

A Skills-Based Analysis of the World Class Purchaser

by

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Executive Summary

The objective of the research was to define the world class purchasing/supply management (P/SM) individual. The goal of this effort was to highlight the efforts in developing a skills matrix for such individuals. The results were gathered from interviewing or surveying more than 100 purchasers, collecting data from more than 30 corporations, and extensively reviewing the literature. Finally, a survey sample of 96 purchasing managers indicated current skills and knowledge required for a world class P/SM individual. The document, which contains several approaches to this daunting task, should provide P/SM managers data to consider when developing skill models within their organizations.

World Class Purchasing Individual

One message emerged from these discussions. There is not one clear definition of what the term *world class purchaser* means. Ultimately, the success of the purchaser in any firm is related to the firm's success regardless of the definition or view of world class. However, a definition constructed from these discussions represents a combination of the researcher's thoughts and those of many purchasers. The only thing certain is that the definition probably comes up short and will change over time:

"The world class purchaser is an individual who visualizes and approaches his or her job from a strategic perspective in dealing with the supplier firm-purchaser firm-customer linkage. This individual continually embraces and leverages his or her skills and knowledge of critical supply chain activities to provide value in meeting corporate and customer objectives."

Comments that purchasers made regarding the world class purchaser include statements that the individual continuously improves his/her skills; is viewed as an important profit contributor to the firm; is a viable candidate for cross-functional promotions; delivers value; makes a very competitive salary; focuses on professional development and education; works well in teams and groups; is willing to change and adapt; is a problem solver

seeking the best solution; is flexible; is knowledgeable about the final customer; uses company goals and metrics to drive performance; is ethical; and sets measurable "stretch" goals that support the organization's mission; and adapts well to change.

Firms that appear to be the leaders in trying to develop the world class purchaser have the following practices in place:

- Continually monitor the trends in their supply environment and within their firms.
- Continually assess the skill and knowledge requirements for their purchasers.
- Continually assess the skill levels that currently exist and compare these skill levels to the ideal.
- Provide for growth in position levels for individuals who seek to follow a non-managerial career path.
- Make training convenient and readily available to their employees.
- Coordinate training and skill development on an enterprise-wide basis and recognize the similarities and differences at strategic business units.
- Understand the need to involve suppliers in their training efforts.
- Use competency tools for the position or job title to track the progress and achievement levels of individuals.
- Establish quantifiable metrics that can be converted into measurable training goals.

World Class Skill Sets

Extensive literature reviews, field interviews, telephone conversations, and surveys resulted in a broadly defined set of skills. These skills were: interpersonal

communications, team skills and facilitation, analytical problem solving, technical, computer literacy, negotiations, education and professionalism, and continuous learning. Results from the survey of purchasing managers regarding skills and knowledge were closely related to the set identified in the other analyses. The top 10 skills rated by the sample included: (1) interpersonal communications (2) decision making (3) teaming abilities (4) negotiation (5) customer focus (6) analytical understanding (7) influencing and persuasion (8) business conditions (9) conflict resolution and (10) managing change. The top skills were also compared to those in *Purchasing Education and Training Requirements and Resources*, published in 1993. In the 1993 study, respondents rated top skills for 1992 and then rated what the top skills would be in 2000. Interpersonal communications and the ability to make decisions were in the top three of all three survey rankings. (See Table 7.3.) Of the skills rated highest in 1992 only three moved into the top 15. The three skills, not previously measured, were the ability to work in teams, strategic thinking, and supplier relationships. For the most part, the key skills forecasted in the 1993 study to be important in 2000 are accurate.

The top 10 knowledge areas as rated by these purchasers were: (1) supply chain management (2) supplier development (3) lowest total cost (4) price cost analysis (5) supplier analysis (6) market analysis (7) personal computer skills (8) understanding markets and industries (9) electronic commerce, and (10) human behavior. In the top 10, personal computer skills and electronic commerce were knowledge areas that were not measured in 1992. In 1992, Total Quality Management was forecasted to be the number 1 knowledge area for 2000. However, rapid improvements in quality by American business left this ranked 11th in the current survey. The knowledge areas required of purchasers varied much more from the previous survey than did the skills. This indicates that, while skills such as ability to make decisions are important, decisions are being made based on new or different subject knowledge.

Applying and Evaluating Skills and Knowledge

Firms used various approaches to assure that necessary skills and knowledge were attained. The most basic method was through P/SM job descriptions. Other firms used a skill requirements matrix by position. Ideally, candidates for each position would possess each of the skills listed on the matrix. A refinement of the matrix approach weighted the extent of use of a skill in each position. Finally, the in-depth skill evaluations and GAP analyses used were the most sophisticated and provided the most detailed assessment of the required skills. One organization broke its evaluations into two tracks, which allowed for progression in a nonmanagerial track as well as in the traditional management track.

Several caveats apply in analyzing the various skill implementation models. First, there are a wide variety of tools that can be successfully used. For example, those using the job description as a skill-set tool had some advanced purchasing practices in place. Second, no attempt was made to correlate the formalization of the skill matrix to the effectiveness of the purchasing function. Third, the key, regardless of the skill-building method used, is to develop metrics to drive improvement and increase skill levels. However, the better-defined skill sets coupled with the measurement of critical dimensions and a plan to raise the existing skill level should produce the best results within a framework that is supported by management.

It, therefore, is logical to expect a progression in using these various models. Several firms have identified the skills required of each purchasing/supply management (P/SM) professional by position level. These skill matrices list the skills required by individuals in these positions. The problem with the skill matrix is that, once the specific skill sets are identified and categorized, decisions concerning skill competency must be made. One organization formalized these skill sets by agreeing to the requisite skills and "ideal" skills for each job category. The mastery of a particular skill by a candidate ranged from 1 (very little understanding) to 5 (excellent understanding). This matrix was then used by the managers and subordinates in one-on-one assessment to determine current skill levels. Comparing skill achievement to the ideal competency will reveal the gaps. The gaps can be prioritized and training tailored to the individual to improve those skills.

Suggestions for Practice

As the P/SM function moves toward more leading edge and strategic practices the skills needed become more sophisticated and the knowledge required more advanced. With this in mind, the following guidelines will allow for a quicker and smoother move toward developing the world class individual:

- Top management must view the P/SM functions as a strategic contributor. In organizations where this does not occur, the focus will be on traditional price issues as opposed to total lowest cost.
- Major knowledge and skills impacts occur when purchasing takes an enterprise-wide focus (supply chain type) in order to leverage expertise throughout the corporation.
- Career paths and goals must be established for the P/SM function. Career paths must retain and promote those individuals who attain skills and knowledge.
- If purchasing "talks the talk they must walk the walk." Attaining greater status implies delivering more value.

- Firms that took a coordinated approach to world class training were more likely to ensure successful and consistent skill implementation.
- Overall training models for upper-level purchasing jobs such as chief purchasing officer (CPO), are not well defined and the skill sets are very open. Organizations need to work on more accurately defining these skill sets, as they now do for other positions. Upper-level purchasing positions should provide training that gradually evolves the individual from a focus on functional expertise to an understanding of general management principles. Generally, a formalized program for this type of training is lacking in the P/SM function, or if it exists, it is not well defined.
- Training should extend beyond the classroom and include a range of activities such as reading pertinent texts, attending trade shows, or establishing a buyer-supplier-user team to solve a pressing problem.

The World Class Purchasing/Supply Management Individual

A Definition

During this project, the researcher interviewed and/or talked with more than 100 purchasing professionals to discuss the idea of what it meant to be a world class purchaser. Data collection and/or in-depth interviews involved more than 30 individuals from large, mostly multinational firms. One message emerged from these discussions. There is not one clear definition of what the term *world class purchaser* means. World class is a term that is used and abused, but not well defined.

Ultimately, the success of the purchaser in any firm is related to the firm's success regardless of the firm's definition or view of world class. However a definition constructed from these discussions represents a combination of the researcher's thoughts and those of many purchasers. The only thing certain is that the definition probably comes up short and will change over time:

"The world class purchaser is an individual who visualizes and approaches his or her job from a strategic perspective in dealing with the supplier firm-purchaser firm-customer linkage. This individual continually embraces and leverages his or her skills and knowledge of critical supply chain activities to provide value in meeting corporate and customer objectives."

Comments that purchasers made regarding the world class purchaser include statements that the individual

- continuously improves his/her skills
- is viewed as an important profit contributor to the firm
- is a viable candidate for cross-functional promotions
- delivers value
- makes a very competitive salary
- focuses on professional development and education

- works well in teams and groups
- is willing to change and adapt
- is a problem solver seeking the best solution
- is flexible
- is knowledgeable about the final customer
- uses company goals and metrics to drive performance
- is ethical
- sets measurable "stretch" goals that support the organization's mission
- adapts well to change

World Class Purchaser Conclusions

As with any process, a range of approaches can be taken to achieve world class status. A broad range of practices relating to skills and abilities were observed and resulted in the following conclusions. Firms that appear to be the leaders in trying to develop the world class purchaser have the following practices in place:

- Continually monitor the trends in their supply environment and within their firms.
- Continually assess the skill and knowledge requirements for their purchasers.
- Continually assess the skill levels that currently exist and compare these skill levels to the ideal.
- Provide for growth in position levels for individuals who seek to follow a non-managerial career path.
- Make training convenient and readily available to their employees.

- Coordinate training and skill development on an enterprise-wide basis and recognize the similarities and differences at strategic business units.
- Understand the need to involve suppliers in their training efforts.
- Use competency tools for the position or job title to track the progress and achievement levels of individuals.
- Establish quantifiable metrics that can be converted into measurable training goals.

Skills Review General Conclusions

Skill is defined as the ability to use one's knowledge effectively. A skill is a developed or acquired ability. In line with this definition, there was not one overall skill set that firms universally adopted. Each firm must analyze its own environment and then determine the specific skills needed to get the job done. However, as will be discussed later, a key body of skills seems to be required of all purchasing professionals.

The changing nature of the profession from a transactional to strategic perspective and from arm's length to relational requires a different mix of skills and higher-level application of tried and true skills. Further, the movement to team-based decision making and the emphasis on serving the final customer require skills that are enterprise-wide and not function specific. Additional findings from firms with well-developed job competency models include:

- There is consistency in the general skills needed across non-managerial job titles. For example, the skills required of a senior buyer include many of those required for a buyer.
- Skill sets at the managerial level are more flexible and exhibit more variance than those at the non-managerial level.
- Skills are cumulative, and it is expected that as responsibilities and experience increase so will the skill levels.
- The priority is placed on the skills where improvement is required.
- A skill improvement plan is developed with employee input.
- Subcategories under each major skill need to be defined in detail.
- A building process from entry level to higher level jobs involves mastering a new skill or exhibiting a higher competency on an existing skill.
- There needs to be a method to recognize progression in skill levels as a means to attain a higher salary and position without assuming a managerial position. One firm had a nonmanagerial track that was more developed than their managerial track.
- There is an emphasis on demonstrated practice of the skills as well as training to indicate skill competency.
- Firms whose culture and top management are committed to learning and training in words and dollars have the greatest chance for success.
- Professionalism through the Certified Purchasing Manager (C.P.M.) or Certified Production and Inventory Manager (C.P.I.M.) is encouraged as a key part of the skill set.
- Formal education, a bachelor's or master's degree, is becoming the norm for entry-level positions.
- Performance measurement was evaluated on metrics, and success, or lack of it, was tied to skill competency and future improvement plans.

Achieving World Class Purchaser Status

Interviews and discussions uncovered several items that would make a difference in raising skill levels to world class status. A summary of these are covered in the following:

- Top management must view the P/SM functions as a strategic contributor. In organizations where this does not occur, the focus will be on the bottom line and the lowest price.

“Our new COO has no previous purchasing experience and wants nothing to do with the function beyond cost reduction.”

“Much of our efforts and work in building relationships are now under attack.”
- Big impacts occur when purchasing takes an enterprise-wide focus in order to leverage expertise throughout the corporation.

“We have no purchasing personnel at the headquarter level to contribute to leveraging efforts across SBUs. This comes at the expense of our time and effort and is not well done.”
- Career paths and goals must be established for the P/SM function. Regardless of what the function is named, (that is, purchasing, supply management, or supply chain management) career paths must retain and promote the best individuals.

The knowledge and skills necessary for upper-level purchasing positions are not well defined. This leaves the P/SM function open to invasion from nonpurchasing managers, such as finance and accounting. Usually people from such backgrounds take a more price-focused approach. Recent research by Johnson, Leenders, and Fearon shows a trend to more nonpurchasers in high-level positions.

- If purchasing talks the talk about wanting to be strategic they must walk the walk and add the value necessary to be considered a strategic player.

Once top management understands the strategic importance of purchasing and this becomes recognized throughout the organization, it is incumbent on the P/SM function to demonstrate results in lower cost, quality, and time. One organization sets quality, time, and cost improvement targets for suppliers in dollars. If these targets are not met by the supplier, a check in the amount of the savings promised, but not delivered, is sent to the purchaser's firm from the supplier.

- Taking a coordinated approach to world class training is the best way to ensure successful skill implementation.

World class skills require a coordinated, evaluated, and measured approach to training. It becomes a way of life. Haphazard training often leads to haphazard performance.

- Overall training models for upper-level purchasing jobs, such as chief purchasing officer (CPO), are not well defined, and the skill sets are not well defined at these higher levels.

For example, the job description for one CPO stated the need to implement and use supply management strategies to drive improvements in cost and quality. The job description also stressed the need for collaborative team activities internally and with the supply base to improve responsiveness and value. Other criteria included the need to globalize the supply base and to develop career opportunities for the staff in an organizational setting that provides empowerment but does not sacrifice opportunities to leverage cost improvements.

- Training extends beyond the classroom and includes other activities, such as self-training through reading texts, attending a trade show, or establishing a buyer-supplier-user team to handle problems.
- Upper-level purchasing positions should provide training that evolves the individual's focus from

functional expertise to an understanding of general management principles. Generally, a formalized program for this type of training is lacking in the P/SM function, or if it exists, it is not well defined.

Developing World Class Skills — A Case Study

One highly successful firm has imbued its corporate culture with training. The firm's annual report insists that its learning environment provides it with a competitive advantage over its competitors. Each employee is required to invest a minimum of 40 hours in training per year. Top management has created a learning culture that motivates employees to renew and grow. The idea that "we have always done it this way" will not succeed in this change-driven environment. Employees are described as seeking, embracing, and driving change.

