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The turmoil in the markets for MIS and AIS - A labor process study

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Abstract
With growing flux in MIS and AIS employment, there is increasing number of questions about the impact and direction of this technology. As far back as 1993, economic surveys consistently showed that the 1993 U.S. economic recovery was the first where white collar employment failed to bounce back (Cooper and Madigan, 1993A; Ehrear, 1993; Farrell et. al., 1993; Mandel and Farrell, 1993.) In the U.S, between March 1991 and April 1993, production jobs rose by 823,000, but white collar payrolls--managerial and administrative positions--fell by 290,000. Even after two years of expansion, non-farm jobs were still below their pre-recession level (Cooper and Madigan, 1993A.) These were the first signs of 'things-to-come'.

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INTRODUCTION

With growing flux in MIS and AIS employment, there is increasing number of questions about the impact and direction of this technology. As far back as 1993, economic surveys consistently showed that the 1993 U.S. economic recovery was the first where white collar employment failed to bounce back (Cooper and Madigan, 1993A; Ehrear, 1993; Farrell et. al., 1993; Mandel and Farrell, 1993.) In the U.S, between March 1991 and April 1993, production jobs rose by 823,000, but white collar payrolls--managerial and administrative positions--fell by 290,000. Even after two years of expansion, non-farm jobs were still below their pre-recession level (Cooper and Madigan, 1993A.) These were the first signs of ‘things-to-come’.

MIS and AIS workers suffered with others in these anxious times. No less disquieting than the decline in the "quantity" of work (unemployment), is the decline in the "quality" of the work experience--through work routinization, deskilling, automation. etc. In this respect, MIS and AIS workers have often fallen victim to their own innovations (Aronowitz, 2000; Braverman, 1974).

The failure of research to problematize these issues lies, in part, in the technocratic tradition of MIS and AIS scholarship (Mason, 1986). At best, the theoretical structures used in AIS and MIS research embraces issues related to economic and financial efficiency, but fails to address the more intractable
problems of technological change, social conflict, the quality of work experience, etc. Yet increasingly, in both academia and in MIS/AIS practice, this technocratic orientation is found wanting (Albrech and Sach, 2000). This paper introduces a framework to enable accounting information systems researchers to begin to undertake such inquiries. Labor Process Theory -- as applied to MIS / AIS experience -- is the methodological option offered for exploring these issues.

THE SOCIAL CHARACTER OF MIS and AIS

Social priorities are not merely optional philanthropy for corporations, MIS and AIS research. These concerns are frequently integral to their long-run survival and economic prosperity. For instance, at the very outset of ruptures in the MIS and AIS work employment sector, Firms like Stride Rite Corporation struggled to balance its social and its economic interests. This firm received 14 public service awards, including ones from the National Women's Caucus, Northeastern University, the Northeast Human Resources Association and Harvard University, which praised it for improving the quality of life in its community and the nation.” (Pereira, 1993.) The company's financial performance was stellar, with record profits for the last 32 quarters, a doubling of sales over a seven year period to $625 million, and a six-fold increase in the stock price over that period (ibid.). This prosperity came at a cost however, savings from closing some 15 U.S. factories and relocating production to various low-cost Asian countries. The company reduced its U.S employment ot 2,500 workers, down from a peak of about 6,000.1

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1 It has been estimated that making Nike's Air Jordan shoe in the U.S. would cost over $300 per pair (the Taiwan-made shoe costs about $100.) Stride Rite's subcontractors in China employ skilled workers for around $100 per month; their U.S. workers earn around
There is often an acute tension between the social (as opposed financial and economic) dimensions of success. Firms develop a "split personality" by having to "balance the demands of two masters--shareholders and society." Donald Gillis, executive director of Boston's Economic Development Corporation is quoted as noting that, "The most socially responsible thing a company can do is to give a person a job."

Information system's technology has been in the front line in cost-saving via staff reductions. In the early 1980's, an estimated $1 trillion was invested in information systems technology (Gleckman et. al., 1993). MIT gauged that this yielded average rates of return of 68%. These results correlated with aggregate U.S employment data, where white collar employment fell by 5%--a pattern mirrored in broader G-7 country unemployment data. The "quality" of work also suffered: the rate of increase in well-paid U.S. jobs fell below 10%.

These macro changes were mirrored in the micro-experience of individual firms. For instance, Aetna Life & Casualty Co. re-engineered its procedures for processing an insurance policy. 22 business centers, and a staff 3000, were reduced to four centers and 700 employees. Echoing Marx's 'formal subsumption of labor', other researchers showed that AIS permitted increases in the average span of control (the ratio subordinates to supervisors) from an average of 7:1 to 20:1. High-paid, white collar labor is being shed at an alarming rate.

