

**OPERATIONS CAPABILITIES AND
STRATEGIC COMPETENCIES:
TRANSFORM AND LEVERAGE**

by

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**Operations Capabilities and Strategic Competencies:
Transform and Leverage**

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Introduction

Strategic planning, as known for the last two decades, seems to be reaching a dead end. At the 1995 conference of the Strategic Management Society¹, several speakers referred to the "fall of strategic planning²," and highlighted the "guru soup" as the current status of the field known for long as strategic management. With this "guru soup" (Rumelt³) suggested that strategy has become a field of buzz words e.g. strategic intent, shared values, vision, re-engineering, restructuring, empowerment, lean manufacturing, concurrent engineering, heavyweight project managers and many more. Each of these concepts finds its prophet or guru in the person of a well-known management specialist and is advocated in a best-selling management book. Strategy appears to have become a succession of fashionable programmes.

Increasing number of executives and scholars are finding that strategic "planning" is indeed the easy but perhaps less relevant part of a strategic exercise, but that its implementation is much harder. Coincidentally, initiatives which finds their roots in operations management e.g. Total Quality Management, Time-Based Competition, Empowerment, and Business Process Reengineering, are considered as the potential sources of future competitive advantages and strategic drivers for the whole of a firm.

Over the last fifteen years the operations discipline has developed and implemented many action programs. The ones we mentioned in the guru list are not exhaustive by any means. In order to survive in the fierce international competition of delivering quality products at lower cost, numerous manufacturers around the world have vigorously pursued programs like statistical quality control, just-in-time production, worker training, flexible manufacturing systems, design for manufacture, materials requirements planning, and many others.

Some of these programs have been leveraged by the firm into a strategic driver, while others have not. Motorola, for example, expanded its trademark "six sigma" program as a corporate-wide program far beyond its product development and operations origin. After successfully upgrading its product and process quality, now the company wanted to achieve the "six sigma" quality (that is, less than a few defects out of million parts produced) in "everything we do," from order handling process, to human resource acquisition and training, to accounting and billing processes. The experiences and lessons learned from manufacturing operations were diffused through a wider range of corporate business processes, and have become the hallmark of how the company wants to compete.

¹ 1995 Conference of Strategic Management Society, Mexico City, October 1995. Also H. Mintzberg has described this in his book "Rise and Fall of Strategic Planning".

² Prahalad and Hamel, 1995 Conference of Strategic Management Society, Mexico City, October 1995.

³ Rumelt R., Key Note Speech at the Conference of the Strategic Management Society, October 1995

On the other hand, many typical manufacturing programs are still restricted to their original scope. The notion of for example flexible manufacturing system, despite the high expectation from the operations specialists as the future source of superior competitive advantage⁴, is yet to be shared by other business functions. In fact we have learned from a survey of ten years of implementing action programmes in manufacturing in Japan, that flexible manufacturing systems are decreasing in emphasis⁵. And Kim⁶ concluded in 1994 that North American companies had very diligently and frantically applied advanced manufacturing techniques, but had not necessarily gained in competitive advantage in the globalising world.

An intriguing question comes to our mind. Why were some action programs so successful that their scope was expanded into the entire firm and their principle components were adopted as corporate-wide strategic driver? Why didn't other programs receive the similar attention from the top management, and stopped from becoming a corporate-wide strategic tool?

One proposition we intend to pursue in this paper is that those successful programs added unique and powerful *capabilities* to the operations function, and their utilities were strong enough to provide unique and powerful *competencies* that top management could leverage in building competitive advantages. In other words, these successful programs were transformed into significant operations capabilities, which in turn were instrumental to the core competencies of the entire company.

We examine some of those operations action programs that have successfully progressed to become strategic drivers, and compare their characteristics against some of the programs that have not made those strides yet. Based on these observations, we attempt to address the following questions:

1. Why are some operations capabilities transformed into strategic competencies?
2. How does this transformation happen?
3. How can the operations function select and deploy only those programs and build those operational capabilities that will have a high probability of becoming strategic competencies?

⁴ De Meyer A., Nakane J., Miller J.G., Ferdows K., 1989, Flexibility : the Next Competitive Battle, Strategic Management Journal, vol. 10, pp. 135-144.

⁵ Katayama H., 1996, Japanese Manufacturers: Having Consistent Policies or Fads, Trends in Manufacturing, Action Programmes and Competitive Priorities from 1986 till 1996, Waseda University, Working Paper

⁶ Kim, J.S., 1994, Beyond The Factory Wall, Overcoming the Competitive Gridlock, Manufacturing Roundtable Research Report Series, Boston University School of Management, September 1996

Operations Programs That Made It All The Way

We looked at some of the strategic initiatives that have been on the hit list of consultants and management gurus. The Total Quality Management initiatives come to the top of the list with the company names like Xerox and Motorola. There are companies like Honda, Hewlett-Packard, and Nokia, that are known for successful deployment of what is known as Time-Based Competition. Ford, Oticon and Taco Bell were in the recent past featured as successful cases of Business Process Reengineering. The list goes on and on, and in the second column of Table 1 we have presented a few more examples of these initiatives .

