From Gutenberg to Juan Doe: The Dulling of Quills, The Inking of Fingers, and the Bluing of Collars

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Print as the Impetus to Societal Change—a Historical Perspective

The graphic communication industry has experienced a vast amount of change over the past 500 years. Since Johann Gutenberg's invention of moveable type made of lead, tin, and antimony, to the introduction of Steve Job's Apple Computer, technology has ultimately been the guiding force for which this industry has progressed. Most importantly, the people who have worked in this industry have inevitably felt this change. Whether through the loss of jobs, inadequate training, attrition, or lack of interest and/or insight on behalf of the work force, the advent of technology has generated significant change, not just in terms of economics or finance, but on a socio-cultural plane that sets apart the classes associated with the working environment, i.e. the white-collar and blue-collar workforces.

Measuring changes that have occurred within the graphic communication industry can be expansive, complex, and stagnating. Technology, albeit, has affected every business entity in the world. Moreover, the printing business, or craft as it was once recognized, required skilled artisans and craftsmen to produce the printed word that became the cherished information appropriately disseminated among the masses of individuals within a given community. Generally this occurred in the form of a book, or flier, poster, or writ. Because of the value placed on this information, the printery was well respected—as were the employees who assisted in producing the end products. Over hundreds of years and the evolution of offset lithography, printing has become less expensive and faster. Technology alone has moved this craft-based industry into a highly profitable volume-producing commodity. As production speeds have increased, output volumes inevitably have became larger, and, as a result, the demands upon the workforce have become greater thus prompting significant growth in the labor force. The ironic turn of events associated with technology is that it constantly improves. Newer technology consistently replaces older technology. Because of the advances made in the field of Computer Integrated Manufacturing (CIM) and automation, printing equipment—once requiring a three-person crew—now only requires a single person. Additionally, with such rapid changeover regarding technology placement, much knowledge (both tacit and explicit) is lost resulting in a poorly informed, minimally trained workforce.

As equipment became more and more automated in the 1980's and production volumes increased ten-fold, business and corporations starting purchasing and installing even more technology. While management became entranced on focusing on the bottom-line and increasing production yields, the blue-collar workforce fell to become a second and often third priority with regards to training and advancement. New technologically advanced equipment requires comprehensive and expensive training. As a result, more white-collar personnel and middle-management became trained in the operation of the equipment. However, lacking daily operation experience, this "trained" workforce still required the daily production equipment operators to assist them. Many businesses were unable to realize the increase in profits or efficiencies because of the communication gap that existed between the two forces.

Additionally, as the printing press was becoming retrofitted with computer interfaces and remote diagnostic devices, and e-mail transactions became the protocol for interdeartmental communication, press operators were forced to write reports, memorandums, and maintenance logs (among other items) electronically. Confused by the overall sophistication of the automation placed on their printing equipment, compounded with their inexperience or lack of ability to communicate through writing composition, the force has become disenfranchised, disengaged, and fearful of employment termination.

How can five hundred years of technological innovation in an industry founded on the skills of a rhetorician-craftsman-artist-editor have evolved into a class system comprised of blue-collar workers who, through the impetus of technology, are inadequately prepared to communicate discourse through electronic written media? The primary objective of this forum is to explore modern social theories that focus upon societal change, most specifically, as it relates to technology. Works from theorists such as Birkerts, Blumer, Ferre, Patterson, Rubin,

Steward, and Veben will be analyzed, contrasted and compared and then integrated with historical perspectives that focus upon the printing revolution based on theories from Burke, Deacon, Eisenstein, Fevre and Martin, McKenzie, McLuhan, and Ong. Each writer has explored the significance of change as a contributor to our multicultural society. Through analysis and comparison of each of these writings, it anticipated that a cathartic synthesis will emerge exposing the underlying foundation for furthering exploration in improving and/or addressing training initiatives as they relate to technology and the blue-collar printing production workforce—a workforce that has removed the ink from their pens and onto their fingers as a direct result of capitalism. It is truly the bluing of collars.

