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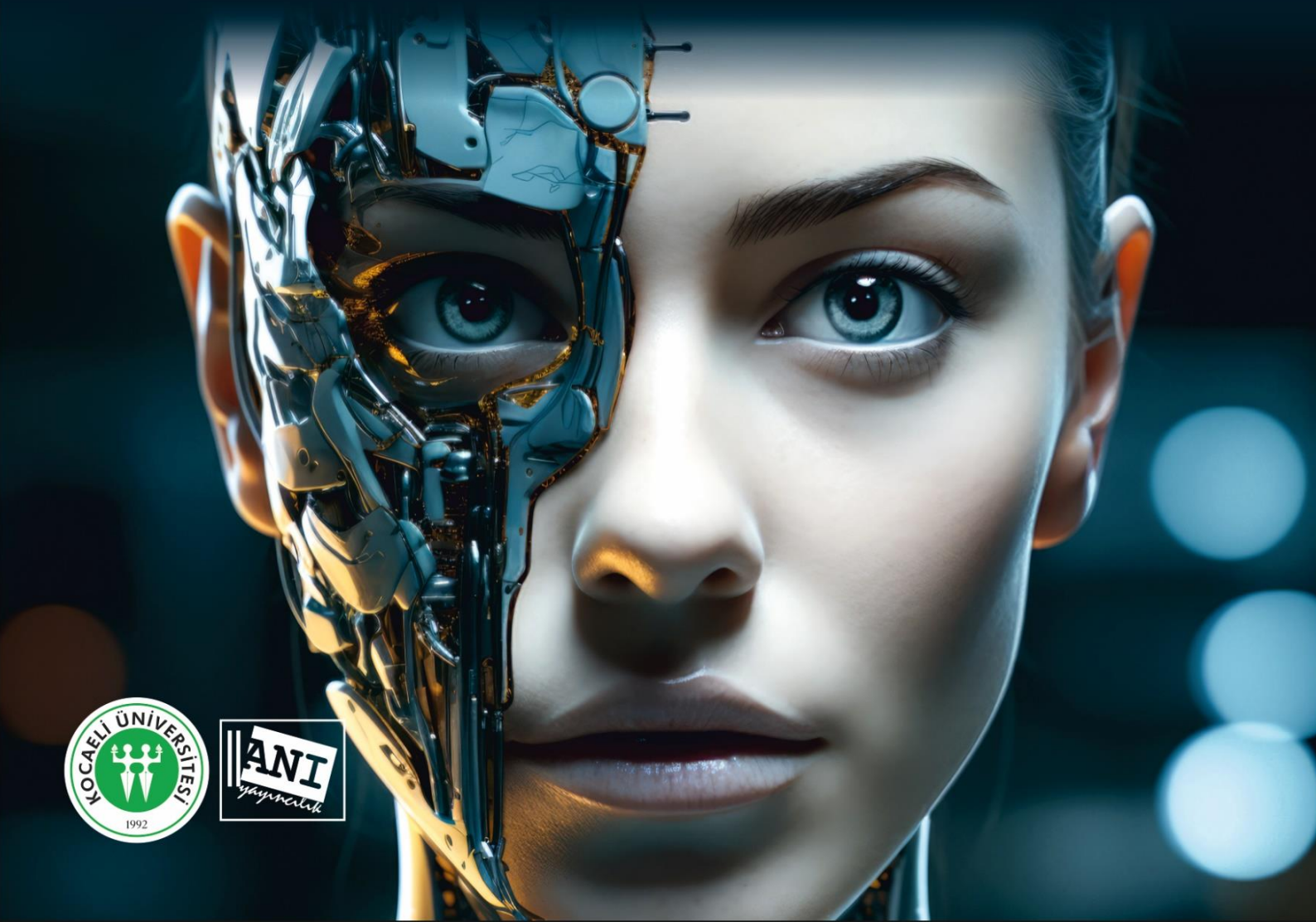

