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Info*Engine: Optimizing Critical Processes
and Users — Across the Supply Chain

Preface

The market for Enterprise Application Integration has taken off over the past 12 months. In fact, Aberdeen research has shown a dramatic three-fold increase in the number of EAI suppliers — and technologies — in that short time. Most of these suppliers have been able to effect an application integration model that allows enterprises to integrate their corporate application portfolio. Some have started to talk about future intent to extend beyond the enterprise barrier and integrate applications across the supply chain. However, today's reality is that when most EAI suppliers discuss supply chain application integration, they're actually referring to the integration of Advanced Planning and Optimization (APO) solutions with the corporate application portfolio — that is, until now.

Now, auxilium is set to enter the EAI market fray, with its Info*Engine technology, as a serious contender. auxilium has recently emerged from its incubation phase where it refined and extended its technology and secured an impressive set of Fortune 50 global manufacturers as early-adopters. Among auxilium's differentiable EAI market attributes are the capabilities to implement integrations across applications *and* across companies — and, more notably, to support the creation and deployment of supply-chain business processes that derive from the integration of those multiple underlying applications. Aberdeen believes auxilium is first in the EAI market to extend the power of advanced application integration technologies into the realm of new business process creation.

This *Profile* examines auxilium's business value proposition as it applies to addressing the requirements of high-end global manufacturers and the unique complexity of their supply chains, the Info*Engine integration technology, and its extended capabilities to support the creation of new Internet-based, supply-chain business processes.

Executive Summary

auxilium, a business unit of Parametric Technology Corporation, is well positioned and poised to fuel a rapid growth trajectory. To date, auxilium has gained significant representation and more than 35,000 user seats in Fortune 50 manufacturers in the Automotive, High Technology, and Aerospace and Defense industries. These industries are characterized by extended, multi-company product development cycles as well as complex manufacturing and distribution supply chains — often comprising hundreds of suppliers, trading partners and resellers. Proof of auxilium's technology and capability is its premier list of early adopters, including Boeing, Ericsson, Ford Motor Company, General Motors, and Lockheed Martin. Aberdeen believes that Info*Engine can be particularly effective as part of an on-going enterprise integration strategy to link business processes across packaged or in-house client-server applications, host-based legacy systems, and Internet e-commerce or other supply-chain-based sources. Information and data-level integration is supported through an extensive number of integration adapters for internal and external data sources and even Web-content sites — basically anywhere business-critical data resides.

auxilium's Info*Engine is a solution that includes a server based architecture as well as powerful interoperability and process integration capabilities. The solution makes use of sophisticated integration technologies such as a unique implementation and exploitation of eXtensible Markup Language (XML). Info*Engine's use of XML overcomes the real-world issue of data value semantics between disparate systems and provides a straightforward means of meeting complex application-to-application, application-to-data, and data-to-data integration requirements. The visualization of Info*Engine-derived processes is delivered through standard Internet technologies and protocols to thin client desktops that the company refers to as "WebTops". These WebTops provide for both the direct Web-enablement of existing non-Internet-ready applications and the delivery of new business-process-based user interfaces that are made possible through the back-end Info*Engine application integration. Aberdeen finds that auxilium offers a new opportunity for business management and IS buyers: a solution that allows for business process *and* application integration using a powerful common infrastructure and extensible, scalable technology.

Market Position

Aberdeen research has indicated that one key criterion for EAI market success is the development of key alliances. The recent acquisition of auxilium by Parametric Technology Corporation takes this critical success factor to a new level in the EAI market space — *strategic technology and business acquisition*.

