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“Time to Reorganize Universities for the Information Era?”

By

Charles R.B. Stowe MBA, JD, Ph.D., Professor
Sam Houston State University
College of Business Administration

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Time to Reorganize Universities for the Information Era?

Charles R. B. Stowe MBA, JD, Ph.D*

Introduction

This paper advances the proposition that technology and needs of society require a new look at how universities are organized. Less than twenty years ago, the computer services departments of most universities were concerned with managing mainframe computers to handle administrative records, payroll processing, and registration/enrollment processing along with some advanced statistical programs used by academic researchers. Today, with the advent of networked computers with substantially more processing power than many older mainframes, there is a need to reexamine traditional organizational frameworks within universities.

This paper advances the notion that universities need to consider their organizational structure in coping with the potential that computer technology has on the learning, teaching of, collection of, and research of all disciplines. The potential benefit of reorganizing is to bring greater resources to the issue of how to best use computer technology to advance human development. While individuals are responsible for making advancements, the thought is that organizational structure can provide the right environment, incentives, and stimulation of intellectual creativity to maximize individual intellectual productivity. Computer technology offers tremendous potential for each of the disciplines, but subject matter specialists who received their research degrees more than two years ago need to be informed and exposed to the latest developments in this rapidly changing field. Computer technology literally crosses new intellectual thresholds every two years as computer power, storage capability increase while transmission costs decline. New application programs and new hardware make the monitoring, gathering, analysis and creation of new knowledge possible but only if those who have subject matter expertise have the latest tools to use in advancing their discipline.

Charles R. B. Stowe MBA, JD, Ph.D Professor, Sam Houston State University, College of Business Administration, Huntsville, Texas also holds a joint appointment as Professor, Leon Kozminski Academy of Entrepreneurship and Management.

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Current Organizational Structures

Most American universities are organized into three divisions: academics, administration and student services. Traditionally the computer services department was placed within the operational control of the administrative division of a university. Since most of their activities involved student registration and enrollment, financial reports, and other record keeping, this was a logical place for the activity. The only academic involvement with the computer services department involved loading data onto the mainframe for statistical analysis for academic research purposes.

Today, the typical computer services department has many more responsibilities and services it must offer. These services include: maintenance of computer laboratories throughout the campus, maintenance of a network system including computer laboratories and faculty personal computers, selection of software, data storage, image

Charles R. B. Stowe MBA, JD, Ph.D, is a Professor, College of Business Administration at Sam Houston State University, Huntsville, Texas and holds a joint appointment as a Professor, Leon Kozminski Academy of Entrepreneurship and Management, Warsaw, Poland.

processing, etc. For most institutions, the entire nature of the computer services department has changed from one that was simply operating a mainframe system accountable to the records and payroll departments to one that is literally networked and accountable to every member of the university and every division of the university from Art to Zoology Departments. The number of directly supported constituents served by computer services departments has grown exponentially. The function of the services offered has changed dramatically from one of processing data to one of managing an active network where users select from a variety of software to perform their own communications, computations, renderings, word processing and so on. Shifting from an environment where computer specialists wrote code to alter the "system" to operating a virtual "software library" of applications programs has transformed these operations significantly.

For many institutions, there has been no structural or managerial change in the infrastructure to reflect the different role the computer services operation is performing. The computer services departments continue to report to the Vice President for Administration with no formal reporting procedures to the academic side of the university. The result can be a wide bridge between what faculty and students need and desire as services and what is actually provided. For many institutions, the computer science department of many universities is entirely divorced from and has no communication with the computer service professionals.

Computer Science – Lingua Franca of Millenium?

Another aspect of the growth of information/computer technology is that computer science has become the lingua franca of modern society. Just as educators once told students that the study of Latin was mandatory for future graduate work in law, medicine and science, 'computer literacy' has now become a standard requirement for all academic disciplines. In art, for example, the digital applications programs have created a new media. In music, computer technology has completely changed the way music is composed and it has all but eliminated "studio musicians" by substituting synthesizers.

In biology/genetics, all the modern research on mapping the human genes was made possible by very elaborate software programs. Computer simulation programs and sophisticated software packages have transformed physics and mechanical engineering. Relational data-base software is changing marketing, finance, political science and just about every discipline where vast amounts of data are manipulated. There are simply no disciplines untouched by computer technology. Even astronomy has seen the application of a World Wide Web effort to analyze radio signals using computer power donated by those who have idle machines hooked up to the internet. In exchange, the users get a free screen saver image of their machine's analysis as it looks for patterns that might be a communication from a long ago civilization!

The problem, however, is that there has been little cross-discipline dialogue about what constitutes 'computer literacy'. Most college computer literacy courses do not expose students to the myriad ways in which computer technology has invaded every aspect of human existence. Most of the introductory courses for computer literacy focus on teaching students how to use some very basic applications software for word processing, email communication, and spreadsheets.