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Main Theme

"Designing the Future: Changing Paradigms and Transhumanism with Artificial Intelligence in Education"

Sub-Themes

- Academic freedom, autonomy, and social responsibility in education
- Artificial intelligence and educational applications
- Augmented reality applications
- Barriers to learning
- Blended learning
- Computer-assisted measurement and evaluation
- Core skill sets for students and teachers
- Design of school buildings in the future
- Designing and delivering a digital strategy
- Digital competence
- Digital parenting
- Distance Education
- Earthquake Education
- Post Earthquake Trauma Training
- Earthquake and Effective Psychosocial Intervention Methods
- Earthquake and Trauma
- The Impact of Earthquakes on School Staff
- Education and society
- Education for healthy living and healthy communities
- Education for a sustainable life
- Education in the digital age: Primary, secondary, high school, higher education, and application examples
- Educational leadership in the digital age
- Effects of regional differences on education
- Equity, Diversity, and Inclusion Related to Marginalized Groups
- Emergency Management at Schools
- Evidence-Based School Counseling Services for Refugees and Marginalized Groups
- Globalisation and Education
- Higher education
- Innovative learning designs for student success
- Instructional technologies in the digital age
- Integration of immigrants into education
- K-12 education (preschool, primary, and secondary education)
- Learning management systems
- Lifelong learning
- Machine learning
- Management information system
- Managing schools
- Measurement and evaluation of students' learning outcomes
- Metaverse
- Migration and education
- Multicultural Classroom Concerns of Educators and Parents
- New educational system after COVID-19
- New skills to live and work in new times
- New technologies in teaching and learning

- New trends in educational research
- New trends in learning and teaching methods
- New trends in research methods
- Pedagogy, educational programs, and teaching
- Politics, good governance, and leadership in the educational sector
- Program design and development
- Promoting equality, diversity, and inclusion
- Psychological counseling and guidance in education
- Quality assurance/standards and accreditation
- Research and innovations in education
- Research ethics
- Right to an education
- Sustainable Educational Goals Related to Refugees
- Teacher education in the digital age
- The Possibility of Fundamental Changes in the Curriculum
- The role of parents in education
- The skills we need to thrive in a post-COVID-19 world
- Vocational education
- Ways to overcome the digital divide

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Author Information

This book has been compiled with contributions from 61 authors representing 35 different universities in Turkiye, the United States, and Iran, as well as Turkiye's Ministry of National Education. Among the contributors, there are 51 authors from 31 universities 6 authors from education institutions in Turkey, 3 authors from 2 universities in the United States, and 1 author from a university in Iran.

CONTENTS

Determination of Building Hall Rouge with GIS in External Exams Held at DEU Campuses

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Abstract

With the growing population in our country, participation in exams organized by institutions such as ÖSYM, Anadolu University, Istanbul University and Atatürk University increases every year. Although the examiners advise candidates to visit the exam halls before the exam, this is not always possible. Therefore, it is of great importance to know the exam location and route, especially the exact location of the exam hall within the building in advance. In this study, it is aimed to use Geographic Information Systems (GIS) to determine the building and hall routes for external exams in Dokuzçeşmeler Campus of Dokuz Eylül University and to design a web-based application that can be used by exam candidates. Within the scope of the study, the architectural drawings of the exam halls were digitized, the building plans updated as a result of field research were transferred to the GIS environment with CAD-based applications and integrated into Google Maps. Exam halls were differentiated from other rooms by coloring, and written directions and open entrances of the buildings were visually presented to the user. This application provides an alternative solution to the limited directions service in the existing exam entrance documents and develops a GIS-based route determination method for the exam halls in Dokuzçeşmeler Campus. It is aimed that the study will be implemented in other campuses of the university in a short time and contribute to the literature in terms of the solution method of the problem and the technologies used.

