
Applying value-based management to procurement

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management

5

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Introduction

Why is the suppliers' performance so poor? Why are parts and manufacturing costs so high? Why are customer deliveries late? Why can't we get a new product to the market on time? Why do we have quality problems? Why do we have so much paperwork? If these questions sound familiar, you are not alone. Collins Air, Tektronix and other companies have faced these issues – and have chosen to fight back by re-engineering themselves.

Collins Air, an avionics system and products producer, recently found itself operating in a declining industry and experiencing a 12 per cent decline in sales; but they were prepared. Having recognized that quality was a "given" in their industry, Collins Air, in 1981, began a cycle time reduction initiative, knowing that quality had to be perfect to achieve the best cycle times. But with the current structure and practices, cycle time reduction was limited, so they undertook an evaluation of their processes, eliminating non-value adding ones and improving needed ones. The company's efforts paid off: since 1981 it has been able to reduce the procurement cycle time from an average of 180 days to 44.8 days, with plans to reach 30 days by the end of 1995; the production cycle time has been reduced from 85 to 19 days, with a goal of 15 days by the end of 1995. The faster cycles have had an additional benefit in that they have reduced the material department's operating costs by 60 per cent since 1985. Actions taken in the re-engineering effort included the elimination of multiple inspections, use of electronic data interchange in order placement, refocusing the supplier selection criteria on "net cost", reduction of the supplier base, automation of procurement processes, use of concurrent design teams, mandates that suppliers use statistical process control in their manufacturing processes, and partnering with suppliers. However, procurement was only a small part of the effort. Everyone in the supply chain was involved. These companywide efforts have garnered Collins a consistent supply of high quality, 95 per cent on-time parts, a total company reduction in operating costs of 60 per cent, ISO certification, and the fact that even with a declining market, their products are in almost every commercial airline[1].

Similarly, Tektronix, facing declining revenues and earnings, started re-engineering in 1990. Through the re-engineering process, it determined that the engineers had too much latitude, purchasing had too little authority in the company, the company was much too vertically integrated, poor procurement

and product development practices existed, and the time to market was too long. To solve these problems, Tektronix reduced both the number of suppliers and parts, elevated the purchasing function, formed cross-functional commodity teams, and modified the supplier selection criteria to focus on lowest total cost. These actions and others have no doubt contributed to the company's earnings in the first quarter of fiscal 1995 being the best earnings performance in ten years[2].

These and other companies: Chrysler, Ford, GM, Avex, BASF, Bose, Honeywell, and IBM are re-engineering themselves to meet the challenges of today's environment[3-5]. The strategies of these companies have two common tenets: first, they focus on the creation of value for the customer and, second, they rely on the contribution of procurement. The approach now being used by these companies is value-based management. Increasingly, firms are pursuing a strategy that aims to increase value – value being the net result provided to the customer in terms of benefits minus sacrifices.

Basic questions remain: what type of working environment engenders the creation of value and how can managers develop this environment? To address this question, the literature on general management and materials management is analysed, this analysis is extended to the concept of the value system, and then a general framework to be used by managers in moving the organization from a functional organization to a value-based one is developed. Throughout the article – and principally in the last section – to make this framework more meaningful, its application to the procurement operation is shown.

Value and value-based management

The concept of value has many definitions. To clarify its use in this article, this section defines value, the value chain, and value-based management.

One common definition of value equates the value of something to its price, wherein the value people place on an item can be inferred from what they willingly give up for it. This concept generally is extended into the notion that something is more valuable if it costs a lot of money. Although an interesting concept, this monetary definition of value is not very useful for managers in the emerging value paradigm because internal customers rarely exchange their own money. Other definitions of value also exist. For example, value is often used as an accepted definition of quality or the added competitive advantage you bring to your customers, both of which may be too vague to operationalize in a management paradigm shift[6-8]. Another definition of value is that it is a function of the item's performance for the buyer in economic terms minus cost[9]. In this case, the firm may choose to increase the value to the buyer by either lowering the item's cost or increasing the item's performance. Although this definition is more useful to the manager than the monetary view because it recognizes that one must focus on better satisfying the buyer's needs, it is also limited because it concentrates only on economic sacrifices that a customer must make when others like confusion, frustration, or time, may also exist. The definition of value that is perhaps most useful to managers is that value equals

“customer benefits minus customer sacrifices”. This definition both focuses on the customer rather than the product and considers economic and non-economic costs[10].

