Paul Strassmann

We took a narrower view of our assignment—looking at what could be prescribed to the Education Foundation as an immediate action program. The Foundation would price out budgets and assess feasability. And we came up with six specific actionable recommendations.

Recommendation #1

We recommend that the Foundation set up a clearinghouse of industry personnel available to e d u c a t i o n a l institutions. By "clearinghouse", we mean classes of commitments that industry people are willing to make either to local lectureship arrangements or, in those cases where industry wishes to make available individuals for assignments to the universities or research institutes, for extended lengths of stay either for refreshing the technical equity of industry people or for the purpose of acting for industry in the same role as academia enjoys in case of sabaticals. The clearinghouse would be a fairly low cost operation in our opinion and eminently desirable. It could operate with suitable circulars and reports. It would perform an extremely valuable function, one which today is not being fulfilled anywhere in industry.

Recommendation #2

We recommend that the Foundation operate a registry of opportunities for academia/industry exchanges, because it's quite clear that industry does not know, for instance, which institutions have graduate students either available for research projects or Ph.D. thesis arrangements, such as those mentioned this morning by Jim McKenney of Harvard.

Similarly, there will be people from academia who want to spend a sabatical in industry and consequently, a registry of these opportunities would be desirable. This is again a gap that needs filling, and I think the Education Foundation is more suited to perform such a service than anybody else available.

Recommendation #3

The Foundation should publish an annual directory of educational resources. As the industry becomes more pervasive and more articulated, the variety of programs, such as Dan Teichroew's, should be highlighted for visibility. The Education Foundation could provide the proper mechanism to make these opportunities and programs visible. Such a directory could also lead to commenting on the curricula and how the various activities of various universities fit into some kind of discernable scheme. This directory has evolutionary opportunities in terms of enhancements that could be added to it.

Recommendation #4

This would require investment by the Foundation in research. It is apparent to all of us that there is far from a unanimous view of what the future will bring. We are talking about millions of computers out there, and about the end of the life cycle of the educational investments that we are making today. Remember that the people who are coming out of graduate school today will be retiring in the year 2020, '25 and '30. Therefore, we are talking about long term investments. The Education Foundation could perform an inestimatable service to the industry by using the techniques of dynamic input/output models to project the most likely shifts in human resource

requirements as time goes on. The input/output models would have (as rows) the categories of skills necessary at a given stage of industry development (most likely in 5-year increments) and (as columns) the educational inputs necessary to satisfy the demands of the environment. And as our economy is tending more and more to be human skills-oriented, the investment in this tool, and in making the results of that research available to industry, could have tremendous leverage in orienting the industry (as well as the educational institutions) toward the kind of program investments needed.

Whether t h e investment should be 15 percent of payroll, as was quoted this morning, or three percent of payroll would come out through an input/output modeling exercise. This likely will be the most costly of the Foundation's programs. It's a long-term program, but there is nobody else even on the horizon to perform this function for the industry.

Recommendation #5

The Foundation should appoint industry/academia steering committees to guide the implementation of the above recommendations. Each program is of sufficient scope and size that the Foundation would need some sort of an organizational structure to keep them headed in the right direction. There should be some way to attest to the industry and to the academic world that, in fact, their interests and policies were properly considered. Steering committees of four to six professionals per program may be perhaps the optimal size to guide the dissemination of these results.

Recommendation #6

Funding for these programs should be by subscription. The Educational Foundation, on a program by the program basis, should solicit sponsors; in some cases the (I/O model, for example) the Foundation should invest in a business proposal, which it would then circulate. Based on these proposals. it should determine a reasonable sponsorship fee per program; and then, based on areas of interest, solicit sponsors. For all the programs we have recommended here, we are talking about an investment of no more than $50,000 to $100,000 per annum.

Comment:

This meeting points out the lack of communication generally in the industry and among different groups within it. For example, ACM already publishes a directory of curricula in educational programs. AFIPS, under Bruce Gilchrist, has done long term planning studies on the need for people in industry at various skill levels. And so the seeds of such programs are around, waiting to be picked up and funded. In the cirricula development area, Dan Teichroew and others have done work for ACM. It's frustrating that more people are not aware of these. Somehow, this information has got to be coordinated, before we go off and start spinning our wheels again.

Comment:

I'd like to strongly support Recommendation #3, the directory of educational resources. In working on this project this year and on my related recruitment effort, I was absolutely staggered at the variety of educational offerings that the universities offered. To take a case in point,

Dan Teichroew from the University of Michigan is associated with one of four programs that we have an interest in there. Now, in relation to the ACM publication, I think there were 21 schools listed but there was no glimmer that would have led us to suspect, for example, that Michigan has four programs. Michigan is not unusual; this is a very common thing on the campuses we visit. Recently I said to a colleague, "We could have stayed for two or three days, because there are two or three different schools here that are turning out different curricula and each one has a different training objective and a different orientation." Now, from our standpoint as recruiters, it is very difficult to sort them out and have some idea as to what the offerings are. It must be impossible from the standpoint of the kids trying to select which school they should go to.

Comment [Strassmann]:

I am aware of Bruce Gilchrist's work for AFIPS, and also of the ACM reference material. But we are recommending a much more comprehensive effort here, and with much greater reference, retrieval and indexing capabilities than are currently available. We are talking about scaling up by an order of magnitude.

Comment:

There are bits and pieces of efforts all around. In fact, there is a substantial base to draw on in some of these areas. We know there are several very useful curriculum recommendations that have been made by Dan's (ACM) committee. I feel though, that a lot of those recommendations are gathering dust, and that's most unfortunate.