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Keywords:*Geographical Information Systems, External Exams, Web Based Applications*

Introduction

Today, with the rapidly developing technology, information on exactly where our current location is located on the earth, how far this location is from any point on the earth, and how and how long it takes to reach that point can be obtained by using Geographical Information Systems (GIS). It is also possible to find an effective and sustainable answer to the question "How can we reach an exam hall on a campus that we have not been to before?" by using GIS.

Geographical Information Systems is a branch of science that allows the data of a place on the earth to be compiled for certain purposes, to determine the geographical location of these places, to determine their relationship with other places, and to store, use and analyze all these data. The first definition of GIS in the modern sense is explained as "It is all the tools that fulfil fulfill the functions of collecting, storing, querying, transferring and displaying real data of the earth for a specific purpose (Burrough, 1998)."

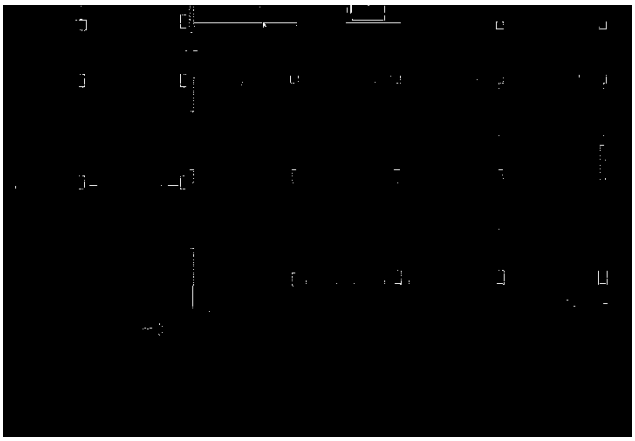
Geographical Information Systems is a tool used to find the ideal solution for an issue that needs a solution, and among the issues, it deals with is finding the most suitable and fastest route to reach from one point to another point. The systems used to determine the most suitable and fastest route are called navigation. Navigation systems are GIS applications that effectively use their comprehensive databases by associating them with geometric data (Doğru and Uluğtekin, 2005).

Various data are needed for navigation systems to work; in principle, it gives the best directions for a person to go from the starting point to the endpoint in the most convenient and fastest way. For the most suitable route from one point on the earth to another, it is necessary to have the geographical location information of the starting and endpoints. Considering the exam halls in Dokuz Eylül University campuses, it can be assumed that the endpoints representing the exam halls where the candidates who will participate in the exams will enter the exams will be the same for each user.

To obtain the geometric drawings of the exam halls, which are the endpoints in route determination, that can be used by navigation systems, which is a GIS application, the buildings where the exam halls are located should be redrawn in CAD environment after the necessary measurements are made and transferred to the GIS application. At this point, unlike the plans produced by architectural drawing techniques, it is important to redraw the exam halls of the buildings within the campus in CAD environment by removing objects and furnishings such as walls, doors and windows, etc. because GIS applications, which serve as a tool in navigation systems, do not need architectural drawing techniques.

Project Image 1

The bold lines represents the drawing which created for gis based applications. Source: by author



Another important concept for transferring the three-dimensional earth to a two-dimensional plane is the geographical coordinate system. The geographical coordinate system is based on the Cartesian coordinate system used in mathematics and produces the concepts of "Latitude (x)" and "Longitude (y)" by dividing the earth into equal parts in width and length. The planet Earth is divided into 180 equal parts from the north to the south with latitudes and 360 equal parts starting from London Greenwich with longitudes. The concept of latitude and longitude is very important for any three-dimensional object on the Earth to be accurately transferred to the two-dimensional plane by GIS applications and used by navigation applications.

Another important concept is projection in order to accurately transfer the projection of an object whose measurements have been taken and which has a certain coordinate on the earth to the paper plane. In order to accurately transfer a point on the earth to two dimensions, three types of projection systems, plane, cylindrical and conical projections, have been developed according to the geographical location of this point. Maps created with plane, cylindrical and conical projection methods have different projection coordinate systems that can be used in GIS applications today, and among these systems, the UTM (Universal Transverse Mercator) projection, which is based on the Gauss-Krüger projection, which has become internationally valid and is also used in our country.