Value-based management is a paradigm that considers, as a single entity, the firm’s entire chain of activities: those with suppliers, internal functions and customers. Emphasis is placed on integration of the activities rather than the functions or organizations themselves. The re-engineering efforts at Collins Air, Tektronix, and others have incorporated the concepts of value-based management. Value-based management, an expansion of Porter’s value chain and Houlihan’s supply-chain management[9,11], revolves around the value chain. The value chain, illustrated in Figure 1, depicts that series of processes which transforms specifications to finished deliverables. Value-based management is the approach used to improve the value created throughout the chain. The concept of a value chain suggests there is a basic sequence of processes which must be performed; it also describes the relationship between processes – each is dependent on the “supplier” process (the previous link) and the “customer” process (the next link). Not only must each element in the chain be strong but so must the interfaces.

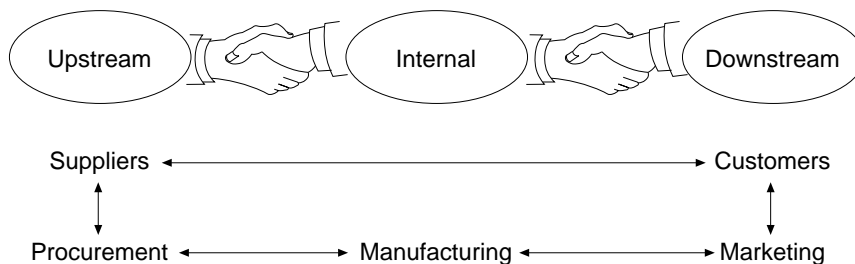


Figure 1.
The value chain

As depicted in Figure 2, an integral component of value-based management is the management and improvement of processes in which a process, using various inputs, adds value to create the outputs. Feedback is used to modify the inputs and processes to provide products that meet or exceed customer expectations. A process often crosses several organizational boundaries and requires co-ordination across these boundaries. The strategy is to link the process suppliers, the processors and the process customers to reduce the quality and timing gaps between the output of one process and what is needed as the input for the next process. Each value process uses various inputs to create its outputs and provide a particular outcome for the customer.

A framework for value-based management

The literature on general management and materials management shows that many variables are likely to affect the long-term effectiveness of value-based management, with the preponderance of effects being the result of organization

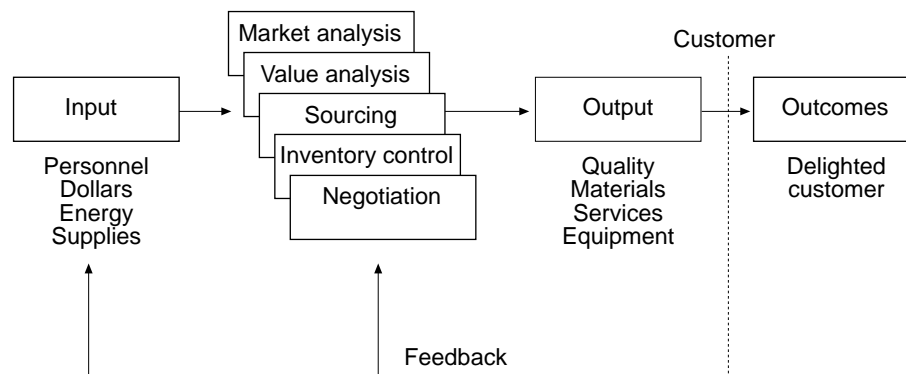


Figure 2.
The transformation
processes add value

Source: Adapted from [22]

design and human resource management. The principal variables in each of these two broad areas form the basis of the framework and are described below.

Organization design variables

The basic structure of an organization, its hierarchy, the availability and use of information, and its relationships with external organizations influence the organization's ability to create value. Each of these variables is discussed below.

Organization structure. The structure of an organization influences the ability of its individuals to interact, as well as to perform their processes. Traditionally, organizations have used a functional organization structure in which individuals are organized by speciality. Such a structure can inhibit horizontal communication and co-ordination, leading to inaccurate and slow decision making. To avoid these problems, some managers are developing a product structure with a strong reliance on cross-functional teams.