The firm's commitment to education extends to its purchasing organization. A structured supply chain management program has been developed. The basis for developing skills is a four-level competency model. At Level 1 "Basic," the employee is focused on doing his or her job and performing the attendant tasks. Level 2 is titled "Improving," and the employee is expected to develop his or her skill set by attending courses and performing certain activities. Level 3 "Succeeding" requires familiarity with tactical skills and more demanding goals at the business unit level. Level 4 "Leading" is the highest level, and it requires a visionary and strategic focus on a corporation-wide basis. Implementing this program requires the identification of leading practices and the establishment of training that supports these practices. Pre- and post-assessments are done on the training courses, and the assessments are tied to the performance measurement program. The program's goals are to support the development of best practices. The key items, which make the program unique, are the following:

- The program is coordinated across business units.
- The curriculum is well defined.
- New employees, workers hired from outside, and suppliers are included in the training.
- Upper management, business units, and individuals support the program.
- The program is phased to cover nonmanagers, managers, and upper management.
- Flexible ongoing training is provided in an accessible environment.
- The program is tied into performance appraisals and business unit or corporate metrics.

An example of the skills required is described for the buyer/planner position. Level 2 employees would be required to complete two American Production and Inventory Control Society (APICS) modules or one C.P.M. module. They would also have to complete course work in negotiation, business communications, conflict management, inventory management, lean manufacturing, MRP, master production, scheduling, and supply chain management. They are expected to become Total Quality Management (TQM) certified, subscribe to a trade publication, and read *The Goal*, a text on inventory/lean production.

Level 3 employees would complete course work in EDI/electronic commerce, logistics, production planning, and risk management. They would either complete two more APICS modules (JIT and master planning) or the current issues module of the C.P.M. exam. The employee is also required to be a member of one cross-functional team. In addition, each may participate in or attend a trade show.

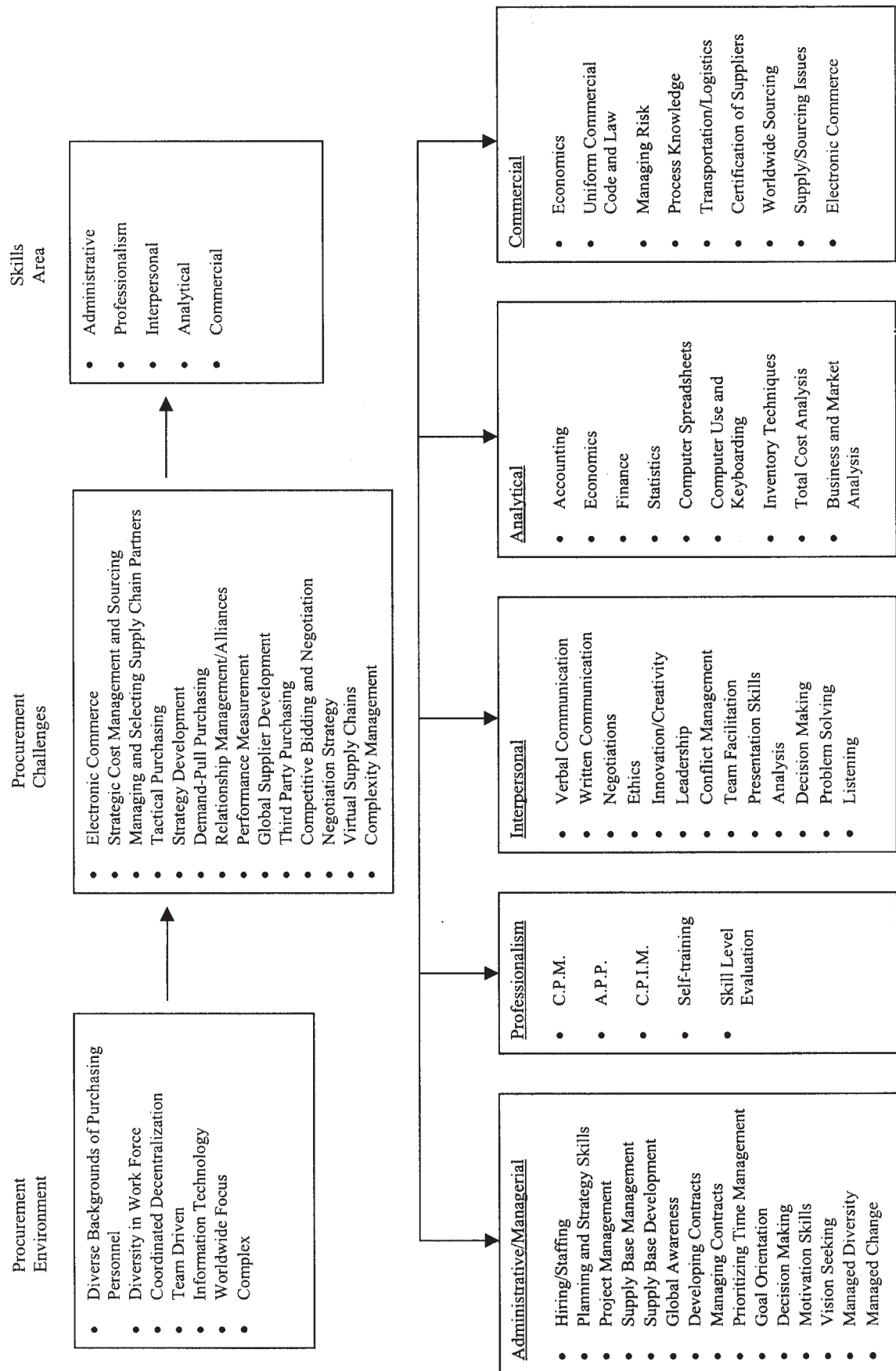
Level 4 requirements increase to advanced negotiations, program/project management, contracts, global purchasing, and statistical applications in materials management. These individuals now get to demonstrate their knowledge by teaching a supply chain management class for half a day. They also finish their APICS or National Association of Purchasing Management certification by taking systems & technologies and supply chain management modules for their CPIM or the administration and supply modules for the C.P.M. Activities include a supply chain conference, a plant tour, or participation with a consortium partner.

Ideal/Emerging Skill Set

The idea of constructing an ideal skill set is difficult given the various procurement environments, challenges faced by P/SM professionals, and the different terminology used. However, based on extensive literature reviews, field interviews, telephone conversations, and survey results, a broadly defined set of skills emerged. Certain skills listed below are those that purchasers of the past needed for effective performance, so in this sense they are unchanged. Meanwhile, other skills are new. Whether old or new, the application and intensity of these skills have been elevated in terms of sophistication. For example, interpersonal skills now are viewed as a tool used to build lasting relationships with suppliers. In the past, the emphasis was on the effective communication of order requirements and expediting transactions. These broadly defined skills are:

- Interpersonal communications – Professionals must communicate well both internally and externally. One respondent said it best, “We are the communication bridge to the outside world, and we must keep the traffic on this bridge flowing smoothly into and out of our organization.” There are many facets to interpersonal communications, such as handling people, having respect for others’ opinions, and so on.
- Team skills and facilitation – Cross-functional teams are a way of life in organizations and decisions are no longer unilateral. Teaming skills build on interpersonal skills. Effective purchasers must learn to play different roles on different teams—from leader to member to advisers. Presentation skills are necessary to influence and convey information within teams.
- Analytical problem solving – With the movement toward closer relationships, supplier selection criteria must be more precise. The focus has shifted from buying to contracting. One quote summed this up, “Our commodity managers must know the suppliers and their industry in order to select the best suppliers. They must translate this knowledge into a total cost evaluation and development of available schedule.”
- Technical – Many of the people interviewed stated that a technical understanding of their business is required. This was particularly true in the high-technology sectors. In many cases, technical training was assured by requiring entry-level personnel to possess a bachelor’s degree in engineering. Because supplier relations extended for longer periods of time, continuous improvement was driven by process improvements. The purchaser needed to have enough of a technical background to understand the suppliers’ processes and scheduling systems in order to make improvements. “Since our specific part numbers usage varies, we ensured capacity by reserving capacity for our chips at the wafer fabrication stage not on final part usage. Our commodity managers must understand the suppliers’ business,” said a manager in the communications industry.
- Computer literacy – The message from managers was that a world class person has to continually add value. Eliminating redundancies and nonvalue activities, such as purchase orders, is accomplished through the use of systems. However, the most important part of selling a system is capturing the data to prove savings, and this is where the computer can help. “Our networked personal computer system enabled us to capture and organize data and purchase expenditures we never looked at.” E-mail, the Internet, and electronic commerce are a few of the applications purchasing can take advantage of through the use of computers.
- Negotiations – While this skill was mentioned less frequently in interviews, it comes through strongly in the literature, surveys, and companies’ printed data describing buyer skills. In reviewing written data, it became evident that most firms are trying to get their

TABLE 3.1
WORLD CLASS SKILLS MODEL DEVELOPMENT



employees to develop negotiation strategies that satisfy both parties and produce lasting agreements. Negotiation is one area in which most purchasers receive some training.

- Education and professionalism – A formal education is a necessity for a purchasing position. The firms were split on the necessity of a business or engineering degree. Clearly, those in the high technology environments favored engineers while others preferred a business degree. The ideal education was an engineering degree with a Master's of Business Administration. Self-improvement through attaining a Certified Purchasing Manager designation and a Certified Production Inventory Manager were important at most organizations.
- Continual learning – Learning is a lifelong process. Thus, while this is a skill set builder, it belongs in the world class professional's tool kit.

skills areas required for effective purchasing. The categories of administrative/managerial, professionalism, interpersonal, analytical, and commercial were developed by looking at the literature and information provided by the participating organizations. These broad areas cover the major skill sets that were encountered in this research, and they provide a framework for understanding the skills necessary to help an individual attain world class status. The model can serve as a guide to firms in developing their own worldwide skill sets.

World Class Skills Model

Table 3.1 shows the procurement environment of today, the major challenges (as identified in the CAPS *Future of Purchasing and Supply* 1998 study) and the major skills areas. The major areas include the broadly defined skill sets mentioned previously plus several other important skills that were mentioned during this research.

The procurement environment is much more diverse today, with more women and minorities holding jobs in the P/SM area. Diversity in background is apparent given the mix of younger, more educated workers with older, less educated but more experienced personnel. The major form of purchasing organization in these firms was coordinated decentralization. Purchasing decisions were made at the business unit level on unique items, but common items were purchased centrally or by a major business unit group on a worldwide basis. The complexity involved in making this system function appeared to increase due to multiple coordination mechanisms, sophisticated technology, and worldwide sourcing efforts. For example, one firm was attempting to standardize part numbers worldwide. Early efforts focused on locating the source of demand, the expertise, and worldwide usage for a family of items.

The procurement challenges shown in Table 3.1 are those identified in CAPS *Future of Purchasing and Supply: A Five- and Ten-Year Forecast* (1998) study as purchasing/supply executive issues, and they include strategy development, strategic cost management and sourcing, global supplier development, electronic commerce, and so on. The CAPS study had a broad focus, and each firm faces its own set of challenges. The specific challenges should be tied into the

Literature Review

Overall Literature Review Findings

Purchasing literature published during the past 15 years was reviewed for this study. Overall findings indicated:

- There is not an explicit definition as to what a “world class” purchaser is or does.
- There is a lack of articles that deal with the skills needed for purchasing/supply management professionals.
- Most articles focus on general skills, particularly entry-level skills attained by recent college graduates.
- A common theme in the reviewed skills literature concerns the movement of purchasing from tactical to strategic and transactional operating mode to a relational environment.
- The movement from a tactical to a strategic operating mode requires different skill sets for purchasers.
- As the purchasing/supply management function embraces supply chain management, a system-wide perspective becomes necessary.
- Literature that discusses what higher level purchasing managers or executives need is limited. It appears that good management skills apply across functions.
- There is a lack of literature that deals with effective skill sets required for executive-level purchasers.

World Class in the Literature

World class is a term that is used frequently but it is not well defined. No definitions of world class purchasing were found in the literature reviewed. Schonberger's 1986 text *World Class Manufacturing* may have popularized the term world class. Schonberger defines world class

manufacturing as analogous to the Olympic Games motto *citius, altius, fortius*, which translates to faster, higher, stronger. The world class manufacturing equivalent is continual and rapid improvement. In a 1996 text, Schonberger lists 16 customer-focused principles. These include teaming with customers and continually striving to improve all the critical demands that keep customers satisfied.

Hayes et al. (1988) suggests that world class manufacturing means being better than almost every other company in your industry in at least one important aspect of manufacturing. They explain that long-term success is not the same as simple survival. To be successful, an organization must build and continually review its competitiveness in all functions, that is, creating and sustaining learning.

A 1998 *Industry Week* article states that world class manufacturers have certified quality processes, high inventory turnover, and consistent improvements in productivity. A 1998 article in *Industrial Distribution* cites a survey of more than 200 large North American firms in which only 1 percent of manufacturers rate their supply chain as world class. Further, only 33 percent feel their performance tops the industry average.

In his text, *Global Purchasing*, Victor Pooler relates world class suppliers to a discussion of statistical process control (SPC). “Its use (SPC) by a supplier is indicative of potential for world class performance. . . . This term ‘world class’ has come to mean those suppliers who can deliver their goods anywhere globally at competitive cost in all marketing arenas.”

Specific Literature Findings

Conclusions from the literature review regarding specific skill sets required by purchasers follow:

- Skill sets, as reported, can overlap, which makes categorization difficult. For example, is financial knowledge an analytical skill? Is relationship development or negotiation an interpersonal skill?
- Broad, general skill sets that are identified consistently in the literature for purchasing/supply management success include analytical, interpersonal, communication, computer, team building, and technical skills.
- Several skill sets required in purchasing, such as technical, interpersonal, and problem solving skills are also important to the engineering, sales, and quality functions.
- Skill sets identified with less frequency include financial skills and relationship development.
- Skill sets that are on the rise include computer-related skills, teaming facilitation, and financial skills.
- Skill sets for executive-level purchasers include profit analysis, interpersonal skills, continuous learning, and cultural awareness.
- Several articles concerned university efforts in the purchasing/supply management area at universities such as Arizona State, Michigan State, Bowling Green, Western Michigan, Penn State, and Florida State.
- Logistics-based programs at Michigan State, Ohio State, Penn State, and Tennessee are discussed in the literature.

