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AUTHOR Lenaghan, Donna D.
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ABSTRACT

The information and service industries are and will remain the largest areas of growth/employment. Among current/projected changes in the work environment are the following: greater competition within/beyond the continental borders of the United States; increasing reliance on new equipment/processes; more/constantly changing information to be produced, used, and stored; and older, smaller, and demographically diverse work forces needing specialized preparation. These changes require new types of training and education outcomes and ways of measuring corporate success. Demand for workers capable of manipulating and creating conceptual information or manipulating and applying discrete information will increase, whereas the types/numbers of jobs requiring workers capable only of completing directed actions will decrease. Leaders of human potential/training departments and colleges and universities must understand and anticipate the implications of these trends in the workplace and must develop strategies to prepare people to work with information and technologies that have yet to be invented. Preparing workers for the 21st century requires training them in five areas: basic skills, functional professionalism (management, marketing, teaching, human resources, research); learning levers (how to learn); people power (how to succeed with other people); and awesome thinking (how to think). (Appended are lists of projected demand occupations requiring different levels of education/training. Contains 25 references). (MN)

BALANCING THE SEE-SAW:
A KALEIDOSCOPIC PARADIGM SHIFT OF KNOW-HOW

(21st CENTURY EDUCATION AND TRAINING PRIORITIES)

PRESENTATION TO THE 1995 CONFERENCE OF
AMERICAN ASSOCIATION OF ADULT & CONTINUING EDUCATION

BY

DR. DONNA D. LENAGHAN

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INTRODUCTION

Three simple yet profound truths provide the rationale for this paper. The future isn't what it used to be! The future isn't what it is projected to be! Someone has pushed the fast forward button and the future is revealed!

How do you react to these three statements? Most people, after the initial confusion or shock about these statements, agree that they are true. Some of us grudgingly accept them and some of us respond: Alright! Yes! Thank Goodness! Those of us who respond with enthusiastic optimism understand the past and know what is needed to be successful in the future. Understanding the past and succeeding in the future is the focus of this paper.

In the year 2001, what will be your job and how will you do it? T.S. Eliot forecast our journey into the future with these words: "In our beginning is our end and in our end is our beginning" (Eliot, 1971, pp. 123 & 129). As we think and plan about the future, it is necessary to understand the past because within the past are our values, roots and foundations for the present and future.

HISTORICAL PERSPECTIVE

Let us begin digging our roots by asking: "How many of us would be working in our current professional positions if the

year was 1970 instead of 1995?" Only a few people can honestly answer that they would. Twenty-five years ago, in 1970, many of our present professional opportunities neither existed nor would be open to us because of our gender, a disability or our cultural, ethnic and/or educational backgrounds. There has been a shift in corporate culture values. Our current occupational era is one in which we achieve and succeed based upon what we know and how we perform.

Think about how we work in the 1990s compared to how we worked in the 1970s. How many professors or researchers would like to complete bibliographic searches or crunch statistical numbers manually, without technology or computers? Or make presentations with chalkboards and slides instead of videos, interactive T.V. or CD ROMS? Do paint store associates want to mix paints by the old fashioned guess method instead of computerized analysis? Do car assembly line workers prefer to stand on a shop floor, manually attaching bolts to a car instead of running the computer to do this? How many medical doctors wish to diagnose or operate without sophisticated technology, and who wants to be his or her patient without it? To report that our work environment has changed is an extreme understatement.

As we grew up and worked in 1940s, 50s or 60s America, there was a solid and consistent image of jobs, workers and the context of work. There were two groups of workers--proletarians and knowletarians. One group functioned independently from the other and had limited interactions with people from the other group.

Proletarians were the laborers in our factories, organizations and businesses. Traditionally, they were called the "backbone of America", "blue collar" and "pink collar" (certain functions such as assembly line workers and salesclerks) workers. Literally and figuratively, they fueled our economy by producing parts and products for sale locally, regionally and within limited regional continental markets. Proletarians worked with their hands and hearts, producing through repetitive, simple and sequential steps. They used less brain power in their jobs and controlled or monitored very simple, if any, information. Their energies were spent in physical labor with a narrow sphere of influence and perspective.

Knowletarians were owners, managers, supervisors and professionals. They supervised, controlled and managed the design, production, distribution and investment functions and delivered professional services. Traditionally, they were called the "movers and the shakers of America", "white collar" and "pink collar" (certain functions such as nurses and teachers) workers. They worked with their hands, hearts and minds in activities that more mental than physical. They worked through and with people to control and manage information and resources.