Parametric Technology Corporation (PTC), headquartered in Waltham, Massachusetts is the acknowledged market leader in delivering computer-aided design and computer-aided manufacturing (CAD/CAM) technology for industries with intensive Product Data Management (PDM) requirements. PTC seeks to extend its value by providing a comprehensive enterprise information management solution that includes the Web-centric, Java-based information management technology of Windchill, comprised of Windchill Information Modeler, Windchill Foundation, and Windchill Lifecycle Applications Suite. By adding the advanced EAI capabilities of Info*Engine, Windchill's ability to integrate disparate PDM, ERP, database and legacy systems will be greatly enhanced and accelerated. With the addition of Info*Engine, PTC will now be able to provide a comprehensive, integrated suite of applications that manage all phases in a product's life-cycle — from concept and definition to production, service maintenance and retirement in a CAD-neutral environment.

The Parametric acquisition also puts auxilium significantly ahead of the EAI pack in terms of sales resources and distribution channels; availability of deep R&D investment pockets and expertise; and access to a Fortune-100 clientele that competitors can still only dream about. Amid the EAI start-ups there was already concern over the EAI market influence of the Enterprise Business Application suppliers (Baan, JD Edwards, Lawson, Oracle, PeopleSoft and SAP). Now they'd be advised to be equally concerned by the potent combination of PTC and auxilium.

What to look for in Enterprise Application Integration Solutions

Enterprise Application Integration solutions, such as auxilium's offerings, represent strategic software that integrates and moves information between legacy applications, databases, client-server systems, and the Internet. These tools become vital to IS, especially when the following mandates exist:

- New applications/systems must be developed and deployed;
- Information must be delivered reliably; or
- Flexibility must be guaranteed for long-term success.

Aberdeen believes the following considerations become paramount when selecting an Enterprise Application Integration solution:

- *Extensibility and reusability.* The integration process should be extensible and reusable for the project at hand as well as for future integration projects. The tools should be designed in such a manner that users can extend the tool from a per-project basis to an ongoing enterprise-wide usage.
- *Scalability and flexibility.* A solution should be built on an architecture that has the ability to scale in order to support and introduce new technologies within a globally distributed environment. In addition, the solution should provide the flexibility to add multiple sources and targets as a system grows.
- *Ease of use.* The availability of visual interfaces and "point and click" techniques encourages product adoption and reduces the learning curve for IT implementers.

An easy to use development environment enables support personnel to easily modify the solution to reflect inevitable business process changes and acquisition of other packaged-application solutions.

- *Cost-effective development.* The ability to rapidly expose core business logic and valuable transactions directly to other applications — and to users — is central to the core goal of rapid development and deployment. To accomplish this task, legacy applications and new business logic must remain accessible from the development environment and be readily reusable. It is also critical that purchased applications be integrated into the framework's development and deployment model. The development environment must also be tied to the runtime environment so that applications can be deployed, debugged, and modified seamlessly.

Technology Overview

The Info*Engine product suite can integrate with existing data sources without relying on source-level programming. In part this capability is due to the suite's ability to work within existing IT infrastructures and with existing standards — e.g., Structured Query Language (SQL), Open DataBase Connectivity (ODBC), Java DataBase Connectivity (JDBC) and Lightweight Directory Access Protocol (LDAP).

Another key factor contributing to Info*Engine's capabilities is its use of XML as an *interface* development environment. Info*Engine's XML-based development environment can be used to create WebTops as well as administrative and management interfaces. With XML, neutral generic API's are defined external to applications. The XML-based development environment is then used to map from the generic XML interface to specific applications. In this way, only one interface is required for a given application to communicate with all other applications through the XML interface. Using this XML API interface, auxilium has already created a large set of Info*Engine adapters that define interfaces for many applications and data sources (Table 1.). When developers wish to create WebTops that access multiple applications they need only have knowledge of the Info*Engine's XML API.