A comprehensive summary of the literature concerning the skill set required of entry-level and experienced purchasers is provided in Table 4.1. It should be noted that the skills categorization is difficult because skills were often described or titled differently. The intent was to capture key skills discussed in the articles received.

The following is a summary of literature reviewed over the past 15 years concerning the skills and knowledge required of purchasers. It has been organized by level of purchasing experience (that is, new-hires versus experienced purchasing professionals).

Literature Review of Skill Sets

“More changes are taking place now than at any time in the history of the profession,” says Gordon Cole, manager of purchasing at Allergan, Inc. “The whole concept of ‘buyer’ is under challenge by management, and the focus of the purchasing department is changing from tactical, with an emphasis on order placement and price savings, to strategic, with an emphasis on value-added activities and total cost savings” (Ciancarelli 1998).

The transition from technician to strategic decision maker requires the acquisition and utilization of specific knowledge and skills on the part of the purchasing professional. In 1998, Edwards asserted that it is a flawed theory to suggest that a firm can just take its people from transactional work and employ them in strategic purchasing. The people who were hired for transactional tasks may be incapable of strategic purchasing without significant retooling of their skill set through training and development (Edwards 1998).

Efforts to identify the key skills required of the purchasing professional is found in research and discussions by academics and practitioners. The title of Murphy’s 1995 article, “Half the Battle Is Knowing What Skills to Acquire,” illustrates the continuing search for the “ideal” skill set that purchasing professionals should possess. This article lists four general skills that were identified via an opinion poll of purchasers who named the skills important in their job function. The skills presented were negotiation skills, management skills (financial/interpersonal), computer literacy, and math. The author does not attach these skills to any particular job within the field.

The purchasing literature was revised to assess the effect of the changing role of the purchasing function on the skills required of chief purchasing officers (CPOs). Surprisingly, few articles addressing this topic were identified in academic journals or business publications. The literature review was expanded to include the skills necessary of top management executives in all fields and is presented in the “Skills Required of Purchasing Executives” section.

Entry-Level Skills for Purchasing/Supply Management

A 1994 survey conducted by Down and Liedtka revealed the seven most critical skills that employment recruiters look for in purchasing professionals. The skills identified were communication skills, interpersonal skills, self-motivation and initiative, professional presence, leadership (potential or actual), analytical/problem-solving skills, and academic achievement.

Although academic achievement ranked as seventh most important to recruiters in the Down and Liedtka study, companies such as Motorola, prefer to only hire purchasers with four-year degrees in materials management or business. In addition, employers are seeking candidates who are strategic rather than tactical thinkers, have experience in the industry and in supply chain management, have the ability to develop and integrate supplier relationships, and possess negotiation skills (Cruz and Murphy 1996).

Koumantzelis (1997) discussed the purchasing professional’s role in supply-chain management from a different perspective. The author interviewed Terry Carlson, vice

TABLE 4.1
LITERATURE & KEY SKILLS

Article	Analytical/Problem Solving	Change Management	Communication	Creative Thinking	Computers	Conflict Management	Contract Writing	Cross Process Thinking	Customer Focus	Decision Making	Entrepreneurship	Finance	International Buying	Interpersonal	Knowledge/Purchasing Items	Leadership	Knowledge and Environment	Materials Mgt. Inv. JIT	Negotiation	Organizational	Production Systems	Prof. Presence/Bus. Perspective	Project Management	Quality	Research	Risk Management	Sales Interface	Self-Motivation	Strategic Supplier Selection	Strategic Thinking	Supplier Evaluation	Supplier Relations	Supply Chain Management	Team Building Facilitation	Technical	Total Cost Analysis		
NAPM (1987)					X								X						X					X												X	X	
Cavinato (1987)					X										X			X			X			X									X			X	X	
Kolchin & Giunipero (1993)	X	X	X	X	X	X			X	X			X			X															X		X					
Down & Liedka (1994)	X	X	X		X				X					X							X								X									
Murphy (1995)					X																X										X							
Cruz & Murphy (1996)			X																X																			
Pye (1996)	X	X							X					X																								
Aron (1997)	X				X			X				X		X																								
Killen and Kamauff (1995)	X		X							X		X		X				X	X	X													X					
Koumantzelis (1997)			X										X																									
Anderson & Katz (1998)	X						X											X	X		X												X	X			X	
Bordon (1998)	X				X						X																							X				
Ferguson Enterprises (1998)	X													X					X	X																		
McKeeffy (1998)																																						
O'Shea (1998)		X	X								X			X													X											
Thomas (1998)				X										X													X											
Inbound Logistics (1998)												X																										
EBN (1999)																																						

president of purchasing at Maytag Corporation. Carlson suggested that the purchasing professional must act as a salesperson as well as a buyer. Purchasers are selling the importance of the supply-chain function and its effects on overall business performance to management and other departments within their company. They also sell the company's business needs and opportunities to its suppliers (Koumantzelis 1997). In order to accomplish these broad objectives, a wide range of skills is identified in the article. The skills include international buying experience and the ability to communicate with engineers about quality. In addition, Koumantzelis notes that knowledge of the current and projected states of domestic and world economies is vital because of the increasing globalization of firms.

The Koumantzelis (1997) article also emphasized that recruiters highly value real-world experience when considering entry-level purchasers. Co-ops and internships provide students opportunities to gain valuable experience. At Florida State University, internships are taken for credit in the students' senior year. Seventy percent of students at Bowling Green University complete one or more internships in a major company. Volvo provides scholarships to students to intern with its company in Sweden and study at Sweden's Växjö University. Participation in internships abroad affords students the opportunity to develop and cultivate the skills necessary to compete in an international purchasing environment.

Deere & Company recently implemented a formal program, in which 20 students from supply management programs at Michigan State University, Arizona State University, and Western Michigan University worked as cooperative students. According to Art Rowe, project manager at Deere, the return on investment for the program was 450 percent in the initial year (NAPM Research Symposium 1999).

A 1998 article by McKeefry featured interviews with Brian Sweeny, director of human resources for worldwide procurement at Dell Computer Corporation and Mary Horton, a recruiter at the Procurement Services Association, to find out the skills that employers seek when they are filling entry-level purchasing positions.

"Recruiters look for understanding of the industry, the corporate business model, finance, and engineering, in addition to traditional procurement skills," Sweeny said. "Purchasers need the ability to look at our suppliers' suppliers, hubbing arrangements, and the global flowchart of how commodities move to be able to identify opportunities for more vertical integration within manufacturing." In McKeefry's article, Horton emphasized technical skills, such as the ability to create spreadsheets, knowledge of word-processing on the personal computer, and familiarity with the Internet as a sourcing vehicle.

When interviewing candidates with MBAs or master's degrees for purchasing positions, Rhonda Thomas, visiting professor at Loyola College, indicated that she looks for credentials, social skills, adaptability/flexibility, creative thinking, and technical skills.

Ferguson Enterprises Inc., like many companies today, provides a Web page for job seekers. The Web site details potential career paths as well as the desired attributes of an entry-level purchasing professional, such as interpersonal skills, an analytical mind-set, organizational skills, and negotiation skills. In addition, the ability to think in terms of long-term goals and a strong work ethic were identified in the company's formula for success.

A 1999 *Electronic Buyers' News* article that profiled Patrick Ferrara, a senior buyer at Hughes Network System, noted that in the past individuals without a degree or who transferred from other disciplines were hired into purchasing. In contrast, this article characterizes Ferrara as representing the new breed of supply-chain management professionals. He became a buyer directly out of college, was prepared with a specialized degree in business logistics, and had practical experience from two supply-chain management internships. Ferrara said that the ability to work on cross-functional teams has become increasingly important, because purchasers now assist engineers in choosing parts that will be cost effective and have a continued source of supply.

Experienced Purchaser Skills

The attempt to ascertain the skills required of the purchasing professional is not a recent phenomenon. A 1987 study conducted by Cavinato revealed the seven technical skills that top managers wanted to see improved within their companies' purchasing departments. The skills were identified as knowledge of materials; production systems and technologies; materials management, inventory systems and JIT; quality systems and options; contract manufacturing relationships; computers, management information systems, and automated purchasing systems; and costing. Top managers also expressed the need for purchasing professionals to possess strong communication skills (Cavinato 1987).

Kolchin and Giunipero (1993) examined the skills and knowledge that purchasers need to perform effectively in the 21st century. A sample of 131 purchasing executives from large U.S. companies was utilized for the study. The skills required by purchasers in the next decade can be categorized into three areas: enterprise (that is, having a good understanding of the overall business), interpersonal, and technical. The following 10 skills were rated as the most important for the year 2000:

1. Interpersonal communication
2. Customer focus

3. Ability to make decisions
4. Negotiations
5. Analytical
6. Managing change
7. Conflict resolution
8. Problem solving
9. Influencing and persuasion
10. Computer literacy

The study suggests that purchasing professionals in the year 2000 must be technically and interpersonally competent and have a good grasp of the total enterprise.

Kolchin and Giunipero (1993) also examined the changes in the purchasing function and the knowledge base required of purchasing professionals. The authors posited that a changing function that requires a different skill set suggests a change in the common body of knowledge on which these skills were developed. To test this premise, the same sample of purchasing executives was asked what knowledge areas would be most important to purchasing professionals in the next decade.

Respondents rated the following as the 10 most important knowledge areas:

1. Total quality management
2. Cost of poor quality
3. Supplier relations
4. Analysis of suppliers
5. Lowest total cost
6. Price/cost analysis
7. Source development
8. Quality assurance
9. Supply chain management
10. Competitive market analysis

Many purchasing professionals recognize that the changing nature of their jobs necessitates a change in their acquired skill sets. In a 1995 article by Murphy, Bob Zimmerman of Metcom Inc., said, "My job started as a purchasing one. Later, I built in management and analytical functions and began to utilize skills for researching, evaluating production and sources, and recommending suppliers."

In their 1995 text, Killen and Kamauff cite the necessary characteristics of a good buyer and of a good purchasing

manager. They group the characteristics of a good buyer into four general areas: product knowledge; principles of purchasing and management; personal attributes; and interpersonal skills. The first category, product knowledge, implies an in-depth technical understanding of the items as well as of suppliers and markets. The second category deals with specific purchasing knowledge that would be found in a purchasing text or in the *C.P.M. Study Review Guide*. The third area, personal attributes, includes the buyer's initiative and integrity. The last category involves interpersonal skills, which are expected to be more important in the future. The authors felt that these characteristics apply to all nonmanagerial buying positions. In their view, the key differentiators within nonmanagerial positions are education, job responsibility, and experience. (See Table 4.2.)

Killen and Kamauff also identified characteristics required for a purchasing manager. These include technical knowledge, analytical ability, interpersonal skills, and managerial skills. In their view, the purchasing manager must possess all the qualities of a good buyer plus those of a good manager. From a managerial perspective, technical knowledge implies product expertise, an understanding of the purchasing function, as well as a basic understanding about the purchasing department, and its operations, processes, and customers. Analytical ability involves identifying and solving problems; making decisions; and thinking in abstract terms. Interpersonal skills are similar to those of a good buyer, but they are deeper because of the need to handle conflict, organizational/departmental politics, and coordination with other departments. Managerial skills include motivating, evaluating, planning, and so on. (See Table 4.3.)

Common skill sets among several disciplines are the topic of a 1996 article by Pye. The results of an informal survey of professional associations identified common skill requirements among sales, marketing, engineering, human resources, and quality. The common skills were technological literacy, the ability to manage change, interpersonal skills, a customer-satisfaction focus, problem solving, and the ability to work in teams. The article suggested that it is important to know what skills are required in other professions because of today's business climate. The author notes that today's business climate involves cross-functional work, fewer people to perform more tasks, and changes in many employees' career direction.

Several executives in sales, marketing, quality, engineering, and human resources were asked to name what they felt were the most important skills in their field. The skill sets included relationship-marketing skills, technological skills, motivational skills, process planning and improvement, and leadership skills. The author posed the following question to purchasing professionals, "How does all this skill set information relate to the real-world job market

TABLE 4.2
CHARACTERISTICS OF A BUYER

PRODUCT KNOWLEDGE	PRINCIPLES OF PURCHASING & MANAGEMENT	PERSONAL ATTRIBUTES	INTERPERSONAL SKILLS
<ul style="list-style-type: none"> • Knows major facets of products or materials • Knows the market price and so on. • Knows major sources • Is familiar with quality requirements and problems • Understands external customer requirements and their impact on internal customers and suppliers 	<ul style="list-style-type: none"> • Knows purchasing's role in the organization • Understands quality theory and its application • Understands pricing theory, policies, and practices • Is a good negotiator • Has a workable knowledge of inventory control and management • Understands and can apply right time concept • Is able to successfully carry out value analysis projects • Knows purchasing role in capital equipment buying • Is able to apply make-or-buy theory • Is able to apply supply chain management concepts • Knows marketing, accounting, MIS, operations, organizational behavior and financial management theory and practice 	<ul style="list-style-type: none"> • Has integrity • Pays attention to details • Likes to do research • Is a careful and deliberate decision-maker • Is able to tolerate conflicts and ambiguity • Takes appropriate risks • Has high self-esteem • Takes initiative 	<ul style="list-style-type: none"> • Can work well in teams • Has good communication skills • - good listener • - persuasive speaker • - good report and letter writer • Is willing and able to deal effectively with people who hold opposing views

Source: Killen, K. and Kamauff, J.: *Managing Purchasing*: Irwin Publishing, 1995, p. 151.

