Critical Process Redesign (CPR) to Achieve an IT Learning Organization

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In July 1995, The University of Memphis established an Information Systems (IS) unit led by a newly recruited vice presidential level Chief Information Officer (CIO). The President charged the CIO with the responsibility of creating an information technology (IT) strategic planning process closely coupled with institutional strategic planning and budgeting, a new governance and decision-making structure for IT, and a central information systems organization that would be responsive to university needs and 21st century demands. A significant and lasting change process was needed to accomplish these objectives. It was decided that infusing principles of a learning organization into all new processes offered the best possibility of success. This paper sets forth what has occurred to date and what is planned for the future.
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Introduction

“As a society, we’ve spent a fortune – and considerable pain – trying to implement changes, using methods like TQM, self-directed teams, reengineering. Yet, studies show that at least two thirds of our change initiatives fail to achieve their intended results. Why? The answer is simple, even if the remedy is not. We have assumed that if you can articulate where you’re trying to go, and differentiate it from where you are now, then change will happen. Simply pointing the way from A to B has worked in the past. But it doesn’t work when the changes in question are deeply behavioral in nature.”

Changes that are deeply behavioral in nature are exactly the kind called for by the President of The University of Memphis when, in July 1995, he charged the new CIO to (1) establish a stable, service oriented, integrated information systems organization, (2) develop a campus wide planning process for IT closely coupled with the university’s strategic planning and budgeting processes, and (3) establish a governance and decision-making structure for IT issues.

The need for significant and lasting change was further demonstrated by three institutional decisions that shortly followed. The first was to complete the campus backbone network and to upgrade telecommunications capabilities for the campus. The second was to move from a heavily modified SCT/IA Plus administrative system running on a VAX cluster to a new SCT/IA Plus client/server based system operating on IBM RISC 6000’s in DB2, with a graphical user interface (GUI) and world wide web front ends. The third decision was to migrate to a standardized distributed client/server based academic computing environment. Each major project requires IS staff not only to learn new and different technologies, but also, to learn and emphasize very different service methodologies aimed at meeting a new set of expectation levels.

The University of Memphis is a large, regional, urban, doctoral granting institution with nine colleges or schools and five centers of excellence. It operates on two campuses approximately one mile apart, and in four off-campus locations (three in other cities). The new IS unit was made up from the Computing Center and Network Services, which previously reported to the Provost, and Telecommunications, which formerly reported to the Vice President for Business and Finance. Staff members in all IT areas tended to be long time university employees deeply embedded in an organizational culture that had existed for many years.

A Philosophy of Planned Change

Prior to joining The U of M, the new CIO held similar positions on three other campuses in an almost 30-year career and had led the development of productive IT organizations and successful participative planning processes at all three. Although each prior position required gaining an understanding of the organizational culture of the place and adapting planning and management philosophies and methodologies to the unique cultures, there were “tried and true” ways of introducing change mechanisms which enabled a relatively
quick reorientation by a critical mass of staff members. Such is not the case at The U of M. Not only are deeper initial changes required because of past circumstances, but the world has changed as well!

Sometime in 1991, this country entered a new era when information age spending overtook industrial age spending for the first time. By the end of 1994, it was four times as great as industrial age spending. The US is rapidly becoming a knowledge society — a society where knowledge incrementally adds value in real dollar terms. Well educated men and women who can innovatively use this knowledge are increasingly needed in the work force. Yet, institutions of higher education seemingly at the center of such a society are sagging and struggling. One illustrative indicator of this is found in the bellwether state of California where spending on prisons has increased from two percent of the state budget in 1980, to 9.9 percent in 1995, while spending on the UC and CSU systems of higher education has declined from 12.6 percent to 9.5 percent in the same time period. Similar trends are found in other states as well, including the state of Tennessee.

A good strategic planning and management process based on rational analysis produces steady and significant incremental change. Such a process might well alter an organizational culture, but it will seldom, if ever, introduce a different and lasting organizational culture. Given the type of external and internal pressures just described and the changes needed to adequately address them, it is clear that the methods of the past alone will not suffice.

What is needed involves IT managers and staff at The U of M applying new theories, methods, and tools while increasing their own skills in the process; resisting current ways of thinking in finding ways to make the organization more effective; experimenting with redesigning the organization’s infrastructure; and gradually evolving to a new type of organization — an organization which can learn. The IS unit must be able to deal with the problems and opportunities of today as it invests in its capacity to embrace tomorrow. Such work involves coming to understand conceptual underpinnings and applying them to the building of a learning organization.