The concept of teaming has been in existence for many years, but now teams are viewed to be essential. Teams are linked increasingly to high performance organizations – both in terms of creating and sustaining such organization. The record of team performance speaks for itself. Teams are providing better and faster decisions, reducing cycle times, improving productivity, quality and customer satisfaction, reducing waste, creating more motivated, responsible employees and improving the credibility and image of some functions[12-16]. One firm, Alcatrel, that recently won the Shingo Prize for excellence in manufacturing, claims that it was due to cross-functional teams[17]; Motorola relied heavily on teams to produce the world's lightest, smallest, and highest quality cellular phone with only a few hundred parts versus over a thousand for that of the competition. Ford used teams to design and produce the highly successful Taurus; 3M and GE use teams as an integral part of their organization, relying on them to innovate and improve continually[18]. As is

evident, employees are becoming increasingly involved in both inter- and intrafirm teams, with the teams demonstrating escalating influence[19]. Obtaining effective team performance is a complicated issue but one element that has been found to affect their performance is reporting level. For example, both General Electric Company[20] and Tektronix[2] found in their operations that the interaction process among team members was more effective if the team members operated at the same level of authority. Consequently, both of these organizations had to elevate procurement to a level consistent with its counterpart functions.

The use of teams is becoming increasingly common and with these teams, organization design issues are being re-evaluated. Issues of centralization, information flow, hierarchy, and the nature of external relationships are being examined and modified to support both team and individuals in their creation of value.

Centralization versus decentralization. One organization design issue receiving scrutiny is that of centralization versus decentralization of functions. Both centralized and decentralized approaches have been shown to have advantages and disadvantages for an organization. Centralization enables the co-ordination of efforts and eliminates duplication by different organizational units while allowing for economies of scale. It may also create better decisions because those managers with more and broader experience make the major decisions. However, the need to get decisions from a central authority has drawbacks in that it can reduce responsiveness, flexibility, creativity and employee involvement. Comparatively, decentralization allows top management to focus on key issues while enhancing the jobs of lower-level individuals. It tends to lead to faster response, easier measurement of output and productivity, and the use of local talents, but at the expense of potentially higher costs.

The most common approach among organizations on this issue has been a combined one in which plant issues are decentralized and policy matters, common materials, and capital equipment issues are centralized[21]. The optimal extent of centralization or decentralization depends on the characteristics and objectives of an organization but in making the centralization/decentralization decision an organization's management must consider its effect on the organization's ability to create value. Because value-based management focuses on improving quality, customer satisfaction, response time, and employee, customer and supplier involvement, decentralization of functions appears to provide more support for value-based management. If needed, selective centralization can be developed to allow for economic benefits or legal considerations (for example, in hiring practices).

Information systems. Another organization design issue receiving evaluation with regard to its ability to enhance value within the organization is that of information flow and the systems which create that flow. The need for information within an organization is not disputed. Information allows teams, individuals and managers to improve performance and innovate while creating higher individual commitment and satisfaction[22-24]. The availability of

information becomes increasingly important as the complexity of the task or the level of uncertainty increases[25]. Within a value-based environment, the issue for management is to ensure that all individuals and teams receive needed information consistently because with today's requirements of rapid response, quality and customer satisfaction, individuals within an organization need to be completely "connected". This task can be quite difficult in a function-based organization. In such organizations, co-ordination problems often occur because one function does not necessarily communicate with, work well with, or pass error-free information to other functional areas. Further, in such organizations, information is often slow in coming and not focused on solving cross-organizational goals[26]. Functional integration, the integration of business processes and data, and organizational communications across functional areas must occur, with the goal being that each individual in the organization be linked to one companywide information system. The supply of consistent, accurate and timely information which results from functional integration generally leads to larger profits, improved quality, productivity, flexibility, and reduced costs because individuals are able to work towards shared objectives[27].

Functional integration can partially be achieved through the previously mentioned cross-functional teams but the optimum methodology is the development of cross-functional information systems[28,29]. Information systems for inventory, costs and scheduling, like materials requirements planning (MRP), computer-integrated manufacturing (CIM) and computer-aided design (CAD), begin to tear down the barriers between functions and hierarchical levels, streamlining processes and enhancing innovation but more extensive, integrated systems are needed[30]. Several organizations are beginning such efforts. For example, Nippon Steel has begun a "computer integrated management" project to integrate manufacturing, procurement, distribution and finance[31], Sony, Syntax and Xerox have designed cross-functional information systems which allow data and process sharing across all functional areas in the company[32].

Information systems are also being used to integrate the firm with external individuals and firms. Select customers and providers are using electronic data interchange (EDI) to transfer order requirements, order status information, invoices, and quality requirements between the firms. These systems have reduced material and labour costs, increased the accuracy and speed of operations, as well as improved relations between firms[33].

It is evident that extensive, process-based information systems (often computerized) facilitate the development of value because they generally cross functional boundaries to allow sharing of information by all relevant decision makers. However, the feasibility and effectiveness of these systems is affected by another organization design issue, the organization's hierarchy.