The Printed Word—The Catalyst to Societal Change

The printing press laid the basis for both literal fundamentalism and for modern science. It remains indispensable for humanistic scholarship. It is still responsible for our museum-without-walls.
—Elizabeth Eisenstein (1976b, p. 704, para. 1)

Martin Luther's Reformation from the Roman Catholic Church is synonymous with societal change. It was the public display and eventually reproduction of his 95 Theses that began such a radical movement. Bringing the information to the masses in a common language understood by that very community was paramount for the success of the reformation. Of course, had it not been for the printing press (and the ability to lock moveable type in a chase), Luther's 95 Theses would have been hand copied in the scriptorium of the local monastery and disseminated exclusively to clergy within the church. The local community would have most likely not been informed of his ideas, and if so, most likely through oral formulation. The printing press, however, provided an excellent means for mass producing Luther's writings in the vernacular; copies were handed out to crowds gathered in village squares. Because Luther wanted his writings to be understood by the common parishioners of the village, he authored his writ in German, thus resulting in the eventual fueling for the evolution of the Reformation.

In fact, Febvre and Martin (1976) credit Luther for the transcendence and modernization of the entire German language through his printed words. In their book *The Coming of The Book: The Impact of Printing 1450-1800,* Febvre and Martin (1976) wrote, "By encouraging the multiplication of the number of texts available in the vernacular the printing press everywhere favoured, as it had done in Germany, the development and systematisation of the language of the nation" (p. 323). The Reformation sparked a great movement in translation of sacred and secular works into common spoken languages as opposed to the traditional Latin translations generally incomprehensible to non-Latin-speaking commoners.

This movement, in and of itself, bred a whole new revolutionary set of issues never before witnessed by humankind. Disciplines and trades that were seemingly different and exclusively unrelated were instantaneously introduced to one another and forged into alliances that provided for a means in which to produce books. Thus, new and innovative skills became demanded of the basic and general printer; and not just craft-based skills, but intellectual, communicative, and variegated skills as well. A collaborative combination of occupational experience emerged within the printery, especially in university towns. Stationers, copyists, illustrators, ateliers, goldsmiths, leatherworkers, monks in scriptoria, clerks of the courts and chanceries, and clergy compiling sermons all found a very profound and deep interest in printing. According to Elizabeth Eisenstein (1979a), "The advent of printing led to the creation of a new kind of shop structure; to a regrouping which entailed closer contacts among diversely skilled workers and encouraged new forms of cross-cultural interchange" (p. 55).

Therefore, printers quickly emerged as prominent business entities within the aristocratic community. "In those places where his enterprise prospered and he achieved a position of influence with fellow townsmen," posited Eisenstein (1979a), "his workshop became a veritable cultural center attracting local literati and celebrated foreigners; providing both a meeting place and message center for an expanding cosmopolitan Commonwealth of learning" (p. 56).

As the printed book became increasingly more popular, there developed a greater need for the translation of existing classical secular and sacred works. In addition, without the existence of punctuation, grammar, or spelling guidelines, printed pieces began to look unorganized and, as a result, had tendencies to be misread or confus-

ing. Rules for punctuation, grammar, and spelling became prevalent as printers began to organize text and prepare it for printing. Much of this burden (or opportunity) fell to the printers. Febvre & Martin (1976) wrote, "Spelling long remained subject to the whims of foremen and compositors: authors might complain but they could not prevent it. Little by little, however, standards were fixed, not so much by a priori principles invented by innovating theoreticians as by the slow changing of habits" (p. 327).

Again, from this once craft-based trade blossoms the new aristocratic intellectual scholar-printer who has been given accord for developing the linguistic world that bridges the sacred with the secular, the aristocracy with the peasants, the foreigners with the natives, and God with the people.

No other noble English printer researched throughout history has been given such recognition for his contributions to printing, and, most importantly, the English language and literature than William Caxton (1422-1491). Caxton has been accredited with translating and printing the first book in the English language: *Recuyell of the Historyes of Troye* (Deacon, 1976). This particular piece was allegedly completed in 1471 and presented to Mary of Burgundy. Most particularly, Caxton is widely studied by literary scholars because of his enlightening and intrinsic inscriptions often placed at the beginning or end of his translations. At the end of Ruceyell of the Historyes of Troye, Caxton wrote (Deacon, 1976):

> *Thus end I this book, which I have translated after mine author, as nigh as God have given me cunning to whom he given the laud and praises. And for as much as in the writing of the same my pen is worn, mine hand weary and not steadfast, mine eye even dimmed with overmuch looking on white paper, and my courage not so prone and ready to labour as it hath been, and that age creepeth on me daily and feebleth al the body; and also because I have promised to divers gentlemen and to my friends to address them as hastily as I might this said book, therefore I have practiced and learned, at my great charge and expense, to ordain this said book in print, after the manner and form as you may here see; and it is not written with pen and ink as other books are, to the end that every man may have them at once. For all the books of this story named Recuyell of the Histories of Troy,*

