# Quality in the Agile, Learning Organization

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**Abstract**

**Agile Manufacturing is alternately described by the terms "the change from mass production to mass customization" or "the ability to compete and thrive in continually and unpredictably changing environment". It is, in fact, both of these, and more. Agility researchers suggest tradeoffs between cost and quality, speed to market and cost, quality and speed to market. Others feel the infrastructure of the agile organization (and its corollary virtual enterprise) will have the profound knowledge needed to understand as quickly as it can respond..**

**Quality in the Agile Enterprise is more than conformance or compliance. It is an intimate knowledge of customers, capabilities, and cultures. The Agile Quality System is an Organizational Learning System in which the PDCA cycle is operating within a larger system of Learn-Know-Teach-Discover.**

## Introduction

We are faced with an air of uncertainty in business today. The competitive roadmap changes every day. The needs and wants of the marketplace are calling for shorter cycles in design, development and time to market. The progress made in the '80's and '90's in quality faces a potential for regression based on "economic analysis" and "marketing tradeoffs". The agility required of manufacturers and service providers can be a double-edged sword. Cycle-time reduction can easily become a metaphor for cutting corners and sloppy workmanship in the same way that "reengineering" has often been used to describe the slash and burn mentality of "downsizing" in the recent past. We'll continue to recreate these mistakes if we don't adopt an attitude of open dialogue and teams with a deep understanding of the processes in which they operate and those with which they interface. The agile enterprise requires agile minds, minds capable of thinking out of their own box, out of the corporate box, and into the virtual universe.

In the next generation of management thinking, we must go beyond TQM and on to Deming's theory of profound knowledge, much of which is embodied in the field of Organizational Learning, and in particular, in Senge's "Fifth Discipline", or Systems Thinking.

## Characteristics of Agility and Organizational Learning

Both Agility and Organizational Learning have been touted as the new way for an organization to think.

## Agility

Agility , for a company, is "to be capable of operating profitably in a competitive environment of continually, and unpredictably, changing customer opportunities" and for an individual, it is "to be capable of contributing to the bottom line of a company that is constantly reorganizing its human and technological resources in response to unpredictably changing customer opportunities."[1]

These definitions change somewhat across authors, depending on the slant of the researchers and the Universities or Corporations they work in. Constant across all definitions, however, is the emphasis on continual and unpredictable change. Some authors stress the speed of change, others its depth and breadth, but in all instances, Agility is a capability to meet change, and to do it profitably. Inherent in the Agile Enterprise, is Juran's early work on *Managerial Breakthrough*[2], a project-by-project management

 

approach, consisting of the right team for the breakthrough at hand. A difference in this organization, however, lies in the focus on *enterprise* activity as opposed to company, or department, or workgroup activity. The enterprise is the business system: the customers, suppliers, licensing, auditing, certification, and registration groups, banks, investors, and boards of directors. The enterprise is the business system. It consists of products and processes, companies, individuals, and teams. The difference in the way we see it, however, is that we are not interested in the individual parts. They are of little importance to enterprise throughput. What is important, is their relationships.

## Organizational Learning and The Learning Organization

Organizational Learning is about relationships. It begins with Personal Mastery, the transformation of one's life into a continuous learning process. Personal Mastery is the basic building block of organizational learning since organizations can only learn through individuals who learn[3]. It extends beyond technical knowledge and deals, once again, with the relationships between and among the parts of the organizational system through the discipline of Mental Models. In Mental Models, we break out of the old paradigms, take off the blinders, and begin to practice dialogue, looking for new ways to understand. As the individual learners begin to understand the weaknesses of the paradigmatic "box", they begin to build the next discipline, that of Shared Vision, a deep and abiding understanding which leads them into the realm of Team Learning and the even deeper, and more profound knowledge of Systems Thinking.

It is this profound knowledge that we must nurture and expect to arise throughout our virtual enterprise, across our virtual project teams, and within our virtual relationship to the systems and subsystems which constantly change around us. Without profound knowledge of business and technical issues, of organizational design and behavior, the concept of quality in the Agile Enterprise will be misconstrued as an element with which we can trade to meet delivery or cost requirements. With things moving this quickly, the infrastructure must be inherent in the gray cells of its constituents and the content of those gray cells must be as flexible, modular, and reconfigureable as the systems in which they are used.

