Data & Knowledge Management: Progress is Inevitable – Timing is E-verything

Greg V. Hess, Director Business Development & Technology, Kelman Technologies*

Summary

The hardware, firmware and software growth continuum will continue to breed efficient tools for vast numbers of processes, eventually progressing toward an on-demand, one-click society.

This premise has been apparent in numerous examples from recent years. As information becomes increasingly digital and appropriate accessibility follows suit, the results should drive the ability to "do more with less." In this working smarter, not harder/anti-zero sum economic e-topia world, the extra time will allow everyone to enjoy life more fully.

Introduction

Three pivotal areas that influence this growth continuum in the oil and gas profession are:

- Digital desktop delivery;
- Secure, accessible storage; and
- Economic advantages for digital assets.

Computing standards and the standards adoption process is a two-edged sword in terms of accelerating this progress. There is an important role for public associations, such as Public Petroleum Data Model Association (PPDM) and Petrotechnical Open Software Corp. (POSC). The ideal goal of most software and hardware development is to reach the critical mass and push the product to a commodity level. It seems obvious that the efficiency continuum would progress at a much faster rate if no standard wars existed. The reality is that doing things differently is healthy and should be respected.

Going back to the commodity push, it is apparent that Internet Explorer™ has become the standard for the Web browser market over the last several years. Users selected it because it works better, but in conjunction, it is also fair to say that Microsoft's marketing machine distributed the browser so effectively that almost everyone now has access to it. With that example in mind, it is important to understand that change, in itself, and associated technology acceptance is the main stumbling block in migrating toward increased efficiency.

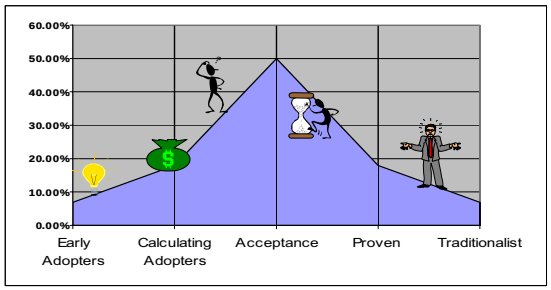


Figure 1: Technology Acceptance Curve

Management is obligated to approve budgets and move their companies forward with appropriate technological investments. The market is flooded with software applications, firmware development platforms and unlimited hardware choices. Making the wrong choice can be detrimental, but making no choice can be even more detrimental. Using total cost of ownership (TCO) and return on investment (ROI) models are highly recommended, and most vendors are quick to show how their products positively influence TCO and ROI. In terms of the geophysical world, transforming physical assets to digital allows a recognized book value increase to that asset. The idea of investing in technology to make a direct improvement to the bottom line is a key factor in strategic business decision making.

Digital Desktop Delivery

Getting applications to the Web and having them integrate to collaborative products is still on the forefront of many development teams. One does not have to look very far back to realize that the desktop has improved work efficiencies. A word processor is certainly much better than a typewriter (given the choice, who would take a bottle of that white correction fluid gunk over automatic document spell checking?). A drastic improvement in the ease-of-use factor has recently occurred with the advent of the Web browser and the connectivity of the Internet–presto chango, we have market hysteria followed by a significant "dot.bomb." The enthusiasm shown in relation to the Web and e-commerce, and all the grandiose promises, will not soon be forgotten.

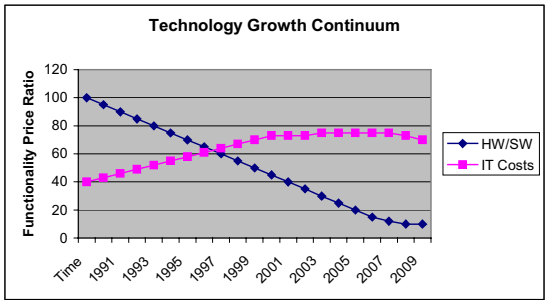


Table 1: Events such as Y2K and dot com will continue to influence the Technology Growth Continuum. Series 1 represents the cost vs. functionality of hardware, firmware and software over 20 year time span. Series 2 represents the overall costs of Information Technology – dominated by labor costs.