Even if the endpoints of the individuals who will use the navigation systems are the same, the starting points will differ from each other. In order to provide accurate and effective route directions, instantaneous location determination of the users will be needed. In order for navigation systems to determine the instantaneous position or speed of a user on the earth, it is necessary to receive signals from at least 4 of the 24 existing satellites according to the WGS84 reference system in UTM projection (Tecim, 2006). Accurate determination of the instantaneous position is very important for the users who will receive route directions using the application to be produced within the scope of the project in order to reach the exam halls, in terms of where the starting points are located in relation to the end, that is, the exam hall, and the navigation systems can decide which route the users should use from the starting point to the endpoint.

With the developing technology, the compatibility of platforms such as computers, mobile phones, etc. with each other has gained importance. Applications that can run smoothly on different platforms with similar interfaces and that are user-friendly in terms of accessibility and accessibility are attracting interest, which distinguishes them from their competitors. "Google Maps", one of the products offered to users by the "Google Group of Companies", which has managed to be a pioneer in terms of user experience in search engines and web-based applications since the first days of the Internet, is a web-based map and navigation application. Google Maps users will not have to worry about collecting their own map data, resolving incompatibilities between browsers in web-map applications and setting up their own map servers (Davis, 2006). Because these services are provided free of charge by Google to users and developers with open-source techniques. In addition, Google Maps products can run smoothly and free of charge on every platform and can be considered as a web-map application to be used in this academic study.

In this study, the architectural drawings of Dokuz Eylül University's Dokuzçeşmeler, Tınaztepe and Faculty of Education campuses, which were selected as a pilot region for the determination of building and hall routes in external exams with GIS, were obtained in physical and/or digitised form, and then the measurements of the exam halls were taken again with field observations and redrawn with CAD-based applications. The current floor plans of the exam halls were uploaded to GIS applications according to the location of the buildings. The campus and building drawings transferred to the GIS environment were transferred to the "Google Maps" application and the outdoor navigation service was offered to the user for use on every platform. The exam hall drawings transferred to the web-based Google Maps application were separated from other halls/rooms on the floor where the hall is located by colouring method.

Institutions that organise external exams prefer to enter the buildings where the exams are held and the campuses in which these buildings are located from only one point on exam days for security reasons. Within the scope of the academic study, in order for the navigation application to be used to make accurate and complete directions on exam days, the only entrances of the campuses and exam buildings open on exam days are taken into consideration and presented to the user in written and visual form on the query screens to be produced within the scope of the application.

In examinations for measurement and evaluation purposes, which is one of the most important subjects of education, it is important to know the exam location, to learn the route and to know the exact location of the exam hall in the building before the exam. This study covers the buildings located on all campuses of Dokuz Eylül University and used in examinations and the layout of the exam halls in the building floor plans. In this study, which is put forward as a prototype for İzmir Dokuz Eylül University, aims to design a web application that can be used by candidates who will participate in the exams by

determining the building and hall routes with Geographic Information Systems (GIS) technology in external exams (ÖSYM, Open Education, National Education Faculties, Insurance, etc.).