## Sharing Information

> "The organization must be adaptable and responsive to changing conditions, while preserving overall cohesion and unity of purpose. This is the fundamental paradox facing businesses, governments, and societies alike---not to mention living cells, brains, immune systems, ant colonies, and most of the rest of the natural world. Adaptability requires that the individual components of the system be in competition. And yet cohesion requires that those same individuals cooperate with each other, thereby giving up at least some of their freedom to compete.
>
> The trick is to find the delicate balance that allows the system to avoid turf fights and back-stabbing on the one hand, and authoritarian micromanagement on the other.[4]"

When we follow Deming's prescription to "break down the barriers between departments", we have to balance it with his admonition to "drive out fear."[5] This can only be done when all of the members of the team, all of the members of the company, and all of the members of the enterprise can meet in dialogue, understanding each other's language and methods. In contrast with the jargon of the industrial quality control system of the post World War II era, we don't talk in AQL, or AOQL, or even PPM, we talk in systems metrics: values which are understood by everyone in the system. The bottom line in systems metrics is just that: the bottom line. Whether it's the earned value of a project, the return on investment for a capital investment, or the potential loss from a design or manufacturing flaw, the metric is financial.

When everyone from the CEO of the customer's firm to the janitors at the supplier's understands the financial and economic impact of their actions on the business system and its ramifications in the community in which they work, they begin to understand Shared Values. When organizations and enterprises share values they are far more likely to act from intrinsic motivation and knowledge. These higher values will be shared, even while striving to maximize the throughput of the enterprise to provide extrinsic value to all of the stakeholders.

Individuals in organizations which understand financial statements understand their relationship to those financial statements, and so their own value to the enterprise, the community, and by extension, to society as a whole. When values and information are shared, the organization is adaptive to change. It understands the economic impact of the concept to cash cycle, the relationships or inventory, depreciation, overtime, scrap, and copy paper to the bottom line. In a word-it is *empowered*.

John Case[6] makes the case for empowerment through understanding the financials by subtitling Chapter 6 of his book: *"Does empowerment make sense? Sure-but only when people understand the financials."* He makes the point that information, and in particular, financial information empowers people to not only do their jobs, but to do them without having to be told. "Empowerment with brains" is what he calls it. Case contrasts financial information with purely operational information by pointing to cases of continuous quality improvements in already highly profitable areas of a business while other parts of the business are bleeding to death, or of the dramatic increase in growth in a young company which eventually causes it to run out of cash.

## Implications for Quality

We have moved from inspection, to quality control, quality assurance, and finally, quality management in approximately forty years. The metrics of quality have evolved from AQL's allowing the shipment of defective product with no penalty to the producer to six-sigma metrics with the goal of 3.4 ppm defective. In most organizations, we have "ceased dependence on mass inspection" and have "empowered" the operator with line stoppage. We use cross-functional teams to investigate the cause of problems and to search for improvements throughout the system. We have developed standards to provide model quality systems and the most common of them (ISO 9000) is being hailed by some as a marketing tool! We have seen Deming on network television, have instituted national, state, and local quality awards. NIST and ARPA have invested heavily in research into the Transformation to Quality Organizations; Metrics for the Agile, Virtual Enterprise; and other uses of organizational and systems design methodologies and theories. We are heading into a new century with new theories about organizations and new philosophies about quality, productivity, and competitive position. The key driving force in all of these new ways of seeing competition is knowledge.

## The Transparent Quality System

If we understand anything about financial metrics, it is the relationship of indirect costs to the bottom line. As quality professionals, we've felt the weight of our indirect classification pointing towards our obsolescence. I've had many conversations with colleagues about the future of the quality profession and there is consensus that by making quality special, with it's own departments and managers, we miss an important point. Quality, in the Agile, Learning Organization, is transparent. It is not a separate department, not a separate discipline, not a special methodology. Quality is doing the right things right. This means both conformance to specifications and delighting the customer as well as everything in between.

This doesn't mean the sudden and absolute dissolution of the quality department or the resident experts. In too many instances, the fruits of an airport seminar in Lean Manufacturing, World Class Performance, JIT, or some other practical and valuable methodology has been misinterpreted to mean get rid of the quality department. In the same way, the difference between superficial and profound knowledge has

taken "cease dependence on mass inspection" to mean stop measuring things. Agility encompasses and embraces the philosophies of World Class, Lean, Learning Organizations, TQM, the Baldrige Assessment, and even ISO 9000. They are all tools for gaining knowledge, assessing its impact on the organization, controlling it, and improving it.

