

How to manage your organization scientifically

Richardson, Bill

The TQM Magazine; 1995; 7, 4; ProQuest

pg. 42

How to manage your organization scientifically

Bill Richardson

The author

Bill Richardson is a Research Fellow in Management Strategy at Sheffield Business School, Sheffield Hallam University, UK.

Abstract

Reflects on the classical administrative approach to strategic management. Discusses how theoretically prescribed steps for improving the organization's functions of supplies management, sales management, supply chain management and total quality management are rooted in the scientific management paradigm. Provides prescriptive help for those strategists who seek to improve their functions and/or undertake business process re-engineering and benchmarking. Uses private and public organization illustrations to demonstrate scientific management at work at the end of the twentieth century.

This article reflects on the classical administrative approach to strategic management – the naturally dominant approach of leaders who share the philosophy and personality type of Frederick Wilmslow Taylor, whose systematic management methods in the early part of this century earned him the title, “the father of scientific management”. It argues, by reference to theoretical contributions and to practical examples, that this approach to the achievement of greater organizational economic productivity, developed in the first decade of the century, has resurfaced as the management method for the last decade.

The article also describes theoretically prescribed administrative steps for improving the organization's functions of supplies management, sales management, supply chain management and total quality management. Business process re-engineering and benchmarking, as important aspects of modern scientific management, are also explained from “how to do them” perspectives and the importance of an effective information systems function is also emphasized.

Private and public organization illustrations are used to demonstrate scientific management at work at the end of the twentieth century.

This article emphasizes the positive economic benefits which our current penchant for intense applications of the scientific management philosophy can generate for the individual organization. A related article[1] adopts a societal perspective on the scientific management movement to argue that “scientific management writ large” poses a big threat to society and organizations as we at present understand them.

Frederick Taylor's personal and organizational worlds

Morgan[2, pp. 29-30, 204-05] reminds us how our personalities underpin our leadership styles and get reflected in the way our organizations operate. He draws attention to the personality which underpinned Taylor's philosophies and practices:

In Frederick the Great's approach to military organization we thus find many of the basic principles later elaborated by the classical management theorists. We also find many of the principles elaborated by the other great Frederick of organization theory, Frederick Taylor, who pioneered what is now known as scientific management...His principles of scientific

The TQM Magazine
Volume 7 · Number 4 · 1995 · pp. 42-56
© MCB University Press · ISSN 0954-478X

management provided the cornerstone for work design throughout the first half of this century, and in many situations prevail right up to the present day.

He fused the perspective of an engineer with an obsession for control... [The man himself] was totally preoccupied with control. He was an obsessive, compulsive character, driven by a relentless need to tie down and master almost every aspect of his life. His activities at home, in the garden, and on the golf-course, as well as at work, were dominated by programs and schedules, planned in detail and rigidly followed. Even his afternoon walks were carefully laid out in advance. And it was not unknown for him to observe his motions, to measure the time taken over different phases, and even to count his steps... These traits were evident in Taylor's personality from an early age... Before playing a game of baseball he would insist that accurate measurements be made of the field, so that everything would be in perfect relation, even though most of a sunny morning was spent ensuring that measurements were correct to the inch... And as an adolescent, before going to a dance, he would be sure to make lists of the attractive and unattractive girls likely to be present, so that he could spend equal time with each... Taylor's life provides a splendid illustration of how unconscious concerns and preoccupations can have an effect on organization.

Taylor saw organizations primarily as economic outcome generators. Left to their own devices, people in the lower levels of an organization would not realize their organization's economic potential. Systematic planning, organizing and controlling by management were needed, therefore, if economic potential was to be realized – if the organization was to achieve “more for less” (Kanter's [3] definition of (desirable) “synergy”). Taylor advocated five simple principles, which can be summarized as:

- (1) *Shift all responsibility for the organization of work from the worker to the manager; managers should do all the thinking relating to the planning and design of work, leaving the workers with the task of implementation.*
- (2) *Use scientific methods to determine the most efficient way of doing work; design the worker's task accordingly, specifying the precise way in which the work is to be done.*
- (3) *Select the best person to perform the job thus designed.*
- (4) *Train the worker to do the work efficiently.*

- (5) *Monitor worker performance to ensure that appropriate work procedures are followed and appropriate results are achieved.*

Getting the ratios right

Taylor knew that the key to improved productivity lay in the concept of ratios and in the ability of management to measure organizational cost/benefit equations and then to devise and implement strategies to improve them. His improvements to working methods, such as the introduction of different sized shovels, for example, reduced the time it took for workers to do jobs and increased the amount of work completed on each shift to such an extent that plant output increased by 200 per cent while labourers' wages increased by only 60 per cent (although the workers were happy to accept a situation wherein everybody won, economically speaking).

The ratio improvement route to productivity improvement has more recently been emphasized by modern-day classical administrators such as Hirsch[4], McRobb[5], Mali[6], Rohlwink[7]. These theorists advocate an approach to organizing which mirrors the systematic methodology of Taylor. Thus, they subscribe to a productivity improvement management exercise which is undertaken as follows:

- (1) Identify all the potentially significant cost and contribution areas. Model the organization as a system of costs – the profit and loss account of the commercial/industrial undertaking provides this sort of information, as do income and expenditure budgets in public and not-for-profit contexts – and list all revenue generators in terms of their respective volume-times-contribution significance.
- (2) Measure existing performances using appropriate productivity ratios (such as R&D spend to sales value of innovations, materials spent to total budget, personnel costs to personnel motivation levels, advertising expenditure to sales turnover).
- (3) Determine through comparisons (compare against industry norms and/or specific competitors and/or other organizations and/or against performances over time) the desired productivity ratio for each performance improvement area

- (these ratios will be the programme's productivity targets).
- (4) Rank the productivity improvement areas in order of monetary importance to ensure that the areas of maximum monetary return are dealt with first (computerized models which simulate the financial consequences of each strategy can be useful at this stage). The idea is to generate a list of highly significant ratios for immediate attention.
 - (5) Choose the top six (say) for immediate action.
 - (6) Develop a plan for attaining the productivity improvement targets including a detailed description of individual tasks, a timetable for implementing these tasks and the names of individuals to be responsible for their achievement. Include also the forecast financial effects of the plan.
 - (7) Monitor progress regularly.
 - (8) Evaluate and communicate the actual productivity performances achieved and act, where necessary, to ensure that improvements are achieved.