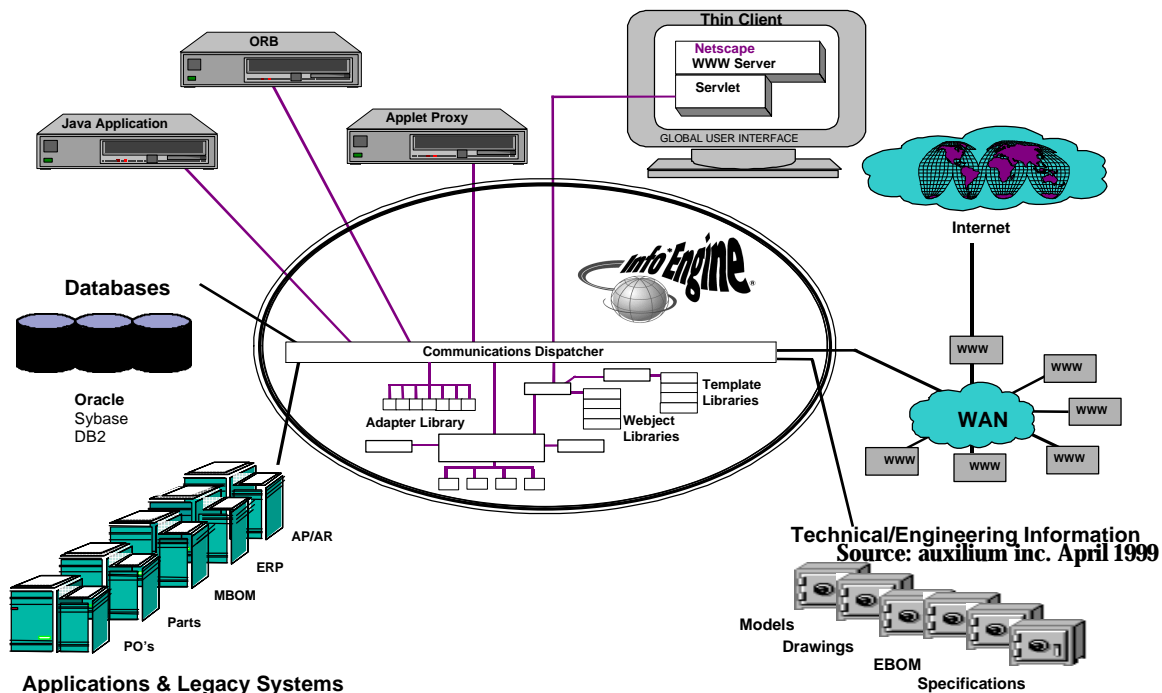
The Info*Engine product suite is comprised of the Info*Engine Communications Dispatcher, Info*Engine Adapter Libraries, Info*Engine Webject Libraries and Info*Engine Template Libraries (see Figure 1).

*Info*Engine Communication Dispatcher* — the Communication Dispatcher automatically provides links to multiple data sources and transports the appropriate data to a Web client or browser. The Communication Dispatcher also has the ability to correlate data from multiple, disparate and independent data stores.

*Info*Engine Adapter Library* — users are able to navigate through various data sources and interact with data without having to know about underlying relationships and schemas. Access to an individual database or directory service is provided through the technology access adapters provided by Info*Engine. Several of these adapters (e.g., ODBC and EDA/SQL) are generic, allowing users to interface to a large number of other applications such as mainframe screens and any ODBC interface-enabled application. The adapter library also includes application level adapters, which enable access and manipulation of business logic and data within enterprise level applications through robust encapsulation of their native APIs.

*Info*Engine Webject Libraries* — enables users to automatically map database schemas and object models into departmental applications. Webjects are Info*Engine’s generic set of operations (or “verbs”).

Figure 1: Info*Engine Collaborative Environment



Some Webjects are used as a generic XML API to interface applications. Others are used to define the format of displays, while still others allow users to describe computational operations external to any of the applications.

*Info*Engine Template Libraries* — templates define business processes. These processes are sets of specific accesses to generic applications and associated generic display screens defined using Info*Engine’s XML interface. Conceptually, sub-elements of templates correlate to business objects and tasks such as “Bill of Materials” or “Create Part.” Templates are reusable components which are used to create custom “WebTops”. Info*Engine comes with a library of example templates.