Table 1
Operations Programs and Strategic Drivers

<i>Operations Programs</i>	<i>Strategic Drivers</i>	<i>Cases</i>
statistical quality control statistical process control	total quality management (TQM)	Xerox Motorola
Just-In-Time	time based competition (TBC)	Nokia, Honda, HP
process analysis restructuring plant network	business process reengineering (BPR)	Ford Taco Bell Oticon
quality circles	empowerment	GE, LG Group
supplier relationship	outsourcing	Limited, Nike, Benetton
kaizen	learning organisation	Chaparral Steel Samsung, Analog Devices

An interesting commonality among those highly publicised cases is that those initiatives were deeply rooted in the actions and programs that have been developed and implemented in the operations function. TQM is an extension of the principles from the statistical process and quality control. Time Based Competition has its roots in the consistent implementation of Just-In-Time concept. Similarly, the core of Business Process Reengineering exists in the analysis of processes, which has been one of the basic tools of the manufacturing operations. Empowerment can be traced to initiatives like quality circles in which employees were entrusted with improving and

redesigning their tasks. Outsourcing is based on supplier partnerships. And the learning organisation has grown out of continuous improvement activities.

These operations programs, in addition to contributing significantly to the strengths of manufacturing operations, have expanded their value-adding influence to a much larger scope of business organisations. For some organisations they have become company wide drivers of the strategy, and have thus made a real contribution to the competitive strength of the company as a whole.

What Made "Winning Programs" Different

Not all operations, however, were adopted as strategic initiatives. There are many other successful operations programs that have not yet made the corporate strategic initiative list. Among them are those three-letter acronyms like FMS, CIM, QFD, DFM, and MRP or concepts like Technological Forecasting, Group Technology or Cellular Manufacturing. Those remain as the issues specific to the operations function, and have not offered the possibility of a strategic turnaround of the company. We are not pretending that none of these programmes can make it into what we have labelled as strategic drivers. For some of these we may not yet see the final result of their evolution, but others will probably never make it.

At the same time our decade-long study of manufacturing programs in Europe (Global Manufacturing Futures Project) shows that some of these programs are beginning to fade out from the operations executives' emphasis list⁷. As seen in the figure, leading manufacturing companies in these regions have been putting less emphases on programs like FMS, CIM, and MRP in the 90s than they had in the 80s. On the other hand, programs like worker training, giving workers more responsibilities, and cross-functional teams, are gaining momentum. Intriguing is the high correlation between the changes in the manufacturing function's emphasis on these programs and the degree to which these same programs have grown into the corporate's strategic drivers.

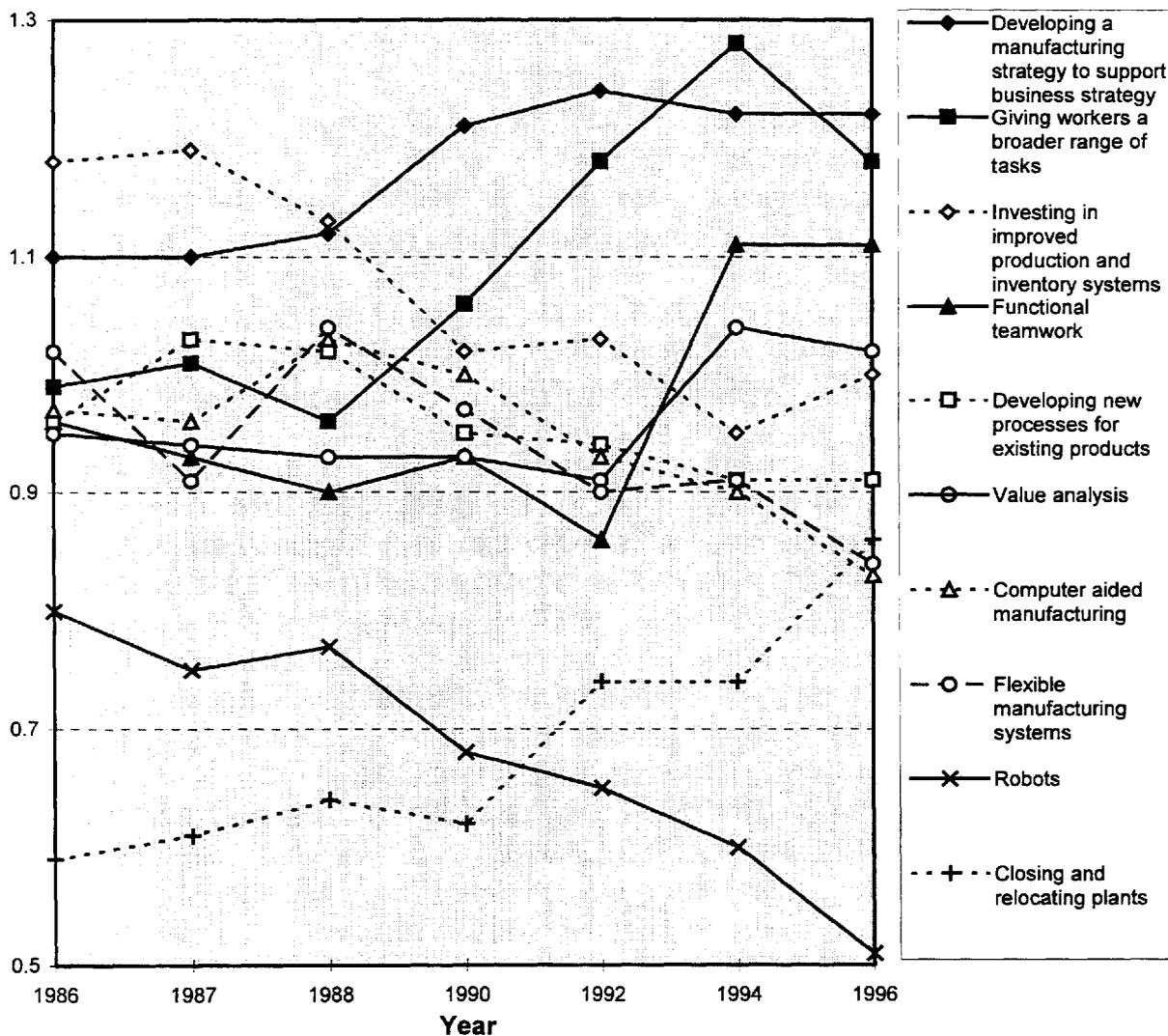
⁷ De Meyer A. and B. Pycke, 1996, Separating the Fads from the Facts: Trends in Manufacturing Action Programmes and Competitive Priorities from 1986 till 1996, INSEAD Working Paper n° 96/21/TM

