

Scenario

Earthquakes and natural disasters have frequently occurred in recent years. To minimize disastrous damage resulted from sudden disasters, schools at all levels in Taiwan are supposed to improve the efficiency of campus hazard prevention and emergency response and enhance simulation drills of earthquakes, tsunami and fire.

To leverage the efficiency of disaster prevention and evacuation on campus, Chien Hsin University of Science and Technology conducts earthquake and fire emergency response drill twice per year. There are up to 4 thousand people joining the drill each time, and the drills always put a strain on the Office of General Affairs. Therefore, the GIS-Based Campus Emergency Online System would be necessary, and the system can integrate information of emergency evacuation routes of every floor of each building on campus, distribution of evacuation equipments and fire-fighting facilities, emergency response team and lists of team members. Therefore, the system can meet the diverse requirements in class training and simulation drill of different situations. Thus, the target of controlling campus safety in every stage can be achieved.



Goals

In order to manage campus safety effectively and leverage response efficiency of emergency rescue, Chien Hsin University of Science and Technology needs a management platform which is capable of integrating map, emergency response facilities management and lists of team members and devices in the emergency response center to allow staff from different divisions to log in, view and query the relevant information.

To manage the plans of evacuation routes and distribution of emergency response facilities, the maps of the management platform must include maps of campus, buildings and floors. In addition, as to the maintenance of emergency response facilities, users are allowed to set and modify the data any time. Moreover, the platform provides users with query function to query the crew lists in each division and facility lists of emergency response center as well, so that all the tasks can be allocated clearly.

Solutions

The GIS-Based Campus Emergency System built by Chien Hsin University of Science and Technology is supposed to include map display, basic GIS manipulation and map navigation. Thus, the platform adopts SuperWebGIS 3 and works with Microsoft SQL Server 2008 to generate spatial data of buildings on campus and a hazard prevention relevant database, and builds GIS-Based Campus Emergency System.

SuperWebGIS 3 is a map server designed to help organizations to publish dynamic map and GIS data to the Internet. According to the far-flung characteristics of Internet, the spatial data of enterprises can be widely distributed and shared.

Goals

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Results

The main contents of GIS-Based Campus Emergency System are listed as below:



Home page of GIS-Based Campus Emergency System

1. Building the Main Page

The main page includes primary function menu such as map information of campus plot and building spatial distribution, hazard prevention equipment, drill information, evacuation routes, shelters, power and water supply in buildings, monitoring system, help and so on. The Web page is designed as picture below.



Map information of GIS-Based Campus Emergency System

2. Map Information

Query function of map information is provided. According to respective requirements, users can select the query variables, such as building name or code, floor number, administrative division name, academics name or spatial code, and the results would be displayed as picture 2.

3. Hazard Prevention Equipment

According to team task, equipment list of each team and equipment items that each team member carries around are displayed respectively.

4. Drill Information

Drill information includes:

- (1) Team member list, team task and service zone
- (2) Emergency response plan of disasters such as situation simulation, hazard potential analysis, hazard mitigation and so on
- (3) Campus evacuation drill during earthquake which consists of tasks in every stage, instant evacuation routes plan and calculation, students gathering map and so forth



Evacuation Routes Plan and Calculation



Students Gathering Map



Shelters

5. Shelters

According to "Disaster Prevention and Protection Act", the spaces of gym and club on campus should be planned to be shelters and be managed via GIS-Based Campus Emergency System.

6. Power and Water Supply in Buildings

For resource controlling and prevention of causing other disastrous damage, every building on campus equips digital power meters and digital water meters to display state of power and water supply instantly during disasters.

7. Monitoring System, Fire-fighting Facilities and Duct Distribution

Via IP web cameras, state information of public space of 70 laboratories usage can be displayed on the website for administrators to seize the harmfulness and personnel safety. In addition, the system provides the relevant map information of fire-fighting facilities and duct distribution as well.

Benefits

The GIS-Based Campus Emergency System integrates information of campus map and emergency response. All the disaster response plans, task of emergency response teams, team member lists, equipments and drill procedures can be queried via Internet so that each division is able to conduct trainings and drills without paying too much labor cost and time on management.

The platform will enable residents nearby and school staff to query distribution of evacuation routes around the campus and locations of shelters via Internet. Therefore, the utility of the platform can be improved as well.

Results

- The GIS-Based Campus Emergency System includes main page, map information, disaster rescue equipment, drill information and so on.
 - For seizing the current situation of campus emergency response facilities, the GIS-Based Campus Emergency System is also used as a platform which enables disaster relief personnel to log in and query information of the relevant facilities online.

Software Used

- SuperWebGIS 3