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Implementation of a Distance MS-CIS Program: Lessons Learned and Principles for Success

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Abstract

The Master of Science in Computer Information Systems (MS-CIS) program at Colorado State University (CSU) was one of the first in the country when it was established in 1967 according to the model provided by the Data Processing Management Association (DPMA). Beginning in 1967, CSU initiated delivery of its MBA at a distance and graduated the first student in 1972, thus, making it the first and most senior program in the US. In 1992 a Computer Information Systems (CIS) concentration was offered in the distance MBA, though many challenges were faced due primarily to the distribution of the necessary software (IEF by Texas Instruments). The concentration was discontinued in 1995 due to difficulties associated with installation of the complex IEF software on distance student computers. Fall 2010 saw the rollout of the entire MS-CIS program consisting of 5 courses in the fall, 4 courses in the spring and the remainder during summer 2011. The purpose of this paper is to share lessons learned in terms of university and college approval, development and deployment. Surprisingly, many lessons may appear to be counter-intuitive and, yet, are critical to the success of the distance program.

Keywords: distance education, distance learning, distance MS-CIS program, lessons learned

1. PROGRAM DESCRIPTION AND BACKGROUND

Distance education programs have been growing at a tremendous rate as state educational budgets are being cut. Each has a different template but most can be fit into a general five stage model (Taylor, 2000). Our MS-CIS program is classified as fourth generation employing a flexible learning model using a variety of technologies. In addition, many institutions are undergoing transformation as distance programs influence those that are residential.

The MS-CIS program (Colorado State University, College of Business, 2011) at CSU follows the university requirements for a 30-credit Masters of Science degree which consists of either a professional paper or a thesis completed under the direction of a three member faculty committee. This later requirement is met with CIS695 for three credits. Table-1 shows the required course work for the program, though not in sequence, and the level of technical content for each course:

The MS-CIS program is offered flexibly over one-year, two-year, and three-year periods, however, students often elect a different duration depending on their needs. Table-2 provides an example of a three-year schedule along with examples of the technologies covered. Surprisingly, 20% of our students, principally those changing a career to CIS, complete the program in one year.

Course Number	Course Title	Technical Level
CIS600	IT Project Management	Low
CIS601	Enterprise Computing and System Integration	Low
CIS605	Business Visual Application Development	High
CIS606	Software Development Infrastructure	High
CIS610	Software Devel-opment Methodology	Low
CIS611	Object Oriented Systems	High
CIS620	IT Communications Infrastructure	High
CIS655	Business Database Systems	Low
CIS665	E-Business Application Technology	High
CIS695	Professional Paper or Thesis	Low/High
CIS370	Business Intelligence (optional)	Low

Table-1: MS-CIS Program Courses and Technical Content

The distance delivery of both MBA and MS-CIS courses is based on a residential class that runs in parallel and for which audio and video is captured during the residential component. Within 24 hours, but often within 12 hours, the material is posted for download or streaming from a server. In some cases (primarily military), we will provide DVDs. Exams, homework and projects are the same, however, there is often a one week delay between distance and residential classes due to a short delay in content delivery. Presentations by distance students are routinely captured and shared with other students in the distance program as well as those in the residential program.

Figure-1 shows the central control room into which feeds from each of the eight video classrooms is routed (note the eight conduits at the top left). This centralization allows a much more scalable allocation of personnel as the number of distance classes increase across programs in the college. Each classroom has three cameras plus video capture of the computer monitor, hence, the columns of 4 monitors mounted on the back wall.

Semester	Course Number	Content
Fall		
	CIS605	Visual Basic
	CIS606	Computer architecture
Spring		
	CIS620	Networks
Fall		
	CIS601	ERP using SAP simulation
	CIS610	Development lifecycles and software testing
Spring		
	CIS611	Java programming
	CIS655	MS SQL Server
Fall		
	CIS600	MS Project 2010
Spring		
	CIS665	HTML, ASP.Net, PHP
	CIS695	Professional Paper or Thesis

Table-2: Example Three-Year MS-CIS Program and Technologies Covered

Figure-1: Video Control Room

Figure-2 is a screen capture of BizCast as it is displayed on a distance student's computer and consists of video of the instructor or students as determined from the control room and course materials. BizCast is based on Mediasite by Sonic Foundry, (Sonicfoundry, 2011) a global leader for enterprise webcasting, lecture capture and knowledge management. Students have a great deal of control of their personalized presentation and may skip forward or backward and play at different speeds (1.5X is a common practice). For students requiring signing accommodation, a third window can be added. Obviously, this also necessitates a capture of the signer from one of the cameras. Surprisingly, this has worked quite well.

