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We recently visited the Walker Art Center in Minneapolis to view an exhibit of the engineering drawings, conceptual art and other items associated with the conception, design and building of Disneyland and Disney World. It was a fascinating exhibit for me, having grown up in Iowa, as far away from the Disney empires as you could possibly get, while simultaneously awakening a flood of memories for my wife, who had the luxury of growing up in Southern California, immersed in the Disney culture. That culture, unlike the high-G force, thrill centric theme parks of today, included a very large educational component to accompany the family oriented entertainment. One of the primary manifestations of that educational vision, Tomorrowland, turned out to be one of the Disney team's greatest ongoing challenges. It seems that every time they would build a futuristic attraction, it would be quickly antiquated by the fast moving advancements of everyday life.

We face the same problems today in data warehousing. As soon as we build a solution to what we think the problems are, the problems change, trivializing our solutions, and requiring a new effort to meet the fresh challenges. Pity the poor technology vendors who are caught in this never ending cycle, their goal ever receding into the distance. Just to keep them from getting complacent as they close in on solutions to yesterday's problems, and to help you best position yourself for tomorrow's challenges, here's a peek into the very near future of data warehousing:

It all starts with

- **ERP LegaMarts.** In the coming months the ERP vendors will flood the market with pre-packaged, turnkey, non-integrated, non-architected data marts and so-called data warehouses piggy backed onto their proprietary relational data sets. These stovepipe DSS resources will have no idea that any of their peers exists in your enterprise, and will not reflect your enterprise architecture, only their own egocentric set of semantics, business rules, and structures. While at best providing a nicely packaged source of data from the 10,000 table world of the ERPs, and at worst forming a balkanized world of politically entrenched LegaMarts, this trend is unstoppable. This phenomenon will drive

- **Mass Commoditization.** Data warehousing is about to get very, very inexpensive, very, very fast. Templates to connect ERP applications to data marts and data warehouses; the back-end "plumbing" of data extraction, mapping and loading; OLAP / BI (Business Information); and data transformation and integration will all become commodity items, at very low or free price points. The data warehouse market itself will continue its expansion, becoming accessible for the first time for the majority of mid-size and small companies. While the hair shirted denizens at the peak of Masochistic Mountain will retain their chant of "if it isn't expensive and painfully difficult, it can't be good," the rest of the world that lives below the snow line will enjoy the fruits of a mass market: more for less. This wholesale re-mapping of the marketplace will be driven by the awakening of the

- **Great White Shark.** Microsoft's entry into the ocean with NT 5.0 and SQL Server 7.0, along with it's free and extensible DTS (Data Transformation Services), the low cost Plato HOLAP server, industry standard Meta Data repository, ubiquitous Excel front end, Back Office tools and servers, and other Microsoft technologies, will completely rewrite the rules of data warehousing. While they most assuredly won't get it right in the first version, and it will take time to be fully

industrial strength, it will eventually happen. And it will happen sooner rather than later. It's very challenging to maintain high growth rates in a large organization such as Microsoft, and the rapidly growing data warehouse market, with its projected size of \$13 to \$20 billion dollars by 2000, attracts a lot of attention from a company with monopoly market share in its traditional, mature markets. As we saw when they applied their seemingly limitless resources to address the internet, when Microsoft wakes up to a market opportunity, things happen very quickly indeed. The use of free or very low cost, widely available Microsoft components and technologies enables the rise of the

- **Plankton Players.** In limitless numbers, every would-be data warehouse warrior with a computer and a "Visual Basic for Dummies" book will be building turnkey data mart solutions to business problems on top of Microsoft components. Thousands of transformation modules to extend DTS along with Plato templates and Excel Macro bundles targeting common business problems will flood public FTP servers. Suddenly, end-to-end, gift wrapped and tied-up-in-a-bow solutions to specific business pain will be a download away at shareware price points. This will drive the rise to supremacy of the

- **Application Centric Warehouse.** These application specific, business pain driven data warehouse and data mart systems will come to completely dominate the market. Generalist, "let's build a big solution and go look for problems" data warehouse initiatives will continue their rapid extinction as business management continues to seize the reigns of the data warehouse wagon and steer it toward the ROI based promised land. Quick relief of specific business problems with measurable impact on the enterprise will become the prerequisite for data warehouse and data mart system funding. Incremental architected data marts delivering specific solutions to specific business pain will continue their march to dominance as the route to the enterprise data warehouse. Due to the nature of the business driven environment, these data centric data mart structures will quickly evolve into

- **Business Solution Servers.** As the technological components of data warehousing become commodities, the "value add" of data warehouse and data mart systems will be based on business pain relief. A new creature will evolve in this context: the Business Solution Server. The BSS contains not only the data, but also the business rules, thin client access and analysis capability required to solve specific business problems, such as campaign management, demand planning, customer value analysis, etc. The BSS will package data and business logic into sharable, easily extensible solution objects that can be joined together to quickly assemble and deliver pain relief for rapidly changing business environments. This requirement for total end-to-end packaged solutions will drive

- **Rapid Market Consolidation.** When Microsoft introduces SQL Server 7.0, with free integrated data extraction, transformation and loading, along with low cost HOLAP later this year, then all the other database vendors will need to have comparable capabilities in order to maintain "checklist" parity. The ability of the Plankton Players to quickly stitch together targeted horizontal and vertical solutions at extremely low price points, and the business driven nature of the market, will force all players to offer end-to-end application specific solutions. In this high speed consolidation of "pieces of the pie" vendors, the small fish will be rapidly consumed by the medium fish, who will be rapidly eaten by the big fish in a feeding frenzy rivaled only by a cow wandering into a piranha-filled stream. The resulting tight integration of core technologies, such as the mapping of database logical data location to physical device track data location, will enable

- **Data Subsystem Intelligence.** Instead of clogging I/O busses, CPUs and general purpose networks with data extraction, transformation, replication and distribution, data, along with its transformation, movement and management, will live exclusively within the data storage subsystem, its backbone and its dedicated, high speed interconnect networks. Current high-end physical track replication technology will be quickly supplanted by commodity priced logical to physical replication and data transformation at lightning speeds and massive volumes. Current examples of 40-hour replication times reduced to five minutes on a physical track basis will add heterogeneous sources and targets and data transformation over the self contained, low cost, shared and interconnected enterprise storage systems. This ability to handle the back-up, restoration, replication and distribution of huge data volumes at very high speeds will enable widespread expansion of

- **Data as Revenue.** While the current view of data warehousing is primarily as an exercise in enabling technology, tomorrow's view is primarily data as a revenue center. The resale of access to huge repositories of integrated, scrubbed, historical, detailed and aggregated data will rapidly expand beyond the limited number of supply chain examples existent today to widespread use by business and public users. The radical and rapid cultural shift for data warehouse teams from technocrats to value chain keystones will drive mass proliferation of the

- **Thousand Yard Stare.** Corporate teams and vendors alike will share the shell-shocked look of a data warehouse software marketing manager I recently interviewed. When I asked him how his company was handling the cultural aspects of having the goal line recede into the distance just as the entire team was ready to spike the ball, he stared off into a non-existent distance and muttered "The speed of the market is just incredible ..."

Welcome to Tomorrowland.

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