Exploring the Effects of key Factors of Smart Urban Governance on Geocultural Relations

Seyed Jalal Faraji- Department of Public and Urban Management, Allameh Tabataba'i University, Tehran, Iran.

Ahmad Zanganeh * - Faculty of Geographical Sciences, Department of Geography and Urban Planning, Kharazmi University, Tehran, Iran.

Pouria Pirastefar- MSc. of Urban Management, Allameh Tabataba'i University, Tehran, Iran.

Hamed Hedari- Ph.D. of Sociology, Shiraz University, Shiraz, Iran.

Abstract

Cultural geopolitics refers to a complex set of interactions among government, power, culture and geographical environment through which the cultural factor, along with the spatial-locational processes formed by the city government, engages actors from various social strata in interaction. It is then very important to identify relationships between the components of the smart urban governance and cultural geopolitics in the political-regional development of metropolises and their globalization process. This developmental research employed a descriptive-analytical method, and the necessary data were collected through library and field research. The collected data were analyzed through decision making trial and evaluation laboratory (DEMATEL) technique using Excel software, and finally, a network of factors was extracted and plotted using Microsoft Visio software. Based on the strength of interaction and affectability of the factors, a network of relations was obtained. The most affecting factor was found to be the participation in decision-making on electronic issues, and the least affecting factor was the political vision and strategy. The other affecting factors were ICT network scope and internet access, online public services, information transparency, and ethnic and national identity (nationalist belonging), respectively. In addition, the most affected factor was the geographical and spatial-locational belonging, and the least affected factor was the political vision and strategy.

Keywords: Smart Urban Governance, Cultural Geopolitics, Cultural Factors, Geo-Culture.

* E-mail : zanganeh@khu.ac.ir

1. Introduction

Culture is an element of development but it is not the only factor. According to Ratzel, the founder of political geography, every culture tends to expand spatially as far as no obstacle occurs on the way, or no stronger culture overwhelms it. The new discourse formed in the global arena today has focused on culture, as many conflicts mentioned in the existing literature on the geopolitical events in the world are rooted in culture (Faraji,2019). The cultural factors of the development include all psychological and social elements that, along with other factors such as science and economics, lead to the improvement of the material and intellectual life of a society in general and urban communities in particular (Amiri,2010). The changes in the modern world today can clearly highlight the significance of the role of culture in the political and international relations, and in modern urban planning policies. Culture along with the three factors of economy, politics, and government is intertwined in the social system. In fact, globalization is nothing but the complex interaction of this four-part structure and the transformation of the world into a small village that McLuhan portrayed years ago.

Throughout history, culture and civilization have always displayed strife, competition, and cooperation. However, quite contrary to the view of social Darwinism, rather than struggling with one another, civilizations have often been in cooperation and have complemented each other through positive exchanges and dialogues (Heidari,2004). One place is different from other places and the social process of each place is determined by its own specifications. The formation of cultural geopolitics with a transregional scope requires the evaluation and employment of geographical capacities for the development of civilization (Hafeznia,2019). Cultural geopolitics is a complex set of interactions among government, power, culture and geographical environment. Through these interactions, cultures, like other phenomena of the social system, are constantly formed, evolve, merging and move over time within a geographical environment. In other words, cultural geopolitics is a combination of spatial-locational processes and cultural power among different actors who play a role in making different social layers of a wide environment on this planet and are in constant interaction with each other (Heydari,2004).

Regional interactions, both culturally and politically, create a cultural landscape. Researchers consider the cultural geopolitical structure of the

world to be made of micro and macro cultures that are formed in the spatial-locational interactions of culture. Cultural geopolitics with various locational levels is based on cultural structure. According to Wallerstein's theory, there are movements in the urban flow between the focal and the peripheral areas, and culture moves from the center of a community to the surroundings. The hierarchical structure of the world's cultural geopolitics is divided into areas of civilization, each of which includes smaller areas the smallest component of which is the micro-cultures that are located in the spatial pixels. Drawn on the two elements of time and place, political geopolitics also grows within cultural geopolitics, aiming at creating regional convergence. With respect to cultural factors, cultural geopolitics plays an important role in devising a political geopolitical roadmap by identifying internal strengths and weaknesses as well as external opportunities and threats. Geopolitical regions create the spatial patterns for developing the political relations of governments within the region and outside the region. Therefore, the proper knowledge and analysis of a political and geographical situation and taking advantage of regional cultural potentials, can stabilize the interests of countries.

In fact, in a geopolitical region, it is the natural forces, human resources and cultural factors that create changes, and the use of new ideas can enhance the power of countries in cultural geopolitics. Accordingly, paying attention to new ideas and paradigms in scientific fields can play a significant role for geopolitical developments.

From a postmodernist perspective, geopolitics is not defined only as enhancing the competitive power of a country and preserving territorial integrity of the land, but heightening its scope in all political and cultural areas (Flint,2006). In this regard, the smart city paradigm, which is one of the new concepts in urban studies, should be seriously considered in cultural geopolitics. A key factor in this paradigm is smart urban governance which seeks to promote intelligent space management by employing a new approach. An integral part of smart urban governance is its relationship with the society and thus cultural elements, social identity and institutional intelligence, which provides the ability to adapt quickly and creatively to the internal and external environmental changes in the society and helps benefit from it to achieve the desired goals of urban governance. It is thus very important to consider the smart urban governance and the role it plays in the future of cultural geopolitics and the related studies. Smart urban

governance includes urban government and civil society, and its realization requires interactions between official and governmental institutions and civil society, which confirms the legitimacy of the public interest in a new format. Smart urban governance promotes government commitment, transparency, and accountability to meet the needs and wants of a society. Paying attention to smart urban governance and its effects on cultural geopolitics can lead to many changes at the urban level and improve the position of local governments and subsequently the central government. Identifying the relationships between the key factors of the smart urban governance and the cultural geopolitics can play an important role in the internationalization of the metropolises and expand their political and regional power. In fact, due to its significant role in smart cities, smart urban governance in collaboration with geopolitics can become an influential factor in the future of cities. Apart from the geopolitical impacts, the cultural approaches and their tremendous effects on the cities are likely to receive increased attention.

Thus, this study aims to examine the relationships between the key factors of smart urban governance and cultural geopolitics because the identification of these relationships can play a significant role in establishing the future interactions of cities with transregional spaces and greatly affect the international performance of metropolises.

