DOCUMENT RESUME

ED 368 241 HE 027 253

TITLE	Planning for Recovery. Proceedings of the Society for College and University Planning: Mid-Atlantic Region Annual Conference (Baltimore, Maryland, April 14-16, 1993).
INSTITUTION	Society for Coll. and Univ. Planning, Ann Arbor, Mich.
PUB DATE	16 Apr 93
NOTE	60p.
PUB TYPE	Collected Works - Conference Proceedings (021)
EDRS PRICE	MF01/PC03 Plus Postage.
DESCRIPTORS	Campus Planning; *College Administration; *College Planning; Community Colleges; Community Development; Facility Planning; Higher Education; Intercollegiate Cooperation; Long Range Planning; Research Administration; School Community Relationship; Student Personnel Services; Total Quality Management; Urban Planning
IDENTIFIERS	*United States (Mid Atlantic States); University of Delaware; Voice Mail

ABSTRACT

This conference proceedings contains an abbreviated conference program schedule, session abstracts, the plenary address and four selected papers addressing planning issues for institutions of higher education, and a final panel discussion. Abstracts are provided for all 17 sessions. The plenary session was given by Stephen J. Tractenberg, the president of George Washington University, and titled, "Quality Management--How Do You Make It Total?" The four additional papers presented in full are: "An Innovative Approach to Student Services" (David E. Hollowell from the University of Delaware); "University Impact on Community Development" (George Hampton and David Higham from the University of Medicine and Dentistry of New Jersey); "'The Open Institution' Redefining the Physical Plan for Community Colleges of the Next Generation" (Karen Anne Boyd and Raymond C. Bordwell); "Voice Processing in the University Setting" (Eric V. Ottervik from Adelphi University). The final selection presents a panel discussion moderated by John Rivers on "Creating a Quality Research Environment During a Time of Reduced Project Budgets." (JB)

PROCEEDINGS OF THE SOCIETY FOR COLLEGE AND UNIVERSITY PLANNING MID-ATLANTIC REGION ANNUAL CONFERENCE

"PLANNING FOR RECOVERY"

APRIL 14-16, 1993
THE TREMONT PLAZA HOTEL
BALTIMORE , MARYLAND

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EDITORIAL POLICY

Proceedings of the SCUP Mid-Atlantic Region Annual Conference

This publication includes selected papers presented at the Society for College and University Planning's Mid-Atlantic Region Annual Conference, held April 14-16, 1993, in Baltimore, Maryland. These papers are published as a service for SCUP members in the region.

Papers were selected for publication based on the decisions of a committee of the Regional Council. Selection criteria utilized by the committee included the following:

- Overall quality of the paper;
- Availability and suitability of the paper in written format (as compared with original presentation format);
- Length of the paper; and
- Mix of papers for publication such that as many of the SCUP academies as possible (including academic affairs; budget, resource planning and development; facilities planning; and institutional governance and policy) were represented in the proceedings.

ABBREVIATED CONFERENCE PROGRAM

"Planning for Recovery"

SCUP Mid-Atlantic Region Annual Conference
April 14-16, 1993

Wednesday, April 14

1:00 - 5:00	Preconference Workshops:
	"Advanced Planning Processes" by Raymond Haas
	"Total Quality Management and Higher Education" by Greg Lozier and Deb Teeter

Thursday, April 15

9:30 - 10:45	Opening Plenary Address by Stephen J. Trachtenberg
11:00 - 12:00	Concurrent Sessions I
12:00 - 1:00	Lunch
1:15 - 2:15	Concurrent Sessions II
2:30 - 4:00	Panel Presentation
6:00 - 8:30	Gala Evening Event at Westminster Hall

Friday, April 16

8:00 - 9:00	Business Meeting
9:15 - 10:15	Concurrent Sessions III
10:30 - 11:30	Concurrent Sessions IV
12:00 - 2:00	Lunch and Plenary Address by Shaila Aery

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Proceedings of the SCUP Mid-Atlantic Region Annual Conference
April 14-16, 1993

SELECTED PAPERS

CONCURRENT SESSION ABSTRACTS

CREATING QUALITY RESEARCH ENVIRONMENTS DURING A TIME OF REDUCED PROJECT BUDGETS Presenters: Adam Gross, Richard Hodgson, Charles Johnsrud, and Robert Rowan

Planning a major facility during this era of limited resources requires continual focus on maintaining program quality goals during both budgetary approval and design review processes and maximizing the opportunities that these processes generate. This panel discussion will explore how program goals were established and preserved during budgetary reviews; how design opportunities for the university were realized without additions to program budget and space; and how building systems and service were arranged to enable near-term budget savings and longer term flexibility.

THE FIRST YEAR OF A JOURNEY TOWARD TOTAL QUALITY MANAGEMENT AT A SMALL INDEPENDENT COLLEGE Presenters: Lorraine Bousard, Lenore Congemi, and James Hennessy

This panel session describes the key elements in the implementation of a Total Quality Management program at a small college. The program was facilitated by the active involvement of the chairman of the Board of Trustees, an expert in the field who teaches a TQM course at the college. The commitment of top administrators resulted in a statement of quality that set the tone for faculty and staff involvement. Careful tracking of the progress of the first three quality improvement teams was another critical element. The improvements designed and implemented by these teams provided the successes necessary to convince others of the college's commitment to the management philosophy.

PLANNING IN AN URBAN ENVIRONMENT: A CONSORTIONAL APPROACH TO COMMUNITY REVITALIZATION Presenter: George Hampton

This presentation will explore the development processes at work in the University Heights neighborhood of Newark, New Jersey. Background information and analysis is provided regarding the context, objectives and methods of a neighborhood development program that has joined the interests and resources of four public institutions of higher education, community residents, local businesses and government. The impact of the University Heights Development Program on a variety of town/gown issues will be assessed, as well as the impact of the higher education institutions in stimulating economic development. The next major initiative, development of the University Heights Science Park, will then be discussed, followed by a summary of the key characteristics of the program that may be replicated in other communities.

ALTERNATE FUNDING FOR HIGHER EDUCATION CAPITAL FACILITIES DEVELOPMENT Presenter: Al Ingle

This session will describe a successful institution-wide program of non-traditional capital facilities development that can be used to establish innovative facilities developments programs. Capital development costs represent an increasing proportion of institutional financing. Adding to basic costs is the universal requirement to remaining current on the proliferating government-mandated regulatory requirements, e.g. ADA legislation, hazardous waste handling and animal care protocols. Higher education has been experimenting with innovative funding techniques for financing facilities development. Examples of such innovation, where entrepreneurial programs and joint government agency development have become the rule, will be cited.

REDEMPTIVE RESTRUCTURING: AN OPPORTUNITY FOR QUALITY AND RECOVERY Presenters: Neville Epstein, Michael Holland and Daniel Klett

The recently completed Facilities Master Plan for Fairleigh Dickinson University is presented as a process and a product in the institution's restructuring for recovery. This process entails the analysis and synthesis of the symbolic, historic and academic and physical issues which impact upon the master plan. The primary issues to be discussed are the nature and quality of the "new" FDU, new academic programs, campus intellectual and social interaction, and campus image and sense of place.

ASSESSING INSTRUCTIONAL PRODUCTIVITY
Presenters: Gertrude Eaton, Michael Middaugh and Javier Miyares

Legislators and other public officials are increasingly asking questions regarding faculty productivity and related accountability issues. It is essential, in this era of scarce resources, that colleges and universities develop mechanisms for ascertaining that fiscal and human resources are allocated and utilized in the most effective and efficient manner. This panel presentation will review methodologies for assessing academic productivity and then focus on two specific approaches. The University of Maryland System's assessment framework will be presented, along with the results of a study on faculty instructional workload. This will be followed by a review of the University of Delaware's data enhancement approach and its potential uses in making resource allocation and reallocation decisions.

THE IMPACT OF NEW TECHNOLOGIES: VOICE PROCESSING IN THE UNIVERSITY SETTING Presenter: Eric Ottervik

Voice mail is often thought of as a simple equivalent of an answering machine. Voice processing is much more technically sophisticated, however, and has many applications in the

university setting. It can be sued to broadcast messages to widely dispersed students in a field study program, with students and faculty readily communicating about assignments and team projects. Other exciting possibilities exist for on-line telephone registration and payment, admissions, financial aid, and calendar and bulletin board applications. This presentation will offer specific examples from several universities.

PRIVATIZING THE BOOKSTORE: TWO CASE STUDIES

Presenters: Jim Lippy and Jennie Mingolelli

This panel will discuss the steps necessary to expedite a smooth transition from an institutional to a private bookstore. Financial, facilities, personnel, and customer service issues will be reviewed. The discussion will focus on the advantages of contracting, the importance of maintaining an appropriate level of institutional control, and financial considerations relative to negotiating a minimum guarantee or commission which increases according to sales volume.

LINKING THE FUTURE TO PLANNING AND ACCREDITATION

Presenters: Pam Bailey and Joel Lapin

A quality management program begins with an effective strategic planning process. The term "effective" implies an environmental scan and market niche review, as well as participative design. This presentation will provide models and tools for practical use in most college settings.

THE OPEN UNIVERSITY: REDEFINING THE PHYSICAL PLAN OF THE COMMUNITY FOR THE NEXT GENERATION

Presenters: Karen Boyd, Mark Chen, Tom Lurcott, and Phil Szujewski

Community colleges continue to expand and evolve in their role as a low cost, accessible avenue to higher education. Due to the high cost of education, coupled with the depressed economy, the community college alternative continues to increase its market share in the competition for the education buyer. This panel session will present a brief history of the physical and master plans of the community college and discuss future directions in community college planning and design. The discussion will include trends in community college demographics, operations and curriculum development as they are likely to impact upon planning, as well as issues related to the expansion of existing community college campuses to meet future needs.

AN INTEGRATED APPROACH TO STUDENT SERVICES

Presenter: David Hollowell

The University of Delaware opened its new Student Services Center in September 1992. The center combines the attributes of a facility specifically designed to serve students, where

technology is used to serve students directly and to enhance staff service capabilities, and where training across organizational lines has markedly increased the ability of a single person to serve multiple student needs. This presentation will describe how the university went about creating a new Student Services Center with the intent of providing "one stop shopping."

"POLITICAL CORRECTNESS" AND MULTICULTURALISM: WHAT DO WE TEACH?
Presenters: John Gissendanner and Julie Ries

This session will address views of what some university students think about living and learning in a pluralistic society. Institutional commitments to diversity and approaches to multicultural curriculum development across the disciplines will be discussed.

A COMMUNITY COLLEGE RESPONSE TO ECONOMIC HARD TIMES
Presenter: Roanne Angiello

This presentation will discuss the development and management of an inclusive planning process that has anticipated the reallocation of resources. It will suggest ways to minimize accompanying blood, sweat and tears.

WHAT IS THE RIGHT SIZE? A CASE STUDY OF ADMINISTRATIVE RESTRUCTURING Presenters: Thelma Hunt and Herman Prescott

This case study will describe a comprehensive management review of all non-instructional units at the University of the District of Columbia. The presentation will outline the processes used in conducting the assessment and in managing the overall project, including interview formats, workload analyses, organizational structure assessments, reporting formats, decision making processes and final recommendations.

REVOLUTIONIZING THE COLLEGE ENVIRONMENT: COMBINING COMPUTER TECHNOLOGY AND THE LIBERAL ARTS Presenters: Tom Birdsey, David Latvis, and Mark Sullivan

In 1988, Marist College entered into a five-year joint study with IBM to see how a small to medium-sized college could adapt to a large mainframe system featuring the latest computer technology. Four years later, the college's computing power and equipment make it a highly technologically advanced liberal arts college. The timeframe has also allowed the college to plan for and incorporated the advanced technologies into a variety of newly constructed facilities. This panel presentation will examine the progress of the study and its implications for academic, facilities and administrative planning.

PARTNERS FOR COMPETITIVENESS: A CASE STUDY

Presenters: Phil Esocoff, Al Neely, and Irwin Price

In the coming years, access to quality education and research will be critical to keeping U.S. companies int eh forefront of international competitiveness. Intellectual resources for innovation exist within universities; talent and capital to transform ideas into commercial applications lie within corporations. The George Washington University Virginia campus represents a collaboration between the intellectual resources of the university, the productive capacity and entrepreneurship of private industry and the investment for the future of Loudoun County, Virginia. This panel discussion will describe and discuss the partnership.

PANEL PRESENTATION

COST CONTAINMENT: WHY SO LITTLE CONSTRUCTIVE CHANGE SEEMS TO BE HAPPENING

Presenters: Edward Delaney, Gerald Finch, and Helen Giles-Gee

Most public and private colleges and universities feel squeezed for resources as state budgets are cut, the need for student financial aid increases, families feel less able to pay, and the sagging economy dries up other sources of support. Yet several recent surveys indicate that institutional efforts at cost containment and downsizing to date have been marginal temporizing. Is this perception accurate? Are more fundamental changes in process buy not yet visible? What approaches promote or inhibit constructive response? This update of a very successful SCUP 27 panel will explore these questions and seek to identify responses to deal with the new demands being place upon higher education institutions.

QUALITY MANAGEMENT--HOW DO YOU MAKE IT TOTAL?

Stephen Joel Trachtenberg, President,
The George Washington University

Like most people whose careers have undergone several decades of development, I have become a connoisseur of both compliments and criticisms. Those I've *recently* received are stacked in a kind of wine-cellar inside my head. I make my way through it, pulling down this or that bottle, blowing away the dust and the cobwebs, checking the precise vintage . . . and then I relive its flavor, its bouquet, and perhaps--*if* it's a compliment, and if it's a compliment of the very finest sort--the delicious afterglow that continued to thrill my palate and the upper part of my digestive tract for many minutes after I took my first exploratory sip.

Right now, the bottle that thrills me most is a relatively young vintage bottled by the Society for College and University Planning . . . *so* young that there isn't any dust on it at all. It was less than a year ago, after all, that I addressed the 27th Annual Conference of the S.C.U.P. on the subject of the new planning environment with which our schools of higher education are *currently* struggling to cope. Only a few months then elapsed, and presto!--I was invited to speak to you today at the Annual Conference of the Mid-Atlantic Region. Among the precious bottles on the *complimentary* side of my internal wine-cellar, *this* one represents a vintage I truly prize, and have shared with my nearest and dearest!