The relationship between the proletarians and knowletarians reminds me of a see-saw (also known as a teeter-totter) that was common playground equipment during the 40s, 50s, and 60s. It was one long narrow piece of wood or metal with a handle bar at each end. The see-saw was balanced or supported off the ground by a

fulcrum that supplied the leverage for action. When you played on a see-saw your options were to: 1) gently rock each other up and down; 2) achieve and maintain a very delicate balance of suspended animation or 3) forcefully bounce the other person off the see-saw.

In the see-saw workforce analogy, the proletarians rode at one end of the see-saw and the knowletarians at the other. The fulcrum that supplied the leverage for action was their distinctively different "*Know-How*"--the amount and type of information they knew and how they used it. It was not unusual to hear workers say: "I know how to do my job. I've been doing it for years. This is my area. You just stick to your job and leave mine to me." It was a very competitive environment and one in which the two groups of workers did not collaborate or interact well together.

The see-saw illustrates the human dynamics of the workforce during the Manufacturing Era in America. There were few if any structural or systematic reasons for the two different groups of workers to mix. They worked as though they were at opposite ends of a plank. Their *Know-How* was so different and secular that there was a lot of bouncing taking place on the see-saw. When the see-saw was balanced, it was very precarious. When the see-saw was off balance (as it frequently was), one group of workers tried to bounce off the other, either by inertia, lock-outs, strikes or sabotage.

Currently, according to futurists, America is in a transition period between the Manufacturing Era and a new Informational and Service Era. The predominance of land, labor and capital (the bases of wealth in the Manufacturing Era) are being de-emphasized in the Information and Service Age. Information and services, supported by computer and communications technologies, are becoming the principal bases of wealth in our present and future. In Table 1, the changes in the industrial sectors of America are illustrated.

TABLE 1: PRINCIPLE SOURCES OF WEALTH IN AMERICAN INDUSTRIAL ERAS

18th -19th CENTURY	Agriculture
20th Century	Agriculture Manufacturing
21st Century	Agriculture Manufacturing Information Service

During the Agricultural Era, production and shipment of food products was the dominant industry and employed the most people. Manufacturing (production and distribution of goods and products for consumption such as cars, steel and lumber and military goods) was the big industry of the 20th Century. The Agricultural sector still existed but it was not a growth area and employed

fewer people than the Manufacturing sector.

In the present and predicted future, (21st Century), the Information and Service industries are the largest areas of growth and employment. There will still be Agricultural and Manufacturing industries but they will employ fewer people and will be shaped by innovations, inventions and trends of the Information and Service industries (See Table 2).

TABLE 2: EMPLOYMENT GROWTH BY MAJOR OCCUPATIONAL GROUP 1990-2005

OCCUPATION	PERCENT CHANGE
Technicians	37
Professional	33
Service	28
Managerial	27
Sales	24
Administrative Support	13
Precision Production	12.5
Agriculture Related	4
Operators, Laborers	3.5

(Source: Reich, R. (1994). pp. 6 & 7.)

Computers combined with communications technology are the major tools shaping and supporting the Information and Service Industries. It affects our country and world by making more information and better service available faster and in different formats. With more information readily available, we are able to provide more in less time with faster service and higher quality. The computer and communications revolution contributes to the

efficiency and effectiveness of production, distribution and consumption of goods and services; it also affects the culture, education, psychology and sociology of communities.

DESCRIPTION OF THE 21ST CENTURY: FAST QUALITY KALEIDOSCOPIC WORLD

The characteristics and outcomes of the 21st Century work environment are different from those of the past. Some of the changing characteristics are: 1) greater competition within and beyond our Continental borders for goods, products and services; 2) computers, new equipment and processes that need to be learned and revised; 3) more and constantly changing information to be produced used and stored about people, products, markets, etc.; 4) an explosion in the type and numbers of jobs in the information and service sectors and 5) older, smaller and demographically diverse workforce that need specialized preparation.

These changing characteristics require new types of outcomes and ways of measuring corporate success. In the Industrial Era, productivity was measured objectively in terms of units per minute and employee retention, etc. They were measured through cost-effective ratios and formulas that quantified units of production per resources expended. In the Service and Information Era, these objective measures are combined with additional formulas--such as cost-benefits across time--to measure quality, innovation and teamwork. As the competitive advantage shift to people and corporations who produce more for less (time,

personnel and money) at a higher quality and invent, innovate and invigorate ideas, people, products and services, additional quantitative and qualitative outcome measures are being developed and utilized.

