eHIS InterStore: E-Commerce With Environmental Data
Communicating (about) environmental data

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Topic: Environmental Communication

Introduction

Nowadays a lot of environmental data values are collected: on one hand to inform the public - like air pollution values -, on the other hand to have decision support for environmental projects – as during the planning of buildings and plants -, and last not least to fulfil public obligations – as is done for proof assurance at hydro power plants. For the last case Simutech has implemented the hydrological information system HIS^{3D}, which is used e.g. at the river power plant Freudenau/Vienna. It delivers all features necessary to load, administrate and evaluate hydrological data values, coming for example from several online measurement stations for water quality and quantity.

But in the past, too, there have been collected lots of measurement data, leading back some decades ago, mainly from public offices, but as well from civil engineers for projects.

Communicating (about) environmental data

In most cases environmental data values are sampled only for one purpose and for a one-time evaluation. And the measurement of environmental data values is very expensive (example follows). On the other hand those data values would be needed by other people, too.

Think for example of a civil engineer for hydrology, who implements a project about water quality in one district for the government. But in this district there are already measurement stations of a water energy company, which has collected the data values because of prescriptions around the building of the power plant. In most cases, these values (especially for water quality) are measured twice. The reason is simple: the missing of communication channels for environmental data!

It would be much easier and cheaper for the civil engineer to buy the data values (or evaluations with these values) from the energy company. And the energy company earns money for already measured data values.

Linking data provider and data customer

How can the civil engineer – let call him the data customer – come in touch with the right man from the energy company – let call him the data provider? OK, an experienced customer knows the right contact person, but in general this is the problem: the data customer does not know the data provider and vice versa. An if he knows him, it costs much time for the provider to put all the needed values together, fix them on a disk and send them to the customer – and in our times man power is the most expensive part in the show!

An easy access to environmental data

So let's use the blessings of modern IT: the data provider can sell his data values and many evaluations using electronic commerce. The data provider can deliver everything in an electronic format: the data values, evaluations, graphics can be sent in file formats or delivered directly over the Internet.

Using electronic data formats the data provider omits one of the great problems of E-commerce in general: the need for large delivery and shipping logistics. The data provider sends his evaluations and files to the customer per E-mail.

The data provider additionally goes the two next, deeper steps into E-commerce, which save him again time and money:

- Billing and payment is implemented as electronic payment, using e.g. credit cards.
- The customer relation ship is based on a fully automated mechanism.

The user selects the desired measurement points on a map in the shop internet side of the data provider (see Fig. 1). The map can be zoomed. When the user clicks at a measurement point or an area, a list of available data values for this area is shown.

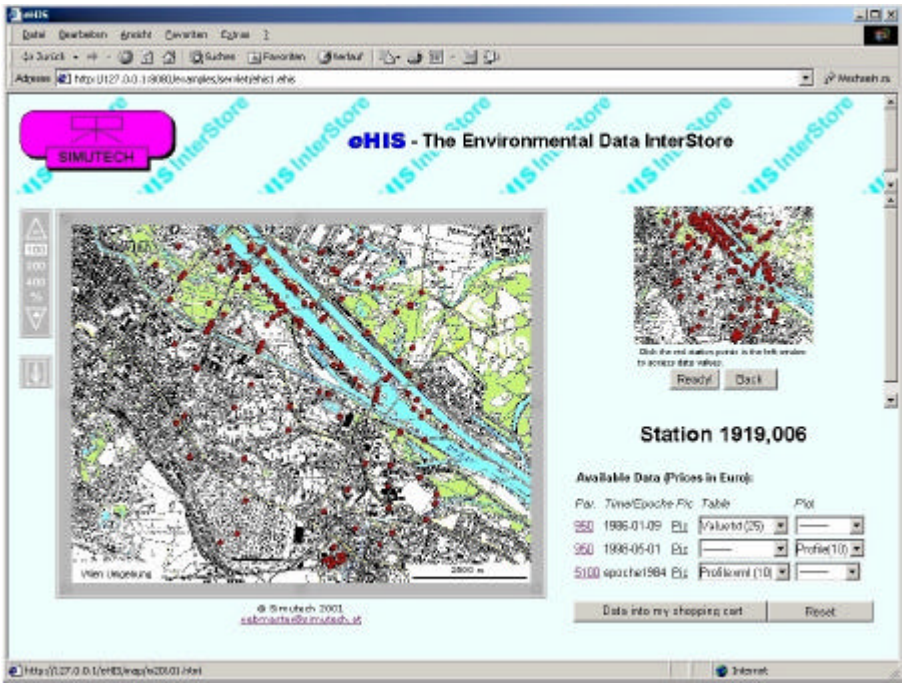

Fig. 1: User's view of the environmental data internet shop.

The customer can look at automatically displayed previews of the data, he is going to buy. He puts the data values and the desired formats and evaluations into his electronic shopping cart, enters his accounting information, like name, E-mail address, where the files should be sent, and his credit card information.

Then the system, we have named it "eHIS InterStore", computes all tables, plots and evaluations automatically and sends it to the customer.

And the money is remitted to the data provider's bank account automatically, too!

eHIS InterStore – the real tool

Simutech has implemented this whole environment in his tool eHIS InterStore. It consists of a database (which contains all data values and user information, as well as the meta data for displaying the list of available time series and curves for one measurement station)., an internet server (containing the web site and the shop with the displaying logistics), a server application (computing plots, tables, evaluations and performing the automatic shipping) and a desktop application for the data and user maintenance. The last two are both based on HIS^{3D}.

The data values can be input into the system in different ways, e.g. by ordinary, arbitrarily formatted data files, or even directly from online measurement stations.

The first real application is the installation for a provider of river profiles. In this case Simutech plays the role of a *DSP* (data service provider), which offers an all-inclusive solution: the data provider only sends the data values and receives the money; everything else is done by Simutech, including server and database hosting.

Legal and security points

In different countries the legal state of measured environmental data is very different; in Austria for example, the data provider has to offer water quantity data values for free to everybody, who wants the values to receive. Nevertheless in this case the data provider using eHIS InterStore does not deliver only values, but delivers a service: the formatting of the data in a modern and easy to use format (like XML), draws plots or performs evaluations – but everything is computed automatically, after the customer has ordered his formats and evaluations.

On the other hand – and this is due to the new E-commerce laws in Austria and the EU as a whole – we had to bare in mind several levels of security. This starts at the server security, which is implemented using firewalls, goes on with the security for the user (no credit card numbers are stored in the server, they are transmitted on secure channels and the user can even use the SET standard for paying), and ends up in the data security: that the user is secure to receive accurate values, that he receives the values at all, and that the data values itself are stored in a secure manner, not directly accessible. The last point is implemented using Java Servlets – nobody has direct access to the database.

Conclusion

E-Commerce with environmental data is the upcoming star on the horizon of treating environmental data. There are a lot of data values available, there are a lot of people, even in the general public, which want these values, if they can be accessed easily. And especially in our times, where governmental offices and every company have to save money and have to look for new money sources, this is a new and promising approach.