A mid-1999 release of Info*Engine will contain a large library of templates related to the Design Engineer environment and associated roles such as purchasing agent, manufacturing engineer, production engineer, and marketing.

Windchill Integration — **Info*Engine will support standard invocation mechanisms (e.g., RMI, CORBA, XML) that external applications (e.g., Windchill) will be able to use to access data provided by Info*Engine (target availability is Q2-1999).**

Table 1: Info*Engine Adapters

Adapter	Version Compatibility
Metaphase Adapter	Metaphase 3.
Baan PDM Adapter	Baan PDM Web 5.1.2n
Enterprise Business Application Interface	Computer Network Technologies’ Enterprise/Access 2.6.x.
Oracle Adapter	Oracle 7.x
JNDI Adapter	JNDI specification 1
JDBC Adapter	JDK 1.1
All major data sources	Information Builders’ IBI EDA/r3.3
SAP R/3	SAP R/3 4.5 (Q2 1999)
IMAN Adapter	IMAN 5.0 (Q2 1999)

Source: Aberdeen Group, April 1999

Extensibility and Reusability

auxilium provides communications software and development tools that enable users to design, develop, operate, and maintain heterogeneous distributed computing environments with the Info*Engine solution.

Info*Engine has been designed in such a manner that users are able to extend the tool from a per-project basis to an ongoing enterprise-wide usage. Information from many different applications can be used in a Web-based environment (WebTops) created by Info*Engine templates. These templates, written in XML, are easily created and modified, enabling extensibility and reusability. Info*Engine has a communication layer that supports standard definition languages and provides multiple input and output models. In addition, Info*Engine's extensive use of XML makes the solution non-invasive to the existing application environment.

Info*Engine uses a set of adapter libraries, enabling the access and integration of legacy, custom, and third-party packaged applications throughout the enterprise. One function of Info*Engine is to extract and transform the required data from one application (e.g., PDM) and make that data readily available for use by the target application (e.g., SAP).

Scalability and Flexibility

Among Info*Engine's valuable attributes are its scalable architecture and design. The addition or subtraction of new applications and data sources into an extended or combined new business process is simplified by the underlying XML-based integration environment.

Moreover, Info*Engine's set of display Webjects makes the definition of user interfaces both flexible and non-dependent upon specific underlying applications.

The Info*Engine solution is ultimately a communications platform that is used as the foundation for developing enterprise integration systems. Info*Engine provides standards-compliant flexibility by enabling users to write highly functional, high-performance, new-business-process servers — without locking a user into one-off proprietary adapter development and management. Using a single, flexible, and consistent development framework for each integration process greatly reduces the amount of personnel resources needed to maintain, develop, and scale systems.

Ease of Use

An easy-to-use development environment enables personnel to easily modify solutions to reflect inevitable business process changes as well as acquisition of other packaged-application solutions. Because auxilium uses a standard Web browser as the client, users are able to access data without having to know on which system it resides.

In addition, the role-based process modeling functionality provides access to the process-oriented information across applications, at the user level, eliminating the need to sort through formats with which individual users or classes of users are not familiar.

Cost-effective Development

Users can rapidly connect core business logic in different applications through Info*Engine's libraries of adapters and Webjects. All applications and embedded business logic are accessible through this generic interface. With Info*Engine's Webjects, changes made to templates in the development environment take immediate effect in the runtime environment — thus allowing seamless deployment, debugging and modification.

Where Info*Engine Can Be Most Effective

auxilium's Info*Engine solution is most effective in high-end, complex-process manufacturing environments—especially those seeking to exploit state-of-the-art technology to rationalize the multiplicity of operational systems within their enterprise, and across the extended supply and value chains that drive and constrain their efforts. Such requirements call for a fundamentally different approach to EAI than is commonly found in the market today. This new approach needs to encompass both the back-end, transactional integration and a means to visualize to the user the resultant integrated process. In these environments the total solution must do the following:

- integrate disparate applications on an application to application basis;
- allow for the creation of new, process-based application front-ends that logically combine and associate discrete application functions and information arising from different sources and seamlessly present this combined view to support the integrated business process; and
- in select cases, make visible specific singular application functionality in the context of the new process.