As I was winding up the talk I gave in Minneapolis last August, I found myself drawn into the kind of language and the kind of thinking that is often identified, today, with total quality management and its "customer orientation." The challenges now facing each and every college and university, I declared,

> mandates participation by all concerned. So competitive have our schools of higher education become . . . so desperate, in many cases, for additional students . . . that every person on the school payroll needs to do his or her darndest just to keep enrollments stable. Students and their families must be treated with levels of respect that could barely have been conceived of ten years ago ... must be treated, in effect, as valued *customers* rather than obvious and expected clients. Suddenly, the job of every faculty member, administrator and staff-person looks tough and demanding, with quick responses and sharp analytic capacities as premium qualities. Suddenly, the need for businesslike thinking is no longer confined to the business office--but has begun to pervade every part of the academic organization.

And what I might have added in Minneapolis was that *suddenly* these very sharp and analytic capacities must be used *on behalf* of rather than *within* the organization--the school--that pays

one's salary. *Suddenly*, they must be deployed in a distinctly cooperative rather than a critical fashion. And *suddenly*, the motto inscribed over the gateway that leads to the halls of ivy must read, **"We're all in this together,"** rather than **"Every man and woman for himself or herself."**

Just between you and me: that's *amazing*. Here we are, after all, in one of the most competitive societies our planet has ever spawned. . . . A society whose members are all the more competitive because it is so profoundly democratic, and so *dis*-inclined toward any form of truly hereditary privilege. . . . And suddenly we are being told to go against *all* of our culture and instincts, and to internalize a new ethic altogether: the notion that each member of the organization can help to make it more competitive--and his or her pay more secure--by deploying his or her intelligence, his or her analytic strength, and his or her imaginative powers in a *cooperative* manner. . . . One, moreover, that puts a special premium on the capacity for self-criticism and the kind of "personal job awareness" that amounts to continuous self-monitoring.

No wonder Arthur Deming, when he first came up with the idea of total quality management, found almost no takers in this country--and was greeted with enthusiasm in the nation of Japan, where cooperation was a historic value instilled in each citizen from infancy and early childhood on. No wonder it is the Japanese whose highest industrial honor is still called the Deming Award. And no wonder it wasn't until 1989, four years ago, that the Japanese union of scientists and engineers first bestowed the Deming Award on an American company, Florida Power and Light.

And in order to outline the relevance of Florida Power and Light's experience to the academic world in which we find ourselves today, I'm going to quote just a few sentences from a book by Alexander Hyam that was published last year and that represents the most up-to-date thinking of the Conference Board, an international network of major companies and executives often quoted on the business pages of our newspapers and magazines. The book is entitled Closing the Quality Gap: Lessons from America's Leading Companies, and the description of the Florida Power and Light experience is from a chapter called--you'll be interested to know--"*Planning* for Quality." Hyam writes:

> FPL's quality journey began in 1981, just two years after the Three Mile Island accident had attracted the nation's attention to quality issues at electric utilities. It reflected a recognition that "the company's internal and external environments were changing faster than the organization could adapt and that corporate goals needed to be established and achieved using new management techniques.

FPL chairman Marshall McDonald puts it more colorfully:

> I made the observation that we had been looking at the horse from

> the wrong end, and it was not a pretty sight. We had been concerned with keeping rejects down, instead of quality up. We had been busy keeping imperfection under control rather than trying for perfection. We had sometimes burnt the toast and then scraped it clear, instead of fixing the toaster. Some of us had even learned to like burnt toast.

Hyam goes on to describe in some detail the quality improvement process that Florida Power and Light created in the mid-1980s. Its three components are policy deployment, quality in daily work, and quality improvement teams. And the really crucial part is that policy deployment--which sets long-term, short-term and mid-term plans for FPL--is based on a system of *consensus-based decision-making*. "Senior management can no longer define the specific strategies that will accomplish corporate goals," Hyam writes, "the hands-on analysis of individual processes by the people who know them best is required"--and the primary documents with which those hands-on people work are consumer surveys.

The critical sentence generated by Florida Power and Light, and quoted by Hyam, is one that I myself will quote to you once again. What FPL recognized was that "the company's internal and external environments were changing faster than the organization could adapt *and that corporate goals needed to be established and achieved using new management techniques*." Is there a better description of the challenges that now confront American colleges and universities? It sometimes feels as if there is not a single aspect of the functioning they took for granted a few years ago that is not being subjected--*right now*--to a sustained critical bombardment.

And as for burning the toast and scraping it clear, or getting used to burned toast, only take as an example what until recently was considered an average administrative scenario. At College or University X, a parent telephones in order to question an item that has appeared on the most recent tuition bill. The parent is told, none too politely, that he or she has reached the wrong office, and should have dialed extension 2653. "I'd try transferring you," says the employee, "but the phones never work right and I'm too busy right now, so please dial again." The employee hangs up without bothering to learn that while College or University X is located in Pennsylvania, the parent is calling from Honolulu. And the parent, after getting a busy-signal for a quarter of an hour, finally discovers that extension 2653 connects him or her directly to the office of campus maintenance.

Need I tell you what so often came next--and on whose desk the burned toast ended up? The president of the university, in between ten million other commitments and crises, had to deal with an outraged letter from Honolulu. "My daughter is a student in your *business school*," the letter might say, "and you appear to be running your own school in a totally *unbusiness-like fashion*. I'm going to advise her to seek an academic environment that *practices what it preaches*."

That was the bad old world--the customer-relations snakepit--out of which our schools of higher education are seeking to raise themselves. What more and more of them are trying to do, through their TQM programs, is to change the entire *culture* of the academy . . . to see to it that every employee from the president to the most recently hired member of the maintenance staff thinks in a holistic manner about his or her job and its relation to the well-being, and the fiscal health, of the entire school.

Now, *culture* is an old world where academicians are concerned. University-based anthropologists have been making use of it for most of the Twentieth Century. Professors of English know that one of the most famous works of Matthew Arnold, the 19th Century British author, was entitled Culture and Anarchy. And it's all the more surprising, therefore, that in today's day and age it is the *corporate* sector of the economy that's much further along, when it comes to discussions of internal organizational culture, than the higher education sector.

In the book by Alexander Hyam that I've already cited, for example, a separate highlighted section is devoted to the subject of "creating a quality culture." Corporate culture, Hyam writes,

> is reflected in the relationships among employees, the mores and taboos within a company, the legends and stories told, even the language and imagery used when discussing business decisions. It can be transmitted through subtle messages such as the way parking spaces or offices are allocated or the nicknames applied to managers when they are not listening.
>
> It can also be manifested in more obvious ways, such as in the criteria by which advancements and raises are awarded. Culture is a subtle but tremendously powerful influence over everything people do. It can influence not only employees but also suppliers, distributors, and others within its reach.

And now I ask you: What is the main challenge that arises when we try to apply this same kind of thinking to an academic as opposed to a business situation?

The main challenge, I believe, has to do with the existence, at a school of higher education, of a rather important group of people known as *faculty members*. It is around *their* work, *their* needs, and above all *their* students that the college or university as a whole quite properly revolves. And what is particularly important and significant in this context is that they represent a group of people who by and large don't think of themselves as or like to be referred to as *employees*.

What this translates into is that in the academic setting, the effort to achieve total quality management has to take careful account of the ways in which faculty members, as opposed to

all the other people on the school payroll, are *socialized* . . . as well as the ways in which they influence the thinking and feeling of everybody else on the institutional payroll. Among the most important points that must be explored are:

> 1. The kinds of people who *self-select* . . . at some point in their teens or twenties . . . and begin to think of a professorial career as appropriate for *them.*
>
> 2. The ethics, values, procedures and psychological tonalities through which they pass as they go about earning the appropriate professorial credentials.
>
> 3. The types of functioning that then come to be considered normative, by them and their academic peers, once they are working full-time in a college or university.
>
> 4. The impact that those types of functioning have on all of the other workers who draw their salaries from the school budget.

I don't think I'm saying anything radical or even controversial when I observe that those who are most inclined to choose an academic career tend to be *more verbally inclined* than the average American . . . more given to criticism, and to the need for *proof* . . . and far less likely to accept a pleasing appearance as the substitute for a documentable reality.

Professors bear some distinct resemblances to lawyers, in other words. But whereas a lawyer knows that all of these inclinations must be harnessed to the need to win cases . . . which in turn means you win more clients, which in turn means you win a higher salary . . . the professor is arguably yoked to an ideal of absolute truth--regardless of truth's practical consequences. That is why professors have so often felt justified in joining student picket-lines outside the administration building or in denouncing their school's policies in front of reporters and television cameras.

The culture that faculty members generate when they gather together in an academic setting is therefore one that is rather unique. And what I mean by that is that while they transact certain obvious administrative necessities during their professional lives . . . everything implied by departments, by votes, by chairpersons, by deans, and by vice-presidents . . . many don't see those parts of their lives as central to their *real identities.*

In between their first inclinations toward higher education and their first full-time job, future professors are shaped by their graduate training. And within that training, they are typically subjected to processes of testing and challenge--summed up by the dissertation defense--that can impact on them in *isolating* ways.

This is followed by a reinforcing process that begins once they are on the full-time payroll of a college or university. They *know,* at that point, that nothing will advance their careers more quickly and effectively than a nationwide reputation within their individual disciplines. Indeed, the metaphors that dominate their thinking about themselves, once they have become fully committed to an academic career, are *independent* rather than *organizational*, and *heroic* rather than *cooperative*.

And sometimes these tendencies are further enhanced when a faculty member is an excellent teacher--otherwise known as a "star performer" . . . the kind of person who--"gets students to sit up and take notice." It's no wonder that angry college or university presidents, when they aren't being overheard by outsiders, are likely to complain that dealing with their faculty is like "dealing with a bunch of primadonnas" or "trying to heard cats."

But complaints like that seem to me to miss the point. The unanswered question in American higher education today is whether the faculty members who represent the heart of our schools of higher education . . . as a result of all of these influences, shaping experiences and reinforcements . . . represent a *culture*--an entire way of doing things--that is incompatible with the goals of total quality management. And the secondary question that immediately follows is whether they also represent a culture that is harmonious with or permanently alienated from the culture of all the *other* people on the college or university payroll.

All over the United States, TQM programs have gotten underway in the academic setting. With certain notable exceptions, they can be described . . . to use the adjective an administrator at my university recently applied to our *own* TQM process . . . as "embryonic." My own sense is that they are being implemented far more swiftly where college and university staff members--especially those working in non-academic areas--are concerned, than in anything having directly to do with those who teach and/or do research and/or do academic "outreach" work with the surrounding community.

I return to a once-famous book in which a British writer, C. P. Snow . . . concerned about the gap that seemed to separate the humanities and the physical sciences . . . asked whether the intellectual life of his time was being marked by the emergence of "two cultures" . . . two cultures that could not really communicate with each other.

The great risk now being run by our schools of higher education is the possibility that they are turning themselves into doughnuts or bagels. Through total quality management, the periphery will be shaped up--but in the center, where the faculty members live, there will be what amounts to an attitudinal hole . . . cosmetically disguised, no doubt, but effectively non-functional.

Put yourself in the shoes of a senior faculty member whose socialization, as an academic, took place in the 1950s or the early 1960s. He or she completed the Ph.D. and became a professor at a time when students were flocking into our colleges and when money was no

problem. He or she has always taken pride in publication, in papers delivered at professional conferences, and in being a tough and demanding teacher whose less ambitious students would transfer to another section of the same course.

Now, he or she is being asked to think of students and their families as *customers* . . . to carefully monitor their satisfaction or dissatisfaction with the professor's services . . . and to be quite open about the fact--if it *is* a fact--that he or she may need some outside assistance . . . some retraining, even . . . if he or she is to become a productive member of the school payroll from a TQM point of view. As a *senior* faculty member, moreover, this professor is being asked to sit with his or her colleagues in order to discuss, regularly and at length, "quality improvement" in the department as a whole.

To an extent that senior administrators sometimes fail to appreciate, faculty members *do* set the tone and *do* powerfully contribute to the culture of a college or university. The institution of tenure, by its guarantee of longevity, makes them all the more influential in that respect. And right now, the future of total quality management in the higher education sector hinges on whether they can be drawn into its presuppositions and procedures. What seems most unlikely is that a successful "quality improvement culture" can be developed within a school of higher learning whose full-time faculty remain permanently separate from it.

A similar question-mark hangs over the role that TQM can or cannot play in the work lives of part-time teachers and teaching assistants . . . who, as you know, make up a growing percentage of the instructors on university payrolls. TQM is a time-consuming process. What these folks have the very *least* of is, as you all know, time. (Money, I suspect, runs a close second.)

The tight and scary American economy of the present and immediate future, I should add, cuts two ways where academicians are concerned. On the one hand, many professors are becoming distinctly more inclined toward cooperative and communal functioning because they realize they can count themselves lucky if their job is stable, their paycheck predictable, and their school in reasonable shape. On the other hand, heightened competitiveness in the academic world . . . *between* colleges, and *between* those seeking promotion and/or tenure . . . can reinforce some of the isolating and independent thought-patterns that I've already discussed today.

For college and university planners like yourselves, these questions are far more than--if you'll forgive me--academic. They are questions about the very medium in which you do your work. What your individual and collective futures will be like . . . *that* will depend, in the long term, on the most fundamental principle of quality management--that it's either total or it's nothing.

AN INNOVATIVE APPROACH TO STUDENT SERVICES

David E. Hollowell, Senior Vice President,
University of Delaware

Key to maintaining one's sanity in higher education in the current economic environment is holding to the notion that adversity breeds opportunity.

This paper will describe one of the ways the University of Delaware is meeting the challenge of maintaining the quality and size of its student body through improved student services.

To provide a context, the University of Delaware is a privately chartered, state assisted research university. There are ten colleges offering 110 undergraduate level; 73 masters level; and 38 doctoral level degree programs. The University enrolls about 21,000 students primarily from the mid-Atlantic region. Just over 7,000 of these students reside in University housing.

As recently as the late 1980s, the University had the luxury of having more applicants than it felt it needed. It was able to attract a freshman class in increasing numbers and of reasonable quality employing a modest admissions program and minimal financial assistance. Computer support for admissions, billing, financial aid, housing and registration were modest to non-existent. Even more disturbing than the lack of computer support was the bureaucracy that students faced to accomplish even the most simple administrative tasks and an institutional attitude that improving services to students was not a priority.