John Woods and James Cortada have produced a little book with some rather big ideas in it[7]. In the preface, they say:

> "We call these ideas QualiTrends, a word chosen to get your attention. But we most assuredly do not think of these ideas as 'trendy.' Rather, they are the foundation of sound management practice. In fact, we are convinced that in the near future, so-called trendy terms such as TQM, continuous improvement, reengineering, and similar phrases will disappear-though the practices they suggest will not. They will simply be the core of any intelligently managed organization. What will we call these practices? The answer is simple: We will call them *management*."

By the same token, in reading Goldratt's[8] work, we see there is no explicit mention of a quality organization, no explicit mention of quality improvement. The Goal is a process of ongoing improvement. Maximizing throughput is eliminating wastes of money, material, time, and motion. Quality is implicit. It is transparent, it is a part of The Goal without which The Goal cannot be met. The remainder of this paper will treat quality as implicitly as Goldratt, Woods, and Cordata. Quality is a given. Without it there is no successful competition.

## The Agile, Learning Organization

What does an Agile, Learning Organization look like? For one thing, you can bet your life, there won't be an organizational chart. You may see systems dynamics diagrams-balancing loops and reinforcing loops; stock and flow diagrams tied into simulation engines and equations. You'll surely see flow charts of all kinds, QFD charts, fish-bone diagrams, and plenty of visual management clues to performance and improvement progress. You may find a department or two, like accounts payable or receivable, maybe benefits administration, or maybe not. You will find leadership of people and management of things. There will be continuous improvement and continuous innovation. Creativity will be obvious.

The order fulfillment process, whether in a manufacturing, distribution, sales, education, or service organization will exhibit the characteristics of a lean manufacturing system. The focus will be on process and its *relationship* to system. And everywhere, there will be *learning*.

In the Agile, Learning Organization, you will see some combination of the competencies listed here, and you will get a sense of total communications because of the integration of these concepts through the ubiquitous use of information systems.

| **Agile Organizational Competencies Inventory** |
|---|
| • Continuous Education and Training |
| • **Customer Interactive Systems** |
| • Customized Marketing and Distribution Systems |
| • **Distributed Information Systems** |
| • Empowered Individuals in Teams |
| • Extended Enterprise Integration |
| • Financial Accounting Systems |
| • Global Multiventuring |
| • **Groupware** |

| |
|---|
| • **Intelligent Flexible Machines** |
| • Lean Organization and Methods |
| • Legal System |
| • **Modular reconfigureable Process Components** |
| • Organizational Inventory Listing |
| • Organizational Practices |
| • Performance Metrics and Evaluation |
| • Prequalified Partnering |
| • Product and Service Inventory |
| • Simulation and Modeling |
| • Total Quality Management |
| • Ubiquitous Communication |
| • Waste Management and Elimination |
| • Organizational Learning |
| Adapted from Goldman, Nagel. And Preiss |

**Figure 1: Agile, Learning Organization Competencies Inventory**

We will discuss some of the key issues in the Agile, Learning Organization's design, the first of which is Customer Interactive Systems. Customer interactive systems are an element of agility which Goldman, Nagel, and Preiss call "enriching the customer." A part of Customer Interactive Systems is what we used to call "early involvement interventions." It means you meet with your customers to share ideas on design, manufacturability, distribution, marketability, etc*œven before you have a contract.* Customer Interactive Systems can include such enabling technologies as EDI, shared CAD/CAM/CAE resources (including human ones), Internet based communications, ordering, and scheduling systems. The Customer Interactive System is based not only on technology, but on shared values and trust.

## Empowered Individuals in Teams and Extended Enterprise Integration

The result of "Customer Interactive Systems" operated by empowered individuals in teams is *Organization By and for the Customer.*The teams span the extended enterprise. They include the customer and the supplier. This organization calls for ubiquitous communication. It is a reflection of the application of the lean manufacturing model to the organizational design. If we think about the batch and mass-production models which preceded the lean manufacturing model, we can visual the "jumbled, clustered approach" to manufacturing as shown in Figure 2. This approach organized like machines in the same areas of a facility. A consequence of this approach was the mandatory plant tour for every part made. Consequences included all of the potential wastes in a manufacturing system: time, motion, material, damage, space. In lean manufacturing, these wastes do not occur. Equipment is grouped as process. Each product or process is contained in its own cell. Each cell is modular, and reconfigureable. All but the heaviest equipment is moveable. Smaller equipment is often fitted with a wheeled base in order to be at the beck and call of the next process which needs it. Figure 3 illustrates a cellular operation.

