

THE ART OF HUMAN PARTICIPATION AGAINST ARTIFICIAL INTELLIGENCE WITH GEOSPATIAL INFORMATION SYSTEM IN THE TOURISM INDUSTRY

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Abstract: The development of the tourism industry is very important for developing countries that are facing problems such as high unemployment rates, a distorted international image, limited foreign exchange resources, and a single-product economy, especially oil. Investing in this industry, which is considered a human art, is measured based on the public health of each country and will be the basis for tourists' decisions as a tourist destination. The purpose of this research is to investigate public decision-making in different temporal and spatial conditions based on psychological events. This fact is a must for the tourism industry of a society that must be managed. Then we challenge the artificial intelligence to realize that, entrusting rational decisions can replace human thinking. The methods of this study are based on NPGIS software, where decision-making methods and statistical sampling are determined together. Therefore, the study methods and a case example are presented just to know. Because it has transnational applications. The results show that: entrusting spatial decisions (space-time-place) to artificial intelligence is only possible if we consider the consequences. Finally, time and the criteria related to it show their key role. The fusion of space sciences with the tourism industry can be related to all the industrial and money-making sectors of a country. It seems easy to make an AI that works correctly once a day, but if it tries to do the same thing several times in a day, it becomes more prone to errors.

Key words: the art, tourist destination, geospatial technology, artificial intelligence, NPGIS

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INTRODUCTION

The history of tourism in Europe goes back to the pilgrimages of the Middle Ages. Pilgrims of the Canterbury Cathedral in England considered their trip a religious trip and considered it an experience on their day off. Pilgrims started activities that can still be seen today. Participation is a very practical subject whose importance is determined based on time. In fact, time is an effective factor in participation. The topic of time is one of the topics that have been discussed with different points of view. In my opinion, everyone looks at time as they think. What is the same for everyone may be too much for someone and too little for someone. Therefore, there is no time to judge because time itself is the judge. But this is also a kind of looking at time because there is no time when decisions are being made. In general, these are the people who judge, look, manage and make decisions in a way. This is when the issue of partnership comes up. Participation is a fascinating topic that accepts all perspectives. On the other hand, he may not accept or reject a point of view. But participation in which a point of view or thought can make it meaningful or impressionable doubles the attractiveness of participation.

Tourism is one of the most important industries because it can create jobs and economic development. Community-based and integrated sustainable ecotourism development can be implemented through improved management and human resources (Arinta et al., 2023). Decision-making with public participation are important as important components in all processes. Also, this component in the conditions of synchronizing with the occurrence of events and being aware of projects from the beginning to the end is the basis for compiling and writing this article, is placed. Today, in the comprehensive planning and development of cities, important and complex decisions are mandatory for every community and local government or municipality. In this regard, it should be said that making optimal decisions by integrating and combining a set of emerging phenomena such as geographic information system or GIS, which itself is a result of participation, has played a significant role in the flourishing of knowledge and information (Johnson et al., 2022; Valánszki et al., 2022). Living in a world without a desk might be tough, but managing a world without time seems remarkably disastrous. The idea that time does not exist is inconceivable to many: time must exist. Almost every experience we have tells us this (Baron et al., 2022).

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In recent decades, "urbanization", "sustainable development" and "information and communication technology revolution", as the most important global trends, have played the greatest role in the life of human societies. It can be said that the movement of cities towards sustainable development, as well as the increasing role of information and communication technology in decision-making and decisions related to urban management, has transformed the city administration system. If this discourse emphasized environmental, social and economic sustainability in the 1980s, in the 1990s, it emphasized the concept of a smart city, but today it has focused on "sustainable smart cities" (Silva, 2013).

In fact, open source urban governance is a new way to attract citizen participation. A participation that is referred to as electronic participation, remote democracy, information technology democracy, electronic consultation, web-based citizenship, online public administration, etc (Silva, 2013). The main part of urban activities is focused on collaborative development for planning, designing and implementing urban services based on electronic infrastructure, E-services involve change in services as well socio-technological change and relate to change in forms of participation (Wessels, 2010). Studies related to participation in place show that GIS plays an important role in this, which can be different at any time.

Regarding the collaborative geographic information system, it should be said that some authors use the abbreviation PPGIS in their studies and others use PGIS, but some researchers use these two terms together and instead of each other in different parts of a study, while there are some who differentiate between these two in nature. In confirmation of this issue, a study was conducted under the title of political rethinking, political rethinking after GIS or PGIS, which completely changes the nature of the discussion. Therefore, whether PGIS is correct or PPGIS just wastes its time and deals with a completely marginal matter, and we move away from the goal and make a system with this historical identity that was created to support the marginalized strata ineffective (Radil and Anderson, 2018; Dunn, 2007). Today, in the comprehensive planning and development of cities, important and complex decisions are mandatory for every community and local government or municipality. In this regard, it should be said that making optimal decisions by integrating and combining a set of emerging phenomena such as geographic information system or GIS, which itself is a result of participation, has played a significant role in the flourishing of knowledge and information (Johnson et al., 2022; Valánszki et al., 2022).

NPGIS was published for the first time by Mahdi Fallah in his scientific Doctoral Dissertation and then in a scientific journal (Fallah et al., 2022a). And then in another article It continued to develop (Fallah et al., 2022b). Having information in time and place is very important. Especially when this information is needed. Despite the incredible evolution of GIS in recent decades, it is important to consider how geographic information can be effective in the age of information technology.

Does the idea of a world in which facts mean nothing cause anxiety? Fear? Maybe even paranoia? Disinformation: The Nature of Facts and Lies in the Post-Truth Era cannot cure all the ills of a post-truth world, but by demonstrating how the emergence of digital technology into everyday life has knitted together a number of seemingly loosely related forces—historical, psychological, economic, and culture—to create the post-truth culture, Disinformation will help you better understand how we got to where we now are, see how we can move beyond a culture in which facts are too easily dismissed, and develop a few highly practical skills for separating truth from lies (Greene, 2022). The first step of the study in this direction is to identify the objective and the desired results from the collection of explicit spatial data, which is ideally done with the cooperation of stakeholders. Data collection is usually based on surveying web-based maps. Respondents fill out a survey individually with the help of a facilitator or a decision maker (Fagerholm et al., 2022).

Public participation in the development of a large-scale or small-scale municipal plan has certain objectives, such as mechanizing the planning process, helping to transfer or disseminate ideas, and supporting the decision-making process. According to traditional methods, public participation in urban planning and management includes neighbor announcements, interviews, exhibitions, public meetings and focus group discussions, and public questions via telephone, e-mail, teleconference or public meetings (Lewenstein, 2022). Based on the opinion of the researchers, the success that is the result of planning, designing and deploying the spatial information system based on national participation is effective in increasing the level of public effectiveness. Provided that it is in sync with the support of such decision-making in the course of urban planning and management. This type of guidance mainly depends on the

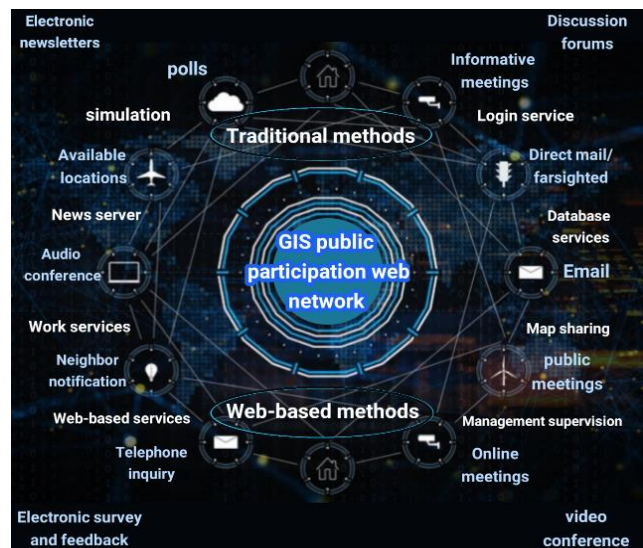


Figure 1. Combination of traditional and new web-based participation (Source: Research and findings of researchers, 2019-2022)



Figure 2. It shows the main concept of modern geographic communication (Source: Research and findings of researchers, 2019-2022)

understanding of society, combination of traditional and new web-based participation is shown in Figure 1. In fact, this new type of information is made available from the location information technology along with the geographic information system for easy use by people. Now, these people include the public, developers, decision-making authorities and researchers in group decision-making processes, which, of course, brings with it special and noteworthy help.

