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AUTOMATION: A LOOK AT THE BASIC ASSUMPTIONS

It appears that the time has come to announce the death of Horatio Alger. No longer is the Protestant ethic of "Work hard and get ahead" a reassuring guideline. U. S. Department of Labor statistics show that among other categories in our changing workforce, the percent of self employed has dropped from 37% in 1880 to 22% in 1940 to only 9% in 1969. The dramatic changes in the structure of the workforce raise a number of questions. We can pointedly ask whether the combined energies of big business and bureaucratic government can absorb the growing number of workers.

With the unemployment rate climbing towards that magical figure of 6% (5.8% at the time of this writing), the underlying causes of unemployment are being reexamined. The impact of automation is on top of the list of potential culprits in the rapidly deteriorating economic situation. Yet we in the computer industry tend to dismiss or at best side-step the issue with a list of basic assumptions about computer technology.

We know and rely on the basic assumptions about automation as if they were a bible lesson or multiplication table learned when we were young. First the industry says to itself (and all who will listen), that automation will create more jobs than it replaces. Then when that morsel is digested and questioned we go on to intone that it is the boring and repetitive tasks that are infact being eliminated. And thirdly when this point is also challenged we quickly retort that retraining and additional education will help balance the possible ill effects.

Despite the serious lack of statistics to support these assumptions, our current economic nightmare is making it increasingly clear that there are soft spots, if not outright fallacies in this logic. If automation will create more jobs, and we may add as a safety factor, more jobs in the "long run", why is the number of new work positions declining. Last year only 1.4 million new work opportunities were added to the employment picture, barely half the number for the previous year. Some economists may argue that this is a result of a slow up in the economy, not automation per se. President Ford's recent tax proposal for a 10% tax credit for corporate spending on plant and equipment that will last more than three years is aimed at enervating the sluggish economy. But in reality it will serve the interests of business, particularly with increasing investment in computer technology. After all, an expenditure for

computer equipment looks better on the Stockholder Report than and investment in x number of new employees. Thus the computer industry's first assumption is being reinforced by Federal economic policy--purchase more equipment, not people, a frightening prospect for the 5.3 million people now looking for work.

The second assumption, that the boring or repetitive tasks will be engulfed by automation presents a wide open target for Bureau of Labor Statistic figures which point out the growing number of skilled workers now looking for employment. BLS numbers show an increase in white collar unemployment, from 2.1% in 1969 to 3.4% in 1972. Excluded from these unemployment figures are the cases -- we all have first hand knowledge about--the underemployed. The Bureau's unemployment statistics reflect only those people actively seeking employment. It can be estimated that there are several million employed skilled or professional workers now doing jobs well below their skill levels.

Ruth Davis, Director of the National Bureau of Standards Institute for Computer Science and Technology, defines automation as technology " to assist as well as replace" human procedures. This broader, but generally accepted definition, helps us understand that it is not only the repetitive tasks which are being automated. The number of scientists and engineers looking for work is growing steadily, both as a result of federal cutbacks in research and the effects of centralized scientific computing power. The number of teachers who can be replaced or augmented by Computer Aided instruction is not many years away. The number of medical laboratory technicians who will not be needed as computerized lab procedures expand will also increase in the near future. No job is sacrosanct, particularly the skilled positions which rely on technology as their fields become more complex.

In our own industry we have ample parallels. Initially an increase in computer equipment meant an increase in the number of data entry, operations and programming jobs. A look at the job opportunities in newspapers quickly points out that both the number of jobs in these categories and the skill levels have been decreasing. It remains true that we still need a few "hot shot" systems experts, but as user oriented languages develop the need for programmers, particularly applications programmers is declining. At the IFIP panel on the Future of Programming in the 1980's the predictions ranged from greater use of "natural languages", to the expectation that more programming functions will be handled by the end user with more access to terminals. If automation is replacing the boring jobs, the list of positions in this category is rapidly expanding.

The third assumption deals with retraining, a much debated topic in the education field. The American Dream, in the form of greater educational experience leading to increased job opportunities, is not panning out for today's 2 and 4 year college graduates. Despite shifts towards more "relevant" higher education, college grads are finding it harder than ever before to enter the job market. According to Columbia sociologist Ivar Berg, American workers are already overeducated for the jobs they hold, and the gap is widening. Those that do find an open door to government or industry are finding that within a brief span of years (as few as 5 in our field) their particular specialty is no longer required.

Retraining should enter the picture at this point, but retraining in what form? Should we retain programmers as data entry clerks as the need for programmers deminishes? Should we retrain physicists as statisticians, social workers as assembly line participants, teachers as secretaries? Part of the problem is the sheer difficulty of meeting immediate needs with often lengthy retraining, but the bulk of the dilemma is of course the emotional impact. Last Spring in New York City 68,000 people applied for the position of sanitation worker, a job classification previously held in disrepute. Although the majority of the applicants were young people seeking their first job, a significant number were older workers looking for a stable career. Human development and expectations contrasted against societal job requirements is a problem well beyond a simple call for additional education or retraining.

Last year there was an increase of 2.4 million job seekers. Many are the young hoping for their first break, but the numbers are expanding with other categories of people unable to be absorbed into the job market. Early retirees in search of income to offset their inflation hit savings, women in hopes of maintaining the family purchasing power of a few years ago, minorities who have not had doors open to them in the past, and Vietnam veterans are but a few examples of people caught in the squeeze. The problems of these people are buried within the overall unemployment figures. Vietnam Veterans for example have a 12.6% unemployment rate, while largely Black areas like Newark have a general rate of 15%. There simply are not enough jobs to go around.

Behind the scenes in all assumption is the premise that continued economic growth will offset or solve these "interim" problems. Federal policies such as tax credits for increase investment reflect this position. James Martin and Adrian Norman in their book

"The Computerized Society" present an intriguing analysis of the effects of automation on projected GNP. Assuming a growth rate in Gross National Product per Man Hour of 3.5% per year (the average rate between 1947-1967), they estimate that by 1980 the work hours needed to increase our consumption by 36% would result in a 5 day/8 hour workweek with 15 weeks off each year. Stated another way, our current living standard would be maintained by less than a 3½ day work week. Although GNP projections are truly gross estimates, the picture of continued growth with fewer human work hours begins to come into focus.

One hundred years ago the 12 hour day/6 day work week was the norm, today the 40 hour 5 day week is beginning to fade. If economic stability does not require increased workers, but rather increased productivity, what is to become of the excess workers?

New questions are needed to begin to understand an economy where the assumption of more jobs in the "long run" is no longer feasible. If we are to achieve a full employment society, we must start to talk about shorter workweeks, shared jobs, and of course a redistribution of income to allow a fair standard of living. There aren't enough jobs around for everyone to work a 5 day week, yet we each need a living wage comparable with the 5 day standard. We have to stop kidding ourselves that the unemployment problem will go away. Increased productivity, through greater automation has resulted in fewer work hours per person over the last 70 years. We can only expect this trend to continue. These questions go far beyond the basic assumptions that the computer industry has addressed itself to thus far.