2. Literature Review

From a terminological point of view, an appropriate way to understand scientific terms is to analyze the parts used in them. The main terms are then described in terms of their constituents below.

2-1. Geopolitics

Like many other concepts in humanities, the term geopolitics is hard to define and there is not a consensus on its definition. However, the relationship between power and geography is emphasized in it. It is academically defined as the study of the interrelationships of geography, power, and politics, and the actions that result from their combination in which the element of geography are space, environment and human beings (Hafeznia,2006). The collapse of the bipolar system and the end of the Cold War created a new geopolitical and geo-economic situation in the world (Ghaderi Hajat and Nosrati,2012). The geopolitical region is in fact a reflection of the consolidated form of the geographical region. While in a

geographical area, one or more factors lead to regional convergence, in a geopolitical area, it is the geographical functions and their impact on government policies that are influential. In order to weaken the power and the interests of a rival country, the political units use geographical, natural, human, and spatial/locational elements and values to impose their will on the rival political units (Nohadani and Ghaderi Hajat,2021). The different nature of geopolitics with different viewpoints on war and peace in the past century has created global reginalization in international relations. In recent decades, global geopolitics has been more effective in drawing regional lines by changing its approach and paying attention to cultural and social dimensions. The geopolitical approach looks at the productivity of spatial-locational capabilities in order to make the optimal use of competitive advantages on a micro and/or macro scale, promoting national power and ultimately the geopolitical power of a country and determining its relations with other powers (Ghaderi Hajat and Golkarami,2020). Agnew (2002) believed that geopolitics should study how policies are shaped by geography and that the social geopolitical approach is important in forming identities and political movements because our identity vis-à-vis others' identity in cultural geopolitical discourse can provide an analysis of identity for survival and security.

Table (1): Perceptions and Definitions of Geopolitics (Adapted from Hafezinia,2006)

Hafeznia (2006)	Geopolitics is the study of the interrelationships of geography, power, and politics with respect to three domains of space, environment, and man.
Jey	Geopolitics is the art and the process of global competition.
John Agnew	Geopolitics is the study of the influence of geography on relationships between nations.
Saul Bernard Cohen	Geopolitics is the applied science of spatial relationship between geography and politics, which examines the mutual influence of spatial patterns of shapes and structures on political ideas.
Patrick O'Sullivan	Geopolitics is the geographical study of managers and administrators, including national leaders and transnational institutions.
Gearoid o Tuathail	Geopolitics is the government's need for spatial structures and political geography provides the knowledge for spatial studies.

2-2 Cultural Geopolitics

Cultural geopolitics is a complex set of interactions between power, culture and geographical environment through which cultures, like other phenomena in the social system, are formed, evolve, merge and move over time on the earth's geographical environment. Culture plays a role in national and international politics in various ways and shapes its desired behavior by influencing the societies. It may be even said that it is the cultural geopolitics that directs the world system (Arab,2011). Nowadays, modern cultural geopolitics can be revisited in the historical formation of societal dialogues and the creation of social identity derived from a global social process rooted in power structures (Leigh,2021). The dialectical understanding of the concept of culture in Western and non-Western societies, considering the common basic concepts in the face of the uneven path of cultural geopolitical development, can only be synchronized with the interactions between societies (osterhammel.2014). Table (2) lists some comprehensive definitions of cultural geopolitics.

Table (2): Perceptions and Definitions of Cultural Geopolitics

Aytekin (2017)	From a theoretical and conceptual dimension, cultural geopolitics, as one of the new approaches of the 21st century, has not been able to provide a proper political structure in accordance with the pattern of human geography.
Bonet & Schargorodsky (2019)	Cultural geopolitics, with its components such as the political background in a region, is a tool for confronting global domination.
Stodolsky 2007	The cultural geopolitical perspective includes symbolic cultural structures, religious (even secular) movements, and mutual critical perspectives (East to West).
Matsuzato 2010	Cultural geopolitics is formed by the cognitive achievements through regional and trans-regional studies on transnational actors such as religious organizations, international corporations, and NGOs.
Heidari, 2012	Geoculture expresses the cultural framework within which systems, beliefs, and ideologies operate, and circulates its intellectual fundamentals in the cultural geography.

The role and status of cultural geopolitics in today's world is so much so that it can play a role in a geographical area more than before. Culture forms the geopolitical relationships in international relations and is deeply connected

with identity as an important factor. Cultural interactions and commonalities in issues such as religion and beliefs, art and literature, which have lasted for centuries in different nations, have been the cause of rich cultural communication opportunities although they have also had the potential to create regional and trans regional tensions and conflicts (Nayef,2014). By reviewing the concepts and the studies conducted on cultural geopolitics, the expected regional consequences are listed in Table (3).

Table (3): Regional and Trans-Regional Results of Cultural Geopolitics (Adapted from Domestic and International Studies)

	Source	**Local Sources**
Key cultural geopolitical factors, derived from domestic and international research	Karani,2019	Cultural power
	Marefat,2019	Political convergence (regional-transregional)
	Karani,2019	Soft political power
	Kahrazeh,2018	Détente and trust policy
		National branding and illustration
	Ghorbani,2014	Boosting multilateral cooperation
	Karani,2019	Religious convergence (regional and transregional)
		Political-religious unity
	Taheri,2018	Ethnic-social ties
		Reconstruction of nationalism
		Institutionalization of international relations
		Expansion of friendly relations with neighboring countries
	Authors	Regional hegemony
		Creation of positive political balances
		Improving opportunities for the export of cultural goods and products
		Cultural convergence (regional-transregional)
	Source	**International sources**
	Jessop and ling,2017	Cultural relations based on culture (geoeconomic relations)
	Zheng lie, 2017	Reconstruction of nationalism
		Institutionalization of international relations
	Leigh,2021	Provision of internal, regional, and global security
	Bonet,2019 Stodolsky,2007	Expanding the dominance of political-cultural geography
	Matsuzato,2010	Cultural and civilizational growth
		Soft political power

The concept of geoculture has rarely been considered in the literature of management theories and international diplomacy and is one of the few concepts that has not found its global dimension and position in Wallerstein's theory, which may be one of the reasons for its lack of meaning (Gelis-Fiho,2022). Nowadays, the concept of cultural geopolitics in cultural diplomacy is emphasized to explain current developments in international cultural policy, that, how cultural geopolitical forms can be used as contexts in which complex diplomatic and participatory structures are formed by multiple actors. Emerge and stabilize (winter,2021).