Now, and in the 21st Century, there is and will be little "business as usual". People are working and will work at home, in offices as part-time, full time or contingency workers in teams webbed and networked across continents, cultures and/or areas of expertise. They will produce, control and invent information, products and services that are supported, supplied and managed through a maze of electronic, cellular and extragalactic devices that, at a minimum, produce sensory overload for those who "haven't kept up".

Keeping-up (knowing what you need to know and applying it) is the new competency for many workers. The shelf life (current, operational and unexpired) of knowledge, especially technical knowledge is rapidly decreasing. Some people feel that workers will need to be retrained every three years to provide the same function (if that function still exists).

Occupational *know-how* is also changing drastically. Artists work with computers to mix colors and sound bites. Trainers and teachers work with videodiscs, electronic walls, interactive videos, and satellites. Architects, economists, pharmacists, scientists, physicians and military strategists make computer graphic models or scenarios and/or complete statistical testing of strengths and interactions with computers, then fax them

instantly or by overnight services to colleagues all over the world for instant feedback and negotiations.

To meet the demand for higher quality in less time, people must work together. Engineers developing a new product work with input from customers, suppliers, distributors, manufacturers and repair technicians on design specifications. These products may be video games, laser scopes, cars, space ships, newsletters, distance education and/or direct mail inserts. He or she no longer works in a vacuum and says, "Well, that will be their problem to solve!". All professionals will work with other people who design, install, operate and service.

Occupations are beginning to resemble Nintendo or Sega games that demand quick responses, new information and interaction with partners. The vast diversification of work and the current *know-how* needed to be successful, create three types of workers.

These three types are reflected in the 1991 Bureau of Labor Statistics Report. Listed within this report are three occupational groups and the educational requirements expected for each. A sampling of these positions is listed below (See the Appendix for complete listing):

> "GROUP 1 - Occupations generally requiring at least 4 years of college or more: system analysts, computer programmers, professionals, top executives and managers.
>
> GROUP 2 - Occupations generally requiring some post-secondary training or extensive employer training: paralegals, assistants, equipment repairers, operators, registered nurses and cooks.

GROUP 3 - Occupations generally requiring high school graduation or less education: clerks, food related workers, home health aides, janitors, salespeople and truck drivers." (Source: Congressional Quarterly (1992), p. 27.)

The 21st Century workforce will have proletarians and two types of knowletarians (infotarians and technitarians). The Bureau of Labor Report's Group 1 and Group 2 positions will be filled by Knowletarians and Groups 3 by Proletarians. The division between the groups is caused by vast differences in their "know-how". The 21st Century Workforce is summarized in Table 3.

Fewer and fewer functions will require physical labor and little information--the arenas of proletarians. Most of these duties will be performed by computers and robots. People who function in the proletarians' positions will enter the workforce with little education, fewer social skills and minimal prospects.

More and more jobs will require mental energy, accessing and manipulating data bases and knowledge--the arena of knowletarians. Knowletarians will access and manage vast amounts of new information and will be interconnected and interdependent on technology and other people. The increasing number of functions and people and the complexity and volume of information to be applied (*"know-how"*) within the knowletarian category causes the division of infotarians and technitarians.

Infotarians manipulate and create abstract theoretical constructs like human development, artificial intelligence, quality, learning, democracy and economies. They create new

TABLE 3: 21st CENTURY WORKFORCE

KNOWLETARIANS **Infotarians**	**KNOWLETARIANS** **Technitarians**	**PROLETARIANS**
Manipulate & Create Conceptual Information	Manipulate & Apply Discrete Information	Complete directed actions
Abstract Global Thinkers	Abstract Detailed Thinkers	Concrete Task Thinkers
Field Independent	Field Dependent	Specific Task Dependent
Macro Perspective	Micro-perspective	Location perspective
Detachment from Daily Operations	Involvement in Daily Operations	Complete routine tasks
Interact with diverse people	Interact with diverse people	Interact with diverse people

information and spheres of applications while being relatively detached from minute details of daily operations. Since they operate from a macro-global perspective, they are generally field independent, holistic and conceptual thinkers. Doctors, lawyers, CEOs, professors, managers, economists and system developers are infotarians.

Technitarians manipulate discrete and precise procedures, instruments and people. They apply, innovate and adapt information and operate within a specialized micro-perspective. They are usually field dependent and know everything there is to know about a specific operation or set of operations. Technicians, registered nurses, service agents and assistants are examples of technitarians.

