Development of Education Management System Based on ArcGIS Technology

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Abstract

Big data thinking and big data technology has brought unprecedented opportunities to education career, big data environment makes the traditional teaching method is gradually improving, student-centered discussion, interactive learning can let students learn anywhere on campus, online combination of hybrid teaching methods has become a new development direction. The diversification of teaching methods for teachers can more timely understand students' suggestions for the curriculum, monitor the frontier of the subject in real time, so as to adjust their own teaching methods. This paper puts forward the view of the current situation of education management, and puts forward the corresponding solutions according to the emergence of the problem. In addition, the help of ArcGIS technology proposed in this paper for the development of education management system is also elaborated in detail, aiming to accelerate the development of education management system based on ArcGIS technology, so as to better help students in systematic learning, accelerate the students' learning progress and also promote the development of education management system.

Keywords: *ArcGIS Technology, Education Management Systems, The Internet, Information Technology*

1 INTRODUCTION

With the rapid development of modern information technology, especially the continuous improvement of computer network technology, network education management technology in higher education, the education career with the rapid development, the application of Internet course teaching has become an inevitable development trend, especially the combination of network information technology and traditional teaching, makes our teaching method has a qualitative leap [1]. One of the important components of modern education management is information management, which is very important for realizing the modernization of education management [3]. Education information management system can provide diversified information management functions for line management departments, so it can provide certain help in the overall planning level.

2 DATA COLLECTION OF THE EDUCATION MANAGEMENT DECISION SUPPORT SYSTEM

The first thing is the information classification. The core of GIS is the data, and the most expensive data in the project development based on GIS technology is the construction of the database. The data in the database contains spatial information data and attribute data. Spatial information data mainly refers to the data closely related to the map elements, while the attribute data refers to the basic description of the characteristics of the map elements [4]. At present, the development level of database is high, so GIS system does not need to develop an independent database system, only with the third party database technology can complete the data management and analysis of data [10]. In this process can through the vector spot check this method of the object in the space through the unique ID and the corresponding properties of the data mapping, then used for spatial information management, and then with the help of mature database technology to the user attribute data management, so that you can complete the comprehensive processing of a variety of information [11]. This processing method can not only manage the user attribute data efficiently, but also help to promote the development of the system.

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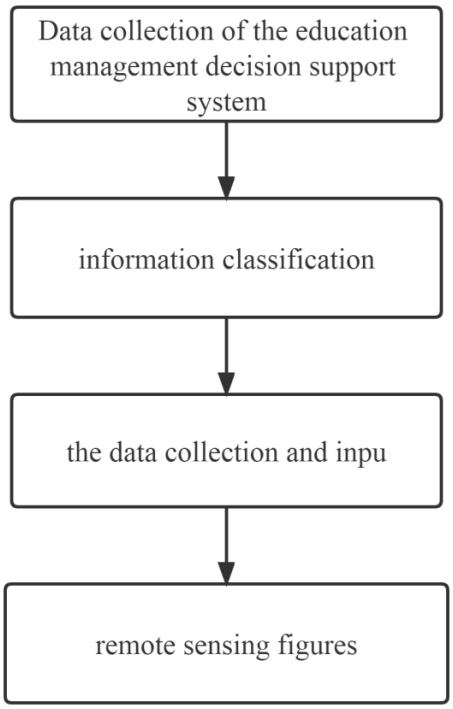

Figure 1: Data collection of the education management decision support system

The second is the data collection and input. The core work of developing educational DSS system is the construction of database, and the core work of database construction is the data acquisition and input, which is mainly divided into two parts: spatial data collection and attribute data collection [5]. Spatial data acquisition is mainly to digitize the topographic map through the scanner. In addition, it can also be cremote sensing figuresollected through GPS coordinate system, and digital measurement maps. The advantages of attribute data collection can improve the auxiliary function of the decision-making system, provide intuitive graph data, and at the same time, describe the relevant attribute data of spatial graphics, which can make it easier to understand the connotation and extension of data, thus contributing to teaching decision-making work [2]. After the completion of data collection, it is necessary to be pre-processed and then input the data. Before the attribute data, it should be coded according to the industry standards of the education department, so as to be stored in the database.