2-3. Cultural Geopolitical Factors

History has witnessed the dialectical relations of great civilizations such as Iran, China, and India with the civilizations of Egypt, Greece, and Rome. In the new era and from a geopolitical point of view, cultural convergence on issues such as religion, literature, and the like has been of special importance for the countries of these regions. Many independent countries today, such as Iraq, Afghanistan, Pakistan, the South Caucasus, and Central Asia, were former parts of other larger countries, and now the history and the common language are the points of cultural connection and their regional convergence. One of the most basic features of regional convergence is a common culture, which is emphasized by convergence theories because it is considered a prerequisite to globalization (Farajirad, 2017). Understanding the geopolitical functions with internal and regional scopes with the aim of strengthening relations may result in the achievement of common goals with neighboring countries to secure benefits. Of course, some functional factors such as religion and ethnicity are two-faced variables that can sometimes lead to regional tensions and conflicts. Taking advantage of the strengths and opportunities that such factors create in a geopolitical structure helps the realization of the convergence of the region and the transition from the geopolitical region to the geopolitical structure. This convergence includes individuals' approach to achieve a specific point, commonly known as a common goal. Therefore, it is necessary to understand and find the factors affecting regional geopolitics to establish convergence (Yousefi,2010).

Table (4): Cultural Geopolitical Factors from Different Viewpoints

Factor	Explanation	Source
Ethnic and national identity	Identity, influenced by spatial geopolitics, is less dependent on factors such as ethnicity, culture, and so on.	Allen Chun,2009
Religion	The link between geopolitics and religion is a growing factor in the formation of international relations.	Kadri,2020
History	Geopolitics is the study of history from a spatial-locational perspective from a strategic angle.	Owens,1999
National ceremonies and religious rituals	Cultural events are unique lenses to display and introduce the structure and activities of cultural geopolitics.	Ormerod and Wood,2020
Music	Music, as a component of cultural geopolitics, has influenced European and American policies	Williams,2020
Architecture and spatial factors	Architecture as a global cultural and abstract message has influenced cultural policies.	Nooria and Atto, 2008
Culture and literature	Nations are identified by their languages so that language can unite nations and achieve geopolitical goals.	Rajagopalan,2008

Religion: Religion, as one of the important geopolitical issues, has a significant role in politics and life. Religion, in a wide range of types, is one of the effective factors in geopolitical political interactions, playing a significant role in the policies and the central power of the countries in the region. Even now, the political stability of some countries is largely related to the spatial distribution of religion and language (Mohammadi,2017). Shared festivals and religious rituals in the region create good opportunities for the adoption of appropriate cultural policies, which will result in political-cultural achievements in cultural geopolitics.

Literature: It is the most prominent cultural element. The cultural geographical significance and impact of language and literature are such that the geopolitics of language, as a cultural-geographical factor, is considered a new branch of geopolitical science.

Tourism and National-Cultural Identity: The development of tourism with the aim of recognizing cultures, historical and national identities leads to strengthening the relationship between countries and increasing cultural

understanding. Thus, tourism can help cultural convergence in the region. In other words, when tourists become familiar with the national culture, they expand mutual dialogues and understanding in international forums. Expanding cultural geopolitics paves the way for political and economic geopolitical issues (Vazin,2010).

History, Ethnic Identity and Common Language: Common history and ethnic-linguistic ideological values and their role in creating common cultural interests play an important role in regional convergence. According to the situation of ethnic groups in the countries, different but appropriate ethnic policies should be adopted in lieu with the interests and demands and special attention to ethnic homogeneity. Furthermore, the urban actions should be in line with national policies. Because if the ethnic policy is not designed and implemented in accordance with the situation of the ethnic groups, it will culminate in ethnic conflict and crisis. The geopolitical weight of ethnic groups reflects all the geographical-cultural and demographic characteristics in various social, political, economic and cultural fields (Valigholizade,2020).

Architecture and Music: The relationship between art and politics can be shown into four parts:

1) Arts in support of politics, 2) Arts against politics, 3) Politics in support of arts, and 4) Politics against arts (Ghezelsofli,2010). Arts can play a credible and legitimizing role in politics. The seven arts, especially architecture and music, due to the commonalities with the neighboring countries can establish a common cultural sense with neighboring countries. Arts, especially through the use of cultural and artistic symbols, can create a sense of regional solidarity.

2-4. Smart City

Since smart urban governance is the basis of smart city, and the new approach to urban management in achieving the smart governance is based on "smart city with a citizen-centered approach", the concept of smart city is explained below. Smart city is a general and multifaceted concept that can be studied from different dimensions. Despite the extensive literature on smart city, there is still no clear understanding and general consensus on it. Some believe that the smart city uses strategic and technological data that leads to the formation and transfer of information services and business innovation, management and optimization of urban operations, and

improved interregional cooperation (Castelnovo,2016). Others define it as a dynamic city for finding ICT-based solutions to public challenges by public participation. The analysis of smart city definitions suggests that this concept can be divided into three key themes: technology, infrastructure-process, and vision. Therefore, smart city is associated with smart governance along with concepts such as smart economy, smart mobility, smart environment, smart citizen, and smart life (Poorahmad et al., 2018).

