University of Applied Sciences Karlsruhe
Department of Geographic Information Science
Institute of Cartography and Geomatic

University of Potsdam
Department of Geography and Geoecology
Institute of Geomatic

OUTLINE

of a

THESIS (DIPLOMA)

on

An Internet drafted conception and realization of an
interactive instruction and learn module on the theme of
Geographic Information System (GIS)
for the Virtual University

by

Dirk Waldik

under the tutorship of

Prof. Dr. Ch. Herrmann
and
Prof. Dr. H. Asche

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Introduction

For centuries the science is engaged with observing and analysing the correlations between mankind and nature, while finally deducing conclusions from it. These correlations can be better prepared and understood since the introduction of complex modules for analysis in the form of databases and graphic surfaces. In the course of the technological development, modern information and communication technology and particularly through continual better data acquisitions, information systems and particularly geographic information systems (GIS) are nowadays used more often. The tool GIS, in the initial development stage, was especially used in geodesy and in the environmental planning at the beginning of its development. Today, these systems are increasingly used on a daily basis in the teaching of geography, in universities, in logistics and in marketing. Thus, through navigation systems and business GIS, GIS beginnings have long outgrown expert systems of the past: Therefore, it is not difficult to ascertain that that the GIS market gains more and more significance. In doing so, it now belongs to the growing markets of the present information society.

The problem

The possibilities, which information systems offer, open a multiplicity of different application areas. The classical geographical fields can be seen as the main sphere of activity. In addition, within the area of the economy (geo marketing, navigation systems) information systems increase continually in importance, thus increases consequently the number of target groups. The increasingly deep interest in information systems calls for a clarification, which has the task of not only communicating the fundamentals but also reflect the complex efficiency of a GIS as also the difficulties of a present-day market. The doctrine, whose function it is to transpose in a didactically correct way the substantial and technical subject-matter is still in a developing stage, unable to convey the vast band width of combined geographic information systems.

Today, the art of conveying the subject-matter experiences a deep change and turns increasingly to the use of the Internet as a medium of communication. In the present-day information-society, locations no longer play a role. Elite American Universities are already preparing to take over Europe with the contents of their subject-matter. The Internet pushes the door open. Very soon, it will be possible to earn a Harvard degree all over the world, through the World Wide Web. Stronger efforts must be undertaken in this direction, if German Universities are not to become obsolete. This is made evident in existing projects, where the carrying out of parts of the study are done via Internet. Thus, computer professors at the universities of Kassel, Goettingen, Saarbruecken and Leipzig already offer their lecture on the web. The certificates for those courses can also be procured on the Internet. Nearly all the Universities conduct pilot schemes, which show the first beginnings of the virtual university.

The University of Applied Sciences Karlsruhe executes projects which are supported by the working-group LARS (achievement-oriented benefit systems in teaching) and the Ministry for Science, Research and Art of Baden-Wuerttemberg. In the course of the project, Development and didactical editing of teaching materials for the virtual university, the thesis (diploma) is integrated into this project. As a co-operation partner, the University of Potsdam places a main part of the textual, didactical and technical support at my disposal and is therefore the place of the thesis (diploma).

Aim of the thesis

In this thesis the basic rudiments of the GIS, which delineate the necessary, substantial teaching syllabus, will be compiled. This compilation will be didactically transferred and finally realized on the communication-platform of the Internet. Thereby, didactic concepts would be developed. In the forefront will be the transformation of the researched teaching and learning material of GIS into a learn and instruction module.

This module finds the possibility of integration in the frame of the project 'Virtual University' of the University of Applied Sciences Karlsruhe. Thus the module must be integratable and likewise expandable in a superior system. Thereby, the theme should possible be pervaded by a complex example, whereby the GIS manager will be trained and the extension of such a project will be graphically clear.

The GIS which consists of hardware, software and procedures captures area data, stores, manipulates, analyses, models and issues information in order to solve complicated planning and managerial problems, should be available in a didactically, incontestable form. A focussing on essentials is enabled through the exploration of the WHAT you can do with GIS and less with HOW you can operate it's tools. At present, the learning of operational skills has still a far too important status in education. In the future you will work as a result of the interoperability of components more strongly on methods and

specific aspects of application. Therefore you will be much better able to meet the necessary requirement of GIS as a decision-support instrument.

The module should be used supplementarily and for depth, even beyond the teaching events. Thereby, it can, on one side, supplement the teaching event (synchronous scenarios) or serve as follow-up or for self-study (asynchronous scenarios). Apart from it's employment in the initial teaching, the module can be used for the further training of externs; it could also be used in the form of presentation at conferences and exhibitions. Students, pupils, probationers and teachers who are being trained as such or who are engaged in further training, form the target group for this teaching and learn module.

The main points of emphasis of the module are an increased illustration of technical contents and the simulation of dynamic facts. The student's individual learning requirements must be taken into consideration by means of navigation (guided tour, reference book, user controlled presentation). Through the application of new media, an additional media-competence is developed. The encouragement of motivation and creativity of all concerned, which thus ensues, brings with it an increased effectiveness of the learn process.

Further, the success of the didactically, newly transferred teaching and learn methods through new media should be evaluated.

Operational sequence

The planning of the thesis runs in three parts, which chronologically as well as in substance delineate equivalent crucial points. Nevertheless, the execution of the thesis does not follow in a strict sequence. Parts of the conceptions are to be seen as the pivotal point of the thesis and thus overlapping. The parts could be subdivided as follows:

Part one:
- Market analysis of available training modules (structure, conversion, design, means of communication, acceptance, learning effect) and establishment of contact to universities
- Examination of new and modern forms of teaching and learning at universities
- Creation of a concept for the didactical conversion
- Integration of the example in the concept

Part two:
- Market analysis of geographic information systems with an outlook into the future
- The different fields of use for geographic information systems (establishment of contacts)
- Compilation of the bases of geographic information systems, which have to be used
- Editing of the essential and fundamental information with the help of the first part
- Editing of a representative example.

Part three:
- Production of the module, based on the communication media Internet with the help of standardised programming languages (HTML, cgi, Perl, Java, among other things.) and tools for the creation of animation (Macromedia Flash, Director, Adobe Premiere)
- Evaluation of success specifically and in general

Summary

The essential condition for the success of geographic information systems is appropriately qualified collaborator. Even if today the access to modern GIS programs is friendlier because of increasing graphical user interface, project managers have to bring apart from a classical technical background, also an extensive cartographic, methodical and data based knowledge. Today an additional qualification in GIS is expected from graduates of many classical job profiles, like landscape planning, the development and ecological planning, cartography and geodesy. For this additional qualification in GIS, numerous teaching curricula has not enough attention and universities are often badly equipped in the technical as well as in the personnel way. The principle of "lifelong learning" and the use of the Internet as learn medium stands in the forefront of the new and modern forms of teaching and learning. The implemented module integrated as part of a virtual university or as an independent training module by itself can assist to guarantee an optimal training or advanced training.