> *this imprinted as ye see here, were begun in one day, and also finished in one day. Which book I presented to my said redoubted lady as afore is said, and she hath well accepted it and largely rewarded me.*
> —*(Deacon, 1976, p. 87, para. 3).*

Deacon (1976) provides valuable insight into interpretations of Caxton's writing. Deacon points out that Caxton—in writing that the book was printed and bound in one day—is essentially Caxton's way of selling the printing press as a new and innovative method in which to quickly disseminate knowledge and information, making it available to the public within the confines of one day. This inscription is his lament for the newly born process known as printing. In addition, what this piece contributes to the mindset of Caxton, a trade printer, is the inherit value placed by him on mankind's ability to translate foreign literature into the native language of his own country of origin, England.

As the art of printing began to emerge all across Europe, more and more printers—predominately scholar linguists and purveyors of the written word—began to see the real assimilation between writers and readers. Deacon (1976) posited, "But as Caxton printed books so his critical faculties were stimulated and so he began to grasp that a dialogue between readers and printers, or readers and editor and translator, was essential" (p. 139). Because of this metamorphosis, printers began to take liberty in the modifying the rhetorical structures of texts that they began to print. They changed wording, they enhanced translations, they inscribed annotations, they added punctuation, they took simple combinations of words in which they added structure and meaning, and provided the foundation in which these words could be woven to form a literary experience for those who could read. They brought about an enhanced sense of civility to the culture in the form of codified expression. "Printing," wrote Febvre & Martin (1976), "thus helped to render the national languages increasingly sophisticated as modes of expression, and in the 16th century they established, on an unquestionable basis, their claim to be languages with an independent literature" (p. 328). Additionally, Eisenstein (1979b) asserted: "The communications shift altered the way Western Christians viewed their sacred book and the natural world. It made the words of God appear more multiform and His handiwork more uniform. The printing press laid the basis for both literal

fundamentalism and for modern science. It remains indispensable for humanistic scholarship. It is still responsible for our museum-without-walls" (p. 704). Hence, the evolution of printing is an ever-increasing and opportunistic commerce.

By the mid sixteenth century, the printer emerged as prominent player in the local aristocracy. Eisenstein (1979a) contended that the printer became a substantial figure within the community as a key liaison to many business centers. While managing money, supplies, production schedules and estimates, forecasting markets, and appeasing labor, "He had to keep on good terms with officials who provided protection and lucrative jobs, while cultivating and promoting talented authors and artists who might bring his firm profits or prestige" (Eisenstein, 1979a, p.56).

The manufacturing of print is the impetus to a movement of societal change like no other phenomenon experienced in the history of mankind. The printed word has contributed to the evolution of highly knowledgeable societies that have created and designed technologies that have advanced them beyond all imagination. The codification and dissemination of knowledge and thought—both physical and metaphysical—presented in the form of printed words (i.e. the book), has been the sole and preferred vehicle of knowledge transference for over 500 years. With this progression has yielded the evolution of the printer from craftsman and artisan to prominent aristocratic businessman and has seen an industry grow from a locally owned sole proprietorship community establishment to a multi-national billion dollar manufacturing industry. Of course, all of this progress has contributed to even more existential change illuminating the pathway for the evolving forces of print.

The Power of the Pen

Elizabeth Eisenstein (1979b) argued that the vast movement of change sparked by the invention of the printing press has continued to generate "additional momentum in the age of the computer print-out and the television guide" (p. 704). Her remarks are entirely true, for the print industry has grown exponentially just over the past 200 years. The overall success of printing as an industry, however, would not have transpired if it were not by the power of the written word. The act of writing encompasses the physical documentation of thoughts

through the expression of words in the form of sentences that convey meaning. Writing is the codification of mental stimulation, processes, and thoughts that can inspire, inform, and/or invoke change within the very soul of the one who reads it. Print is simply the vehicle in which to carry the words and the writing. Henri-Jean Martin (1994) wrote, "No invention has struck people's imagination quite as much as the invention of printing, nor has any been as glorified by its contemporaries, precisely because it involved things of the mind" (p. 227). Of course, writing, synonymous with the academy, requires an advanced level of intellectual processing, a skill that is learned and continuously honed. Therefore, those who possessed the skills to write, at least as seen in the eyes of those living in fourteenth century Europe, must be part of the social elite. "In the hands of the bourgeoisie," wrote Martin (1994), "whose emergence was connected with the use of writing, it was an instrument of power used to combat the aristocracy" (p. 22). It can be assumed then, that a significant number of the merchants who took to the art of printing could read and write—at least those who evolved to become prominent figures within their communities.