**Initial Steps**

The new CIO had for many years utilized a strategic planning and management model based on the work of Robert Shirley and John Bryson that was modified and adapted to IT planning. Although the model was highly adaptable to conform to the decision-making culture of a particular campus, it needed further revision to respond to the constraints and requirements evident at The U of M. Such formalized planning systems need a higher degree of flexibility to address the rapidly changing environments of the 1990s. They need to include line management in the strategy making process to ensure acceptance of responsibility for results, and the models should be seen as only part of a total approach toward strategic management. Other essentials include an enhanced focus on clients and markets and an emphasis on organizational culture.

Workshops designed to acquaint staff members with the strategic planning and management model incorporated techniques from *The Fifth Discipline Fieldbook* to help participants recognize their own biases and to generate new mental models as they engaged in planning activities that solicit “thinking out of the box,” imagination, and innovation.
Of particular importance is recognizing and understanding the ladder of inference\(^\text{10}\) in oneself, a common mental pathway of increasing abstraction that can often lead to misguided beliefs. Protocols for balancing advocacy and inquiry\(^\text{11}\) are also very important to the processes of creating shared vision, agreeing upon commonly recognized strengths and weaknesses in the internal environment, and identifying the important opportunities and constraints from the external environment. Other exercises focused on finding alignment between an individual’s personal vision and the shared vision statement that is expressed for the organization.\(^\text{12}\) Additionally, the strategic design for the actual process of building the shared vision\(^\text{13}\) was presented, discussed and carried out.

Other learning organization sources were also used to augment the planning and management model. The strategic learning cycle,\(^\text{14}\) a process of continuous planning, improvised implementation, and deep reflection was built into each of the feedback loops inherent in the model. Finally, Argyris’ Models I and II contrasting social virtues,\(^\text{15}\) which demonstrate how organizational defenses for the status quo are rationalized and then sets forth a rationale for how such defenses might be overcome, were presented and discussed in workshop format.

Internal and external communication channels were completely overhauled. Two ombudspersons (nominated by the IS staff) were appointed by the CIO and given complete and confidential access to any management level within the division. Their charge was to listen to any complaint by an IS staff member or any IS client and attempt to resolve it at the level of occurrence. If that failed, they could bring the issue directly to the CIO for help in finding a resolution. Minutes from director and senior manager meetings were posted on an IS world wide web (WWW) page, as were working documents related to planning, standards, etc. All IS staff members were invited to participate in strategic planning meetings (about 65% did throughout the process). Annual division-wide meetings, to be held in early Fall, were designed to provide an assessment of the past year, to set forth priorities for the current academic year, and to link IT initiatives to institutional goals. Periodic “question and answer” brown bag luncheons with the Vice President (VP) and Associate Vice President (AVP) were begun. All managers were asked to meet regularly with their staff to share information and to seek input on up coming decisions. A new internal newsletter for IS staff was begun and Technology, the campus-wide IT newsletter, was redesigned to appeal to a broader constituency, and was also placed on the WWW after publication. Impact reports, which alerted E-mail recipients of any significant technical problem anywhere in the division, were instituted. Any staff member was authorized to issue such a report immediately upon discovery of a problematic circumstance. All IS staff were given voice mail boxes.

**Decision-making and Governance**

Many elements of the planning and management model were already designed to reinforce alignment between the strategic, tactical, and operational stages among the division, a unit, and an individual and between specific strategies, goals, and objectives. A representative, senior level, policy council was formed by the President and delegated decision-making authority with respect to IT issues. This is the group that is used as the primary “sounding board” for concepts included in drafting the mission statement, the vision (a values statement), and IT goals for the university. Once a draft is conceptually endorsed, it is circulated as widely within the university community as possible for further input and
suggestions. After further modification based upon this cycle, the policy council provides final approval for *The IT Strategic Plan for The University of Memphis*.

Separate representative advisory committees for academic and administrative IT issues were also appointed. The academic committee is made up principally of faculty and the administrative committee consists primarily of mid-level administrators. These groups carry out assignments from the policy council, provide recommendations to the policy council, initiate proposals, and prioritize IT projects. Their overall focus is tactical, having major input into such things as campus-wide IT standards and guidelines.

Each college and most major administrative units, including IS, have groups or committees that examine IT issues of specific and/or unique interest to that unit. Ideally, they work with their representatives on the advisory committees and the policy council to ensure that their needs are addressed. Such groups usually have an opportunity to interact directly with one of the strategic planning facilitators and can always submit suggestions or recommendations via Email.

Institutional IT strategies are proposed by the CIO and approved by the policy council. They are few in number and broad in scope. Goals are derived through the participative planning process, number about 20, and have a three to five year horizon. Objectives are also derived through the planning process. They are measurable, time bounded by the fiscal year, and must be funded in the current budget. There are usually several objectives for each goal. Objectives are linked to operational units within IS, and there is a one to one linkage between an IS manager and each objective to ensure its accomplishment. Each manager has an annual work plan that is the basis of formal evaluation which reflects the objectives for which she/he is responsible.