Management by ratios has taken root in many formerly "rule of thumb" technology-based industries as in case study 1, on modern pig farming, indicates.

Productivity, therefore, is achieved through the successful implementation of one or more of five generic productivity ratio improvement strategies:

- (1) Manage effectively (get more outcome for the same input).
- (2) Manage efficiently (get the same outcome for less input).
- (3) Manage effectively and efficiently (get more for less).
- (4) Manage growth (invest more but achieve even more, proportionately).
- (5) Manage decline (reduce outcomes, but reduce inputs even more, proportionately).

Focusing on business function productivity: improving supplies management and salesforce management

Theorists such as Drucker[8] and Porter[9] have viewed the organization as a system of interlocking functions (sales, personnel, marketing, R&D, accounting and purchasing, for example) and have emphasized how organizational success (above industry-average profitability, in Porter's terms) can be achieved through continuously reorganizing these functions to reduce the costs they incur for, and/or to improve the contributions they make to, the total organization effort.

Porter has modelled the organization as a series of functions which together create a "value chain" comprising the activities and costs of each of these functions and the extra "margin", which the customer is prepared to pay, over and above these combined costs. This section examines how functions at the beginning and the end of the value chain –

Case study 1: productivity ratios in the pig industry

Increased competition from pig producers in other EC countries will mean greater pressure on UK pig producers to become technically more efficient. Mr Tim Brigstocke, BOCM Silcock's chief agricultural adviser, said: "With one sow producing around 1.66 tonnes of pig meat annually in Holland, compared with 1.26 tonnes in the UK, the threat to our industry is not difficult to evaluate". The most social area for research and development activity was in the development of alternative production systems. There was a need to develop new systems which enhanced productivity and animal welfare. Mr Brigstocke noted that British producers could be at considerable disadvantage as they move towards greater welfare-oriented methods while such systems as sow-stalls and tethers are allowed on the continent.

In efforts to improve productivity, many pig farmers were already working to a best practice ratio checklist. Some of the best practice targets had included:

- Sows should be capable of producing 24 piglets per annum on one tonne of sow feed.
- Growing pigs should convert food between weaning and bacon weight at no more than 2.3:1.
- Conception should be 90 per cent to first service.
- Mortality should never be more than 10 per cent before weaning.

supplies management and salesforce management, respectively – might be “scientifically managed” to improve their contributions to organizational productivity.

The supplies management function

The supplies management function has been defined as “buying materials of the right quality, in the right quantity, at the right time, at the right price, from the right source” [10]. In order to achieve these objectives better, the supplies function can be broken down into the following sub-functions:

- (1) maintaining standards of quality in materials, based on suitability for use;
- (2) procuring materials at the lowest cost consistent with the quality and service required;
- (3) maintaining continuity of supply to support the manufacturing schedule;

- (4) achieving the above with the minimum investment in materials inventory, consistent with safety and economic advantage;
- (5) avoiding duplication, waste and obsolescence with regard to materials;
- (6) maintaining the company’s competitive position in its industry and conserving its profits, insofar as materials are concerned;
- (7) analysing and reporting on long-range availability and costs of major purchased items;
- (8) searching the market continually for new and alternative ideas, products and materials whose adoption might improve company efficiency and profitability.

The management of supplies and suppliers assumes increasing importance for a number of reasons. The principal among these relate

Case study 2: supplies management at the heart of Jaguar’s resurgence in the 1980s

In April 1980, a new chairman came to Jaguar and marvelled at the extraordinary paradox he found. On the one hand, there were glowing descriptions of the new XJ6 Series 111 from motor-ing journalists the world over. On the other hand, John Egan found a seemingly endless catalogue of complaints from owners and dealers about failures and breakdowns.

First he researched the facts. Hundreds of owners of Jaguars and rival cars were contacted and questioned, and their experiences correlated with warranty statistics to find how many fault codes had to be eliminated. The frightening answer was – 150. The next move was to set up a communications system to tell everyone in the company what the problem was and how it was going to be tackled. The slogan of the campaign was “In pursuit of perfection”.

Managers from different departments were brought together in task forces, which were allocated groups of faults to investigate and cure. The worst 12 problems were given to the board of directors.

One of the first facts to emerge was that 60 per cent of the faults did not originate with Jaguar at all; they were in bought-in components. John Egan went straight to the senior management of Jaguar’s suppliers – and discovered that many of them were not aware of the shortcomings of their products, and were grateful to be told. Commented one Jaguar executive: “We had lived with some problems for so long that we had adjusted to them”.

“Adjustments” of that sort were ruthlessly weeded out. Jaguar insisted that all contracting firms should sign an agreement accepting responsibility for warranty costs arising from failures of their components. Jaguar also let it be known that components would be bought abroad, if foreign quality was better.

“All this seemed to concentrate the mind remarkably”, says Egan. But not all the tactics were so abrasive. At the same time, suppliers were invited into the Jaguar factory – and, in one extreme case, a task force was actually led by a director from a component manufacturer. Suppliers became regarded as part of the Jaguar team, and were involved in product design at the earliest stages. Their co-operation turned to enthusiasm. Components were tested by the original manufacturer to Jaguar standards, and audit systems set up to ensure the standards are maintained.

The new approach to supplies – and supplier – management was a cornerstone of Jaguar’s return to success in the 1980s.

