Enabling Operational Effectiveness: Adding Value Through Process Management.

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Abstract

Nearly 10 years ago, management guru and strategist Michael Porter stated that strategy and operational effectiveness are both essential to superior performance in any enterprise[1]. Porter stressed the difference between the two concepts and much has been written on these topics, although a literature search suggests that strategic management is the more popular, contemporary topic. Yet, operational effectiveness is something nearly every employee is involved with on a daily basis, in manufacturing plants, call centres, reception desks and shop aisles, people are actively engaged in often complex sets of activities and tasks that are expressly pursued to accomplish particular objectives for customers, either internal or external. These processes may be large, and cross functional, such as order management, or relatively narrow, like order entry.

Enabling operational effectiveness means performing similar activities and processes better than rivals perform. Operational effectiveness includes, but is not limited to efficiency. It refers to any number of practices, some of them explored in this paper that allow an organisation to better utilise its inputs by, for example, reducing defects in products or delivering enhanced services, faster. Differences in operational effectiveness among organisations are pervasive. Some organisations are able to get more out of their inputs than others because they eliminate wasted effort, employ more advanced and functional management information systems, motivate employees better, or have greater insight into managing and enhancing particular sets of processes. Such differences in operational effectiveness are an important source of differences in determining value enhancement, profitability and enterprise efficiency among organisations because they directly affect relative cost positions, and outcome efficacy.

Porter coined a phase 'productivity frontier' and described a scenario whereby organisations moved closer to this frontier *only* through deliberate improvement of its operational effectiveness. The productivity frontier is constantly shifting outward as organisations grapple with and change their people management, enhance their processes and develop their technology capability.

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Key Words:
Operational Effectiveness, Productivity, Process Improvement, TQM, Six Sigma, Theory of Constraint, Lean Management, and Process Management.

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This paper is based on applying a simple, consistent approach to process enhancement premised on the basis of operational effectiveness and ultimately aimed at adding tangible value to any enterprise, focusing on two contemporary process improvement tools – Six Sigma and Theory of Constraint.

PROCESS IMPROVEMENT MANAGEMENT – TOOLS AND OPTIONS

Several management scientists are credited with formalising process improvement and turning it into a mainstream activity. A defining impact point must surely be the work undertaken by Walter Shewhart, a physicist in the Bell Laboratories who is credited in the 1930's with using statistics to look at the way quality could be controlled in manufacturing processes. Shewhart is also credited as being W.Edwards Deming's principle influence and mentor. Deming is credited as the founder of the quality movement, and in particular a direct influence in the creation of Total Quality Management (TQM) principles.

The Japanese transplanted TQM to America in the 1980's and proved that even when they employed Americans, they could make it work. One of the classic TQM case studies involved the joint Toyota / General Motors Nummi car assembly plant in California. The original GM plant was so inefficient that it was mothballed. Toyota re-employed about 80% of the original workers and transformed it into one of the corporations best through a reinvention of high performance business units, meaningful work experiences, collaborative problem solving and process enhancement reviews of all the production and service delivery processes.

By the 1990's TQM had been reinvented by Allied Signal, General Electric and Motorola as the 'Six Sigma' system of process optimisation. In practice, Six Sigma has become a code name for a set of methodologies and techniques used to improve quality and reduce costs.

Process optimisation techniques leading to operational effectiveness has several champions. Aside from TQM, Michael Hammer and James Champy coined the term 're-engineering' which, in the 1980's became a synonym for downsizing. Some observers have made the distinction between re-engineering and process improvement, as that where re-engineering is a practice that builds from scratch – as opposed to process improvement whereby you build on and transform the process or function that already exists. Perhaps as a consequence - Hammer has recently been touting 'operational innovation' as the organisational process saviour, being the 'invention and deployment of *new ways* of working' (as opposed to just doing work the way it should be in reducing errors, costs, delays but without fundamentally changing how that work gets accomplished).

Finally, one of the more recent innovative and compelling methods for process improvement (and problem solving) is the concept known as the 'Theory of Constraint' (ToC).
Devised by Eli Goldratt, one of the benefits of ToC is the emphasis and reality that a lot of process improvement may not enhance processes sufficiently to make a tangible difference. As such ToC specifically addresses the fact that most process problems involve bottlenecks or process issues that are critical ('constraints') and need to be either eliminated or modified to allow improvements to be made.

