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I & J Munn Ltd

# ENTERPRISE RESOURCE PLANNING – CREATING REAL BOTTOM-LINE IMPACT



*I & J Munn's response to the application  
of ERP systems in developing  
shareholder value within enterprise  
focused organisations.*

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# The challenge of ERP to provide a foundation for long-term growth

*ERP has been implemented in many companies with a wide variety of results. This paper argues that without the focusing ability of the Theory of Constraints, bottom-line improvement will remain illusory.*

## Synopsis of the paper

For many manufacturing companies today the application of Enterprise Resource Planning (ERP) is becoming a necessary condition for success. Without the power of such software packages the ability to manage the whole of the enterprise becomes almost impossible. The ability of ERP systems to provide all of the relevant data is without question, yet many companies are not seeing the expected benefits the providers of ERP claimed. The missing element is that changes in the rules, procedures, and other supporting systems, in particular measurements have not changed to match the new operational dimension that ERP brings.

With examples from the world of manufacturing, production and project management, the author will present research findings undertaken within his own organisation to support the view that without a fundamental change in the way companies are managed, the benefits of ERP will out of reach. These examples will show that the starting point is the area of measurements, both financial and non-financial. Here the need to is to recognise the enterprise nature of the organisation and measure accordingly. Retaining the silo approach to measurement will no longer suffice, there has to be coherence throughout the whole organisation, with each function, each department, being measured on the contribution to the whole and not in isolation.

## The current reality of ERP systems today

The environment in which ERP systems find themselves today has changed dramatically from that of even two years ago. With most of the major companies having already gone down the path of ERP systems the companies providing such systems are running out of the types of clients they targeted in the early days of the technology. Based on the available number of users within any organisation the initial group of people so targeted is now saturated. Equally it would appear that moving to the medium to small type of companies does not offer any real way forward because the time taken to bring such

companies on board is not affected by size. Equally, the number of users in these companies is much smaller than in the large sized organisations. This is not the only factor however, many companies who have embarked on ERP implementation have found that the impact on bottom-line performance has fallen short of expectations. There might be greater visibility of data, but the question remains, what impact has this had on profitability, cash flow, return on investment? The common answer in both the USA and Europe is that the impact has been minimal. Just why this is the case is the focal point of this paper.

Goldratt (2000) argues that the key dimension of any technology is that it should diminish a limitation within the operational aspects of any organisation. Of course the new technology has to be implemented into an existing system of policies, behaviours, measurements and other assorted rules and regulations. A limitation requires definition. It has to be connected to a problem. The limitation might be the problem itself or the manifestation of the problem. But in order to have a real feel for the limitation it is necessary to examine the true nature of the problem. There is also the likelihood that the problem is part of a complex picture of causality, of dependencies. This therefore demands a proper analysis of the problem space.

The current rules exist to enable people to accommodate the current limitation. If, when implementing a new technology the rules of the old paradigm remain, will the new system still deliver the expected benefits? This suggests that the rules, measures etc of today have to be challenged in the light of the imminence of the new technology.

### **The typical response from ERP providers**

The usual response to this problem from the ERP companies has been a drive to include more and more features within the overall product. There is also the question of the focus of the selling cycle. The nature of most ERP selling is to focus on the technology and the question of whether there is any improvement on the bottom-line financial measurements of the organisation is rarely asked. The primary selling focus of most ERP companies is the technology fix approach rather than any real focus on bottom-line. This is shown on the conflict diagram below.