3 ARCGIS EDUCATION MANAGEMENT SYSTEM DESIGN

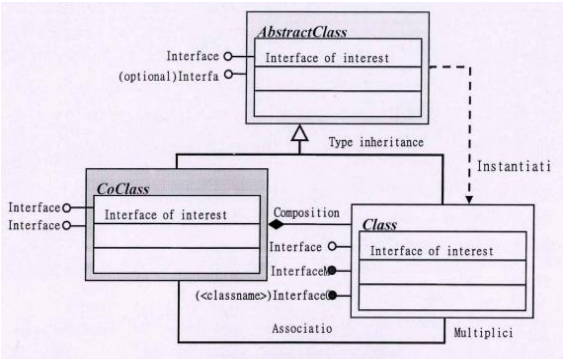

Figure 2: ArcGIS Engine Object model diagram

3.1 The Analysis of the ArcGIs Education Management System

The analysis of the education management system based on ArcGIs technology can be analyzed through the following aspects: system function, system requirements, and corresponding system feasibility. In terms of system functions, the education management system based on ArcGIS technology mainly realizes the functional fusion between digital management and map management, and realizes the fusion of corresponding attribute data and spatial data [12]. Specifically, the following functions: firstly, the expression of controllable geographic information, the user can view the corresponding campus geographic information through the digital management system, then enlarge and reduce the campus geographic information system, realize the corresponding virtual roaming of the map, and measure the spatial information of the map; the last, the user can improve and maintain the corresponding information through the system [6].

In terms of system requirements, ArGIS education management system, as a spatial information display and management tool, should not only meet the users to grasp the materials and spatial characteristics of the overall campus geographic information, but also effectively and intuitively display the corresponding attribute information and spatial information. In terms of system feasibility, ArcGIS education management system is developed twice based on GIS system, and its underlying basis is solid and reliable [9]. At the same time, the current computer hardware and software facilities in universities are also constantly updated. It can meet the corresponding system hardware and software requirements.

3.2 The overall structure of the ArcGIS education management system

For the overall structure design of the education management system, electronic each for its host architecture, through electronic map of campus

geographic information corresponding positioning, zoom, roaming and the corresponding spatial information, after the user can according to their own needs for different map window printing or different layout selection. In practical applications [13], space can select the corresponding system information to find different regions [7].

4 THE IMPLEMENTATION OF THE ARCGIS EDUCATION MANAGEMENT SYSTEM

After having a certain plan for the ArcGIS education management system, it is necessary to program to complete the implementation of the overall system functions, which mainly includes loading the corresponding map data, map amplification and reduction, map query and other functions [8].

4.1 Loading of the map data

For loading the map data, the corresponding document needs to be loaded first [14]. The code is written as follows:

```
private void Open _ItemClick (object sender,
ItemClickEvent)
Aras e)
{ ICommand command = new
ControlsOpenDocCommand Class （）；
command_OnCreate（m_mapControl.Object）；
command_OnClick}
```

After implementing the corresponding document loading, the corresponding Shape file and SHP file are added as follows:

```
private void Add Vector _Item Click (object sender:
Item
ClickEvent Args e)
{
addShapeFile（）；
LoadEye（）；
private void addShapeFile（）
{
System_Windows_Forms_OpenFileDialog
openFileDialog;
openFileDialog=new OpenFileDialog（）；
openFileDialog_Title = Open Layer File
FileInfo fileInfo=new Fileinfo
（openFileDialog_FileName）；
String path=fileInfo_Directory_ToString（）；
String fileName=fileInfo_Name_Substring（
0=?fileInfo_Name_
IndexOf（“
-”））;try
{
axMapControl l_AddShapeFile（path;fileName）；
catch （ Exception e ）
MessageBox_Shcw (" Failed to add
layers!！ ！ ”+e_ToString（）））；
```

