO2, methane, and nitrous oxide concentrations have climbed 40% since the pre-industrial period. Urban areas are responsible for around 75% of the world's energy consumption, with outdoor urban lighting contributing 20–40% of power-related spending. Solutions that allow for the appropriate control of both the natural and artificial environments created by humans are crucial in this setting (Bachanek et al., 2021). It is equally essential for citizens to be involved in these solutions. It is said that residents of smart cities are very dedicated to creating scalable and environmentally friendly habits like recycling trash and making good use of energy (Alderete, 2021).

1.5.Technology Anxiety

The Technology Acceptance Model (TAM) is the most well-known of several frameworks designed to facilitate the widespread use of cutting-edge technological innovations. Perceived utility and ease of use are the two main factors determining a technology's intended use, according to TAM (Neupane et al., 2021). Theories of technology acceptance (TAMs) explain what elements impact users' decisions to adopt new technology. Another purpose for them is to find out what makes people want to use a particular device (Shore et al., 2018).

Anyone hoping to fit in with modern culture must become proficient in the tools and apps used for smart city life and communication (Popova and Zagulova, 2022).

One of the primary factors that determines the degree of digitalisation of people is the education of residents. One robust indicator of ICT use is the level of education. Cognitive resources, digital abilities, and, most crucially, social and informational resources are all at an educated person's fingertips (Alderete, 2021).

The younger generation has more excellent hands-on expertise with technology due to greater exposure (Arar et al., 2021). Older people see potential profits from innovation as smaller than younger people. It is also asserted that older individuals have less access to ICT than younger ones. According to Alderete (2021), one way to begin understanding the traits of early adopters and the degree of adoption of smart city services based on information and communication technologies is to look at their age. This is because age is a proxy for personal innovativeness. The fact that an assistive robot's complexity can deter some older adults from using it is a serious concern. Service churn could be the end consequence of these unpleasant encounters (Shore et al., 2018).

Developing smart city solutions with the safety of people's personal information in mind has always been a top priority. Users will become suspicious of the reliability of online services and, in extreme circumstances, develop negative emotions due to a lousy security experience. It is noted that consumers' anxiety about privacy resulting from online services impacts their feelings and overall well-being, regardless of whether their private information is published (Lin et al., 2019).

Technology anxiety is the fear and worry of using technical equipment (Jeng et al., 2022). To study the primary drivers and challenges to technology adoption in smart cities, technology anxiety might be considered as an indicator of residents' behaviour. The term "technology anxiety" describes a wide range of feelings people experience when confronted with new technological concepts or while attempting to master existing ones. Anxieties over technology's potential downsides, like data loss or human error, are central to this idea (Troisi et al., 2022). According to the research, technology anxiety is a negative emotional state that impacts how people interact with technology. Furthermore, by evaluating people's emotional states rather than their acceptance and usage of technology, technology anxiety permits the research of the development of negative emotions and fear as outcomes of a particular technology's introduction. Consequently, studying the level of tech anxiety in modern cities can provide insight into the various emotional aspects of public opinion and citizen behaviour (Troisi et al., 2022).

2. Literature Review and Establishment of Research Hypotheses

Software and hardware proliferate and diversify, making people's lives easier (Jeng et al., 2022). An essential component in the future success of smart cities is their growth, which caters to their inhabitants' collective and individual demands (Lin et al., 2019). Smart cities are becoming increasingly appealing to people as digital services proliferate in communities, fostering a sense of connectedness and improving city life for everyone. According to Campisi et al. (2021), these smart technologies can significantly boost civic engagement with a bottom-up planning strategy.

The potential for connected transit systems to greatly enhance efficiency across the city is enormous. Cities can better accommodate their residents, even in the face of a frequently exponentially increasing population, thanks to intelligent technologies such as improved traffic management and the ability for public transportation riders to monitor the whereabouts of their buses and trains. Technologies like smart traffic lights optimise traffic flow to alleviate peak-hour congestion. Intelligent parking management is only one example of how other smart mobility technologies open new income streams for communities. During crucial times like a pandemic, the transportation industry and customer services can be better managed using applications and sensors (Campisi et al., 2021).

The population is immediately impacted, and smart city orientation results from using mobile applications that provide intelligent services, including smart weather forecasting, smart community development, and smart transit (Basbeth et al., 2019).