As a management consultant, my practical industry preference, tempered by time and cost imperatives is a blend of both Six Sigma, building on what already exists and finding ways and means to enhance and optimise what is already there – often through the application of ToC.

ENHANCING THE PROCESS COEFFECIENT OF PERFORMANCE
Everyday organisational constraint is typically characterised by a set of bloated, slow or replicated tasks that build an activity. Recognising that tasks and activities are often joined together as part of a networked system focuses examination of improvement and enhancement around the linkages between each set of tasks, as well as the actual utilisation of the collective activities. Figure One, illustrates this concept.

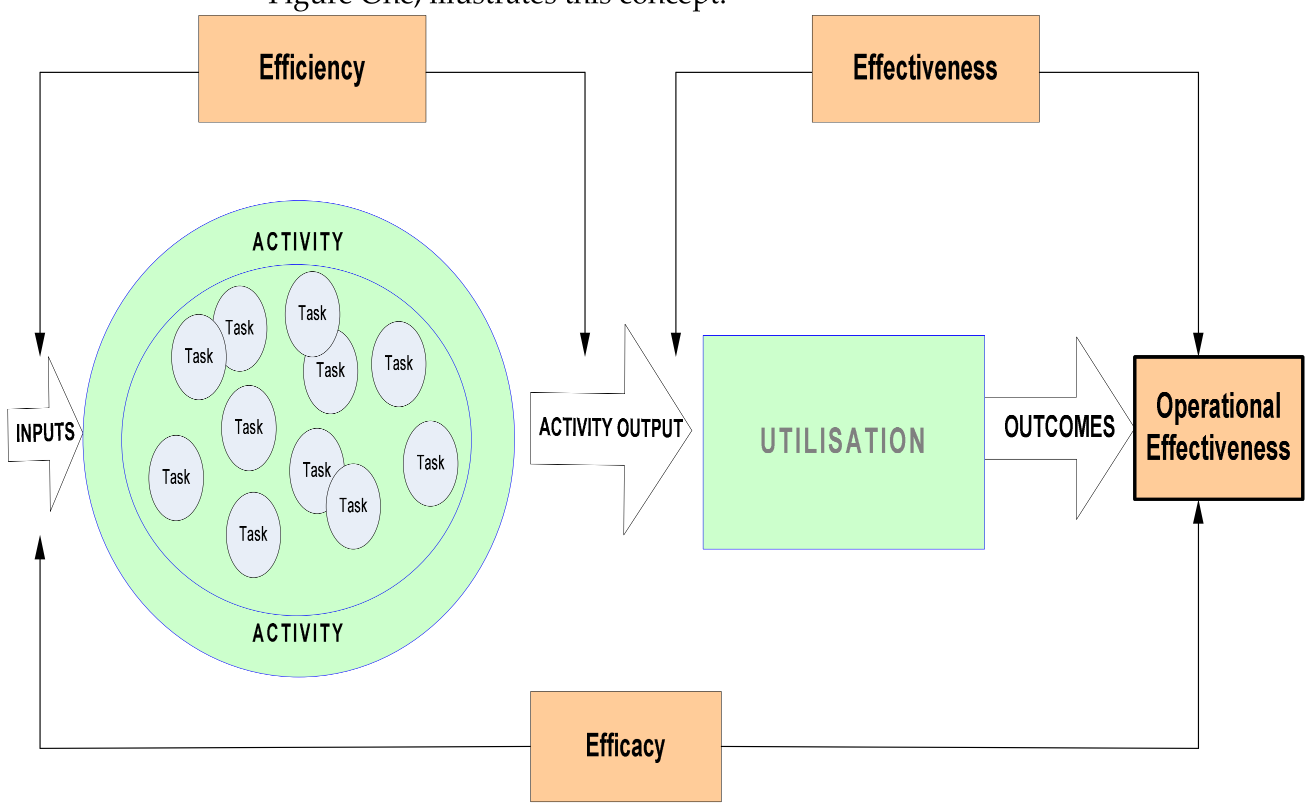

Figure One: How Inputs turn into Outcomes, to Create Operational Effectiveness (Rogers 2004).