TABLE 4.3 - CHARACTERISTICS OF A PURCHASING MANAGER

TECHNICAL KNOWLEDGE	ANALYTICAL ABILITY	INTERPERSONAL SKILLS	MANAGERIAL SKILLS
<ul style="list-style-type: none"> • Has product knowledge – has a good understanding but is not necessarily an expert in every product bought by the department • Has mastered the principles of purchasing • Is knowledgeable about the organization's business • Stays ahead of current trends, such as ISO 9000, TQM, and supply chain management • Knows the theory and practice of marketing, finance, operations, accounting, MIS, and organizational behavior • Is familiar with the needs of external customers and their impact on internal customers and suppliers. 	<ul style="list-style-type: none"> • Is able to identify problems • Is able to solve problems and not get caught up in the symptoms • Is a good and fast decision-maker • Is able to think in the abstract • Is able to analyze various strategic options and their direct potential and indirect impact on the organization 	<ul style="list-style-type: none"> • Works well with department members, other departments, and suppliers • Is able to reach workable compromises • Can handle conflict • Is adept at organizational politics • Is able to maintain a positive mental attitude • Coordinates purchasing departments role with that of the organization 	<ul style="list-style-type: none"> • Knows how to plan materials, budgets, work, and so on • Knows how to organize the department's work and people • Is a good leader • Communicates well and is able to articulate the department's needs to top management and the rest of the organization • Is able to establish a work environment that enhances department members' motivation • Controls well – is able to monitor and adjust department activities to meet plans • Can develop purchasing objectives and strategies that are congruent with organizational goals and strategies • Is able to participate in new product/service development, organizational growth, and strategy formulation

Source: Killen, K. & Kamauff, J., *Managing Purchasing*: Irwin Publishing, 1995, p.153.

today and in the future?” Paul Leland, vice president of McInturff and Associates, an employment service, said, “Purchasers are responsible for a larger scale; they need to have more technical knowledge. You can’t just throw things over the wall to engineering. You need to be as technically astute as possible. . . . Aside from technological savvy, other skills important to employers include supplier-management skills, financial aptitude, analytical skills, and an understanding of how an entire corporation operates.”

A 1996 poll by Cruz and Murphy of purchasing’s advisory board indicated that the three most desirable skills in a purchasing professional are supply chain management, technological competency, and effective communication. According to the authors, the successful purchasing professional must keep abreast of relevant procurement concepts. A purchaser who does not know the latest computer programs and communication tools may have difficulty finding another position (Cruz and Murphy 1996). The article indicates that educational programs provide opportunities for even advanced purchasing professionals to learn new methods for global sourcing and communication.

In order to transform the purchasing and supply functions into strategic, profit-generating centers, Bordon (1998) found that increasing numbers of firms are implementing commodity segmentation. Commodity segmentation involves the creation of commodity-focused, strategic sourcing teams. The teams are often cross-functional, and they may include a mix of experienced employees and new hires brought in with specific commodity experience. The article identified six skills that facilitate the implementation of commodity segmentation: strategic-thinking skills, research skills (including use of the Internet), analytical skills, financial skills, computer skills, and team-building.

A 1998 National Association of Purchasing Management *Info Edge* article by O’Shea discussed how the purchasing function is changing into a strategic role within firms. Corresponding changes in the skill set will be required of purchasing professionals. The author related the 18 major issues found in the 1998 CAPS report, *The Future of Purchasing and Supply: A Five- and Ten-Year Forecast*.

Logistics Skills

A set of logistics skills and knowledge has traditionally been separated from purchasing but will become more integrated as supply chain management gains increasing acceptance. Aron’s 1997 article examined university education from a logistics viewpoint. The author noted that—with the exception of universities such as Michigan State, Ohio State, Penn State, and Tennessee, which are well known for their distribution/logistics programs—most universities offered only a few old-fashioned

transportation and distribution courses for business students. Aron indicated that once the concept of total supply chain management became prevalent in academia, the industry recognized the need for people with more than simple competence in purchasing, transportation, or distribution tasks. The changing requirements of the purchasing function caused companies to seek personnel with skills to manage the complex supply chain.

Aron’s logistics-based article included interviews with Lee Swerline of Caliber Logistics, Walter Weart of the University of Northern Colorado, and Pete Datos of Lever Brothers to find the skill sets and attitudes they look for in new hires. “Formal education and industry experience is a vital combination,” Swerline said. He indicated that his firm values strong analytical skills and the ability to systematically approach problems and deliver the best solutions. Computer literacy and interpersonal skills, such as commitment, the ability to plan, organize, lead, and communicate, were also identified as skills sought in new hires.

According to Professor Weart, the next major initiative that logistics will drive is the acceleration of the cash-to-cash cycle, which is essentially a company’s internal cash flow (Aron 1997). Given this anticipated change, Weart suggested that competency in finance is a vital skill. When considering candidates for entry-level supply chain management positions, Pete Datos said Lever Brothers “is not necessarily looking for logistics knowledge, but basic competencies in teamwork, cross-process thinking, and the ability to understand trade-offs across the entire supply chain.”

A strong demand for candidates who understand finance has emerged from the new total-cost world of supply chain management (Inbound Logistics 1998). “If I were hiring someone today, I’d lean toward a logistician with great finance experience or a finance person with logistics experience,” said Joel Borovay, senior vice president of Insight Enterprises. When asked what drives a successful business, Borovay said, “It’s not what you can do on the sales side. I can always find salespeople. The buy side is where you make or break your business. What’s critical is understanding inventory needs and how to drive costs out of production.”

Jerry Fust, assistant director of placement at Michigan State University agreed: “With the trend in industry to drive costs out, there are lots of companies with aggressive programs to do this, and there is a huge market for these skills.”

O’Shea (1998) emphasized the need for purchasing professionals to inventory their current skills and determine what additional skills and capabilities they need to be successful in their new roles. O’Shea asserted that the skills required of the purchasing professional depend on

the industry in which he/she works, the general direction of the organization, and individual's future career plans.

A set of general skills make the purchasing professional more marketable and valuable. The three major skill areas identified were relationship-building skills, job-related skills, and success skills. Relationship-building skills included communication/interpersonal skills, writing skills, and facilitation.

Communication skills were viewed as making the difference between success and failure. The important dimensions of communication skills were identified as personal rapport, nonverbal communication, listening skills, and avoiding jargon. Personal rapport is vital to the ability to negotiate, persuade, supervise, and lead. Nonverbal communication can be sent or received. Co-workers notice who is paying attention to what they are saying by watching others' actions, for example, someone giving them full attention or someone looking at a report. Listening skills are actively listening to suppliers, co-workers, supervisors and subordinates. Avoiding jargon means being clear in communication and receiving clear feedback.

Writing skills are necessary in purchasing for a number of reasons, such as communication, management of contracts, and requests for quotes. Facilitation skills involve leading groups of people in meetings in a team environment.

Job-related skills are comprised of technical knowledge, project management, and risk management/risk assessment. Job-related skills were identified as those used daily in the job. The importance of computer skills in this era is evident. Once the purchasing professional has learned the software system, the next step is to become certified in this area. Project management is facilitated through the use of various charts such as PERT and Gantt. Risk management is the process of identifying and managing risk through alternate strategies.

Finally, success skills consist of leadership skills, strategic thinking, change management, and entrepreneurial skills. Leadership skills involve the ability to motivate, inspire, and direct either a team or group of subordinates. Strategic thinking is a complex set of skills, but two important areas are the ability to think about the long term and visualize an overall picture from many details. Change management is necessary in a world where technology, markets, and products change rapidly. Lastly, entrepreneurial skills generate a spirit of identifying customers and then satisfying their needs.

Anderson and Katz (1998) examined the role of strategic sourcing and its contribution to the maximization of the firm's value growth. The authors asserted that strategic sourcing can be taken to new levels and applied to the business designs that will shape corporate revenue realiza-

tion as well as competitive cost position. The article pointed out that a number of firms that employed cross-functional teams, along with selective upgrading of skills, have been able to exploit their strategic sourcing opportunities within a two- to three-year time frame. Anderson and Katz divided sourcing skills into four broad categories: technical skills, business development and management expertise, marketing, and sourcing specialist. Marketing knowledge skills included relationship-building, close linkages between the marketing and sales functions, and quick response capability. The business development and management expertise category included a broad business perspective, creative contract writing, and project management. Technical product/service knowledge, cost analysis and problem-solving, and integrated supply chain management were included in the technical skills category. Finally, sourcing specialist skills included facilitation and team building, sourcing strategy development, supply evaluation process management, negotiating and contracting, and business case analysis.

Skills Required of Purchasing Executives

The great majority of the literature addressed skills of nonmanagers in purchasing. Discussions about higher-level skills for purchasers in positions such as chief purchasing officer, vice president of procurement, and so on were not found. Because higher-level purchasing positions are primarily at the executive level, a review of the literature for general executive skills was undertaken. It was assumed that such skills are transferable regardless of function.

The discussion in the 1984 article by Frommelt, which concerned the health-care industry, paralleled the overall premise of the present study. Frommelt noted that health-care chief financial officers (CFOs) have assumed a new role due to changes in the health-care industry, such as the demise of cost-based reimbursement. This new role demanded new skills in working and communicating with others to achieve institutional and financial goals (Frommelt 1984). The article emphasized the importance of interpersonal skills on the part of CFOs. Specifically, the author indicated that, in order to fully use the financial information and technical skills for the benefit of the institution, the CFO must possess effective communication and listening skills.

Callen (1993) indicated that, given the narrowing competitive advantage of the U.S. in some areas and the disappearing advantage in others, the fundamental skills necessary for CEOs should be re-examined. Callen cites a 1992 study that surveyed 900 executives to define the skills necessary for upper-level management. The skills that were rated as most important were the abilities to do the following: communicate, think logically, apply ideas and theories, work as a member of a team, and manage time effectively.

A 1995 article by Gunzburg points out that there is no standard skill set for successful chief executives. Depending on the situation, executives call on various skills. The author asserted that, although there is no standard set of skills required by chief executives, the fundamental duties of the CEO include understanding and interpreting the external environment, which requires the application of a set of key skills. These skills were identified as: information gathering, the ability to communicate in a meaningful and motivating manner, and the capacity to be open to learning on a continuous basis.

In an attempt to ascertain what types of CEO skills will be associated with changing technologies in the future, Perey (1996) asked experts in business and academia what they believed would be required of CEOs in the year 2020. Waring Partridge of AT&T said, "While CEOs will not be expected to stay abreast of technology details, they will need to know intuitively what the company needs to know technically." Tom Malone, co-director of the Sloan School of Management, Massachusetts Institute of Technology, said, "CEOs will need to be sensitive to changing circumstances and to be generally skilled, not technology-centric." Finally, Jeff Papows, of Lotus Development Corporation, said "As specialization blurs and technology becomes more ubiquitous, executives all the way up to the CEO will experience technology, and they will not be as reliant as now on technology specialists. The CEO will be forced to take center stage."

The skills required of the CEO in the new millennium were also discussed in a 1997 article that was published in *Chief Executive*. The article focused on one of the skills necessary of CEOs in an increasingly global business environment—namely managing cultural aspects of business. Jeanette Wagner, President of Estée Lauder International Inc. – New York, said, "I don't think most people really understand what global really is. It's not taking your culture and transplanting it someplace else." Brenda Lauderback, Group President of Wholesale/Retail at Nine West Group, Inc. based in Stamford, Connecticut, said, "I believe we are going to have to understand cultures in much more depth. We wrestle with how you put the formula together so people can use that knowledge from country to country. The formulas are very different in each culture and country." Finally, Edward Kangas, Chairman and CEO of Deloitte Touch Tohmatsu International, said, "The ability to manage an intertwined entity with global consistency is an absolutely overwhelming task for the CEO."

Bowers pointed to the continuing wave of mergers and acquisitions in the insurance industry as the reason for the shrinking market for jobs at the highest corporate levels. In addition, she noted that firms have greater expectations for those looking to fill the top positions. Recruiters said that, although it is still advantageous for candidates to rise

through the ranks, today's boards highly value a chief executive with a big-picture view (Bowers 1998).

"Companies are looking well beyond technical competence to executives who have a strong understanding of the bottom line, who respond and react to change, and who exercise sound business judgement," said Margaret Resce Milkint, executive vice president of J.J. & H., Ltd.

Winkleman discussed the changing role of the CEO in a 1998 article. The author indicated that the CEO's job is not as tightly and narrowly defined as in the past. The role of the CEO is multifaceted; he/she has to "wear a number of hats." The author points out that CEOs have major responsibilities in the following areas, each of which require special skills: technology, finance, human resources, governance, marketing, investor relations, logistics, and real estate.

Research Methodology and Participating Organizations

A two-step methodology was used to identify the firm sample in this research. First, a list was developed of firms that had won *Purchasing* magazine's Medal of Excellence Award plus those that were perceived as progressive via CAPS membership and other instances of public recognition. Second, a list of firms thought to be leaders was sent to 50 purchasing managers. The managers were asked to rank their perceptions. Firms were also ranked independently by the author and the CAPS director. The convergence of these two rankings resulted in the final list of firms. These organizations were then contacted to assess their willingness to participate in the research and the extent of their activities in developing programs to assess buyer skills. All participants were offered confidentiality and assured that they would not be identified unless they chose to do so. The final sample consisted of six firms that were designated as Medal of Excellence winners in *Purchasing* magazine and 24 others that had demonstrated skills evaluation capabilities in place. In addition, 96 participants provided survey information through executive programs or CAPS Executive Purchasing Roundtable discussions. The sample is biased toward large firms and is thought to reflect organizations that are active in skill development activities to attain world class status.

The following firms participated in this research by describing their efforts to attain world class purchaser status. In addition to participating firms, survey data was collected from CAPS roundtable participants, Arizona State University, and Florida State University Executive Program participants.

Covance Inc.
Cummings Engine Corp.
DaimlerChrysler Inc.
Deere & Company
Dupont Corp.
Eastman Kodak Corp.
Ericsson
Exxon Inc.
Federal Signal Corp.
Florida Power & Light Co.
Georgia-Pacific Corp.

Motorola Inc.
Praxair Corp.
People's Gas Corp.
Qualcomm Inc.
Scholle Industries
Seimens Inc.
Stanadyne Corp.
Varian Corp.
Virginia Power Corp.
Whirlpool Corp.
Xerox Inc.

Participating Firms

AlliedSignal Inc.	IBM Corp.
Bose Corp.	Kimberly-Clark Corp.
Case Equipment Corp.	Koch Industries
Cinergy Inc.	Lucent Technologies

Approaches to Developing the World Class Purchaser Skill Matrix

This section presents the various approaches to skill development. This section starts with the basic P/SM job descriptions and then moves to a general skill matrix by position, a weighted matrix approach, in-depth skill evaluations, and the two-track evaluation method (see Table 6.1.)