Figure 1:

Rise and Fall of Manufacturing Action Programmes

	1986	1987	1988	1990	1992	1994
Developing a manufacturing strategy to support business strategy	1.1	1.1	1.12	1.21	1.24	1.22
Giving workers a broader range of tasks	0.99	1.01	0.96	1.06	1.18	1.28
Investing in improved production and in inventory systems	1.18	1.19	1.13	1.02	1.03	0.95
Functional teamwork	0.96	0.93	0.9	0.93	0.86	1.11
Developing new processes for existing products	0.96	1.03	1.02	0.95	0.94	0.91
Value analysis	0.95	0.94	0.93	0.93	0.91	1.04
Computer aided manufacturing	0.97	0.96	1.03	1	0.93	0.9
Flexible manufacturing systems	1.02	0.91	1.04	0.97	0.9	0.91
Robots	0.8	0.75	0.77	0.68	0.65	0.6
Closing and relocating plants	0.59	0.61	0.64	0.62	0.74	0.74

Emphasis on Action Programmes in Europe from 1986 till 1996



Why didn't some of these programs make it all the way into strategic drivers like others? Comparing the general characteristics of those programs that made it all the way (the "Winners") and those that have not (the "Not-Yets" or perhaps "Losers"), we propose the following distinctions between these two groups (Table 2):

Table 2	
Comparing General Characteristics of Operations Programs	
<i>The "Winners"</i>	<i>The "Not-Yets"</i>
internally developed	externally packaged
no beginning, no ending	projects
brick by brick	total solution
soft	hard
organic	mechanistic

First, the "Winners" are not to be purchased as project or a package, while there appear to be many external "providers" of the expertise or packages for programs like CIM, QFD, or MRP.

Second, the "Not-Yets" are often considered as distinct projects, while the "Winners" tend to have no visible end-points. Indeed, it is not so clear when and how the Just-In-Time initiatives should end, for example. Quality management programmes have often been described as a 'never ending' exercise.

Third, companies who were successful in implementing the "Winners" did not believe that any one program alone could solve all the problems faced by the organisation. The illusion of "total solution" was not visible. Rather, those companies were counting on the belief that small and continuous improvement in their current operations would eventually provide them with superior competitive abilities.

Fourth, most of those programs we called "Winners" deal with human and other "soft" issues as much as investment in hardware. Studies on successful implementation of JIT, TQM, and many others all emphasised the importance of training workers and supervisors as a critical success factor, for example.

All in all, those "Winners" are an organic approach to operational improvement, while the "Not-Yets" tend to be more mechanistic. Familiar account of the success stories about the "Winners" include concepts like synergy, learning, and cycles, more than words like planning, control, and optimal solutions.

Two examples of the implementation of J.I.T. and of an F.M.S can illustrate these. They are almost archetypal, and readers familiar with these two manufacturing programmes will probably be able to identify with some of the elements of these cases.