The quality of life for city dwellers is enhanced by smart city services, which lead to a more pleasant living situation. People living in urban areas of Taiwan were polled. The results show that people are open to using smart city services based on information and communication technologies if built with creative concepts that protect their privacy and offer good quality (Yeh, 2017).

Citizens' opinions and perspectives must be carefully considered for the effective administration of urban services because these services are utilised by the public (Alderete, 2021). High-tech residents are expected to be proactive in the citizen-centered smart city. Having only tech-savvy people in smart cities is a pipe dream. Marginalised populations, especially those without technical understanding, may not benefit from smart cities. Residents must be tech-savvy and comprehend emerging technology to use smart city services. If more susceptible to new technology, smart city residents may not use urban services (Shin et al., 2021).

Users may experience discomfort with smart city service technologies due to the intricacy of smart services. Anxieties among users will dampen enthusiasm for smart city services and make it harder for them to be utilised the channels (Abu Salim et al., 2021).

Neupane et al. (2021), in a study conducted on 229 people, found that trust in smart cities significantly affects the intention towards smart cities. Furthermore, the results of their research demonstrate that trust in smart city technologies is influenced by two factors: perceived benefit and perceived information security.

Abu Salim et al. (2021) studied take samples with size of 580 participants in Dubai. They found that perceived benefit, perceived capacity, perceived ease of use, perceived trust, and security significantly affect user satisfaction, and satisfaction affects the intention to continue using smart city services.

Jeng et al. (2022) found that the perceived usefulness of smart health wearable device technology significantly affected the attitude and intention to use of 166 people in Taiwan. They also found that technological anxiety moderates the effect of attitude on intention to use.

Müller (2019), in his research on autonomous and electric vehicles on 1177 participants in Europe, North America and China, found that perceived usefulness significantly affects attitude, and attitude significantly affects intention to use.

Meidute-Kavaliauskiene et al. (2021) conducted a study on autonomous vehicles with 611 participants in Turkey. They found that perceived safety and advantage have a significant positive effect on intention to use, while perceived risk has a significant negative impact.

Research conducted in Vienna by Ptak (2021) revealed that smart cities connected to ICT can influence cities' ability to save electricity. In addition, the participants believe that smart city technologies have the potential to reduce power usage, particularly when it comes to optimising urban transportation and lighting. Sixty-one per cent of people who took the survey think that smart city-related information and communication technology improves city operations. Almost everyone who took the survey said they would support cutting power use with technology if given the chance. According to the poll results, respondents know commonplace remedies are utilised to decrease power usage.

According to Alderete's (2021) study of 97 Argentineans, smart city activity performance is strongly impacted by ICT use and smart city concept awareness. According to the study's author, smart citizens' actions can be better understood when familiar with the smart city concept. Additionally, the author asserts that smart cities can only come to fruition once information and communication technology applications are widely used.

According to Arar et al. (2021), users' desire to adopt smart home technology is negatively affected by technological anxiety but positively affected by expected performance, social influence, and facilitating factors.

Vo et al. (2022) conducted a study on 322 people and found that technology anxiety has a moderating role in the effect of attitude towards augmented reality applications on usage intention.

Giao et al. (2020) conducted a study on 584 people in Vietnam and found that technology anxiety moderates the attitude towards internet banking on usage intention.

Dash (2022) conducted a study on 494 people in India and found that technology anxiety has a moderating role in the relationship between the built environment of smart cities and citizens' quality of life.

As a result of the theoretical framework and literature review, the research hypotheses were formed as follows.

H1: Smart public service among smart city applications significantly positively affects the intention to live in a smart city.

H2: Smart transport services among smart city applications positively and significantly affect the intention to live in a smart city.

H3: Smart environmental service among smart city applications positively and significantly affects the intention to live in a smart city.

H4: Technology anxiety has a moderating role in the effect of smart city applications on the intention to live in a smart city.

3. Method and Findings

This section gives information about the method used in the research, data collection tools and the findings of the research data analysis.

3.1.Method

This study investigates the effect of smart public services, smart transport services and smart environmentalism applications on smart city life intention. Another aim of the study is to test the moderating effect of technology anxiety on the impact of smart city applications on life intention. For this purpose, data were collected from 386 people residing in Ankara by questionnaire. The convenience sampling method was preferred as the sampling method. Research data were collected online in 2023. The smart city applications scale was prepared using Pinochet et al. (2019), the intention to live in a smart city scale was prepared using Pinochet et al. (2019) and Lytras et al. (2021), and the technology anxiety scale was prepared using Lytras et al. (2021).