Several caveats apply in analyzing these cases because a wide variety of tools are used. First, those using the job description as a skill set tool had some advanced purchasing practices in place. Second, no attempt was made to correlate the formalization of the skill matrix to the effectiveness of the purchasing function. Third, the use of these various skill-building tools to develop metrics that drive improvement and increase skill levels is the key regardless of the method used. However, the better-defined skill sets coupled with the measurement of critical dimensions and plans to raise existing skill levels should produce best results within a framework that is supported by management.

Job Descriptions and Skill Sets

Some of the firms interviewed use job descriptions as the basis for assessing their skill sets. Such an approach is less formal, but it does not preclude the use of advanced purchasing techniques. Table 6.2 shows a comparison of two firms' skill sets, as taken from their job descriptions. Both firms relied on job descriptions as a basis for skill development. Firm #1 is a high-technology instrumentation maker, and Firm #2 is a manufacturer of transportation equipment (not automobiles). Both firms had detailed job descriptions. However, neither firm used a formal skill set to assess and develop purchasers. The job performance appraisal was used as a means to evaluate buyers' progress. At Firm #2 performance appraisal was based on the following dimensions: interpersonal dealings; persistence in meeting goals; team skills; goals attained; and verbal and written skills.

Regarding education, Table 6.2 shows that Firm #1 required an engineering degree for its senior buyers and electronic commodity specialists. The importance of understanding technical job aspects, such as MRP, ERP systems, and value analysis, was also stressed in Firm #1's job descriptions. As a whole, the purchasing function worked hard to develop close relations with its suppliers. However, a new manager with no previous purchasing experience changed this philosophy. Attaining the bottom-line lowest price became the focus.

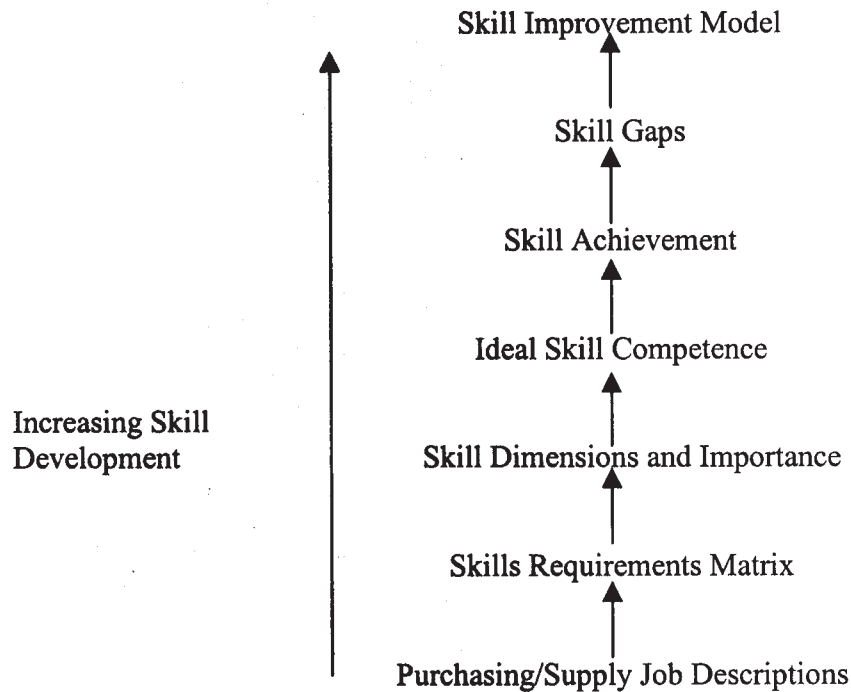
At Firm #2, the starting position of junior buyer required an associate's degree. The competition in the area for buyers was extensive. The purchasing manager stated that the junior buyer's entry-level salary was less than individuals could get with a bachelor's degree. The firm's philosophy was to start people at the junior buyer level and move them up. A bachelor's degree was optional for promotion to buyer status; a junior buyer could also qualify for a promotion by passing two of the four modules on the C.P.M. exam. This major equipment manufacturer faced competitive conditions that dictated high inventory turnover and cost reductions based on lowest total cost. Higher-level purchasers, including senior buyers and purchasing managers, were focused on lowest total cost and value analysis to constantly achieve cost/value improvements.

Firm #2 had implemented some leading practices in their organization:

- All purchasers were required to attend a 40-hour buyer training course.
- C.P.M. certification or progress toward it was a requirement for promotion.
- Two levels of purchasing existed— transactional buyers who handled day-to-day activities and senior buyers who performed the long-term tasks of contract management, negotiations, and value analysis.

TABLE 6.1

WORLD CLASS SKILL BUILDING BLOCKS



- Sourcing teams were used extensively.
- Top management viewed purchasing as a cost-reduction contributor.
- Purchasing worked closely with suppliers.
- Twenty-five to 30 suppliers were regularly on site working with purchasing and operations.
- Vendor Managed Inventory System and Kanbans were used with major suppliers.
- A newsletter was initiated and sent to other corporate business units.
- Strategic business unit planning of commodity and material purchases was done annually with an emphasis on leveraging through coordination with other SBUs. Purchase planning was part of the goals and strategies developed by the entire SBU.
- Long-term agreements were in place with key suppliers for three-, five-, or 10-year durations.

Efforts were made to reduce supplier costs through process improvements and sharing savings with suppliers.

Despite these significant efforts, the firm realizes it can upgrade the skills of its people and the organization's effectiveness by overcoming several shortcomings:

- Leverage needs to be improved through coordinated buying with other business units, because a separate purchasing function does not exist at the corporate level.
- Communication needs to be improved between purchasing locations for enterprise-wide activities.
- Better training for higher-level purchasers needs to be developed and coordinated.
- There are no training goals in the organization beyond entry-level and buyer positions.
- Strategic plans should be viewed from a customer driven lowest total cost approach versus a cost reduction emphasis.

TABLE 6.2

SKILLS FROM JOB DESCRIPTIONS

									Firm #2 Equipment Manufacturer			
	Firm #1 High Tech											
SKILLS	Buyer/Planner	Senior Buyer	Senior Buyer/Planner	Tech. Comdty. Spec.	Elect. Comdty. Spec.	Sup. Quality Engineer	Contracts Manager	Junior Buyer	Buyer	Senior Buyer	Purchasing Manager	
Value Analysis/Engineer				X	X	X					X	
Project/Program Manager				X	X		X				X	
Outsourcing				X		X						
MRP ERP Floor Shop Control	X		X						X	X		
Technical/Machine Principles		X		X	X					X		
Negotiations	X	X	X				X				X	
Supply Chain Management		X										
Supplier Assessment						X					X	
Supplier Development						X			X			
Contract Management							X					
VMI Programs Kanban			X						X	X		
Cycle Time Analysis			X									
Commodity Knowledge					X							
Expediting								X				
Cost Reduction								X	X			
Computer/Software								X	X			
Analytical Math								X	X			
Business Practices								X				
Total Cost Analysis								X		X	X	
Supplier Performance Evaluations								X		X	X	
Supplier Certification										X	X	
Relationship Management										X	X	
Interpersonal								X	X	X	X	
Team Facilitation									X	X	X	
Goal Setting									X	X	X	
Education:												
B.S. Business	X		X	X		X						
B.S. Engineering		X			X							
M.B.A.			X	X								
J.D. Law							X					
A.A.									X	X	X	

Job Descriptions Via the Intranet

A large electronics conglomerate used an employee profile skill description and listed this information on their intranet. Each business unit purchasing manager at each location has access to his or her employees' skill profiles—the employee name, department number, job title, profile description, and profile tasks. Skill levels run from 1, which indicates the individual is in training, to 4, which indicates the individual can train others. The comment section lists the training the individual has completed. When job openings occur, managers can search the intranet for candidates at other business locations who might fit their desired skills profile. (See Table 6.3.)

list the skills required by individuals in these positions. Tables 6.4 through 6.7 show a comparison of skills across the three to five firms who used these matrices. Three of these firms listed the skills, and one had a fully developed matrix. The other matrices were developed by reading job descriptions or listing skills by position. As employees moved from junior buyer to buyer, skills at the lower-level job were carried to the next level, but there was an increase in skill sophistication and in the number of skills required. For example, analysis by position indicates that expediting and computer literacy were required by all firms for the junior buyer. (See Table 6.4.)

Skill Matrix

Several firms have identified the skills required of each P/SM professional by position level. These skill matrices

Buyer Matrix

At the buyer level written/oral communication skills, computer skills, and negotiation were required by four out of five firms. Negotiation, financial analysis, and problem solving were required by at least three of the firms.

TABLE 6.3
EMPLOYEE PROFILE SKILL DESCRIPTION

Employee Last Name:	Smart
Employee First Name:	Linda
Department Number:	107
Job Title:	Buyer/Planner
Profile Name:	Buyer/Planner
Skill Level:	1 – In Training
Profile Description:	Planning MRP, scheduling, and procuring material and services to meet company plan.
Profile Tasks:	Implements financial objectives; progressive role within commodity team; working knowledge of components; proficient at PC/MRP database systems; any additional task required by departmental management.
Comments:	Has passed MRP module of APICS exam and Module 1 of C.P.M. exam. Completed inventory management course.

TABLE 6.4
SKILL MATRIX - JUNIOR BUYER

COMPANY	A	B	C	D
Expediting	X	X	X	X
Cost Reduction	X			
Computer Software or Literacy	X	X	X	X
Analytic	X	X		
Math	X		X	
Total Cost Analysis	X			
Buying Basics		X	X	
Policies Procedures Processes – Basics		X		
Priority Setting		X		
Problem Solving-Limited Complexity		X	X	
Good Written and Oral Communication		X	X	
Basic Teaming		X		
Continues Professional Development		X		
Team Participation		X	X	
Team Contribution		X		
Initiative		X		
Drive		X		
Ethics		X	X	
Procurement Process – Identification				X
Understanding of How to Buy				X
Purchase Order Preparation and Distribution				X
Understands/Creates Buying Agreements				X
Negotiation Skills				X
Distribution/Transportation				X
Sourcing Terminology				X
Sourcing Quality Systems and Quality Improvement Processes				X
Understanding of Strategic Issues			X	
Communication Skills			X	
Time Management and Priority			X	
Influencing			X	
Resolving Conflict			X	

For employees moving to senior buyer positions, again written and oral communications, negotiations, procurement processes, contracts, and legal skills were mentioned. In addition, presentation skills, technical knowledge, and MRP/ERP system knowledge were important. (See Table 6.5.)

Purchasing Manager Matrix

The purchasing manager list was more mixed. All five of the firms expected the individual to possess the general nonmanagerial skills. Two of the firms listed every one of these skills plus other managerial issues; the other three listed managerial items and some of the key purchasing skills.

TABLE 6.5
SKILL MATRIX - BUYER

COMPANY		A	B	C	D	E
Change Management	I				X	
Creativity	I				X	
Delegation and Accountability	I				X	
Flexibility	I			X		
Integrity	I			X		
Initiative	I			X	X	
Negotiation	I		X	X	X	X
Personal Sensitivity	I			X		
Problem Solving	I		X		X	X
Team and Facilitation Skills	I				X	
Team Player	I				X	
Thoroughness	I			X		
Written/Oral Communication Skills	I		X	X	X	X
Business Analysis and Practices	J			X		X
Commitment to Schedule	J		X			
Company Business Strategy	J				X	
Contract Writing and Administration	J		X		X	
Cost Reduction	J	X				
Customer Focus	J				X	
Ethics	J		X			X
Evaluation of Supplier Performance	J				X	
Expediting	J		X			
Information Processing	J				X	
Knowledge of Procurement Process	J		X			
Legal	J				X	X
Minority/Women/Diversity	J		X			
Organization	J			X		
Planning	J			X		
Strategy Formulation and Execution	J				X	
Supplier Development	J	X				
Time and Priority Management	J				X	X
Analytic Math/Algebra	T	X		X		
Computer Software/Keyboard	T	X	X	X		X
Continuous Improvement Skills	T					
Decision Making	T			X	X	
Economics/Industry Analysis	T			X	X	
Finance/Financial Analysis/Accounting	T			X	X	X
International Buying	T					X
Project Management	T				X	
Root Cause Analysis Skills	T		X			
Statistics	T			X		X
Supplier Technology Management	T				X	
Technical Business Reading	T			X		
Total Cost Analysis	T				X	X
Total Quality Practices/ISO 9000	T				X	X

I = Interpersonal

J = Job Related

T = Technical

TABLE 6.6
SKILL MATRIX - SENIOR BUYER

COMPANY	A	B	C
MRP/ERP Shop Floor Control	X	X	
Technical	X		X
VMI Programs/Kanbar	X		X
Total Cost Analysis	X		
Performance Evaluations	X		
Supplier Certification	X		
Relationship Management	X		
Written and Oral Communication Skills		X	X
Knowledge of Contracts/Legal		X	X
Presentation Skills		X	X
Socioeconomic Requirements		X	
Drawings and Specifications		X	
Negotiation Skills		X	X
Procurement Processes		X	X
Basics of Cost/Price		X	
Basics of Performance Measurement Management System		X	
Performance Measurement Management System		X	
Problem Solving			X
Supply Chain Management		X	
Math/Algebra			X
Computer/Keyboard/Spreadsheets			X
Economics Finance Statistics Accounting			X
Technical Business Reading			X
Total Quality Management			X
Purchasing Process Knowledge			X
Service Buys/Built to Drawing			X
Transportation			X
Manufacturing Process Knowledge			X
Initiative Integrity			X
Personal Sensitivity			X
Thoroughness			X
Analysis			X
Decision Making			X
Flexibility			X
Organization			X
Planning			X
Controlling			X
Decisiveness			X
Motivation			X
Tenacity			X
Creativity			X
HR Development			X
Organizational Sensitivity			X

Managerial issues included career planning, human resource development, and organizational sensitivity. In the area of ethics, the manager was expected to serve as a model for others in the department. Education required for most skill matrices analyzed was an associate's, bachelor's, and even a master's degree at higher levels. As one moved up, experience or continual training could serve as a substitute for the advanced degree. However, where two candidates were fairly equal with regard to experience and updated skills, the advanced degree could be the decider.

While skill matrices are useful in determining the specific skill sets a person in P/SM needs, they don't measure skill level attainment. However, the matrices represent an improvement over the job description and provide a general framework of skills by position. Companies indicate significant variation in detail about the skills required for purchasing managers. (See Table 6.7.)