**Organizational Restructuring**

Prior to the creation of the CIO position, Computer Services, Telecommunications, and Networking were all led by director level positions with different reporting structures. During the first year, the new Vice President created an AVP position responsible for daily operations of all units, an Executive Assistant (at the director level) responsible for managing the VP office staff and general administration functions of the division, a Director of Planning and Special Projects, and consolidated Telecommunications and Networking by establishing one director with responsibilities for both. The AVP was recruited in a national search, the Executive Assistant was hired from another on-campus department, the Acting Director of Computer Services was moved into the planning and special projects position, and the network director was assigned responsibility for the new Network Services unit. Several positions throughout the division were redefined to fit the needs of the developing environment and filled with individuals who possessed different skill sets. Finally, four new networking positions were authorized to be filled during the second year of operation as the network project went forward.

Early in year two, the CIO proposed and the President and Executive Officers approved an agreement with SCT to outsource the Administrative Systems Development unit. Twenty-four managerial and technical positions were moved from the university to SCT under a five-year contract (all existing staff were offered employment by SCT). Initially SCT provided a director and two experienced managers with extensive SCT/IA Plus
background to lead the migration effort from the COBOL and VAX environment to the DB2 and RISC6000 platform. This decision was based on the need for experienced systems development leadership to enable the institution to meet a fairly tight implementation schedule for the new administrative systems. The SCT Director reports to the AVP and works within the parameters of the IT Strategic Plan and its established processes in instituting detailed project plans.

**On-going Training**

Obviously the type of change being attempted calls for extensive and on-going training and professional development of all IS staff. Technical training on all of the new hardware and software began in the first year and continues. SCT has the responsibility to provide updated training in systems analysis, project management, and documentation to the systems development staff. The strategic planning and management workshops introduced concepts related to empowerment of individuals, the linkage between planning and doing, delineation of individual versus organizational responsibilities and expectations, group decision-making within a team based orientation, and new communication patterns.

Additional workshops focusing on service, quality, responsiveness, innovation, and accountability have been conducted or are in the development stage. As previously mentioned, a seminar on “Overcoming Organizational Defenses” was offered and was well attended. New workshops on gaining better listening skills, handling conflict resolution, and developing team work skills will be offered during the current fiscal year.

The various workshops and seminars are conducted by a combination of professional providers, SCT, The U of M Human Relations staff, faculty with particular areas of expertise, IS staff, and the VP office. The IS Training Center has revised its current offerings and is moving to provide formal classes related to the new environment for anyone on campus. It has also enlarged its library of videos and CD-ROM tutorials for desktop applications to enable more diverse self-study options.

**Institutional Implications**

A recent journal article notes that the load on IT organizations is heavier than ever before, and the management of IT is more complex. The article states that the managerial challenge might be equated with “changing an airplane engine in mid-flight.” It then goes on to list imperatives in which successful IT organizations of the late 1990s must excel. They are: (1) achieve two-way strategic alignment, (2) develop effective relationships with line management, (3) deliver and implement new systems, (4) build and manage infrastructure, (5) reskill the IT organization, (6) manage vendor partnerships, (7) build high performance, and (8) redesign and manage the “centralization-decentralization” issue. The perspective evidenced in this paper is in full agreement with this list. Furthermore, each of these imperatives is being addressed through specific actions at The U of M.

information architecture, implementing reengineering, improving the IS human resource, improving the systems development process, educating management on IT, changing technology platforms, and restructuring the IS function. Many of these issues are restatements of the list above and provide added emphasis to their magnitude. Each of the unique issues identified here are also of importance to The U of M.

The same survey shows that just 13 percent of North American CIOs think that their IS organization is “very effective” and only six percent believe that their internal clients would rate their IS unit as “very effective.” It is doubtful that a survey in higher education would yield results that were any better. Overall, the survey results indicate that visionary leadership, competent execution, comprehensive management development, technical training, strong systems development, and service delivery processes are the ingredients that produce highly effective results and form the foundation for positive, trusting relationships with internal clients.

Without question, these findings reflect senior administrative thinking at The U of M in creating a CIO role and their hopes as to the ultimate results from that decision. The steps taken to date and those already planned are designed to move the IS organization toward such a goal. However, much more remains to be done if there is to be a real IT transformation not only in the IS unit but across the entire campus.

**Next Steps**

Within IS, several things remain to be started and/or completed. In a recent focus group exercise on communication, conducted with IS staff, most of the actions detailed earlier in this paper were commended. But, requests were made for even more frequent meetings with the VP and AVP, posting of meeting notes from mid-manager meetings, general education on the campus budgeting process, education on the IS budgeting process, and input to the utilization of fiscal resources. This indicates that mid-managers may not be empowering their staff in the same manner that they are being empowered. If found to be true, the situation must be changed.