Research questions and hypotheses

It should be said that according to the mentioned cases, not having a specific plan as well as environmental conditions are influential factors in participatory decision-making. Here some questions arise in the mind that need to be expressed.

1. Does geographical science interact with the tourism industry? 2. Is the continuation of the tourism industry possible with the emergence of artificial intelligence? 3- What is the determining criterion in collaborative decision-making? Based on these important questions, hypotheses are proposed by the researcher: 1. There is a relationship between geographical sciences and the tourism industry of a region. 2. It seems that artificial intelligence can replace the tourism industry in the coming decades and 3. There is a significant relationship between time factors and collaborative decision-making.

LITERATURE REVIEW

Research questions and hypotheses When it comes to participation, Arnstein (Arnstein, 1969) elementary ladder and her previous topics are not forgotten. Despite the incredible evolution of GIS in recent decades, the understanding of spatial information has not changed over time, with different GIS approaches applied and considering geographic features (such as neighborhoods, cities, and regions) would be considered foreign territory. Currently, however, limiting the term "place" to an external realm is meaningless, as 80% of people's daily lives are spent indoors (Teixeira et al., 2021). In the last decade, the use of collaborative geographic information system has been increasing in topics related to urban sciences. This system, which is based on other knowledge such as critical mapping, collaborative methods, Development-oriented and ideal cities are connected with optimal urban planning, civil governance, community development, resource management, environmental and natural hazards, reaching a smart city, etc. This approach, in addition to the need for a platform for civil and political interaction and participation, requires the ability of spatial information system specialists to guide its operation toward the main issues of local management, such as optimal service delivery, spatial justice, and politics (Indrajit et al., 2019; Prener, 2021). Accepting participation as a legitimate political approach and process, due to the belief in the role of people in the development process, has a great tendency to produce and use participation information, including participatory data and spatial information. This tendency provides the grounds for the use of extraordinary capacities that are the result of combining the capabilities of the geographic information system with innovations in the field of information and communication technology and new approaches based on electronic and online participation (Ghose, 2017; Anderson and Radil, 2019). Such efforts are also a growing part of policymaking in the GIS participation literature, which advocates the use of GIS to foster civic engagement and participation among population groups that have historically been marginalized in formal arenas of governance, refers to and considers political results to be more valid than social opinions (Anderson and Sternberg, 2013; Sternberg and Anderson, 2014). Therefore, this topic has become a suitable field for urban research in the field of participation and electronic governance. To solve any crisis, a series of solutions and detailed planning is needed. These solutions include: a set of operations that are carried out by government, private and public organizations in facing the crisis with the aim of reducing damage and waste, normalizing conditions and returning to the pre-crisis state.

Background Research

Evaluation of the collaborative mapping effort, as a proxy for spatial data quality, showed that the facilitated collaborative spatial information system process provides better map production results than individual surveys. The cooperative mapping effort in the sampling group is to facilitate the display of the largest dimensions. With the number of markers and the response time in the range of effort to produce a map that has been reported in other studies of this type of public contributions of participatory GIS (Brown, 2016). In a 2017 study in a developing country, participants were able to match place values and place preferences with current land uses, suggesting that a non-expert in Malaysia can interpret digital maps effectively. It is interesting to establish local knowledge about the place to bridge the knowledge gap with experts. The newness of PGIS as a participatory method can help stimulate public participation, but developing a stronger culture of participation in Malaysia for land use planning requires continuous effort over time (Zolkafli et al., 2017).

In 2019, Ushahidi projects the potential of dedicated maps for disaster response in a large city, and provides a comprehensive baseline model for municipalities as well as the international community to advance future emergencies and how, in times of crisis, Emergency, participatory geographic information system can easily help a major disaster and is discussed in many studies (Heinzelman and Carol, 2010; Morrow et al., 2014; Ushahidi H.P.E, 2011; Haiti Situation Report, 2019; Haiti Projects, 2019). For the above two examples, it should be mentioned that not taking into account the time of the incident, the weakness of crisis management, which has been emphasized many times by the responsible authorities, and the lack of complete and comprehensive familiarity with it, especially complete familiarity in the country's municipalities with the lack of a location database to obtain Optimum decisions cause things like damages, lack of a precise division of work between the members of the organization, lack of coordination between various devices for planning and making correct and quick decisions at the right time and on time, among these shortcomings in the country in the field of participation. Another important point is that, at the time of writing this treatise, in the summer of 2022, Haiti suffered a severe earthquake once again after about eleven years, which caused similar and even greater damages. The United States Geological Survey (USGS) announced on Saturday that an earthquake with a magnitude of 2.7 on the Richter scale

occurred off the coast of Port-au-Prince, the capital of Haiti. The director of the Haitian Civil Defense Agency said, unfortunately, the death toll of the recent terrible earthquake was about 1500 people. According to this official, the aid is mostly concentrated in the southwestern regions of the country, which have suffered heavy losses due to the earthquake. About 7,000 people have been injured in the Haiti earthquake and many others are missing as the search for survivors continues. Since the earthquake, many have been sleeping outside their homes for fear of aftershocks, and many have no roofs. For many Haitians, this earthquake was a reminder of the 2010 magnitude 7 earthquake that killed more than 300,000 people. The earthquake 11 years ago caused one million and 500 thousand Haitian residents to become homeless (Weword, 2022). The problems that have arisen are similar to the previous calamities for which preparations were not considered, such as the release of waste by rescue organizations, which alone has caused many problems. In such cases, the importance of time should be taken into account. The effect of time is actually management on personal performance as well as people's well-being, and in its social expression, it is related to job performance, academic progress, and general health. Also, time management shows a moderate and negative relationship with personal stress or distress, which is related to people's health and not related to people's gender (Aeon et al., 2021). This research can be jointly investigated and developed in medical sciences, engineering sciences, and urban sciences.

STUDY ZONE

Nowadays, modeling and visualization of 3D models and programming for cities is a big challenge in computer and graphics software. Recently, 3D urban modeling has grown due to the advancement in applications along with the storm of information technology revolution. These technologies have become very important in representing large cities and performing various analyzes in the virtual environment of cities and in order to support urban decision-making (Badwi et al., 2022). It should be stated that the area studied in this research was only for the purpose of investigating this method to respond to the new participation based on the creation of a software and its use. Therefore, it can be checked in any area. Sari is the former capital of Iran (before Tehran), which is located in Mazandaran province in the north of Iran.

This city is one of the oldest cities in Iran with a historical background and has a moderate climate. is located at the coordinates of 36°33'48" north latitude and 53°03'36" east longitude and whose is 347/402 people (Urban sari with 6 thousand years old and historical memory, 2018) (Statistical yearbook of Iran: Population of cities of Iran 2018).

Figure 3 it shows A) the map of Iran, B) Mazandaran province, C) Sari city and C) Sari (The investigated area).