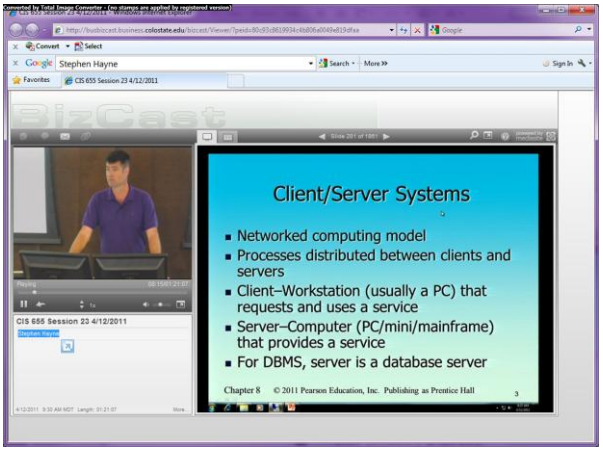

Figure-2: BizCast Environment

These courses vary a great deal with respect to the volume and type of required support, either in the residential program or at a distance. All require homework, projects, and some require collaboration as well as access to specialized software. The latter is the greatest challenge at a distance and in particular CIS 605, 606, 611, 620, 655 and 665 are technologically intensive.

2. TAXONOMY OF LESSONS LEARNED

CSU is a Land-Grant institution and has a long history of traditions and administrative structures, in addition to strong faculty governance. The faculty owns the curriculum, but not most administrative prerogatives. Approval of the distance MS-CIS program required a great deal of time and effort, both within the college and at the university level.

The lessons learned will be put into three categories and are not in sequence based on importance or effort. The categories are: administrative; faculty incentives and effort; marketplace. Each lesson will be identified and discussed within this framework.

Administrative:

There are six important lessons learned in the administrative category. In some ways these may take time and/or resources to handle properly, but the outcomes are clear, and in general, more predictable. Faculty is not involved in a significant way.

- **Immediate, full deployment –** There was a great deal of pressure from the faculty to ease into the program by rolling out courses over a two or three- year period. Though taking this approach was considered, it was decided that due to number of students who wish to complete the program in a year (approximately 20%), that an immediate offering of all classes scheduled during fall and spring semesters was the best approach. In retrospect, this worked far better than anticipated because the participating faculty all faced the same challenges and issues and assisted one another in their concurrent implementation of classes. The amount of cross-faculty assistance was remarkable both in terms of volume and creativity.

- **Common story of program justification –** There are many myths associated with distance delivery, including difficulty in doing research, managing collaboration among students, as well as increased workload. Some faculty contended that they would not have enough time to do research with the anticipated additional workload of preparing for distance classes, and that the distance medium was not suited to teach and do research. Collaboration also was claimed to be a problem at a distance. Evidence we have from our distance MBA contradicts all three of these myths. In addition, having stored distance program materials available for residential students who wish to make up a missed class is very beneficial.

- **Academic hurdles –** The approval process required to obtain permission to offer an existing course at a distance is quite time consuming as it must be voted on at the departmental, college and university levels. The latter has multiple signoffs from the

following: The Institute of Learning and Teaching (pedagogy); Division of Continuing Education (administrative); Faculty Council Curriculum Committee (academic). This process can easily take a year and must be completed prior to a course offering. We completed this in four months. Slowly, our conservative academic culture is beginning to realize the importance of doing things differently, better and more responsively.

- **Scalability** – Many distance programs have requirements that do not scale as enrollments increase. Currently we have 500 to560 students per class in our distance MBA. Our MS-CIS is in a position to handle large numbers as well through the use of Distance Section Coordinators (DSCs) who take care of all email, and other types of student interaction, formatting and posting of materials, administration of exams and grading. Each DSC is under contract that imposes responsibility for responsiveness to student and faculty demands. For large classes, these positions are arranged by time zone to facilitate more local interaction. As numbers increase beyond some yet not reached threshold, Senior DSC's may be recruited so that faculty members will not be required to manage as many support personnel. Each DSC is responsible for approximately a 40 student section, and for large classes, these are assigned according to time zone.