With the ability to write, and the ever increasing popularity of the book with respect to the public, printers assumed an even more advanced role within the hierarchical organization. Public writings associated with administrative proclamations, judiciary documentation, and financial recordings began to fill shelves at public archives and institutions. Such a movement exemplifies how the expanding uses of writing extended the systematic advancement of Western societies (Martin, 1994). With this newly found power, the printer became highly respected entity within the monarchies ruling their given territories. For with the printing press, and the skilled printer well versed in the skills of writing, the presiding governing body could enhance its power base by communicating to its constituency. Such communication could be conjured as such to be both manipulative and encouraging. Martin (1994) reported that a movement was started to standardize pronunciations stemming from different dialects of spoken French. In order to do this, marks were invented in order to instruct readers when and how to pronounce a given word. Martin (1994) wrote, "Since any standardization of the sort could be effected only with the aid of a printing press, it was essential to have the necessary characters cut and to persuade both the typographers and the public to change their

habits" (p. 500). Furthermore, this reform was fueled by humanist printers familiar with Latin and Latin grammar. They, as a result, became closely protected by the reigning king and soon became a favorable addition to the existing chancery and royal courts—a movement referred to by Martin (1994) as "monarchic centralism" (p. 500).

Print as the Impetus to Societal Change—a Modern Perspective

No other contemporary scholar's work has echoed the sentiments of the intrinsic importance of printing as a catalyst to social change than Marshall McLuhan's *The Gutenburg Galaxy: The Making of Typographic Man* (1962). McLuhan generates a very challenging, in-depth, highly-intellectualized, and compelling argument on the positive and negative ramifications of printing and the evolution of literary, communicative, and technological advances that have collaboratively yielded a modernized society. Although similar to Julian Steward and his theories regarding multilinear evolution and cultural ecology, McLuhan analyzes more closely the implications of printing technology as the major contributor to social change and modernized civilization. McLuhan (1962) argued that printing, in its earliest forms dating back to the seventh century China, was merely a way in which to codify and display spiritual ideographs en masse in order to visually direct a cultural following. "Print was an alternative to their prayer-wheels and was a visual means of multiplying incantatory spells, much like advertising in our age" (p. 34). His argument is that even though the content was not based on capitalistic gain, print was a method in which to manufacture a vehicle (paper and ink) that communicated a message repetitively. This would equate to contemporary marketing theory involving marketing saturation and the ability to embed content in consumers' minds through instantaneous recognition. Print, in essence, is about repetition.

Of course, printing and literacy are two concepts that go hand-in-hand. McLuhan argued that literacy—a direct result of printing technology—has gradually distanced members of society from true societal and cultural bonds. In other words, the more literate or well-read individuals in society become, the more they become detached and independent of that society (p. 76). McLuhan (1962) posited, "Until now a culture has been a mechanical fate for societies, the automatic interiorization of their own

technologies" (p. 76). His belief is that the introduction of technology and, most importantly, printing technology, degenerates an individual's need and dependence on community. From a simplistic linear perspective, his argument could be summed up as: printing begets literacy begets independence begets osmosis and the continual splitting and re-splitting of communal groups. "The difference between the man of print and the man of scribal culture" wrote McLuhan (1962), "is nearly as great as that between the non-literate and the literate" (p. 90).