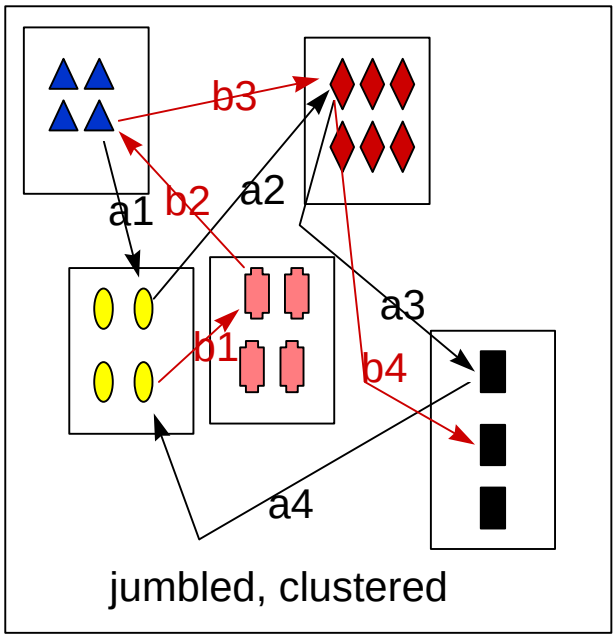


**Figure 2: Clustered, Jumbled**

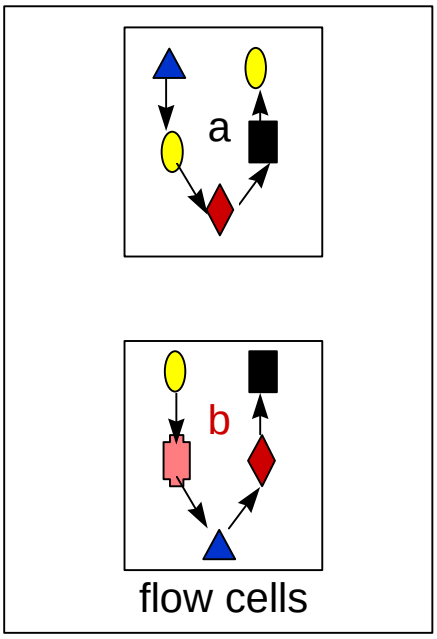


**Figure 3**: Modular, Reconfigureable

One of the questions I often ask when looking at a lean, flexible operation is: "why aren't the people on wheels?" Think about it. In the same way the spot welders, brake presses, turret lathes, or whatever kind of machines are a part of a process, so are accountants, engineers, purchasing people, and the rest of us. Why aren't we organized by process?

Lean organization and methods entail intelligent, flexible people in the same way that lean manufacturing entails intelligent, flexible equipment. Think about it. SMED, the Single Minute Exchange of Die concept can be extended to organization as well. Fool-proof the project by categorizing, indexing, and making project members instantly retrievable. Know the capacity constraining human resources as well as the ones in the production process. Streamline the process by eliminating the distance between operations, both physical and psychological.

We're back to Juran again. In Managerial Breakthrough and throughout his other work, Juran talks about project-by-project improvement. In the same way we move equipment to get the job done, we have to move people. Look at the "Project Management Body of Knowledge" in Figure 4. Does it look like a good product/process independent body of knowledge? Does it seem a little like the Certified Quality Manager's body of knowledge? Or maybe a good approximation of an MBA for non-financial products and services?

| The PMBOK (Project Management Body of Knowledge) |
| --- |
| Integration Management<br>Scope Management<br>Time Management<br>Cost Management<br>Quality Management<br>• ISO 9000<br>• 7 Tools<br>• 7 New Tools<br>Human Resource Management<br>Communications Management<br>Risk Management<br>Procurement Management |

**Figure 4: The Project Management Body of Knowledge**

## Project Management: *By and For the Customer*

A customer order is a project. In the same way we say that "everything is a process" we can say that every use of a process with a specific goal, is a project. Tom Peters, in the first session of the "Worldwide Lessons in Leadership Series" made the point exceedingly clear. If there's not enough time and your resources are constrained, you need to manage your project. You can't just do it. You have to know what to do, how to do it, when to do it, who's doing it, who's not. Who's capable? Who's free? You need an MRP engine, a modeling and simulation tool to manage your projects. More starwars. More wire heads.