Source: [12, p. 92].

to the competitive nature of modern market-places and the impact supplies and suppliers have on competitive positions. Thus, for many organizations, a major proportion of the cost of the products and services which they offer is that related to purchases and the associated costs of bringing supplies into the organizational conversion process. Often, this cost-benefit ratio can be of the order of more than 50p to each £1 the organization earns from its customers, as was the case in 1989, for the following US manufacturers[10, p. 4]:

- Apple Computer, 65 per cent;
- Bethlehem Steel, 55 per cent;
- Ford Motor Company, 60 per cent;
- General Electric, 46 per cent;
- Texas Instruments, 50 per cent;

Butler[11] has taken a UK-wide view of the importance of supplies management to micro- and macro-productivity. He attacks the preoccupation of government personnel with the effects of wage settlements and labour costs on productivity and competitiveness.

“Although, undoubtedly, rapidly rising wage costs are inflationary, and can reduce a firm’s competitive edge, they are only one element in the complex web of economic variables that contribute to reduced profitability”, points out Butler. By way of illustration, Asda, the food and clothes retailer, would have generated an 8.47 per cent increase in profit before tax from a 1 per cent reduction in its 1990 raw material costs. A similar reduction in the wages bill, however, would have improved profits by a still healthy, but comparatively small 1.06 per cent. In terms of cash savings terms, these improvements in operating costs produce £20.9m and £2.6m, respectively. If Unilever had been able to reduce its raw materials bill by just 1 per cent, it would have saved £105.6 million. Disturbingly, according to Butler, few of the firms he surveyed were aware of the figures (for raw materials and wages) in relation to each other or have any individual employee with knowledge of both.

Clearly, therefore, supplies management is an important route to cost competitiveness. The illustration which follows demonstrates how the inputs of suppliers are also a crucial aspect of competitive differentiation capability.

Other reasons for the increasing importance of the supplies management function are more to do with social responsibility and the avoidance of crises than with the securing of supplies in a way which achieves competitive

advantage. These reasons relate to shortages of materials and the growing scarcity of some key materials. Quayle[13], for example, draws our attention to some of the social and moral considerations which are associated with the supplies management function, including:

- conservation of the environment;
- avoidance of pollution;
- employment security;
- social welfare;
- philanthropic contribution to the general community.

Mali[6, p. 625], too, warns us that every manager must prepare for continual material shortages on the road to the twenty-first century and that the competitive challenge is to obtain these scarce resources from suppliers at the lowest possible cost – without damaging the organization’s competitive position. Managers, he considers, tend to emphasize the organization’s resource situation only for as long as a resource crisis prevails. They forget ingenious strategies for managing resources just as soon as the crisis passes. In contrast ongoing proactive resource management is now vital.

Mali also supports the view that supplies management makes sense for very *personal*, selfish and altruistic reasons – and not simply for reasons of organizational competitive positioning[6, p. 8]:

We cannot run our industrial economy efficiently with energy from our own sources. This means that any drastic cut-off in oil, gas, or other energy sources for whatever reason, be it war, politics, or policies, will require a painful adjustment in our life-style as well as in our company operations. We [the USA] are roughly 50 per cent dependent on outside energy sources, while our internal consumer demands for energy are increasing at a rate of 10 per cent per year. This suggests we are moving towards an energy crisis. It also suggests ways to get gas, shrinking home size, smaller cars, continued price increases, brown-outs, waits for production runs, radical cutbacks in lighting, and lighter and smaller materials will continue for some time to come. Energy dependence is worldwide. Management on any spot on the planet Earth must now take into account the effect of energy costs on the buying and selling of products, services and materials.

The power-dependency perspective of supplies management

Supplier organizations often need to feel a clear threat to their survival before they will change the ways in which they at present

conduct business. As is evident from the Jaguar illustration, powerful organizations, seeking to be more productive and more attractive to their customers, have been major driving forces for changes in their supplier organizations' practices. Underpinning many of these changes is an understanding that the important customer will seek supplies elsewhere if the supplier does not play ball. Small companies, therefore, are most at risk from the new emphasis on supplies management as big organizations worldwide exert their power through adopting the sort of practices described in the third case study. For small suppliers who are prepared to collaborate within the dictates of powerful customers, the supplies management movement has provided a major source of performance-improving opportunity (see, for example, [14, pp. 70-74]).

We conclude this section on productivity improvement in the supplies management function by identifying some potential supply management "productivity drivers" (from [13, pp. 200-05]):

- (1) Develop new materials and equipment which seem likely to reduce costs and improve performance.
- (2) Develop supply capacity perhaps through the identification of additional suppliers or the "locking in" of existing suppliers through contracts which ensure ongoing supplies on productive price and quality terms.
- (3) Reduce the number of suppliers to the organization and develop a closer working relationship with those few who are expected to provide the most productive link in the organization's supply chain.
- (4) Develop price and supply-market restructuring strategies using "countervailing power" mechanisms. For example:
 - develop price-cost analysis techniques to improve negotiating ability with existing suppliers;
 - allocate business to more than one supplier to preserve competition;
 - encourage new suppliers to enter the market or develop foreign sources of supply to increase competition;
 - contact the Director-General of Fair Trading to investigate monopolies and restrictive agreements (argue that the public interest is being jeopardized);
 - investigate the possibility of takeover or merger with a supplier in order to increase control of essential supplies and their prices;
 - develop substitute materials.
- (5) Improve the stocking and warehousing functions to ensure supplies of the necessary quality at the lowest cost to the organization.

Case study 3: shaping up your suppliers

"Small manufacturing companies are in crisis. Their main customers, the big boys... have been humbled by global competition and are seeking their salvation in higher standards of quality and productivity. The big companies cannot find redemption alone. So, like passionate converts, they are spreading the gospel of efficiency to their suppliers. Suddenly, small companies whose greatest concern was once simply to get the product out of the door are under pressure to adopt the latest technologies, use quality control methods, and slash prices.

"The suppliers often do not understand the new processes and management techniques their customers want them to embrace... Small suppliers had better learn fast. Most large US manufacturers are reducing their number of vendors in order to control quality. They want two or three suppliers instead of ten or 12, and they are giving preference to those close to home. For those who spend a lot of time with subcontractors it's a lot easier to work with someone who is based nearby.