Clearly, as societies evolved and cultures emerged, the mechanization of print provided a new method in which to mass manufacture a tangible product with an indefinite life-cycle that could be bought and sold on the open market. McLuhan (1962) contended, "[p]rint was the first mass-produced thing, so it was the first uniform and repeatable 'commodity.' The assembly line of moveable type made possible a product that was uniform and as repeatable as a scientific experiment" (p. 125). Until the introduction of moveable type, products sold on the market were individually crafted by hand. Potters, blacksmiths, weavers, coopers, and carpenters all single-handedly built or constructed their wares one-by-one. This resulted in low productivity and low market saturation. Additionally, from the eighth to fifteenth century, books were hand scribed by young monks who sat for endless hours in their monastery's scriptorium copying texts day-in and day-out. This yielded a book every two months or so. Because of this method of reproduction, books were extremely expensive and could only be obtained by the more affluent population and/or clergy—who were literate. As a result, the art or craft of calligraphy gave way to the printing firms and publishing houses, thus forcing scribes to either join the print production milieu or enter the realms of book selling.

The word literate assumes that a person has the cognitive ability to visually recognize phonetic symbols that form words and sentences and purvey contextual meaning in the form information and—most importantly—knowledge. With the evolution of a literate society, print has been able to make accessible and advance all forms of knowledge to the entire literate population at their convenience. Book shops and libraries emerged to sell and house books and manuscripts for the community. Print is the catalyst to knowledge access and, as we shall see, the evolution of the world of electronic communications. Regardless, no other form of mechanization has changed

the instantaneous availability of information than printing technology. McLuhan (1962) wrote, "This principle of translating non-visual matters of motion and energy into visual terms is the very principle of 'applied' knowledge in any time or place. The Gutenberg technology extended this principle to writing and language and the codification and transmission of every kind of learning" (p. 155).

Like McLuhan, Sven Birkets (1994) postulates that the successor to print—as an agent of significant social change—is the world of electronic communication. Although less concerned than McLuhan with the historical value associated with the technology surrounding printed matter, Birkets (1994) argues that society is currently experiencing a paradigmatic shift from the printed word. He writes, "This shift is happening throughout our culture, away from patterns and habits of the printed page and toward a new world distinguished by its reliance on electronic communication" (p. 118). Birkets' (1994) appreciation for the significance of print as a quintessential factor for the evolution of literacy is not paramount to his theory of the major current changes affected by the Internet and electronic communications. "Print communication requires the active engagement of the reader's attention, for reading is fundamentally and act of translation. Symbols are turned into their verbal referents and these are in turn interpreted," writes Birkets (1994), "Print also posits a time axis; the turning of pages, not to mention the vertical descent down the page, is a forward-moving succession, with earlier contents at every point serving as a ground for what follows" (Birkets, 1994, p. 122).

Birkets (1994) argues that the electronic order—experienced today through the Internet—is essentially opposite to print in that information travels through a network of channels easily accessible to everyone engaged or authorized to engage in the stream of data. In other words, the information in a book is only accessible to whomever possesses it, whereas, electronic information is accessible to everyone simultaneously. "If the print medium exalts the word, fixing it into permanence," Birkets (1994) contends, "the electronic counterpart reduces it to a signal, a means to an end" (p. 123).

Unconscionably, the evolution of society has been greatly and adversely affected by the printed word as a product of revolutionary technological advancements of print mechanization. Through the development of literate cultures and acting as the conduit for major political reformation, printing and the product of print—words—have shifted humanity over the past 500 years into a progressive civility like no other catalyst of change. Additionally, the printing process and the technology associated with it have risen into the commercial sector to become the third largest revenue generating industry in the world. As a result, many printers have earned a great wealth and have lived financially secure and productive lives. Throughout all of this great change, however, one minute yet highly important component of the printing industry has transitioned through time to become second to the technological advancements of the industry—the print production worker.

The Evolution of the Blue-Collar Print Production Employee

Skill acquired in any printing-house or any city is easily turned to account in almost any other house or city; that is to say, the inertia due to special training is slight. Also, this occupation requires more that the average of intelligence and general information, and the men employed in it are therefore ordinarily more ready that many others to take advantage of any slight variation in the demand for their labour from one place to another.
—Thorstein Veblen (2001, p. 67, para.2)

With any technological shift, especially associated with the changes witnessed over the past 150 years during the industrial revolution, personnel who operate antiquated equipment—equipment that is considered slow and inefficient—eventually have to learn new skills or be trained how to operate new and innovative equipment. This is true with every industrial manufacturing entity. The automobile industry introduced automation, which resulted in the retraining and repurposing of thousands of production personnel. The same is true with the tire industry and the introduction to vulcanization and tire making. Still, these manufacturing facilities required a limited-skill and uneducated workforce, just strong men who could operate or function on the manufacturing line.