In the middle of the eighties a French supplier of automotive components was forced by its main customers to increase the quality level of its supplies and to reduce the costs. Based on the stories about the success of the Japanese automotive industry they chose to invest in a J.I.T. programme. Originally this was considered to be a simple inventory reduction programme, limited in scope to production, and implemented with the support of a well known consultant who had developed a packaged concept of J.I.T. procedures and software. Though the solution was limited to the production environment it was expected that the rational application of the concepts would lead automatically to a better cost and quality performance. Very soon however the company they discovered that J.I.T required more than the application of a tool box, but that it needed a complete change in the internal culture of the organisation, retraining of the workforce, partnerships with suppliers, reorganisation of the production site, redesign of the products. In fact they developed gradually a proprietary form of Just in Time management and created a factory where their suppliers come and deliver and assemble the components on their final products. What started as a packaged solution supplied by a consultant became under the impulse of a visionary management an internally developed way of life for the organisation.

The example of the implementation of an F.M.S. started in a similar way. A supplier of customised industrial lenses for high tech applications used to have a lead time for production and delivery of about nine months. Part of the long lead time could be explained by the inflexibility of the production process. Competition in this highly oligopolistic market was mainly based on technical characteristics. But the sales department had regularly mentioned that shorter delivery lead times may help in obtaining orders, or at least would allow them to get higher prices. The company was organised on a functional basis and power was mainly with the technical people. They decided on their own to make a major investment in increasing the flexibility of the production process. Two years after the investment was successfully completed (and the lead times should have been halved to four to five months) the board of directors ordered an audit of the investment. They wanted to know whether the originally projected productivity improvements and increased margins had been obtained. It turned out that the sales department still quoted the same delivery lead times of nine months. They did not trust the capability developed by the production department, and kept on competing on the basis of technical performance characteristics of the product as opposed to reaction speed. One may explain this partially by a bad implementation of what was a technically sound project. But the failure to capture the benefits of a successful technical investment was

in our opinion also the consequence of the fact that it was an isolated solution to what was in fact a company wide attitudinal problem.

More general we have observed that M.R.P. I and II had created enormous expectations in the eighties. It may sound exaggerated but in particular M.R.P II was often described as a rational system that would enable us to get the whole of the flow of goods and information in manufacturing under control. Underlying some of the expectations about M.R.P. II was that we would be able to model the whole of the manufacturing process, and that a centralised and intelligently managed database would provide the company with sharply improved productivity and reaction speed and a clear competitive advantage. Though many companies have satisfactorily implemented these M.R.P. systems, they have usually failed to turn them into a well differentiated competency that would help them in the market place. That does not mean that the underlying concept did not provide potential. In fact an M.R.P. II that would have implemented not as a total solution, well packaged by hard and software vendors and mechanistic in its philosophy but rather as an organic solution, might have led to a distributed information processing capability that then might have helped the company to transform that capability into an information management competency and an original type of learning company. But that would have required more internal development, a more organic approach and an attitude that resource planning is no a finite activity.

Similar observations could be made about the difference between the implementation of SPC/SQC with the aim of continuous improvement leading to Total Quality Management and the more packaged and normative ISO 9000 methodology which may lead to productivity improvements, but which has not led to a driver of strategy.

From Operations Capabilities To Strategic Competencies

Will those "Not-Yets" grow into a company-wide strategic driver, if more time is given to them? Is it a question of timing, or is there something more fundamental going on? While the observations made above help us understand the differences between the "Winners" and the "Not-Yets," they do not give us an answer to whether those "Not-Yets" will, if time permits and those winning characteristics are reinforced into the original structure of the program, make it into the status of strategic drivers. -- In fact our example of the J.I.T. implementation started with the characteristics of a "not-yet", but evolved to a "winner".-- Do these categorical differences provide sufficient and necessary conditions to the transition from a functional program into a strategic driver? There seem to be more fundamental principles that explain the progression from operations programs to company-wide strategic initiatives.

We posit that the real difference resides whether a program builds unique and strong capabilities, and whether the company can leverage these capabilities into unique and strong core competencies. If the answers to these questions are yes, then the operations program is more likely to be adopted into a company-wide strategic initiative. The development form programmes to drivers that we propose goes as follows.

First, those "Winning" programs have generated superior operational capabilities. For example, Just In Time programs helped firms to develop capabilities to deliver products with higher dependability and speed.

Second, those operations capabilities have to be transformed into actively deployed competitive competencies. That is, with the improved dependability and speed of delivery, the business unit can respond to the changes in the customer's requirements. In other words, delivery speed and dependability are recognised as the sufficient and necessary ingredient for the competence of rapid response.

And third, the company diffuses those competitive competencies throughout the organisation by adopting a consistent strategy. For example, the firm with the JIT program, highly dependable and fast delivery, and competency in rapid response, now recognises the "time-based competition" as the company-wide strategy.