Peter's suggests that most of us who have left our teenage years behind us "just don't get it." He suggests hiring a really bright fourteen year-old to be your "Chief Knowledge Officer." And he's right. My nine year old daughter knows more about using a computer that I did after a couple of years of academic computing and my first few years in industry. If you don't have a PC at home, if you're not connected to the Internet, if you're afraid of the network in your office, you really don't get it. Get it. Find a fourteen year old and hang around with them until you do get it.

There is more learning done by accident on the World Wide Web than in most corporate training programs. There's a tremendous amount of information available instantly, for free. Go get it. It's the concept of universally distributed information and shared values, vision, and knowledge at it's best. If you can understand it and use it, you'll come to organization by and for the customer and the supplier and the community and the world.

Internet and Intranet technologies make the extended enterprise project management team as intelligent and as flexible as the equipment we use to fulfill our orders. Good project management software, Groupware, modeling and simulation engines, process mapping, mind mapping, brain storming software is available. A lot of it is free, or close to it. Don't wait for a corporate solution using COBOL and mainframes to begin managing your projects. Find your own solutions, now, so you'll have the time to lead your teams. Communicate with your customers and suppliers ubiquitously. Learn their processes as well as your own. Enrich the customer, reward the supplier, and gain the competitive edge.

If everyone in the organization has business literacy and is proficient in the Project Management Body of Knowledge, you'll be able to run Virtual, Extended Enterprise, Self-directed Teams on a project by project

basis. By using project management technique, you'll also be building a learning history. You'll also be building stronger, smarter business people within those teams, each with a core body of knowledge allowing them to move anywhere in the organization, each with a unique talent allowing them to contribute to the knowledge base.

## Preliminary Organizational Models

Organizing by and for the customer can take on many forms. In every organization, there are relationships between process and product, customer and product line, product line and skill set.

| Projects / Teams | Customer | Product |
|---|---|---|
| One/One | One | One |
| Many/One | One | Many |
| Many/Many | Many | Many |
| One/Many | Many | One |

**Figure 5: Organizational Models**

This is an extremely simplified model. It deals with the order fulfillment element of the concept to cash cycle. Depending on the complexity of products and services, the same teams which perform the order fulfillment projects may be supplemented with planning and design teams, using project management technique as well. Team size and composition will be dependent on the operational characteristics of the order fulfillment process. In some instances, teams will be responsible for everything from planning to shipment. In others, there will be standing members or sub-teams who will participate in all projects by function. Some teams will serve one product or service to many customers, others will serve many products or services to one customer.

The make-up of these teams is a function of project integration management as shown in figure 6. The project plan development phase uses a "project management information system" to find out who's got capacity and capability and availability and puts together the teams based on the need of the enterprise and the project.