In 1987-88, a new administration came to the University, replacing an administration that had been in place for 19 years. That administration oversaw the doubling of enrollment and significant growth in academic and research programs but the administrative support for student, business and other services had not kept pace. The challenge for the new administration was not only to consolidate and build upon the academic advancements but also to improve the service and efficiency of support systems and to develop the tools needed to better manage the institution in the years ahead. While there was another change in presidents in the late 1988 to early 1990 time frame, the work begun in 1988 continued through the period of transition and has been endorsed and supported even more vigorously by the current president who arrived in February of 1990.

The author came to the University of Delaware in January of 1988 with a mandate to improve administrative services in every area and to develop management systems that would better support ongoing operations, management and institutional planning. The focus of this paper is on what has been accomplished in the area of student services.

With few exceptions, the student service units on the campus were very inward focused. There was little teamwork and cooperation among the departments nor was there any perceived

need or incentive for such cooperation. Students were bounced from office to office and stood in many long lines to accomplish the semester ritual of enrolling at the University. Some of the student service units had a reputation as uncaring, even downright unpleasant in their dealing with students.

It did not take an in-depth management review to determine that a major change in approach was imperative. While the overall plan would take longer to develop, it was clear that the inability to provide better service and much of the perceived and real staff attitude problem was due to the lack of tools to get the job done. Simply put, people often did not have the information needed to do their jobs in a timely and efficient manner.

In April of 1988, the author appointed a student information system steering committee chaired by the registrar with senior representation from the offices of admissions, billing & collection, financial assistance, housing, institutional research and management information systems. The basic charge to this committee was to guide the conversion and development of student related administrative systems. The immediate goal was to develop functional specifications for an integrated student information system; evaluate software packages available in the marketplace; compare such products to an in-house MIS development plan; and to recommend an action plan within six months.

The initial dynamics of this committee were interesting to watch. Some shared the view that an integrated system was unnecessary. The committee spent its first few meetings figuring out how to work with one another and then to understand each others' issues and problems. As time went on, the concept of a team approach matured as members of the committee came to understand that many of their problems were either common or caused by discontinuity of procedures from one office to the next.

In September of 1988, one month ahead of schedule, the committee made its recommendation that the Information Associates Student Information System be acquired and installed. A project and funding plan were developed and the recommendation was approved by the president in October of 1988, with an 18-24 month implementation schedule. The contract was signed with Information Associates in December of 1988 and data base conversion began in August of 1990 with the system going live in October of 1990.

Going into this process several key goals were established:

- Emphasize quality and efficiency of service
- Develop a team approach among both management and staff
- Develop the tools needed to get the job done

As the process evolved, several objectives emerged under each of these goals.

From the start an objective has been to apply technology to its fullest advantage. By 1988, the University had already made significant investments in computing technology and had begun to install a broadband campus fiber optic network. Any system developed would have to be fully on-line and have the capability of being accessed by departmental offices and, where appropriate, students themselves. The University had also made investments in a data base environment that would allow the integration of what were five separate and redundant systems into a single, comprehensive data base system with the ability to easily navigate from one area to another.

As mentioned earlier, the success of this endeavor was dependent upon the cooperation of several units and teamwork at both managerial and staff levels. The steering committee and eventually the various project teams focused on overall goals and objectives, subordinating those of individual units. A major objective was not to accept past practice without question. The results were changes to many archaic policies and streamlining of many procedures in order to achieve efficiencies and to make the processes more "user friendly."

With the units involved reporting to four different vice presidential areas, it was essential to have a sponsor at the level of the senior vice president with clear support from the president. The steering committee knew that it had direct access to those who were able to change policies and procedures or even reorganize functions if that were necessary to get the job done. The committee also knew that they had direct access to those who would provide the moral, financial and priority setting support needed to implement the committee's recommendations.

Full implementation of the student information system during the 1990-91 academic year proved to be very successful. Staff in the offices were trained and became comfortable with using the system very quickly. Even before the system was installed, concepts for how it could be distributed more broadly were being devised. Clearly the new system could be used to foster change as it provided tools to support new and innovative services.

Even before the new system was installed, a hybrid of old registration system and new data base capabilities were combined to support a telephone drop/add system that in most cases saved students the inconvenience of having to fill out forms and visit various offices on the campus. This system which was initially staffed during limited periods of time by up to 20 people was replaced last fall by an automated touch-tone registration system that is fully integrated into the student information system.

Even in the student information system's first year of operation (1990-91), a selection of college and departmental offices were tied into the system to support a variety of applications including advising, course scheduling, drop/add and senior checkout. By last fall, all colleges and departments had access and many of the faculty are now using the system directly to access class lists, student schedules and for advising. On a broader basis, the University is moving to complete installation of campus network connections in every office, classroom and residence hall room within the next two years.

Another major activity that has supported this effort has been training. From the start the issue of helping University staff to better serve their clients has been receiving attention. Programs in improving interpersonal skills and telephone manner were provided. As the systems were available in test mode, staff began to receive training on their use. As an integrated, menu driven system, the student information system is very easy to use and has the power and flexibility for one person to answer questions that may involve information from two or more areas. For example, a person answering a billing question can look at a student's registration record to see the specific courses listed, examine details of a financial aid award and determine the basis for room and board charges through simple navigation from one screen to another.

Having the tools gave the University a basis on which to develop better and more efficient means of supporting students and those people who interact with students on a regular basis. The student information system steering committee was not discharged once the system went live but has continued to exist to monitor the effectiveness of the system and to identify additional ways to improve the effectiveness and efficiency of student services.

One of the issues identified by the committee had to do with the physical location of the various student service offices. They tended to be scattered and not well arranged to provide efficient service given the new tools available. In the summer of 1991, a small, centrally located building of about 11,400 square feet became available and the thought was that it could serve as a centralized student service facility. One advantage of this building was that it was a single story shop building that needed total renovation if it were to be used for any other purpose. So, the plan was to gut the building and lay out the interior from scratch.

The challenge was to select the functions that would be best served by their relocation to this building (as it was not large enough to house the entirety of all the student service offices) and to design a layout that would provide efficient service. To once again prove that no good deed goes unpunished, the registrar was again asked to assemble his steering committee to consider the issue. The initial reaction of the committee was to bring in the architect to begin laying out the space. Their request was refused. Their instructions were to take a step back from their current thinking and to focus on the objective that students who visit this facility should be served as efficiently as possible including the novel notion that they might be able to satisfy their question without talking to a single person. If that was not possible, then they should be served by only one individual whenever possible. Again, the committee was reminded of the goal of using technology to its fullest advantage.

The committee began to analyze the kinds of questions and processes that caused students to visit their offices. They also considered what parts of their activities were essentially "back of the house" functions that could be separated from those functions that directly served the public. The committee determined that about 20 percent of the people who visited their offices did so to accomplish very simple activities such as to pick-up a registration or financial aid form; to get a copy of their class schedule; to get the status of their loan application or student account; or request an unofficial transcript. About 60 percent of the questions were routine and

could be answered by a person who was trained to access information in the various components of the student information system. Only about 20 percent of the questions required the assistance of someone who was a specialist in a particular student service area.

Given this information, the committee developed a list of items and services that should be provided in the lobby area of the new building. Some of these items were as simple as having racks with clear signs where students could pick up various forms and information booklets. Others were easily available using the technology which led to the development of "kiosks" where students could sign onto the system using their student ID and a personal identification number and have access to their class schedule, academic record, financial aid record and billing information on a read only basis. By-adding a printer, students could print their class schedule or an unofficial transcript and be on their way.

For the routine activities the idea was for a service counter that could be staffed by personnel who were cross-trained in the various student service areas ("generalists"). In those cases where a "specialist" was needed, they should be located in close and visible proximity to the generalists.

As these concepts were evolving, issues such as an initial belief that individuals could not possibly be cross-trained well enough to serve as generalists or that more staff would have to be hired were overcome. There were already individuals who essentially served full-time on the front counter and the system provided the tools needed for one person to answer a wide variety of questions. Proper training would be the key.

With this groundwork accomplished, the architect was then brought in to lay out a floor plan that would meet the service requirements. There was some skepticism among the managers and staff involved. One action that helped to turn that skepticism to enthusiasm was a meeting called by the president that included all the managers involved as well as all the staff who would eventually occupy the building. The meeting began in a classroom where the president talked of his views on the importance of serving the students well and proceeded from there to the building location which at that point was a gutted shell. Set up inside the space were drawings of the layout, exterior elevations and furnishing and fabric samples such that the concepts and physical realties could begin to merge in peoples' minds. In the months that followed, visiting the building to monitor construction progress became a favorite lunchtime walk destination for many of the people who are now housed there.

The building floor plan is shown in attachment I. For control and audit reasons, the cashiering function is separated from the other service functions but the staff in all areas received the same training such that a cashier is often able to answer questions about the source and nature of a charge without having to refer the student to another individual. The training program involved having staff rotate through the various offices so they could see first-hand the work of each office and the kinds of information that they process. In addition to the small number of individuals whose primary duty is to staff the front desk, students are often used to

serve as generalists and other individuals in each area were identified and trained to provide backup during peak times.

The building houses the entire billing, collection and cashier function; portions of the registrar, dining service and financial assistance operations, and at peak times staff from the parking and housing offices assist in staffing the counters. Very recently the long distance student telephone service operation has been relocated there also.

The student services building opened in August of 1992 and has been received extremely well by the students who have used it. Already the University has found ways of adding other services in the building without adding more staff. After the first full year of operation, it will be easier to assess whether any staff savings will be possible without diminishing the level or quality of services provided.

The development of the student services building has been the single most visible outcome of what is now a five year program of improving the administrative services provided to the students. Certainly the ability of academic departments and most advisors to access student information to answer questions and improve advising is having an impact as is the installation of touch-tone registration. Where we go from here is to continue to distribute access to the system more broadly on the campus and eventually to permit greater student access to the system as network and system security issues are resolved.

While this paper has focused on the development of the student information systems and student services building, these activities are but a part of a larger focus on the lives of our students both in and out of the classroom. As budgets have been reduced, the most significant cuts have been in administrative areas with the least impact on instructional units. A major facilities renewal program has focused on classrooms, residence halls, dining halls and student recreational facilities including a recently completed sports/convocation center and a new student center which will begin construction within a year.

How has all this benefitted the students and the University? Based on satisfaction surveys and general observation, the students are responding well to our efforts. While there are few students still at the University who recall how these services performed in 1988, there has been enough annual change that the juniors and seniors can easily see the improvements. Time will tell if their increased good feelings about the University will translate into a more supportive alumni or if word of student satisfaction will spread and assist in our recruitment efforts. Of course, we hope that this will be the outcome. In the meantime, the administration and the staff at the University can now take pride in being able to provide responsive levels of service thanks to the investments made in systems, facilities, training and the hard work of many dedicated employees.

Annex II
University of Delaware
Student Services Building

UNIVERSITY IMPACT ON COMMUNITY DEVELOPMENT

George Hampton, Vice President for Urban Planning
and Community Relations, and David Higham, Manager
for Urban Planning, University of Medicine and
Dentistry of New Jersey

Introduction

Today colleges can, do, and should play a major role in positively impacting their local county or city, and especially the immediate neighborhood.

Historically, the contributions of colleges to their host cities or regions followed closely to that of their traditional services. Increasingly, however, colleges are becoming involved in community development initiatives that have not been traditionally considered within their realm. Urban universities, especially, are recognizing that they must directly intervene to stem the decline of the neighborhoods that surround them. Through increasing their economic investment, and by promoting positive images of the community, urban universities can have a catalytic effect on investment patterns and neighborhood development. Elementary and high school education, neighborhood housing, recreation and employment opportunities are issues where universities can have a positive impact upon their communities.

Colleges that work closely with their communities in these and other areas do so at some peril. Short-range efforts or apparent inconsistencies in commitment by the college will do more harm than good for town/gown relations. Colleges should expect that potential areas of conflict between the campus and the community will increase with the level of involvement. New town/gown disagreements will arise as others are resolved. Colleges must recognize that residents have the right to question their role in the neighborhood's development.

However, a university and other community institutions may be the most valuable asset within the neighborhood and, with proper coordination, these institutions can use their resources to effect positive change. Two very important strategies are: (1) pooling collective university resources for community betterment; and (2) calling upon other institutions to use their resources as well. No one in an urban environment wants to feel alone when they invest their time and resources for urban development; but there is safety and confidence in numbers.

Four universities can do more than one, and all can do more if they are joined by businesses, government and residents willing to work collectively for change in a geographically defined neighborhood. These principles are illustrated by the impact that four institutions of higher education are having on the University Heights neighborhood in Newark, New Jersey.

Council for Higher Education in Newark

The Council for Higher Education in Newark (CHEN) is a consortium of four public colleges and universities. Through CHEN, a strong spirit of cooperation has developed among the schools, yet each institution has maintained its own distinct identity and mission. Essex County College provides two-year, vocation-oriented and transfer programs; New Jersey Institute of Technology offers engineering and other technological programs through the doctoral level; Rutgers-Newark provides baccalaureate and graduate-level liberal arts and sciences education; and the University of Medicine and Dentistry of New Jersey (UMDNJ) offers a full array of educational programs in the health professions. UMDNJ's University Hospital is the principal source of health care for the Newark community.

CHEN has worked for two decades in service to New Jersey's largest city and the state. The CHEN leaders meet monthly and their staffs cooperate regularly on a number of initiatives. With a student body of 26,000, an investment in plant and equipment of over $1.250 billion, and a nationally recognized faculty, the CHEN institutions have brought honor to the City of Newark, opportunities for its residents, and acted as a stabilizing force for the surrounding 700 acre neighborhood.

University Heights: A Time For Action

By the early 1980s the CHEN institutions recognized that the time was right to make a major effort to stimulate the development of their neighborhood. The area had made significant strides in its recovery from the devastation left behind from the 1967 Newark Riots, and it offered distinct advantages for further development.

The University Heights neighborhood is located immediately next to a "Downtown Renaissance" district which, in the late 1970s, was starting to attract investment for the construction of many new office buildings and other improvements. What was not as well recognized was the potential for development of University Heights. After the 1967 Riots, several garden apartment complexes were built, providing attractive (rental) housing options for about one-half of the residents.

