MRP as a Service:

An Alternative Way to Execute Models for Business Processes

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Software as a Service (SaaS) is an alternative worth considering for companies that face the high costs of enterprise -wide implementations and extensive re-engineering efforts to enhance existing business processes.   In particular, small companies often do not have the financial resources to purchase "on-premise" systems that require significant investment in packaged software and dedicated hardware. However, it is also true that large companies with extensive installations are beginning to consider SaaS as a cost cutting measure.   In recognition of this trend, SAP has begun shifting their basic strategy to "on-demand" services.   This is a major development in the delivery of various types of software to customers.

Some analysts estimate that within five years, one-third of all new software will use the SaaS model.   The recent successes of Apple's iTune's and Google Apps have paved the way for more software and content to be offered in this way.   For example, Salesforce.com has introduced AppExchange, an innovative approach to establishing a software-sharing platform.   The vendor no longer distributes software

using CD-ROM as a media; rather it sells access to applications located on internet.   With this approach, Salesforce.com is becoming the eBay of hosted software by supporting about 1,000 developers specializing in Customer Relationship Management (CRM) applications.   Another company doing something similar is NetSuite, financed by Oracle founder Larry Ellison.   The firm is preparing for an initial public stock offering in the US.

With the current interest in SaaS, it is just a matter of time before material requirement planning systems (MRP) become an Internet-based service rather than a dedicated software application hosted on local computers.   Eventually, it might become obsolete to use packaged software for management of manufacturing processes and other applications in business.   While packaged software will be around for many years into the future, peak sales might have been reached with the most recent economic expansion.   For the United States market, where the growth of manufacturing has slowed considerably and the idea of MRP is a mature technology, SaaS

represents an innovative way of reducing cost of operation.

One of the major innovations in manufacturing during the 20th century, MRP is nothing more than a calculator that does addition and subtraction.   Using the bills of material (BOM), beginning inventory levels, and purchased orders as inputs, an MRP system calculates a time-phased schedule for end-items, work in process, and material purchases.

With the advent of the Internet, there is no fundamental reason why MRP calculations for a firm need to done using dedicated software and computers located on-site.   Further, more advanced mathematical models that consider capacity for MRP systems also do not need to be operated locally.

Establishing MRP-as-a-service, however, requires resolution of significant issues relating to the connection of data, especially when dealing with the BOM and routings, which both have complex

hierarchies and semantics.   This is especially true for make-to-order

and engineer-to-order situations where the BOM tends to contain many

levels and the manufacturing process involves extensive amounts of

work-in-process.   An example of this type of manufacturing situation is

the assembly of large aircraft such as the Boeing 777.   In this case,

sub-assemblies are produced by suppliers located outside of Boeing,

requiring a great deal of coordination for materials and parts.

Since 2003, the MIT Data Center Program has been exploring the

relationship between computing systems and the standards needed to

make the next advance in semantic technologies.   The result is the M

Language, a means of creating semantic links for business objects that

are machine understandable.   With M, it becomes much easier to

initiate connects between various kinds of BOMs and routings that must

be accessible through "multi-tenant" SaaS.   Semantic ambiguity

between different operating systems and various data formats becomes

much less of an issue with the M Language.

Our next step on this research is to design an open-structured BOM and routing that can be easily translated into XML document.   In this procedure, M Language will provide a common abstraction of databases from various companies with different syntaxes and semantics for master data.   Because of the absence of an existing standard for describing legacy data such as the BOM and routing, the goal of using M remains rather challenging.   However, by achieving the goal of implementing MRP as a service, companies will no longer need to maintain their own MRP engine.   The focus would shift to keeping the company database containing product information accurate.   In addition, an external MRP system using SaaS might also have other beneficial outcomes associated with the movement to "open" systems.