Chief Purchasing Officer Matrix

The chief purchasing officer (CPO) as reported by these firms varied greatly. It was apparent that a bachelor's degree was necessary for these positions, and a master's degree was preferred. One important criterion was significant experience in the purchasing/logistics area. Other required skills were dealing with ambiguity, global awareness, managing with vision and purpose, creativity, managing others, and managing diversity.

Developing a Skills Assessment Matrix

Once the specific skill sets are identified, decisions concerning skill competency and weighting by job position can be established. One example of such an approach is illustrated in Table 6.8 and explained in the following discussion. One firm that had recently developed its competency model defined the skill sets required in the goals and objectives section of its assessment matrix. The matrix stated the following:

- Define the skills needed today and in the future to support global strategy
- Continuously develop the needed competencies in employees so they continue to succeed
- Provide employees with the framework and processes for career development.

In this case, the identified skill sets were grouped into six major categories: sourcing, asset management, contracts/legal, interpersonal, quantitative, and computer

skills. Next, the job descriptions for each position are analyzed and, if necessary, updated. Often job descriptions left in the human resources department are looked at only during the hiring process, and they may be outdated. Human resources should review the updates to make sure that all diversity and legal issues are properly covered. For purchasing the primary question to be answered is, "Does the skill set match the job description?"

Once skills and categories are agreed on, the ideal skill competency for each position should be determined and documented. As is shown in Table 6.8, the mastery of a particular skill can range from 1 (very little understanding) to 5 (excellent understanding). This document can be used by the managers and subordinates in one-on-one assessments to determine current skill levels. Comparing this assessment to an ideal competency will reveal the gaps. The gaps can be prioritized and skills training tailored to the individual to improve needed skills. Various approaches to training can be used, including self-training tapes, videos, CD-ROMS, distance learning courses, and more traditional classroom seminars. This assessment allows for a review of company-wide purchasing efforts, which involve various business units.

A large producer of consumer products uses this competency model to gain agreement on areas of strength and those requiring improvement and development. This skill weighting is illustrated in Table 6.8. Prior to the annual review, the employee is asked to assess his/her skill level on 30 supply base management skills. Independently, the manager rates the skill competencies of the individual. Examples include problem solving, project management, team facilitation skills, total cost analysis, and so on. The skill levels are described in detail. For example, the problem solving dimension is described as:

"Solves problems based on prompt and accurate information analysis and development of alternatives. Handles complex analysis well. Demonstrates ability to utilize process flowcharts, create and implement alternative courses of action, and logically draws conclusions."

The rating of this skill is broken into four competency categories:

- 1 - Not applicable or no chance to demonstrate
- 2 - Seldom demonstrates
- 3 - Usually demonstrates
- 4 - Always demonstrates

The supervisor and purchaser then meet to discuss their ratings. During this discussion, the supervisor asks the employee to recall situations where the skill was applied and what the results were.

TABLE 6.7 SKILL MATRIX - PURCHASING MANAGER

COMPANY	A	B	C	D	E
Algebra/Math	X				
Computer/Keyboard/Spreadsheet	X				X
Economics	X				
Financial Analysis	X				X
Statistics	X				
Accounting	X				
Technical Business Reading	X				
Quality Management Processes	X				
Policies and Procedures	X				
Purchasing Computer Systems	X				
Process Knowledge	X				
Commodity/Vendor Manufacturing	X				
Contract Law/Uniform Commercial Code	X				X
Negotiation Skills	X				X
General Corporate Policies	X				
MRO/OEM Buying	X				
Software/Services	X				X
Presentation Skills	X				
Problem Solving	X				
Transport/Shipping/Logistics	X				X
Inter-Functions Relations	X				X
Manufacturing Process Knowledge	X				
Knowledge of Company Products	X				
Initiative	X				
Integrity	X				
Oral Communications	X				
Career Planning	X				X
Thoroughness	X				
Analysis	X				
Decision Making	X				
Flexible	X				
Organized	X				
Planning	X				
Oral/Written Communication	X	X			
Controlling	X				
Decisive	X				
Motivation	X				
Technical	X				
Tenacity	X				
Creativity	X				
Human Resource Development	X				
Organizational Sensitivity/Diversity	X				X
Ethics – Models Behavior		X			X
Management/Interpersonal/People		X			X
Leadership		X			
Business Knowledge		X			
International Sourcing		X			X
Sets and Implements Goals		X			
Drives Continuous Improvement		X			
Leads Cross-Functional Teams		X			X
Matrix Management Ability		X			
Merit Planning and Meeting		X			
Value Analysis/Value Engineering			X		
Project Management			X		
Supplier Assessment			X		X
Total Cost Analysis				X	X
Performance Evaluation				X	
Supplier Certification				X	
TQM/ISO 9000					X
Market Analysis					X
Benchmarking					X
Cycle Time Analysis					X
Leasing vs. Buy					X
Investment Recovery					X

Table 6.8 – WEIGHTED SKILLS MATRIX
BY POSITION

	Category	Purchasing Assistant	Buyer Non-Production MRO	Buyer Equipment Services	Buyer Product Materials	Inventory Manager	Materials Manager
Market Strategies	A	2	4	4	3	2	5
Negotiation	A	2	3	4	3	3	5
Total/Cost Analysis	A	2	3	4	3	3	4
Transportation	A	2	3	3	4	3	5
Supply Base Management	A	2	4	4	4	4	5
Ethics	A						
Supplier Qualification	A						
Outsourcing	A						
Project Management	B						
Inventory Mgmt. and Analysis	B						
Process Strategies	B						
Electronic Performance	B						
Supplier Performance	B						
ISO 9000	B						
Supplier Certification	B						
Contract Administration	C						
Contract Law	C						
Contract Alternatives	C						
Environment and Safety	C						
Communication	D						
Decision Making	D						
Initiative	D						
Interpersonal Skills	D						
Innovation	D						
Leadership	D						
Teamwork	D						
Problem Solving	D						
Statistics	E						
Life Cycle Costing	E						
Lease vs. Buy	E						
Forecasting	E						
Budgeting	E						
Computer Skills	F						

Skill Level Rating Key:

- 1 Very Little, if any, use of skill in the position
- 2 Has a basic understanding of the skill
- 3 Working knowledge and use of skills
- 4 Good understanding and use of the skill
- 5 Excellent understanding and application of the skill

Skills Weighting By Position	Purchasing Assistant	Buyer Non-Prod.	Buyer Equipment/ Services	Buyer Product Materials	Inventory Manager	Materials Manager
A = Sourcing	5	30	20	35	5	20
B = Asset Management	5	25	25	20	40	25
C = Contracts/Legal	5	10	15	10	5	10
D = Interpersonal	15	15	15	15	25	35
E = Quantitative	15	15	20	15	20	5
F = Computer Skills	55	15	5	5	5	5

The discussion focuses on areas in which the candidate is strong and on those that need improvement. Once an agreement is reached on the gaps, a development plan is proposed for implementation using specific, measurable, relevant, and attainable goals. The other important aspect of this system is that the weighting given to skill sets varies based on by position level. A purchasing assistant would not be required to have a high level of understand-

ing about sourcing and asset management, but he or she would be expected to have excellent computer skills because much of the job involves using the firm's automated ordering system and preparing basic reports and spreadsheets in a networked environment. Meanwhile, a materials manager would be expected to display high levels of competency in understanding sourcing, asset management, and interpersonal communications.

Skills Competency Sets

Once a skill set was identified as important, the level of detail that defined the mastery of this skill set was found to vary from firm to firm. Excerpts from four organizations that had well-developed competency based models are used to illustrate the various levels of skill mastery definitions. These firms' skill sets were well defined and were used to evaluate the buyer's skills during performance appraisals.

Corporation 1

The first firm selected 11 skill categories that, in its opinion, were necessary for the effective purchasing/supply management professional. These 11 skill categories were communication, ethics, strategic sourcing management, business and financial analysis, supplier quality management, individual leadership, team leadership, early supplier involvement, negotiation, planning/decision making, and quality.

Four broad levels of attainment were defined under each skill. The individual was rated first as to whether he or she exhibited the skill, and then the level of attainment was noted. The levels were termed as follows:

- Awareness
- Learning
- Practicing
- Mastering

The negotiation skill is an example. (See Table 6.9.) Attaining the awareness level in the negotiation skill requires the candidate to describe a variety of negotiation styles and tactics. Further, the employee is rated on how effectively he or she works with suppliers on day-to-day business processes and issues. Finally, the individual is asked to describe the concept of BATNA. BATNA is an abbreviation for the Best Alternative to a Negotiated Agreement from the text *Getting to Yes* by Fisher and Ury.

Moving from the awareness level to the learning level on the negotiation skill required demonstration of how negotiation with suppliers was used to improve quality, price delivery, and service. The candidate identified and applied basic negotiation principles and participated in a team negotiation. The demonstrated use of principled-versus-positional strategy was also required. Movement to the practicing level requires the individual to plan and lead negotiations that involve clients, support staff, and suppliers. The needs of the other party were understood, and areas of agreement and disagreement were defined. The candidate developed alternatives to reach mutually acceptable outcomes. Attaining the highest level (mastering) required a demonstration of collaborative and creative negotiations, as well as the development of detailed nego-

tiation plans, strategies, tactics, and actions. Finally, the candidate showed the effective achievement of objectives in a negotiation and earned a reputation as a demanding, but fair, negotiator.

The advantage of such a well-defined skill set is that the candidate understands the expectations and the operating philosophy under which he or she will be measured. Thus, with regard to negotiation, the dimensions indicate that while the individual is striving for a win-win approach in negotiation he or she must still be very demanding, set stretch goals, and develop plans to achieve the goals. The maximum score for each level is three, and the total competency maximum for negotiation is 12 points if all four levels are attained.

The model provides sufficient detail and allows management to evaluate a candidate's skill progression over time. The competency tool is well developed and can serve as a model for firms that want to improve competency assessment of their purchasing personnel.

Corporation 2

Another large multinational firm selected 13 skill categories necessary for effective P/SM individuals. The major categories included broad areas, such as procurement process knowledge, planning, market knowledge/supply assurance, managing supplier performance, and contract administration. Each of these major categories had several subcategories. For example, contract administration included duties/responsibilities (for example, ensure the contract is well documented and communicated), performance monitoring and appraisal, managing contract changes, and contract closing. Purchasing managers assess the skill demonstrated by the individual employee and their estimation of the skill level required. The four levels of skill competency are basic, intermediate, advanced, and expert. (See Table 6.10.)

For the contract administration skill, a candidate would be rated on:

- Duties/responsibilities
- Performance monitoring and appraisal
- Managing contract changes
- Contract closeout

This is followed by a gap analysis in which the required skill for the position is compared to the candidate's demonstrated skill level, and the priority (high, medium, or low) for future training is established. A gap identified for low priority skill competencies would not be as urgent as gaps on high or medium priority items.

This competency assessment is coupled with a formal P/SM training program. The four-year program starts with

TABLE 6.9
NEGOTIATION COMPETENCY SET

Skill Level	Exhibits Behavior Yes No	Score (0, 1, 2, 3)
Awareness		
1. Described a variety of negotiation styles and tactics. 2. Worked effectively with suppliers on day-to-day business processes and issues. 3. Described the concept of Best Alternative to a Negotiated Agreement (BATNA). Score for Awareness Level = 3	Yes	3
Learning		
1. Interacted with suppliers to improve quality, price, delivery, and service. 2. Participated effectively in team negotiations led by a more experienced buyer. 3. Identified and applied basic negotiation principles, planning, satisfy needs over wants, set stretch goals, and concedes per plan. 4. Utilized principled-versus-positional negotiation processes. Score for Learning Level = 3	Yes	3
Practicing		
1. Planned and led negotiations involving clients, technical support staff, and suppliers. 2. Effectively explored and expressed understanding of the other person's needs. 3. Defined areas of agreement and disagreement. 4. Developed alternatives to reach mutual outcomes that were supported and accepted by purchaser and supplier. Score for Practicing Level = 3		
Mastering		
1. Demonstrated the differences between competitive, collaborative, and creative approaches to negotiation. 2. Developed detailed negotiation plans complete with strategies, tactics, alternative courses of action, and a BATNA. 3. Effectively achieved objectives from at least one supplier negotiation. 4. Described by negotiation partners as demanding but fair. Score for Mastering Level = Score for Competency		

TABLE 6.10
COMPETENCY ASSESSMENT WORKSHEET

Competency	Skill Demonstrated (N/A or B-I-A-E)	Skill Required (N/A or B-I-A-E)	Gap	Priority (High, medium or low)	Learning Plans
Supplier Relations					
Supplier Knowledge					
Supplier Relationship Management					
Contract Administration					
<ul style="list-style-type: none"> – Responsibilities – Performance monitoring/appraisal – Changes to the contract – Contract closeout 					

Skill Demonstrated/Skill Required: N/A = not applicable

B = Basic

A = Advanced

I = Intermediate

E = Expert

internal customer interfaces and moves to negotiation training, purchasing fundamentals, and interpersonal skills. Then, the focus moves toward higher-level strategic and entrepreneurial skills. The capstone course involves bringing creativity to bear on P/SM issues and processes.

Corporation 3

A third firm called its matrix a "Procurement Training Assessment Profile." This firm identified 21 key skills. The 21 skills were applied across all nine managerial and non-managerial positions. The ideal competency levels were rated as basic, intermediate, or advanced. A buyer would need a basic skill competency in areas such as understanding the procurement process, purchase order preparation, negotiation, transportation, team facilitation, and communication skills. He or she would be required to have an intermediate skill competency for legal and ethical aspects, communication skills, and problem solving. A senior purchasing agent would be expected to have intermediate skills in the areas of negotiation and communication. A senior purchasing agent would need only basic knowledge of transportation and purchase order preparation and distribution; but advanced team facilitation skills would be required. The company has a list of recommended courses that will help bring the employee to appropriate skill level competency. This system tied course work and self study to the skill categories to provide improvement suggestions. Ratings were tallied as a 1, 2, or

3 under each major category. Thus, an individual could be at a Basic 1, Basic 2, or Basic 3 level. (See Table 6.11.)