In addition to the housing complexes, there were other significant stakeholders including three hospitals, the central administrative offices of Essex County Government, the county vocational school, a city high school, a parochial high school, and the four CHEN institutions. Each of these institutions are within walking distance of the others, and their employment and construction activities had provided stability for the area. Collectively they had already invested hundreds of millions of dollars in new construction and, as the 1980s unfolded, many were planning further investment.

Two of the four college campuses had interest in building dormitories and creating a 24-hour campus life. All four CHEN schools planned to enlarge their physical plants, and expand

their academic and research programs. The universities recognized that the lack of restaurants, suitable housing for employees and other amenities were an obstacle when trying to attract students and faculty to the area. The neighborhood's poverty rate, illiteracy, crime, weed-filled lots and other urban ills provided a disheartening contrast to the multi-million dollar university facilities. The CHEN schools recognized that the future of Newark's higher education community was linked to that of their surrounding neighborhood.

The future of the neighborhood was linked, in turn, to its major institutions. Home to large educational, hospital, and government complexes, the community offered thousands of employees very limited options to enjoy lunch or to access other conveniences or amenities away from their work site. The students, staff and faculties at the university campuses, alone, offered a large and lucrative market. Abundant vacant land existed between the university campuses. Most of this land was not only laying in disuse, but was cleared of structures and could be made immediately available for development. The university leaders were convinced that such development could serve the needs of both the day-time workforce and the neighborhood residents, increase area job opportunities, contribute to the City's tax ratables, and generally improve the neighborhood.

Planning for Development

In 1984 the CHEN schools began work on a draft development concept for the University Heights area. **Its primary purpose was to persuade others, outside of the universities, to invest in the area.** The university's strategy was based on critical mass development. It was hoped that substantial neighborhood progress could be achieved if enough investors could be convinced to target their resources within a small geographical area.

To help transform this concept into a workable plan, the N.J. Department of Higher Education provided funding to CHEN. This support was used to initiate parallel activities for the development of both a community plan and a comprehensive plan for the neighborhood. This support allowed for wide community participation in the planning efforts. State funding was later used to carry out some of the plan's recommendations, including the creation of pre-college programs at the CHEN schools, and to help the colleges and community organizations promote the development of the area.

The community plan, authored by neighborhood residents, political and business leaders, addressed community concerns on employment opportunities, education, housing, and other issues. With the involvement of CHEN a comprehensive plan was then drafted in 1986 which addressed the community concerns and provided a blue-print for the overall economic development of the area.

University Heights Development Program

Several community-based corporations were formed to oversee the plan's implementation. All of these organizations have continued their work to the present day. The University Heights Community Council was created first to oversee development and provide a forum for a dialogue to continue between neighborhood residents, the CHEN schools, area businesses and city government. The University Heights Neighborhood Development Corporation, with seed money donated by CHEN, was created to direct the construction of specific projects within the neighborhood, the first of which was a 66-unit low/moderate income condominium project. This project led to the birth of a third community-based organization, the University Heights Condominium Association.

Community residents make up a majority of each of these organizations, and the four CHEN schools participate actively in their work. Close university involvement with these community groups has helped to achieve significant progress in implementing the development plan.

In the past seven years, private and public investment within University Heights has occurred at a rapid rate. Construction of more than 1600 units of low, moderate and market rate housing and related commercial development is now taking place or planned in University Heights. The universities have encouraged and assisted minority owned firms to participate actively in this development. Generally, all of the development that is occurring owe their origins to the new levels of interest generated toward the community because of the efforts of CHEN.

CHEN: Contributing to Revitalization

Starting in the early 1980s, a sizable construction program undertaken by the universities on campus land provided further stimulus for the development of the neighborhood. Counting only major construction projects, CHEN campuses made nearly $300 million in capital improvements during the last ten years.

New facilities and programs at the universities meant more employment opportunities for Newark residents and a greater economic impact for the City. Table 1 below estimates CHEN's 1991 employment impact on Newark and on the surrounding region.

TABLE 1

EMPLOYMENT BY THE CHEN INSTITUTIONS

Employee Residence	Number of Employees	% of CHEN Emp.	Annual Payroll
Newark	1,900	21%	$ 44 Million
Remainder of Essex County	2,900	32	100 Million
Remainder of New Jersey	3,900	42	160 Million
Out of State	500	5	28 Million
Total for CHEN Employment	**9,200**	**100%**	**$332 Million**

One of the CHEN schools (UMDNJ) uses zip code analyses and special economic impact studies to further define its employment and other impacts on the community. These analyses have revealed that over one-half of the 1,200 Newark residents employed by UMDNJ live within the two City Wards in which the University is located.

Many other university activities are having positive impacts on Newark's economy. These activities include the purchase of goods and services from area businesses (see Table 2 below for 1991 figures); the employment of local residents for campus construction projects; the use of area banks for institutional and staff/student banking needs; the creation of 24-hour campuses at two of the four schools; and the multiplier effect of local spending by university visitors, staffs, and students. Pre-college education programs at the CHEN schools are helping to encourage more than 4,000 elementary and high school students in the Newark area to stay in school and prepare for college.

TABLE 2

ANNUAL PURCHASING BY THE CHEN INSTITUTIONS FROM NEW JERSEY BUSINESSES

Location of Business	Estimated Annual Purchasing
Newark	$ 10 Million
Remainder of Essex County	14 Million
Remainder of New Jersey	79 Million
Total for New Jersey	**103 Million**

Completing The Neighborhood

A key element has yet to come in the neighborhood's development: the University Heights Science Park. Urban science parks build upon the existing strengths of universities and hospitals to overcome the negative factors that inhibit the redevelopment of urban areas. Science parks provide the environment for partnerships to develop between industry, universities, and government. The sharing of new scientific and physical facilities in close proximity to university-based research can result in significant technology transfer.

A not-for-profit corporation, the University Heights Science Park Inc., has recently been established to oversee this project, and is a collaborative effort by the City of Newark, the community, Newark corporations, and the four CHEN schools. The corporation is developing a strategy for implementation, is soliciting investor support, and is seeking community input into this development process. It is projected that the Park could result in a short-term development expenditure of $90 million, and in a long range scenario (15-20 years) exceeding $230 million.

The Newark proposal, however, seeks to go beyond the traditional science park development strategy and extend benefits to the larger community. Instead of calling for isolated development, the University Heights Science Park concept incorporates the proposed 51 acre project into the existing neighborhood. In addition to office, research and incubator space, the Park's components include a Science Park High School, affordable housing development, a day care center, recreational and retail space. Local entrepreneurs will benefit from the creation of new markets and consumers; and training programs will be designed to prepare residents for the jobs created by the new businesses that locate in the Park.

An attractive opportunity for CHEN lies in working with area school districts to create a new regional high school with a strong focus on science, mathematics and technology. This school would take advantage of the educational programs on the university campuses.

Conclusion

In 1983, CHEN launched University Heights with the premise that universities can and should make substantial investments in their community that go beyond their traditional services. The specific goals of the project were to preserve neighborhoods; to develop new affordable housing on abandoned land; to stimulate the area's economy; to increase opportunities for minority entrepreneurs and local job-seekers; and to increase the colleges' involvement in improving educational opportunities for area youth.

Substantial progress has been made on all these fronts. The most obvious accomplishment is the physical improvement of the neighborhood. Many new buildings have been and continue to be built on land that was predominately vacant. Urgently needed low and moderate income housing has been constructed. Market rate housing has also been developed, bringing in to the neighborhood persons with discretionary income important to the area's future

prosperity. Businesses have been attracted that offer employment, conveniences and amenities that suburban localities take for granted, such as a neighborhood supermarket, a cinema, and a variety of service and dining establishments.

Early on, the CHEN leaders agreed that stabilization of the neighborhood was critical if the development concept was to succeed. The question was whether sufficient investment could be generated to halt the decades of population decline.

New population figures from the Census Bureau indicate that the neighborhood is beginning to meet this test. According to the 1990 Census, the neighborhood's population declined by seven percent during the 1980s; a rate substantially lower than the City's overall population loss.

In addition, the 1990 Census total for University Heights does not include about 450 units of new housing that were occupied just after the Census enumeration, or are presently being constructed. Because of these and other activities, old and new residents of University Heights express the feeling that the neighborhood has turned an important corner.

The University Heights Science Park project offers additional reasons for optimism that the neighborhood will continue to attract new jobs, residents, housing, and shops.

Because the monetary investment required from a college is relatively small, all colleges have the potential to impact their communities in ways similar to the University Heights experience. Critical mass development in a neighborhood is dependent only on the ability of the stakeholders to convince as many other developers as possible to make targeted investments.

The college may need to take the lead in planning and marketing the development scheme. Initially, CHEN's vision of University Heights was more developed than that of the community and even of the city government. CHEN made the political decision not to wait for the city government to plan for the area, but to proceed despite initial opposition from some government and community leaders.

Many community residents who now support the concept initially opposed it. From the beginning it was critical for the universities to not forget that community residents have a right to be concerned about change, and to want a say in how powerful institutions might impact upon their lives.

Some members of the community will continue to question the role of the university in neighborhood development. Colleges must recognize the diversity of views that often exist within a single community, and initiate strategies that will bring dissenting voices into the process. Some will always harbor suspicions and negative feelings and seek out the institutions as inviting targets for criticism; while others may hold praise for university initiatives to themselves. Important lessons that were learned by CHEN and by the larger community were

the value of continuing dialogue, with the awareness that they will not win the support of everyone, nor will the necessarily receive deserving praise.

Indeed, the continual give and take between town and gown can lead to better policy making faster implementation once decisions are reached if issues that are important to the community are addressed beforehand. Working with the community on large project like University Heights takes an enormous amount of time and commitment on the part of the college. Many obstacles will be presented, but none that outweigh the rewards.

"THE OPEN INSTITUTION" REDEFINING THE PHYSICAL PLAN FOR COMMUNITY COLLEGES OF THE NEXT GENERATION

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Introduction

The community college holds a unique and important place in the history of the American higher education system. As an institution, the community college appears to be poised for significant evolution and transformation from a philosophical, ideological and educational point of view. Because successful educational campuses and buildings are, we believe, expressive of their institutional ideals and goals, it is important for us as architects and planners to understand how new or changing directions in institutional missions might impact the future of community college campus planning and building design.

Perkins & Will has been fortunate to have been a part of the enormous growth in community colleges which has occurred during the last three decades, having worked with over 30 community colleges throughout the United States since the early 1960s. This paper, which originates from a slide presentation made at the Spring SCUP Mid-Atlantic Conference, has a three-fold agenda. First is to set the stage by providing a brief historical background on the development of the community college. Second is to identify a series of fundamental issues from past planning experience which will continue to influence the physical form of the community college. And the third is to speculate upon future directions in planning and design that will redefine the physical plans for community colleges as we move into the twenty-first century.

Background

Since the founding of the first public junior college in Joliet, Illinois, in 1901, the community college, as an institution, has experienced significant evolution. Historically, two important roles of the community college have been to provide a two year academic preparatory program for transfer to a four year institution and to provide two year terminal, career-oriented programs. These dual missions continue to be important goals among most community colleges today and are augmented by a third mission area: community service, which is currently in a state of redefinition. In studying various institutions, it seems that the unique and specific needs of the individual community which each college serves determine the hierarchy or emphasis among these three missions.

Historically, community colleges have embraced as their mission addressing the educational needs of the changing "average" American. One hundred years ago the average American was a 22-year-old white male who worked on the farm and had a fifth grade

education. Fifty years ago the average American was a 29-year-old blue collar worker who toiled in our factories. He had a ninth grade education. Today the average American is a 35 year old female who has completed, on average, one year of college.[1] Growing out of both the tradition of the land grant institutions established by the Morrill Act of 1862, which promoted "practical" educational programs, and sponsorship by the some of the most prominent universities of the early twentieth century, which promoted the development of two-year academic transfer programs, "junior college" systems grew steadily through the first six decades of the twentieth century. The boom years of community college growth and development began in the 1960s and continued over a period of approximately thirty years. In 1962, there were 672 community colleges and a half a million community college students. In 1992, there were over 1,200 community colleges with 1,500 campuses and the number of students had grown to over 6.2 million.[2] As community college enrollment increases, the impact of this growth on the physical form of the college is yet to be determined.

Influences on Physical Form

Looking back on past community college planning and design work since the 1960s, a number of planning ideas can be identified that will remain relevant to planning and design projects for community colleges in the future. These include: creating a sense of community, planning with sensitivity to regional diversity, developing environmentally responsive designs, providing organizational clarity, and embracing change and innovation.

A unique challenge in community college planning and design stems from the fact that they are non-residential, commuter institutions. Creating a strong sense of community, through the development of communal spaces, a distinctive identity and a unified image, is an important goal. At the Orchard Ridge Campus of Oakland Community College in Farmington, Michigan (See Figure 1), the creation of communal spaces was a significant aspect of the design of the campus plan. The site planning strategy involved creating a series of informal courtyards around the Commons Building which was designed to be the hub of communal activity at the center of campus. The Commons contains lecture rooms, lounges, conference rooms, the snack bar and book store. Creating a variety of both internal and external gathering spaces where students and faculty can meet informally, study quietly, enjoy a snack, hold a conference, or work at a computer strengthens the sense of community at an institution.

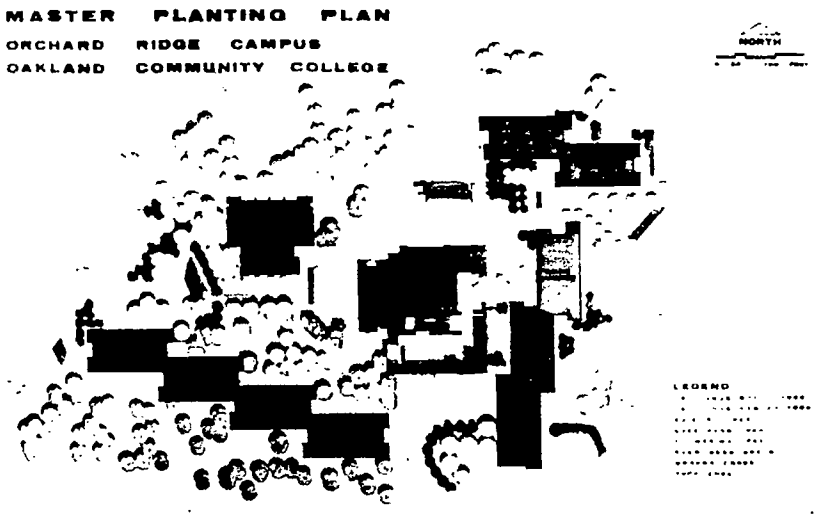
Another important contribution to the sense of place at community colleges, is developing plans and designs which give the college a distinctive identity. This includes providing clear and consistent way-finding systems throughout the campus and the buildings. It is equally important to develop clear entrances to the college campus--significant points of arrival for both pedestrians and vehicles. Presenting a unified college image on the main campus and among satellite campuses will reinforce a sense of identity and can be accomplished through the use of compatible building materials, a consistent palette of paving, site and landscape materials, and a clear definition of the boundaries between the campus and the neighborhood, be it rural, suburban or urban.

