

GOOD NEWS FOR OPERATIONS MANAGERS – APPLICATION SERVICE PROVISION (ASP)

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THE INTERNET CHANGES EVERYTHING

Every day the web impacts some aspect of our lives. It would be surprising if it did not affect manufacturing in some ways. This article is about a new breed of manufacturing systems that are web-enabled. It's a revolutionary idea that will please operations managers.

Operations managers, if you are:

- considering changing your computer system, or
- concerned about the IT costs,

you should be aware of coming Application Service Provision (ASP) manufacturing systems. Already, giants like BT and SAP are trying to get *your* IT business.

APPLICATION SERVICE PROVISION (ASP) – COMPLICATED NAME FOR A NEW IDEA

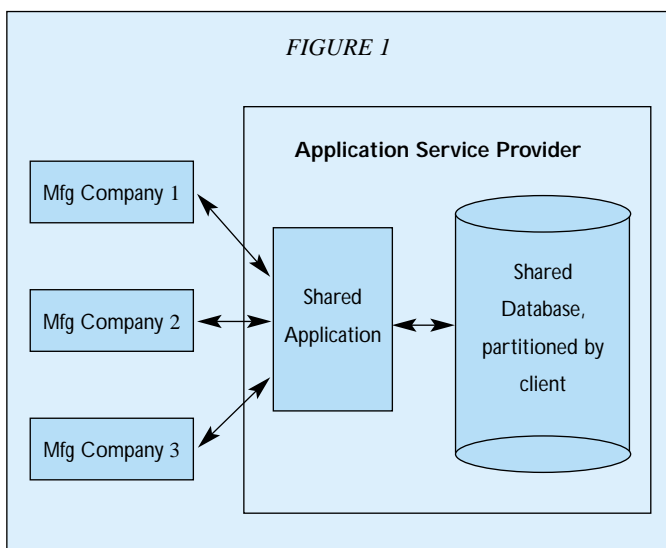
The concept behind Application Service Provision (ASP) is that the manufacturing system, or ERP, is accessed over the web. The system is no longer installed on a computer within the factory. Instead, the end user logs on to a web browser and is online to a system hosted by a web organisation.

All kinds of systems are potentially involved, not just those for manufacturing. Already, payroll and accounts systems are offered on the web.

For manufacturing, the Application Service Provider (ASP) will provide a complete manufacturing system (an ERP) that can be accessed over the net by a client manufacturing company. What about the client's database? It will be held securely in the custody of the ASP.

(In this article, we will use the acronym ASP for both the *provision* and the *provider*.)

'Sharing' is a key aspect. Many client manufacturers will share the same system. Each will have the illusion that the system is dedicated to them. Moreover, in each company, multiple users will use the system, unaware they are sharing with other companies' users. The following figure illustrates the principle:



Because the system is shared, economies of scale kick in, to make the annualised cost much lower than today, perhaps as much as 50% lower. Moreover, instead of paying for the software in a single capital investment as today, it will be paid for by annual rental.

WHO WILL BENEFIT?

The beneficiaries of this revolution will be SME manufacturers (small and medium enterprises with employment up to 250). IT systems have always been problematic for such companies, mainly on grounds of cost. Their computer systems are often poorly used, as a consequence of limited budgets.

HOW?

- **Lowered cost, perhaps to 50% of current cost.** This arises from the shared nature of the new system.
- **Minimal or no in-house IT.** The technology that needs to reside on the customer site is relatively simple: a standard PC network, with a gateway to the ASP. The PCs will be 'thin clients' – IT terminology meaning they have minimal software loaded in them. Naturally, on-site IT personnel costs should diminish.
- **Training delivered over the web straight to the user's desktop.** This can be done well in advance of cutting over to the new system.
- **Lowered technical barrier to implementation (because of minimal on-site IT).** A traditional on-site system can take months to install and get working, whereas this system can be switched on immediately.
- **Functionality.** Highly functional systems will be made available to SMEs. Although the functionality of the ASP system will be extremely sophisticated, it can be offered in digestible packets. Thus a client may start out with just Inventory Control or Accounts. Thereafter, an incremental growth path is available so that he can easily move to the next stage with no technology hurdles.
- **Added value services** such as consultancy, simulation, education, multimedia (eg. for drawings and 3-D visualisation) and user groups will be available, much of it delivered over the web.
- **Benchmarking.** Because custody of many databases is in a common format, it should be easy to make inter-company benchmarking comparisons (subject to strict confidentiality arrangements, of course).
- **Software is always at the most up-to-date level.** Today, software suppliers must distribute software fixes to many customers and have to manage a user base with a mix of different levels. This arises because many manufacturers cannot afford the upgrade costs. This complexity will be totally eliminated, a fact that should reflect in cost of systems.