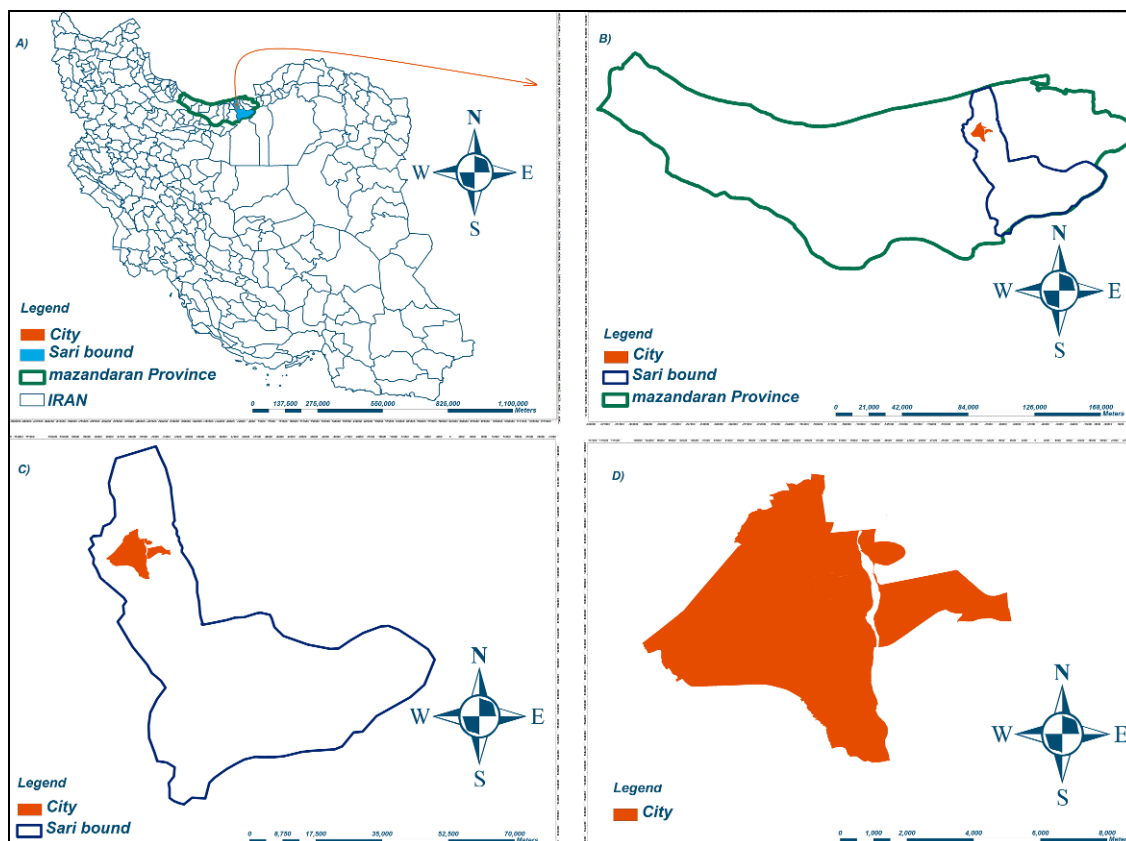


Figure 3. Location of Sari city in Iran (Source: Research and findings of researchers, 2019-2022)

METHODOLOGY

Data

Every day and night is divided into twenty-four hours, and the length of a day and night, for example, solar or astronomical, is not always twenty-four hours, and the length of the days of the year always increases or decreases by a few minutes. In the contract between the public, in order to prevent inconsistencies and anomalies, all days and nights are

assumed to be twenty-four hours. Time measurements have occupied many people of knowledge and technology. Events and alternating movements during different times have been used as standard units of time. For example, we can refer to the movement of the sun in the sky, the phases of the moon, and the heartbeat or pulse. Currently, the standard unit of measurement of time is the second, which is defined based on the measurement of the range of electron jumps in the cesium atom, which is element 55 of the periodic table. Time has a high social importance and due to the limitation of time in a day and night and human life, it has a special economic and personal value (Builes, 2022; Malpass, 2021; McAllister, 2020).

Artificial intelligence is a subject that is widely used humans. And interesting thing is That most people are satisfied with this issue. Because Doing any activity in a faster time makes people happy. The desire to use it has increased dramatically these days. Artificial intelligence and software development based on participation have also been used in this project. Also, computer software has been used to rank the criteria and statistical scores, and almost the complex calculations that were supposed to be done by humans have been done by computer software easily and in a short period of time.

Artificial Intelligence: Technologies, Applications, and Challenges is an invaluable resource for readers to explore the utilization of Artificial Intelligence, applications, challenges, and its underlying technologies in different applications areas. Using a series of present and future applications, such as indoor-outdoor securities, graphic signal processing, robotic surgery, image processing, character recognition, augmented reality, object detection and tracking, intelligent traffic monitoring, emergency department medical imaging, and many more (Sharma and Garg, 2021). These processes were carried out based on the choices and reactions of the human brain in decisions and considering artificial intelligence, As stated, artificial intelligence based on human neural networks was designed in such a way that it can estimate decision-making processes for any type of spatial participation activity And its subsets are like a neural network. Brain activities that can always be edited in this new spatial system in a way. which can be seen in Figure 4 And the steps used in this case are shown and the stages of studying with artificial intelligence in Figure 5. In Fact, Artificial Intelligence offers comprehensive coverage of the most essential topics, including: Rise of the machines and communications to IoT (3G, 5G). Tools and Technologies of Artificial Intelligence Real-time applications of artificial intelligence using machine learning and deep learning. Challenging Issues and Novel Solutions for realistic applications Mining and tracking of motion based object data image processing and analysis into the unified framework to understand both IoT and Artificial Intelligence-based applications (Sharma and Garg, 2021).

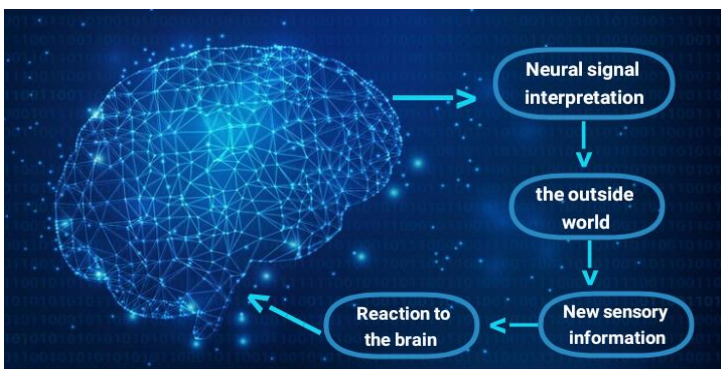
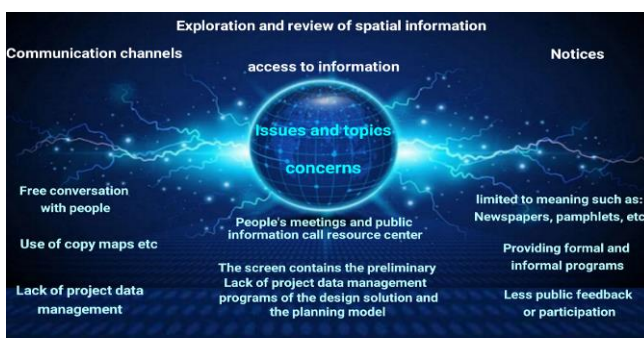


Figure 4. Human mind process based on artificial intelligence (Source: Research and findings of researchers, 2019-2022)



Figure 5. Steps to use neural network (Source: Research and findings of researchers, 2019-2022)



Establishing contact and confrontation under the supervision of a higher authority, solving the problem of lack of time in feedback and the amount of access

Figure 6. Combining the human mind with artificial intelligence in solving spatial concerns



Figure 7. Making a software model of artificial intelligence (Source: Research and findings of researchers, 2019-2022)

These processes, in which psychological factors are involved, are considered suitable based on observations, questions and answers, and past experiences along with locational factors in participation. This process includes the issues and concerns existing in the current methods of public participation in the planning process and the processes related to urban development based on the summary of the aforementioned studies along with solving the problem of lack of time by higher level officials, at the same time as emergence of the web occurs. This human mentality also shows the amount of feedback and the size of accesses. The lack of time here is considered a fundamental problem that the human mind

tries to overcome these limitations with issues such as time management, stress reduction, etc. also The accesses that are established with the human mind and by making contact. It can be seen in Figure 6. For example, in Europe and America North, according to the laws of many municipalities and local governments, it is necessary to have a certain amount of public participation in decision-making processes. According to a survey, public participation relies on information, a public solution and its effective feedback through public meetings, which is still one of the most specific forms of public participation (Goreis and Voracek, 2019; Larrain and McCall, 2018; Lewenstein, 2022).