A particularly useful way of instigating and categorising process improvement projects is to consider the findings and approach developed by Lapre & Wassenhove[2] who categorised process improvement projects as those that produced two types of learning; *Conceptual learning* and *Operational learning*. Conceptual learning is the process of acquiring a better understanding of cause-and-effect relationships – using statistics and other scientific methods to develop a theory. Operational learning is the process of implementing a theory and observing positive results. Put another way, conceptual learning yields 'know-why' – the team understands why a problem happens. Operational learning yields 'know-how' – the team has a tested solution and knows how to apply it and make it work. By using a blend of Six Sigma and ToC, allows you to develop and observe *operationally validated theories* – those theories that are derived from strong conceptual learning experiences and practical operational experiences.

Operationally validated theories were found by Lapre & Wassenhove as being the most effective at improving operational effectiveness. This was because their research showed that not only did process improvement teams develop solutions (through a variety of means including Six Sigma and ToC) that worked, but the solutions were often derived using scientific principles, and the effective actions were isolated from idiosyncratic local conditions so they were embraced and utilised by other employees elsewhere in the organisation – through a robust transfer of knowledge.

BLENDING SIX SIGMA AND THEORY OF CONSTRAINT FOR PROCESS IMPROVEMENT

Manufacturing process improvement is often easier to demonstrate process improvements as, the 'cause and effect' of change can often be measured in a more quantitative sense – as opposed to service delivery outcomes which are often customer related, subjective and more qualitative.

Figure Two is a good example of where I blend the concepts of Six Sigma and ToC in a basic manufacturing cause and effect model – focusing and leading towards the most effective return on capital employed (Return on Capital (ROC)). Six Sigma and ToC are not mutually exclusive – and can be blended to suit different activity improvements better.

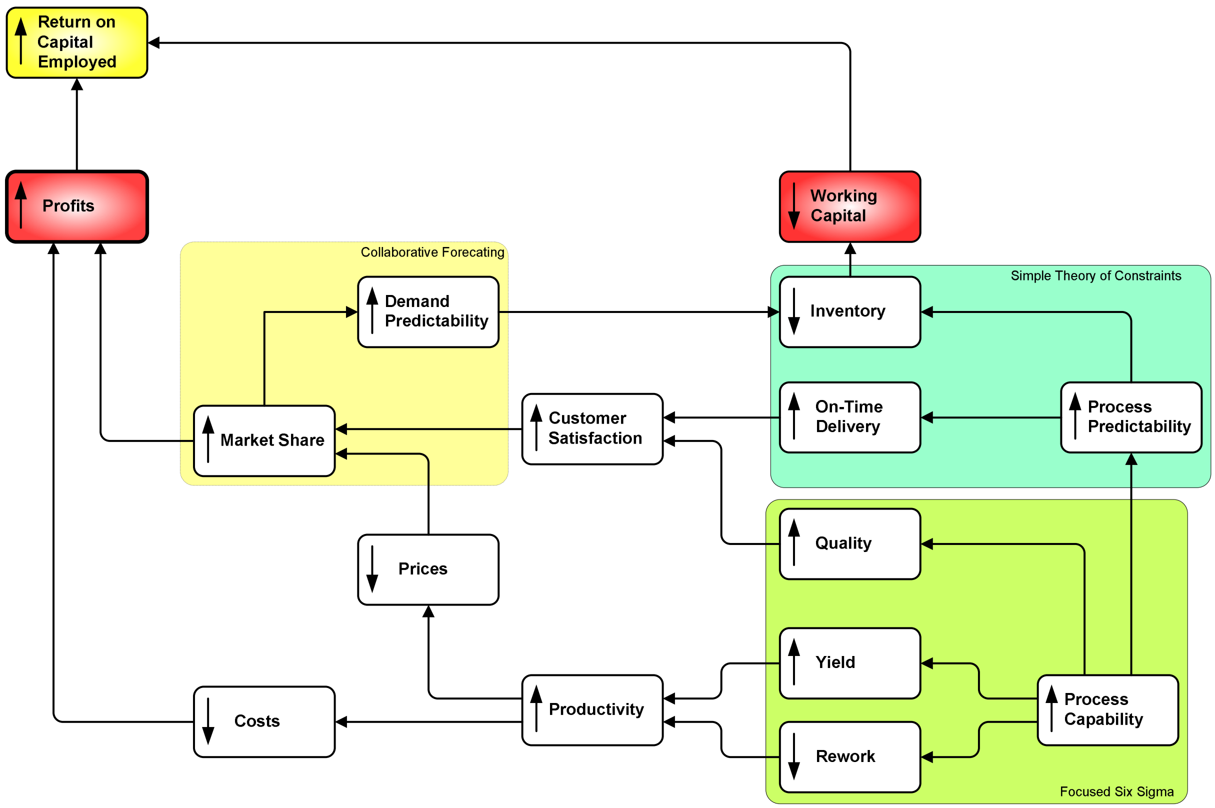

Figure Two: Manufacturing Cause and Effect: How Six Sigma and Theory of Constraint Applies. (Shannon 2003).

