Software to Teamware: Leveraging Knowledge in Real Time Through the Internet

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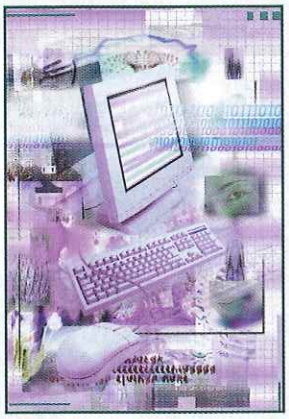
The value of knowledge is beyond question. Technology, information, and knowledge are expanding at an unprecedented pace. With different disciplines in the oil and gas industry, what is science to one discipline is "black magic" to another; a perplexing concept to one group can be practical knowledge to the next. For example, to deal with the complexities of drilling a difficult well, knowledge of drilling engineering, geology, geophysics, rock mechanics, seismic interpretation, and petrophysics is required. It is not feasible for one person, regardless of experience, to have all the knowledge necessary from each discipline to complete the well plan successfully.

Experience has shown that successful drilling requires knowledge about rock mechanics. To train software licensees, very different groups within the same company are brought together (generally, geologists and geophysicists with drilling engineers). Often, drilling engineers have little contact with geologists or geophysicists. The value of the resulting interaction goes beyond the obvious increase in use of expensive data and information to the permanent exchange of knowledge that often is held exclusively within the confines of one group. A language gap exists along with the technology gap, as experienced by integration of drilling engineers into the authors' company. Often, breaking through barriers between disciplines can be more difficult than drilling through granite.

Where does the burden of practical-knowledge transfer lie? With upper management? With individual business units? With individual practitioners? With suppliers of internal or external training programs?



The authors believe that, in part, the burden lies with innovators of cross-disciplinary software technologies and services, "teamware." Developers must have rigorous knowledge of both disciplines to spare the scientists and engineers of each discipline the task of learning the other practice. Designing software to bridge the knowledge gap between two or more very different scientific cultures is a challenge. It must be able to translate between several technical languages. By design, it must clearly deliver added value and benefits; otherwise, no group would have a compelling reason to change its internal process.

Cross-disciplinary problems present an opportunity to develop software products that enable a high level of creativity in the problem-solving process. One careful consideration in the development of cross-disciplinary software tools must be the user interface where the user can visualize complex data and processes, where tools are provided that enable exploration of solutions, and methods are available to visualize evaluation of limits and performance.

Another important aspect of cross-disciplinary-software development is a process-mapping program that involves equivalent expertise from constituent fields. This process can be similar to that of mapping across company boundaries in supply-chain management of e-commerce initiatives. Discussions among peers about the functionality and accuracy of software tools need to be related to the developer at all stages of product development. Subjecting the software to rigorous testing and case-study evaluation will eliminate bias toward a particular practice.

The future of knowledge distribution is the Internet. Through the progression from hypertext markup language (HTML) to Java, the Internet has been transformed from an information-delivery mechanism to an interactive medium for collaboration. Desktop software is giving way to Web-accessed applications. This evolution will expand the availability of sophisticated, cross-disciplinary tools to a broader market, and, with this, the practical knowledge of a discipline will expand into other domains. In addition to Web-based-software delivery, the Internet can host on-line tutorials and distance learning. Through shared-screen interaction, companies can deliver virtual consulting services. Through portals and trading platforms, more collaboration will be possible.

The most significant value of the Internet will be the breakthrough in how cross-disciplinary decisions are made. Knowledge will be tapped from experts worldwide at the exact time the decision is required, reducing logistical setbacks and guesswork. In the oil and gas industry, where delays in decisions related to well planning or production can cost hundreds of thousands of dollars daily, leveraging knowledge has tremendous value. Leveraging knowledge through the Internet will become mission critical, and those who do it will prosper. JPT

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