These advantages still don't guarantee good usage of the system. However, by removing the IT complexity from the implementation project, and being able to divert the limited budget towards user rather than IT needs, better usage of systems should follow.

THE PERILS OF CHANGE

Operations managers will welcome the benefits of ASP but will be rightly concerned about some aspects of change.

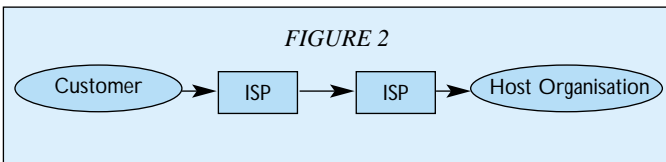
Confidentiality

By giving custodianship of their database to a third party, isn't there a risk of data loss or breach of confidentiality? But outsourcing companies already face these problems and measures to combat them are well tried. In addition, the Internet itself is producing new security solutions.

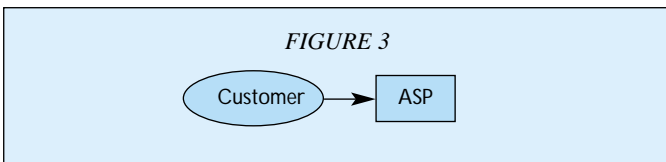
Transaction Processing Speed

Will a user input a transaction, then wait...and wait...? The biggest concern is line transmission speed. The answer lies in higher and higher bandwidth connections becoming available from Telecoms companies. Just as the performance of computers has risen dramatically, so has (and will) the bandwidth of connection lines improve.

The number of intermediate connections also affects speed. Consider if the host organisation sets up an ordinary web site - the consequence is multiple intermediaries between host site and customer, which is detrimental to speed:



The answer is for an ASP to be an ISP (Internet Service Provider, like FreeServe). The connection will be direct, ensuring fast connection speeds:



Cost of Connection

Connection costs now are about £4 – 5,000 annually for a leased line. For the smallest SMEs this is very high. However, on the horizon are ADSL lines that will come in at about £1,200 for a line, and still offer acceptable performance. Anyway, it makes sense for the ASP to pay for the connection costs as part of the annual subscription, rather than the customer being picked off by Telecoms for the full cost of a single leased line. The ASP can make a bulk deal for many leased lines.

Data Capture

A major pre-requisite to any system cut-over is data capture. ASPs will need to be experts at mass data capture and conversion.

We are confident that technology and lowering costs will remove these sources of concern for the operations manager.

THE BOX OF TRICKS

What is the technology? Well, transactional software has always given the illusion that, when you put in a transaction, a programme is already warmed up in the background to deal with it.

In reality, a supervisory programme would say, "Ah, this is a part number update. Let's fetch the right programme into memory to deal with it." Thus, only those programmes needed for currently live transactions would be fetched into memory.

Computer memory is used effectively, at the expense of the time to load up the right programme.

ASP extends the concept of transactional systems even further and allows users from different customer companies to share the same system, with the illusion that they have a dedicated system all to themselves.

When the user inputs a transaction, a perfectly generic programme will be called up to handle it. The generic aspect is what allows the system to be used by different companies. Their unique needs are met by pointing the generic programme towards the customer's own database.

Although the transactional concept is as old as the hills, new products have emerged in response to the web. An example is Microsoft's MTS.

HOW ABOUT THE HEAVYWEIGHT PROGRAMMES?

Every manufacturing system has lightweight and heavyweight programmes. An example of a lightweight programme would be a stock transaction. A heavyweight programme would be MRP.