Although the strategic learning cycle activities of continuous planning, innovative implementation, and reflective assessment have been incorporated into the formal planning process and to some degree into senior management levels, they still must be built into the routine operational level processes. It is at this level where they will make the greatest positive impact.

The organization as a whole has begun to “create time for learning.” This is reflected in the formal and informal training and professional development activities that are being emphasized across all IS units. It is even more important, however, for each unit and each individual to begin to do the same thing in their particular areas of technical competence. Significant work needs to be done for these things to occur on a regular basis.

IT leaders are beginning to be identified at different levels of the IS organization. It is critical to continue this process and to more and more utilize such individuals in group activities, as team leaders, and in matrix management circumstances.
As teamwork skills are taught and teams play larger and larger roles in performing a variety of functions and providing services, evaluation processes designed to assess overall team performance and individual teamwork contributions must be designed and introduced into the annual performance evaluation. The results must also be reflected in the reward system.

Outside of the IS unit there are changes that also must be made. In implementing the new administrative system teams of IS staff, primary clients, and secondary clients will be defined and charged with the responsibility for discrete segments of the project plans. These groups will need training similar to the teamwork workshops that will initially be conducted for IS staff. Once more, IT leaders at different organizational levels will need to be identified and used effectively. This is not only essential to the implementation process but to the on-going operation of the new integrated RDBMS modules.

In the current environment, individuals within functional administrative units have had responsibility for data security, data access, etc. of each module. Moving to an integrated administrative system mandates that an institutional data administration function be established. Those who have been “Data Managers” will now become “Data Custodians.” Not only will their technical roles change, but the way in which they relate to each other will require different attitudes and methods of interaction. The need to cooperate, to share information, and to make joint decisions will increase greatly.

The new systems will be implemented differently than has been the historical custom at The U of M. In the past, systems were modified, sometimes heavily, by changing baseline COBOL code. The new methodology calls for base code to be changed as little as possible so that on-going maintenance will be easier to manage. Wherever possible the GUIs and WWW front-ends will be used to provide client “friendly” access. Where major modifications are necessary, separate modules will be written rather than rewriting base code. Before, customization was determined by the “owner” of a particular administrative function. In the integrated system, such decisions must be jointly made by the primary client, secondary clients, and the IS staff. Once again, the ability to cooperate, to have a broader systems understanding, and to make mutually agreeable decisions will be paramount.

The University is interested in reengineering some of its administrative processes. An outside consultant will work with institutional managers to determine which processes have the greatest potential for improvement. When this has occurred, cross-functional administrative teams will need to work with the consultant to streamline and revise the existing processes. The newly defined stream of activities in the process will certainly change systems requirements. Once more, that will call for group decision making and far better systems thinking than has been the case before.

**Concluding Observations**

The University of Memphis has determined to make broad based systems changes in its administrative environment. The technical implications of that decision are evident and significant. They will demand across-the-board retraining of the technical IS staff and of other IT staff on the campus. These changes, however, may well be the easiest to make.
Any existing organization is a collective entity for accomplishing specific tasks. The organization contains a group of systems – a cultural system, a strategic system, a technical system, and a political system. In an environment of constant change as higher education has experienced for some time now, each of these systems tends to wear down. Alignment within and between the systems is significantly diminished or lost. Staff find themselves working harder and harder than ever, yet benefiting less and less from their efforts. As tensions mount the natural tendency is to find someone to blame. The real problem, however, is embedded in the underlying organizational systems that have shifted out of alignment – with each other and perhaps even with the external environment. Such a situation requires not only a new technical system, but also deep changes in the other systems, if realignment is to be recaptured.

The author believes that this description is an accurate depiction of the circumstance at The U of M, and very probably at many other colleges and universities as well. IS organizations must change more than their technical systems, and in most cases they will need to make such changes before it is reasonable to expect others across the campus to follow. However, at a given point the campus will need to respond. One of the primary functions of a CIO must be to help bring a recognition at the senior administrative level of the necessity for these things to occur. For it is the changes in the political and cultural systems that will be most difficult to make – but also most likely to ensure that the needed systemic realignment becomes a reality.

The success sought at The U of M, in implementing new systems, within the IS unit, and in the campus-wide IT environment will not come quickly nor easily. Although progress should be evident within months, true success will take years to measure. Technical systems may be changed relatively quickly but a lasting cultural change requires constant, patient, intervention and motivation for an extended period of time. The journey has begun, resources have been allocated, and expectations have been set. The wait for fulfillment may be slow, but if the goals are ultimately reached even in moderate terms, it will have been well worth it.
Endnotes

2 V. Lane Rawlins, “Initial Assignments,” University of Memphis Memorandum, July 1, 1995, p. 1.