"To make the cut, suppliers will have to go through a rigorous survival drill. Buyers routinely send inspection teams to rate a small company's plants. Some small companies resist, either from ignorance or from fear. Many suppliers feel just-in-time is a way for big companies to dump on them. When a large company begins asking for three deliveries a day, a small supplier may end up stockpiling the goods the customer wants... Just-in-time becomes just-in-case".

Source: adapted from [15, pp. 509-10].

- (6) Choose “make or buy” decisions which take account of the longer-term importance of the item to be made or bought, the strategic (strengths, weaknesses, opportunities, threats, etc.) situation surrounding the organization and its supply situation and the comparative costs and benefits of making the item “in-house” or contracting-out its manufacture.

Salesforce management and sales-targeting the big contributing clients

A productivity discussion on supplies management naturally orients towards the ways in which greater efficiency (cost savings) might be achieved. At the other end of the organization value chain, the sales function is more concerned with the generation of income. Hirsch[4] draws on his professional experience as a consultant to offer and explain his prescriptions for greater profitability through “prioritized” sales activity. As an example of “non-prioritized” activity, Hirsch describes how one company – a wholesale distributor – proudly referred to the fact that every customer was visited at least once a month. The problem was that 82 per cent of salesmen’s time was spent with customers who were not worth the time the salesmen spent on the visits. Another, an office supplies company, was growing at 50 per cent in turnover each year and yet was not increasing profitability. Management consultancy input established that 95 per cent of the company’s turnover came from just 25 per cent of its customers. This quarter of clients produced more than 100 per cent of the firm’s profits. Many of the other clients were small-order generators which, although appearing to offer good margins, were actually loss makers because of the order-processing costs. In an unfocused way, however, the company’s seven sales staff were attempting to visit continuously all 1,600 existing customers as well as acquiring 150 new customers each year. This picture of overstretched, and wrongly focused, salespeople is characteristic of many UK companies, in industry and commerce, claims Hirsch.

The solution to these organizations’ problems, and the way forward for all firms operating in similar fashion, is to prioritize salesforce attention. This requires that information systems be sufficiently sophisticated to allow

the sales planners to establish who the profit-generating customers are.

A points system can be used to categorize customers in terms of potential sales and profit volumes. Top customers and emerging winners may receive more frequent calls, while medium and smaller profit generators receive calls on a descending scale of frequency. By providing greater direction over sales calls, the organization provides a message to its personnel over the best ways of expending time and effort. It also encourages sales staff to set their own priorities. Supervision needs are reduced as the team comes to share the same values. The directed system can also avoid too many calls being made on the best customers – who might resent being pestered by the ever-present salesman and/or might use the perceived keenness of the salesman as a basis for demanding reduced prices. Because of the system’s emphasis on time-effectiveness, salesmen endeavour to get customers’ orders “right first time”.

If information systems are a first requisite for a prioritized sales campaign, then organizational systems to ensure the motivation and control of the campaign are also essential. Sales targets need to be set and a clear reporting system developed. Ambiguity over what constitutes a sales call needs to be removed. Do visits to different managers in the same organization, for example, count as one visit only? Also, reward systems need to be geared to the achievements required of the salespeople. Sales calls are useless in themselves. The sales campaign planners need to devise a system which takes account of sales turnover achieved (bigger volumes might produce purchasing discounts from suppliers for the selling organization itself) and profitability achieved. The profit measurement should avoid salespeople “giving away” products to create bonus-attracting (but loss-making) turnover. It should also instil in personnel the importance of profitable activity. Although sales conversion rates are not always an appropriate basis for measurement and rewards (in some industries orders are received directly), nevertheless, targets do need to be set and monitored for new account acquisition, as well as for average turnover and margin contributed by a salesman’s customers, in each accounting period. The sales plan should be part of corporate strategy and should be supported by an integrated, organization-wide effort.

National Semiconductor Corporation (NSC) prioritizes projects after the sales and service focus has been directed at likely world-beating manufacturers of systems in major markets. Relationships with less likely winners are delegated to distributors and other intermediaries. In this way, NSC has retained its position as one of the largest integrated circuit manufacturers.

By prioritizing salesforce activity in this way, all organizations can beneficially change Pareto's rule of 80:20 (20 per cent of customers provide 80 per cent of profits) by extending the proportion of high-performing customers.

Making the links: supply chain management, the marketing-controlled concept and total quality management

Taking root throughout organized society in the 1990s is the concept of supply chain management. This concept is akin to Michael Porter's value chain concept. Porter[9] prescribes that all pieces of the chain, and the links between them, should be arranged to support the low cost (of operation) or the higher-price-attracting differentiation capability of the organization. Value chain activities comprise and create value – the price the customer is willing to pay for the product or service offered. "Margin" is the difference between the combined costs of the value activities and the price paid by the customer.

Like Porter, the supply chain management theorists emphasize the importance of linkages between functions. They point out that it is not enough to focus on particular business functions in isolation. Rather, greater efficiency, effectiveness and more subtle, less easily copied, competitive advantage is to be earned through improving the ways in which the organization's people and functions relate to and work with one another. The supply chain is all those linked activities which collectively determine the quality and cost which get built into the delivery to customers of the organization's products and services. It includes links with "external" stakeholders, such as suppliers, distributors and customers, too.

This area of productivity administration, therefore, involves the conceptualization of the organization as a supply chain and, following on from this, the reorganization of all aspects of the chain – activities, resources and

their linkages – to enhance quality, reduce costs and avoid waste.

Viewed in this way, "supply chain management" can be seen as another title for "marketing-controlled management"[16], the underlying objective of which is to improve organizational performance by giving everyone responsibility for ensuring that their bits of the organization contribute to high levels of customer satisfaction and profitability/productivity. Both concepts imply the need to manage scientifically more-for-less productivity improvement across the width and through the depth of the organization.