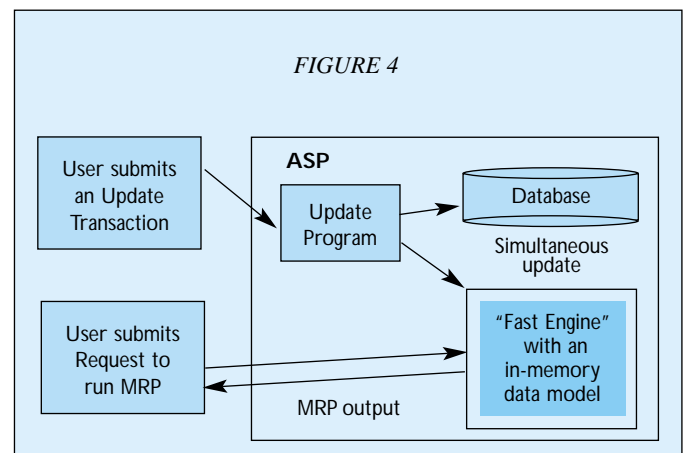
In the current environment, despite the progress of computer technology, the MRP module of an ERP system can still run for a long time, during which time all other system processing could be suspended. Users might have to meet a data processing deadline at a certain time in the week, and then IT staff take over to run a set of jobs on the main business computer.

In the web environment, this would be awkward indeed. Would the web system shut down, until an email arrives two hours later saying 'MRP is complete'? Hardly. What is needed is fast software to take care of the heavyweight programmes.

By fast, we mean that MRP might take 15 – 30 seconds. In that time, the user who kicked off the programme will still be at her terminal, expecting the output a few seconds later. Maybe she receives an email from the system saying "Hmm. Rather a lot of unplanned issues this week..." By the time she's read it, MRP output is complete.

Speeding up heavyweight programmes can lead to new ways of working. Suppose you run MRP and Capacity Analysis and 30 seconds later the output tells you your plan is infeasible (due to capacity overload). It is easy to modify the plan and rerun, until feasibility is established. Quite a change from traditional MRP!

Typical heavyweight programmes are MRP, Capacity Analysis (CRP), Order Promising, Finite Capacity Scheduling (FCS), Material Allocation (Kitting) and Configuration.



The key to warp-speeding these heavyweights is 'Fast Engine' software components. By packaging all the necessary data into a compact model in computer memory, the heavyweight programmes can be run at fast speed. The 'Fast Engine's' data

model is called such because it is a complete mini-model of the factory. It contains parts, products, BoMs, operations data, and so on.

The downside to an in-memory data model is keeping it current as database updates are taking place continuously. The secret is to keep the model loaded at all times and simultaneously update the database and the model. (See Figure 4).

This 'Fast Engine' technology is proven in current computer environments, but is particularly suited to the ASP system. These 'Fast Engine' software components will become much sought after, in the ASP environment.

HOW ABOUT CORPORATE ENTERPRISES?

We said earlier that ASP is particularly beneficial to SMEs, but it can also benefit corporates. Just as corporates have Intranets, they could have internal versions of an ASP system, with each of their divisions acting as a customer to the shared system.

The concept is also beneficial to managing a supply chain. Suppose the supply chain partners are 'customers' to a shared system. Normally the back end database would be strictly partitioned by company, but in the case of a supply chain, some parts of the database would be exposed to all, particularly demand data.

WHEN?

Application Service Provision (ASP) is already available from BT. Their Business Manager service allows SMEs to log into SAP R/3 for Finance, HR and Payroll.

It's only a matter of time before recognisably manufacturing applications come on stream, like MRP and scheduling.

We predict manufacturing ASP solutions will be available this year, and that within 5 years all SME manufacturers will have converted to this form of system delivery. The market for ERP software is of the order of £300-400M in the UK (\$5-10bn world-wide), and much of this market will divert to Application Service Provision over that period.

How quickly this type of system comes on stream depends on how quickly existing software suppliers transmute themselves into ASPs, given that much of their existing software technology is pre-web. 'Marriages' will be arranged between software suppliers and general purpose ISPs simply as a way of acquiring the web hardware and Telecoms knowledge. UUNET, the world's largest business ISP, have moved to create the 'hardware' element of the ASP solution by providing Internet data centres to host the software.

Some software suppliers could be 'shaken out' in the process. If SAP R/3 can be provided to the masses, what's the outlook for smaller software companies? It's like musical chairs, if the chairs are hardware partners like BT and UUNET, the software suppliers must scramble to sit on one. The weakest will be left standing.

Much sought after will be the 'Fast Engine' components to handle the heavyweight programme needs. The future small software supplier may be a component supplier to an ASP market dominated by giants.

All in all, interesting times are ahead as software suppliers move to adapt themselves to the new realities of the web-connected world.

About the author

Mike Stares of Pansophic Limited is a consultant in manufacturing planning and control, and manufacturing software development.