Planning with **sensitivity to regional diversity** is an especially relevant goal in the design of community colleges, which have grown up in every region of the country. The creation of campuses and architecture that are responsive to local and regional customs, culture, climate and materials is consistent with the ideological goals of community colleges to meet the unique needs of the community in which they are located. The College of Alameda represents a strong example of embracing regionalism (See Figure 2). Alameda is located on the San Francisco Bay in California. The mild climate in this region allowed the buildings to be oriented and configured along an open mall to take advantage of cross-ventilation, and balconies and connections among the buildings are open-air. The buildings are not mechanically air-conditioned, but remain quite comfortable year round. In keeping with local Hispanic cultural influences, the college was named Alameda, meaning "tree-lined promenade," which is what the linear, central plaza is intended to be.

Linked to the recognition of regional diversity in the design of community colleges is the idea of developing **environmentally responsive designs**. The Megastructure is a building type that was in prevalent use at educational institutions in the 1970s. Its use at Rhode Island Junior College in Warwick, Rhode Island (See Figure 3), was dictated by the cold New England climate where accommodation of all of the college programs and services within one building made sense. A second environmental factor which impacts campus design is terrain. At Lorain County Community College in Elyria, Ohio (See Figure 4), sensitivity to the ecology of the campus site is shown through the location of a series of small parking lots within the trees--a parking strategy adopted to minimize changes to the natural topography, drainage patterns and landscape of the site.

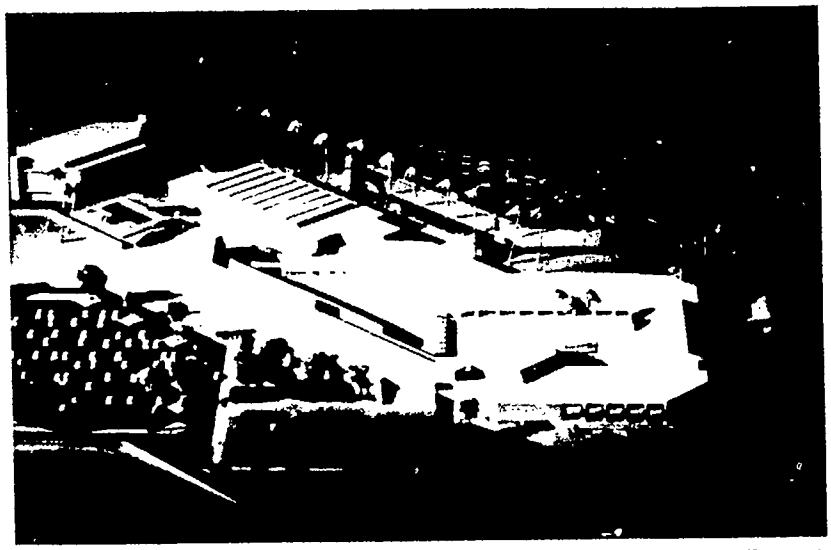
A fourth planning axiom influencing community college design is providing **organizational clarity** to the campus and its buildings, especially with regard to access, circulation and connection among buildings and campus sectors. At Oakland Community College (See Figure 1), there are three clear entrances to the campus. The main entrance is nearest the largest parking lots and leads directly to public-oriented facilities including the Administration Building, the Performing Arts Center and an outdoor amphitheater. A second entrance and parking lot are provided at the west end of the campus at the Gymnasium/Recreation Center, and a third service entrance is provided on the south edge of campus. Traditional organization of campus spaces into formal courtyards lends clarity to the circulation pattern at Monroe Community College (See Figure 5). Two new buildings, a Fine Arts Center and an Instructional Resource Building, define the fourth edges of two courtyards and were designed to clarify and extend the internal circulation route through each of the college buildings which form the courtyards.

A final quality which has influenced the physical design of community colleges is their tendency to **embrace change and innovation**. In embracing technological innovation, for example, community colleges have been in the forefront of incorporating developments in distance learning capabilities and networking, as well as preparing students for today's expanding, high-technology job market. The Applied Technology Center at Grand Rapids



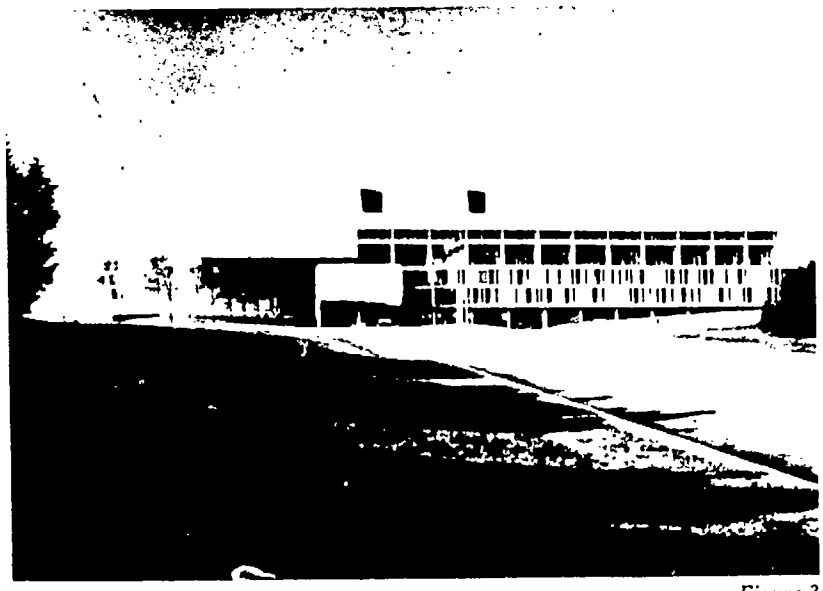
Oakland Community College
Orchard Ridge Campus
Farmington, Michigan
Master Plan, 1965

Figure 1



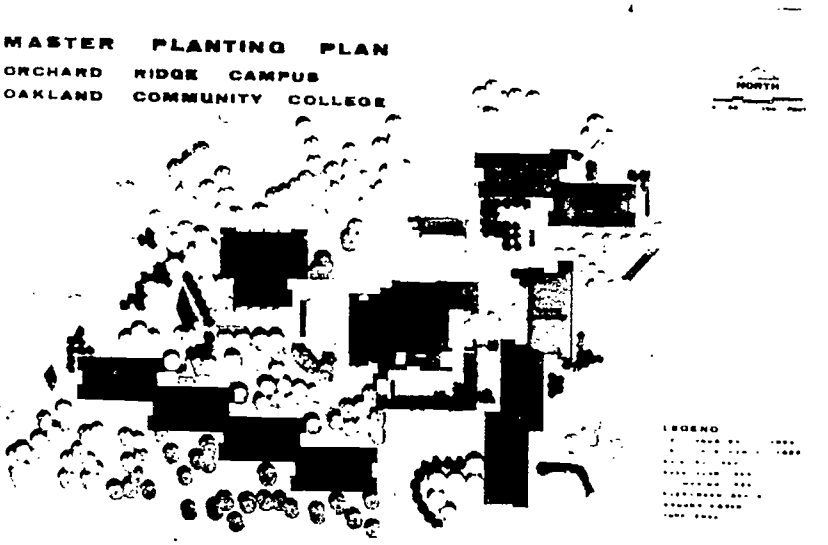
The College of Alameda
Alameda, California
Master Plan, 1966

Figure 2



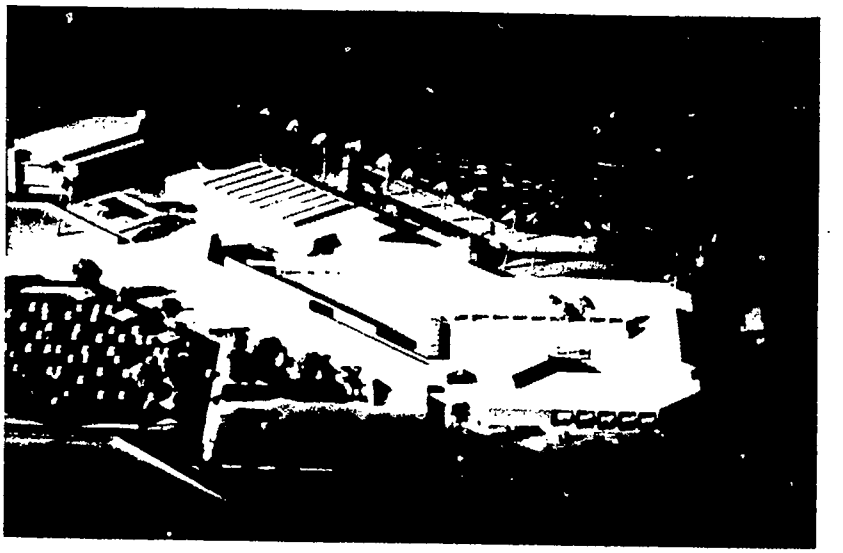
Rhode Island Junior College
Warwick, Rhode Island
Central Building, 1972

Figure 3



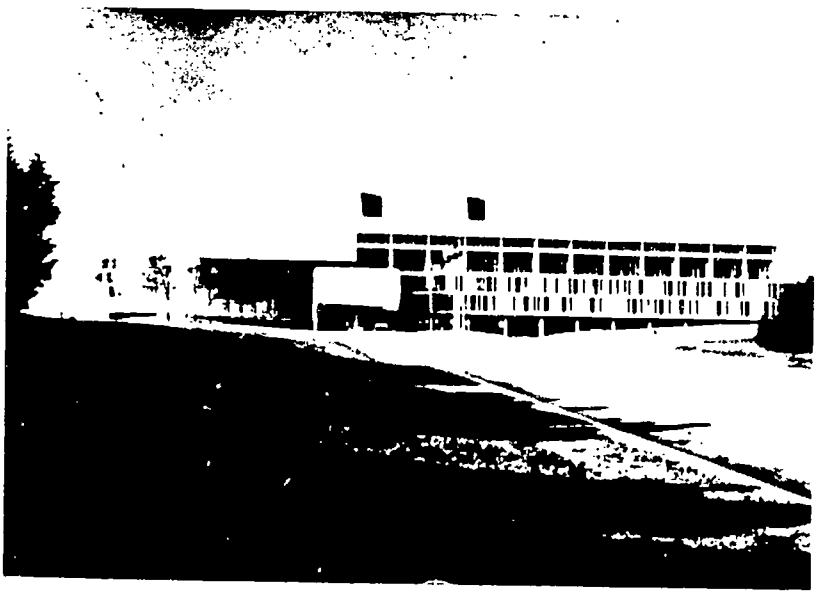
Oakland Community College
Orchard Ridge Campus
Farmington, Michigan
Master Plan, 1965

Figure 1



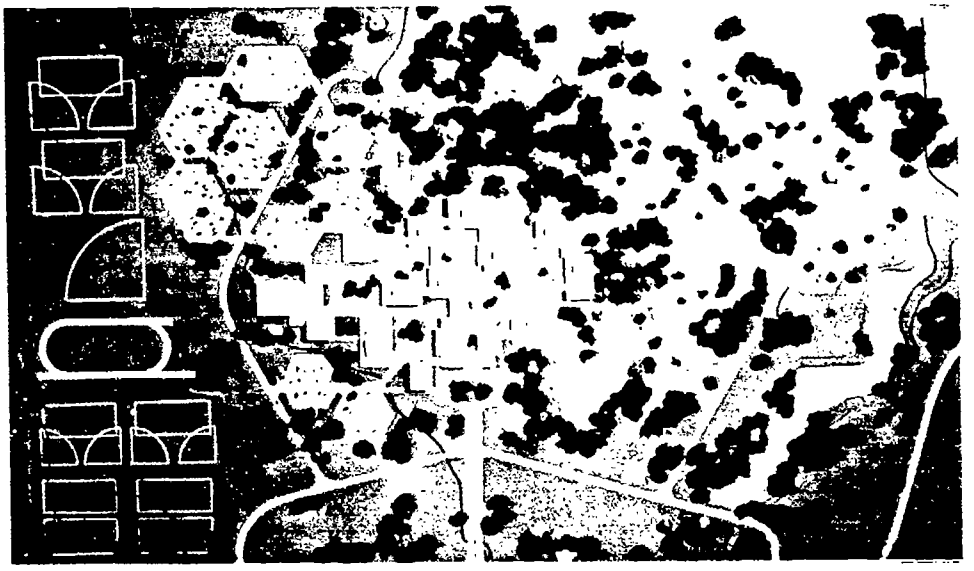
The College of Alameda
Alameda, California
Master Plan, 1966

Figure 2



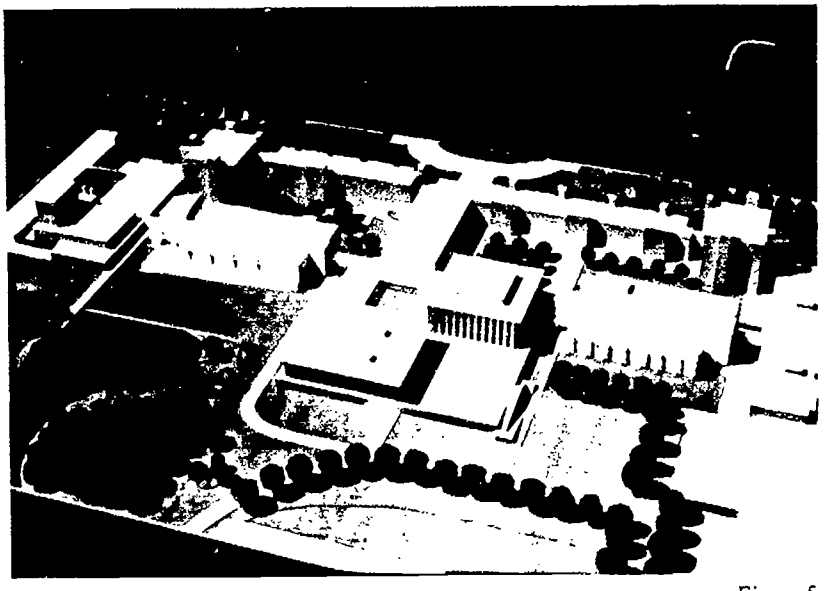
Rhode Island Junior College
Warwick, Rhode Island
Central Building, 1972

Figure 3



Lorain County Community College
Elyria, Ohio
Campus Development, 1964-1975

Figure 4



Monroe Community College
Rochester, New York
New Buildings, 1993

Figure 5

Grand Rapids Community College
Grand Rapids, Michigan
Applied Technology Center, 1990

Figure 6

Community College (See Figure 6) serves the educational needs of traditional students and the training needs of business and industry, accommodating the College's programs in automated manufacturing, computer-aided design, informational systems management and robotics. In the new Instructional Resource Building at Monroe Community College (See Figure 5), presently under construction, the communications network linking the various electronic labs, classrooms and resource centers consists of both an overhead cable tray primary distribution system and a multi-cell, in-floor distribution system, providing significant flexibility for accommodating future changes to the system.