Supply chain management can also be equated with Total Quality Management (TQM), a related concept which is permeating organizations in the 1990s. TQM is a concept which widens and deepens the "conformance to agreed performance" approach of the BS 5750 quality system. It is based on the notion that everybody in the organization has customers to serve and that these customers might be inside or outside the organization:

The ability to meet the customer requirements is vital, not only between two separate organizations, but also within the same organization. There exists in every department, every office, even every household, a series of suppliers and customers. The typist is a supplier to her boss – is she meeting his requirements? Does he receive error-free typing set out as he wants it, when he wants it? If so, then we have a quality typing service. Does the air-hostess receive from her supplier in the airline the correct food trays in the right quantity?...Some people in customer organizations never see, experience, or touch the products or services that their companies purchase, but they do see things like invoices. If every fourth invoice from a certain supplier carried at least one error, what image of quality is transmitted?

...Within organizations, between internal customers and suppliers, the transfer of information regarding requirements frequently varies from poor to totally absent. How many executives really bother to find out what their customers' – their secretaries – requirements are? Can their handwriting be read; do they leave clear instructions; do the secretaries always know where their boss is?[17, pp. 9-5].

Thus, the TQM concept has been used in a number of organizations to improve the functioning of supply chains. Clearly, a campaign which continues to achieve improvements across all the organization's customer-servant links is one which will significantly improve

Case study 4: attracting the strategic benefits of the quality concept – more than a decade of development

The winning of the Baldrige, 1989, and European Quality, 1993, Awards have been side-benefits from Milliken's drive to use quality to reduce costs, lever price premiums through perceived-by-the-customer product differentiation, and enlist everyone in the plan. Milliken promotes from within and uses its own people to teach improved quality. Its present *Hoshin* movement is little known outside Japan and involves disaggregating business objectives down to the individual's level and in so doing identifying the crucial areas where breakthroughs are needed to progress. One outcome of this movement has been that, according to Mike Sharkey, business manager for carpets, "People set themselves much more stretching targets than we would ever have done for them".

In 1989, Milliken celebrated the winning of the Baldrige Award by delivering itself a fresh challenge: 10-4 goals, or a tenfold improvement over four years to the end of 1993 along eight dimensions: cost of non-conformance; quality; cycle and throughput time; customer lead time; customer responsiveness; total customer satisfaction; and innovation.

In 1991, following an epochal visit to Japan by 24 senior managers, during which the managers realized that Japanese organizations were doing routinely the things Milliken had been especially proud of, the Milliken total quality movement was divided into seven component parts – quality, cost and delivery (the top trio), followed by innovation, safety, morale and environment – each of which is pursued using a number of management systems, bound together by continuing education and quality assurance.

Since Milliken's first foray into Japanese management systems in 1981, his organization has never stopped travelling the quality road.

Source: [18].

strategic performance through the impact of "thousands of continuous 0.001 per cent improvements" as well as through any other, more significant, discrete changes which flow from it. Continuous TQM can help maintain strategic success (see case study 4).

Productivity and business process redesign (BPR): reconfiguring the value chain

Competitive demands and, in the public sector, the legal requirements such as price-capping imposed by central government, have promoted the adoption of business process redesign, or business process re-engineering as it is also called. Business process engineering is now established as a modern-day scientific management technique. It aims to develop and implement proactively more effective ways of doing things continuously. Like the most successful productivity techniques, BPR often leads to big changes in traditional ways of organizing, and to significant reconfigurations of the organization as a competitive value chain.

According to the School of Management at Cranfield University:

Business Process Redesign (BPR) is a term which is now firmly established in the manage-

ment vocabulary. It refers to attempts to achieve order of magnitude improvements in organisational performance by redesigning the processes by which an organisation delivers value to its customers. The newly designed processes are often enabled by information technology. In many quoted cases, this has led to transformational changes in the way in which organisations are structured. In particular, traditional functional structures, and the barriers between them, are being broken down in favour of multidisciplinary teams responsible for complete processes[19].

Information technology-based systems, in particular, have created the potential for enhanced administration, for example, through facilitating quicker and more direct communication chains. Thus, many business process engineering functions have developed during the past decade from information technology systems' functional roots.

Case study 5 demonstrates how a significant rethinking and restructuring of how an organization at present does business can impact massively on its range of value chain activities – related activities such as work-inputting, processing, human resource development, selling, marketing, distribution and strategic decision making – and, consequently, generate improvements to the competitive performance of an organization.

Case study 5: the move to district service centres (DSCs) at the Midland Bank

By 1988, branch encoders were getting old and needed replacing. This came at a time when there was great competition between high-street banks, and pressure was on to reduce unit costs.

Rather than replacing the branch equipment, the whole process was rethought and a centralized approach was advocated by Gene Lockhart, Midland's Banking and Group Operations chief executive. The aim was to move some back-office processes out to DSCs and use the space for customer-operated devices and counsellors who are available to talk to customers.

A business case was prepared for building eight carefully sited DSCs dedicated to back-office work, supported by a nationally integrated system which would take in central clearing.

The whole new system was provided by Unisys. Implementation was phased; there were pilots and there was a steady migration to the new system. Eventually, DSCs entirely took over the cheque and credit processing. A delivery service was set up to collect cheques and credits from branches and take them to their nearest DSC. Processed items would then be delivered to Zetland House. Midland cheques and credits would then be taken to the single, national Midland Clearing Centre at Park Street, London, which deals with credit and debit clearing. The Park Street building is dual purpose in its the second floor is also the London DSC. Here, all operations happen on one carefully planned and laid-out floor which maximizes efficiency.