Aside from the introduction of robotic automation, the workforce in automotive manufacturing plants today still do not require highly-skilled and highly-educated personnel to operate the equipment on the production

line. Of course, the intent of the argument presented here is not to berate the workforce employed within American manufacturing firms, nor is it to suggest that traditional line positions employing blue-collar workers require limited skills in order to produce high-quality output. It is to show, rather, how the emergence of printing as a highly respected craft facilitated by prominent aristocrats in a society long ago has gradually transgressed to become a common commodity reliant on a forgotten, under-skilled and technologically challenged blue-collar workforce. The rise of capitalistic industrialism, coupled with technological advancements, has essentially morphed this respected workforce into a seemingly lower social class that has become secondary to the organization's overall mission and future directives.

How would William Caxton's life be different today? A distinguished and well educated businessman who was considered to be a noble craftsman in his time, Caxton apprenticed a growing workforce that consisted of educated and literate men. To be a printer from the fifteenth century well into the nineteenth century was a very honorable, revered, and respected occupation. Apprentices employed in the printing trades were required to read, have experience in foreign languages, and have a mastery of the gradually evolving grammar, syntax, and punctuation guidelines developed at the time. This is completely in contrast to today's employment requirements for an entry-level production line employee on a large web printing press. It is assumed that the employee can read, but the language does not matter.

Today's highly automated printing presses require production personnel to periodically take applicable quantitative readings, enter them into a computer, and let the automation protocol make the necessary adjustments during the production run. Many of these employees speak English as a second language. However, their language skills are quite rough and they are often hired only because they are expendable and inexpensive to employ. Most assuredly they are given minimal training and often misguided due to communication deficits. Consequently, without proper training and attention to the workforce, the overall quality of output can diminish and, most importantly, safety can be jeopardized.

Is capitalism and technology to blame for this change? Frederick Ferre (1988) writes:

The needs of the capitalist rulers lead to ever-increasing concentrations of workers, as industrial technologies in the service of profits grow larger and larger, with new markets to feed—and feed upon. At the same time, the needs of capitalism also have led to widespread literacy, made possible by the technology of printing and made economically necessary by the factory environment in which workers need a modicum of education to function at a profitable level of efficiency. The two technological forces in combination are an explosive mixture. As the exploited workers are forced together in greater numbers by technologies of the industrial system, they also are made aware, through technologies of educational and mass communication systems, of their exploitation, of the injustice for their circumstances, and of their raw power to revolt against the masters.
— (Ferre, 1988, p. 57, para. 1).

Ferre (1988) argues that the invention of printing—the technology itself—is the determinant for the severity of change that has transformed the workforce within this industry. In other words, an educated, literate, and industrial society is the direct result of printing technology. However, as this technology progressed in an age of industrialism, the highly skilled workforce employed within it became obsolete as automated technological innovation—coupled with a distinct drive to increase production efficacy and profits—became more prevalent.

For all intents and purposes, this gradual period of change essentially took place at the origination of the industrial revolution or the mid to late 1800's to the present day. This particular duration of time will henceforth be acknowledged as the Bluing of Collars (BOC) period.

During the BOC period, many changes took place with regards to those who held the position of printer or master-printer. These changes encompassed artistic skills, writing and communication skills, societal class standing, organizational hierarchy, and decision making authority. Herbert Blumer (1990) posits that the impetus to this change is driven from the development of a new kind of economy solely based on a production mentality. Blumer (1990) writes that this new economy is "[b]ased on the utilization of physical power such as steam and electricity, the replacement of hand labor by machines, and the development of a factory system. Appearing and develop-

ing as a new type of economy, it has moved group life from an agricultural base to an 'industrial' base" (p. 2). Blumer (1990) also contends that the new economy is the catalyst for the changes in the organization of work, "[c]hanges in the kinds of groups in which people live, changes in social relations, changes in residence, changes in institutions, changes in standards of living, changes in interests and objectives, changes in values and ideals, and changes in problems of social control" (p. 2). The industrial base, therefore, is considered to be paramount to the greatness, vastness, and profoundness of change experienced during this time.