Permission was obtained for the research with the decision of the Kastamonu University Social and Human Sciences Scientific Research and Publication Ethics Board dated 4.10.2023, numbered 11/2.

The research relied on questionnaires to compile its findings. The study included assessments of validity and reliability. We used EFA and CFA at the primary level to establish construct validity, respectively. The EFA utilised the Barlett Sphericity and Kaiser-Meyer-Olkin (KMO) tests. According to Büyüköztürk (2002), factor analysis can be carried out on the scale if the value of the KMO test is greater than 0.60 and the Barlett Sphericity test has a significance level of $p<0.05$. Byrne (2011) states that in CFA, the scale statements' factor loading values must be greater than 0.50 and that there must be a significant association between the statements ($p<0.05$).

Reliability analyses followed the construct validity analyses. All dimensions and the scale were subjected to Cronbach's Alpha coefficient as part of the reliability investigation. To gauge reliability, Cronbach's Alpha (Cα) was employed. This coefficient reveals if the claims made on a scale adequately describe a consistent framework. The scale is highly dependable if the Cα value is between 0.60 and 0.80, and it is highly reliable if it is between 0.80 and 1.00. In addition to CR values, AVE values were computed for each dimension to ascertain if the scale offers convergent validity. According to Hair et al. (2010), in convergent validity, AVE>0.5, CR>0.7, and CR>AVE. The acquired data were tested for normality using a Normality Analysis. The data was statistically analysed using the SPSS and AMOS programs.

The goodness of fit index values are used in Structural Equation Modelling to understand if a scale is supported by the data obtained. This study examined six popular appropriate indices: CMIN/df, GFI, CFI, RMSEA, and NFI.

3.2.Findings

Firstly, some demographic findings of the participants were included in the study. The findings are presented in Table 1.

Table 1. Demographic Findings

Gender	**f**	**%**
Woman	206	53,4
Man	180	46,6
Age	**f**	**%**
18-25	77	19,9
26-35	121	31,3
36-45	129	33,4
46-55	43	11,1
56-65	16	4,1
Occupation	**f**	**%**
Public sector	152	39,4
Private sector	126	32,6
Self-employed (lawyer, doctor, accountant, etc.)	12	3,1
Tradesman/company owner	19	4,9
Retired	6	1,6
Housewife	20	5,2

Student	51	13,2

206 of the participants are female, and 180 are male. 129 are between 36-45 years old, 121 are between 26-35 years old, 77 are between 18-25 years old, 43 are between 46-55 years old and 16 are between 56-65 years old. 152 of them work in the public sector, and 126 of them work in the private sector. 51 of them are students, and 20 of them are housewives. 12 of them are self-employed, and 6 of them are retired.

In the study, firstly, the validity and reliability of the scales used in the research were tested. The EFA findings of the scale of smart city practices are given in Table 2.

Table 2. Smart City Practices EFA

Smart City Practices Items	Smart Government	Smart Transport	Smart Environment
SG1	,759		
SG2	,764		
SG3	,766		
SG4	,782		
ST1		,688	
ST2		,744	
ST3		,594	
ST4		,743	
SE1			,816
SE2			,575
SE3			,587
SE4			,678
SE5			,558
SE6			,485
SR7			,810
SE8			,670
KMO: 0,925 Chi-Square: 3648,831 df: 120 sig:0,000 Total Variance Explained: 65,965%			

As a result of the EFA conducted for the smart city applications, the scale reached a three-dimensional scale structure, including smart public, smart transport, and smart environment applications. Factor loadings were obtained between 0.759 and 0.782 for smart public, 0.594 and 0.744 for smart transport, and 0.485 and 0.816 for smart environment. KMO value was found to be 0.925. For 3648,831 chi-square and 120 degrees of freedom, Barlett's test of sphericity was found to be significant (sig<0.05). The scale was found to explain 65,965% of the total variance.

The EFA findings on the intention to live on a smart city scale are given in Table 3.

Table 3. Intention to Live in a Smart City EFA

Intention to Live in a Smart City Items	Factor Loadings
IL1	,900
IL2	,909
IL3	,936
IL4	,893
IL5	,921

IL6	,897
KMO: 0,898 Chi-Square: 2559,417 df: 15 sig:0,000 Total Variance Explained: 82,708%	

As a result of the EFA for the smart city life intention scale, factor loads were obtained between 0.893 and 0.936. KMO value was found to be 0.898. Barlett's sphericity test was significant for 2559,417 chi-square and 15 degrees of freedom (sig<0.05). It was determined that the scale explained 82,708% of the total variance.