The changes generated a number of strategic benefits. First, reductions in staff costs were achieved in a number of ways – through branch staff reduction, salary reduction and average full-time equivalent reduction. Initially there was over-investment in management staff, so now they have been reduced. Other cost reductions include: reduced hold-over (i.e. the time value of money associated with items that remain unprocessed on peak days in operations in centres and branches); site closings – savings associated with closing the existing operations centres; branch overtime reduction – forecast savings in branch operations from reduced overtime as a result of processing being done in DSCs; other equipment reductions – expense reduction associated with space saved in branches; courier reductions – the savings associated with discontinuing current courier service as it is replaced by dedicated support. Deals can be negotiated with couriers based on all deliveries to a single site.

A significant increase in income owing to bulk revenue was also anticipated – income related to business growth in bulk processing as a result of increased DSC processing capacity. Unit costs were also expected to fall, particularly through the filling of “white space” – the quiet periods in the mornings when DSCs are not busy doing branch work (which starts at about 3.30 p.m. when the branches close for the day). The Midland hoped to tie-in new customers by offering competitive pricing for bulk processing to, for example, large retailers.

Maintenance is also easier for a small number of sites. Resident engineers are employed and system up-time is greater than 95 per cent. Also, contingency planning and disaster recovery are easier.

A number of intangible benefits have also been achieved. For example, branch space saving is an enormous benefit. Space can be used for customer added value rather than for operational needs. New products are offered, such as mortgages and financial services, and a counsellor can sit with a customer and demonstrate products using a PC with graphical user interface.

Other benefits include better quality of service and increased customer satisfaction. Owing to the quality of the system, accounts are balanced every day and there is less rework (i.e. error correction) needed. Financial exposure is down significantly, too.

The changes also create potential for increased staff satisfaction in that streaming can now occur in two types – those who prefer back-office work and those who prefer talking to customers.

Finally, new functionality can be added more quickly and easily to the technology at the sites.

Better management information also arose as a spin-off from the new systems, for example, volumes processed and finishing times. This gave evidence of improvements and highlighted areas which were not performing well, so that an improvement-oriented investigation could be carried out.

(Continued)

Case study 5 (continued)

The DSCs thus fitted in with the Midland's overall business strategy, which was to reduce costs and increase market share by achieving a number of critical success factors: becoming more sales-oriented; improving quality; saving costs; taking out the drudgery of back-office work; bringing a new image which was more welcoming, with more glass in the building, more face-to-face contact with customers and less talking across the counter through glass barriers, and putting self-service equipment into the branches and offering new products.

Source: [20].

Process redesign issues

Bessant and Buckingham[21] refer to the lack of success achieved by business process redesign in the area of computer-aided production management systems. They point to a 1989 Kearney report, based on a survey of some 1,200 users of computer-integrated technologies in 1988, which concluded that:

benefits on the whole have been disappointing with an achievement of 70 per cent of planned gains... CIM has not resolved the problems of quality and performance to schedules as anticipated...

For Bessant and Buckingham, a key to improved success at implementing redesigned organizations is to be found in the concept of organizational learning. Learning about *why* organizational changes are being undertaken is as important as learning about *how* to perform particular parts of the total process. Technological learning (the "how to do your bit" aspect of the new process) has to be accompanied by organizational learning (which is concerned more with managerial issues and the "whys" associated with the rationale for embarking on the process). Administrators who wish to ensure the successful implementation of a business reprocessing venture need to facilitate the adoption of a "learning to learn" culture in which people perceive the purpose of challenging old ways of doing things (generative learning) rather than merely working on the assumption that the major organizational task is to keep tweaking the old system and correcting deviations from the traditional course (adaptive learning). Bessant and Buckingham's prescriptions about how business engineering administrators might more certainly ensure successful redesign projects are provided in the following lists of success and failure characteristics (based on [21]).

Success is associated with...

- top management commitment at all stages of the project;

- clear strategic vision, communicated throughout the organization;
- shared views of project aims and implementation approach;
- multi-function project teams with multi-perspectives;
- effective conflict resolution within team;
- extensive user education to give understanding of broader implications and purpose of system;
- user involvement in system design (of hardware/software, jobs, structures, roles, etc.);
- close involvement;
- readiness to re-examine and change existing procedures;
- performance measures reflect broader organizational effectiveness;
- flexibility in design and continuous monitoring to adapt to unexpected changes.

Failure is associated with...

- lack of commitment;
- lack of clear strategy or its effective communication to the rest of the organization;
- lack of shared view and unresolved conflicts regarding design and implementation;
- single function teams, unilateral function perspective;
- unresolved conflicts over key implementation issues;
- minimal training for operation;
- unilateral design, organization expected to adapt to systems rather than change systems;
- minimal involvement;
- attempt to computerize what is already there;
- performance measures narrowly-defined which relate to efficiency at local level;
- inflexibility in system in response to unexpected changes in environment.

Underlying these lists is the notion that the development of the success characteristics

described therein will lead to a generative learning culture.

Knowledge about how to re-engineer significant changes to the organization is being transferred by publications such as Bessant and Buckingham's and from organization to organization and from industry to industry through the technique of benchmarking.

Benchmarking

As discussed earlier, Taylor was among the first of our modern industrial era's scientific managers. As such, he was required to plan more effective and efficient work operations himself – there were few other exponents around from whom he might learn. In the final decade of the twentieth century, however, we have countless scientific managers working in different organizational contexts on productivity improvement issues. This situation creates the incentive for others to manage scientifically – otherwise competitive races are lost to those who generate greater productivity on an ongoing basis. It also provides opportunities for modern scientific managers to learn from one another rather than to keep reinventing, slowly and by themselves, cogs in the productivity wheel. Hence, we are witnessing a growing preoccupation with the technique of benchmarking and an accelerating speed with which productivity-oriented strategies are being implemented.

Watson[22] is a quality executive with Xerox and one of the pioneers of the benchmarking movement. He has “first-hand knowledge of how this technique can improve a company's overall performance and competitiveness” [22]. For Watson, benchmarking is: a continuous search for an application of significantly better practices that leads to superior competitive performance, [and] the process by which organizations learn, modeled on human learning process.