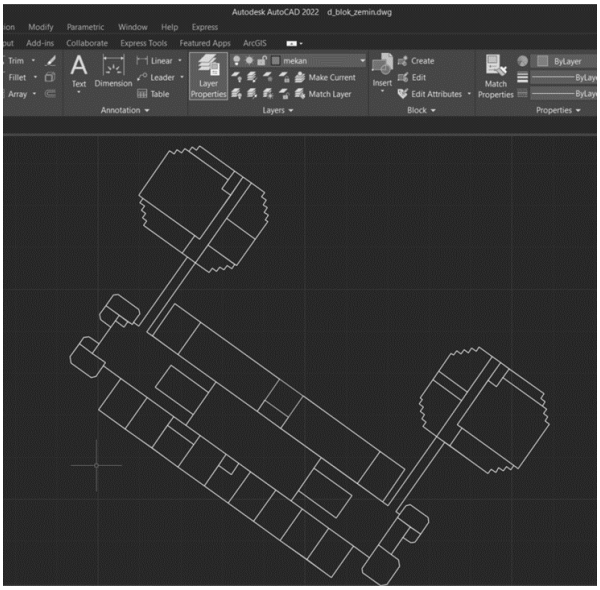
Method

Within the scope of the study, physical and/or digital drawings of the buildings and exam halls used in external exams (ÖSYM, Open Education, National Education, Insurance, and others) held within Dokuz Eylül University were obtained and route determination studies were carried out using GIS technology. All steps of the methodological transformation related to the study are listed below;

- The exam halls used in the exams organized by ÖSYM, Open Education, National Education, Insurance, and other institutions within Dokuz Eylül University were identified.
- Floor plans of the identified exam halls were obtained in physical and/or digital format.
- To bring the floor plans up to date and to be used by GIS applications, internal and external measurements of the buildings were taken within the scope of field observation studies.
- Within the scope of field observation studies, after the necessary observations were completed to produce maps to be used by GIS applications, the classrooms, whose floor plans were provided, were redrawn in AutoCAD application by removing objects such as walls, windows, furnishings, etc. unlike an architectural drawing.
- These drawings obtained in AutoCAD application were placed on the geographical coordinates of the drawn building and scaled with the help of ArcGIS plug-in added later.

Project Image 2

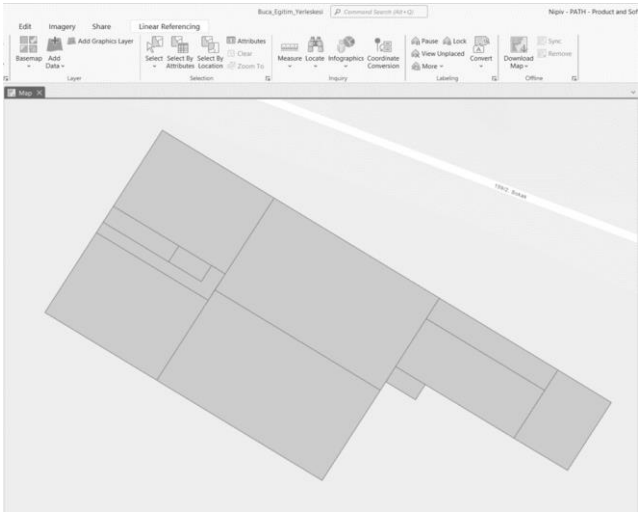
A Coordinated Floor Plan with Arcgis Plugin in AutoCAD - Source: by Author



- These coordinated two-dimensional drawings were saved in ".dwg" format to be transferred to ArcGIS application and transferred to GIS environment with the "Import from CAD" command in ArcGIS application.
- A "shapefile(.shp)" file was created and saved for each floor plan transferred to ArcGIS application.

Project Image 3

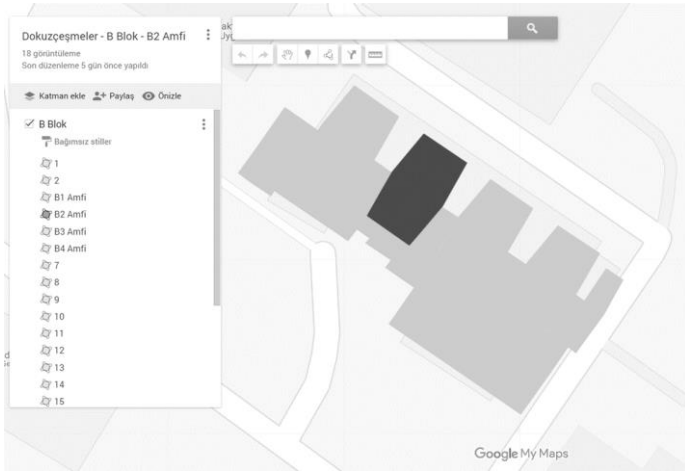
A floor plan transferred to gis application - Source: by Author