Table 3 lists some of the operational programs that made successful progressions to the strategic level. For many manufacturers, statistical quality control (SQC) program helped them establish the operational capability to consistently produce goods without defects (conformance quality), and this capability was instrumental for the firms to deliver consistent value to their customers. On the other hand, the total quality management (TQM) initiative was pursued by these companies to use that capability as a strategic weapon. Without the basis of conformance quality, delivering value to customers would be an empty slogan. Maybe, this existence of the fundamental operational capability is the critical difference between the real TQM companies and the ones that just say it.

On the other hand, the "Not-Yet" programs we contrasted earlier, appear to have failed some of these transformations. Despite the high expectations toward Flexible Manufacturing Systems (FMS) for example, many manufacturing companies reportedly failed to achieve competitive gain (large enough to compensate the significant capital investment) mainly due to the lack of strategic shift in the mind of strategic planners.

Perhaps, FMS initiatives have not made it into a corporate strategy due to one of the following failures. First, the operations function was probably not able to build a unique capability, like product and/or volume flexibility, just by

implementing an FMS system. Second, the product or volume flexibility may not have been powerful enough for the business unit to exploit as a core competency. Third, the company was perhaps not ready to use flexibility as a key ingredient in its strategic positioning in the market. That is actually what seemed to have happened for the example of the producer of the industrial lenses.

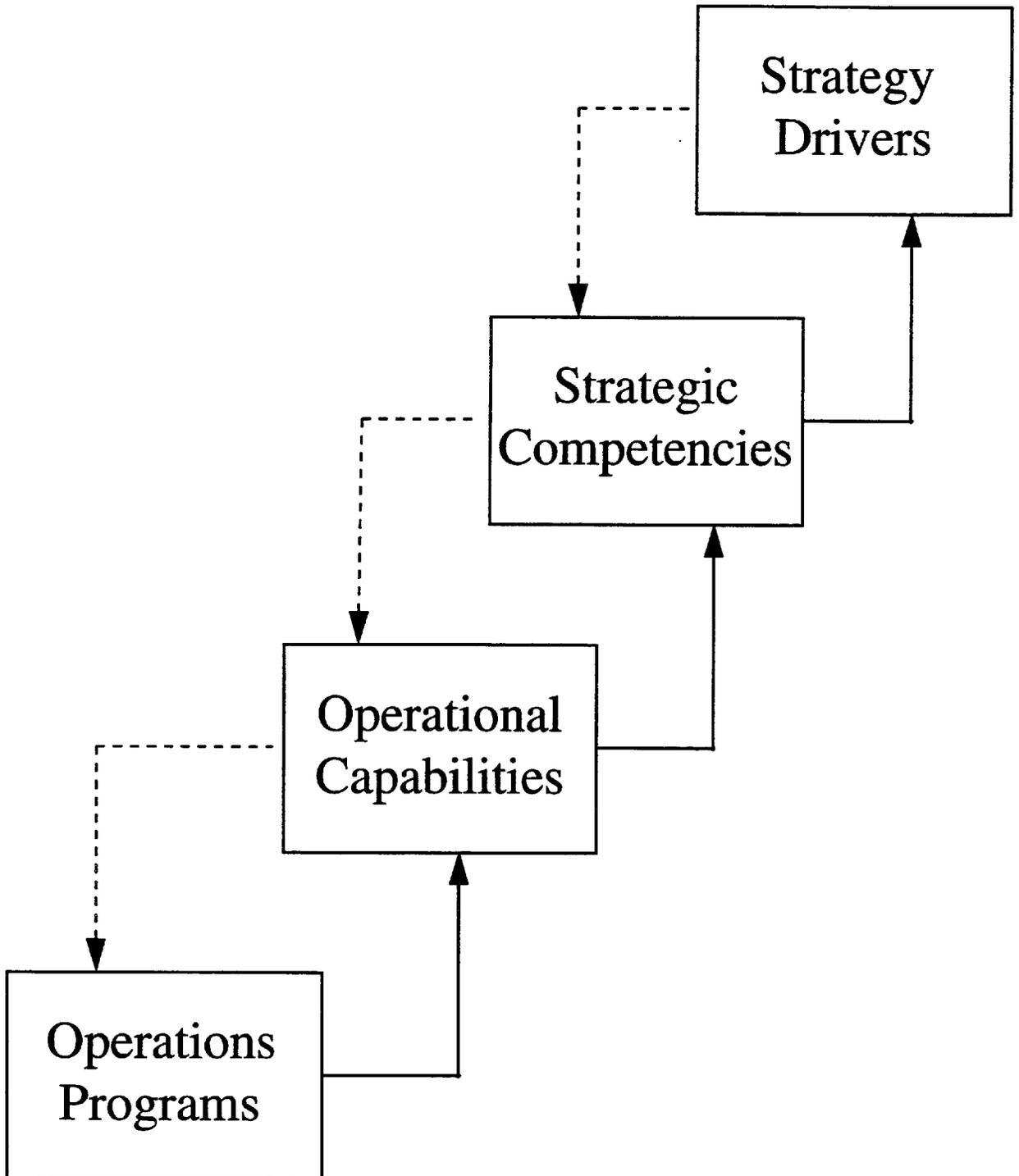
A short example may illustrate that this sequence of transitions and leveraging is not exclusive to large organisations, but applies as well to smaller companies. The example is one of a small European processed meat producer. Due to his tradition its production management focuses on two main aspects: the efficient utilisation of the raw materials (meat) and the flexibility of its production capacity. Both of these foci were a consequence of competitive pressures in the market for cheap processed meats. The raw materials are the major cost driver of the end product. The high variability of the demand for products with a limited shelf life time forced the management to render its workforce and production capacity as flexible as possible. The constant emphasis on these two factors led this small company of 400 employees to a culture whereby at all levels and in all departments one constantly asks the questions about flexibility and savings of raw materials. From action points they have become a capability and have led to a competency which has enabled top management to build up a strong position in a very difficult market, i.e. the one of distributors brands. They have given up their own brand but have developed a low cost and highly flexible production and delivery system which renders them to be an unavordable and strong partner to large distribution chains.