In artificial intelligence, countless situations can arise when we are faced with a large number of variables to solve problems. Due to human limitations in memory and processing power, direct programming would be nearly impossible. In these cases, using artificial intelligence and machine learning, the computer learns concepts from past data and can analyze and predict the future. When we want to teach a concept like participation to a computer, it does not mean that people of different ages and genders or different points of view are supposed to talk to each other and express their opinions on different issues. And at the same time, let's look at the horizon with memories of the past. If that were the case, probably no human would seek dialogue and participation in various matters, and there would never be any cooperation, and humans would talk alone and to themselves until their generation became extinct. Therefore, there was no relationship or marriage. In fact, computers are much more ignorant than we think. So we can only talk to the computer in binary or zero and one language. The intelligence that a machine shows in different situations is called artificial intelligence. Python programming language was used in NPGIS, which is a high-level language and close to human language. There are different algorithms in the field of artificial intelligence for machine learning. Figure 7 shows the common steps between all machine learning methods. In solving the problem, according to Figure 7, we first give the common state data of the past days (the so-called training data) to the machine learning algorithm. After learning the participation patterns from the data and training, the machine learning algorithm delivers us a predictive model. Now it is enough to give the characteristics of today's participants to the trained model. In the third step, the model tells us what will happen tomorrow. It prints (1) if collaboration was to be done and (0) if no collaboration was to be done, which is visible. A) Machine Learning line, B) Training stage from training data (dataset) and C) Prediction stage is shown.

METHODS

Network-oriented decision-making process

The ANP method is one of the multi-criteria decision-making methods in which criteria or sub-criteria or options (individuals and variables) are dependent. It should be said that the hierarchical method or AHP can be a special case of the network technique. If there is a problem in the calculation relationships of criteria or sub-criteria, this type of problem cannot be done through the AHP method because the problem goes out of the hierarchical mode and creates a network mode. So this problem must be solved through the ANP method. The process of network analysis is a comprehensive and powerful method for making accurate decisions using empirical information or personal judgments available to each decision maker and by providing a structure for organizing different criteria and evaluating the importance and preference of each of them over alternatives. That makes the decision making process easier. This method can be implemented in the software. Network analysis is implemented using Super Decisions software and is applied to various decisions including marketing, medical, political and urban, military, social and forecasting among many others, which is available in NPGIS software. This method is one of the compensatory methods (compensatory methods are techniques in which the weakness of an option in a specific criterion is compensated by the strength of another criterion. For example, suppose you intend to buy a house. The price of the house may be high, but the location of the house must be good, so the location index somehow compensates for the cost index, and the indices are independent or dependent on each other, which are two important features of this desirable model (Bayazit, 2006; Saaty, 2004).

To implement and implement the ANP method, the following steps must be implemented in order to properly form the implementation along with questionnaires and other software in line with the integration with the GIS software:

1) Creating a research network diagram: At this stage, the problem should be divided into criteria levels and sub-criteria and options, if any, and the relationships between them should be determined. A very important point at this stage is the existence of relationships between standards. These relationships can be specified in several ways. You can find out the relationships between standards by asking experts. Suppose a system consists of N clusters or N components, and the elements in each cluster influence or are influenced by all or some of the other elements in the cluster. Of course, this effectiveness should be checked according to the special feature that controls the interactions of the entire system (control criteria). Three types of clusters are shown in the figure below: source, destination and intermediary cluster. C1 represents the source cluster, C5 represents the destination cluster, and C2, C3, C4 are intermediate clusters. C2, C4 have loops that connect them to themselves. These rings represent internal dependencies and other connections (edges) represent external dependencies.

2) Forming the matrix of pairwise comparisons: In this step, the elements of each level are compared with other related elements at a higher level in a pairwise manner and matrices of pairwise comparisons are formed. Also, at the end, a pairwise comparison of internal relationships should be done. Of course, first the matrices should be explained to the residents as examples. Imagine that the problem has N clusters named C1, C2, ... CN and there are N_i elements in the i th cluster. Now if two clusters i and j are selected and all elements of i are paired with respect to the first element of j . The coupling matrix shown below is obtained. This matrix is a pairwise comparison of all elements of branch i with respect to the first element of branch j . These formulas can be seen in Figure 8, Figure 9, and Figure 10. It is mentioned twice that the NPGIS software has completed these steps. This ranking was done by 30 experts in geographic sciences due to its expert-oriented nature.

3) Calculating the inconsistency rate: In this step, we calculate the ANP inconsistency rate. If this rate is less than 0.1, it indicates the consistency of the matrix.

4) Forming the initial super matrix: Using the weight of the obtained pairwise comparisons, we form the initial super matrix. The primary supermatrix is the same weights obtained in step 2 from pairwise comparisons, which can be seen in formula (Saaty, 2004; Bayazit, 2006).

5) Creation of balanced supermatrix: After creating the initial supermatrix, the balanced supermatrix should be created.

6) Creating the limit supermatrix: The balanced supermatrix should be raised to the infinite power so that each row of it converges to a number. That number is the weight of that criterion or subcriterion or option and it is visible in formula.

$$D = \begin{bmatrix} i_1 & a_{11} & a_{12} & \dots & a_{1n} \\ i_2 & a_{21} & a_{22} & \dots & a_{2n} \\ \vdots & \vdots & \vdots & \ddots & \vdots \\ i_{ni} & a_{ni,1} & a_{ni,2} & \dots & a_{ni,ni} \end{bmatrix} = \begin{bmatrix} w_{i1}^{j1} \\ w_{i2}^{j1} \\ \vdots \\ w_{ini}^{j1} \end{bmatrix}$$

Figure 8. Prediction stage (Source: Research and findings of researchers 2019-2022; Bayazit, 2006; Saaty, 2004)

$$w_{ij} = \begin{bmatrix} w_{i1}^{j1} & w_{i1}^{j2} & \dots & w_{i1}^{jn} \\ w_{i2}^{j1} & w_{i2}^{j2} & \dots & w_{i2}^{jn} \\ \vdots & \vdots & \ddots & \vdots \\ w_{in}^{j1} & w_{in}^{j2} & \dots & w_{in}^{jn} \end{bmatrix}$$

Figure 9. Prediction stage (Source: Research and findings of researchers 2019-2022; Bayazit, 2006; Saaty, 2004)

$$D = \begin{bmatrix} C_1 & \dots & C_n & A_1 & \dots & A_n \\ \vdots & & \vdots & \vdots & & \vdots \\ C_1 & \dots & C_n & A_1 & \dots & A_n \\ \vdots & & \vdots & \vdots & & \vdots \\ C_n & \dots & C_n & A_1 & \dots & A_n \\ \vdots & & \vdots & \vdots & & \vdots \\ A_1 & w_{n+1,1} & w_{n+1,2} & 0 & \dots & 0 \\ \vdots & \vdots & \vdots & \vdots & \ddots & \vdots \\ A_n & w_{n+m,1} & w_{n+m,2} & 0 & \dots & 0 \end{bmatrix}$$

Figure 10. Prediction stage (Source: Research and findings of researchers 2019-2022; Bayazit, 2006; Saaty, 2004)

$$\begin{aligned} (1) \chi_r^2 &= \frac{SS_{br}}{\frac{\mathcal{K}(\mathcal{K}+1)}{12}} \\ (2) \chi_r^2 &= \frac{12}{N\mathcal{K}(\mathcal{K}+1)} \left[\sum (\mathcal{T}_g)^2 - 2N(\mathcal{K}+1) \right] \\ (3) SS_{br} &= \frac{\sum (\mathcal{T}_g)^2}{N} - \frac{(\mathcal{T}_{all})^2}{N_a} \end{aligned}$$

Figure 11. Statistical formulas (Cochran, 1977). for estimating the sample size (Source: Research and findings of researchers 2019-2022)

Statistical Analysis

Statistical analysis was performed on user performance data collected from pre-post web activity questionnaires and analytics software. Finally, all the data were sent to the Statistical Package for Social Sciences (SPSS) for statistical analysis, and the results were discussed. These steps are also available in NPGIS software. Following are the activities of statistical authorities that have been used in research and have tried in this way (Tabatabai et al., 2022; Choi et al., 2021). After the explanations and in the general question phase, matching with the statistical population of Sari city and the minimum sample size of 74/383, in other words 384 people, was done, which is shown below. In fact, since Milton Friedman first tested it in 1937, the experiment is named after him. This test does not need to know the distribution of variable values (Friedman, 1987; Friedman et al., 2010; Friedman, 1959). Calculation of Friedman's statistic, denoted by χ_r^2 . In the first formula, SS_{br} is the sum of squares of ranks between distributions and k is the number of categories or distributions about which the ranking is done. In the second formula, N is the number of subjects, k is the number of categories or distributions about which the ranking is done, and T_g is the sum of the ranks of the g -th group. In the third formula, N_a is the total number of ranks of all groups and T_{all} is the total number of ranks assigned to the subjects. The statistical value of this test is compared with the critical value obtained from the chi-square distribution table with $k-1$ degrees of freedom and at the desired confidence level, which is usually 95%. If χ_r^2 is greater than the critical value of the table, the null hypothesis is not confirmed and if the value is Sig. If the result is greater than 0.05, it does not create a significant difference between the groups (Krejcie and Morgan, 1970; Cochran, 1977). These levels are shown in Figure 11.