Organization hierarchy. The traditional organization hierarchy with multiple layers of functional managers is not appropriate for the new, value-based paradigm. Instead, a flatter organization with fewer levels, each with a wider span of control can better meet the goals of value-based management by reducing costs, speeding information flow and decision making, reducing redundancies, and

increasing innovation[34,35]. Identifying process managers or “owners” in the hierarchy may also enhance cross-functional information flow and co-ordination.

External relationships. Because the creation of value depends on not only the processes performed but also on the organization’s internal and external linkages or interactions, these relationships are being re-evaluated. The organization’s internal relationships are becoming more consistent and are gradually being supported through the organization’s structure, hierarchy and information systems. However, the nature of the external relationships must also be examined.

Top-performing firms are moving away from adversarial relationships and forming partnerships with select providers and customers. These partnerships address tactical and strategic issues, involve extensive information exchange, and often involve issues of mutual training, design, costs, or forecasting[36-39]. As indicated by the experiences of Tektronix, Collins Air, and others, modification of the supplier selection criteria, reduction in the supply base, single sourcing, partnering, long-term agreements, mutual training, the use of linking information systems, and the involvement of suppliers on internal teams are actions being taken to enhance external relationships. These actions have, for these firms, already reduced ownership and product costs, and design time, while improving quality and competitiveness[4,39-41].

To summarize the organization design issues, we have found that high-performing, value-based organizations are moving towards flatter, team-based structures. Cross-functional teams bring together technical experts to assess and improve both the product and the processes. The teams, which tend to work with a high degree of autonomy in a decentralized environment, may extend beyond the doors of the firm to include both the suppliers and the customers. They rely on computer-based, highly integrated, detailed information systems to exchange information and make planning and execution decisions individually and collectively. How these organizations manage their critical human resources is the focus of the second half of the value-based management framework.

Human resource management variables

Much of the general management literature discusses the importance of managing human resources. This section extends the discussion found in the literature regarding job responsibilities and formalization, performance measurement system, and education and training to the value-based management framework.

Job responsibilities and formalization. One human resource management variable receiving renewed attention is that of job responsibilities and formalization. Value-based management requires that individuals focus on the performance of processes as well as the maintenance and improvement of linkages. Consequently, the job responsibilities, guidelines and instruction provided by the organization need to be broad, allowing for the performance of a variety of short-term and long-term activities. They also need to encourage innovation, creativity and interaction. The use of guidelines, rather than rules, tends to be more beneficial in creating value within an organization. Formalization (e.g. written documentation) tends to enhance vertical co-ordination and efficiency

within an organization and may be necessary in a large organization; but extensive documentation, in terms of rules and procedures, tends to stifle and discourage change and innovation[42,43] so balance is needed in a value-based environment.

Performance measurement system. Another variable in the management of people which is undergoing new scrutiny with regard to its ability to support value-based management is the performance measurement system. As firms undertake new philosophies like computer-integrated manufacturing, just-in-time, total quality management and value, traditional performance measurement systems are often incomplete because they do not capture the relevant information needed for decision making in these environments. As managers seek to create value, it is essential to develop performance measurement systems which link the firm's operating decisions to this effort. The components of objectives, performance measures and feedback are discussed with regard to the performance measurement system (PMS) and its ability to encourage the creation of value.

First, with regard to objectives, the bulk of existing management literature indicates that clear, specific objectives are needed to provide direction and consistency, and enhance performance for individuals and teams[16,44]. However, some quality-related literature suggests that general objectives are more useful, with the primary argument being that the achievement of the objective is not within the individual's control[28,45]. A practical guideline is to use specific, quantifiable objectives if achievement is within the individual's control and if the specified level of performance can accurately be determined. If not, provide a general objective, i.e. improve customer satisfaction, to establish direction and focus.

Perhaps the more critical issue with regard to objectives lies with the areas for which the objectives are established. Areas in which objectives are frequently established are department costs, productivity, price, incoming quality, efficiency, inventory, incoming on-time, order cycle time and documentation[46]. Unfortunately, objectives in these areas may conflict, and do not consistently encourage the creation of value. Value-based management requires an analysis of current objectives for both their fit with the firm's objectives and their ability to support the creation of value. Additional objectives in areas like integration, training and development, continuous improvement, the provision of superior quality with low cost, flexibility, dependability, and innovation; long-term considerations over short-term profitability; and customer satisfaction may be needed[47]. Managers need not develop objectives in all of these areas; rather, they need to identify those which are most relevant to their organization. One single objective – that of continuous improvement in customer satisfaction – might be sufficient to cover all these areas for all levels in the hierarchy.

