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Food Distribution Research Approaches for The 1970's

Current Limitations of EDP

Food 70's

The author points out some of the limitations in EDP in site location or other research and management situations

Howard L. Green, President
Howard L. Green and Associates, Inc.

I feel as if I am speaking to you today under somewhat false pretenses. I am not a systems analyst nor an EDP specialist. I am a consultant and marketing research analyst with an emphasis in my work on retail expansion planning. However, I have followed the various applications of computer technology to my work, from a conceptual point of view, from their very beginnings.

The purpose of my talk is to balance what in mine, and other practitioners' opinions, is the degree to which management may be oversold on present day computer capabilities as compared with their long term capabilities.

Frederick A. Koomanoff, in an article in Transportation and Distribution Management (July, 1968, pp. 34-37) outlines the four general phases of the long range intellectual growth of the computer. Phase One he describes as the primitive stage in which traditional functions such as clerical work, accounting and financial reporting are computerized. Phase Two - the "kick-off" phase - occurs when management, realizing the possibilities of this amazing extension of man's intellectual capacities, begins designing and using integrated data processing; i. e., management information systems, simulation techniques and mathematical models. This phase eventually merges into Phase Three - the think phase. In this later phase there are regional data banks, advanced information systems, and on-line uses of simulation. The Fourth Phase is the future phase - systems where learning and perception concepts represent the programs rather than the step by step procedures we now have.

The question is - which of these four phases is the intellectual growth of the computer now at. To some, we are well into the third phase and any day will break through into the fourth. A case in point is a recent Business Week article entitled "The 'New Management' Finally Takes Over," (August 23, 1969, pp. 58-62):

The boss is finally getting to use the computer and the raft of sophisticated mathematical tools that

feed it. The whole package is known as the "new management," though some call it a philosophy and others say it's a fad.

The techniques involved - computer-based information systems, the mathematical wizardry known as operations research, decision analysis, and theories of group behavior - all have been around for years. Now, they're coming out of the specialized departments and staff deep-freezes to create systems that look at the business as a whole.

My own opinion, and that of others I have talked to who have studied the application of computers to their specific fields, is not quite as optimistic. It is our opinion that, intellectually, the computer is somewhere between the primitive and "kick-off" phases. An example from my field of work would, I think, illustrate my lack of optimism.

I have recently seen a promotional book entitled Site Evaluation Models, published by a computer systems firm, which is described as being a phase of management information system for supermarkets. In this book a site evaluation model is developed which is predicated on the probability of a household consumer frequenting a supermarket at a given site. According to this formula the probability of a person going to a particular retail store is directly dependent upon the square footage of the store and inversely dependent on the distance required for the consumer to reach the particular store. Also, the probability of the customer going to this store is inversely dependent upon the square footage of the competitors and directly dependent upon the distance required for the person to reach the competitor's store.

Despite the fact that this basic formula has been around for some time and is widely quoted in the literature, the promotional booklet quite correctly realized it is really not workable and into the formula introduced an alpha factor. Alpha is supposed to take care of the differences in image between one supermarket and another because of price strategy, merchandise carried, layout of store, etc.

Despite even this modification of the original formula there is still one gaping hole in the end product; it takes no account of the unique characteristics of a store's trading area. The trading areas of stores vary by type of location. For instance, a freestanding supermarket will have a different trade area even than a supermarket directly across the street but in a regional shopping center. A model, to be a factual representation of the way people shop, must take such location types into account. This model does not.

What am I suggesting by these comments? Two factors have been pointed out that are not taken into account by this computer model. Both factors have

been known to site analysts for many years. Indeed, I gave a speech in 1954 measuring the value of alpha for supermarket trading areas. Never once, to my knowledge, have model builders experimenting in the area of site analysis come to the experienced practitioners and said, "We would like to put what you know into a model. Would you please sit down with us and together, we with our techniques and you with your experience, determine which factors are relevant and which are not, which can be quantified and which cannot."

What I am suggesting, therefore, is that there is a lack of communications on the part of the model builder and the site location analysts. By working together, however, true progress can be made in advancing the computer's intellectual progress well into the kick-off phase.

But what will the rate of progress be beyond that? Again, I am not overly optimistic and another example from my experience will illustrate why.