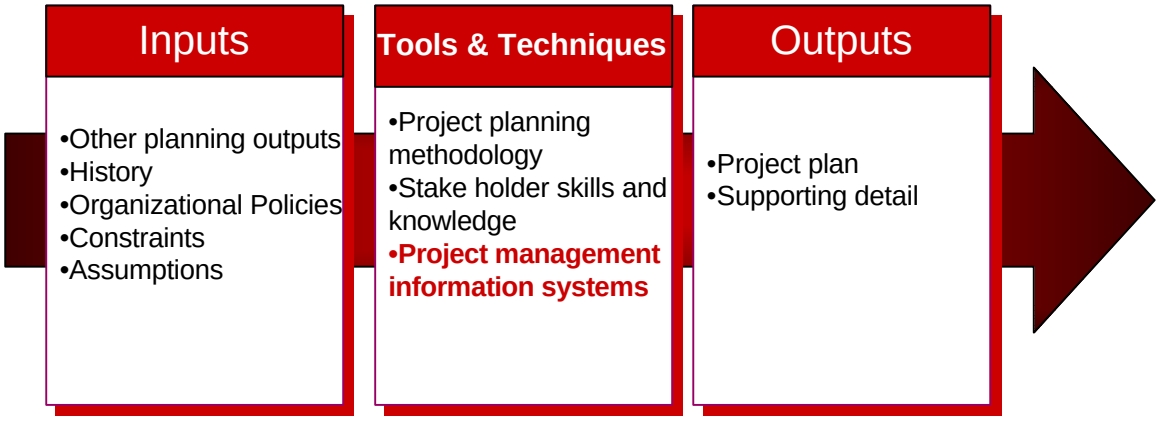


**Figure 6 :Project Integration Management**[9]

## Back to QualiTrends

I feel the same way that Woods and Cordata do when it comes to TQM and the other labels we've used for good management. Let's put it all together and just call it management. Agility and Organizational Learning are breakthrough methodologies. They contribute much to both organizational leadership and market leadership. Project Management and Quality Management are planning and control methodologies which contribute to the organization's abilities by letting it know where it's been, where it is, and where it's headed. By integrating the philosophies, tools, and methods of these similar and

supplemental disciplines into the infrastructure of the organization, we can make order out of the chaos of rapid change. The trick is to view them as *descriptive* methodologies as opposed to *prescriptive* methodologies.

Think, for a minute about quality standards. ISO 9000, which is based on Mil-Q-9858, is a far cry from its parent linguistically, although its intent is very much the same. Where the military standards use the prescriptive *shalls* and *wills* of the contract lawyer, the ISO standard proclaims itself a model for a quality system and suggests a lot more than it actually prescribes. Still, with its dependence on third party registration and assessment, it becomes a capacity constraint and a damper to generative thought processes in the management of enterprises. It is not the standard itself which is problematic, but the lack of trust and faith in the genuine ability of the business world to collaborate through the extended enterprise for the benefit of all.

Without registration and third-party assessments, the systems approach of the ISO standards is a thing of beauty. Applying feedback loops to control points gives us some key indicators of system health. Such metrics entail both financial and operational information and are invaluable. Concerns with corrective and preventive action, management responsibility, and training needs assessment (and by extension, education), places it in the realm of Shared Vision, team learning, and learning history. Its concern for quality planning and management review takes us into strategic learning areas.

Like the other words we don't need, however, this fixation with standards, too, should become a transparency. Quality standards are management standards and standards are all about ethics, ideals, principles, and integrity. These are the ideas which allow us to transcend the management of things and become leaders of people..

**Sharing Vision, Value, and Knowledge**

Managers are concerned with accountability and responsibility. Leaders are concerned with visions and values, knowledge and learning. To be agile is to learn and to observe the subtle differences in business scenarios which require different responses and different competencies. To do this as a team, leaders must emerge who can teach by example and show the full body of the extended enterprise the meaning of the visions and values which drive it.

Because the Agile, Learning Organization uses the extended enterprise model to enhance its competitive edge, it takes on the characteristics of the Virtual Organization. In the Virtual Organization, "…complementary resources existing in a number of cooperating companies are left in place, but are integrated to support a particular product effort for as long as it is economically justifiable to do so."[10] When visions, values, and knowledge, as well as material, production, and human resources are shared across organizational boundaries, an extension of the Learning Organization occurs. When this broader model forms, it approximates the concept of the "Virtual University." The Virtual University is the learning laboratory in which we practice the five disciplines of the Learning Organization and where we learn to use them in more creative ways to enhance the values which we share.

## Conclusions

The Agile, Learning Organization will, in the future, be simply known as the organization. Quality systems and standards as we know them today will simply be management models. Quality management, project management, and change management will just be management. If we're lucky, systems thinking will be thinking and everyone will do it.

For the Agile, Learning Organization to be realized, for the model to become widespread and practiced, we must begin to learn how to let go of our proprietary models of the enterprise and share our knowledge across organizational boundaries. Business schools, engineering schools, high schools and pre-schools must begin to teach the principles of Agility and Organizational Learning. The core curricula at all levels of education must be in consonance with the core curricula of the Agile, Learning Organization:

**Business Literacy** Open Book Management-Teach everyone to read the financials

**Management Literacy** Project Management/Quality Management Body of Knowledge-Teach everyone planning, assessment, diagnosis, and improvement

**Leadership Literacy** The Art and Practice of the Learning Organization-Teach everyone to learn, first as an individual, then as a team, finally, as a system

**Technological Literacy** Internet/Intranet/Groupware-Teach ubiquitous communications and instill the use of technology for learning in everyone

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