Accessing information tailored to the client will increasingly become the norm, while simultaneously, where that information comes from will matter less and less. Once a user logs on to his work system, prefetch caching and predictive modeling software will quickly migrate all necessary information to complete the task from distributed storage. This delivery system is being developed under the aegis of knowledge management. With the complex and multidisciplinary nature of the oil and gas industry, it is logical to compress processes by integrating information into a collaborative approach. The desktop progression will be challenged by the attempt to bridge the virtual desktop with business requirements. This approach supports a future where a combination of information from electronic warehouses is coupled with internal information to provide significant improvement to the bottom line.

Sharing pieces of information at the desktop through improved infrastructure management and connectivity will provide significant benefits to those companies who can leverage an early adopter position in this envisioned desktop of the future. The base assumption is that the power of the desktop will progress and drive the underlying applications to the preferences of the desktop client.

In an article in the November 2001 issue of *The American Oil & Gas Reporter* (page 66), Jan Hay with Excalibur-Gemini Group Ltd. made the following statement concerning desktop integration with good data management practices: “Blending these carefully planned and executed practices with the right software or online system has netted as much as 400 percent improved productivity with 10 percent fewer staff.” Indeed, speed of delivery to the desktop and reduced costs associated to ceasing the “sneaker net” approach to transporting data has lead to substantial day-to-day productivity gains. The neutral digital library will increase availability for data collaboration with long and short-term storage options. The ability to pull large raw field files to a workstation and run a variety of seismic processes is available today. That work can then be placed back into the library with an information tag on it, and made available to others through business relations. This data asset can also be considered a revenue generator by taking advantage of asset value improvement and revenue realization by putting it on the open market. Taking the time to analyze the value proposition of assets and then making the up-front effort in planning the organizational cleanup of the data is critical to building a foundation for success.

Secure, Accessible Storage

A key component of the storage industry is based on media dependencies. Assets stored on older media such reel to reel tape are at risk. On one hand, the equipment needed to read older media is quickly becoming obsolete, and on the other, the actual life of the media is in jeopardy. By placing media in a digital library, these dependencies can be eliminated.

With digital storage, the industry has seen continuous change with drastic price reductions and more complex structures. At what point does it make the most sense to put digital data into a storage facility that guarantees accessibility, safety via backups and media independence? The answer to that question should be based on a direct ratio of the projected value of asset to the cost of digitizing. Critical mass and associated economies of scale will allow digital libraries to maintain superiority in storage, connectivity and security.

The technology for storing large volumes of data in a digital library with fiber connectivity and desktop delivery has been available for several years, but the industry has been slow to embrace it. Some reasons for this reluctance are a lack of confidence, unwillingness to part with the asset, concern over security, format changes, digital accessibility, lack of standards, and poor recognition of “short-term pain for long-term gain.”

Business efficiency drivers, such as total cost of ownership, will lead the oil and gas industry to the inevitable outcome of a digitized world. One of the most significant challenges will be assuring that the assets are secure and safe, both in transport and when idle in the digital library.

Anadarko Petroleum Corp.’s Will Morse provided an excellent discussion of security issues in *The Reporter’s* November 2001 issue (page 56). Morse emphasized the key fact that everyone within an organization is responsible for computing security, stating: “It can be tempting for oil and

gas companies acting as e-customers to treat security problems as an e-vendor concern. This is not wise." The bottom line is that management is obligated to provide policy to assure that all employees adhere to proper security.

There will always be risk associated with progressive decision making for security and access. A business decision, for example, might be to purchase basic oil field supplies using business-to-business (B2B) transactions directly between machines. Integrating this type of process will require servers supporting inventory, accounts receivable, and so on that will be separate from the Web server, which means a single firewall cannot be limited to only passing HTTP (hypertext transfer protocol). Without proper procedures and expertise, the integration of this business decision can place an internal network in serious jeopardy. Does this company have a plan in place if an intrusion is detected?