4.2 Zoom in and zoom out of the map

The amplification and reduction of the map also need to be written by the corresponding code. For the function of map amplification [15], the amplification function under the current map layer is mainly realized. Users can enlarge and narrow the map through different small workshops. The main code is as follows:

```
private void amplification _Item Click (object
sender:
ItemClickEventArgs e)
{
axMap Control 1_MousePointer=
esriControlsMousePointer_esriPointerZoomIn;
flag=2
}
private void shrink _Item Click (object sender:
ItemClickEventArgs e)
{
axMap Control 1_MousePointer=
esriControlsMousePointer_esriPointerZoomOut;
flag=1
}
```

Figure 3: A magnified schematic diagram

Figure 4: Reduce the schematic diagram

4.3 Query for maps

The map query function needs to be implemented through the ArcGIS Engine space corresponding to ArcGIS technology, and the basic data supports the corresponding SQL database. The main code compilation is written as follows:

```
private void Select_Click（object sender：
EventArgs e）
{
string pQuerySentence=textBox1_Text;
IQueryFilter pQueryFilter=new QueryFilterClass
（）；
p QueryFilter_Where Clause=pQuerySenten ce;
fieldindex=listBox1_SelectedIndex;
if（pMap_LayerCount==0）
{
MessageBox_Show (" Please load the map first!":"
point out ");
}
else
{
if（Layerindex !=-1）
{
if（fieldlndex !=?-1）
{
IFeatureSelection pFeatureSelection;
pFeatureSelection?= ?（IFeatureSelection）
pMap_get_Layer
（Layerinde x）；
try
{
pFeatureSelection_SelectFeatures（pQueryFilter;
esriSelectionResultEnum_esriSelectionResultNew：
false）；
pFeatureSelection_Selection Chang ed（）：
ISelectionSet
pSelectionSet=?pFeatureSelection_SelectionSet;
Icursor pCursor=null;
}
pSelectionSet_Search（null;false;out pCursor）；
IFeatureCursor pFeatureCursor=（IfeatureCursor）
pCursor;
IFeature pFeature=pFeatureCursor_NextFeature
（）；
IEnvelope pEnvelope=new EnvelopeClass（）：int
index=0：
}
bool b=false;IFeature pFea=null;
while（pFeature !=?liull）
{
In dex++;
```

```
if
（pFeature_Shape_GeometryType==esriGeometryTyp
e_esri
GeometryPoint）
b=true;
}
Fea=pFeature;
p Envelope.Union（pFeature_Extent）；
pFeature=pFeatureCursor_NextFeature（）；
}
If（index==1&&b）
{
IPoint pPoint=pFea_Shape as Ipoint;
pMapCtrl_Center At（pPoint）；
Icomm and pCommand=?hew
ControlsZoomToSelecte
}
dComm and Class（）；
pComm and OnCreate（pMapCtrl_Object）；
pComm and OnClick（）；
}
else
{
pEnvelope_Expand（1.5：1.5：true）；
pMapCtrl_ActiveView_Extent=pEnvelope;
}
pMapCtrl_ActiveView_Refresh（）；
pMapCtrl_ActiveView_ScreenDisplay_UpdateWind
ow（）；
pMapCtrl_FlashShape（pFea_Shape3：500：
null）；
}
catch
{
MessageBox.Show (" Invalid query
statement!Syntax error (the operator is missing)
In Query Expression " + pQuerySentence +
Properties Query MessageBoxButtons.
OK）；
}
else
MessageBox.Show (" Select a Layer field!"point
out);
Else
}
MessageBox.Show (" Please select layers
first!"point out)
```

Through the above code writing, you can complete the implementation of the ArcGIS education management system.

5 CONCLUSION

With the rapid development of network technology and the diversification of network products, the traditional classroom teaching has been unable to meet the needs of students and teachers. In recent years, China's education modernization reform has been continuously deepened, and information technology in education management is more and more extensive. The introduction of information management system greatly improves the work efficiency of education management, and provides effective data and information support for the decision-making of education management. The information system integrated into the current education department can improve the function of the information management system by making advantage of its advantages, which is of great significance for improving the decision-making level of education management. I believe that as time goes by, the development and application of the education management system will be more perfect.

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