Corporation 4

This firm used its competency matrix to achieve agreement on skill attainment between the buyer and his or her supervisor. The buyer rated his or her competency in the following areas:

- Supply base management
- Sourcing strategy development
- Business skills
- Leadership
- Technical/qualitative skills

Supply base management covered the dimensions necessary to optimize cost quality and availability in meeting current operating needs. This included profit management, supplier quality, information exchange, and problem solving. Sourcing strategy development dimensions included industry analysis, supplier evaluation, strategy formulation, negotiations, and strategic thinking. Business skills included general business knowledge, the company's overall strategy, and cost and financial analysis. Leadership included taking a customer focus, being a team player, leading change, and taking initiative. Finally, technical/

Table 6.11
PROCUREMENT TRAINING
ASSESSMENT PROFILE
TYPICAL TITLES: BUYER, SENIOR BUYER

Minimum Skill/Knowledge Requirement	Basic	Inter- mediate	Advanced	TRAINING TOOLS AVAILABLE	Need	Taken	Equivalent
Understanding the procurement processes – Identification of need/fulfillment of need	✓			Fundamentals of Procurement			
				Basic understanding of Procurement Guide and related quality documents			
Understanding of "how to buy" – Defining the need – Supplier qualification/selection – Order placement/follow up/expediting Purchase order preparation and distribution	✓			Fundamentals of Procurement			
				Basic understanding of Procurement Guide and related quality documents			
Ability to understand and create various types of buying agreements	✓			Fundamentals of procurement			
				Basic understanding of Procurement Guide and related quality documents			
				Fundamentals of Procurement			
				Basic Agreement Development			
				Law			
				Advanced Law			
				Training Videotape Library			
				Procurement Agreements manual			

qualitative skills included communication, creativity, priority management, and supplier technology management.

The firm identified the skills necessary for positions now and into the future. Each individual makes an assessment of his or her capabilities based on these skills. The manager independently assesses the candidate's skills. They then meet to obtain mutual agreement. They agree on areas where a gap exists and develop action plans. (See Table 6.12.) An example of the skills assessment form used by this firm is shown in Table 6.13.

GAP Analysis

Deere & Company has developed a model, which it has shared with several other corporations, that can serve as a useful tool in skill analysis. The system consists of:

- 1) identifying skills and their relative importance;
- 2) deciding on an ideal level of competency for the particular purchasing position;
- 3) identifying the individual's skill competency;
- 4) calculating the gap; and
- 5) establishing a priority for upgrading skills.

Table 6.14 shows the skill requirements profile. The specific skills are listed under four categories: administration, interpersonal, analytical, and commercial. The first step is to obtain an importance rating for each skill on a level of 1 (least important) to 5 (most important). The relative importance of a skill can be determined in a number of ways: inputs from a cross-functional team, a survey of all purchasing managers, input from top management, or information from the chief purchasing officer and his or her staff. A combination of these approaches can be used to gain a broad perspective of skill importance. The importance of these skills should be updated periodically. In the example shown, strategic development was rated as 4.2 out of 5, and supplier certification was a 2.3 out of 5.

The second step involves analyzing the various position levels in the P/SM function and determining the ideal skills for each position. Skill competency may vary by position. For a buyer/planner position, a 3 on the strategic development skill might be ideal, yet for a senior buyer, a 7 might be the ideal skill level. In the third step, an assessment of the current skill competency level of the candidate is determined. In the example, the candidate is rated a 4 on strategy development. The gap between the ideal 7 and the current skill competency 4 is 3. The fourth step is calculating the "gap," which is the ideal competency rating for the skill minus the individual's current competency. Finally, the gap multiplied by the importance yields the priority. In this case, 3 multiplied by 4.2 equals 12.6. This

TABLE 6.12
MANAGER AND EMPLOYEE
COMPETENCY NEEDS ANALYSIS

Step 1	→	Identify skills needed currently and in the future
Step 2	→	Obtain self-assessment from each individual
Step 3	→	Identify the level of the skill needed in the current position and future positions
Step 4	→	Identify the gaps necessary for improvement
Step 5	→	Discuss these gaps with affected individuals
Step 6	→	Gain agreement on the gap analysis
Step 7	→	Jointly establish plans to close the gaps by using a development plan that is specific, relevant, measurable, attainable, and in a reasonable time frame

TABLE 6.13
FUNCTIONAL/KNOWLEDGE COMPETENCIES – BUYER

Area	Key Action Areas	Rating of Demonstrated Competence			
		No chance to demonstrate competence	Seldom demonstrates competence	Usually demonstrates competence	Always demonstrate competence
Sourcing Strategy	Develops sourcing strategies that meet the needs of our partners. Addresses these needs to identify and select suppliers that provide a competitive advantage in total cost, quality, availability, and technology.				
Strategy formulation	<p>Able to synthesize supplier information into a strategy, which can be clearly documented, communicated, and implemented.</p> <ul style="list-style-type: none"> Organizes and presents data logically to support a sourcing strategy 				
Negotiations	<p>Good negotiator capable of leading some negotiations. Understands some different negotiation tactics. Prepares and participates in strategic supplier negotiations.</p> <ul style="list-style-type: none"> Able to separate the people from the problem Able to focus on interests, not positions Adequately protects company interests Invents options for mutual gain Uses objectives criteria 				

Table 6.14
SUPPLY MANAGEMENT SKILL REQUIREMENT PROFILE

Position _____

DATE _____

Supply Management Skills

*Basic *Intermediate *Advanced
1 2 3 4 5 6 7 8 9

IMPORTANCE		ADMINISTRATION									PRIORITY	
		1	2	3	4	5	6	7	8	9		
4.2	Strategic Development				0			X			12.6	
4.1	Project Management							X				
4.1	Supplier Development							X				
3.4	Contract Administration						X					
4.0	Time Management							X				
	INTERPERSONAL											
4.6	Effective Communication								X			
4.5	Negotiating Skills							X				
4.4	Business Ethics								X			
3.4	Professional Development							X				
4.0	Leadership Skills							X				
4.2	Problem Solving Skills								X			
	ANALYTICAL											
3.2	Accounting/Microeconomics						X					
3.4	Business Math/Statistics						X					
3.4	Materials Management Systems						X					
4.4	Cost and Price Analysis							X				
	COMMERCIAL											
2.8	Microeconomics						X					
2.7	Business Law						X					
	Risk Management											
3.8	Industrial Processes							X				
2.9	Transportation						X					
4.3	Quality							X				
2.9	International Purchasing						X					
3.5	Purchasing Practices							X				
2.5	Legislative/Social Respblty						X					
2.3	Supplier Certification						X					

Weight = Degree of importance 1 to 5 (1 = least to 5 = most)

STEP 2

Basic = Understanding of key principles and function in repetitive situations.

Intermediate = Having a depth of knowledge and skills and being able to function in a broad range of moderately difficult situations.

Advanced = Having a broad and deep understanding of skills and being able to function in complex, varied situations. A model of subject matter mastery and skills.

X = Ideal skill level

O = Attained skill level

(Released with permission from Deere & Company, Art Rowe)

priority would allow a plan to be developed for the individual or department focusing on highest priority skills that need improvement.

A Case of a Two-Track Program

A large multinational firm in the technology sector that does a significant amount of functional purchasing training has developed a skill set that offers progression for

both nonmanagers and managers. This system recognizes the need of an organization to advance the skills of individuals who do not wish to pursue traditional promotions from functional nonmanagerial purchasing roles to management. There are multiple reasons why an individual may wish to pursue a nonmanagement track, including lack of desire to manage or the decision to stay in a certain geographical location.

In this system, a candidate can advance his or her skills and salary in the nonmanagement track as well as in the

traditional management track. It is interesting that, the skill sets for the nonmanagement track are more formalized than many of those in the management track. Candidates can also switch tracks throughout their careers because business as well as personal circumstances change, and employees may decide to move from one track to another.

Nonmanagement Track

In the nonmanagement track employees are judged in four areas: administrative, analytical, business and supplier, and interpersonal skills. Each area contains specific skills and five levels of competency.

Administrative

Administrative skills include contract knowledge, understanding the business unit, understanding the mission of the business unit, and computer skills. These administrative skills relate to the purchaser's ability to manage contracts while utilizing technology to accomplish the goals and missions of the business unit. Each specific skill set has five levels as shown in the example in Table 6.15.

As an example, the contract management skill under the administrative area will be used to illustrate one skill set. Level 1 is the basic, or entry, level that is the starting point for all people who take positions in purchasing. At this level (under the contract management skill), the candidate is planning purchases and is aware of the terms and conditions. At Level 2, the candidate is capable of drafting a request for quotes and understands the various terms and conditions. In Level 3, the individual is drafting more complex nonstandard clauses and manages high-level contracts, which represent more risk for the organization.

Attaining Level 4 requires the candidate to illustrate leadership in managing contracts. The candidate may manage a complex contract that requires input from a cross-functional team. The purchaser must demonstrate leadership in the team and leadership in working with suppliers and customers to effectively manage the contract. Level 5 is the highest skill level. In contract management, Level 5 would include the leadership ability demonstrated in Level 4, plus the mentoring of lower-level purchasers in the contract process. Additionally, the Level 5 candidate

TABLE 6.15
SKILL LEVEL MASTERY

Required Skill: Cost/Price Analysis	
Level	Individual Knowledge
Level 1	- Aware of cost/price analysis concept
Level 2	- Has training on cost/price analysis
Level 3	- Performs and demonstrates proficiency in cost/price analysis
Level 4	- Capable of performing cost/price analysis and assisting entry-level personnel
Level 5	- Provides expertise on cost/price analysis to a cross-functional team

must serve as a knowledge resource to less skilled purchasers and other functional groups in the firm.

Analytical

Analytical skills are a mix of quantitative skills and professionalism, including cost/price analysis, total cost of ownership, understanding quality, and professional certification. Candidates can achieve professional certification by becoming a Certified Purchasing Manager, Certified Production and Inventory Manager, or Certified Transportation Manager. In this firm, analytical skills also include some softer, more qualitative issues. However, the skills are all measurable. To illustrate the dimensions, this report will use cost/price analysis. (See Table 6.15.) At Level 1 (entry level), the purchaser is aware of cost/price analysis. In Level 2, the candidate has some training on cost/price analysis. At Level 3, the person is performing and demonstrating proficiency in cost/price analysis. Once reaching Level 4, the purchaser is capable of performing cost/price analysis and assisting entry-level personnel with cost/price analysis applications. To attain Level 5, the candidate is expected to provide expertise to a cross-functional group on cost/price analysis and to be a team leader.

Business and Supplier

Business and supplier skills include knowledge of the enterprise, markets, and suppliers. Enterprise-wide knowledge focuses on the purchaser's broad knowledge of his or her firm and its products, services, and customers. Market knowledge includes an in-depth understanding of the market conditions in which the purchaser buys his or her products and an understanding of the needs of internal customers. At higher levels of market knowledge the buyer looks for trends and matches them to product strategies. For example, if copper and aluminum wire is being replaced by fiber optic cable, the purchaser will follow such a market trend as well as the suppliers of fiber optics, and then make recommendations about future supply categories.

Supplier knowledge is the overall understanding of suppliers and their capabilities and the type of relationships the firm has established with these suppliers. Supplier knowledge and enterprise knowledge merge in the definition of these skills. Level 1 employees have an entry-level awareness of the enterprise and suppliers. Level 2s have domestic commodity knowledge, and Level 3s possess global commodity knowledge. A Level 4 must exhibit in-depth global commodity management skills. At the highest level, the purchaser is expected to provide expertise and leadership in global commodity management. Further, he or she must understand the drivers of commodity supply and pricing and know where demand is generated within the enterprise. The enterprise and supplier knowledge are used to match suppliers to final customer needs and internal operating requirements.

Interpersonal Skills

Interpersonal skills include oral and written communication skills, as well as leadership, values, and diversity. As shown in the literature and in this report, interpersonal skills are one of the most important aspects of the purchaser's job. Leadership and values are skills that purchasers display with internal customers and suppliers and on cross-functional teams. The firm also measured these interpersonal skills on the five-level competency scale.

Measuring Nonmanagement Skill Competency

The previous section described the skills and levels that the nonmanagement employees were graded on. Attaining higher skill levels and subsequently higher pay levels involves much more than the candidate's saying that he or she possesses the skills or has attended a training session. Moving to higher levels is accomplished through training, but the key is demonstrated in job performance.

A committee of corporate level and business unit purchasers meets periodically to review the competency level each person has attained on the various skills. The review committee is composed of experienced senior managers who meet every three to four months. To move up in each area, the individual must put together a folder to demonstrate how the skill was utilized or implemented. For example, in total cost of ownership the candidate would detail a project that used this skill along with the results and the implementation sequence. The committee audits this and approves or denies the candidate's movement to the next level. The review process also includes a review of candidate's qualifications. The most important qualification is satisfactory performance. Second, experience in the job is considered, and lastly formal education possessed by the candidate is reviewed.

Often managers will nominate individuals who they feel are ready to move to the next level. The review board always gives feedback to candidates about why they weren't promoted and offer some suggestions for improvement.

The Management Track

The skills in the management track are much more general, and the process allows for more flexibility in candidate selection. Several of the skills categories in the management track are generic across functional areas. Less emphasis is placed on specific commodity skills. The criteria in the purchasing management track include the following four categories:

- Leadership capabilities
- Motivation of subordinates and peers
- Creativity in thinking and problem solving
- Vision for the function and organization

These skill sets are applicable to purchasing supervisors and purchasing managers.

Higher-level purchasing management positions require attainment of three additional broadly defined skill categories: managerial training, leadership styles, and previous high performance results. Specific skill sets included in the higher-level purchasing management positions include

- Leading change in the business unit
- Setting high or stretch goals
- Being a leader in initiating and supporting corporate-wide change and innovation
- Risk taking and entrepreneurial activities

These skill sets apply to directors of purchasing, directors of operations, and vice-presidents of purchasing.

World Class Skills Survey

Skills Required

Ninety-six (N=96) purchasing managers rated the skills that they felt would be required for a world class purchasing/supply management (P/SM) individual. Respondents were asked to rate the importance of 30 skills from 1 (not important) to 5 (very important). The current top 10 included

- interpersonal communications
- decision making
- teaming abilities
- negotiation
- customer focus
- analytical understanding
- influencing and persuasion
- business conditions
- conflict resolution
- managing change.

