

A GIS, GPS, Database, Internet GIS software© The First Arabian GIS Software©

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Keywords

GIS, GPS, Database, Internet CGI, pocket Pc, Software engineering, and Developing.

Abstract

Elshayal Smart© software is an almost **First Arabian GIS software©** which completely developed by Arabian developers team and independent of any commercial software package. **The software current Features are** View and Edit shape files, build new layers, add existing layers, remove layers, swap layers, save layers, set layer data sources, layer properties, zoom in & zoom out, pan, identify, selecting features, invert selection, show data table, data query builder, location query builder, build network, find shortest path, print map, save map image, copy map image to clipboard, save project map, edit move vertex, edit move features, snap vertexes, set vertex XY, move settings, converting coordinate system, applying VB script, copy selected features to another layer, move selected features to another layer, delete selected features, edit data table, modify table structure, edit map features, drawing new features, GPS tracking, 3D view, etc... **The software expected Features are:** Viewing raster image and image geo-referencing, read other map formats such as DXF Format and Tiger Line Format.

Introduction

A Geographic Information System (GIS) is a computer program for storing, retrieving, analyzing, and displaying cartographic data.

GIS Software is impacted by various sciences, which are integral to the GIS programming such as geographic, graphic, database, operating research, software engineering, software programming and code enhancement.

By applying those above mentioned sciences and techniques, to the GIS programming activities, we achieved our stable version 1.17 of our GIS Software ElshayalSmart.exe.

1. The software is a GIS standalone applications that Read and write Shape files and attribute tables and present them in layers and give the user the full GIS tools such as (zoom in, zoom out, pan, full extend, select, measure distance, edit existing layer, make new layer) and view these layers as 2D & 3D
2. The software allows the user to build a Network and measure the Shortest Path between 2 points in any LINE layer.
3. It also has location and data Query builder modules, which allow the user to search through the locations or attribute tables of any layer.
4. GPS tracking Module, which reads from the GPS Device and can, convert the Lat. & Long. to 23 projection coordinates system such as (Airy , Australian National , Bessel 1841 , Bessel 1841 (Namibia) , Clarke 1866 , Clarke 1880 , Everest , Fischer 1960 , Fischer 1968 , Fischer 1968 , Fischer 1968 , Fischer 1968 , Hough , International , Krassovsky , Modified Airy , Modified Everest , Modified Fischer 1960 , South American 1969 , WGS 60 , WGS 66 , WGS-72 , WGS-84)

5. Selection Module allows the user to select, edit, copy, and move features from the map view or from the attribute table.

Objectives

Developing the first Arabian GIS, GPS, database, and internet GIS software by Arabian developers' team and independent of any commercial software package

Developing several versions for different Platforms:

1. GIS Editor© for browsing, analyzing and editing maps on the desktop computers (windows 98, 2000, XP, 2003)
2. GIS Net© for browsing maps on the Internet Server (windows server 2000, 2003)
3. GIS Mobile© for browsing maps on the PDA & Pocket PC (windows CE .Net)

Methodology

ElShayal Smart GIS software development process model is "waterfall model" or software life cycle. The fundamental development activities of the software are divided among several stages:

1. Requirements analysis and definition
 - a. Converting Lat. and long. to 23 projection coordinates system such as (Airy , Australian National , Bessel 1841 , Bessel 1841 (Namibia) , Clarke 1866 , Clarke 1880 , Everest , Fischer 1960 , Fischer 1968 , Fischer 1968 , Fischer 1968 , Fischer 1968 , Hough , International , Krassovsky , Modified Airy , Modified Everest , Modified Fischer 1960 , South American 1969 , WGS 60 , WGS 66 , WGS-72 , WGS-84)
 - b. Reading and writing shape files, and data base files.
 - c. Drawing shapes in different scales in 2D view and 3D view and apply GIS functions such as zoom in, zoom out, pan, full extend, select , identify, distance measure, edit, copy, move
 - d. Viewing tables, distinguish the selected features by different color, and edit in tables cells.
 - e. Crawling through the network matrix to calculate the shortest path route between 2 points in any LINE layer.
 - f. Reading GPS coordinates and tracking it in the map
 - g. Saving and retrieving layers properties.
 - h. Achieving fast, small, nice looking software by visual Basic, which can work in desktop, pocket Pc, and internet Server.
2. Software design

10 menus, 28 buttons, and 12 forms have been designed to reflect the above-mentioned requirements and to give the user the full control of the Software and its functions. Each menu, button, and form are designed to work with one requirement or function according to the integration and coherence of the functions.
3. Software implementation and testing

30 modules contain all formulas and calculations. Each module are written individually and tested by itself. Each module is designed to work with one requirement or function. According to the integration and coherence of the functions.
4. Software integration

Combining the above-mentioned Modules, menus, buttons, and forms in one complete system, which achieves the system requirements.
5. Operation and maintenances

The System is offered for more than 5000 users to install it and put it into practical use. Many errors have been discovered and corrected.