Performance measures are needed to support and track progress towards the objectives. Measures should be provided for those processes determined to be critical to the firm's performance, because often if it is measured, it is performed. In developing these measures, two considerations exist: the nature of the measures

and the use of individual versus system or team performance measures. Across firms, the nature of the performance measures varies and an abundance of different performance measures are used to measure and direct the performance of individuals. However, traditional measures like hours worked, purchase price, efficiency, cost reduction, and other internal cost or time measures are being questioned as to their validity in today's value-based environment because these measures often reinforce behaviours which minimize cost and time at the expense of total cost or value[48]. This discovery is consistent with the views of world-class companies and manufacturing authorities who recognize that the use of traditional cost and accounting measures are insufficient and even counter-productive to today's value-added strategies[49,50]. However, this does not mean that all traditional measures can or should be replaced. Rather, an evaluation must identify the most useful measures for the situation. Additionally, because of auditor and government requirements, it may not be feasible to totally eliminate some measures. For example, price, efficiency, or utilization tend to be tracked consistently by auditors and, at this time, these measures cannot be discontinued even if it were desirable. These measures may not be counter-productive to value-based management, just incomplete. For example, a total cost or cost of quality measure would support value-based management more effectively than simply measuring the number of defects.

To support value-based management, performance measures need to support the attainment of the objectives, link an individual's decisions to the firm's strategy, and track both the performance of the processes and the quality of the interactions[51]. In this regard, measures like productivity, cost of quality, number of long-term agreements, total cost, job-related knowledge, professionalism, cycle time, and customer satisfaction would be appropriate and are being used in addition to traditional measures within some functions[52,53].

The nature of the performance measures is critical in value-based management, as is the choice of individual versus team-based performance measures. Both the literature and practice have long emphasized individual performance and assessment. However, quality management and team-based literature advocate the abolition or at least the combination of individual and team or system assessment[16,54]. Quality-oriented firms increasingly are adopting such measures[55,56] and research shows that the greater the weight placed on team measures, the greater the individual's commitment to the team[57]. In fact, a focus on individual performance when individuals work in teams creates conflict within the team as well as a focus on short-term results[58]. A combination of individual and team measures would be most effective in developing both team performance and supporting value-based management[59].

Finally, regarding feedback; performance objectives and measures provide focus for an individual's or team's efforts but performance feedback enables individuals to improve processes, performance and interactions[60,61]. Feedback can be provided in terms of the outcomes of performance, i.e. the number of units completed (outcome feedback) or the manner in which the individual is performing the task (process feedback). Both types interact with goal setting to

affect performance but in different ways[62]. Outcome feedback identifies the need for individuals to adjust action but does not provide specific information about how to adjust. Such adjustment information is provided through process feedback and is particularly important when performing complex or unstructured tasks in which the relation of actions to performance outcomes may be uncertain. Both outcome and process feedback are essential in value-based management because this management paradigm requires new tasks of individuals, relies on cross-functional processes that are unstructured, is frequently brought into an operating environment that is uncertain, and establishes self-directing teams. Additionally, as the individuals become empowered, the availability and provision of more of both types of feedback becomes even more important.

The nature of the performance objectives, measures and feedback within an organization are critical to the organization's ability to create value because these elements guide and motivate individuals in the right direction. Direction alone, however, is insufficient. The individuals must also have adequate education and training to be capable of creating value.

Education and training. Value-based management requires individuals to assess and improve processes while contributing to team performance. Continuous education and training can enhance the ability of individuals to perform in this manner, enabling employees to make better decisions, work as a team, and adapt to change, while increasing efficiency, quality, productivity and job satisfaction[63-65]. It is generally recognized that training is often for improving immediate work while education develops people for tomorrow. To enable individuals to create value consistently, both education and training are needed[66,67].

Value-based management is generating increased attention and the education and training received by employees in some companies is being examined. This examination has caused high-technology companies to increase the average hours of training for their employees from 18.4 to 19.4 hours, thereby increasing training costs from US\$996 per employee to US\$2,915. Both John Deere and Motorola have put vast resources into training employees, including classes in robotics and cost-reduction techniques, increasing both the training hours provided in advanced manufacturing methods and the number of continuing education subjects[64,68]. "Multiskilling", providing employees with a variety of skills, is being developed extensively in both companies and has been found to be essential in developing cross-functional teams, improving quality, and reducing cycle time[69]. Training for both companies has been quite beneficial, generating more than the equivalent cost in payback. The amount of training provided across all companies has increased, causing the number of US employees receiving training to increase from 11 per cent in 1983 to 16 per cent in 1991, but the overall number is still small and the distribution of training is still biased towards upper management[70]. To further the goals of value-based management all employees need broad and continuous education and training.