Table (5): Definitions of Smart cCity from Different Viewpoints (Adapted from Albino,2015)

A smart city is an advanced compact city with high technology that connects people, information and urban elements with the assistance of new technologies, which aims at creating a sustainable, green and competitive city with a high-quality life.	Bakici,2012
Smart city means using all available resources and technologies in a smart and coordinated way to develop sustainable, inhabitable and integrated urban centers.	Barrionuevo,2012
A city is smart when investing in social-human capital, and strengthening communication infrastructure, transportation, information and communication technologies, economic growth and sustainable energy and living with intelligent resource management are all made through participatory governance.	Caragliu,2011
A smart city takes advantage of the communications and capabilities built into urban infrastructure to optimize transportation and other logistics operations that support daily life, and improve the quality of life for everyone. .	Chen,2010
A smart city connects the physical infrastructure, information technology infrastructure, social infrastructure, and business infrastructure to strengthen the collective intelligence.	Harrison,2010
A smart city is highly productive, has many people with higher education, knowledge-based jobs, results-oriented monitoring systems, creative activities, and sustainable orientations.	Kourtit,2012
A smart city is a land with a high capacity for learning and innovation, which is based on the creativity of citizens and institutions, knowledge-based institutions and the digital infrastructure to communicate and manage knowledge.	Komninos,2011
A smart city is the result of creative and knowledge-based strategies that aim to enhance the competitive, supportive, ecological, and socio-economic performance of the city. Such a smart city promotes human capital, infrastructure, social capital, and enjoys risk and creativity.	Nijkamp and Kourtit,2012

2-5 Smart Urban Governance

Smart urban governance provides fundamental changes in society through the expansion of communication infrastructure and information technology (Hosseini,2019). As defined by the United Nations, smart urban governance refers to a body of the methods of planning and public management of space, public and private institutions, as well as a continuous process that is facilitated by mutual the interests, cooperation, and interaction. This way of governing is a process, not an end in itself, as it is about drawing the future and vision.

Table (6): Definitions of Smart Urban Governance from Different Viewpoints

- Smart urban governance can be used to control urban challenges. - Smart urban governance offers a practical strategy in dealing with urban issues. -Smart urban governance offers a method based on technical and social concepts.	Huaxiong Jiang,2020
Smart urban governance targets the management of the socio-spatial issues in smart cities through technological innovations and the provision of new opportunities for the realization of urban ideals.	Jiang, Huaxiong* | Geertman, Stan | Witte, Patrick ,2019
Successful smart urban governance effectively coordinates urban technological innovation with urban actors in regard to urban challenges.	

This dynamic model requires an accurate understanding of the cultural and social needs of society, the structure and cultural factors, and the role of urban governance in using the smart city approach and tools such as ICT (Faraji,2019). A review of the theoretical frameworks and the studies focusing on smart urban governance, some indices can be extracted as illustrated in Table 7 below.

Table (7): Indices of Smart Urban Governance

|			
1	Participation in Decision Making	Giffinger,2007	
2	Public and Social Services		Indices of Smart Urban Governance
3	Transparent Governance		
4	Political Visions and Strategies		
5	ICT and e-Eoevernment	Azkuna,2012	
6	Free Access to Information		

Since no research has been done on the relationship between the two concepts of smart urban governance and cultural geopolitics, the results of this research can help benefit the strategic governance strategies in identifying available potentials.

3. Method
This research employed a descriptive-analytical design with a developmental approach. The data were collected through the field method and library research. At first, the necessary data were collected using the library method. Then decision making trial and evaluation laboratory (DEMATEL) technique, which is one of the multi-criteria decision-making methods, was used to identify the patterns of causal relationships between research variables. Finally, Microsoft Visio software was used to illustrate the network of relationships between the factors of smart governance and cultural geopolitics.

DEMATEL technique is one of the decision-making methods based on pairwise comparisons. Using the experts' opinions in extracting the factors of a system and based on the principles of graph theory, this technique systematically structures the factors into a hierarchy of cause-and-effect relationships, and the strength of the relationship is determined through scoring. The purpose of the DEMATEL technique is to identify the pattern of causal relationships between a set of criteria by examining the strength of interactions through scoring, monitoring feedback, and finally identifying non-transferable relationships. For this purpose, 15 academic experts who were professional in the field of urban studies and cultural geopolitics were selected through snowball sampling. According to Tersine and Rigidez (1976), if the group of participants is homogeneous, a sample size of 10 to 15 people is sufficient to create reliable results. After finalizing the key factors of each of the research variables, the factors were made into a questionnaire and tested by the experts. Since the questionnaire was based on the criteria identified in previous research and in line the scientific findings, the validity of the questionnaire was empirically confirmed. Cronbach's alpha test was used to measure the reliability of the questionnaire, and its value was 0.81, indicating accepted reliability of the questionnaire. Finally, based on the scores, the strength of the relationships between the factors and the effects between them were extracted.

In general, this research was carried out in three stages. In the first stage, the research variables with a focus on smart urban governance and cultural geopolitics were identified through documentation and library method (Tables 1 and 4). In the second stage, based on the opinions of experts, the data were analyzed through DEMATEL technique. Finally, in the last stage, using the obtained results, the relationships between the factors were extracted as the output of the research Figure (1).
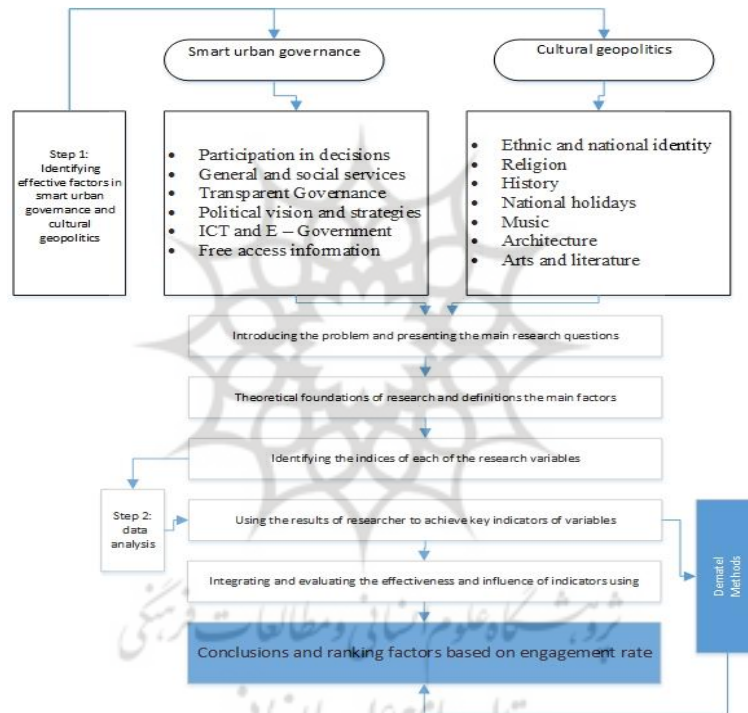
Figure (1): Research Framework

4. Findings

Identifying Key Factors of Research Variables: The first stage of this research focused on finding factors that could define the research variables. For this purpose, the available data were examined through library study. Finally, using the available data on smart urban governance and cultural geopolitics, the key factors that are commonly mentioned in most studies in referring to these two concepts were identified and extracted (Table 8).

