Intelligent Agents for Competitive Advantage

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INTRODUCTION TO MEASUREMENT AND REPORTING SYSTEMS

Since 1494 with the appearance of the double-entry accounting system, developed by Pacioli, those involved in business have attempted to measure business performance in an organized manner. As many accounting functions are repetitive in nature (payroll, inventory, etc.), accounting was one of the first business disciplines to which early computing technology was applied. Today we see comprehensive enterprise models that have been incorporated into ISO Standards in an attempt to build quality, capability, and uniformity into business enterprise systems. Supporting these models and systems is an effort to also launch the Extensible Business Reporting Language (XBRL), such that metadata models gain uniformity and make business information more readily accessible across systems and enterprises.

This article addresses a concept for transitioning from an "end of period" reporting model to one based on "push agents" delivering to the pertinent manager information that is key to managing the enterprise in near real time in order to gain substantive competitive advantage. The high-level model in Figure 1 demonstrates the suggested movement from an "end of period" model to an automated push agent model, with an intermediate step already utilized in some enterprises, that is a "dynamic query model."

Comparing where we are today in business reporting to that of network reporting, Computer Associates, perhaps the first to offer comprehensive, automated agents that forewarn of impending network trouble introduced some time ago neural agents that measure current states as they change against historical databases of past network activity in order to discern conditions that may be reoccurring and are similar to those that caused problems previously. Such detections may involve likely equipment failure to circuits becoming overloaded, with automated warnings and recommendations as to corrective actions being sent to the appropriate manager via the chosen message system (e-mail, voicemail, paging, etc).

Such "heads-up," automated, near-real-time reporting of impending conditions permits network operators to be proactive in addressing problems before they occur. Such real-time network feedback requires an enterprise to develop "key performance indicators" (KPIs), or key measurements that it wishes to track against to plan and run the enterprise. Here, many products are on the market that address the identification of such KPIs and go by the names of "Cockpit Charts," "Digital Dashboards," and "Balanced Scorecards." The secret of the balanced scorecard and the reason it has gained such wide acceptance is primarily due to the fact that it allows organizations to reach their full potential by putting strategy—the key driver of results today—at the center of the management process in organizations facing uncertain equity markets, an accelerating pace of change, and increased expectations for productivity and results. The comparative characteristics of reporting models are listed in Table 1.

Instead of waiting for end-of-period reports, critical measures can be monitored in near real time as a function of the KPIs assigned to each measure, as seen in Figure 2.

Figure 1. Migration of reporting models for competitive advantage

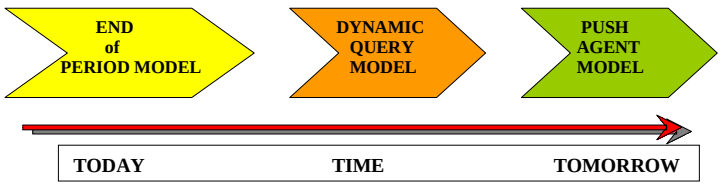
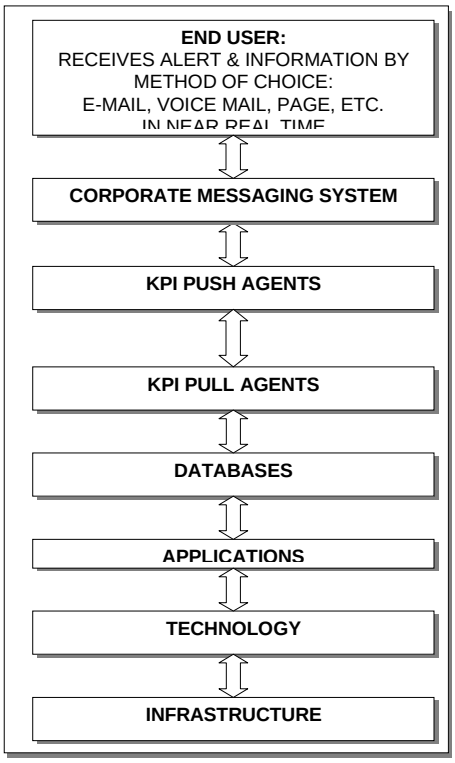


Table 1. Comparative characteristics of reporting models

Type of Reporting	End of Period	Dynamic Query	Push/Pull Agents		Pull/Push Agents
Timeliness of Data	Stale	Near Real Time	Near Real Time		Near Real Time
Potential for Managerial Filtering	Yes	No	No		No
Delivery Choice	No	Not Typically	Yes		Yes
Alerts	No	Not typically	Yes		Yes
Silo Issues	No	Possibly	No		No

Figure 2. Simplified intelligent agent push model



BENEFITS OF EMPLOYING A BUSINESS MANAGEMENT PROCESS INTELLIGENT AGENT TOPOLOGY

Erik Thomsen, Distinguished Scientist at Hyperion Solutions Corporation, defines the term "agent" as:

"…a solution-oriented ensemble of capabilities including natural language processing, autonomous reasoning, proactive computing, discourse modeling, knowledge representation, action-oriented semantics, multimodal interaction, environmental awareness, self awareness, and distributed architectures."

He describes the following five areas where the potential impact of intelligent agents on the logical functionality and physical performance of traditional business analytic systems can be positive (Thomsen, 2002):

- Agents should help move business intelligence (BI) from being application centric to being truly process centric, and provide a single point-of-access to distributed information. This is operationalized in intelligent agent solutions by self-description of individual modules that is made available to the system of agents as a whole, and a user's personal agent being able to query all librarian agents responsible for various data sets in an organization for specific information.
- An active dialog is needed between the software and the user to seek out and learn user wants, and be able to anticipate/predict user wants in the future. Thus in addition to tailoring client layers to individual users and enhancing BI applications with options and preferences, the software/intelligent software agent plays an active role in querying the user.
- As attention shifts to business process as much as data states, the number-centric BI applications will have to provide more integrated text and multimedia handling.
- Intelligent software agents can provide personal analytic "coaching" for higher-level business processes by observing, learning about, and interacting with users. Agent applications within an overall BI/Business Process Management (BPM) framework can be deployed to encode horizontal and domain-specific analytic knowledge.