When this 21st Century Workforce is analyzed the growing and diverse spectrum of *know-how* is revealed. Individual workers know different and specialized information, language, procedures, perspectives and culture, and how they apply these components is very distinctive. How they work is largely determined by what they know, how they access it and how they apply it. They need each other to complete a product, system or service from inception through delivery and evaluation. No one person has mastery or command of all the *know-how* necessary for success.

Therefore, the 21st Century workforce with its diversity, different levels of preparedness and interdependency, isn't a workforce illustrated by a sturdy see-saw with a balancing fulcrum. Instead, it is an incredibly fluid mosaic of diverse

interactions, dependencies and specialties. It is more like a kaleidoscope with different parts reckoning, revolving and regenerating. When this mixture is aligned, a powerful mosaic is created. When something needs adjustment or is off line, blurred vision and stress exists.

The dynamic and constantly changing global, informational and service society creates needs that did not exist in the Manufacturing Era. The need to interact with other people in order to manage chaos, create competitive cooperation and produce high quality innovations requires a new set of knowledge, skills and attitudes. Therefore, training and educational systems must respond.

Leaders of Human Potential/Training Departments and colleges and universities need to understand the distinctions and interactions of this kaleidoscopic workforce. When we understand and anticipate the trends and workforce characteristics, we are less likely to misallocate precious resources on an historically passe paradigm and short-term training.

The Kaleidoscopic Paradigm Shift presents us with a dilemma: How do we prepare for information and technologies yet to be dreamed and invented? We do not know what new information *(know)* and techniques *(how)* will be created in the future. Since we cannot train or teach people on equipment, systems and routines not yet invented or produced, we must equip and train them to be able to handle, respond to and energize the new technologies and human configurations that emerge.

The strategic solution for this dilemma is to prepare people in five distinctive categories of knowledge, skills and attitudes that will equip workers to alter, adjust or adopt whatever is inspired, invented or inverted. These are: 1) Basic Skills (reading, writing, arithmetic and computer applications); 2) Functional Professionalism (management, marketing, teaching, human resources, research, etc.); 3) Learning Levers (how to learn); 4) People Power (how to succeed with other people) and 5) Awesome Thinking (how to think). Upon the solid foundation of basic skills and functional professionalism, the three new (or newly understood and crucial) areas of Learning Levers, People Power and Awesome Thinking are added. The Success Formula for the 21st Century is: Basic Skills plus Functional Professionalism plus Learning Levers plus People Power and Awesome Thinking. (See Table 4).

Most of the educational components within the Basic Skills and Functional Professionalism categories existed in the Manufacturing Era and still serve as the foundation for occupational performance. The major shifts in these categories are: 1) computer applications is added as a basic literacy skill, 2) corporate culture adaptations of functional skills are more extensive and diverse because of the vast differences between and among companies and 3) corporate training departments are increasingly more involved in the review or remediation of basic skills.

TABLE 4: 21st CENTURY SUCCESS FORMULA

LEARNING LEVERS	PEOPLE POWER	AWESOME THINKING
Concentration	Collaboration for Competitive Edge	Creative Productivity
Types of Intelligences Awareness	Multicultural Magnificence	Critical and Evaluative Analysis
Learning Styles Engagement	Negotiating Through Conflicts	Futuristic Forecasting and Planning
Memory: From Recall to Application to Evaluation	Personality Styles	Logical plus Circular Thinking
Cooperative Learning Strategies	Serving Customers, Clients, Constituents and Co-Workers	Media Mania
	Speaking and Listening	Solutions Oriented Decisions
	Team Triumphs, Tests and Togetherness	Team Thinking

FUNCTIONAL PROFESSIONALISM: Adapted to Corporate Culture
BASIC SKILLS: Reading, Writing, Math and Computer Applications

Learning Levers are the categories of skills, knowledge and attitudes needed to handle the problems of speed, application and retention of learning. We frequently hear people say: "It is so overwhelming; Too much to learn; I can't keep up; I never did well in school; I give up; and It doesn't transfer!"

Effective courses or workshops in this area help participants master concepts of concentration, multiple intelligences, learning styles, memory development and cooperative learning. Learning levers help people begin to understand, celebrate and expand their learning capabilities. Each person is unique in their interests and experiences with learning. This uniqueness, when understood and developed, can be leveraged to produce outcomes of faster learning, practical application, long term retention and transfer and synthesis to new situations.