In practice, Six Sigma has become a code name for a set of methodologies and techniques used to improve quality and reduce costs. The Six-Sigma methodology that is most widely used – the one promoted in best selling books – is know as DMAIC (define, measure, analyse, improve and control). DMAIC offers a structured and disciplined methodology for solving problems.

With DMAIC, a problem is first defined and quantified (can be described as the 'root cause' or 'constraint'); then measurement data is collected to bound and clarify the problem; analytic tools are deployed to trace the problem to a root cause; a solution for the root cause is identified and implemented; and finally, the improved operations are subjected to ongoing control to prevent recurrence. The Six Sigma tool kit includes a variety of techniques, primarily from statistical data analysis and quality improvement. Many tools are familiar from the era of TQM; others are more recent and more sophisticated.

The power of a mixture of Six Sigma and ToC lies in the discipline it provides for coping with the complexity of business operations and contractual processes. Many different factors could be the cause of a quality problem: a poorly calibrated machine, no operating procedures, raw material, lack of appropriate employee training that is not up to specification, a supplier who performs a task incorrectly. Rather than trying random solutions, using Six Sigma pinpoints the cause of a problem and applies only appropriate solutions.

Six Sigma has been aptly compared to detective work: filtering through clues in a logical way to solve a problem and ToC then being applied to decide:

1. "What to change?"
2. "To what to change?"
3. "How to cause the change?"

Application of the three change questions in conjunction with DMAIC, can be described in the table below.

D: Define and Quantify Problem	What to Change?
M: Measure and Collect Data	
A: Analsyse and identify problem root cause	
I: Improve the task(s), activities that build the process	To What to Change?
C: Control, to prevent reoccurrence	How to cause the Change?

What to Change? From a list of observable tasks and activities (to create a process), cause-and-effect is used to identify the underlying common cause, the core problem, for all of the symptoms. In organisations, however, the core problem is inevitably an unresolved conflict that keeps the organisation trapped and/or distracted in a constant tug-of-war (management versus market, short term versus long term, centralise versus decentralize, process versus results). This conflict is called the *Core Conflict*, and in the ToC methodology – the Core Conflict, must be removed, modified or replaced.

To What to Change? By challenging the logical assumptions behind the Core Conflict, a solution to the Core Conflict is identified.

How to Cause a Change? Whereby a revised process is planned, listing the revised tasks and activities, to be undertaken by whom and when.

ToC is premised on maximizing the performance of a value chain by using these five basic steps:

1. **Identify** the issue/system's constraints
2. If a constraint can be immediately removed without large investments, do it now and go back to Step 1. If not, devise a way to exploit the system's constraints. (The original step: Decide how to exploit the system's constraints.)
3. **Subordinate** everything else to the above decision.

4. **Evaluate** alternative ways to elevate one or more of the constraints. **Predict** the future constraints and their impact on the global performance by theoretically employing the first three steps. Execute the way you have chosen to **elevate** the current constraints. (The "original step": Elevate the system's constraints.)

5. Go back to step 1. The actual constraints may be different from what you expected – **beware of inertia** in the identification of the constraints. (The original step: If, in the previous step, a constraint has broken, go back to Step 1, but do not allow inertia to cause a system constraint.)

The identification of the key constraint in any process is fundamental to creating a remedial and enhanced process. When examining processes, zero in on the task or activity, whether its an assumption or not, that fundamentally interferes or clearly places a constraint in the process and stops you achieving your business aims, goals or objectives – the figure out how to remove the constraint. By way of example, a major hospital, for instance recognised that to increase the number of patients admitted for (well reimbursed) cardiac bypass graft operations, it needed to respond more quickly to surgeons who wanted to refer a patient. The reason for the delay in response was the assumption that the hospital first had to assign a prospective patient a bed, a supposition that generated hours of delay and often led surgeons to send patients somewhere else. The solution? Send the patient to the hospital immediately, and assign the bed while the patient is in transit.