RESULTS AND DISCUSSION

Weighting based on the opinions of experts and stakeholders with the network analysis process

The final weight of the sub-criteria is obtained from the coefficient of the weight of each criterion in the weight of its sub-criteria. According to the results, the government cooperative GIS has won the first place with a weight of 0/342. Access technologies and tools with a weight of 0/188 have won the second place and transparency with a weight of 0/168 has won the third place, which shows the importance of the economic criterion in any process and its alignment with social factors can greatly optimize the expected results. Also The summary of the network analysis process and the activities that

have been done for it can be seen in Figure 12. However, if these matters are placed in the hands of the powerful and beneficiaries or politicians and at a higher level than the public, it will multiply the intensity of achieving the goals in this process as shown in Table 1. The criteria were selected in three social, socio-economic, and socio-economic groups. The selections were made in such a way that it is consistent with the statistical ranking of the public, Also Weightings were done with Super decision 9.24 software. The method is available in NPGIS software. Also Its diagram is also in Figure 13.

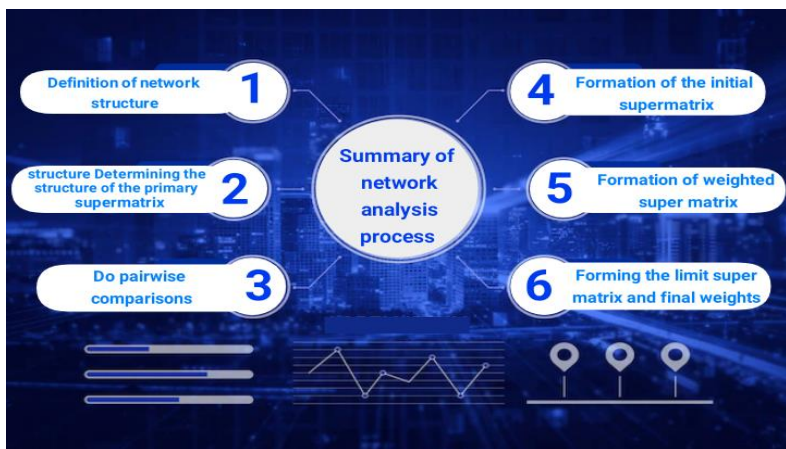


Figure 12. Network analysis process and its activities (Source: Research and findings of researchers, 2019-2022)



Figure 13. Diagram of network analysis process in this study (Source: Research and findings of researchers, 2019-2022)

Table 1. Final weight and ranking of sub-criteria (Source: Research and findings of researchers 2019-2022)

Criterion	Criterion weight	sub-criterion	Relative weight of the sub-criterion	Final Subcriterion weight	The final rank of the sub-criterion
Social	0/309	Strategic insight	0/117	0/0361	8
		transparency	0/543	0/1679	3
		Lawfulness	0/255	0/0788	4
		Responsiveness	0/085	0/0262	9
Socio-Economic	0/109	Transportation	0/097	0/0107	10
		Urban infrastructures	0/333	0/0365	7
		Participation and location	0/570	0/0623	5
Economic - Social	0/582	Effectiveness and efficiency	0/089	0/0517	6
		accessibility tools&Technologies	0/323	0/1881	2
		GIS government partnership	0/588	0/3417	1

Statistical ranking of selected criteria with the priority of the general public

Analytical, superficial and statistical methods as well as software usability can be seen for this study in Figure 14. In addition, it shows the sequence of steps taken during the usability evaluation for an NPGIS prototype, which is used to measure the success or failure of the prototype based on the selected evaluation criteria. In this section, the ranking results of criteria based on Friedman's test are shown. The selection of criteria is based on previous experiences and studies as well as individual creativity of the researcher. Citizenship rights, Complications, Residue, Transportation, Timely activity, the traffic, participation, Cell phone, Time. The results of this test showed that the proposed factors have a significant difference at the 99% confidence level. The comparison of the average ratings showed that the time with an average of 5/97 is in the first place and the activity on time is in the second place with an average of 5/90 and the mobile option which is the same as the mobile smartphone and the result of the first and second options with a score of 5/97 is in the third place and Other factors were ranked next. The rating was done by computer software. Its results can be seen in Table 2. Also Weighting was done with SPSS 22.0 statistical software. These steps are available in NPGIS. And its diagram can be seen in Figure 15.

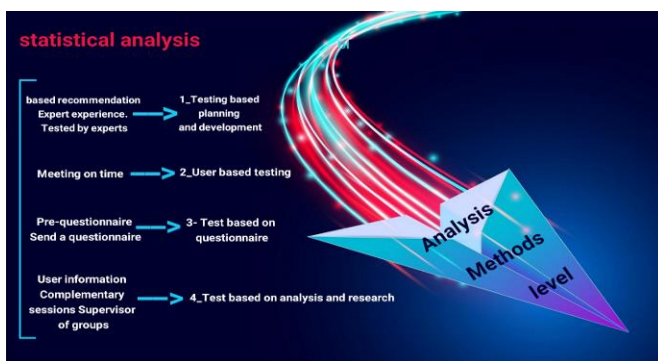


Figure 14. Steps of analysis, review and statistical evaluation (Source: Research and findings of researchers, 2019-2022)



Figure 15. Statistical diagram of the study (Source: Research and findings of researchers, 2019-2022)

Programming and creating open source software

It was explained in the previous sections, the priority of creating software with the help of artificial intelligence, in addition to statistical questionnaires, as well as ranking with network and hierarchical analysis simultaneously, are considered other innovations of this study. Artificial intelligence and the use of neural network machines and the importance of time play a significant role in this part. Python has been used for programming, an example of which can be seen in Figure 16. This image is one of the stages of making NPGIS software, which was selected for display based on discretion. The main importance of the information related to the user's knowledge and work experience with webGIS programs, collaborative planning, education and general web surfing. This information makes it possible to interpret the corresponding responses and reactions from different participants and also helps to determine the limits on the complexity of the prototype program (Brunsdon and Comber, 2021) (Arribas et al., 2021). The last decade has seen increased computational intelligence to solve problems that lack a definite solution or are difficult to solve. The human biological neural network inspires artificial neural networks (ANNs), and research on neural networks has been accompanied by an understanding and study of the human brain's structure and learning function. There is no requirement for a set of special rules to solve the problem in this computational. The issue of time is one of the main criteria of NPGIS, was discussed for the first time by Mehdi Fallah, the researcher of this article, in his doctoral Dissertation. According to the researcher's opinion, which he has already stated in his articles, time is something that does not exist in reality and is created only on the basis of contracts between humans. According to the discretion of the creator of this environment, which includes open source software, it is possible to access it for the public and for all ages. Of course, this action is done according to the terms and conditions of each region or each place, which will indicate its flexible activity (Fallah et al., 2022a; Fallah et al., 2022b).