Discussion

From scratch GIS software developing, consumes a lot of efforts, and dedicated time and money, while importing ready-made software save a lot of efforts, time, and money.

From scratch GIS software developing, gives us knowledge, experiences, and qualifications, while importing ready-made software put us in the audience seats.

Results & Conclusion

As can be seen from the preceding discussion, developing from scratch GIS software is very expensive, very exhausting, and academic research centers and institutes must support and endorse those efforts.

References

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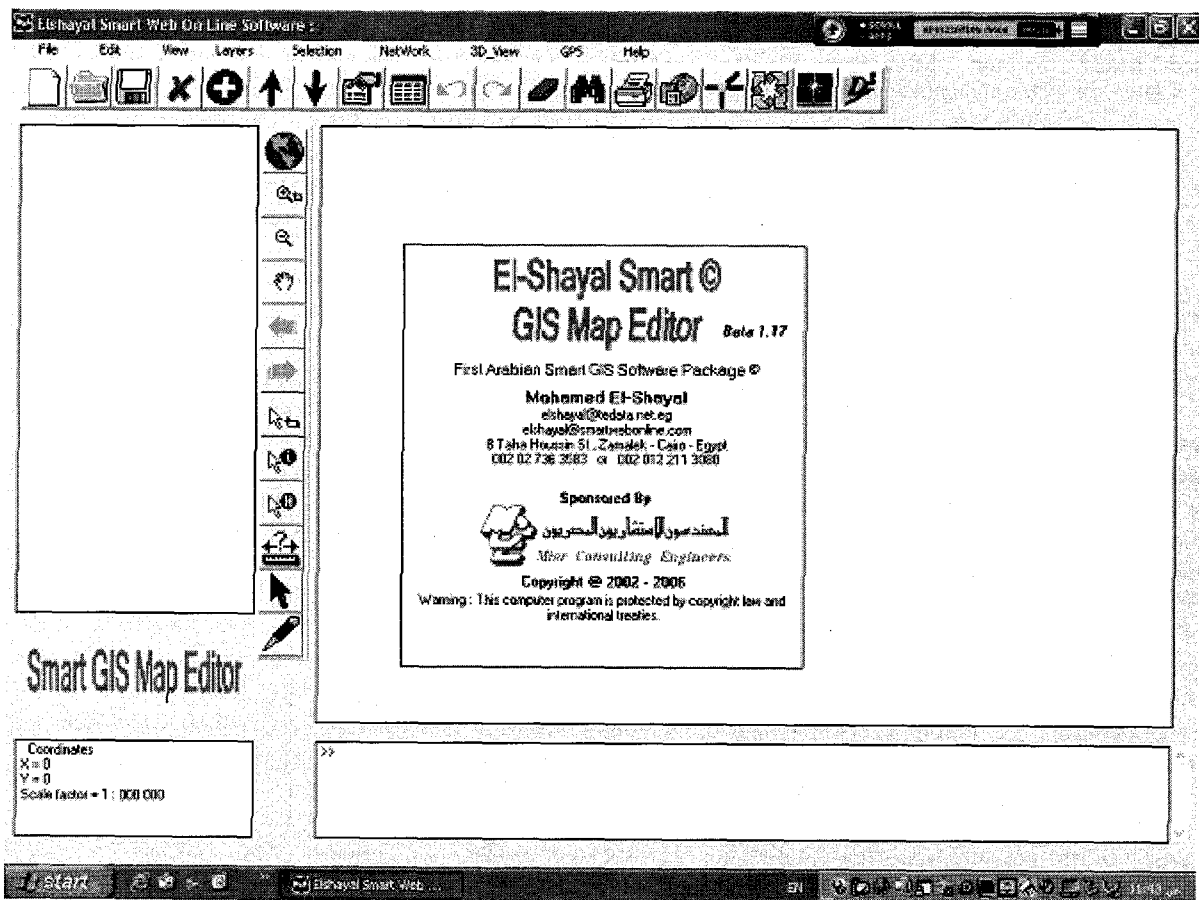


Figure 1. Elshayal Smart GIS Map Editor First View