The merge of Six Sigma and ToC and the discipline to focus on 'what really matters' is important in busy organisations. Hammer[3] suggests the following approach as the 'First Steps Towards Process Management':

- Identify organisations processes, typically 5 to 10.
- Make people throughout the organisation aware of the processes and how their own work fits in.
- Create and deploy measures of end-to-end process performance, derived from customer and shareholder needs. Assess current process performance and set targets.
- Designate process owners: senior managers with end-to-end authority for a process, responsible for ensuring consistently high performance. The process owner establishes the process design, ensures the design is followed, obtains resources that the process requires and intervenes as needed to improve the process.
- Select two or three processes for redesign – those processes that are suffering from a core constraint and redesign for improvement – implement those new designs in a staggered fashion.

Selection criteria for those processes requiring redesign / modification can also often be tied back to processes that directly impact on the customer. Operational effectiveness process improvement focuses' for the customer, include:

1. Solve the customer's problem completely by insuring that all the processes that contribute to the goods and services work, and work together.
2. Processes should never waste the customer's time.
3. Processes should provide exactly *what* the customer wants.
4. Processes should provide what's wanted exactly *where* it's wanted.
5. Processes should provide what's wanted where its wanted exactly *when* it's wanted.
6. Continually aggregate processes to create solutions to reduce the customer's time and hassle.

Examples of where we have blended Six Sigma and ToC successfully include:

The cost overrun mystery. A municipal water pumping facility experienced operational costs over-runs on their pump repairs and maintenance budget. The invoiced amounts recorded in a bulk upload file showed excessive operational maintenance costs for breakdown items, yet the overall equipment effectiveness (a benchmark that measures industrial plant and equipment availability and reliability) was positively very high. Using a mixture of Six Sigma and ToC analysis, traced this seemingly high expenditure back to incorrect cost coding on the bulk upload file. Old redundant cost codes had been used that had previously lumped energy expenditure together with repairs and maintenance, thereby effectively tripling actual repairs and maintenance cost figures. Once the correct codes were in place, reported expenditure fell within budgeted guidelines.

The bad cheese incident. A dairy processing factory producing cheese for export to Japan had to recall an entire contaminated batch of processed packaged cheese. The contamination was aesthetic in nature, rather than a health related issue. A mixture of Six Sigma and ToC analysis examined the entire production line and through careful inspection found that a new routine scheduled maintenance activity had been added in an attempt to increase through-put but coincidentally, altered the tolerances thereby affecting the finished cheese product. By modifying the maintenance routine and testing the result - allowed for better plant performance and eliminated the contamination.

The multiple supplier overload. A telecommunication organisation had traditionally relied on dozens of suppliers servicing and maintaining their telephone exchanges. Following a benchmarking exercise, the transaction cost economics of utilising all these suppliers were excessive, and furthermore, priority conflicts between suppliers and the Telco, as well as the inherent risks of having multiple suppliers entering mission critical sites, was high (see Figure Three below). Following a tender process, the supplier base was aggregated through a supply chain optimisation process with suppliers diminishing from approximately 60 per site to just three. Savings across the entire portfolio of sites exceeded (total cost of supply) $AUS 1M and service effectiveness, customer service and asset management increased significantly.