Future Directions

In comparison to the 1960s and '70s, the 1980s evidenced a relative decline in community college planning and building. However, today, as we prepare to enter a new century, community college building and planning is once again more active, and no time could be more opportune for speculation on trends and future directions in planning and design of community colleges. As with any speculation about the future, the exercise can often raise more questions than provide answers. However, several important issues appear to be facing community colleges as they position their institutions to meet the educational needs of the next century. These include the need to focus on the unique needs of the community; to respond to increasing student diversity; to adapt existing space to meet new, changing needs; to provide industry-specific vocational training; and to initiate strong college-business partnerships.

As the socio-economic fabric of our society changes and communities become more diverse, there are consequential reverberations which can impact the role and mission of community colleges. As evidenced by an excerpt from a feature on military cutbacks which appeared in the New York Times in early April,[3] communities will increasingly look to their community colleges to **respond to the specific educational and training needs unique to that community**. The article mentions a Worker Re-Entry Program for laid-off McDonnell Douglas workers offered through a collaborative effort between St. Louis Community College and the State of Missouri held in a converted, former McDonnell Douglas office building. The program was funded by a $3.4 million Department of Labor grant. At the other end of the educational spectrum, there is a growing tendency towards the creation of magnet schools in many districts which has led to associations between area community colleges and public secondary school systems. Grand Rapids Community College in Michigan, for example, is experimenting with the idea of enrolling high school seniors in courses for college credit in preparation for entering higher education programs.

Community colleges are now confronted with **increased diversity of their student bodies**. A growing number of non-traditional students (elderly, non-English speaking, physically challenged) will be present on campuses of the future. This trend results in an increasing need for clarity of internal and external circulation and signage. Growth in the importance of the community service aspect of community colleges' missions will result in a growth in the number of shared and non-academic facilities on campus, such as county museums, performing arts

centers, technology high schools and day care centers. As business sends its employees "back to school," the educational environment must become more conducive to these students, with facilities equipped and configured to simulate the working environment. All facilities, existing and new, must meet the requirements of the Americans with Disabilities Act and be accessible to physically challenged individuals. By accommodating multiple and diverse groups, community colleges become more durable and versatile.

A corollary to the expanding roles of the community college is the **need to adapt existing space to meet new needs.** New teaching/learning environments will likely need to support collaborative teaching and learning situations. The traditional classroom with rows of individual chairs is giving way to a series of conference stations where team projects can be undertaken by groups of students. Security and student safety must be addressed in campus design (planting, lighting and campus infrastructure) and building design (zoning, lock systems, building infrastructure), in response to a growing and more diverse student body using the campus for expanded night and weekend classes.

As community colleges have grown, many have expanded to satellite locations, remote from their main campus. This dispersement has been facilitated by greater access to and use of information technologies. A diminishing need for physical presence on the campus might be seen to be clouding institutional identities, as these "invisible" students go to college. The trend toward increased access to learning through technology will not, however, result in the abandonment of the college campus. To the contrary, it results in a greater challenge for community colleges to maintain and strengthen their senses of identity and community as they vie for students.

The technological impetus has given rise to new building types, such as Computation/Communication Buildings which house all computer, communications and distance learning facilities in a single location. Instructional Resource Buildings, as at Monroe Community College, which house new instructional technologies and high technology presentation rooms will become more common. Industry-sponsored, dedicated Applied Technology Centers will have to be designed to meet the specific needs and requirements of the sponsoring industry. Better mechanical systems and infrastructure systems that provide flexibility and easy connection throughout the building will become more critical as diverse programs must be supported. These systems will need to be highly efficient in order to allow for cost-effective operation of the college facilities over longer hours, as the demand for evening, weekend and summer programs increases.

It is estimated that Corporate America spends billions of dollars a year on training, yet not all corporations are prepared to construct their own educational facilities. Increasingly, community colleges are providing programs for "re-educating" America's workers and managers in new technologies. This process of re-education is essential to competitiveness in the global market place. The **growing demand for vocational training**--a sign of the faltering economy--has led to and increased "vocationalization" at many institutions. In the boom years of the

1980s, less than 40% of the student population at Bronx Community College in New York was enrolled in vocational programs; today the figure is close to 70%.[4] This has led to a growing presence of business and industry on the community college campus. The Applied Technology Center at Grand Rapids Community College bears testimony to this trend.

Community colleges, in their commitment to accessibility, have prided themselves on maintaining affordable tuition costs. However, additional costs accrued through the need for expanded programs will mean an increase in operating costs. Because of their dependence on government subsidies, community colleges will increasingly be in competition for tax dollars being diverted to such needs as infrastructure improvement, health care, and technology upgrading. Institutions will need to look to other sources for supplemental financial support. In order to meet the need for training and re-training, community colleges will need to **develop strong college-business partnerships** to insure the success of these programs. An example of this type of partnership is described in an article in the Spring 1993 Community College Journal about Edison Community College's new dental hygiene program.[5] The program was initiated in response to indications from area dentists that dental hygienists were scarce. What is unique about the program is that the dental societies within the College's district joined forces to raise money to guarantee the costs of running the program in its initial three years. This infusion of much needed, dedicated funds from external sources has significant implications with regard to the growth and development of community college campuses in the future.

Concluding Remarks

A review of the past has resulted in the identification of five fundamental planning strategies that remain relevant to the design of community college campuses and buildings in the future:

- creating a sense of community;
- planning with sensitivity to regional diversity;
- developing environmentally responsive designs;
- providing organizational clarity;
- embracing change and innovation.

Speculation about the future has identified five issues which will impact the design of community college campuses and buildings as we approach the next century:

- focusing on the unique needs of the community;
- responding to increasing student diversity;

- adapting existing space to effectively meet new, changing needs;
- providing industry-specific vocational training;
- initiating strong college-business partnerships.

Community colleges of the future will be the logical choice for training and re-training for millions of students. The challenge for those of us involved in the planning and design of community colleges of the next generation, is to provide facilities that offer maximum flexibility to adapt to changing enrollments, programs, and technology applications. This challenge is complicated by the fact that many community colleges possess a significant inventory of existing space which must be successfully upgraded to meet these requirements. New construction is not always a viable alternative. A closer partnership between planners, architects, the colleges, local business, local and state government, and the community will be necessary to successfully bring America's community colleges into the next century.

Notes

1. The Institute for Future Studies. Critical Issues Facing America's Community Colleges. Warren, Michigan: Macomb Press, 1992.
2. As per telephone conversation with a representative of the American Association of Community Colleges, February, 1993.
3. Kilborn, Peter T., "Military Cuts: A Millstone for Ex-Workers." New York Times, Vol. CXLII, No. 49,292 (April 5, 1993): p. 1 ff.
4. As per telephone conversation with Dr. Rosenstock, Head Librarian at Bronx Community College, February, 1993.
5. American Association of Community Colleges, "Edison--Southwest Florida's Community College." Community College Journal, Vol. 63, No. 4 (February/March 1993): p. 44.

We would like to acknowledge and thank our colleague Imran Ahmed for his assistance in the research and writing of this paper. For a copy of the full bibliography for this paper, please contact Karen Anne Boyd, Perkins & Will, One Park Avenue, New York, NY 10016, (212) 251-7000.

VOICE PROCESSING IN THE UNIVERSITY SETTING

Eric V. Ottervik, Vice President for Administration
and Information Systems, Adelphi University

It is 3:30 in the afternoon in Dallas, and I am stuck in the office for a 4:00 meeting although I had planned to register for my third semester of part-time graduate work at the University of Texas at Dallas today. I know the traffic is already building on Route 75, and I'll never make it there before the registration office closes. I wonder . . . what the heck, let's try that new way I heard about . . . IVR, whatever that is!

I pick up the phone and dial. A pleasant-sounding recorded voice answers. I say I want to register for that fall semester, I am asked for my social security number. A quick check of my record shows that I am a student in good standing and have no outstanding bills, so I am allowed to proceed. I give the number of the first course I want, and I am told that is scheduled Mondays at 7:00 pm and that seats are available. Almost immediately, a prerequisite check reveals that I have the courses required. I have previously discussed my proposed choices with my adviser, and she has approved, and that approval is now also verified. I confirm my course registration and ask about my second course. It turns out to be filled but I am put on a "wait" list. I try a third choice and learn that it is available, so I register for it. I certainly can't take three courses, but I am told that I can Add and Drop courses by phone also.

I now indicate that I want to pay my tuition and fees and am quickly told the amount due. I choose the credit card I want to use, give the number and expiration date and shortly am told that my payment is confirmed. All I have to do is buy the textbooks and show up for class. And I still have 20 minutes before my 4:00 meeting.

This example is only one of many that could be chosen to illustrate what is possible with IVR--Interactive Voice Processing. Many institutions have Voice Mail nowadays, which is about ten years old and started by functioning much like an answering machine. But even basic voice mail is now much more sophisticated. Messages can be saved, forwarded, or marked "Confidential" so that they cannot be forwarded. Group messaging allows information to be broadcast to a large number of people with a single call. Thus, the President's Office can invite 50 people to a reception with one call and receive the responses by voice mail. Or, the School of Social Work can send information to all doctoral students in one message and all field work students in another. Faculty in general are particularly receptive to voice mail since they may be located in individual office quite far from a departmental secretary and in their office only a few hours per week even though they are on campus. Voice mail allows them not to appear to be unreachable by phone.

I should note here two advantages of voice mail over electronic mail. First, the message is more personal because it arrives as a human voice. It will have some electronic overtones but can still transmit human emotion and inflection. Second, in my Social Work examples, we

are talking about people spread over a wide geographical area; in fact, few of them are on campus. How many of them have both computers and modems? But, they all have phones. That is why my institution requires all Social Work students to have voice mail. For a primarily graduate, part-time widely dispersed student population, it provides a marvelous opportunity for communication.

In fact, we require all resident students to have voice mail, and the cost in built into their regular bill. This requirement allows the administration to be able to get an important message to any student even though he or she may not be in the room when the call comes. And, of course, it also permits broadcast messages to be sent to all resident students from the Dean of Students, the Director of Residential Life, etc. An interesting feature of this application is that we do not publish resident student phone numbers in our campus telephone directory. Student can be reached by dialing their names. After enough letters have been entered to guarantee identification of a particular student, the connection is made. Thus, students are guaranteed the same kind of privacy as guests in a hotel: The desk will ring a person's room but not divulge the room or phone number to the caller. This also avoids having to get written permission from each student, which we would have to do in order to published what are really their "home" phone numbers.

Another major use of voice mail is for Information Lines. Call the Athletic Department Hot-Line and find out what games are scheduled this week (with IVR you could order and pay for tickets) and what the scores are of yesterday's games. Call the Career Planning and Placement Center and find out what jobs are currently listed and what companies will be interviewing on campus next week.

The next main feature of voice processing I would like to mention is call Automated Attendant and provides for electronic transfer of a call driven entirely by the caller. For example, call the university's main number and learn whether we'll be closed because of today's snowstorm (press #1), directions to campus (press #2), or who's speaking or performing in the auditorium this weekend (press #3).

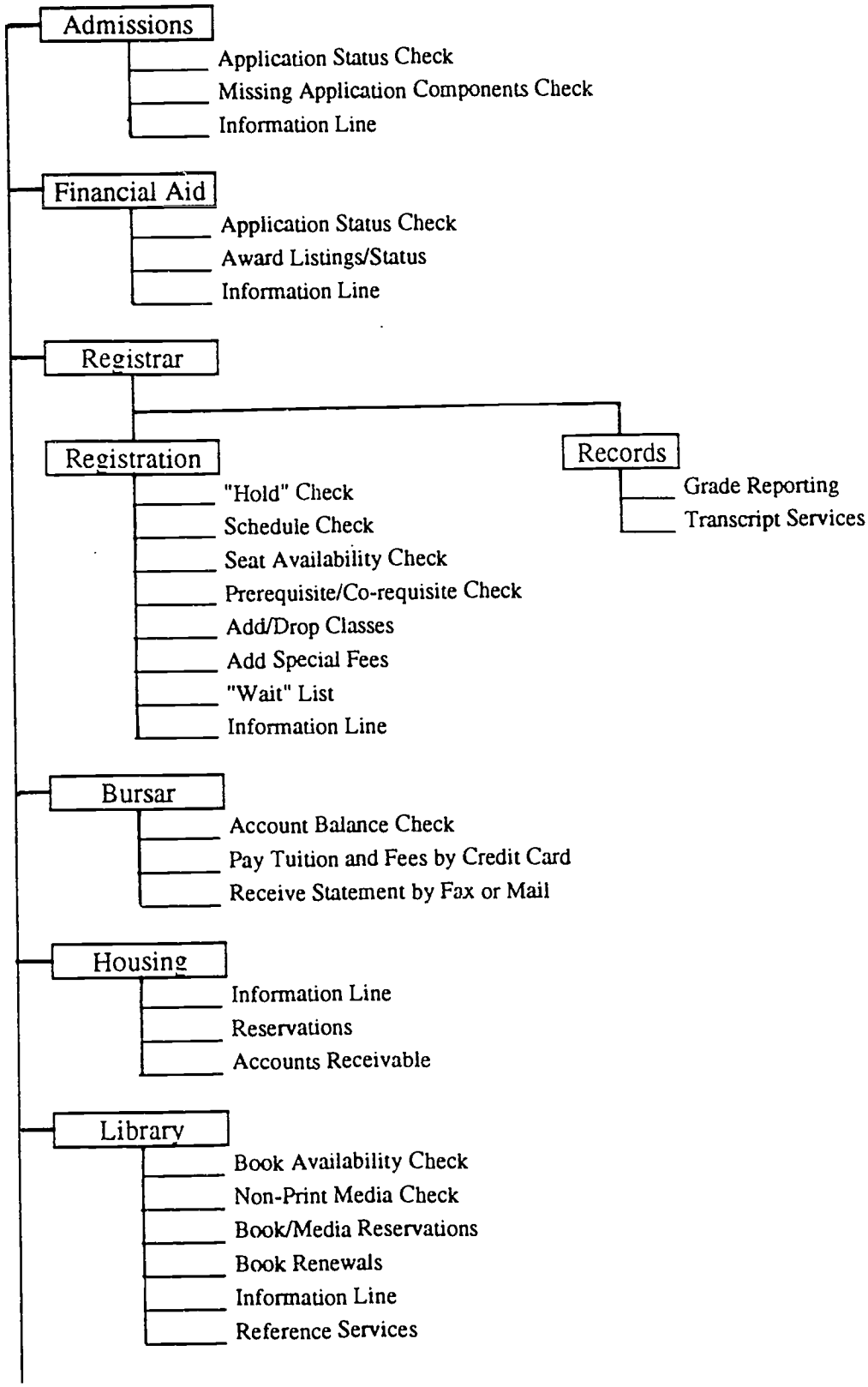
But, clearly the major application of this technology is IVR. This application is quite recent and depends upon telephone access to electronic data bases. Banks were quick to take advantage of this technology, and I'm sure most of you use that regularly to prevent the unexpected overdrawn account. To date, very few academic institutions have taken advantage of the technology. Let me give you a smorgasbord of applications.