As shown above, the value-based management paradigm requires a rethinking of the management of human resources. A clear delineation of important job

responsibilities must be made and, in general, these responsibilities will be broad and cross-functional, requiring significant knowledge about the processes and linkages. These responsibilities must be linked directly to the firm's performance measurement system. The measures themselves must cross the necessary boundaries and motivate team performance. Similarly, the feedback provided to individuals and teams must generate guidance for both process and product improvement. It would not be unusual for this feedback to come from providers and customers, as well as management. Finally, because value-based management requires flexible, cross-functional individuals, education and training will need to be an integral part of all employees' development.

The presentation in the previous sections has discussed a number of organization design and human resource management variables which are likely to affect the long-term effectiveness of value-based management. A summary of these variables and their role in both a traditional function-based organization and the more contemporary value-based organization is depicted in Table I.

As indicated in Table I, an environment that supports value-based management varies considerably from that which exists with the function-based approach. To support value-based management, individuals are linked with management, individuals from other functions, providers and customers. Knowledge of the mission, the existence of top-down objectives with related performance measures, and process guidelines link individual or group performance to the firm's goals and expectations of upper management. The use of teams, cross-functional managers, broad process and linkage-oriented job responsibilities, and extensive information systems enable individuals to balance conflicting objectives and improve processes. Partnerships with providers and customers, long-term agreements, and the inclusion of customers and providers in internal teams provide critical planning information, reduce costs, and improve quality. Education, training and professional development are skill and process oriented and, most of all, continuous.

The framework for value-based management presented in this article is generic. It identifies variables that need to be evaluated by any organization as it attempts to embrace the value-based paradigm. To illustrate the use of the framework better, the following section applies it to the procurement function.

Applying the value-based management framework to procurement

Although each individual and function play a role in increasing the value of the firm's products and services, the involvement of the boundary-spanning function of procurement is critical. Perhaps one of the first requirements in managing procurement to create value is to recognize that procurement entails many broader functions than "buying". Procurement encompasses not only the traditional buying processes, but also a wide range of supply processes, like the management of value analysis processes, supplier negotiations, supplier quality certification; and supply market research as well as buyer participation in related materials processes such as the development of specifications and the purchase of inbound transportation. The breadth of processes and linkages make the function ideal for

Variables	Function based	Value based
<i>Organizational design</i>		
Structure	Speciality-based	Process and product based; teams throughout
Centralization	Extensive	Decentralized with limited centralization to take advantage of economies of scale
Information systems	Limited and task related; often constrained to within the function; little need for computerized information systems	Extensive and process based; crosses functional boundaries; computerized cross-functional information systems used for integration of information
Hierarchy	Multiple layers with functional managers, each reporting at mid-level	Few levels with wide span of control; cross-functional, process or production managers at top levels
External relationships	Narrow and cost-based; adversarial, short-term relationship with many providers and customers; limited exchange of information; task focus	Broad, strategic partnering with select providers and customers; extensive information exchange; market forecasting; focus on mutual benefit
<i>Human resource management</i>		
Job responsibilities and formalization	Specific and functionally focused; primarily related to tactical tasks; often clerical and task specific; detailed. Extensive task-based documentation	Broad, cross-functional; tactical and strategic processes; requires knowledge and thought; process and linkage oriented. Flexible, process guidelines based on objectives, mission, performance measures
PMS – objectives	Function-oriented, often unconnected to firm's, limited employee involvement; top-down	Written, specific, support firm's objectives in quality, customer satisfaction, continuous improvement; high employee involvement; team and individual focus
PMS – performance measures	Cost and efficiency based; function and individual oriented; limited employee involvement	Related to objectives; cross-functional boundaries; mix of team and individual measures; high employee involvement
PMS – feedback	Outcome feedback related to function's performance; scheduled; provided by management	Continuous outcome and process feedback; related to process and firm performance; provided by providers, customers, team members, management
Education and training	Task based and function oriented; initial training, on the job training and frequent refresher and/or upgrade classes related to job performance	Process based and firm oriented; provided continuously; managed; scheduled as part of career; broad-based; focus on both team and individual improvement

Table I.
Creating an environment to support value-based management

value-based management. In the following sections, the value-based management framework will be applied to the procurement function with regard to the organization design and human resource management variables.