People Power is the category of knowledge, skills and attitudes that addresses the problem of specialized workers collaborating, intertwining and colliding. A structural mandate to work together does not ensure productivity. How many times have you heard people, reorganized to work together, shout: "Oh, sure this will work! They are just trying to save money. She is so different. He is so aggressive. We don't even talk the same language, much less think alike, so how are we supposed to do this together?"

Unfortunately, the initial negatives about working together are broadcast louder than the smooth and enjoyable positive

experiences that emerge (in reality, not just rhetorically) once people navigate through the rough waters of differences. Once the energy force is understood and the prevalent strengths are intertwined and channelled, there is a powerful force and subsequent outcome that surpasses any individual effort.

The areas of information, skills and attitude needed to channel this galactic force are: 1) the competitive advantage of working in harmony; 2) a vast range of multicultural specialties; 3) the styles of negotiating; 4) personality characteristics; 5) service strategies and solutions; 6) speaking and listening nuances and 7) promise, potential and production of cross-functional teams.

Awesome Thinking is the remaining ingredient in our Kaleidoscope. "Business As Unusual" requires creative, reflective and effective thinking. Do you remember the last time you stood in awe of something? For most people it was time of silent reflection when people say or think to themselves--WOW! How did he or she do that?

These "awesome" people know what they need to know, know how they know it and know what to do with it. Their awesome knowledge, skills and attitudes include: creatively productive thinking, critical and evaluative analysis, logical plus circular processing, media mania, solution oriented decisions and team thinking. In the 21st Century the prizes, accolades and enrichment will go to people who together create, innovate and evaluate the novel solutions.

With the knowledge, skills and attitudes in these five areas, people will be prepared to handle the demands of fast applied learning and communicating, production with diverse individuals in cross-functional teams and creation of innovative products, services and markets. This is what we need for our Fast Forward Era in which our future is yet to be discovered.

FAST FORWARD FOURSOME INTO DISCOVERED FUTURE

This fast forward future reminds me of a story about a trip in the past. The story illustrates and symbolizes the four major elements needed for success now and in the 21st Century. The story, rooted in Middle America, describes a female, her three friends and a future destination--off to see the Wizard, the wonderful Wizard of Oz. Each character--Fast Forward Foursome--illustrates a quality or characteristic of our present and future workforce.

"If I could only **go back**". How many times have you heard or thought that? To many of us, the changes taking place in corporate life seem like a tornado force wind and we want to go back to the good old days. Well, unlike the story we cannot go back, and, honestly, the past isn't always as great as we fantasize it was.

"If I only had **a brain**". Most of us have a brain with incredible untapped capacities way beyond our initiatives. Understanding your personal learning style is the key to unlocking all this untapped power. When you understand how you

We are the Wizards of AH HAs! As wizards, we help people learn so they will achieve success in the present and future. When we do this, we develop and focus our brains, hearts and courage together.

(Author: Donna D. Lenaghan is President of IQ Enterprises, an Organizational Development and Training Company, and Professor of Behavioral Studies at Miami-Dade Community College. For information about organizational development services and workshops, please call 305-829-8224).

APPENDIX

BUREAU OF LABOR STATISTICS OCCUPATIONAL PROJECTIONS BY YEAR 2005

Group I: Occupations generally requiring a bachelor's degree or more education

- Systems analysts and computer scientists
- Physical therapists
- Operations-research analysts
- Psychologists
- Computer programmers
- Occupational therapists
- Management analysts
- Marketing, advertising and public relations managers
- General Managers and top executives
- Teachers, secondary and elementary schools
- Accountants and auditors
- Lawyers

Group II: Occupations generally requiring some post-secondary training or extensive employer training

- Paralegals
- Radiologic technologists and technicians
- Medical assistants
- Physical and corrective therapy assistants and aides
- Data-processing equipment repairers
- Medical-records technicians
- Surgical technicians
- Cooks, restaurant
- Respiratory therapists
- Licensed practical nurses
- Maintenance repairers, general utility
- Teacher aides and educational assistants
- Registered nurses
- Legal secretaries
- Medical secretaries

Group III: Occupations generally requiring high school graduation or less education

- Home health aides
- Human services workers
- Personal and home-care aides
- Correction officers
- Travel agents
- Flight attendants
- Salespersons, retail
- General office clerks
- Cashiers
- Food counter, fountain and related workers
- Truck drivers, light and heavy
- Nurses aides, orderlies and attendants
- Food-preparation workers
- Receptionists and information clerks

(SOURCE: Cooper, M. 1992. CQ Researcher,2, pp. 186)

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