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Industry Panel on Human-Computer Interaction of Spatial Technologies in Business

A picture is worth a thousand words (perhaps a million bytes?). Cognitive processes are based on our intuitive capacity to recognize patterns. Spatial technologies provide a window through which data can be visualized. This can range from a simple chart generated by data in a spreadsheet to an intricate web-based application that serves an entire group of business functions. Correctly configured, it can provide critical decision support throughout an organization.

Over the last 20 years we have provided spatial technology services to municipalities to help manage their jurisdictions; public utilities that supply natural gas, electricity, water and waste water services; real estate for analysis of metropolitan markets; healthcare to track infectious disease, and recently management of sales territories for a consumer products company.

Five aspects of our experience may be of interest to this discussion. First is the difficulty of explaining benefits to a potential user. Second is in gaining user acceptance by use of simplified user interfaces and standard convention in the graphic and reporting interface. Third is the option of meeting the needs of a specific unit within an organization or offering an enterprise solution. Fourth is the centralizing force that spatial technology brings to IT in its sharing of information throughout an organization, the resulting improvement in communications, and the recognition of data redundancy and duplication of effort that appears to be the norm in most large organizations. Last is an interesting side benefit of data quality control that becomes an issue in using the medium.

I was Dr. Pick's research assistant at the University of California, Riverside in 1984. My thesis was based on using GIS for market segmentation of municipal jurisdictions. Neither my marketing nor my urban planning professors could see the connection at the time, and Dr. Pick was kind enough to chair my MBA thesis. Who could have guessed that I would survive the next 20 years making a career out of it? These were the early days of GIS, but we continue to encounter skepticism from the very people that often can benefit most from these systems. People, who are otherwise dedicated to their professions, sometimes resent simplification of their work; almost as if it is demeaning of their expertise. Obscurity is often mistaken to be an ally of job security with transparency representing the enemy. Invariably, these same persons become the biggest champions of our systems once they are implemented.

Users can sometimes be reluctant to appreciate spatial output. Over the years, we have learnt that the first step to gaining acceptance is to replicate conventions that users are accustomed to, and to simplify the user interface. This is especially true for engineers who are used to obtaining complex information through the graphic medium. Cartographic convention has evolved over thousands of years. On the other hand my daughter-in-law, who has great difficulty in using a Thomas Brothers' map book, uses the geo-navigator in her car with the utmost of ease. The map orients itself to the direction she is traveling. Left is left and right is right.

Two alternatives exist in introducing the technology to an organization. The first is in targeting a specific user department, such as marketing in a financial services organization, or say, public works in a city. Given the option, we prefer the enterprise approach. To be contracted to conduct a spatial audit of an organization's data infrastructure by studying enterprise-wide business and functional requirements. This allows us to recommend a structured spatial approach to the creation of an organization-wide decision support system.

Spatial technologies offer the potential to share data as layers of information both in terms of content and in terms of ownership and responsibility. The scope for creation and recreation of duplicated information within any large organization is significant. Visualization of overlaid data categories on an enterprise scale forces users to recognize the utility of data normalization and the need to eliminate redundancy. Spatial methods allow users to customize individualized perspectives of organizational information. The basis is a drill-down capability that views common information shared in a multiplicity of relational database formats typically maintained within an organization.

Finally, there is an interesting by-product. In visualizing analytical relationships between different data layers, inconsistencies are clearly perceived, and the quality and accuracy of data becomes a serious issue. We are getting used to taking the digital world for granted. As IT applications become more and more comprehensive in scope, the need to ensure data integrity will become of prime importance.

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