Table (8): Key Factors of the Main Research Variables

Smart Urban Governance	Factor 1	Transparency of information
	Factor 2	Public online services
	Factor 3	Participation in decision-making (Electronic democracy)
	Factor 4	Political visions and strategies
	Factor 5	ICT network and internet access
Cultural Geopolitics	Factor 6	Geography and spatial belonging
	Factor 7	Religion and beliefs
	Factor 8	History and civilization
	Factor 9	Culture and literature
	Factor10	Ethnic identity (nationalist belonging)

Based on the results, a total of ten key factors were identified for the two main research variables. In the next stage, the relationships between these variables and their effects on each other was studied. To this end, the DEMATEL technique was used.

Identifying the Interrelationships between the Research Factors through the DEMATEL Technique: In the second stage, the extracted factors were made into a questionnaire and submitted to experts in this field. The DEMATEL technique was used to identify the relationships between the factors for each of the research variables. In the meantime, for comparison of the criteria with each other, five values and their corresponding verbal expressions were used. They are given in Table 9 below.

Table (9): Verbal Expressions and their Corresponding Numbers through DEMATEL

Effect Type	Value
No Effect	0
Little Effect	1
Medium Effect	2
High Effect	3
Very High Effect	4

Direct Relation Matrix Formation (M)*:* At this stage the effectiveness of the criteria is examined in pairs. When using multi-viewpoint, we use the simple average of the comments and form matrix M. To examine the impact of the criteria on each other, the verbal spectrum in the following table was used. In general, six steps could be used to perform the DEMATEL technique:

Step (1): Forming direct relation matrix aij: At this step, the experts use the numbers 0 to 4 (no effect, very low effect, low effect, medium effect, high effect and very high effect) to determine the effect of factor i on j. Due to the use of several multi-viewpoints, a simple average of expert opinions is used.

Table (10): Average Opinions of Experts

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7	Factor 8	Factor 9	Factor 10	Total
Factor 1	0	3.2	3	3.8	4	2	3.2	1.6	0.8	2.8	24.4
Factor 2	3	0	3.4	4	4	2.8	0.4	0	0.4	0.8	18.8
Factor 3	2.8	3.4	0	3.6	4	2.8	3	1.8	0.4	3.6	25.4
Factor 4	3.2	4	3.6	0	4	1	0	0.4	0.4	1	17.6
Factor 5	3.8	4	3.8	4	0	3.4	0.2	0	0.4	0.8	20.4
Factor 6	2.6	2.7	2.3	1.3	3.4	0	4	4	4	4	28.3
Factor 7	3.4	0.8	2.4	0.5	0.6	4	0	4	4	4	23.7
Factor 8	1.9	0	1.8	0.2	0.4	4	4	0	4	4	20.3
Factor 9	1.3	0.6	0.4	0.5	0.5	4	4	4	0	4	19.3
Factor10	2.9	0.7	3.2	1	0.7	4	4	4	4	0	24.5

Step (2): Normalizing the direct relation matrix: For normalization, N = k * M equation is used. In this formula, k is calculated as follows: First, the sum of all rows and columns is calculated. The inverse of the largest number of rows and columns forms k.

$$K = \frac{1}{\max \sum_{j=1}^{n} a_{ij}}$$

Table (11): Normalized Direct Relation Matrix (M)

Normalized Matrix (M)	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7	Factor 8	Factor 9	Factor 10
Factor 1	0	0.1131	0.106	0.1343	0.1413	0.0707	0.1131	0.0565	0.0283	0.0989
Factor 2	0.106	0	0.1201	0.1413	0.1413	0.0989	0.0141	0	0.0141	0.0283
Factor 3	0.0989	0.1201	0	0.1272	0.1413	0.0989	0.106	0.0636	0.0141	0.1272
Factor 4	0.1131	0.1413	0.1272	0	0.1413	0.0353	0	0.0141	0.0141	0.0353
Factor 5	0.1343	0.1413	0.1343	0.1413	0	0.1201	0.0071	0	0.0141	0.0283
Factor 6	0.0919	0.0954	0.0813	0.0459	0.1201	0	0.1413	0.1413	0.1413	0.1413
Factor 7	0.1201	0.0283	0.0848	0.0177	0.0212	0.1413	0	0.1413	0.1413	0.1413
Factor 8	0.0671	0	0.0636	0.0071	0.0141	0.1413	0.1413	0	0.1413	0.1413
Factor 9	0.0459	0.0212	0.0141	0.0177	0.0177	0.1413	0.1413	0.1413	0	0.1413
Factor 10	0.1025	0.0247	0.1131	0.0353	0.0247	0.1413	0.1413	0.1413	0.1413	0

Step (3): Calculating the total relation matrix: At this step, we check the results of the previous steps. We first subtract the normal matrix from the unit I matrix (I-N), in which "I" is equal to the unit vector, then reverse it, and then multiply the normal matrix by the reverse matrix. This is obtained through the following equations. The total relation matrix is calculated from the equation $T = N \times (I-N)^{-1}$.

Table (12): Total Relation Matrix (T)

Total Relation Matrix	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7	Factor 8	Factor 9	Factor 10	Rows (R)
Factor 1	0.3829	0.4147	0.4682	0.424	0.4686	0.4771	0.441	0.3523	0.3087	0.4595	4.1968
Factor 2	0.3997	0.2651	0.4068	0.3826	0.4155	0.4015	0.2719	0.2235	0.2168	0.3097	3.2932
Factor 3	0.4903	0.433	0.3895	0.43	0.4831	0.5208	0.4543	0.3753	0.3143	0.5016	4.3922
Factor 4	0.3842	0.372	0.3931	0.2447	0.3965	0.3273	0.2385	0.2132	0.1962	0.2916	3.0573
Factor 5	0.4466	0.4105	0.442	0.4034	0.316	0.4441	0.2901	0.2433	0.2345	0.3348	3.5654
Factor 6	0.5185	0.4201	0.4897	0.3698	0.4758	0.4971	0.5535	0.506	0.483	0.5816	4.8951
Factor 7	0.4825	0.3125	0.4337	0.2933	0.3406	0.5642	0.3949	0.4764	0.4537	0.5401	4.2917
Factor 8	0.3929	0.2479	0.3696	0.2421	0.2877	0.5166	0.4791	0.3202	0.4249	0.497	3.778
Factor 9	0.3584	0.2496	0.3133	0.2355	0.2735	0.497	0.4594	0.4281	0.2883	0.4762	3.5793
Factor 10	0.4793	0.3199	0.467	0.3167	0.3542	0.5749	0.5269	0.4836	0.4598	0.4262	4.4085
Column (D)	4.3354	3.4452	4.173	3.342	3.8117	4.8206	4.1094	3.6219	0.3801	4.4183	