These macro patterns correlate with changes at the micro (firm) level. Much research attention has already been devoted to the capacity of technology to deskill and routinize work. Again, echoing Marx's early accounts of the formal subsumption of skilled, professional work, Braverman, describes the $1,300 per month.
transformation of early office work, composed of "Master craftsmen, such as bookkeepers or chief clerks" to the more familiar factory office of today (Allen, 1975; Braverman, 1974, pp. 298-306.) Later writers described the transformation of computer programming from a field populated by unconventional, nonconformist, oddball eccentrics to the an increasingly specialized, structured and routinized personnel. The impact of technological change reaches beyond routine clerical and administrative tasks. Artificial intelligence and new AIS developments have now penetrated the highest levels of strategic judgmental and entrepreneurial management (Sutton et. al, 1993; Arnold and Sutton, 1993)

Paralleling this labor process work are the observations of management gurus. Prescient remarks are found in REENGINEERING WORK THROUGH INFORMATION TECHNOLOGY, Hammond and Champy (1993) whose self-described task is:

"a fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical, contemporary measures of performance, such as cost, quality, service, and speed. The creative use of information technology is essential, not to merely computerize tasks, but to start from scratch, discarding traditions and reinventing the way work is organized."

Lest their message is unclear, these writers are proposing the achieving lower costs by de-skilling work; by taking high-cost, high skill work, discarding (professional traditions and barriers) and recasting it into a lower cost form. This proposal isn’t directed just at managerial work; but also MIS and AIS work. In the opinion of these authors, most reengineering efforts fail because people resist them:

"Getting people to accept the idea that their work lives--their jobs--will undergo radical change is not a war won in a single battle.... it is an educational and propaganda campaign that runs reengineering's start to its
As Byrne (1993) notes, "Ultimately, reengineering means doing more with less--not only less time but fewer people. That means individual hardship."

Management gurus like Champy and Hammond are frequently more perceptive about the stresses and strains underlying the MIS / AIS fields than technocratic researchers. Contributions to the gurus literature are openly and unabashedly partisan. It is usually allied with the cause of capital accumulation (profit accumulation) and takes it as “self-evident” that, what is good for the market (Capital) is good for “America”. These writers almost never problematize the relationship between the imperatives of the market and the needs of the community. Market efficiency may sometimes be consonant with social needs, but we can rule the possibility that this is not always the case.

MIS and AIS requires a literature that doesn’t camouflage and conflate social needs with market efficiency, but takes as problematic the irreducible antagonism between “the social” and “the economic”. Labor process research keeps in mind the disharmony between the market priorities governing the organization of work and (very different) concerns for human and social advancement. This doesn’t require that we invoke some Lost idyllic World (e.g, a Socialist Utopia) but simply posits that human growth (beginning with basic wage, decent working conditions, interesting and even edifying work) are not the first call in a market economy. Growth in human potential is likely to be stunted by low-cost (dangerous and/ or unhealthy) work practices, cheap (polluting) production technologies, adulterated (junk) food, etc, etc. To suppress analysis
of the irreducible antinomy between accumulation and social and human interests is to indulge in ideology. This contradiction needs to be put on the research table.2

1. Structural and Subjective Problematics in MIS and AIS

The stress between the market imperative, and the needs of a community’s denizens, evokes two types of problems for MIS and AIS: economic (also termed objective or structural, and subjective (sometimes called problems of alienation). Economic problems include upheavals in employment generated by increased investment in technology (O’Doherty and Willmott, 2001; Mandel, 1962.). The impact of investment is rarely even or stable, but frequently results in cyclical ‘booms and slumps’, in terms of economic activity in general, and employment levels in particular. MIS and AIS are not insulated from such fluctuations in employment.3 In Labor Process Theory terms, this type of problem is described as "objective," "structural," or "economic," because the conditions exist independently of the awareness of social actors (Mandel, 1962; Tinker, 1985)4.

2 Writers from Braverman (1974) to Adorno (1973) insist that Marx did not share the conventional scientific commitment to The Truth, together with a belief in an unalienated human essence. In place of these eternal and invariant standards, with which the evaluation of ideas and technology becomes trivial, Marx recognized the socially contingent character of both philosophy and the state of human alienation, development, emancipation, and enlightenment. In this sense, Marx would certainly have subscribed to Hegel’s view that "[P]hilosophy is its time apprehended in thoughts." (Hegel, 1989, pp. 297.)

3 Economists since Marx (Volume II) and subsequently Keynes, have acknowledged that there is no natural tendency for a profit-seeking economy to gravitate to a full-employment equilibrium (Kregel, 1975.) Rather, an uneven and anarchic pattern of boom and slumps is the general case. These instabilities make it impossible to guarantee a sufficient and stable volume of work, and thus minima wage and other working conditions.