According to Watson, the premiss underlying benchmarking is simple: organizations choose to benchmark outstanding companies whose business processes are analogous to their own. Milliken, whose company is the subject of a case study in this article, puts it more succinctly: “Benchmarking is stealing shamelessly”.

Comparative evaluations can be made against competitors or against any organization in any industry (British Gas, for example, has benchmarked its customer service func-

tion against that of Marks & Spencer, an acknowledged exponent of this function in the high-street retail trade). The practice of benchmarking against operators in other industries means that benchmarking can take place in a friendly, collaborative way, with each organization checking out those business processes which the other performs more effectively. Thus, the best practices and associated performances can be transferred from industry to industry.

The process of benchmarking requires that administrators undertake a four-stage exercise:

- (1) Planning the benchmarking study (this, in turn, involves selecting and defining the process to be studied – say, for example, the organization's transport management function: identifying the measures of process performance to be used; evaluating one's own capability at this process; and determining which companies should be studied).
- (2) Conducting secondary and primary research including an investigation of public sources of information about the business processes of potential benchmark-target organizations and thereafter, if pertinent, entering into direct communication with the organization (through telephone surveys, written questionnaires, or perhaps site visits).
- (3) Analysing the gathered data to produce findings and recommendations. The findings should relate to the performance gap which exists between the benchmarker and the benchmarked and the strategies which enable the better performance by the benchmarked and can be transferred for implementation by the benchmarker.
- (4) The adaptation, improvement and implementation of these strategies (referred to as “process enablers” by Watson).

The basic objective of the benchmarking exercise is to change an organization in a way that increases its performance. Thus, claims Watson:

benchmarking is a process with a built-in bias for action; it goes beyond just conducting a business process study or obtaining a relative measure of business performance.

Although Taylor compared his organization's practices and performances against others in the early part of the twentieth century,

benchmarking has only recently taken off in a big way in many of our more sophisticated organizations. Thus, for example, Lucas instituted a productivity improvement campaign in the 1980s, based on CAPs – competitor action plans – designed to target the best competitors and at least to match them in the functions they were best at performing. In the privatizing UK public sector strategic benchmarking has also become a way of organizational life, as institutions such as British Gas and British Telecom have sought to generate big productivity improvements.

Information systems and productivity improvements

All decisions are based on information. Productivity improvements to the functions of the organization are made when decisions are implemented based on information which has conveyed a sense of how effectively the organization is functioning at present and how things might be changed to improve that functioning.

The classical administrator, traditionally, is that leader to whom we have turned for the provision of quality decision-making information. As we might guess, his/hers is a systematic approach to the provision of information which is: timely (it does not arrive too late to be used by the decision maker); appropriate (it relates to the problem being addressed); accurate (it is sufficiently accurate to be relied on); adequately, but not overly detailed (it is effectively concise); understandable (it is presented in a style and format readily understandable by the decision makers); and communicated (the information actually reaches, and is picked-up by, the decision maker).

It is the classical administrator who assumes the major responsibility for the organization's formal management information system(s) (MIS), which Lucey[23] has described as:

A system to convert data from internal and external sources into information and to communicate that information, in an appropriate form, to managers at all levels in all functions and to enable them to make timely and effective decisions for planning, directing and controlling the activities for which they are responsible.

Information and information systems are required for effective productivity management of all the organization's functions. Eccles[24] exhorts every company to redesign

how it measures its business performance. At the heart of his prescriptions is the need for a change from treating financial figures as the foundation for performance measurement to treating them as one type of measurement among a broader set of measures – some of which might be given greater status in determining strategy, promotions, bonuses and other rewards. Eccles points to examples of this shift:

Senior Managers at a large high-tech manufacturer recently took direct responsibility for adding customer satisfaction, quality, market share, and human resources to their formal measurement system...the existing system, which was largely financial, undercut its strategy which was focused on customer service.

In the same vein, Eccles goes on to criticize traditional accrual-based accounting systems and short-term financial performance-dominated thinking. The mind-set which accompanies these features of business culture is short-sighted, introverted and prone to manipulate the figures they report.

Quality is a key concept for information system designers. The growth of the TQ movement demands that organizations devise criteria to measure the performance of their entire operations – not just their products – in minute detail. Thus, customer satisfaction needs to be measured. Companies will increasingly collect data directly from customers for more direct measures like customer retention rates, market share and perceived value of goods and services. Competitive benchmarking is also necessary. This form of measurement is particularly useful as a mind-set changer. It makes people aware of improvements of magnitudes beyond what they would have thought possible. Internal yardsticks focus on internal and historical situations only, of course, and tend to breed a false sense of security and intramural activity.

Information technology has played a crucial role in making a performance (strategic competence) measurement revolution possible. In terms of sophistication, ease of use and cost, it continues to improve its position as a source of help to management evaluation processes.

A five-step procedure for the implementation of a newly effective system is as follows:

- (1) There is the need to develop a new information architecture. This covers:
 - the categories of information needed to manage the business,

- the methods used to generate this information, and
- the rules regulating its flow.

A surprising number of companies describe their strategies in terms of customer service, innovation, quality and the capabilities of their people, yet do little to measure them. In the case of bigger organizations, work is necessary to integrate information systems to bring together common needs and to produce a measurement vocabulary which is understood across divisions. "Softer" data should achieve equal footing with the financial data. One way to do this is to assign the responsibility for its generation and publication to an appropriately specialized functionalist (personnel, marketing, strategic planner, for example) but to make clear that his/her duty includes ensuring that the information is disseminated to managers throughout the company. The newer type of information needs to be dealt with as often as is the financial information. In terms of the rules of information, important decisions need to be made at the outset over issues such as who is responsible for how measures are taken, who actually generates the data, who is responsible for changing the rules and who receives and analyses the data. Information flow systems need to be flexible – to change as the business environment changes.