Organization design of procurement

Traditionally, procurement has often been centralized and then organized by task, i.e. buyer, expeditor, manager. The buyers are then most frequently organized by commodity. In many organizations, this organization design based on specialization is being phased out and replaced with one that entails a merging of functions, such as the jobs of the buyer and the production control materials scheduler, creating a new function often described as a “buyer/ planner”. This individual handles daily interaction with the supplier and production; prepares master schedules, determines order quantities, and expedites materials while a buyer or team performs the strategic procurement functions like supplier selection, partnering, certification and negotiation. This approach has increasingly been adopted over the past few years, with firms using it reporting three major benefits: smoother materials flow, improved co-ordination with key suppliers, and increased productivity[71]. Some organizations have developed a procurement organization that goes further to support value-based management – the integration of procurement individuals into product teams. Procurement individuals are becoming increasingly involved in teams throughout the organization and this team responsibility is expected to continue to increase[17,57]. Through involvement in teams, procurement individuals are gaining credibility and increasing value for the firm[18,57,72,73].

To enhance the ability of procurement individuals to contribute to the cross-functional team's goals, procurement may need to be elevated to a level equivalent to its counterpart functions. They may also need to receive additional tools, resources and training because they generally do not have the status, resources, or tools possessed by manufacturing, design and process engineering[73]. Participation in cross-functional teams is becoming more common for procurement individuals but if teams are not yet part of the firm's structure, the manager of procurement may wish to develop teams within procurement to perform negotiation, sourcing or specific problem solving. Teaming would encourage interaction, develop procurement individuals with greater awareness and skills, and prepare these individuals for further companywide teams.

The decision to centralize or decentralize has not been a uniform one. A recent study indicates that 59 per cent of the firms use a combined centralized/ decentralized form of procurement organization; 28 per cent a centralized form; and 13 per cent a straight decentralized form[21]. These numbers show an increase in completely centralized procurement from an earlier study[74], with most of the change coming from a reduction in combined centralized/ decentralized organizations. However, although centralization has increased from the past, another study shows expected movement towards greater decentralization in the future, with the reasons cited being cost pressures to reduce staff and the need to place decision making closer to the design and manufacturing centres[75]. These

reasons are consistent with those driving value-based management and based on the value framework, decentralized procurement would better meet the needs of value-based management, especially as the product becomes more technically complex or the supply environment more uncertain. Selective centralization of common requirements initially may provide benefits in economies of scale but this decision may be evaluated periodically because over time, the development of supplier relations and increased information flow from a decentralized structure might more than offset the savings. In either case, whether the function is centralized or decentralized, taut linkages with providers and customers must still be developed.

One technology that can be used to tighten the linkages between procurement and its suppliers is that of electronic data interchange (EDI). EDI allows for the electronic transfer of business documents between or within firms through a structured format that allows the data to be transferred without being rekeyed. When implemented, procurement typically has direct involvement with EDI and several studies indicate that EDI can improve procurement productivity, reduce costs and improve external relations[76]. Unfortunately, these benefits have not occurred – mostly because the extent of EDI usage in procurement is still very low. A recent study indicated that about 50 per cent of the responding firms use EDI for less than 10 per cent of their total procurement transactions and only 8 per cent of the respondents have EDI links with more than 50 per cent of their suppliers[76]. Procurement needs to be more proactive in implementing EDI. They also need to initiate efforts to develop additional computer and information systems to perform their processes and strengthen linkages. With such systems, procurement individuals would be able to improve the speed and accuracy of information flow, freeing them to concentrate on value-adding efforts.

In addition to developing EDI, procurement must further strengthen its external relationships. Within some firms, closer, partnering relationships are being developed and suppliers are becoming involved in internal teams. Such actions enable procurement to involve suppliers in design issues and obtain information about the supply market, thereby enhancing the ability of the procurement function to perform its long-term strategic planning role. Critical to the development of strong external relationships is the reduction of the supply base to allow for long-term agreements with single sources where possible. High-performing firms are reducing their supply base but many firms still single source only an average of 34.3 per cent of all purchased items (excluding maintenance, repair and operating supplies)[38,39]. In addition to allowing the nurturing of good relationships, single sourcing can provide many other benefits. For example, Xerox, since beginning its move towards single sourcing in 1980 has, as of 1990, obtained a 50 per cent reduction in material costs, a 66 per cent reduction in overhead materials costs, and a drop in defects from 10,000 to 25,000 per million to about 350 per million[77].

To support value-based management, procurement needs to further evaluate key organization design issues. An organization structure must be developed which both supports team performance and the ability of procurement individuals

to create value for the firm. This new structure should seek to enhance coordination and information flow by minimizing the number of levels in the hierarchy, decentralizing where possible, identifying key suppliers with whom the firm can develop strategic partnerships, modifying supplier selection and evaluation criteria to include areas critical to the firm's performance, and sharing information with "partners", through EDI, teams, or mutual education and training.