The EFA findings of the technology anxiety scale are given in Table 4.

Table 4. Technology Anxiety EFA

Technology Anxiety Items	Factor Loadings
TA1	,832
TA2	,842
TA3	,846
TA4	,817
TA5	,783
KMO: 0,871 Chi-Square: 957,313 df: 10 sig:0,000 Total Variance Explained: 67,944%	

As a result of the EFA for the technology anxiety scale, factor loads were obtained between 0.783 and 0.846. KMO value was found to be 0,871. For 957,313 chi-square and 10 degrees of freedom, Barlett's test of sphericity was found to be significant (sig<0.05). It was determined that the scale explained 67,944% of the total variance.

After EFA, CFA was conducted for the scales. The goodness of fit values obtained from CFA are given in Table 5.

Table 5. CFA Goodness of Fit Values

Variable	χ^2	df	χ^2/df	GFI	CFI	TLI	NFI	RMSEA
Criteria			≤5	≥.90	≥.90	≥.90	≥.90	≤.08
Smart City Applications	297,644	98	3,037	0,912	0,943	0,925	0,92	0,076
Intention to Live	18,82	7	2,688	0,984	0,995	0,987	0,993	0,074
Technology Anxiety	15,814	5	3,163	0,985	0,989	0,977	0,984	0,075

The results of the CFA demonstrated that the scales showed good fit and fulfilled the acceptable goodness-of-fit requirements (Simon et al., 2010).

After that, we checked the component validity with a reliability analysis and computed AVE and CR values. The results can be seen in Table 6.

Table 6. Reliability and Component Validity

Variable	Alpha	N of Items	AVE	CR
Smart City Applications	,613	16	,528	,946
Smart Gouvnement	,838	4	,540	,831
Smart Transport	,788	4	,483	,784
Smart Environment	,904	8	,543	,905
Intention to Live	,958	6	,781	,955
Technology Anxiety	,880	5	,600	,882

As a result of the reliability analysis, it was determined that the scales were reliable since the alpha coefficient value between 0.60-0.80 indicates that the scale is reliable, and between 0.80-1 indicates that the scale is highly reliable (Karagöz, 2017). It was determined that the AVE value was above 0.50, except for the smart transport dimension. The AVE value of the smart transport dimension was calculated as 0.483. Therefore, it is very close to 0.50. Moreover, AVE is considered a stricter criterion, and AVE<0.5 is considered acceptable when other reliability criteria are sufficient (Berthon et al., 2005). The CR value was calculated above 0.70 for all scales. According to the results, it is understood that the scales provide convergent validity, have composite reliability and are reliable scales.

Finally, descriptive statistics findings were analysed to determine whether the data were normally distributed. The findings are given in Table 7.

Table 7. Normal Distribution Test

	Mean	Std. Deviation	Skewness	Kurtosis
Smart Gouvnement	3,5097	,79716	-,631	,112
Smart Transport	3,0453	,95357	-,050	-,680
Smart Environment	3,0926	,80919	,015	-,051
Smart City Applications	3,1857	,73715	-,065	-,031
Intention to Live	3,9413	,89338	-1,035	1,120
Technology Anxiety	3,2301	,93860	-,172	-,606

As a result of the analysis, it was found that skewness and kurtosis values took values between +2 and - 2. This finding means the data are normally distributed (George and Mallery, 2010).

A structural equation modelling analysis was performed to test the research hypotheses. The model is given in Figure 1.