4 Boland (1989) clearly recognizes the dangers of the objectivist versus subjectivist dichotomy, and relies on Morgan’s IMAGES OF ORGANIZATION (1986) as an integrative
Subjective problems of alienation center on workplace experiences. They embrace the stress and anxieties emanating from the subordination of work to the priorities of the market. Deskilling, work routinization, a lack of control over work processes and their products, are all instances of these problems. These problems are termed "subjective" because a full appreciation of the viewpoints and perspectives of those at the workplace is a central to the analysis (Mandel, 1975; Tinker, 1985; Boland, 1989.)\(^5\) The importance of "the subjective" -- relative to "the economic" -- demonstrated by force of religion, patriotism, and nationalism, in social change today.

The two types of problems--objectivist and subjectivist --are integral to each other. First dimension -- the economic force of the market -- ensures that ever-economizing technology reconstitutes MIS / AIS work and workers by a gradual assimilation into global markets (Hertz, 2001). This process of commodification reflects the market's quest for lower costs and cheaper labor (labor power). It is only labor power that interests capital; those specific skill-sets that earn profits. Firms have no interest in developing the whole person; indeed rarely does the market permit them to entertain such interests. \(^6\) There is no remedy. This solution has its problems however, as Morgan never actually provides a framework that elucidates the "objective" social context. Indeed, he remains imprisoned in all the ambiguities of subjectivism. The framework examined here is offered as a potential remedy to these problems.

\(^5\) This paper does not aim to provide a comprehensive review of the labor process literature; such reviews already exist (c.f., Knights and Willmott, 1990; Thompson, 1989). Rather, the paper aims to avoid a cul-de-sac in which much of the current labor process literature now finds itself (Knights and Willmott, 1983, 1985, 1989.) This "side-tracking" has arisen, in part, because of the predominance of "industrial sociologist" readings of Marx (1977) and Braverman (1974) that frequently undervalues "structural" or economic aspects, and fails to fully integrate them into the "subjective" aspects (Arthur, 1986; Boland, 1989; Cleaver, 1979; Gunn, 1989; Smith, 1990.)

\(^6\) To reiterate an earlier caveat: no distinction is made here between value and price relations; as far as possible, the discussion will be conducted in the more familiar
reason according to logic of the market, that a person be well-paid, or that work be interesting, enobling, or edifying. It is the market’s "piece" of the total person-that hyperrational being (homo economicus or homo technocraticus) -- that inhabits much of the IS literature. The remainder of the person lies dormant and underdeveloped in the workplace. This “Divided Self” has been a perennial concern in literatures, ranging from studies in alienation (Arthur, 1986, Hegel, 1989; Mandel, 1971) to more recent psycho-analytic investigation (Fromm, 1986, Laing, 1965).

What remains underdeveloped in a market economy are full set of human potentialities, capacities and abilities -- embodying all the aesthetic, emotional, political, social, cultural, and economic capacities and potentials for becoming a fully developed person. This is the neglected side of the Divided Self; the side that labor process research gives voice to, in the form of interpretative, hermeneutic, and ethnographic studies. In the AIS and MIS literature, the writings of Richard Boland stand apart (see, for instance, Boland, 1985, 1987).

THE TRANSFORMATIVE IMPACT OF MIS / AIS TECHNOLOGY

The revolutionary impact of MIS / AIS technology on the nature of work is a two step process in the evolution of capitalism. The first step, or early phase, is termed the "formal subsumption of labor." In this phase, the productivity of labor is increased simply by greater specialization: by reorganizing craft workers into more specialized, repetitive tasks (Braverman, 1974; Edwards, 1979). Thus, in (phenomenal) form of profits, wages, etc. (i.e., price relations.) In general however, price and value relations are not synonymous and a more precise discussion should maintain the distinction (Dobb, 1973; Meek, 1975.)

7 Regarding the condition of alienation at work, we may quote Marx: ’man is never at home at work, and never at work at home." (Marx, 1977, pp. 389.)
Adam Smith’s, and later Frederick Taylor’s workshops, craft-persons lose control over the total process of production (of producing from inception to final product) in exchange for a smaller place in a division of labor (Cooper and Taylor, 2000). This act of specialization alone, increased productivity, and therefore workshop competitiveness in a local market. No additional machinery or technology was needed at this phase. It is termed the “formal” or “in principle” subsumption of labor, because it was the first step in the craft-persons loss of sovereignty (to the market). The formal subsumption is merely the first phase, but we can express these incipient forces of a market economy in the following manner:

1. \( \frac{S^h}{V^h} < \frac{S^A}{V^A} \)