Step 4: Creating cause-effect map: In this step, we calculate the sum of the elements of the row and column of the total relation matrix (T) and analyze it as follows:

- The sum of the elements of each row (D) for each factor indicates the extent to which that factor affects other factors in the system. (Impact of variables). The higher the value of this variable, the more effective that factor is.
- The sum of elements in column (R) for each factor indicates the degree of influence of that factor from other factors in the system. (Impact of variables)

Therefore, the horizontal vector (D+R) is the amount of influence of the desired factor in the system. In other words, the higher the D+R value of a factor, the more it interacts with other system factors. The vertical vector (D - R) indicates the influence of each factor. In general, if D - R is positive, the variable is a cause variable, and if it is negative, it is an effect.

Finally, a Cartesian coordinate system is drawn. In this system, the horizontal axis is the values of D+R and the vertical axis is based on D-R. The position of each factor is determined by a point with coordinates (D+R, D-R) in the system. In this way, a graphic diagram will be obtained.

$$R = [ri] \times 1 = [\sum n J = 1\ tij] n \times 1$$
$$D = [Dj] \times 1 = [\sum n\ i = 1\ tij] n \times 1$$

Table (13): Relative Strength of Direct and Indirect Relationships

Results	D	R	D + R	D − R
Factor 6	4.8951	4.8206	9.7157	0.0746
Factor 10	4.4085	4.4183	8.8268	-0.0098
Factor 3	4.3922	4.173	8.5652	0.2192
Factor 7	4.2917	4.1094	8.4012	0.1823
Factor 1	4.1968	4.3354	8.5323	-0.1386
Factor 8	3.778	3.6219	7.3998	0.1561
Factor 9	3.5739	3.3801	6.9594	0.1991
Factor 5	3.5654	3.8117	7.3771	-0.2463
Factor 2	3.2932	3.4452	6.7384	-0.1521
Factor 4	3.0573	3.342	6.3994	-0.2847
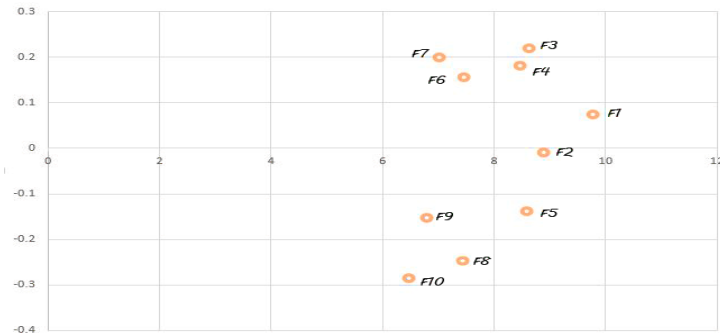
Figure (2): Cartesian Diagram of Research Factors

According to the relation map, the effect of the main factors can be obtained using a data set (D+R, D-R). In this figure, D+R is located on the X-axis, and D-R is located on the Y-axis. The results indicate that the variable that has the highest D-R value has the most impact. The more positive the D-R value is, the stronger the cause is, and the more negative the stronger the effect. The evaluation indices are analyzed according to the Cartesian coordinate diagram (Figure 2), and the research variables are ranked based on the degree of effectiveness and impact as illustrated in the tables below.

Table (14): Ranking Affecting and Affected Factors

Affecting Rank	D-R	Factor Code	Affecting Factors	
1	0.2192	Factor 3	Participation in Decision-Making (Electronic Democracy)	Affecting Factors
2	0.1991	Factor 9	Culture and Literature	
3	0.1823	Factor 7	Religion	
4	0.1561	Factor 8	History and Civilization	
5	0.0746	Factor 6	Geography and Spatial Belonging	
Affecte Rank	D-R	Factor Code	Affected Factors	
1	-0.2847	Factor 4	Political Visions and Strategies	Affected Factors
2	-.02436	Factor 5	ICT Network and Internet Access	
3	-0.1521	Factor 2	Online Public Services	
4	-0.1386	Factor 1	Transparency of Information	
5	-0.0098	Factor 10	Ethnic Identity (Nationalist Belonging)	

According to Table 14, the most affecting factors are participation in decision-making with the electronic approach respectively, and the most affected factors are vision and political strategy, ICT network and internet access, online public services, information transparency, and ethnic identity (nationalist belonging) respectively.

Finally, using all the obtained data and analyzing the available data, it is possible to evaluate and rank the factors using Table 15. Accordingly, the factors of geography and spatial belonging had the highest rank according to experts, while vision and political strategy had the lowest rank.

Table (15): Ranking Factors in Terms of the Amount of Interaction

| Rank	D+R	Factor Code	Factor
1	9.7157	Factor 6	Geography and Spatial Belonging
2	8.8268	Factor10	Ethnic Identity (Nationalist Belonging)
3	8.5652	Factor 3	Participation in Decision-Making (Electronic Democracy)
4	8.5323	Factor 1	Transparency of Information
5	8.4012	Factor 7	Religion and Beliefs
6	7.3998	Factor 8	History and Civilization
7	7.3771	Factor 5	ICT Network and Internet Access
8	6.9594	Factor 9	Culture and Literature
9	6.7384	Factor 2	Online Public Services
10	6.3994	Factor 4	Vision and Political Strategy

Step (5): Matrix and graph for the network of relations between factors:

To determine the relationships between the factors, we take the threshold value from the total interaction matrix (T). The threshold value is obtained from the arithmetic mean of all entries of the matrix. Then we set the number to zero for each entry of the T matrix smaller than the threshold value, if otherwise, we set the number to 1. The cells numbered 1 indicate the relationship of the row criterion with that column (See Table 15 and Figure 2).