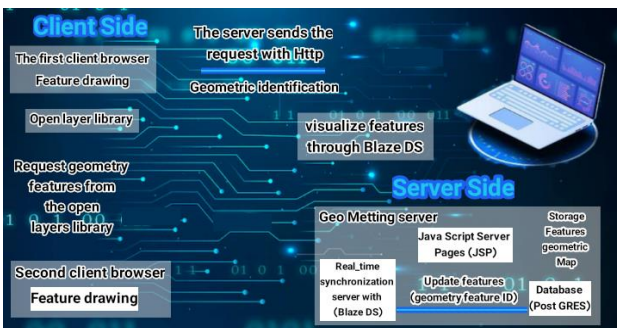


Figure 16. Steps of analysis, review and statistical evaluation (Source: Research and findings of researchers, 2019-2022)

Table 2. Results of Friedman's rank test for criteria (Source: Research and findings of researchers, 2019-2022)

	Dimensions	Average Rank	Rank	K square	df	Sig
Transportation	C ₁	4/72	10	47/765	9	0/000
Timely activity	C ₂	5/90	2			
Citizenship rights	C ₃	5/20	8			
Complications	C ₄	5/80	4			
Residue	C ₅	5/55	5			
the traffic	C ₆	5/00	9			
participation	C ₇	5/55	5			
Cell phone	C ₈	5/86	3			
Time	C ₉	5/97	1			
Privacy	C ₁₀	5/46	7			

Progress in awareness of participation in the order of the stages to this study

By reviewing similar fields in the communication resulting from collective participation, it was determined that the relationship between a common set of geographic information system prototypes and the level of public participation, which shows the exchange of information at different levels of participation, that is, the power of citizens and their non-participation and cases. Such has been the case between the common people and the decision makers. In our relationship between the level of participation and the proposed information system, it was also found that this type of approach had the ability to expand after implementation and it was needed more than ever, which was ignored for any reason. Each level of public participation is directly related to one or more components of NPGIS, namely notification, GIS-based discussion forum, real-time map sharing, and virtual meeting environment. Finally, Figure 17 shows the role of participation proposals and increasing the level of participation at the local, national and transnational levels. This form has been proposed considering the spatial and temporal conditions of real-time.



Figure 17. Increase the level of participation (Source: Research and findings of researchers, 2019-2022)

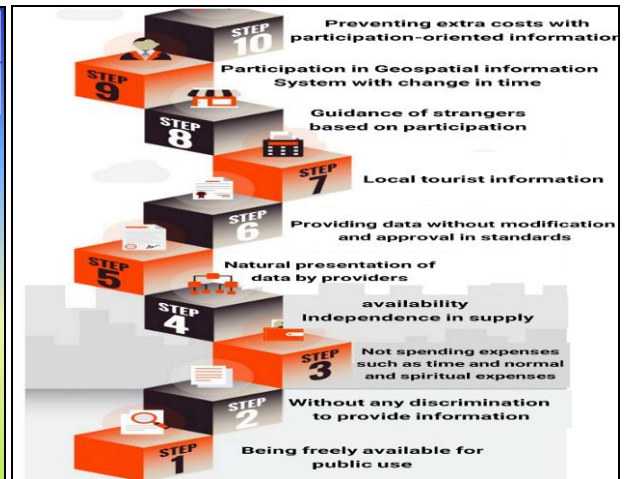


Figure 18. Participation-oriented information at the national level for use in the tourism industry

Participation in tourism information

Tourism in the place .One of the important parts of spatial partnership is participation in tourism and the development of this industry. Consequently, cities with standard spaces and amenities can attract a large number of tourists. Because the space of cities should be attractive not only for its citizens but also for tourists and express the special identity and characteristics of that city. Recent years have been an exciting time for tourists interested in urban tourism. As a complementary process, branding the potentials of urban tourism endows the city with a distinct identity and contributes significantly to the competitiveness approach in cities, which is now referred to as the primary link in the economic structure. While the global coronavirus outbreak significantly reduced domestic and international tourism and posed a severe threat to the industry. tourists’ sense of security and easy access to medical facilities. Therefore, the closer a location is to medical and health care facilities, When the potential of tourism in a region is greater, the risk of disease transmission is also increased. For example: the Covid-19 virus has been the most influential crisis that has affected countries, organizations and various economic sectors since the Second World War. Therefore, knowing which place has what risks is also a part of participation in the notification of the occurrence of risk, which is another important advantage of participation-oriented spatial information. (Uğur and Akbıyık, 2020; Bustomi and Avianto, 2021; Novy, 2019; Kamarudin et al., 2022; Shirshamsi et al., 2021).

The connection between spatial participation and the important topic of tourism

Tourism is one of the activities of attracting capital in countries, and it is necessary to have real-time information about it. To create infrastructure and develop tourism in many countries, traditional and old methods such as television and radio, books and even newspapers or catalogs are used, which are almost obsolete in modern societies today. Also, in terms of the depth of application and development of information technology in tourism management, it is far behind the general level of tourism. At the time of explosion of real-time information and modern technologies, which has turned the center of attention, as well as the emergence of the new generation of the Internet and new software, which the present study is also included in this category, They are very popular and known to the public.

Even now, the use of these tools and methods are very conventional and low-cost, unlike traditional methods, because they do not require extensive production such as printing and distribution of the latest updates and information. As a result, they will be able to answer many essential and specific tourism questions, such as which historical sites exist in a particular country and where they are located. Incorrect decisions can increase participants' confidence in negative results of any type of test. This trust is not enough to influence people and it may also affect people's health and belief (Uğur and Akbıyık, 2020; Novy, 2019; Mariakakis et al., 2022).

Urban tourism has developed into one of the most efficient and effective economic and recreational activities in the modern era since the late second half of the twentieth century. Although attention to urban tourism development is increasing, this paper indicates that no comprehensive study has yet combined the two subjects of tourism development and branding for spatial modeling (Moghaddam et al., 2022). Most respondents are interested in web development. However, some, not many, do not agree with this process. Some of the respondents disagreed and were interested in web development. Therefore, many respondents agreed the website was easier to access and friendly use for tourism (Chen et al., 2022). Tourism is one of the economic sectors that have the greatest impact on the economic and social context of nations, as its multiplier effect contributes to the growth of other sectors. It includes transportation, accommodation, food and beverage, entertainment, leisure, historical and cultural experiences, tourist attractions, shopping, and other amenities available to travelers in foreign countries (Kamarudin et al., 2022; Clark et al., 2022). Nowadays, new technologies play a significant role in the tourism industry. Digital technologies have created new bridges for communication between tourists and marketers. Tourists' perception affects the intention to use digital marketing tools and platforms. Also, information quality, system quality, service quality, and user satisfaction are significantly related to the intention to use digital marketing tools and platforms (Chamboko-Mpotaringa & Tichaawa, 2023).

The tourist industry is important for every society and one of the main points in the current research topic is national participant, which shows the importance of research even in this field. National participant in the tourism industry and the information that is made available have both public and private aspects in the countries Information such as the location of recreational places, holy places, historical places is such information that is obtained through the participation of foreign and domestic tourists of a country. In some cases there are places where only local residents can act as a proper guide to help tourists. In general, collaborative location information is important in most activities.