- **Quick resolution of technical issues**– It's both irritating and unproductive to have technical needs for the classroom unmet during the semester. Residential students are somewhat understanding to a point; distance students will not tolerate such disruptions for long. This is likely due to paying a premium for the tuition, but also may be due to not hearing an off-line explanation of why maintenance has been delayed. In addition, if a technical difficulty is encountered during a class that is digitally captured, one cannot conveniently reproduce the classroom experience. We have a support staff assigned responsibility for classroom technology but the MS-CIS has required additional support for software used by our students.

- **Distance Section Coordinators** - The MS-CIS is different from the MBA with respect to specialized software competencies and we expect to add Technical Section Coordinators (TSC) as a support vehicle to accommodate this need. The TSCs will add specialized technical support for our classes that have a high technical component as shown in Table-1. It has become obvious that a lecture class, as is typical in an MBA program, doesn't place nearly the demand on delivery as does one with a large technical component. We use VM-Ware and McCabe's software in our classes, both of which require significant technical support for delivery on-campus and at a distance.

Faculty Incentives and Effort:

This category of five lessons is far more subtle and risky in terms of outcome. In a sense, all deal with getting faculty to do something that they are unlikely to have done on their own, but which is in their best interest and that of the department and college.

- **Muted distinction** – It is difficult to make a distinction in student's expectations between residential and distance delivery. Faculty require the ability to treat all students on a uniform platform, perhaps with the exception of assignment due dates, if there is a delay in the delivery of the distance material. We, therefore, provide grading assistance for both the residential and distance sections of a class, allowing a consistent expectation of returned graded assignments. Also, residential students should have a consistent and high expectation of faculty preparation, and the formality of distance delivery encourages this.

- **Honoring faculty optionality** – Most chairs of academic departments attempt to assign classes based on interest, expertise and convenience. For residential programs, faculty understands that classes must be taught and are part of their workload assignment. When distance classes are added, the subject of optionality of teaching is an issue. It may only take one or two faculty to prevent the delivery of a program if they choose not to participate. A clear workload document stating distance participation would clearly assist in this regard. Without it, however, one may need to schedule around the non-participating faculty. In our case, we needed to reassign

a class to someone willing to take on both the residential and distance components.

- **Not a substitute for research** – A common question has been whether a faculty member will be expected to do less research if they participate in distance delivery. The answer is an emphatic no. As a Carnegie 1 research institution, faculty is held to a high standard of scholarship. There seems to be a myth that distance participation takes a tremendous amount of time and therefore research productivity will necessarily be reduced. Experience in our distance MBA is that our best instructors also have been our most productive researchers. Each will admit to additional workload during the first semester of offering a distance class but reasonable time for both after the first semester.

- **Respect for faculty workload** – It is clear that distance delivery consumes more resources thus justifying higher costs being transferred to students through tuition. Much of this work, however, can be well accomplished with some combination of student and professional assistance for material preparation, grading, posting of materials, exam administration and other forms of support. One of the areas we are still perfecting is the provision of technical assistance with entry level programming. For this purpose, we have established a help center accessible by both residential and distance students fully staffed by student assistants. This center also provides the student assistants an opportunity to gain valuable experience as they respond to the variety and number of calls received.

- **Shared benefit with accountability** – There is a potential shared benefit to the university, college, department and the faculty member involved in the distance program. The revenue stream, based on $660/credit is split 12% to the university (10% to the University, 2% to the Division of Continuing Education), and the remaining 88% to the department, for a three-year period, at which time the college will have a negotiated revenue stream. Even at this point, however, most revenue will be directed to the department. Table-3 shows an example of the revenue stream associated with the distance program for different levels of enrollments. The dean has been supportive of the department retaining a very large portion of this revenue in support of travel, research and other initiatives. Our intent as a department is to direct a portion to faculty in support of research, much of which may be done on salary during the summer. We are still considering how to make this assignment of revenue both transparent and yet serve as an incentive for research and publication in premier and high-quality journals.