The new economic order, sparked by industrialism, became the solid foundation for the emergence of true profit-driven capitalism. It was at the beginning of the industrial revolution when the upper-class (usually associated with a particular industry) could see real profits in the mechanization and mass production of products that, in effect, was the impetus to commercialism and consumerism. Ironically, as consumers (as seen in the eyes of capitalists) evolved, and large profits were generated, more and more venture capitalists began building factories in order to compete in the open market. With the increase in consumer products, commercialism was brought to a new level with the introduction of marketing initiatives through printed products that included newspaper advertisements, posters, flyers, billboards, product marketing collateral, books, pamphlets, and, not to forget, business cards, letterhead stationery, and envelopes. As a result printing plants grew tenfold in order to keep up with the demand and, consequently, the pressure to automate the printing production process, increase output and turnaround (speed of production), forced the focus from the quality of craft to the quantity of the product.

Thomas Patterson (1999) contends that capitalists incur expenses associate with raw materials, tools and, ultimately, labor. Patterson writes, "That is the labor power of the workers, whose wages the capitalist pays in return for their knowledge and activity as the producers of the particular commodity. By exerting their labor power, the workers produce a given product that has value, which the capitalist—as the owner of both means of production and the goods produced—realizes when he sells the commodity in the market. In other words, it is the workers, and only the workers, who create value" (Patterson, 1999, p. 32).

With the emergence of newly established printing companies, the trade of printing and print making became obsolete as automated or streamlined printing technology emerged. Electric motors placed on drive trains assisted in increasing production. New letterpress technology that was "self-inking," using mechanically automated roller systems, provided less interaction from the printer/operator. This technological shift eventually led to change in the employer's requirements of labor entering the workforce, a need predominately for men who need not read nor write but can learn a couple of skills required to operate a printing press. In turn, they would receive a "fair day's wage."

Patterson's (1999) point is well made, in that, in the infancy of capitalism, the workforce was valued. However, as this workforce became accustomed to a changing economic order—one that increased their standard of living—social problems began to emerge as the workforce came to the realization that they were perhaps being exploited. Other problems such as "unhealthy and dangerous working conditions; congestion of workers in poor living quarters; absence of adequate housing, sanitation, medical care, and schooling" (Blumer, 1990, p. 10) began to emerge. As a result, the workforce en-masse began to question their conditions and seek concessions in order to increase their standards of living or improve their working environments.

This movement, albeit gradual, provided significant leverage on printing press manufacturers to develop enhancements in more areas of automation. Automation, after all, requires less labor and, inevitably, less skill to operate. By strategically reducing labor and, consequently, skills of personnel who commanded less wages, capitalists who owned printing companies were able to increase production and profit margins with their newer technology. Patterson (1999) posits that the visionary capitalists desirous of increasing productivity and output were successful when they were able to acquire machinery that "perform the same tasks more rapidly and make the workers mere appendages of their tools." This, according to Patterson (1999), "[i]nvolves the mechanization of the production process, the displacement of skilled workers, the incorporation of unskilled workers—often women and children—into the labor force, and rising unemployment or the growth of a reserve army of labor" (p. 33).

There have been significant technological and innovative enhancements introduced to the world of printing over the past 100 years. Letterpress moved to offset lithography; the introduction of roll-fed or web press gravure technology increased production volumes exponentially; and flexography emerged to become a steady and practical print methodology. With all of this automated changing technology saturating the industry, however, labor became secondary and less valued. Presses that once required a shift of ten personnel now require two. A piece of bindery equipment that once required three to four knowledgeable operators now requires only one person to successfully operate it. Additionally, since the onslaught of electronic documentation and the emergence of the computer, typesetters who once set lead type by hand were replaced by the arrival of the Apple Macintosh computer. Thousands of jobs were displaced when the stripping and masking areas of printing production were replaced with electronic imagesetters and computer-to-plate (CTP) systems. Technology has taken a major toll on the once valued print production laborer.

The question arises, "where did this displaced workforce go?" Many of former stripping and masking personnel were thrown in front of a Mac and asked to imposition pages electronically. Many retired, left for another position at another company, or merely left the industry all together. Others were "re-purposed" onto the production floor or into customer service positions. Many became frustrated and/or worked poorly in their new positions because of their inability to successfully operate the equipment. This is what Beth Rubin (1996) refers to as deskilling. She writes (1996), "One result of scientific management, worker specialization, and the use of new production technology is often to deskill and cheapen labor. Deskilling refers to transforming skilled work into unskilled work." Rubin (1996) posits that when the capitalist removes "the skill involved in the job, employers have more control over the process, and workers have less" (p. 68). This stage in the paradigmatic shift represents the final transformation from the highly skilled craftsman to the industrial laborer to the service-based knowledge worker.