Table (16): Matrix of the Relations of Research Factors

Relationship Map Matrix	F 1	F2	F 3	F 4	F 5	F 6	F 7	F 8	F 9	F 10
Factor 1	0	1	1	1	1	1	1	0	0	1
Factor 2	1	0	1	0	1	1	0	0	0	0
Factor 3	1	1	0	1	1	1	0	0	0	1
Factor 4	0	0	0	0	1	0	0	0	0	0
Factor 5	1	1	1	1	0	1	0	0	0	0
Factor 6		1	1	0	1	0	1	1	1	1
Factor 7	1	0	1	0	0	1	0	1	1	1
Factor 8	0	0	0	0	0	1	1	0	1	1
Factor 9	0	0	0	0	0	1	1	1	0	1
Factor 10	1	0	1	0	0	1	1	1	1	0

The interaction network graph of the affecting and affected factors is drawn according to Figure 3 and based on the data of the factor relations matrix in Table 15. VISIO software is used to show the relationship between research factors and drawing input and output arcs. Each output arc means the affecting factor, and each input arc shows the affected factor. According to the extracted factors in this research, the most affecting factor was the vision and political strategy with the lowest output arrows, and the most affected factor was participation in decision-making with the highest output arrows, and geographical factors and spatial belonging with the most input arrows had the most interaction compared to other factors.
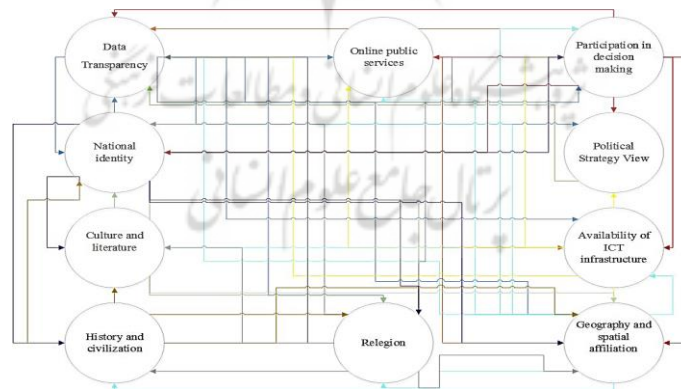
Figure (3): Interaction Network of the Impact of Research Factors

5. Conclusion

In the global rivalry system today, each city or region, depending on its geopolitical weight, tries to use its indices of smart urban to strengthen its

influencing territory, and to enhance its international situation. The success of this attempt depends on the performance of local government and consequently the central government. Therefore, in implementing the policies to enter the transregional arenas, paying attention to the cultural dimensions and smart governance can increase the depth of geopolitical influence. The managers and authorities of metropolises can systematize their future actions according to the nature of affecting and affected factors. In this study, we examined the network of relations between the key factors of the two concepts of smart urban governance and cultural geopolitics by extracting the necessary data through the DEMATEL technique. Finally, the affecting and affected factors and the degree of interaction between them were identified and ranked. Assigning the first rank of each of the affecting and affected factors to the indices of smart urban governance and the geopolitical factor, and geography and spatial belonging as having the highest level of interactions emphasizes the spatial-dialectic role of such concepts. In the second and third ranks, the prominent role of culture and literature along with religion, confirms the fundamental influence of these two factors in the processes of smart urban governance. By proving the interactional role of the above two concepts, smart urban governance should boost its cultural impact in the society in order to maintain and enhance its transregional rivalry and benefit from cultural geopolitics, and increase its effectiveness in the desired regional areas. This goal impresses a wider geographical area by focusing on one or more cultural components. Using such tools and its spatial-locational capabilities through purposeful planning, a smart urban governance paves the way for the establishment of creative cultural cities and the achievement of cultural centrality as countries try to provide a proper image of their community, cities and country, to gain prestige and promote their global image and implement their geopolitical goals. They can use soft power to present their national culture and to achieve political, economic and social goals by attracting the audience. Society (ethnic and national identity) is the link between smart urban governance and cultural geopolitics as a common arena. Therefore, no planning and activity in this area is possible without social participation.

6.Acknowledge

References

1. Agnew, J (2002). Making of Political Geography, New York: Oxford University press.
2. Ahmadi Nohdani, S; Ghaderi Hajat, M; Yousefi, H (2021). Explaining the Geopolitical Challenges of Iran-France Relations. Geopolitics Quarterly, 17(63), 1-31. **[In Persian]**
3. Albino, v; Beradi, U; Danjelico, R.M (2015). Smart cities, definitions dimensions, performance and initiatives, journal of urban technology.
4. Allen, C (2009). On the Geopolitics of IdentityCulture in Context: Pragmatics, Industries, Technologies, Geopolitics, Institute of Ethnology, Academia Sinica, Sept. 16-17, 2006Article in Anthropological Theory · November 2009 DOI: 10.1177/1463499609348245.
5. Amiri, M; Rahmanian, M; Ghaffri, A (2013). Assessment of Effective Cultural Factorson Sustainable Management of Tehran. Journal of Public Administration, 5(4), 19-38. doi: 10.22059/jipa.2013.50386. **[In Persian]**
6. Arab Hossein; Arab Fereshte; Mokhtari, B (2013). Geo-Cultural and its impact on national security under study of Greater Khorasan. 5th urban planning and management conference Mashhad- Iran. **[In Persian]**
7. Azkuna, I (2012). Smart Cities Study: International study on the situation of ICT, innovation and knowledge in cities. The Committee of Digital and Knowledge-based Cities of UCLG Chaired by in ˜aki Azkuna, Mayor of the City ofBilbao Bilbao
8. Bonet, L; Schargorodsky, H (2019). The challenges of cultural relations between the European Union and Latin America and the Caribbean, Quaderns Gescènic. Col·lecció Quaderns de Cultura n. 5,1st Edition: August 2019.
9. Faraji, S; Amini, S; Jafari Nozar, M; Arash, M (2020). The Future of Internationalization of Iranian Metropolises Based on the Competitiveness of Local Governments in the Islamic Republic of Iran. Strategy, 29(2), 139-165.
10. Faraji, S., Khabazi Chaloshtri, M., Ahmadi, S. (2020). The role of citizen participation in promoting social security and development (Case study: Herat city, Afghanistan). Journal of Urban Social Geography, 7(1), 97-124. doi: 10.22103/JUSG.2020.2007.
11. Farajirad, A; Ghorbaninejhad, R; Mehraban, A (2017). Impact of Globalization on Convergence Enhancement in Cultural Territory of Nowruz. Geopolitics Quarterly, 13(46), 93-12. **[In Persian]**
12. Flint, C (2006). Introduction to Geopolitics, London, Rutledge, P 33.
13. Gelis-Filho. A (2022). GEOCULTURE: MISSING IN ACTION. Handbook of Revolutions in the 21st Century.
14. Ghaderi Hajat, M; Golkarami, A (2020). Investigating and Analyzing the Geopolitical Attitude of the High-Level Documents of Spatial Planning in Iran.