(See Table 7.1.)

The respondents' skill ratings were compared to ratings in the Purchasing Education and Training Requirements and Resources (PET) study (1993). The PET study asked individuals the current importance (1993) and the future importance (2000) of the skills. As shown in Table 7.2, seven of the 10 skill categories were rated in the top 10 for all three periods. Clearly, interpersonal communications is the skill rated most important by the surveyed managers. Interpersonal communications was forecasted to be most important in the year 2000 and ranked second in 1992. The ability to make decisions was second in the current survey; it was forecasted to be third in 2000 and ranked first in 1992. Negotiations skills were ranked

fourth for 1999 and 2000 and third in 1992. Taking a customer focus was ranked fifth in the current survey; second for 2000, and eighth in 1992. Analytical skills, influencing and persuasion, and conflict resolution were in the top 10 in each of the three studies. The ability to work in teams was rated third in the current survey but this skill was not measured previously. Finally, understanding business conditions moved into the top 10, reflecting the need of the P/SM function to take a broader perspective.

Although there was a great deal of consistency among the top 15 skills from 1992 to 1999, three new skills moved into the top 15. These new skills were the ability to work in teams (No.3), strategic thinking (No.11) and supplier relationships (No.15). As a group, most skills were rated highly; 22 of the 30 were rated a 4 or higher. Respondent ratings were consistent for the top 10, but variability increased on lower rated items. Blue print reading was the only skill with a standard deviation of 1.00. The P/SM managers visualized a skill set that is based on interpersonal communicators who make decisions in teams and use behavioral skills, such as influencing and persuasion, and solid analytical skills.

The consistency of each of the highest rated skills was analyzed by taking the mean rankings over the three data sets and comparing the averages to the current ranking. Six of the top 15 skills had no relative position change. (See Table 7.3.) These skills were

- Interpersonal communications
- Ability to make decisions
- Negotiation skills
- Customer focus
- Analytical
- Influencing and persuasion

TABLE 7.1
SKILLS REQUIRED OF PURCHASERS
1999 RESULTS

SKILL	MEAN	STD. DEVIATION
	N=96	
Interpersonal communications	4.82	0.38
Ability to make decisions	4.78	0.44
Ability to work in teams	4.60	0.60
Negotiation skills	4.59	0.59
Customer focus	4.50	0.55
Analytical	4.50	0.63
Influencing and persuasion	4.50	0.59
Understanding business conditions	4.50	0.59
Conflict resolution	4.50	0.63
Managing change	4.42	0.65
Strategic thinking	4.41	0.75
Problem solving	4.41	0.67
Leadership	4.33	0.72
Computer literacy	4.29	0.73
Structuring supplier relationships	4.27	0.71
Managing internal customers	4.22	0.74
Tactfulness in dealing with others	4.15	0.70
Creativity	4.14	0.77
Organization/time management	4.11	0.72
Written communications	4.04	0.72
Risk taking/entrepreneurial	4.02	0.82
Inquisitiveness	4.01	0.76
Supply base research	3.99	0.86
Selling skills	3.91	0.79
Computational	3.81	0.79
Supplier cost targeting	3.80	0.91
Technical	3.51	0.76
Technology planning	3.29	0.93
Specification development	2.88	0.94
Blue print reading	2.52	1.00

Scale: 1 = not important; 5 = very important

Three other skills moved a maximum of two places. Finally, understanding business conditions increased six places while problem solving dropped by the same amount.

Knowledge Required

Ninety-six (96) purchasing managers rated the knowledge areas that they felt world class purchasing/supply

management individuals possess. Respondents were asked to rate the importance of the 55 knowledge areas on a scale of 1 (not important) to 5 (very important). The top 10 knowledge areas as rated by these purchasers were

- supply chain management
- supplier development
- lowest total cost

TABLE 7.2
COMPARISON OF TOP 10 SKILLS
1999 VS. 2000 FORECAST VS. 1992

1999	2000 Forecast	1992
1. Interpersonal communications	1. Interpersonal communications	1. Ability to make decisions
2. Ability to make decisions	2. Customer focus	2. Interpersonal communications
3. Ability to work in teams	3. Ability to make decisions	3. Negotiation
4. Negotiation skills	4. Negotiation	4. Problem solving
5. Customer focus	5. Analytical	5. Influencing and persuasion
6. Analytical	6. Managing change	6. Conflict resolution
7. Influencing and persuasion	7. Conflict resolution	7. Analytical
8. Understanding business conditions	8. Problem solving	8. Customer focus
9. Conflict resolution	9. Influencing and persuasion	9. Leadership
10. Managing change	10. Computer literacy	10. Tactfulness

TABLE 7.3
TOP 15 SKILLS AND RANKING COMPARISON

	(1) 1999	(2) 2000 Forecast	(3) 1992	(4) 1992 Mean Rank ₁	(5) Mean Minus 1999 Rank ₂
1. Interpersonal communications	1*	1	2	1.5	+0.5
2. Ability to make decisions	2	2	2	2	0
3. Ability to work in teams	3	-	-	-	-
4. Negotiation skills	4	4	3	3.5	-0.5
5. Customer focus	5	2	8	5	0
6. Analytical	6	5	7	6	0
7. Influencing and persuasion	7	9	5	7	0
8. Understanding business conditions	8	12	17	14.5	+6.5
9. Conflict resolution	9	7	6	6.5	-2.5
10. Managing change	10	6	11	8.5	-1.5
11. Strategic thinking	11	-	-	-	-
12. Problem solving	12	8	4	6	-6
13. Leadership	13	11	9	10	-3
14. Computer literacy	14	10	21	15.5	+1.5
15. Structuring supplier relationships	15	-	-	-	-

*Ranking

₁ 1992 Mean Rank = The average of 1992 and the 2000 forecasts done in 1992

₂ Column (5) = Column 4 minus Column 1

1999 = Current survey

2000 = Forecast from 1993 Study

1992 = 1993 Study

- price cost analysis
- supplier analysis
- market analysis
- personal computer skills
- understanding markets and industries
- electronic commerce
- human behavior

Table 7.4 shows the rankings for all 55 knowledge areas ranked by purchasers in 1999. Currently, respondents rated knowledge of supply chain management first and supplier development second. Five of the next eight knowledge areas were related to supply market and cost analysis, including lowest total cost, cost/price analysis, supplier analysis, competitive market analysis, and understanding markets and industries. The importance of these knowledge areas relates to the new strategic role of purchasing. When P/SM professionals construct supply chains, they must understand the various markets and industries prior to performing a detailed analysis of markets and suppliers. Further, they must evaluate these industries and suppliers on a total cost basis. The impact of technology on purchasing is shown by the high rating given to the knowledge of personal computer skills, which ranked seventh, and electronic commerce, which ranked ninth. Understanding human behavior was ranked 10th followed by Total Quality Management at 11th.

These top 10 were compared to the 1993 Purchasing Education and Training study (data taken in 1992). (See Table 7.5.) The majority of respondents in both samples held managerial positions. When compared to the 1992 data, the largest decline by a knowledge area was Total Quality Management. It was forecasted in 1992 to be first in importance by the year 2000, and it ranked third in 1992. The shift from the early 1990's focus on quality to the current focus on managing supply chains at the lowest total cost is evident in these rankings. Today, quality is still an important requirement, and suppliers who don't provide quality products and services will not be members of the supply chain.

Certain knowledge areas appeared in the top 10 all three times. These purchasing knowledge standbys include supplier analysis, lowest total cost, price/cost analysis, and supplier development. Comparing the current top 15 to the earlier study indicate some interesting findings. (See Table 7.6.) The largest gainers in knowledge importance were inventory management, supply chain management, and understanding markets and industries. As previously discussed, the largest losers were cost of poor quality and Total Quality Management. It is important to remember that quality is still in the top 15; it just lost the most ground vis-a-vis other knowledge related to managing total supply chain costs.

An analysis of the large standard deviations indicates areas where the largest divergence of opinions exists regarding the importance of the knowledge areas. Those areas having standard deviations greater than 1.00 are shown in the following:

Knowledge Area	Overall Rank	Mean	Standard Deviation
Lean manufacturing	44	3.33	1.18
Storeroom operation	53	2.80	1.09
Safety issues	41	3.37	1.05
Computer-assisted design	55	2.48	1.04
Value engineering	39	3.46	1.02
Learning curve	43	3.37	1.02
Receiving operations	54	3.37	1.02
Just-in-time	40	3.38	1.01
Manufacturing processes	42	3.37	1.01
Value analysis	20	3.81	1.00

TABLE 7.4
KNOWLEDGE REQUIRED OF PURCHASERS

KNOWLEDGE AREA	MEAN	STD. DEVIATION
	N = 96	
1. Supply chain management	4.37	0.81
2. Supplier development	4.32	0.69
3. Lowest total cost	4.29	0.80
4. Price/cost analysis	4.27	0.82
5. Supplier analysis	4.27	0.84
6. Competitive market analysis	4.21	0.76
7. Personal computer skills	4.12	0.73
8. Understanding markets and industries	4.08	0.82
9. Electronic commerce systems	4.04	0.86
10. Human behavior	4.04	0.87
11. Total quality management	4.00	0.95
12. Commodity expertise	3.97	0.97
13. Cost of poor quality	3.94	0.93
14. Motivational principles	3.94	0.79
15. Inventory management	3.92	0.88
16. Group dynamics	3.89	0.79
17. Legal issues	3.86	0.85
18. Cultural awareness	3.86	0.83
19. Logistics	3.82	0.85
20. Value analysis	3.81	1.00
21. International sourcing	3.81	0.95
22. Project management	3.81	0.92
23. Service buy expertise	3.80	0.90
24. Outsourcing	3.77	0.91
25. Make versus buy	3.74	0.97
26. Decision support systems	3.74	0.80
27. Financial evaluations	3.71	0.82
28. Process flows	3.71	0.90
29. Cycle time management	3.65	0.95
30. Information systems	3.65	0.76
31. Reengineering principles	3.64	0.90
32. Electronic data interchange	3.58	0.94
33. Understanding technical jargon	3.54	0.79
34. Operations	3.54	0.81
35. Material requirements planning systems	3.52	0.92
36. Enterprise resource planning systems	3.51	0.87
37. Environmental regulations	3.48	0.93
38. Inbound transportation	3.46	0.92
39. Value engineering	3.46	1.02
40. Just-in-time	3.38	1.01
41. Safety issues	3.37	1.06
42. Manufacturing processes	3.37	1.01
43. Learning curve	3.37	1.02
44. Lean manufacturing	3.33	1.18
45. Currency fluctuations	3.32	0.98
46. Database management	3.26	1.01
47. Activity based costing	3.24	0.95
48. Fundamental statistics	3.22	0.81
49. Macro-micro economics	3.22	0.96
50. ISO certification	3.18	1.02
51. Cost accounting	3.12	0.87
52. Production planning	3.06	0.94
53. Storeroom operations	2.80	1.09
54. Receiving operations	2.78	1.02
55. Computer assisted design	2.48	1.04

Scale 1 = Not Important; 5 = Very Important

TABLE 7.5
COMPARISON OF TOP 10 KNOWLEDGE AREAS
1999 VS. 2000 FORECAST VS. 1992

1999	2000 Forecast	1992
1. Supply chain management	1. Total quality management	1. Supplier relations
2. Supplier development	2. Cost of poor quality	2. Supplier analysis
3. Lowest total cost	3. Supplier relations	3. Total quality management
4. Price/cost analysis	4. Supplier analysis	4. Quality assurance
5. Supplier analysis	5. Lowest total cost	5. Price/cost analysis
6. Market analysis	6. Price/cost analysis	6. Lowest total cost
7. Personal computer skills	7. Supplier development	7. Supplier development
8. Understanding markets and industries	8. Quality assurance	8. Commodity expertise
9. Electronic commerce systems	9. Supply chain management	9. Procurement process
10. Human behavior	10. Market analysis	10. Cost of poor quality

TABLE 7.6
TOP 15 KNOWLEDGE AREAS AND RANKING COMPARISON

	(1) 1999	(2) 2000 Forecast	(3) 1992	(4) Mean ₁	(5) Mean Minus 1999 Rank ₂
1. Supply chain management	1*	9	15	8	+7
2. Supplier development	2	7	7	5	+3
3. Lowest total cost	3	5	6	4	-1
4. Price/cost analysis	4	6	5	5	+1
5. Supplier analysis	5	4	2	3	-2
6. Market analysis	6	10	11	9	+3
7. Personal computer skills	7	-	-	-	-
8. Understanding markets and industries	8	18	14	13	+5
9. Electronic commerce systems	9	-	-	-	-
10. Human behavior	10	-	-	-	-
11. Total quality management	12	1	3	5	-6
12. Commodity expertise	12	14	7	11	-1
13. Cost of poor quality	12	2	10	8	-5
14. Motivational principles	14	-	-	-	-
15. Inventory management	15	26	33	25	+10

1999 = Current survey

2000 = Forecast of year 2000 in 1999 study

1992 = 1993 study

* Ranking

₁ 1992 Mean Rank = The average of 1992 and 2000 forecasts

₂ Column (5) = Column 4 minus column 1

A partial explanation of the wide variation is the fact that the sample consists of both manufacturing and nonmanufacturing firms. Many of the areas that would rank as very important for manufacturers rank less important for nonmanufacturing firms. Except for value analysis, which ranked 20th, all the items, excluding large standard deviations, had average ranks in the lower quartile. For example, lean manufacturing has been adopted by many manufacturers, but it appears to have little importance for the nonmanufacturing sector. The purchasers' knowledge of stores, receiving, and just-in-time depends on their organizational structure. If they operate in a traditional materials management structure, these areas are important. Otherwise, these knowledge areas are not as great a part of their requirements. Perhaps the most interesting knowledge areas are value engineering and value analysis. Both of these techniques seek to creatively take cost out of a product or service, and they would be good ways to reduce/attain lowest total costs. Value analysis is the more popular of the two, and it can be used in both manufacturing and nonmanufacturing environments.

Overall, it appears that supply chain management and supplier development have replaced Total Quality Management and the cost of poor quality as the prime knowledge areas. Personal computer skills and electronic commerce, combined with market analysis and decisions based on lowest total costs, are important knowledge areas for purchasers today.

Appendix A:

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