Conclusion

In retrospect, there are many contributing factors to the changes that have fueled the shift, including economic, social, technological, industrial, and organiza-

tional. However, one consistent inadequacy becomes evident from many different perspectives, and that is education and training. For over 400 years, or until the mid-to-late 1800s, printing craftsmen trained under a tutelage/apprenticeship system. Once a young man had studied under a master craftsmen for up to several years, he was given the status of printer and was free to work independently for either his master trainer or to set-up a business elsewhere. This was the case for William Caxton and his apprentice/heir Wynkyn De Worde. Although apprenticeships still exist in today's print production facilities, students are only exposed to one particular production component of the process and are measured on their ability to master one production task.

With the development of highly complex centralized electronic enterprise decision support systems (DSS), innovative printing organizations require all plant personnel (both line and staff) to interact with one another on a daily basis. For thousands of print production personnel across the country, effectively communicating through a computer interface (PC) is a very difficult and angst-ridden experience. Usually because of finances or lack of logistical planning and facilities, basic PC skills and communication training are viewed by white collar management to be overly expensive with a minimal return-on-investment. However, as a vendor remotely logs on to a printing press digital interface to perform some maintenance diagnoses, this activity requires interaction with the operator. The operator, intimidated by the technology and by his/her inability to communicate effectively in an on-line environment, inadvertently provides the incorrect information thus resulting in unnecessary down-time that costs the company thousands of dollars. Beth Rubin (1996) posits, "Computers, for example, create not only flexibility but also a labor force distinguished by computer literacy" (p. 53).

Rubin (1996) argues that the mundane world of manufacturing (such as an assembly line), from laborers' perspectives, disengages them from the corporate culture, thus alienating them rendering them with feelings of "powerlessness, meaninglessness, isolation, and separation" (p. 68). This is exactly why a grass-roots effort should be developed and launched at providing basic computer skills, writing, and communication training for production employees. Such training would assist workers in communicating more effectively, researching archived documentation and knowledge more effectively,

generating written correspondence more efficiently and effectively, enhancing their overall self-esteem, and engaging them more within the corporate culture. Rubin (1996) writes, "Workplaces that use dynamic flexibility strategies require highly educated and skilled workers who are familiar with computers and other advanced technologies and can respond rapidly to changing markets. Dynamic flexibility relies on employee commitment to the organization and willingness to use their knowledge, skills, and effort to continually improve the product or service" (p. 74).

Juan Doe works on a large MAN Roland gravure printing press as a web tender for a prominent printing company. He works four ten-hour shifts a week making $16.00/hour plus benefits and has been training and employed in the same position for five years. He speaks very little English and communicates minimally with his supervisor, the head pressman, throughout the day. He does not access email or the company web portal and rarely uses the many computer interfaces wired to the mammoth press for use of diagnostics and visual progression. He knows that they exist and that those who use the technology possess more authority and generate a higher wage than him. Yet, he remains in the production position and aspires to be promoted when the time is right. Perhaps he is content, perhaps he is not, but his ability to understand the corporate culture, let alone effectively communicate within it, is highly stifled.

William Caxton, on the other hand, was a noble leader well respected by the highest echelon in his community. He worked hard and produced high quality books relished by those who could afford them. He translated documents into text and published them for members of the aristocracy. He was considered to be an artist, a craftsman who could take as much needed time to produce the finished product. He was well educated and literate and took on the task of translating and editing many texts and creating a style of punctuation for the easement of reading. Yet, he was a user of new technology and a master of it. Although considered to be a radical technological advancement for the times (especially from the sidelines of the church), the printing press eventually gained overwhelming popularity and changed the course of history forever.

Walter Ong (1982) wrote, "Print eventually removed the ancient art of (orally based) rhetoric from the center

of academic education" (p.131). How profound that the very industry that employe es Juan Doe communicates to him and through him orally. Ironically, technology eventually removed the ancient art of print from the center of the corporate culture. Today workers must rely on an electronic based knowledge repository and must be literate in both communicative skills and computer skills in order to access, engage, and process the knowledge gained. Gone are the days of the printer in the aristocracy, but advancements of the knowledge worker/printer are only a classroom away.

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