Geopolitics Quarterly, 16(58), 58-87. **[In Persian]**

15. Ghaderi Hajat, M; Nosrati, H (2012). Geopolitical Goals of Regional and Trans-Regional Powers in Central Asia. Geopolitics Quarterly, 8(26), 63-95. **[In Persian]**

16. Ghezelsoflie, M.T (2003). Art and politics. Bulletin of Human and Social Sciences (10)3. **[In Persian]**

17. Giffinger, R; Fertner, C; Kramar, H; Kalasek, R; Pichler Milanovic, N; Meijers, E (2007). Smart cities: Ranking of European medium-sized cities. Vienna: Centre of Regional Science - Vienna UT.

18. Hafeznia, M.R (2006). Principles and Concepts of Geopolitics, Mashhad: Papoli Publications. **[In Persian]**

19. Hafeznia, M.R (2001). Geopolitics: A new definition. Geographical Researcher 15(4). **[In Persian]**

20. Hafeznia, M.R; Masrour, S; Amirhossein, H.F (2019). Inter - regional extremists ' involvement in Iranian - Azerbaijani cultural geopolitics. Quarterly bulletin the new studying in human geography. (11)2. **[In Persian]**

21. Haidari, G.H. (2004). Geo culture or Geopolitics. 01st Congress of Iranian Association of Geopolitics. **[In Persian]**

22. Huaxiong, J (2021). Smart urban governance in the 'smart' era: Why is it urgently needed? CitiesVolume111, April2021, 103004, https://doi.org/ 10. 1016/j.cities.2020.103004.

23. Hosseini, S; Laali Niyat, I; Heidarinia, S (2019). Analysis of the Pattern of Urban Smart Management, a New Way to Improve Urban Governance. Geographical Urban Planning Research (GUPR), 7(4), 743-762. doi: 10.22059/jurbangeo.2019.276474.1064. **[In Persian]**

24. Janparvar, M; Ghorbani Sepeher, A. (2018). Explaining and knowing urban geopolitical factors. Geography (Regional Planning), 8(4), 289-310. **[In Persian]**

25. Jiang, H; Geertman, S; Witte, P (2019). Smart urban governance: An urgent symbiosis? Information Polity, vol. 24, no. 3, pp. 245-269, 2019 DOI: 10.3233/IP-190130.

26. Jessop, B; Ling, S (2017). Geopolitics: Putting geopolitics in its place in cultural political economy, Environment and Planning A, DOI: 10.1177/0308518X17731106.

27. Kadri, H (2020). Geopolitics of Religion: How Does Religion Influence International Relations and States' Foreign Policies? International Journal of World Policy and Development Studies ISSN(e): 415-2331, ISSN(p): 2415-5241 Vol. 6, Issue. 3, pp: 28-37, 2020 DOI: https://doi.org/10.32861/ ijwpds.63.28-37.

28. Leigh, J (2021). Geoculture and unevenness: Occidentalism in the history of uneven and combined development, Cambridge Review of International

Affairs, Volume 34, 2021 - Issue 2 https://doi.org/10.1080/09557571. 2020. 1820953.

29. Matsuzato, K (2010). Cultural geopolitics and the new border region of Eurasia, journal of Eurasia studies, jun 2010.

30. Mohammadi, H.R; Ahmadi, E; Salamehnezad, N (2019). Redefinition of geopolitics of shia (by emphasizing on demonstration of Arba'een). Geography,52 (15). **[In Persian]**

31. Nayef, AL. R (2014). THE GEOPOLITICS OF CULTURE: FIVE SUBSTRATES, the blog of Department of Politics and International Relations, University of Oxford.

32. Osterhammel, J (2014). The transformation of the world: a global history of the nineteenth century (Princeton. NJ: Princeton University Press).

33. Ormerod, N; Wood Emma, H (2021). Regional Event Tourism Funding Policies: A Strategic-Relational Critique of Current Practice Journal of Travel Research 2021, Vol. 60(4) 860– 877

34. Owens Mackubin, T (1999). In Defense of Classical Geopolitics, Naval War College Review, AUTUMN 1999, Vol. 52, No. 4 (AUTUMN 1999), pp. 59-76

35. Pourahmad, A; Ehasanifard, A (2019). Smart governance as a pattern of sustainable development. 6th National Conference on Applied Research in Civil Engineering, Architecture and Urban Management. **[In Persian]**

36. Rajagopalan, K (2008). The Role of Geopolitics in Language Planning and Language Politics in Brazil Language Planning Volume 9, 2008 - Issue 2.

37. Stodolsky, I (2007). Cultural geopolitics in the new Russian intelligetsia: a case study of Timur Novikov, artist and cultural ideologue, 1958-2002. I E. B. M. H. A. S. B. (Red.), Contemporary art and nationalism (s. 126-153). Institute for contemporary art Center for Humanistic Studies Gani Bob.

38. Valigholizadeh, A (2020). Explaining the Role of Cultural Geography in the Formation of Geopolitical Identity: A Case Study of Iranian Azerbaijan. Geopolitics Quarterly, 16(57), 75-109. **[In Persian]**

39. Vazin, N; Sheikhi, A (2021). Cultural Impacts of Tourism Development in Iran from the Perspective of Experts. Tourism of Culture, 1(3), 21-28. doi: 10.22034/toc.2020.241748.1012. **[In Persian]**

40. Winter, T (2021). Geocultural Diplomacy International Journal of Cultural Policy. https://doi.org/10.1080/10286632.2021.1967943.

41. Yousefi, S; Karimi Pashaki, S (2010). Geopolitics a factor for convergencing Islamic world countries. 4th international congress of the Islamic world congress 14-16 April. Zahedan. Iran.