- The "Google Maps" application, which has a completely open-source working principle in order to be used on every platform, has been determined as the map application to be used for users to receive navigation services.
- The floor plans, which were converted to ".shp" file format in ArcGIS application, were converted to ".kml" file format, which is the format that Google Maps application can run, with the "Map To KML" command of ArcGIS application and saved.
- The buildings converted to ".kml" file format were uploaded to the Google Maps application with each floor plan as a different map for route directions.
- The halls belonging to the exams organized by the examining institutions on the campuses of Dokuz Eylül University were identified on the floor plans uploaded to the Google Maps application, and the name (e.g. A2 Amphitheatre) and Meksis Codes for each of them were manually entered into the layers uploaded to the application.
- A different colored view was obtained from the other rooms/classrooms on the floor where each exam hall was located by using the coloring technique on the floor plans uploaded to the Google Maps application to be presented to the users for route directions.

Project Image 4

A Classroom/Floor Plan with Coloring Work Completed on Google Maps - Source: by Author



- The "WordPress" application, which has many paid and free features, was determined as the web server where route directions and exam hall information would be given.
- For the exam halls whose necessary procedures were completed with the coloring technique, the codes to be added to the WordPress pages were obtained with the "Place on My Site" command of the Google Maps application, and these codes were added to the WordPress pages.

  An example of the HTML code generated by the Google Maps Application to embed the map on the website where the query screen is located:

<iframe
src="https://www.google.com/maps/d/u/0/embed?mid=18JwJsitMdlRf9t56MtvTjYh8FJyuo70&ehbc=2E312F"width="640"height="480"><
/iframe>

- The location of the examination hall in the building is supported by written directions. Since the electronic devices that candidates will use for the application will not be allowed to enter the exam buildings and not every user is expected to have floor plan reading knowledge, written directions are of great importance.
  Example of "Written Examination Hall Route Directions in the Building" in the Query Screens Designed Using Wordpress Servers:–

  E Blok – E1 Amfi(Zemin Kat) – Sınav Salonu Tarifi

  Sınav Salonu'nun kat planındaki konum tarifi;

  1. *Dokuz Eylül Üniversitesi Dokuzçeşmeler kampüsünde sınav binanızın işaretli olduğu konuma ulaştıktan sonra binaya ana girişten girin.*
  2. *Binaya giriş yaptıktan sonra sola dönün.*
  3. *İçinde bulunduğunuz koridorun sonuna doğru yaklaşık 40 adım yürüyün.*
  4. *Yürürken koridorun sonunda sağınızda göreceğiniz koridora doğru sağa dönün.*
  5. *Koridorun sonundaki kapıyı geçtikten sonra sola dönün.*
  6. *Sınav salonunuza (E1 Amfi) giriş, yürümekte olduğunuz koridorun sağındaki kapılardan yapılmaktadır.*
  7. *Sınav salonunuz başarıyla ulaştınız!*
  8. *Başarılar dileriz!*
- Since candidates will be admitted to the buildings where the exam halls are located and to the campuses where these buildings are located only through a single door for security reasons on the exam days, the written location description of the exam hall clearly indicates which door the candidates will enter the building from. In addition, in order to show the entrance door of the campus in which the exam hall is located, the campus drawings were made in AutoCAD environment, the campus boundaries were indicated and the campus entrance was marked with an arrow.