Table 3

The Path of Transition

<i>Operations Program</i>	<i>Capabilities</i>	<i>Competencies</i>	<i>Strategy Driver</i>
JIT	delivery reliability and speed	fast response	Time based competition
SQC	conformance quality	consistency and value	TQM
Kaizen	continuous improvement	faster learning	Learning Organisation
Process analysis	elimination of waste	maximise value added	Business Process Reengineering

Figure 2:
*A Dynamic Model of Operational
Capabilities and Strategic Competencies*



The Transition – How Does It Work?

How does a capability, inherently internal to a specific function like operations, become a core competency of the organisation? Anecdotes provide different scenarios - some appear to have emerged from "learning by doing" and stumbling into a competency, which can be described as emerging strategies. Others required some "programmatic" intervention by top management. Very quickly one ends up in a debate whether the strategic drivers are developed top down or bottom up. We are convinced that this is a false debate. Indeed our model suggests that we have to understand how the three translations (from programmes to capabilities, from capabilities to competencies and from competencies to strategic drivers) can occur. Phrased this way it becomes clear that the transformation and leveraging has to happen at different levels and with different time perspectives at the same time. We like to offer seven considerations which can help us to understand this triple transformation and leveraging process.

Triggering the transitions

Firstly, in order to fuel the transformations *some triggers are needed*. For example, Honda's rapid gain in time-based capabilities was triggered by the strategic duel with their rival Yamaha. In other instances, those operations programs are picked up by the strategic planning group when the company is faced with imminent competitive crisis. Xerox expanded its quality control into total quality management in the early 80s, when it became apparent that they would soon be chased out from the market by the Japanese competitors who have attacked the U.S. market with superior quality. Xerox's journey toward achieving their objectives was not a short one in any measures, but it would have been much longer, if not impossible, had it not been the threat of extinction from the market. Business Process Re-engineering became possible when companies who had invested in continuous improvement discovered that the pace of their change was largely insufficient to catch up with competitors.

We are not arguing that the transformation can only be made when there is a threat of extinction, nor are we suggesting that one should create artificial threats. --We know that there are sufficient competitive threats around and that there is no need to create some new ones.-- But what appears clear from the few examples we have studied is that the (real) threat was made clear to all levels of the organisation and phrased in terms which were concrete to all levels of the organisation. Xerox's perception of the external threat and its intended response may have been defined as a market share problem at the marketing level, but at the same time as a concrete quality issue for production and a responsiveness issue for the developers. An external threat was leveraged to mobilise the whole

organisation in a language appropriately adapted to all levels in the organisation.

Simultaneity in the three transition processes

Secondly the three transition processes of operations programs into strategic drivers demands at the *same time both bottom-up and top-down directions*. On the one hand, efforts invested in programs have to be transformed by a manufacturing manager into operations capabilities that can support and enable higher-level strategic competencies. This is probably what Skinner has defined as the concept of manufacturing in the corporate strategy⁸ : 'designing a coherent internally system focused on a strategic business task'. The alternative for the manufacturing manager would be to do some tinkering with advanced manufacturing techniques, with an elusive and badly defined goal of World Class Manufacturing in mind. This can only lead to catching up with standards set by other manufacturers, in the worst case by one's competitors. On the other hand, organisation's strategic drivers need to be formulated by top management around those competencies that can drive and leverage operational capabilities. They need to have the tools to recognise and nurture these competencies. And in between at a business level one needs to understand that what has developed into an operations capability can be extended in scope in order to turn these capabilities into a competency. This leads us to two more considerations about the need for *scope and speed in implementation*.