In addition to the organization design issues, in implementing value-based management, procurement also needs to consider the methods being used to manage the human resource in the function. These issues are considered next.

Human resource management practices in procurement

Value-based management requires that procurement individuals perform processes that go beyond traditional "buying" processes. It requires that they obtain relevant information from the external environment or their customers and transmit it to the appropriate individuals. It also requires that they perform both tactical and strategic processes to enable the firm to maximize its value opportunities. Unfortunately, procurement individuals currently perform routine, short-term activities rather than strategic ones, are not focused on the performance of major processes, and are restricted in terms of interaction with others on non-routine activities[78,79]. Consequently, job responsibilities, performance measurement, and education and training need to be rethought.

Procurement job responsibilities need to be expanded and rewritten to incorporate traditional tactical buying processes as well as strategic processes, focus on both processes and linkages, and identify procurement's role in cross-functional teams. These job responsibilities should selectively be accompanied with general policies and procedures because the unstructured, non-routine tasks, which are the bulk of the strategic activities of procurement, are best handled through the provision of general guidelines which allow for flexibility, change and innovation. To help identify and develop the needed documentation, intra-functional teams can be used.

As value-based management changes the activities, job responsibilities and method of operations for procurement individuals, the performance measurement system must be designed to provide support. Clear, specific objectives need to be developed for the procurement function which support the firm's objectives and strategies. Research indicates that current procurement objectives often do not meet these requirements[22]. Objectives should be established to improve the performance of critical processes and interactions. These critical processes may include non-traditional processes of supplier relations, education and training, or forecasting. If teams have been, or are being, established in the firm, both individual and team objectives are needed to gain best performance. These teams can and should be used in developing the objectives. After the performance objectives have been established, the appropriate performance measures to track progress towards those objectives can be identified. Systems may need to be established to provide consistent,

accurate outcome and process feedback from management, customers, team members and suppliers (internal and external).

Successful implementation of value-based management in this complex procurement function requires well-trained and educated employees. Unfortunately, the level of education and training of procurement individuals has been decreasing rapidly, as has the number of certifications[80]. One study indicates that formal training programmes exist for procurement individuals only within 44 per cent of the firms surveyed and only 26 per cent of the firms have a formal career development programme in place for procurement professionals[21]. These statistics provide concern as to the probability of implementing an effective value-based management programme in procurement.

Education and training is needed continuously during the application of value-based management, not only for procurement individuals, but also their “customers” and providers. This training should include the following four elements:

- (1) an overview of value and process management;
- (2) technical training to improve the competence of procurement individuals in cross-functional teams;
- (3) training in computer systems, strategic planning, and problem-solving techniques, including statistical process control;
- (4) team-based training in skills like communication, setting objectives and conducting meetings.

With this foundation, the managers and procurement individuals, together, can identify the function’s strategic value processes, develop job responsibilities, set performance objectives, determine appropriate performance measures, and identify needed feedback. The framework also then exists for the teams and individuals to improve continuously the function’s processes and linkages. Additionally, such training reduces the uncertainty associated with value-based management and improves the probability of its success. The development of strategic training schedules and formal career development plans would further increase the probability that individuals receive the needed training continuously. Managers should also encourage involvement in professional development activities by covering expenses and becoming involved personally in these activities.

Summary and recommendations

This article has developed a framework for generating a value-based management organization and shown its application to the procurement function. Implementation of value-based management will require changes in both organizational design and human resource management.

Bold managers seeking to implement value-based management may want to start by developing cross-functional critical process improvement teams. These teams should report directly to top management and be given training that

teaches both value and process management and, initially, change management. The teams should be given a specific process to own (for example, the qualifying of suppliers) and sufficient authority to change the segments of the entire process. In our hypothetical example, members of the team would include procurement, manufacturing, engineering, accounting and suppliers. Although top management may provide specific objectives for this team, the members might participate heavily in the development of individual and team performance measures. Information systems may be defined by the team to accomplish the process as well as provide feedback on both product and process performance. Over time as the improved processes are implemented and feedback is continuously generated, the process improvement teams should identify other inputs or process segments which need to be improved.

We use the term “bold managers” because change is not the domain of faint-hearted managers. Implementation of new structures and management paradigms are never easy, but occasionally are necessary. Top management must expect and tolerate some failures and setbacks in the transition to value-based management, but faith in the underlying concept and the need for change should enable them to create an organization that continuously creates value for the customer.

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