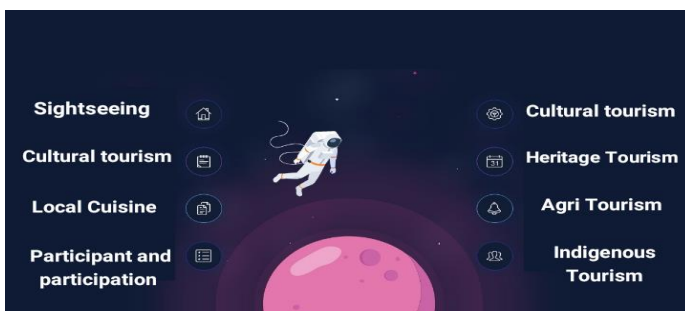


Figure 19. Different types of functional tourism (Source: Research and findings of researchers, 2019-2022)



Figure 20. The false cycle of public accountability (Source: Research and findings of researchers, 2019-2022)

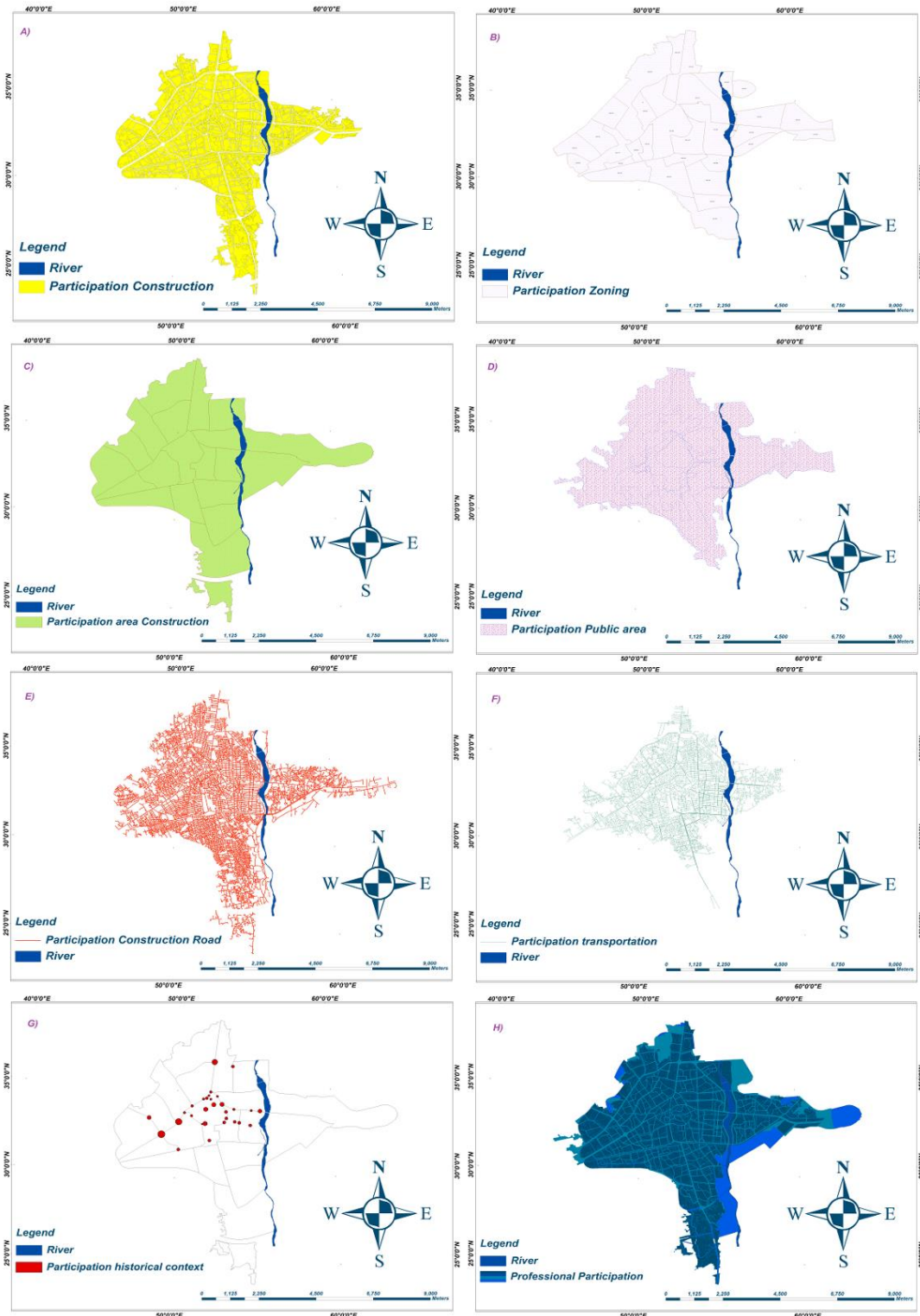


Figure 21. National participation (Source: Research and findings of researchers, 2019-2022)

Figure 18 shows Participation-oriented information at the national level for use in the tourism industry. There are different types of tourism, each of which can be used separately. But blessed is the place or area that has all these things, which can be seen in Figure 19. Using a systematic location system helps this activity and introduced in this study.

The importance of responding in real-time or synchronous

In a clear way, it should be mentioned that if we want to consider criteria for Participation of decision-making for urban planning in this study, we will face countless criteria. Accordingly, the time factor turned the center of attention to itself. It should be kept in mind that you cannot fight with technology and progress. Also, all criteria and topics have a common feature called time. However, the very big problem that experts are facing in 2022 is that everyone knows everything by using tools like Google and YouTube, and in the end, they do not become experts in any subject because they are only observers of generalities. Programs should be designed in such a way that they have the ability to talk in real time so that

users can use topics aligned with real objects for geographic reference. Real-time conversation integration provides a powerful and flexible way to manage spatially referenced topics, Figure 20 is an example of the wrong cycle of establishing public contact with the municipal body, which leads to neglect. The reason for this topic is the response of the operator or the officials along with the delay and in some cases ignoring the issue. Reasons include traffic, being far from the location of the report, lack of facilities, and issues like that. The importance of studying in this section becomes clear, although other reasons have been mentioned in the previous sections. Therefore, answering at the right time or at the synchronous or real-time and any other title we put on it is not only important, but also necessary in some cases.

Participation

Participation in the form of public services

The value proposition of a great city is not limited to encouraging jobs, but creating opportunities for all city residents to reduce inequality and protect against harm. Opportunities should be equal for everyone. When a problem is solved in a short period of time, it actually benefits the whole city, and everyone does the right thing based on the time required, and like dominoes, the problems are solved. Based on the suggestions made with the general public and stakeholders, places were identified at the city level that could be very useful for medical activities and services. It can be seen in Figure 21.

As seen in Figure 21, participation is possible in any field and location activity. Especially when spatio-temporal software along with its environment provides this platform easily and makes it available to the public. The abundance of responses, even with a small number of participants, indicates an easy-to-use interface. This means that even the hands of those who do not have mass planning experience in routing will be able to create a new network of routes with confidence and without any doubts. Therefore, in addition to effective decision-making, the paths that are created in a place will be clear and realistic. A) participation in constructions, B) participation in zoning based on smaller and larger areas with relatively lower prices, C) cost construction based on participation, D) public participation in all areas, E) Participation in the construction of intra-city roads, F) Participation based on transportation, G) Participation based on historical areas around which the fabric of deterioration is also located, H) Participation of professionals who are all software experts.

All these maps are based on participation. In this usability section, the participants were asked to identify concerns related to planning and participation in the development of Sari city. This is the subject of investigation and how to respond to the moment and simultaneity created in this scenario. Evaluating the usability of the GIS map sharing system as a support tool for participation urban planning, which is a fictitious example and can be a justified and optimal participation basis. Therefore, a person who is active in this field was used. 15 municipal employees were selected to share the map and introduce it in an interactive work environment. Everyone's behavior and answers were observed and recorded using a computer and creating a questionnaire. The purpose of this study was to test the usability of the prototype by presenting a fictitious case study related to Sari Municipality for its planning and development based on the public accountability system. With the assumption that according to its regional reform plans, it was possible to make reforms in any place and region. Spatial data related to the corrections were prepared using software in the form of GIS files, which are uploaded to the computer as a web-based map layer so that it can be displayed as an open and public layer.

This issue has been extremely important that participation in any sector is possible and will improve the situation, especially if it is real-time. You can also see in Figure 22, A) and B) production of logical map is based on artificial logical intelligence in the software. It can be seen in the map C) and in the map D) it shows the three-dimensional calculations in the analyzes on the two-dimensional map, that the software has the ability to show the entire area in the zones where it is located, This is an add-on to GIS. which can instantly or in real time perform all the features for all kinds of services such as aid, tourist services, postal services, applying all opinions including people and officials, providing assistance in the fastest possible time, etc. which is a very new feature that revolutionizes the world of GIS, coding and programming. As mentioned before, due to the protection of personal privacy, more explanations are possible in this case. The final locations that can be seen in the Google image indicate what activity or help each area is closest to, which in turn is completely new. This area with dimensions of 36,423,900,000 square meters is located in UTM zone 39.