Scope and Speed : key challenges

Scholars working in the field of the resource based view on the firm suggest that competencies, in order to become a long-lasting source of competitive advantage, need to be developed, diffused, integrated, and leveraged with clear goals and objectives⁹ : core competencies, albeit their tendency of "natural growing," need to be managed with some regularities that are common to conventional strategic planning. Similarly, we posit that the above-mentioned transition processes of operational program into strategic driver need careful management. Operations managers need to understand how their programs can contribute to the organisation-wide strategic competencies, not just the improvement in the operational measures. Similarly, strategic thinkers at the business unit level need to see how the "naturally grown" operational capabilities can be effectively exploited to enhance the competitive position of the entire enterprise.

In these transition processes, two critical challenges have to be managed carefully. They are related with the *scope of program intention* and the *speed*

⁸ Skinner, op.cit.

⁹ Doz Y., 1995, Managing Core Competency for Corporate Renewal ; Towards a Managerial Theory of Core Competencies, INSEAD Working Paper n° 94/23/SM

of programme implementation. In order to become a strategic initiative, the operations program has to expand its action scope (not just production line, but to cover entire value-delivery chain). In parallel, the speed with which these programs are implemented should be accelerated.

Competencies grow with the repeated interaction between individual skills, systems and processes, and tangible and intangible resources of the organisation¹⁰. Likewise, in order to become enterprise-wide strategic initiative, the capabilities built in operations must be shared and diffused across functional and organisational boundaries. The scope of program application needs to be expanded, and the focus has to shift from a specific function to a cross-functional process that might encompass several work units.

In earlier papers¹¹ we noticed that traditional manufacturing had a tendency to isolate and buffer itself from its environment. Some examples of these buffers were the inventories between the manufacturing operations and its suppliers and distributors, the demand for clear specifications from design and development department, the tendency to reduce the interaction with the workforce to negotiations with unions, the demand for exact forecasts from the markets and long lead times for deliveries, or the hiding behind laws and regulations when it comes to the evaluation of the environmental impact of the operations. It is striking that many of the recent advanced manufacturing techniques are precisely focused on the reduction of these buffers. J.I.T tackles the inventory buffers, Q.F.D. would create better communications between markets, operations and design, empowerment is a catch word for a different style relating to the workforce and D.F.M. creates common ownership of the development process between operations and design. These are but a few examples, but many of the recent manufacturing programmes precisely attempt to lower the buffers that manufacturing had created in order to create a stable environment in which one can run smooth operations. We argue that companies that have successfully made the series of transitions are precisely those who did not deploy advanced manufacturing techniques in order to improve productivity in one area, but saw them for what they really are : buffer reducing programmes which ultimately will lead to integration of manufacturing with other functions.

In order to make the transformation possible from an action programme to capability and into competency, the operations function has to break its boundaries and extend the scope of its process. For so long, the operations function was purposefully isolated and buffered from the external constituencies in order to maximise its efficiency. What we learn from the proposition established in this paper suggests that the operations function has to break those "walls of isolation" if their successful programs are to be shared

¹⁰ Doz Y., op.cit.

¹¹ De Meyer A. and K. Ferdows, 1990, Removing the Barriers in Manufacturing, in J. G. Miller, A. De Meyer and J. Nakane, Benchmarking Global Manufacturing, Business One Irwin, 1992.
De Meyer A., 1992, Creating the Virtual Factory, INSEAD Working Paper, n° 92/82/TM.

with other functions, and if their unique and powerful capabilities are to be leveraged into company-wide core competencies. They have to see themselves not as an isolated operation, but as a part of a set of integrated processes, e.g. the supply chain process, the customer delivery process, the product and process development process, or the learning process.¹²

As the scope expands, the complexity of the program implementation grows, probably in an exponential scale. Increased complexity usually leads to reduced speed of implementation. Thus it becomes critical for the company *to accelerate the rate at which it learns* and to practice the core principles of these programs so that the involved parties can overcome the overwhelming complexity. Speed in implementation appears to us an essential element of the successful series of transitions.

Experimentation and diffusion

It would be too simplistic to expect that one manufacturing programme would lead to one capability, which in turn would lead to one competence and one strategic driver. We have carefully used throughout our reasoning the plurals to indicate that it is the repeated interactions between different action programmes, tangible and intangible resources that lead to a multiple set of capabilities and competencies.

Therefore there are two more relevant considerations. Companies need to have a pool of operational programmes that can interact. That needs a willingness to *constantly experiment* with new concepts. Essential to us is that companies actually develop a capacity to experiment and learn. In practice we have seen an organisation that had consciously set aside some of its production capacity throughout about half of its plants in order to constantly try out new ideas and programmes. That did not imply a sloppy running of the capacity. The real production capacity that was available after deducting the experiment capacity from the maximum available capacity was run in a most efficient way. Also the experiment capacity was run efficiently but only for the purpose of continuous experimentation.