There is a need to consider computer technology's impact on society. The flattening of organizations, the ability to conduct polls or surveys, the reduction of the costs of communications over vast distances, the ability to generate and analyze massive amounts of information are some examples of how society is changed by this technology. Computer technology has given people a plethora of choices in entertainment and news but it also has the possibility of eliminating societal bonds that come from the shared experiences of a population that watches the same two or three or four tv channels. With computer technology are we creating intellectually isolated pockets of societies or has the effect been to expand awareness and appreciation of diverse cultures? Within organizations, has the impact of computer technology made institutions more responsive or has it permitted more manipulation by those in power? These types of questions provide fertile intellectual fields deserving of research by philosophers, sociologists, political scientists and economists. The issue is whether such individuals operating within these disciplines have begun to recognize the potential for research in these areas under the current organizational and reward structure of today's university?

An informal survey of 30 college curriculums conducted by examining the university home page and related catalogues reveals that many academic departments teach computer-based skills courses. At my own institution in Texas, I was surprised to discover that we have six different introductory computer courses: some offered by the computer science department within the College of Arts and Sciences, one offered by the management department within the College of Business, and one offered by the Journalism department. Some clever students discovered that they could fulfill course requirements by taking several of these introductory courses which all cover basic applications software such as word processing, spreadsheets, email and the World Wide Web.

Another finding of the survey of university web pages revealed that many schools are employing computer science professionals in different departments to teach similar courses. One area of overlap is between computer science departments and management departments. While e-commerce is a specific application of computer technology, to some extent the e-commerce curriculum overlaps with the traditional code-writing oriented computer science discipline. And some accounting departments have decided to offer accounting information management systems degrees or courses. The irony is that all these different faculties who share an appreciation and understanding of computer/informational technology never even meet each other.

The current organization can result in the following:

- (1) a lack of input and coordination between computer services and the academic side of a university,
- (2) an uneven and overlapping development of courses relating to the understanding and use of computers for a particular discipline,
- (3) a lack of historical analysis of the impact of computer technology on different disciplines,
- (4) a lack of an overall strategy of purchasing software,
- (5) a diffusion of intellectual assets that might be better leveraged if placed in one area where members would have the opportunity to interact,

(6) a dispersion of hardware such that it becomes difficult for faculty to have access to scanners, art clip libraries, video clip libraries, video editing, CD-making capacity to all used to create high tech software materials to use in class.

(7) an overlapping of course material as each department sets up their own computer literacy courses, and

(8) a lack of training for faculty wishing to know how to employ technology to improve their pedagogy.

The above problems mean that the institution is not achieving maximum utilization of its resources.

Organizational Alternatives – Time to Restructure?

A possible response to the above condition is to organize a “College of Information Technology” with the following missions: (1) providing the university with computer administrative resources and services, (2) providing students with a revised introductory curriculum that would eliminate duplication and overlapping material in computer related courses, (3) providing a central organization to fund research and multi-disciplinary intellectual inquiry, (4) developing a core expertise of intellectuals who bridge the gap between technicians and applications developers to influence these developments and (5) directing the creation of distance learning courses to name a few. The new college would not be staffed solely by Management Information Specialists or by Computer Science programmers, but would include representation from all the disciplines perhaps on a rotating basis. Those who specialize in pedagogy and androgogy from the College of Education (or their European equivalent) could explore the dynamics of learning and communication using computer technology. Subject matter specialists could take a semester or two to explore new software that is impacting research and development of their disciplines. For example, political scientists might take a look at how governments are using G-commerce (Term I am creating to describe the use of the internet by governmental agencies to communicate and serve the public). In the United States, the annual task of renewing one’s automobile registration is now possible by logging on to state government department of motor vehicle registration sites and with a

credit card the payment of the annual tax is simplified. Traditionally, payment of the motor vehicle tax involved hours of standing in line in rather dingy registration offices.

A bolder alternative is to do what Cornell University did in creating a separate, for-profit corporation to commercialize distance learning courses. This experiment was quite controversial as the university's governing body did not solicit input from the faculty before deciding to allocate money to fund such an operation. Despite its controversial beginnings, the project is going to involve faculty volunteers who will have the potential of supplementing their salary from royalties earned from such a venture.

Other organizational alternatives include shifting some of the academic and learning aspects of computer technology to the library. While it may seem odd to shift high technology into one of the oldest institutions in human history, there is some logic to this strategy. The mission of a library is to serve as a repository of human intellectual inquiry. The electronic web is a portal to massive amounts of information. A major part of a librarian's professional qualifications is their ability to conduct searches using this median. With the growth of electronic storage capability at very reasonable prices, it is possible that our grandchildren will laugh at the notion that we used to fill warehouses full of books that can be carried around on a micro-chip. A second benefit of using the library as the organizational leader or arbitrator of computer technology and education is that it is the one institution on a university campus that serves *all* disciplines.

Conclusions

This paper advances the notion that universities need to consider their organizational structure in coping with the potential that computer technology has on the learning, teaching of, collection of, and research of all disciplines. The potential benefit of reorganizing is to bring greater resources to the issue of how to best use computer technology to advance human development. While individuals are responsible for making advancements, the thought is that organizational structure can provide the right environment, incentives, and stimulation of intellectual creativity to maximize individual intellectual productivity. Computer technology offers tremendous potential for each of the disciplines, but subject matter specialists who received their research degrees more

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