Let us set up a hypothetical case. Let's suppose we have as a client a supermarket chain who wants to enter a new market. Our assignment is to make a sales forecast for new locations in this market based upon that operator's performance in his existing markets. Being thorough analysts we factor out and weigh all the pertinent individual variables in both our client's operations and in the operations of competitors in the new market. We spell out assumptions and facts upon which we select areas for sites, construct our model and from it make potential sales volume forecasts.

But, suppose our client is a merchandiser who gives trading stamps, merchandises fine perishables at full mark-ups and has a very wide assortment of grocery products and in this market there is already another chain existant that merchandises in exactly the same way, who has a significant market share and has built up a reputation with consumers over a period of time. Invariably, our model would tell us that our client would fare very poorly in this new market and we might well conclude from this that they should refrain from entering it.

However, because we learned somewhere along the line that the computer is only a logic machine we decide to find out why our client would not be successful and, further, what he would have to do to be successful in this new market. Re-evaluating the data ourselves we find that there seems to be substantial potential for low-price, discount, non-stamp supermarkets.

The key problem, ladies and gentlemen, is that the inputs, the variables, of the model that we built to forecast our client's sales volumes were predicated upon the way our client operated in the past. We have no historical data to tell us about how he should operate in the future in this new market. Based on our years of experience we had to perceive what the market needed and suggest that if our client can meet that need he can be successful.

Here, then, is the greatest limitation on the use of rigid models in our kind of work. Our computer model told us how well our client's new stores would

perform if he were going to operate them in the same way as his old stores in other markets, but it could not tell him anything about the potential for operating them in a different manner.

This point was very well made by Brian Berry, Director of the Center for Urban Studies at the University of Chicago, when he reviewed an earlier draft of this speech. He wrote me as follows:

"EDP provides a great routine servant for accounting and payroll purposes, and for any well-defined routine scientific application, but when a change in system relationships is called for it is not simply misleading - by creating a false sense of security it can lead to disaster. "

In our example, had we relied solely on the computer's wisdom we would have recommended our client not enter the new market and in so doing passed up a potentially profitable opportunity.

This same point has also been well said by Peter Drucker in his book The Effective Executive. Let me paraphrase Drucker. His point is that the truly important events for business management are not trends but rather the point at which there are changes in trends. Such changes, he suggests, have to be perceived by a human being. These changes cannot be counted, they cannot be defined, they cannot be classified - in short they are not facts - they are perceptions. In using a computer we have a logic machine. That is the computer's great strength but it is also its limitation. Events which suggest that changes are in the offing often cannot be reported in the form a computer can handle. Man, while not a particularly logical creature, in the way a computer is logical, is perceptive - that is man can conceptualize change.

One caveat: We are not saying that the information-gathering capacity of the outside events lags behind the technical abilities of the computer. The problem is rather that the important and relevant outside events are often qualitative and not capable of quantification. In Drucker's terms they are not yet facts. For a fact, as has been suggested a moment ago, is an event which is defined, classified and endowed with relevance.

The danger, continues Drucker, is that executives will become contemptuous of information and stimulus that cannot be reduced to computer logic and computer language. Businessmen may make themselves blind to everything that is insight and perception and rely only upon facts.

To summarize and return to the computer's four phases of intellectual growth: We have learned to undertake the primitive steps of data processing in Phase One and are well on our way into the kick-off phase and have even made some pioneer experiments into the third phase. But in spite of what many computer promoters would have businessmen believe - and as Berry and Drucker

point out - the computer today realistically can only be relied on to quickly and accurately perform only those routine applications which have previously been well defined. It cannot yet think or perceive change - this is still the responsibility of the businessman. To cite an analogy: the computer has just emerged from the infant crawling stage and we can foresee its ability to stand permanently upright on two feet. Regrettably at the same time many of our minds are jumping ahead to the time when the computer can run a swift race. But it cannot yet even walk quickly.

Computer usage offers us great opportunities. The future is bright. Despite our great vision of its potential uses, however, each actual advance is going to be a slow step-by-step procedure with many failures and occasional successes. This is the experience in scientific research and this we must expect to be the EDP experience.