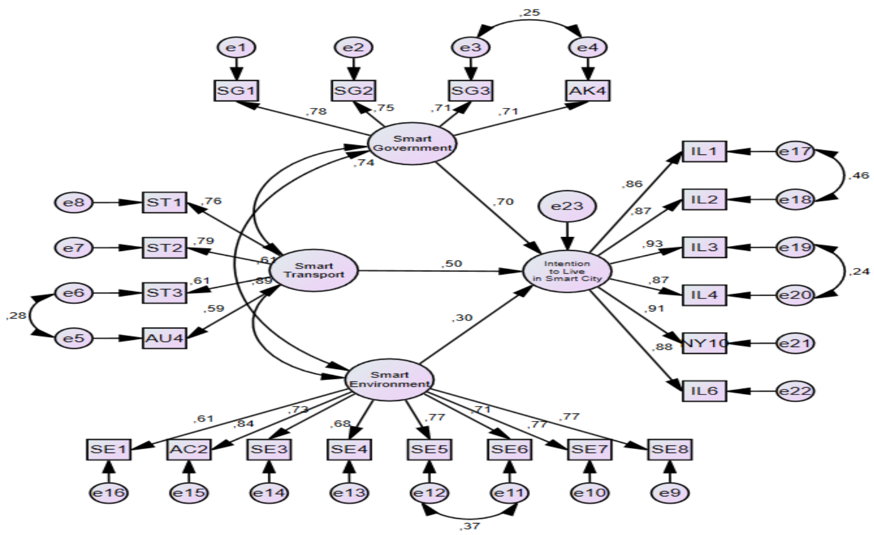

Figure 1. Structural Equation Model

Structural equation model goodness of fit values are given in Table 8.

Table 8. Model Goodness of Fit Values

	χ^2	df	χ^2/df	GFI	CFI	TLI	NFI	RMSEA
Criteria			≤5	≥.90	≥.90	≥.90	≥.90	≤.08
Model	625,694	198	3,160	0,872	0,933	0,918	0,908	0,078

The study concluded that the model demonstrated a good fit and fulfilled the required goodness-of-fit requirements. The results of the model analysis are given in Table 9.

Table 9. Model Analysis Results

			B	β	S.E.	C.R.	p
Intent to Live	<---	Smart Gouvernement	0,839	0,696	0,118	7,113	***
Intent to Live	<---	Smart Transport	0,582	0,503	0,201	2,89	0,004
Intent to Live	<---	Smart Environment	0,298	0,298	0,195	1,527	0,019

As a result of the analysis of the structural equation model found that smart public, smart transport and smart environment significantly positively affect the intention to live in a smart city. Hypotheses H1, H2, and H3 were accepted according to the results of the analysis.

To test the moderating role of technology anxiety, an interaction variable consisting of the product of independent variable smart city applications and moderator variable technology anxiety scales was created. Then, it was analysed with path analysis. The analysed path is given in Figure 2.

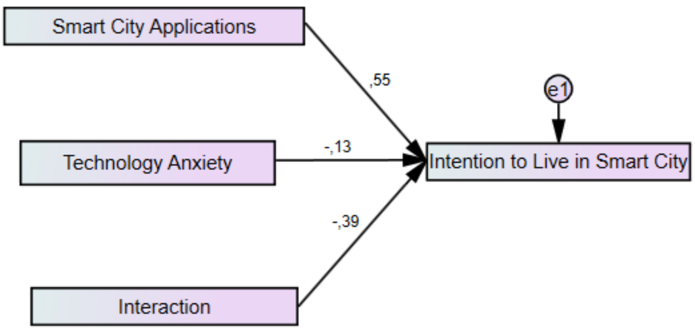

Figure 2. Path Analysis

Moderator analysis findings are given in Table 10.

Table 10. Moderator Analysis Results

			B	β	S.E.	C.R.	p
Intention to Live in a Smart City	<---	Smart City Applications	0,81	0,548	0,055	14,782	***

Intention to Live in a Smart City	<---	Interaction	-0,106	-0,389	0,01	-10,473	***
Intention to Live in a Smart City	<---	Technology Anxiety	-0,156	-0,135	0,043	-3,631	***

As a result of the moderator analysis, it was found that smart city applications, technology anxiety and interaction variables significantly affect the intention to live in a smart city simultaneously. This finding shows that technology anxiety has a moderating role in the effect of smart city applications on the intention to live in a smart city. As a result of the analysis, hypothesis H4 was also accepted.

The findings showing the moderating effect are given in Figure 3.