The following charts indicate, department by department, the kinds of applications that are available (Figures 1 through 3). The applications seem almost endless, and they are growing all the time.

Let me dwell, for a moment, on a few of these and stress, at the same time, the benefits. First, in certain high-traffic areas, such as Admissions or Financial Aid, there is often a high

Figure 1

For Departments/ Offices:



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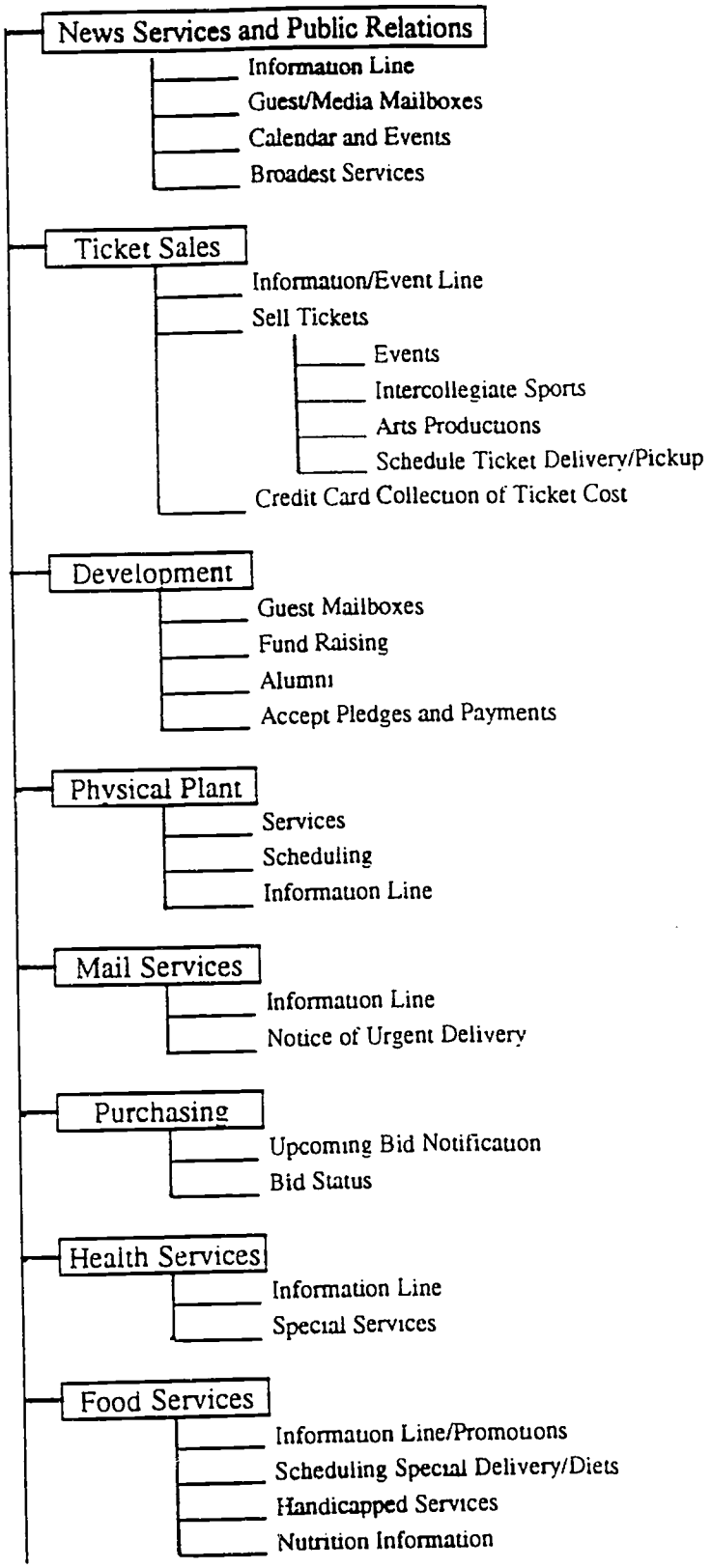
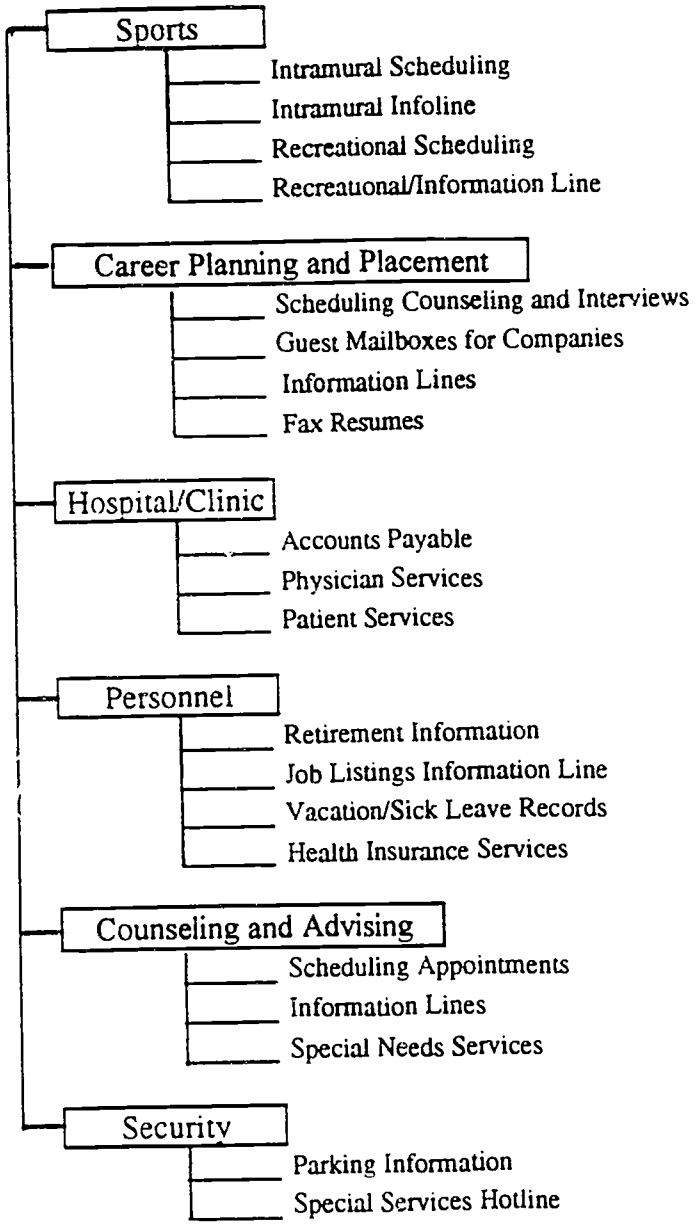


Figure 3

For Departments/ Offices (continued):



Figures courtesy of Higher Education Technology Co., Inc.,Richardson, TX.

level of frustration at the consumer end in getting though at all and the getting current, accurate information. At certain times of the year, these office are typically inundated with telephone calls to the extent that many calls are unanswered, put on hold indefinitely, or responded to inadequately.

The harried staff in these departments simply cannot handle all the calls. Nor do they need to. Many callers are seeking simple information: What are the dates for certain filings? Can I be sent an application? When will State awards be announced? Has my application been received? Is there any missing information I can provide now over the phone?

Another set of questions often receive short shrift from these harried clerks because the questions take time to answer and also require leaving what they have up on their computer screens in order to pull up new records. To them, this is time lost from their immediate, pressing duties. Those instances are the ones where IVR can help.

In my initial registration example, if I had been a student on Financial Aid, I could have gone into that system and learned the status of my account. Has my Pell Grant come in yet, for example? How much do I owe? Can I pay by phone? Do I wish to receive a statement by mail? And, here is an exciting development, do I wish to receive a current transcript or Bursar's statement by Fax? I should also note that, in all IVR applications, there needs to be an option early in the "tree," as it is called, that permits a transfer to a human. It is important that this transfer be possible early to avoid frustration on the caller's part. There is nothing worse than being held in what is call "voice mail jail," which occurs when you are virtually forced to choose to transfer from A's mailbox to B's to C's and back to A's without being able to get out of the loop to a human.

A small, but potentially very useful public-relations option is listed for more than one of these areas and that is "Guest Mailboxes." This option allows you to provide courtesy voice mail service for campus visitors, conference attendees, alumni, placement recruiters, etc.

A more major application that can be very useful for people without computers is immediate access to the Library's automated card catalog and media services for information and even book reservations or renewals.

Now, for a moment, how does this all work? The technology is basically the ability to record sound, digitize it, store it, manipulate it, and reproduce it readily at close to its original sound. As I mentioned earlier, it also depends on access to computer data bases (in financial aid and registration, for example). That is, the telephone system and the administrative computing systems become physically linked through another computer that contains the IVR system. Therefore, the IVR system requires a sophisticated computer program like any other administrative system.

There are inevitably, some constraints on an institution's ability to avail itself of these services:

First, you need to have a digital telephone switch (either your own PBX or a Telephone Company Digital Centrex) and touchtone phones;

Second, you need to have data bases that are accurate and current;

Third, security of your data bases is critical before you open them to large groups;

Fourth, your current hardware and software may not work well, if at all, with the voice processing company's;

Fifth, your top administration must support the concept; i.e., the recorded voice, "the machine;"

Sixth, your own institutional reporting requirements as well as possible requirements for reporting to external agencies;

Seventh, your commitment to provide training is critical for all users at both ends of the application; that is, the departmental manager, on the one had, and the end user, whether students, faculty, or staff, on the other.

Finally, what lies in the future? Several exciting developments:

Text to Speech: This could provide the real connection between computer and telephone systems. For example, E-mail could be "read" over a phone line. It also makes possible a myriad of other applications in accessing records of various sorts. This capability does exist now but is not quire mature enough yet for most users (quality of voice is still a problem in most cases).

Speech to Text: The converse of the above. This feature, not yet commercially available, would let you update data bases and send E-mail over the phone.

Automated Fax: Already possible and mentioned earlier in the case of transcripts. This requires only that the data base filed are formatted for Fax dissemination.

Voice Recognition: Will eventually replace the constraint of touchtone versus rotary telephones and will, in fact, be quicker than pushing many buttons on a keypad. Will be important in establishing identity for security and access purposes but not available yet.

Networks: Voice mail systems will be able to be linked together so that, for instance, multiple sites in a University system can communicate with each other as if they were all on one campus.

In conclusion, I would like to emphasize three points:

First, everyone would presumably prefer to interact with a live person on all calls. The reality in today's environment driven by peak periods, downsized staffs, and ever-increasing demands for information is, however, lessened productivity and lost or irritated parents and students. The relative impersonality of "the machine" can reduce costs, improve effectiveness, and avoid the innumerable unanswered phones, calls on interminable holds, lost messages, telephone tag, and wrong numbers.

Second, voice processing can be very cost effective. It can result in a reduction in staff or at least the avoidance of staff additions. It can reduce mailing and paper costs. It can increase productivity of staff no longer tied up with trivial phone calls and record checking.

The costs need not be prohibitive. Most systems are modular, and new applications can be added over time. Start-up costs are not large because the IVR system utilizes existing computing resources, hardware and, especially, software. Voice processing services can be sold to students and certain faculty (in, say, clinics and research operations) or become part of the overall fee structure (my institution charges students $30/year for voice mail. And, in time, the system become just another part of the institution's technological infrastructure (or, perhaps, infostructure).

Third, IVR is a growing part of what may result in the nineties being called the Communications Decade as the eighties were sometimes known as the Information Decade. Improvements in technology itself and its cost-effectiveness, in such areas as computer chips, fiber optics, and switching mechanisms have linked telecommunications and computing in far-reaching ways.

We are reading daily that the telecommunications and cable TV industries are evolving at a rapidly intersecting pace. As people become more and more accustomed to these technologies in their homes and their workplaces, they will certainly expect colleges and universities to be among the leading, most adventuresome institutions in the field. And, in our increasingly competitive situation as we struggle to recruit and retain students, every little edge in better service will be critical. Voice processing is one way to obtain this edge.