- (2) The organization needs to make decisions on its hardware, software and telecommunications technology. This is a difficult task given the vast range of items on the market. A key to making appropriate choices is in the earlier tasks of establishing the information which needs to be generated. Too often companies buy-in the technology before having thought through their architectural needs and systems.
- (3) The new system should be aligned to the company's incentive system. People should be rewarded in line with their performance on the measures that management has said matters. Eccles[24] favours linking incentives strongly to performance, but leaving managers free to determine their subordinates' rewards on the basis of all the relevant information, qualitative as well as quantitative. Thus, managers have to explain candidly

to subordinates why they received what they did, and an important by-product of this type of reward system should be an improved approach to the conducting of performance appraisals.

- (4) Outside parties such as trade associations, data-vendors, information technology companies and accounting firms should be brought into the design process. These types of stakeholders should bring expertise to the tasks of identifying key performance areas, taking the measures and supplying comparative statistics. More generally, accounting firms could also assist the information systems' movement by developing measurement methods which are common to an industry or across industries. A major problem for performance measurement processes, at present, is created by the use of different accounting conventions.
- (5) A process to ensure that the new measurement system actually happens is required. As is the case in most prescriptions over strategic change, the CEO is the prime mover. He/she must demonstrate commitment to the new process. Additionally, in order to make sure that sufficient time is devoted to the implementation and maintenance of the new system, it might be advisable to appoint a high-level champion to oversee it on a permanent basis. One company resisted the temptation to place this job in the finance function. Rather, it recruited, from outside, someone who would integrate a new performance measurement system function which drew resources mainly from the information systems and consumer services departments.

In hostile conditions, a fundamental strategic requirement is that the organization has an effective management information system. Modern systems need to focus on a range of performance yardsticks, including financial, quality, customer service, competitive position, human resource development capability, market share, public responsibility and innovation performance. Those who take the lead in this new philosophy of performance measurement, and in enhancing the effectiveness of traditional systems, are likely to reap rewards in all the above areas – cumulatively these rewards measure up to competitive advantage.

Conclusion

Taylor's philosophy and practice of scientific management is alive and well, and stronger than ever, in the final decade of the twentieth century. It masquerades under pseudonyms such as "supplies management", "salesforce management", "supply-chain management", "total quality management" and "business process re-engineering", as strategists seek to improve the productivity ratios of their business functions discretely and in combination. As its application grows in volume and sophistication, so too the need intensifies for managers to embrace scientific management as an essential prerequisite to the assurance of ongoing organizational success. Scientific management applications in one organization can be studied by another and routes to increased productivity learned. The activity of benchmarking is growing as organizations seek to learn in this way.

This article has sought to provide theoretical prescriptions and practical examples to validate the view that scientific management grows in importance and to help readers understand some of the concepts and techniques involved in a systematic approach to improving the organization's productivity.

References

- 1 Richardson, B., under review by *Journal of Contingencies and Crisis Management*, forthcoming.
- 2 Morgan, G., *Images of Organization*, Sage, Beverly Hills, CA, 1986.
- 3 Kanter, R.M., *When Giants Learn to Dance: Mastering the Challenges of Strategy, Management and Careers in the 1990s*, Unwin Hyman, London, 1990.
- 4 Hirsch, R., "Getting the ratios right", *Management Today*, April 1990, pp. 107-10.
- 5 McRobb, R., "Industry's lost costs", *Management Today*, May 1984.
- 6 Mali, P., *MBO Updated*, Wiley Interscience, New York, NY, 1986.
- 7 Rohlwink, A., "The mature strategist", *Management Today*, February 1988.
- 8 Drucker, P.F., *The Practice of Management*, Pan Books, London, 1968.
- 9 Porter, *Competitive Advantage*, The Free Press, New York, NY, 1985.
- 10 Heinritz, S., Farrell, P.V., Guinipero, L. and Kolchin, M., *Purchasing: Principles and Applications*, 8th ed., Prentice-Hall, Englewood Cliffs, NJ, 1991.
- 11 Butler, D., "Raw deal on pay", *Management Today*, August 1990, pp. 34-8.
- 12 Richardson, B., "M&M Supplies Ltd", in Richardson, B., Patterson, J., Gregory, A. and Leeson, S. (Eds), *Case Studies in Business Planning*, 2nd ed., Pitman, London, 1992.
- 13 Quayle, M.R., *Logistics: An Integrated Approach*, Hodder & Stoughton, Sevenoaks, 1993.
- 14 Wilsner, P., "Where Britain leads wht world", *Management Today*, June 1993, pp. 70-74.
- 15 Baird, L.S., Post, J.E. and Mahon, J.F., *Management: Functions and Responsibilities*, Harper & Row, New York, NY, 1990.
- 16 Richardson, B., *Business Planning: An Approach to Strategic Management*, 2nd ed., Pitman, London, 1992.
- 17 Oakland, J.S., *Total Quality Management*, Butterworth-Heinemann, Oxford, 1989.
- 18 Caulkin, S., "The road to peerless Wigan", *Management Today*, March 1994, pp. 28-32.
- 19 Burke, G., "Business process redesign: academic directions", call for conference papers, School of Management, Cranfield University, Cranfield, January 1994.
- 20 Bessant, J. and Buckingham, J., "Innovation and organizational learning", *British Journal of Management*, Vol. 4, 1993, pp. 219-34.
- 21 Lauener, A. and Bertram, R., *Midland Bank and the New District Service Centres*, Sheffield Hallam University, Sheffield, 1993.
- 22 Watson, G.H., *Strategic Benchmarking*, Wiley, New York, NY, 1993.
- 23 Lucey, T., *Management Information Systems*, 5th edition, DPP, Eastleigh, 1987.
- 24 Eccles, R.G., "The performance measurement manifesto", *Harvard Business Review*, January-February 1990, pp. 113-37.

Commentary

How interesting to see Frederick Winslow Taylor appearing with increasing frequency in the pages of this and other publications. We all glibly said that scientific management was antithetical to TQM a couple of years back. Can we be as sure now, with the powerful (and often results-bearing) work on re-engineering proposed by Hammer et al.?