MIKE Zero – A Platform for Project Support

Lars-Chresten Ekebjærg, Software Development Manager
Shanghai Development Center, DHI-Denmark

Niels K. Olsen, Senior Software Developer
DHI-Denmark

Mizan Rahman, Senior Software Architect
Millennium Information Solution Ltd

Ma Weishan, Senior Software Developer,
Shanghai Development Center, DHI-China

Abstract

Software packages for mathematical modeling of environmental processes has during the last 10 – 15 years matured dramatically. From being mainly scientific oriented software tools over commercial off-the-shelf software engineering applications to now with the latest release of DHI Software almost productivity type of software products like e.g. Microsoft Office.

Generations of Hydraulic Modeling Software

Three generations of hydraulic modeling software can be identified:

1. The scientific generation
2. The engineering generation
3. The productivity generation

In the scientific period of the late 70's and early 80's the focus of the development was very much on proving the capabilities of the models. At the time the competition was physical modeling – environmental modeling experiments were usually made as physical modeling experiments. I.e. it was important to prove that is was feasible to use mathematical model. The development in that period largely followed the advances of the computer industry – the ever more powerful computers made it possible to make better and more refined mathematical models. The models of that period were typically developed as in-house tools by universities and other research institutes.

The focused changed during the late 80's. It now became more important to make generalized computational engines that could be applied for many different types of studies as well as providing an easy to use interface to the engines. The engines also became accompanied by a large set of utility programs – typically programs for visualizing data. This engineering period lasted until the late 90's.

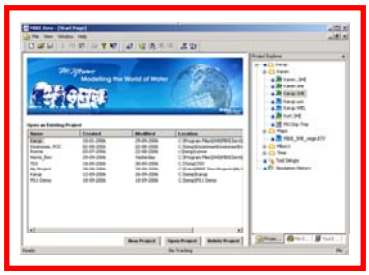
With the new millennium focus started to change again. Now it was not enough with powerful and capable engines and easy to use interfaces – they applications also had to be easy to deploy in project contexts. The engines had already become an integral part of most hydraulics engineering projects, had already proven their capabilities and had now become commodities – most engines of today have similar set of capabilities. The focus drifted therefore from engine-oriented modeling to integrated problem modeling, e.g. flood modeling.

Maturity of the products

The maturity of the latest generation of products has now reached a level where it is difficult for the vendors to differentiate their products based only on the scientific capabilities. This combined with the facts that use of mathematical modeling software for analyzing environmental problems is well accepted calls for the vendors to market their products differently.

The same trend has been observed with many other technical products, e.g. compilers. During the early 90's where the programming language C++ was defined, the companies Zortech, Borland and Watcom were the market leaders for C++ compilers. The three of them competed very hard with each other on technical merits – in particularly on supporting various suggestions to the C++ standard. In the mid-90's entered the C++ market with their Visual C++ product. They did not focus on technical features; but on the usability of the product – i.e. making it easy to use C++. Today they probably have more than 90 pct of the marked for C++ compilers for Windows.
It is very likely that the same will happen for hydraulics software products.

MIKE Zero 2007



With MIKE Zero 2007 DHI software has fully entered the usability generation with its water resource and marine software products. Previous versions of MIKE Zero were typical engineering products with focus on:

- Problem-oriented engines, i.e. different engines for different types of physical phenomena
- User interfaces supporting the engines

MIKE Zero 2007 introduces three new and very important features or concepts:

- The Project Explorer
- Workgroup support
- Holistic modeling

The Project Explorer provides the modeling engineer a central place to administer his work with the different parts of MIKE Zero. From the project explorer he can create new projects, access all documents belonging to the project – both data and setup files constituting the modeling work as well as project reports, e-mail correspondence etc. The Project Explorer also includes functionality for maintaining document meta data – data explaining the documents or data – and a log over all simulations performed in the project.

With the Workgroup Support MIKE Zero 2007 makes it easy to execute modeling projects involving more than one engineer. With previous versions of MIKE Zero the project group members had to manually place files on file shares in order to share data and there were no mechanism that ensured that data not accidentally was overridden. The Workgroup Support introduces a central repository were all data belonging to the project is stored – this includes data files, setup files and other types of documents. The users access the files from the repository by checking them out from the repository and later checking them in again. When a file is checked out, the system can be configured not to allow other people updating the file. The Workgroup Support also provides full traceability for changes made to the project files – who has changed what and when.

The last – but not least important – innovation coming with MIKE Zero 2007 is MIKE Flood. MIKE Flood represents a completely new approach to modeling by seamlessly integrating three different engines – MIKE 11, MIKE 21 and MOUSE – to provide a powerful flood analysis tool. This approach represents a step away from the specific engine-oriented modeling way where the user has to break down the project scope into engine specific subproject – with MIKE Flood the user can concentrate on the true project purpose.

Beyond 2007

In the releases to come DHI Software will focus more on the usability aspects of hydraulics modeling. Already now there are plans for e.g.

- Visual Project Explorer – an explorer where the user on a map can see the locations of all his data. The user will also be able to access the data from the map.

- Quick view of data from Project Explorer – the user can just right-click any data file in the Project Explorer and see the data rendered in a window
- Accessing audibility information directly from within MIKE Zero – with MIKE Zero 2007 the user has to open the repository management tools in order to inspect the change records of the data and setup files. This will be integrated into the Project Explorer.