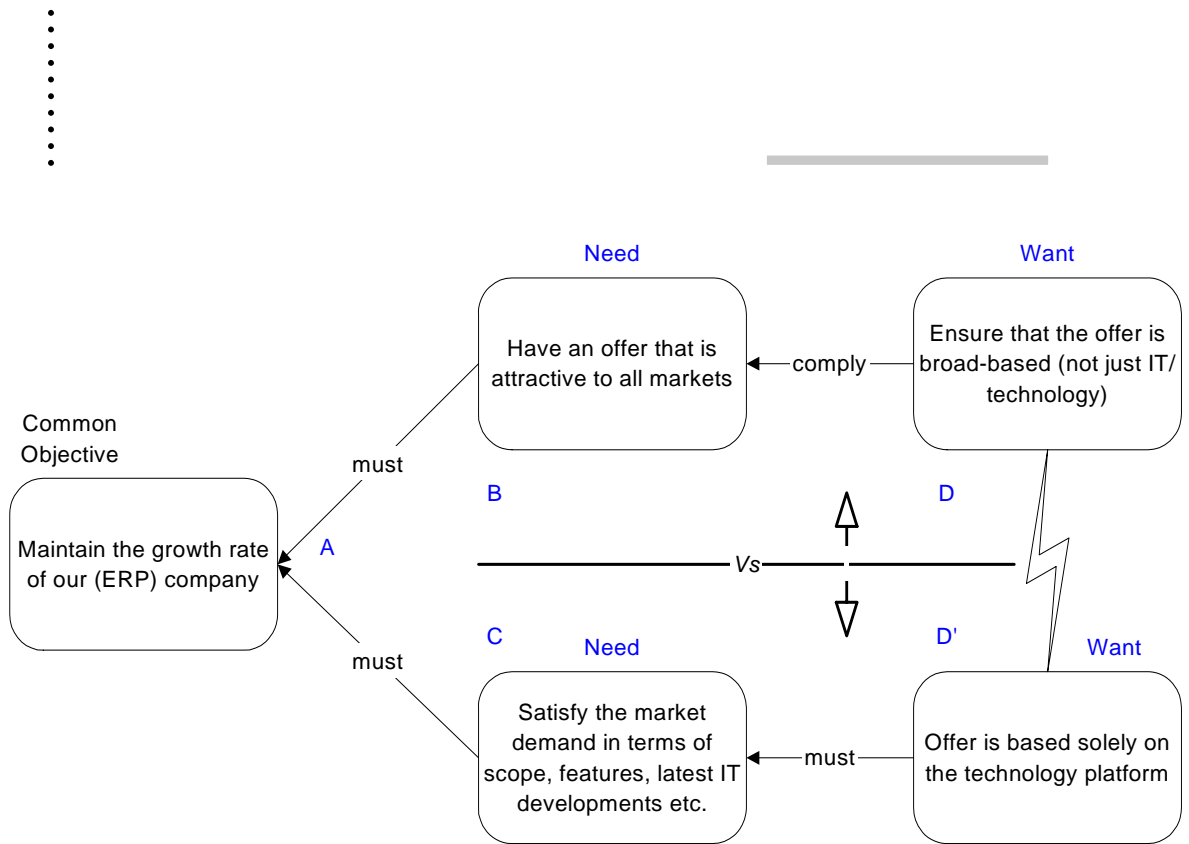


Fig. 1 The conflict between technology platform and a wider base

This conflict creates pressure for the ERP company in that whilst they are keen to develop new markets, and more clients within existing markets they also have to keep things simple. One of the common features of many ERP systems is the level of complexity they are now achieving, and with all the new features the issues of integration are becoming a major problem. This can be shown in the following conflict diagram:

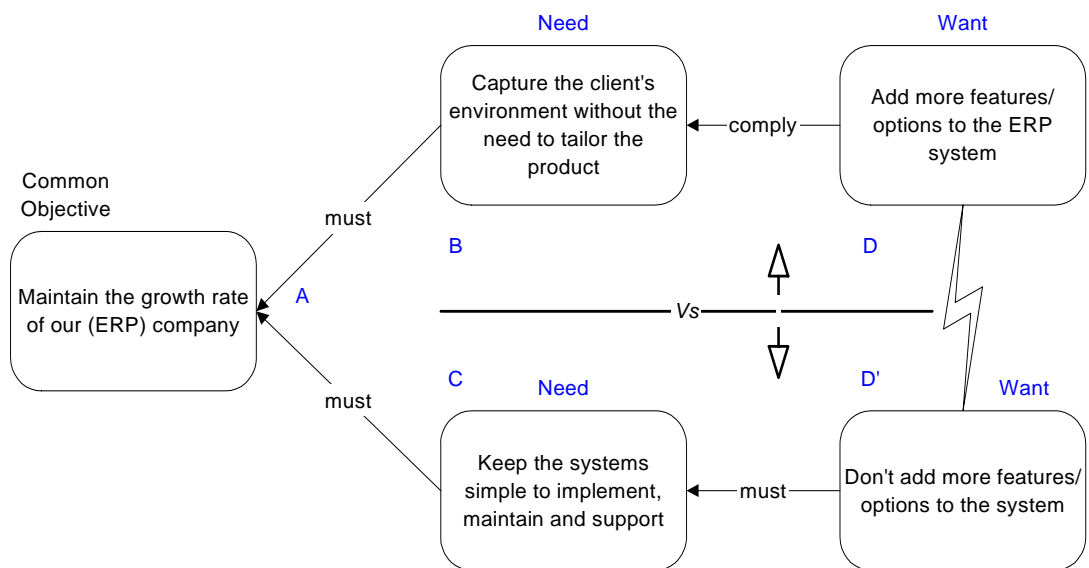


Fig. 2 The feature conflict

This conflict is a reaction to the ever-increasing complexity of ERP systems themselves. In order to have a system that is all things to all manner of organisation, the software is fast becoming very cumbersome to both implement and maintain.