Project Image 5

Dokuzçeşmeler Campus Gate Open on Examination Days - Source: by Author

Results

In this study, Geographical Information Systems (GIS) were used to determine the building and hall routes during external examinations in DEU campuses. The results of the research are presented below:

i. Elimination of Uncertainty

By determining the exact locations of the classrooms used by the examining institutions, the information on where the exam halls are located has become transparent for the candidates who can access them with "Google Maps" in a web application and the uncertainty has been eliminated. In addition to the

navigation services offered by the Google Maps application, candidates can reach the exact location of the exam halls in the fastest and shortest way with the written route directions made available to the candidates on the web.

ii. **Facilitating Candidates' Access to Examination Halls**
Candidates can easily access the exact location of the exam hall in the exam building with the floor plan created with the coloring method in the "Google Maps" application and the indoor route directions in the written form, and candidates who have the information of the location, will go to using the application have a decrease in the time it takes to reach the exam hall on exam days.

iii. **Increasing the Comfort of Candidates on the Morning of the Examination**
The information about the exam building and the exam hall provided to the user in the web environment eliminates the uncertainty of the location where the candidates will reach and allows the location of the exam hall within the exam building to be determined quickly and the time that the candidates will spend for travelling on the morning of the exam is significantly reduced and a comfortable environment is provided before the exam.

iv. **Reduction of Exam Stress**
With the final product of this study, which was carried out by determining GIS technologies, it was possible to eliminate the uncertainty of the hall where the exam will be held, to reach the exam halls in the fastest and shortest way, and to reduce the stress levels that candidates who did not have the chance to see the exam hall before taking the exam would experience on the morning of the exam.

Discussion

The findings of the study emphasize the importance of GIS for the candidates to reach the exam halls in the external exams organized on DEU campuses. In the exams organized, the location of the exam buildings cannot be known precisely by the candidates and the lack of information about where the exam halls are located poses a great problem for the candidates who will reach the exam halls on the exam days. Knowing in advance which campus, which building, on which floor and in which direction the exam hall is located can minimize the time to be lost on the morning of the exam, especially for candidates who do not have the chance to visit the exam hall at least one day before the exam and provide a comfortable environment by reducing the stress level of the candidates. In addition, with the implementation of this practice, an environment of trust can be provided for candidates who want to observe the exam hall in advance, eliminating the need to go to the exam hall twice and potentially reducing the time and money to be spent. In addition to the candidates who want to identify the exam halls in advance on exam days, the fact that DEU students have the information about the location of the classroom in a course that they will attend for the first time at the beginning of the semester may also contribute to a positive effect in increasing the number of attendances to the courses.

Conclusion

In the exams organized by ÖSYM, Open Education, National Education, Insurance, and other institutions in our country, the problems of access to the exam halls are frequently on the agenda. Despite the recommendations of the examining institutions that the exam hall should be visited and seen at least one day before the exam day and how to reach it should be discovered, this situation is not possible for every candidate. In this study, DEU campuses were selected as a concept to overcome the deficiencies in access to exam halls, and we focused on the determination of building and hall routes with geographical information systems in external exams held here. In this direction, firstly, the exam halls where external exams were held in the classrooms on DEU campuses were identified. After the architectural drawings of the exam halls were obtained, they were updated with field observations and floor plans that can be used by GIS applications were produced and uploaded to the Google Maps application, which users can access free of charge online from any platform using open-source codes. The route determination studies were completed with written and visual aids, uploaded to WordPress servers, and made available to users. With this study, the experiences of the candidates participating in the external exams organized by DEU were improved in a positive sense, and the confusion of access to the exam halls was eliminated, contributing negatively to the stress level experienced by the candidates on the morning of the exam. The results of this study show that GIS can play an important role in exam hall directions.

Recommendations

With the findings and results obtained in the study of determining the building and hall routes with geographic information systems in external exams held on DEU campuses, positive effects were observed in solving the problems of candidates' access to the exam halls. Although this study, which covers the exam halls used in DEU campuses, gives encouraging results that the general problems experienced in accessing the exam halls can be solved with GIS technologies, it is a known fact that more comprehensive and more sample studies are needed to solve the problems of all candidates participating in the exams of ÖSYM, Open Education, National Education, Insurance and other institutions organized throughout the country. It is suggested that more constructive and more inclusive results can be obtained by working in an integrated manner with the exam conducting institutions and the management of the places where these institutions organize their exams, with the addition of potential sponsors, qualified labor force and time factor that can be included in future projects.

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