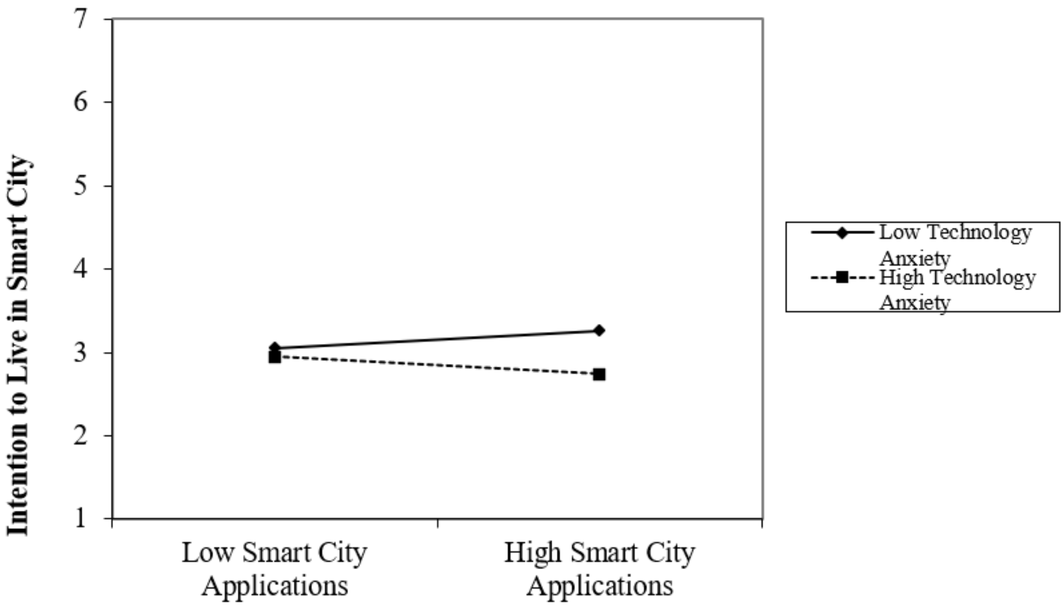

Figure 3. Illustration of the Moderator Effect

As seen in Figure 3, as the level of technology anxiety increases, the level of intention to live in a smart city decreases, and when the level of technology anxiety decreases, the level of intention to live in a smart city increases.

4.Conclusion and Recommendations

4.1.Conclusion

This research examined how three concepts related to smart cities—smart public service, smart transportation, and smart environmentalism—influence the desire to call these places home. Smart city applications were also examined for their impact on the desire to reside in such communities and the moderating effect of technology phobia. Smart public service, smart transportation, and smart ecology practices significantly increase the intention to live in smart cities, according to the structural equation modelling analysis. The moderator analysis revealed that worry about technological failure moderates the relationship between smart city apps and the desire to call one of these places home. Since more and more people are expected to reach city homes soon, and smart city planning is crucial for improving city life, these results hold great significance. Indeed, almost 2.5 billion people will be residing in urban areas by the year 2050, according to the UN World Urbanisation Prospects (Martins et al., 2021).

The discovery that intelligent public services have a substantial impact on life intention is a crucial one. Smart public services optimise the processes of providing services to residents through technology, which is regarded as the most critical cause for this conclusion. Services are being delivered more quickly, easily, and efficiently due to digitalisation. Because of this, city people have it more accessible and may make better use of their time. According to Sabory et al. (2021), enhancing people's quality of life is the primary goal of smart city development. According to Georgiadis et al. (2021), smart cities are the best way to plan for city growth. Another noteworthy discovery is the substantial impact of smart transport applications. It is believed that the ability of smart transport technologies to optimise public transportation systems, control traffic flow, and decrease traffic density is the primary reason for this discovery. Because of this, getting around town will be easier, safer, and quicker. Consequently, individuals will feel less pressure and better grasp their schedules. Enhanced road safety is another potential benefit of smart city technology, as highlighted by Ptak (2021). Ptak (2021) states that smart transport applications also aid in maintaining traffic flow and that signage warning drivers of dangers might further decrease the likelihood of accidents. Environmentally sensitive measures in energy efficiency, waste management, and expanding green spaces are believed to be the driving forces behind the substantial influence of smart environmental practices. Urban areas may lessen their adverse effects on the environment, make better use of their natural resources, and enjoy higher quality of life by implementing these apps.

The study also discovered that technological anxiety acts as a buffer. One possible explanation is that people may be wary about sharing their personal information with smart city applications because of the inherent risks associated with data collecting, storage, and usage. Worries about the abuse or unauthorised access to personal data can cause technology anxiety, which in turn can alter life goals. Additionally, not everyone will have smooth sailing when utilising smart city technologies. Users' intention to adopt and use the technology may be reduced due to factors such as the complexity of the applications, difficulty of usage, or the risk of suffering technical problems. Therefore, smart city apps may be challenging to adopt for people with limited technological ability.