Info*Engine covers these key requirements with a robust suite of application and data store adapters. Moreover it provides the ability to create new process WebTops that either present the new front-end to the combined application, or simply Web-enable legacy application functions that otherwise could not participate in the new process navigation experience.

From a technology perspective, and as Aberdeen has long noted, users in these situations particularly need Internet/Intranet deployment capabilities, scalable application servers, Java support, and back-end database- and application-access and integration tools.

Implemented effectively, Info*Engine can enable enterprises to establish true cross-application and cross-company supply-chain applications. Info*Engine's flexibility, integration focus, and rapid-implementation capabilities make it an excellent fit for the toughest enterprise integration initiatives. Finally, Info*Engine adapts well to the specific needs of key vertical markets — in particular Automotive, High-Technology and Aerospace and Defense.

Competition

Aberdeen's market research report, *Enterprise Application Integration: Advanced Technologies and a Sense of Process*, details more than twenty EAI suppliers and their technologies. auxilium has come to Aberdeen's attention after the most recent publication of that report. In the context of this market analysis, Aberdeen finds auxilium to be unique. Info*Engine covers the now-expected advanced technology approach to integrating applications based on a sophisticated server-to-server API and Adapter methodology. It has an open and sophisticated architecture that is highly flexible and easily amenable to being deployed with industry-leading infrastructure technologies (e.g., MQ Series messaging). On this basis alone, Info*Engine should be evaluated with the likes of Active Software, CrossWorlds, NEON, Oberon, and Vitria. Where auxilium fully differentiates itself is in Info*Engine's ability to create and deploy Internet-based application front-ends that bring the value of the back-end application integration to the fore — both as a new superset application and as more productive and efficient user experience.

Aberdeen Conclusions

Aberdeen finds that auxilium's Info*Engine provides a comprehensive, flexible, and customizable combination of technology, tools, and processes that can be used as an enterprise integration base from which to tackle complex and distributed application and data-integration problems. Info*Engine's broad technology infrastructure and standards support is especially useful in allowing enterprises to leverage both state-of-the-art EBA solutions and the embedded business logic of legacy applications. Info*Engine has already proved to be particularly effective for large-scale, complex application integration efforts involving unique industry-specific business-process and data-integration issues.

Aberdeen believes that the Parametric/auxilium strategic technology and business combination raises the bar significantly for all other suppliers in the EAI market. The combined technology solution will accelerate PTC's ability to integrate disparate PDM, ERP, and database and legacy systems and provide yet another impetus to make the Windchill vision a reality. auxilium benefits greatly in terms of:

- Rapid expansion of sales resources and distribution channels;
- Availability of deep investment pockets and R&D expertise; and
- Access to a Fortune-100 clientele that competitors can still only dream about.

Amid the EAI start-ups there was already concern over the EAI market influence of the full-suite Enterprise Business Application suppliers. Now they'd be advised to be equally concerned by the potent combination of PTC and auxilium.

Aberdeen finds that auxilium offers a new opportunity for business management and IS buyers: a solution that allows for business process *and* application integration using a powerful common infrastructure and extensible, scalable technology.

Aberdeen research indicates that Info*Engine can be particularly effective as part of an enterprise's overall plan for strategically including the Internet in its business computing environment — an environment that increasingly demands both cross-application *and* cross-company business processes. Moreover, Info*Engine's singular ability to support the creation and deployment of supply-chain business processes that derive from the integration of multiple underlying applications is unique in the EAI market. Aberdeen believes auxilium is first in the EAI market to extend the power of advanced application integration technologies into the realm of new business process creation.

Fortune 500 manufacturers, especially those in the Automotive, High Technology and Aerospace and Defense industries, concerned about strategically implementing enterprise integration solutions into and across the supply chain are well advised to include Info*Engine in any serious technology evaluation.

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