CREATING A QUALITY RESEARCH ENVIRONMENT DURING A TIME OF REDUCED PROJECT BUDGETS

Case Study: The University of Maryland at Baltimore Health Sciences Facility

Architecture, Engineering, and Planning: A Joint Venture of CUH2A, Inc., and Ayers/Saint/Gross

Panelists: Richard Hodgson, University of Maryland at Baltimore, Director, Resource Planning and Analysis, School of Medicine;
Robert Rowan, Assistant Vice President, Facilities Management, UMAB;
Adam Gross, AIA, Principal, Ayers/Saint/Gross, Baltimore, MD;
Charles Johnsrud, AIA, Project Manager, CUH2A, Inc., Princeton, NJ;
Moderator: John Rivers, AIA, CUH2A, Inc., Princeton, NJ, Project Executive.

John Rivers: A university research facility is a collaborative commitment by the school's administration to invest in science, scientists, and a supportive teaching environment. The planning process for any architectural/engineering project becomes even more complex for administrators and designers when already tight budgets are cut even further during the course of the job. When the $43 million budget for the new Health Sciences Facility (HSF) at the University of Maryland at Baltimore (UMAB) was cut over five per cent in early 1993, two months before groundbreaking, UMAB and its architects turned to successful value engineering and project review processes that had been in place since the start of the design process. By following these procedures, UMAB's design team exceeded the budget reduction mandated by the Legislature without compromising quality.

UMAB's medical school was founded in 1807, the fifth institution established for the training of doctors in the United States. It faces many of the same issues of other major universities with academic research divisions:

- Older research space is outdated, inefficient, and potentially unsafe;
- The University's priority on research means that UMAB must seek to expand its grant-funded research initiatives;
- There is stiff competition for the best researchers and for research grants.

Robert Rowan: UMAB's School of Medicine occupies four buildings on the campus. Two relatively new high-rise research buildings were constructed in the 1970's, plus Howard Hall, built in 1892, and Howard Hall Annex dating from 1928. The Annex was a wood frame structure and had an outmoded ventilation system. Howard Hall was originally a department store warehouse. It was converted to research space in 1960. Although it has a variety of mechanical and electrical problems, we thought that we could kick off our expansion program by renovating this building.

We realized that while the demand for research space was growing dramatically, we had no place to relocate researchers while Howard Hall was undergoing renovation. It was then that we decided to consider building a replacement building that would give us state-of-the-art research space as well as a place to relocate the Howard Hall staff while we thoroughly renovated it floor-by-floor. It would also deal more realistically with plans for research growth.

Planning for this project was begun in the early 1980s. The capital planning process for the State of Maryland is rather lengthy. Our program was approved in 1990 and construction began in 1993. Today, the project is at the point where we have completed necessary demolition. Howard Hall Annex has been taken down along with a 700-car garage. Site work is well underway, and caissons are about 50 percent complete; steel will begin coming out of the ground in early June.

Richard Hodgson: UMAB ranked thirteenth in 1990 in National Institute of Health (NIH) grant and award contracts. Our specific goal is to be among the top 10 public medical schools in the U.S. in research funding.

Ten years ago, the dean of the medical school decided that he was going to invest the resources of the school to create a very strong research institution. Since then, we have had a 233 percent increase in research funding. Today, we have a total of $100 million in research grants and contracts (NIH and Veteran's Administration). We just opened a new VA Medical Center across the street from University Hospital and our research facility, and we expect an increase in VA funding as well. Our aspiration to be in the top 10 of public medical schools in research funding has been supported by our Governor and Legislature, as indicated in their approval of this project.

Compared with our peer institutions, UMAB ranks relatively low on the scale of net square feet (nsf) to full time faculty members. This ratio has to be improved. Included in a facility master plan was an examination of our faculty in relation to an optimal standard of 325 net square feet per lab occupancy in public and privately funded research facilities. Considering that some of our researchers had spread out into the hallways, it was not surprising that the study corroborated the observation that several departments were significantly space deficient.

John Rivers: Several groups took part in the planning of the new HSF including a Steering Committee made up of the president of the university and the vice presidents and deans; a Scientific Advisory Committee made up of department heads and senior research faculty; technical and maintenance people from the Facilities Management office; and representatives of state and city institutions.

One of the challenges of a project like this is to allow the building team--users, facilities staff, architect, engineer, contractor, etc.--to develop its own goals, and channel them into a common pursuit so that all groups are working toward a common goal.

Robert Rowan: The prime mover is new research space, and surge space to allow us to renovate Howard Hall. Our new campus master plan has given us guidelines in terms of building setbacks, construction materials, and general direction. The Health Sciences Facility was the first step in the implementation of the plan. We were looking for a building that was distinctive, that would blend with the campus and with the city. We were trying to solve some functional problems of adjacencies within the School of Medicine, and to provide space that would be flexible to facilitate renovation. In a typical year, we spend $3 million for renovations in the School of Medicine, just moving labs around. Mechanical and electrical system flexibility was an important criterion in the planning process for the new HSF.

Quality architecture was high on the list of objectives, and it was important to retain an architect who could bring a wealth of experience to the table. The CM was selected at the same time the architect was hired so that we could initiate the process as a team.

Richard Hodgson: Our four primary goals and objectives are:

- *Excellence in biomedical research and training.* This requires recruiting and retaining excellent faculty, students, and graduate students, a driving force in any academic research institution.

- *Flexible, state-of-the-art facilities responsive to the changing research environment.* We are also trying to address our teaching space needs. The emphasis will be on increasing information technology in the education of our students.

- *Strengthening and expanding interdisciplinary and inter-professional approaches.* We need an environment that promotes interaction between our faculty and students. The fact that the Health Science Facility will now connect all of our research buildings will be important to promoting that interaction. We want to facilitate collaboration with the other schools on the UMAB campus--dentistry, law, pharmacy, social work. We have a unique opportunity to improve our collaborative research efforts.

- *Enhance our strategic role in the economic community development.* This was an important factor in getting the construction funding approved.

Adam Gross: One of the advantages that UMAB has over its neighbor to the east, Johns Hopkins, is that it is right downtown. The Chamber of Commerce has been emphasizing the city as a center for the life sciences, important to its future. The University Center site is in excellent visual proximity to the crest of major highways coming into the city. We studied how the city and the campus developed over time. Our building had to be a bridge between the two worlds of modern, free-standing urban buildings, and the traditional campus structures. It should also function as an urban marker for those entering the city.

One of HSF's neighbors is the Shock Trauma Center which has a helicopter landing pad on its roof. One of the significant design challenges of the project was to discharge fume hood exhaust without interfering with helicopter traffic. This was accomplished by arrangement of systems within the building and penthouse to allow separations of fresh air intake from the exhaust stack housed by the tower.

Another part of our challenge for this building--which will bridge a major city street--was how it could enhance the city and inform pedestrians as they move through the site. There is a major north/south connection that we wanted the building to respond to. At the same time, we wanted to correct problems from the Medical School Teaching Facility (MSTF) that does not have a front door (you have to enter through a fire stair). Bressler Hall also has less than a noble entry. Our new building was expected to give a front door not only for itself but for adjacent neighbors. Our design connects both the first floors and upper floors of adjacent Medical School buildings.

Our charge was to connect not only at the first floor but at all floors. The scheme had to tie in all the floors of existing Howard Hall where our building was going to abut and then bridge them across Pine Street to the MSTF.

The ultimate plan created a "superfloor" and all floors in the HSF will abut and tie in with Howard Hall and MSTF.

Robert Rowan: Maryland's capital budget process is no doubt similar to the capital budget process in other states. It took us 10 years from inception to program approval. There were constant rewrites to the program. We had to incorporate the School of Medicine's program as part of the document.

Initially, we estimated a project of over $100 million, and decided to phase the project. Phase I is under construction now. We also had to deal with two significant challenges. First, benchmark figures for medical research space are $200 to $300 per square foot, figures that legislators find hard to grasp. Another restriction was the net-to-gross ratio, for which the state

uses certain fixed averages. Medical research space is typically on the low end of those ratios. We also had to deal with rigid adherence to the program. Early on, we decided to build as much generic space into the building as possible. The second challenge was that elements such as connecting bridges, meeting spaces, and spaces for interdisciplinary action were hard to define in terms of square footage yet had to be built into the program.

We made a decision early on to use a CM. That was also something that was not typically done in Maryland. It took a while to fight and win that battle.

There were many site constraints that drove up the cost. We had to relocate about 80,000 square feet of combination research/office space; this was done at the University's expense. We also had to relocate a methadone clinic.

In early 1993, the Legislature approved the program. But, they arbitrarily cut five percent off the project appropriation. We were just about finishing construction drawings at the time. They didn't tell us to leave anything out; they just gave us five percent less money.

Because of the judicious use of the value engieering process, begun early in the design process, we were in a position to deal with the five percent cut without jeopardizing quality or program. In fact, our value engieering allowed us to come in $1 million under the Legislature's mandated cut.

Richard Hodgson: For UMAB, the driving force was to maximize labs and lab support space as the major component of the building. Our connection to other buildings will ultimately help us to provide more office space. HSF is also directly connected to our University Hospital and the new VA Medical Center; users will never have to leave an interior space, and that is a very important benefit.

Early on, the decision that was made was to group the laboratory modules together so that there would be flexibility in assignment of two, three, or four lab modules to any given research program. Module sizes are 260 square feet and 520 square feet. The design enables the programs to expand and contract as their funding expands or contracts. The modules will allow the departments to establish their departmental administrative and faculty areas.

There are other ways we could have gone. We could have put faculty members' offices directly outside their labs, and some would have liked that. But, we felt that this module design gave us the maximum flexibility.

Several options were developed for these generic lab modules to allow for changes in the utilities and the casework to meet a variety of needs down the line.

Maryland Department of State Economic and Employment Development multipliers were the basis for the job numbers and the induced expenditure numbers. That was a very powerful

argument for getting the building. We also demonstrated the impact of the Health Science Facility itself on the economy based on projected research dollars brought into the state as well as construction dollars.

Charles Johnsrud: Our approach to cost control and value engineering was a continuous process. The project team met regularly and evaluated every decision on its response to project requirements, on its impact to operations and other systems, on first and operating costs against the budget, as well as on esthetics. This occurred whether it was a user request or a design recommendation. There were two formal value engineering exercises, one each at the close of the schematic and design development phases. During those phases, we worked against the budget but put as much into the project as we could, so that at the end of the phase we would come in slightly over budget.

Those value engineering exercises gave us an opportunity to challenge and defend decisions in the context of total budget which allowed us to reconfirm and re-prioritize everyone's goals. This gave us an even playing field to bring the job back in line, and to strengthen the resolve of the team that this was their project.

Different approaches toward value engineering were taken over the course of the project. We had a design approach. We saved money in the fit-out of labs and arrangement of building systems. We evaluated criteria. For example, the program could have said, "all." Challenged and considered in relation to other goals, it came out "most." Saving costs on details and finishes was a last resort--they offer little in the way of savings but are very obvious. Fortunately, we did not have to resort to significant changes here.

A project is successful when all participants feel that their goals have been met and the overall goals of the project are satisfied.

Adam Gross: CUH2A's mechanical engineers designed the mechanical system to be transferred horizontally to a very large mechanical floor on the other side of Redwood Street. Then, the fume hood exhausts were located in the new collegiate tower which will be lit at night to be a marker during day and night.

John Rivers: Facility costs are not just the initial capital costs. They have to do with operations and maintenance, and renovation as well. The longer you can delay program decisions, the better off you are.

Richard Hodgson: One of the principal reasons we decided to go with the generic building as opposed to one with assigned investigators was that we had a new dean coming on board during the planning phase of the project. He was interested in developing strategic plans about where he wanted the school to go before making assignments for the HSF. The dean also wanted the flexibility to award productive and promising investigators at the right times. He saw the HSF as promoting interdisciplinary research rather than departmental-based research.

In order to get a high quality generic building, we utilized the Scientific Advisory Committee, consisting of senior and junior faculty and investigators in a variety of departments. It was a battle, because all along, members of that community wanted someone to step forward and say who was going to occupy the HSF. That did not happen. We are now in the process of identifying specific occupants for the building so that we can achieve the customization of this generic space. We will be getting funds from departments and investigators to customize their spaces.

Charles Johnsrud: One of the dilemmas of planning a laboratory building is the length of time it takes to get from concept to occupancy when compared with the dynamic nature of scientific methods and the scientists who will occupy the labs. It is difficult to tell the best researchers in the country--whether they are members of the current faculty or being recruited--that they will do their work in a generic lab. It is more diplomatic and realistic to let them know that lab will he fitted-out to support exactly what they are doing.

To accomplish this, we created a generic infrastructure. The basic sizes of 260 and 520 square feet were tested with the Scientific Advisory Committee. We also tested various configurations of benches and equipment within the module to respond to specific sciences. Required services were identified. The typical labs which the Scientific Advisory Committee thought would ultimately be included in this building were biochemistry, electro-physiology, imaging and tissue culture. Labs were documented but not assigned to specific locations.

The infrastructure of the building that addresses the air systems, piped services, electrical, and communications has to respond to various requirements of individual researchers. We created an infrastructure which is routed through the building so that it is readily accessible when specific needs are identified and labs are to be customized.

This approach offered significant savings over creating a generic lab with every service that potentially could be needed extended to an outlet on the bench. Money was set aside for customization that will be done when labs are assigned.

John Rivers: The process, as we look back on it, went very well. We made hard decisions all along the way. We have maximized the program, and included the program elements that were not necessarily specifically called out. We kept the project within budget, and we did not lose any time during the period when the new dean came on board, or dealing with the five percent cutback.

Richard Hodgson: The School of Medicine participants learned that it was important to create and maintain very open, consistent, and frequent communications with others on our team--our architects and engineers, our facilities management people, and the CM. Consistent joint client/team monitoring of the quality and the achievement of our goals was important. Function had to be balanced with design considerations and the budget.

Robert Rowan: Teamwork on the project was critical to its success. We analyzed almost every decision you could make on this project, and that gave us the flexibility to deal with changes when they did come up. We knew what different options cost, what the implications were of deleting a system or adding a finish.

We are really excited about the project. I'm convinced that we will have a landmark building. We have great design, architectural finishes that blend well with the campus, and maximize the impact on our campus master plan. The School of Medicine is pleased with the outcome. Having a good team was critical to the success of the project.

We started with many restrictions. A limited budget that was reduced even further. Many site constraints had to be dealt with. But by having that open process, many people participated in the process, and now they understand that they are going to get the best that is possible.

The building is under construction and is scheduled for occupancy in the spring of 1995. We look forward to its completion which may coincide with your next regional conference in Baltimore.