At the same time one needs to ensure that the mechanisms are in place to *distribute and deploy* the results of the experimentation throughout the organisation. In one organisation with which we worked there was an influential 'learning manager', whose task it was to constantly create opportunities for collective information interactions through conferences, pilot implementations, projects and task forces, etc.¹³ This is one of the many ways of

¹² Kim J.S. ,1994, Beyond the Factory Walls : Overcoming the Competitive Gridlock, Manufacturing Roundtable Research Report Series, Boston University School of Management, September

¹³ An interesting perspective on the creation of an organisation as a set of information interactions is provided by Itami H, 1996, Theory of Ba (interactive Field), INSEAD EAC Research Paper

stimulating the information exchange that is necessary to leverage the results obtained through experimentation.

Keeping strategic momentum

Strategic drivers are not timeless. Once competitors learn about those programs and resulting capabilities, and of course replicate them in their own companies, they will cease to be strategic. For many Japanese manufacturers (and increasing number of Western manufacturing companies), the ability to provide consistent quality with low defects (stemming from persistent effort in statistical quality control) and the ability to deliver on-time (a key result from just-in-time efforts) provided those strategic flexibility that the corporate strategic planners could exploit. But today they have become common among top manufacturers all over the world¹⁴.

There is also the big risk of decreasing marginal return of incremental investment in the successes of the past. You need to be realistic about what the extent of the power of a capability can be? Do you go from six sigma to seven sigma ? Or from an inventory rotation per year of 250 to 500 ? And the same applies to competencies or strategic drivers. How far can you go with TQM or TBM ? There may well be a time that you need to overhaul the whole system of capabilities and competencies, and even dare to abandon some of your expectations and beliefs you may have about the current set of competencies.

Though the lead time you may have over your competitors, may be quite long, you have to move up, to the next level of performance and to a further development of strategic drivers. The momentum gained in the process of implementing a great program and achieving strategic capabilities, needs to be reinforced constantly, probably with a larger scope and faster speed. Only when you can ride on the momentum of building capabilities, you can generate a consistent stream of strategic competencies. Generating this stream of competencies and drivers may require *a certain logic* in building capabilities and competencies. Based on an earlier analysis we found that manufacturing can create lasting capabilities on three conditions¹⁵ : (1) there is a certain preferred sequence in building capabilities¹⁶, (2) they are not independent from each other and every newly developed capability must be anchored in a well maintained previous set of capabilities; thus older capabilities require

¹⁴ See also De Meyer A., H. Katayama and J.S. Kim, 1996, *Competing on Partnerships*, INSEAD EAC Research Paper

¹⁵ Ferdows K and A. De Meyer, 1990, *Lasting Improvements in Manufacturing Performance*, *Journal of Operations Management*, vol 9., no.2, pp 168-184

¹⁶ In the original article it was argued that the sequence was : quality followed by dependability, followed by reaction time, followed by cost efficiency. This logic was proposed on the basis of case studies and some empirical analysis of a database. Later observations have suggested that quality remains the basis and that cost efficiency remains the end of the sequence, but the intermediary steps may well be industry specific.

continuous investments though they may have lost a lot of their competitive power; and (3) one has to accept that for a company operating close to the economic frontier cost improvements are a consequence of investments in other capabilities. Similarly competencies and drivers anchored in operations are subject to the same conditions : there is a logical preferred sequence of sets of transitions leading to strategic drivers; competencies and drivers are cumulative and anchored in previous achievements; and lasting business performance is a result of investments in strategic drivers, not of the squeezing the existing businesses.

And some final thoughts

Strategic competencies do not happen over night, strategic drivers cannot just be implemented in a vacuum. They are established over time on the base of numerous programs. An important question that any executive should ask before developing and implementing a strategic driver is whether the organisation has built a pool which is rich enough of capabilities through programs like the ones we presented in this paper. Operations managers, on the other hand, need to seek vigorously how the entire enterprise can exploit their functional capabilities as strategic competitive advantages, not just to enhance operational performance.

Not all capabilities are strategic, just as not all operations programs can become enterprise-wide strategic initiatives. Only those capabilities that can provide enhanced flexibility to strategic planners are strategic. Others will remain just operational capabilities. The Million Dollar question is obviously what the next step in the development of capabilities will be ? Perhaps this question does not make a lot of sense, because it is impossible to give a general answer about what the next strategic driver will be with which companies will *differentiate* themselves. But we may just attempt to indicate a direction.

From the longitudinal analysis of the data provided through the Global Manufacturing Futures Survey¹⁷, we see a trend towards increasing price competition on a global scale. The analysis of European, Japanese and North American data suggests a great commonalty in the responses that companies prepare, and some differentiation. The common concept is customer partnerships. The differentiation comes from the way this partnership will be implemented. Whereas for Japanese manufacturers there is slightly higher emphasis on design and development partnerships, for the Europeans it is one of flexible responses to varying demand volumes, and for the North American respondents we observe an organisational integration of the supply chain. This is obviously nothing more than scratching the surface of what the next sets of transitions could entail. But the avenue of customer partnerships seems to be an

¹⁷ De Meyer A., H. Katayama and J.S. Kim, 1996, op.cit.

interesting one to explore. Indeed it promises to have all the characteristics of what we described as potential winners.