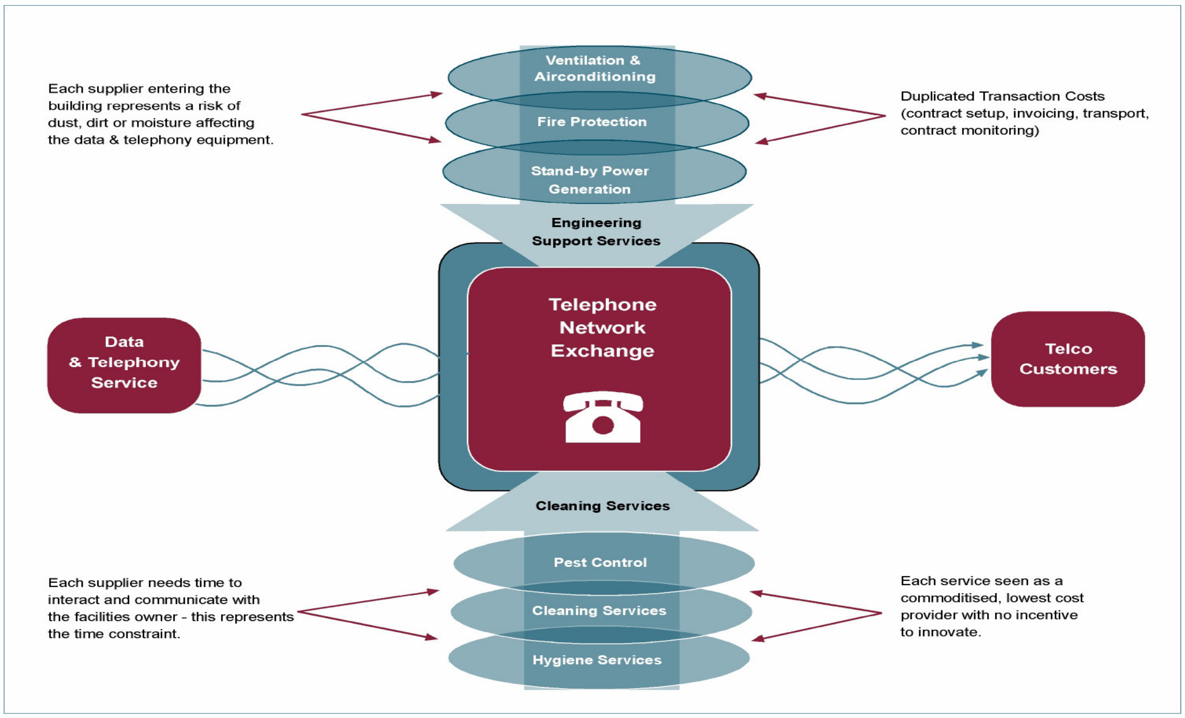

Figure Three: Multiple Supplier Dilemma - Transaction Costs and Priority Conflicts. (Rogers 2003).

The invoice payment dilemma. A telecommunication company had outsourced nearly all of its non-core data and telephony services. As a result, they rely on a few strategic suppliers who undertake high volumes of work in the information technology and facilities management areas. When these contracts were set up in the early 1990's, payment of monthly invoices took between 60 - 90 days. Through a mixture of Six Sigma and ToC analysis, we refined this time frame down to less than 20 days through instigating a process where the suppliers 'create' their own invoices (known as a 'Buyer Created' invoices) based on actual service work undertaken in the past 30 days and submit them for payment within a flat file detailing all services undertaken in the payment period. This process improved the supplier's cash flows enormously and dropped the overall total cost of supply to both parties.

CONCLUSION

Creating operational effectiveness through process improvement, using tools like Six Sigma and Theory of Constraint entails making choices in seven key areas. It requires specifying *what results* are to be produced and deciding *who* should perform the necessary processes, *where* they should be performed, and when. It also involves determining under which circumstances (*whether*) each of the processes should or should not be performed, *what information* should be available to the performers, and how thoroughly or intensively each process needs to be performed.

Organisations actively employing operational effectiveness, created through enhanced process improvement have staying power. Some competitors, even when confronted by competitors' innovations will not rush to emulate them. Operational effectiveness is often a step change. It moves the enterprise to an entirely new level.

Once there, the organisation can focus its efforts on a generation of additional changes – refinements of the operational effectiveness – that will keep it ahead of the pack until the inevitable time comes for a new wave of innovation, part of the continuous improvement cycle. That's why organisations should make operational effectives a way of life, not just a special project. Operational effectiveness isn't as 'sexy' as strategic management and it may be unfamiliar to many executives, but it may well be the lasting basis for superior performance.

In a modern era where we are plagued by new management guru's with new buzz words and in which the customer is central to your decision making, operational effectiveness through process redesign and improvement offers a meaningful and sustainable way to move ahead, and stay ahead of the pack.

REFERENCES

[1] See M.Porter, "What is Strategy?", ***Havard Business Review***, Nov – Dec 1996. Pages 61-78.

[2] From Michael A. Lapre & Luk N. Van Wassenhove, "Learning Across the Lines – The Secret to More Efficient Factories", ***Havard Business Review***, October 2002. Pages 107 - 111.

[3] See M.Hammer, "Process Management and the Future of Six Sigma", ***MIT Sloan Management Review***, Winter 2002. Pages 26-32.