Marketplace:

These three lessons may well be important for residential programs in small measure, but are critical for those at a distance. Historically, it could be argued that many information systems departments do not pay attention to these.

Course Enrlmts	Revenue/ Course	University Split-12%	College Split-88%	DSC Cost	Net Revenue
100	198000	3960	194040	9000	185040
150	297000	5940	291060	18000	273060
200	396000	7920	388080	18000	370080
250	495000	9900	485100	27000	458100
300	594000	11880	582120	27000	555120
350	693000	13860	679140	45000	634140
400	792000	15840	776160	45000	731160
450	891000	17820	873180	54000	819180
500	990000	19800	970200	54000	916200

Table-3: Revenue Split Examples

- **Marketing message and responsiveness** – A consistent and responsive message is needed to all potential students from the first point of contact, through admissions, coursework and graduation. Promotion of the program through any and all appropriate channels should be considered. Growth of the program will be significantly slowed if one simply waits for students to show up, as is so often the case with a residential program. All materials, on-line or in print, must be consistent. Not only does this take a great deal of work, it may also require outside assistance from professionals. Web site search ranking is an excellent example of a specialized area of importance.

- **Positioning of program** – A distance marketplace may well be different than the one for residential students. For the most part, residential programs are populated by those that are close to campus from a

geographic perspective. This attraction, or restriction, depending on one's point of view, no longer applies at a distance. Rather, other factors such as service and/or unique positioning of the program are likely to be more relevant to the marketplace. For the MS-CIS program, 50% of our students enroll to obtain an academic credential to enter the information systems job market. The other 50% of students want to update their skills to better serve their current employment. Our program has been specifically designed to accommodate both objectives without layering a great deal of undergraduate prerequisite work for those who wish to enter the field for the first time.

- **Market opportunities** – Initially we believed that most students would come to us from out-of-state locations, principally where no other reasonable educational opportunities existed. We have been quite surprised, and find that we are attracting local, in-state and out-of-state students in cities that have excellent alternative educational opportunities. Many examples can be cited, but a surprising number of students are close to campus but too busy for a traditional residential program. International opportunities also exist. Though we have several students outside of the country, beginning summer 2011, we have launched a certificate program with several campuses in India. The certificate can be used both as a stand-alone program for students seeking only 9 credits of coursework and without the necessity of gaining admission to a full MS-CIS program. Some may wish to obtain both, and for those, the certificate serves as a qualifier for graduate admission. At the present time we expect to have 25 students in this program.

3. CONCLUSIONS

There have been a number of surprises during the first year of the program including the relative ease with which we have accomplished the construction and deployment of the coursework. Frankly, a great deal of difficulty with complaints from both faculty and students was anticipated. Neither has been a problem to a greater degree than those we face in our residential programs.

The second surprise is how well the faculty has worked together to solved the inevitable problems that have arisen, rather than complaining amongst themselves. There is a great deal of pride in the accomplishment of the work that has been completed and the likely continued refinement of the program as we enter its second year.

Thirdly, it is refreshing to have access to a revenue stream that may be tapped to solve problems in both residential and distance programs as well as to support research. The challenge here is being both transparent in allocation of this resource and effective in promoting the mission of the college and the department.

The largest challenge has been the administrative burden on the department. Most academic departments are not organized to operate a business, and in many areas, do not have the expertise. Fortunately, we have access to some centralized resources for marketing, recruitment and material development which we are required to support financially. One of the challenges we didn't anticipate was the time requirement of responding to student information requests. The Customer Relationship Management (CRM) is a critical component of our business and we have become increasingly dependent on it. Many other opportunities exist that will be explored as the program is refined. Some of these are:

- **International offerings –** Though we have begun with both certificate and full MS-CIS offerings in India, China and Brazil also appear to be attractive. The business model used must be adjusted accordingly to fit each of these marketplaces.

- **Specialized concentrations within the Distance MBA –** Project management, including PMP (Project Management Professional) certification and business intelligence are both a good fit and are likely to be popular.

- **Use of mobile platforms –** iPad and similar devices can be used to deliver content effectively for those on the move.

- **Complete asynchronous delivery to select audiences –** This is a big step and one that will require caution but may be significant for some market-places.

In short, we are off to a good start, but there is still a great deal of work ahead.

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