### **The response from the TOC perspective**

The basic model of organisation from the Theory of Constraints is that of a chain, a revenue chain. Any organisation can be viewed as a interdependent set of links within one overall chain, a chain that generates money, hence revenue. This being so, the analogy then argues that if the organisation can be viewed as a revenue chain, then the only place to focus is the weakest link, the constraint. This constraint offers the area of greatest improvement, indeed the only area of improvement, as by definition all other links are capable of more performance already, they are constrained by the weakest link. This has been developed into a set of laws. (Hutchin 2001)

### **The laws of constraint management**

Whilst involved in many TOC/TP activities during the last ten years, Hutchin noticed that in every activity what could be described as a series of truths, a series of what is now called laws, exist. They might appear to some to be statements of the obvious, and maybe they are. But equally they are ignored at peril and therefore are worthy of recognition. They should also be thought of in the context of some of the business performance indicators that ERP systems are designed to address. These include shareholder value, profitability, productivity, time to market, resource effectiveness, sound financial reporting systems, sound decision-making processes and so on. There are seven such laws.

The first law of constraint management is that every organisation is a system comprising interdependent elements that form a revenue chain.

The second law of constraint management is that the ability of the revenue chain to maximise performance is determined by the weakest link – the constraint.

The third law of constraint management is that the constraint is the primary location for both focus and leverage for the improvement of the overall performance of the system.

The fourth law of constraint management is that improving any other link in the chain does not improve the overall performance of the chain itself.

The fifth law of constraint management is that subordination to the constraint in terms of the measurement system, the policies of the organisation, and the way in which the people operate, is a fundamental requirement of managing the chain.

The sixth law of constraint management is that the management of the constraint, and non-constraints is dependent upon the use of an effective decision support system.

The seventh law of constraint management is that variation in the system has most impact on the constraint.

The variation we are talking about here is special cause variation rather than common cause. This last law also argues that variation at a non-constraint is therefore far less important. This leads to the necessary conditions of both a sound management methodology and a decision support system, which ensures that actions, as a result of such variation, are undertaken only when the management system says so.



This is primarily when either the goal, or at least one necessary condition to achieve the goal is being violated.

When the notion of the constraint is linked to the focus and leverage offered by Throughout Accounting (see Smith 2000, and Corbett 1998) the application of ERP systems changes significantly. By determining the capability of the constraint, and how to use it for such questions as volume and mix calculations, the ERP system now has to answer very different questions.

### The integration of TOC and ERP

Once the notion that the organisation can be viewed as a chain, and the importance of the constraint also recognised what is the impact on the ERP systems? There are typically three key areas of focus, manufacturing, project management and distribution.

### The manufacturing response

The problems within manufacturing are well documented, and the links between them and the application of TOC are equally documented. (Srikanth and Umble, Stein). The application of approaches such as Drum – Buffer – Rope, have been well researched and the results clearly achieved. The use of ERP systems offers a wider range of visibility than ever before. The capability to examine the whole of the revenue chain from supply to customer is made possible with ERP. The ability to use this range of visibility coupled to the constraint offers a decision-making capability that is currently missing from the arsenal of tools and techniques available to most manufacturing managers. But in many implementations of ERP whether linked to TOC or not, one dimension stands out, that the rules, procedures and measurements have not changed. The use of cost accounting still dominates, the use of efficiency measures still dominates, failure to really harness the power of the ERP system is commonplace. The conflict is shown below:

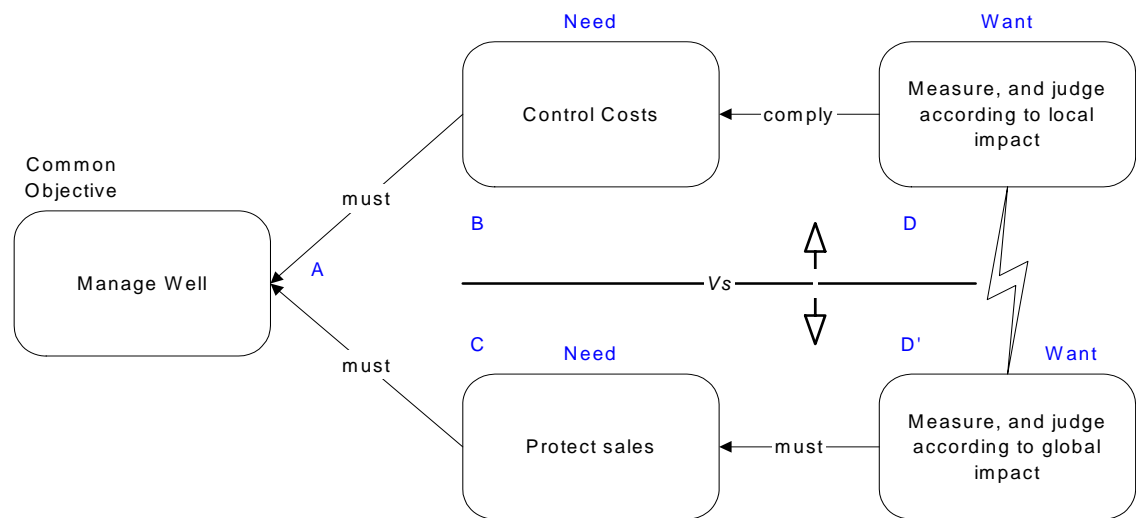


Fig. 3 The cost conflict

For a further examination of this cloud see Smith (2000). What this conflict shows clearly is that often the ability to protect sales is limited by the continual focus of local optima measures, and at the same time, should people try to operate in line with global measurements, costs will not be properly controlled. There are, of course, some erroneous assumptions here, but they are rarely surfaced and even more rarely challenged. But this is not an issue only of production, what about projects, or distribution, do they suffer from the same problems?

### **The project management response**

Here the issues surround the difference between the current paradigm of managing projects through the use of Critical Path and the TOC approach known as Critical Chain. For a full description of Critical Chain see Goldratt 1997, Newbold 1998, Leach 2000 and Hutchin 2001. The same problems affect project management as do production. Here the issues of estimation give rise to project plans that contain float at all stages, most of which is then used up in the first third of the project lifetime. This is then compounded by the operational methods contained within multi-tasking which takes away so much time in project that just addressing that one area alone can often give between 50 – 60% additional capacity to any project manager from the same resources. Once more the focusing capability of the TOC linked to the data contained within ERP systems offers a much more robust way forward. At one conference held in Indianapolis during November 2000 the following results were announced by a US Navy repair shop. For the H46 helicopter before the application of Critical Chain ERP solution the norm was for 54 helicopters to be serviced per year, with each taking between 190 – 200 days to complete. This is a multi-skilled, multi-project environment. Following implementation the turnaround dropped to 133 days, there was a 1000 hours/direct labour reduction and overtime fell from between 15 – 18% to 5%. In short the Navy had more aircraft available to defend the nation.

### **The distribution response**

The primary focus here is the impact of a stock-out. Once more the application of ERP systems is forced to fit into a local optima environment, which is totally at odds with the overall structure and capability of ERP. The same conflicts occur as above in terms of the measurement system, and the use of min-max only serves to make things worse. The notion that improving any link improves the whole is to be discounted. Given the laws of constraint management this only leads to organisation to disaster.

### **Creating a new focus for ERP systems**

What this paper has shown, coupled with the research that supports it, is that ERP systems are shackled from the outset. For any ERP system to really deliver the rules and procedures that were in existence prior to the arrival of the ERP must be challenged and in many cases changed. To tie the investment in ERP to a prior system that has already been determined as failing seems paradoxical. ERP is about an holistic approach to



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organisations, not a local perspective. Many ERP systems are implemented from the measurement system/costing system elements first. Yet the real impact is on production, or projects, or distribution, or some other part of the organisational revenue chain. If ERP systems are implemented in conjunction with the focusing power of the thinking processes of TOC then they will start to deliver results very quickly. This is what GM have already found in the USA, and companies such as Seagate with their disc drive design and manufacture. The combination of ERP and TOC has shown that companies can make a significant difference to their financial, and non-financial performance in a short period of time. The investment in ERP is recouped earlier, and the opportunities that are opened up are much more attractive.

In conclusion, what has been found in both Europe and the USA is that ERP systems and system providers need to rethink their strategy. That the people who buy such systems are looking for a better return than they have had to date. What is also clear is that those who combine the power and focusing ability of the TOC thinking processes in order to apply the power and visibility of ERP have gained substantially.

## References

- Corbett, G. 1998 Throughput Accounting North River Press Great Barrington MA
- Goldratt, E.M. and Cox, J. 1984. The Goal. Gower. London.
- Goldratt, E.M. 1997 Critical Chain North River Press Great Barrington MA
- Goldratt, E.M. 2000 Necessary But Not Sufficient North River Press Great Barrington MA
- Hutchin, C.E. 2001 Enterprise Focused Management Thomas Telford London
- Leach, L.P. 2000 Critical Chain Project Management Artech House Boston
- Newbold, R.C. 1998 Project Management in the Fast Lane St Lucie Press Boca Raton USA
- Stein, R. 1996 Re-Engineering the Manufacturing System Dekker New York
- Smith, D. 2000 The Measurement Nightmare St Lucie Press Boca Raton USA
- Umble, M. M. Srikanth M.L. 1990 Synchronous Manufacturing South-Western Publishing Dallas