DISCUSSION

From the day when humans have access to food, they followed it and immediately understood that there are only two other things they need to live better, the first is the knowledge that is related to the inner child and the need to know, and the second is the issue of environmental health, which leads to individual or collective form and in a shared form. In fact, all three mentioned cases require the process of participation, and participation is a problem beyond the imagination of individual intelligence, because it requires collective intelligence. So humans need three things for survival, 1) food, 2) awareness and 3) environmental hygiene. By observing the above, the human being will no longer be considered a sick person and will only worry about his future, as the attitude of the future and the perception of each person about it are different. These reasons were always emphasized on the issue of time, because man has turned prediction or prevention into worry and in some cases obsession and mental stress. An example of that is the children of man, if they give him the things he wants and there is no talk of greed for money and material issues, there will be no more complaints. For example, in America, they say that equality and opportunity are the same, which means that everyone can become president with this kind of view. In the opinion of the researcher and in fact, these statements are not acceptable and are more likened to a joke, because in equality of opportunities, equality is established when all human beings have the same type of equality, such as having security, health, housing, Peace, food, clothing and the like and nothing else, in fact, the minimum should be provided to each person first so that all people can enjoy the kind of equality that was said and then the talk of equality comes. So Participation is one of the important ways to achieve equality in the true sense. Participating with artificial intelligence in map generation may be faster, but with logical decisions. That is, mental and psychological conditions are not measured, social criteria are not taken into account.

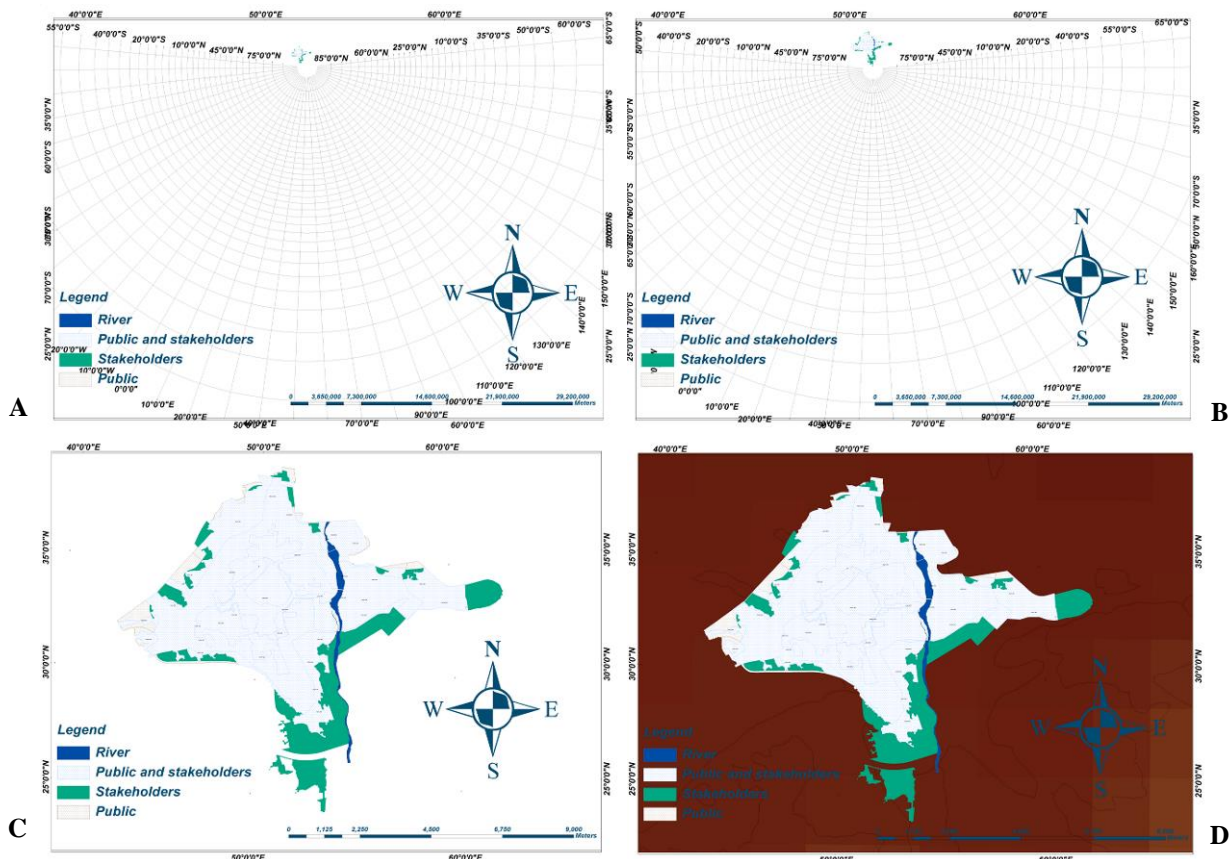


Figure 22. Location priorities in the final image of the study (Source: Research and findings of researchers, 2019-2022)

This case will probably cause many crises and have irreparable consequences. A question is raised at the end that has an interesting answer. Do humans care about the construction of a road, if the ants' nest is destroyed during the construction of the road? Artificial intelligence also has a similar view about humans. It is better for me to say that artificial intelligence only makes rational decisions to achieve its goals. Without him knowing what crises are created for the human race.

Testing Hypotheses and answering Questions

- 1) The first hypothesis is confirmed in line with the answer to the raised question. Because as seen in the results, the tourism industry is mixed with spatial sciences, especially geographical sciences.
- 2) In response to the second question, it should be said that artificial intelligence will not be able to examine the mental and psychological factors of people in very different conditions and provide a different version of it. Therefore, touristic places indicate the superiority of cities, and fortunately, the second hypothesis is rejected.
- 3) Regarding the third question, first of all, the hypothesis proposed in this research should be confirmed, because it is precisely this time factor that strongly affects people's decisions, behavior and answers.

CONCLUSIONS

The tourism have a special role in the process of urban development but As long as people do not benefit from mental and psychological health and are constantly involved with current events, they will suffer concrete mistakes in decisions in the same way. The results of this collaborative study have consciously interwoven all remote sensing sciences and pure GIS science in a completely specialized way. Of course, this was the topic that the researcher reached in the middle of the road. Because the main activity of this research was to introduce a new research using space-time-place and to invent software related to these features, the details of the study were not mentioned for different reasons, including the protection of personal works and privacy. which is considered natural.

As mentioned in the previous sections, these days the desire to use artificial intelligence has increased greatly. Because I think they don't know what they are facing. Doing any activity in a faster time makes people happy. But at what price? The loss of human relationships, the adjustment of the workforce and people's disappointment, the loss of human emotions and the use of logic and machine intelligence, which sometimes turns out to be wrong and may make people sacrifice their rational decisions. Can artificial intelligence take responsibility for these? Artificial intelligence is a subject that is widely used and developed by humans. Finally, I say this with my personal opinion so that it will be recorded in history: artificial intelligence is infinitely more dangerous than nuclear weapons.

Time was not lost in this study because according to the researcher there is no such thing as time. Time is a contractual matter between humans that has come into existence. But this study broke it down significantly and was able to moderate it significantly. Of course, based on the attention that people have to time. This was not found in other studies. People answered the questions based on personal opinions and views and participated in the participation.

In this study, for the first time both statistical analysis and ranking methods were used which has not been seen in a research so far. When we talk about the future, we are talking about a possible process. History has shown that it is always unpredictable in nature. In fact, there is a gap and a trend between what is predicted and what happens, such as the future of global participation and the future of participation in the country, for example, Romania. Therefore, the future envisioned for the American continent from the end of the 21st century is definitely different from the future of the European and South African continents, and what is common is the existence of all three continents in the factor of time and, in other words, their imagining. It will be in the final moments of the 21st century. Based on the results obtained and due to the misleading nature of the issue of time, it cannot be managed, and people should not worry about time management, because they lose their focus. Therefore, they should manage their concentration and be focused in the moment. It is only in this way that you can use the time effectively and continue with the desired activity. This way will continue

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