In this formulation, \( S \) is the profit per hour, and \( V \) is the hourly wage. The superscripts refer to values for home and abroad. In general, the profit per hour would be greater abroad than at home \( S^h < S^A \). In addition, the wage at home is likely to exceed the overseas wage rate: \( V^h > V^A \). The combined result of these relationships is to give a ratio in Equation 1, where the first term will always dominate the second. In general, the statistic \( S/V \) points in the direction capital will gravitate in its quest for the most lucrative outlets -- from Germany and Japan in the 1950’s and 1960’s, to Korea and Singapore in the 1970’s and 1980’s, to Malaya, Indonesia, India and China in the present. The moral of this history is that this restless quest of capital has no patriotic motive (and no overseas beneficiary should be complacent in assuming that they are the final resting

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8 Technically, \( S \) represents “surplus value” rather than “profit”. While his distinction is important, is not explored in this paper, where surplus value and profit are used interchangeably, and we will usually use the phenomenal form: profit.
The second phase--exemplified by MIS/ AIS technology-- is called the "real subsumption of labor." This phase signals the onset of large-scale production and the revolutionary impact on work of science and technology. Some skills were obliterated, others were reconstructed, and new occupations appeared for the first time (Pollard, 1965; Braverman, 1974; Baritz, 1960). In the 19th century, physical work was revolutionized by inventions such as the steam engine and the telegraph; in the 20th, we are witnessing a comparable revolution in mental (managerial) work with the development of computer technology, artificial intelligence software and AIS technology (Kraft, 1979). In accounting, first the spreadsheet, and then the database, transformed the skill-set of accounting (Zeff, 2003).

The hours of training required to for today’s accountant (a laptop minder) is far less than the years of preparation to be a Dickensian accountant. A laptop minder with an accounting database does not require an understanding of double entry bookkeeping; the accountant simple makes a single entry and the software automatically records the correct entries in the journal, subsidiary, and general ledger, and final accounts (Tinker and Feknous, 2001, 2003). The accountant is reduced to a data-entry worker. The economic force of the market is not limited to the time spent entering data, but also to the time spent in training. Arguably, today’s accountant, conversant with modern technology, does not require 150 hours preparation for the CPA exam, but probably less than 100 hours accredited hours.

2. \( S^H / V^H + C^H, S^A / V^A + C^A \)
The previous considerations are reflected in the relationships posited in Equation 2, where -- compared with Equation 1 -- an additional term, C, has been added. C reflects “constant capital” -- the investment in new technology and in training. C can be represented as the labor hours, accumulated over time, that has been used in producing the “machinery” (e.g, laptops, software) and the skilled worker (i.e, the hours of training). C is an accumulation over time of labor hours, hence these hours are “dated labor” as they are incurred in different time periods.

When C is conceived as a monetary amount (the value of the investment in machinery and skill-produced workers) it is conventional to use a present value calculation to reduce the spectrum of outlays over time to a single amount. While most scholars today would be more familiar with using values (C$) rather than hours (Chours) to represent C, there is a wealth of literature warning of the problems of using a monetary yardstick of value (Marx, 1977; Dobb, 1936, 1973, Sraffa, 1960). The additional factor in Equation 2 (C) also includes innovations that are disseminated through home and abroad. However, more productive technology may be represented by less -- not greater --- values of C. $500 laptops today are far more productive than (inflation adjusted) luggables costing $3000 ten years ago. Hence, over time, the value of C may fall in value, as well as increase. However, these cannot be realistically treated as ceterus paribus movements. First, the market is likely to distribute more productive / lower value innovations (C) from home (C^h) to abroad (C^a), and vice versa. Second, the relationship between S and V is also likely to change as a result of market pressure. The higher profits generated by new technology (reflected in a higher S
V value) will attract competition and downward pressure on prices; and on thus on S and perhaps V. Hence, while new innovations may reverse the falling rate of profit, these reversals can only be temporary (as there is an absolute limit beyond which C cannot fall).

SUMMARY AND IMPLICATIONS

The technocratic (and sometimes jingoistic) euphoria that has engulfed AIS / MIS has anaesthetized inquiry into a spectrum of problems that haunt these fields. Like all technological wonders that proceeded them, these technologies fields are unstable in terms of their impact on employment levels, skills, and the quality of work-life. Moreover, notwithstanding the nationalistic rhetoric, market forces have no particular national loyalty (in the reply of the Emperor when challenged regarding a proposition to tax users of the Roman toilets, “Money has no smell.” (Marx, 1977).

This paper offers a theoretical lexicon for problematizing the issues. Research broadly housed under the umbrella of labor process research underscores the antagonistic social relations present on MIS / AIS territory, and thus possible trends in the contemporary economic environment. Developing such a theoretical apprehension is the first step in beginning to engage the phenomenon in a more political informed manner, at the personal, institutional, and social levels.
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