4.2.Recommendations

Smart city technologies should be integrated into government policies over the long term. Among these goals can include the digitalisation of public services, the modernisation of city infrastructure, and the promotion of sustainability. Tax benefits, incentive measures, and laws might encourage investments in this field. To finance the necessary technology for the development of smart cities, Fialová et al. (2021) argue that governments should enhance public service to decrease transaction costs during efficient contracting. Smart city service providers could minimise user problems by involving and engaging consumers throughout the service development cycle (Abu Salim et al., 2021). In other words, a system must be implemented to facilitate public engagement in city planning and decision-making. People living in the area can have their voices heard by using feedback systems and maintaining open lines of communication.

As Abu Salim et al. (2021) proposed, smart city service delivery channels should be made as simple as possible by using efficient and adaptable interface technology. Users will have all the information they need to make real-time decisions and meet their service demands efficiently.

To lessen the ecological footprint, it is necessary to neutralise all harmful consequences, including waste products, with slight alteration. Soil and groundwater contamination is an ongoing problem, and agriculture is a major contributor. Investigate novel approaches to real-time anthropogenic effect mitigation, conduct data analysis regularly, and verify compliance with environmental laws. We urge that penalties for both natural and legal people be increased in the event of infractions. The collected funds should be directed towards initiatives that conserve the environment and foster innovative development within the settlement (Koval et al., 2021).

Building smart cities is, of course, a shared responsibility across many sectors, not just governments. Businesses also need to do what's required of them. Companies should put their efforts into smart city technology, develop creative ideas, and invest money in this area. They should provide answers to city problems by emphasising tech like sensors, data analytics, and AI. Businesses might collaborate with public and private entities to implement smart city concepts. Combining resources can realise more extensive and successful initiatives through these collaborations. By creating eco-friendly technology and apps, businesses may develop solutions focusing on sustainability. A few areas where they can step up their game include energy efficiency, trash management, and carbon footprint reduction.

Electric vehicles are crucial to reducing carbon dioxide emissions and advancing smart city technology (Razmjoo et al., 2021). Companies and governments should move quickly to make electric cars more popular and to finish setting up the required infrastructure.

In smart cities, researchers can conduct more studies in fields like data analytics, artificial intelligence, and the Internet of Things. They can develop novel methods to make the most of these technologies in urban areas. Researchers can bring smart city technologies to the public's attention through educational programs and awareness-raising events. They can better grasp the technology and be more engaged if this is done.

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Conflict of Interest

The authors declare that they have no competing interest.

Ethics Approval

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Appendix: Scale Items

Smart City Practices Items
SG1: ICT technologies and innovation in public services are encouraged.
SG2: Strategic plans are presented to promote e-government.
SG3: Municipality uses e-applications.
SG4: Public services are provided online.
ST1: Innovative and safe transport systems are available.
ST2: Traffic management and parking system is carried out effectively based on technology.
ST3: Public internet access and Wi-Fi hotspots are provided in the city.
ST4: Safe and efficient public transport (e.g. metro) and general modes of movement (e.g. taxi, aeroplane) are available.

SE1: Recycling of solid wastes is ensured.
SE2: Sustainable resource management is encouraged.
SE3: ICT is used to improve public safety.
SE4: There are initiatives for the digitisation of heritage assets.
SE5: There is a disaster forecasting and early warning response system.
SE6: Disaster alarm system of fire stations is provided.
SR7: There is a management approach to minimise expenditures such as planned management of green areas and efficient use of resources (e.g. water and electricity).
SE8: Renewable energy resources are used.
Intention to Live in a Smart City Items
IL1: I would like to live in a smart city since e-governance systems will be used.
IL2: I would like to live in a smart city as it will contribute to city planning.
IL3: I agree that compared to ordinary cities, living in a city that uses such smart city technologies will definitely have benefits.
IL4: I believe that smart cities are an improvement in the quality of cities above current standards of use
IL5: I believe that initiatives and proposals for the implementation of technologies related to smart cities will benefit from their use in my city.
IL6: I would like to live in a smart city as it will provide energy efficiency and a low-carbon environment with a focus on renewable energy.
Technology Anxiety Items
TA1: Smart city services worry me about my ability to use technology
TA2: I think a lot of money is spent on smart city services without offering anything significant to the society and individuals.
TA3: I think we lack basic infrastructure in the city and therefore smart city services are a meaningless luxury.
TA4: I think smart city services give organisations a good excuse to manage my personal data and I don't like it.
TA5: On average, I think people my age lack the skills and courage to use these services.