In the geophysical digital library environment, transactions to and from the database are best handled with extensible markup language (XML), a self-defining format (data files that contain both structural definitions and data content) that creates a new opportunity for sharing and transmitting data in a semantically accurate and consistent way. Database model standards are in place from PPDM and POSC, with initiatives coming from both organizations to provide standard schema for data exchange in XML. The data exchange standards will allow companies to store varying volumes of data, get a copy when it is needed, distribute copies to partners or purchasers, and work with that data in a variety of technical software applications (information on the use and standards associated with XML is available at www.ppdm.org).

Digital Assets

One man's used asset can be another's success. Digitizing a seismic asset for a company can be a large undertaking. A data brokerage company recently made 2.5 terabytes available to the open market with an electronic delivery process for sales in less than five months. The go-forward advantage is that it will now take minutes rather than days to deliver a seismic sale.

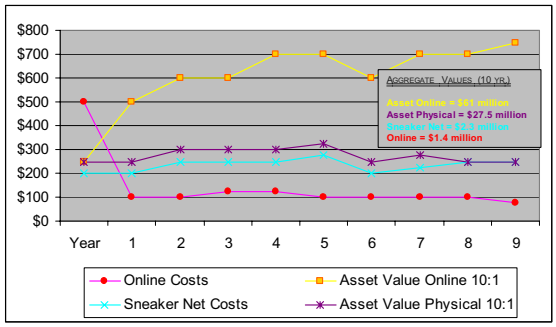
This advantage is also applicable for exploration and production companies that have leveraged digital libraries. The typical cycle for getting data to the geophysical workstation requires a request to a storage facility that makes a copy of the requested data and then ships that data to the client – a timeframe that usually takes days rather than minutes.

Since a good portion of seismic data remains stagnate, but definitely still worth retaining, it makes solid economic sense to store this data outside of the internal network and retrieve it on demand. A digital library that integrates the knowledge asset contained in seismic data will retain the value of the seismic asset over time.

Depending on the targeted zones or areas of interest for an exploration company, it may be advantageous to place the seismic data asset on the open market. The premise for this trend is, of course, management's obligation to increase shareholder value. As long as strategic competitive advantages are not lost in the process and revenue is gained exploration companies have been making this move more often.

The outcome of this market shift is the "broker-owner." Seismic brokers have become asset owners by investing significantly in block seismic purchases with the intent of reselling that data to the market at a profit. This type of arrangement allows the original owners to gain revenue and maintain access to the asset. This model has increased the commodity nature of the asset and has been accused of flooding the market. Although on the open market, the value of that asset is substantial and the opportunity to gain significant revenue is a reality. Archiving companies will often work with data owners, either brokers or E&P companies, to structure a risk-sharing approach that provides costs for archiving within the revenue from the first digital seismic sale.

Operators should conduct a value analysis of assets within a company, identifying those assets that can be digitized (hint: seismic is a good place to start!) and establishing a costing model to activate the plan. The "refined" asset should be evaluated in terms of the original investment, past amortization schedules, new costs to place the asset into a digital library, and value analysis for the new improved asset. Applying real numbers to this theory allows for a significant bottom-line increase on the balance sheet as demonstrated in the graphic below.



Conclusion

In conclusion, progress is a wonderful thing, but investments in technology should be evaluated from many perspectives. Making the decision to store data in a neutral digital library with an up-front standard of completeness can be accomplished with a well thought-out plan. Timing is "e-verything", especially when strategizing about desktop delivery and securing information systems and economic opportunities

Greg V. Hess is director of business development at Kelman Technologies Inc. in Calgary, Alberta. He serves on the PPDM XML Exchange Committee, the PPDM board of directors, and the advisory board to BP Technology Centre-SAIT. Before joining KTI last year, he was president of Strata Web Systems, A Petroleum Place Company. Previously, Hess had worked as an independent consultant, director of client services at DOCU.MAX Enterprises Ltd., manager of operations at ImageMatrix Corp., western regional sales manager for Optika Imaging Systems, an instructor of business administration at California Lutheran University, and a high school social sciences teacher and basketball coach. He holds an accounting diploma from Lethbridge Community College, a bachelor's of education from the University of Calgary, and an M.B.A. from California Lutheran University.