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ITP4125

Developing a Graduate Program in Project Management

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OVERVIEW

Project Management is "the application of knowledge, skills, tools, and techniques to the project activities in order to met or exceed stakeholder needs and expectations from a project." [Duncan, 1996] A project is defined as "a temporary endeavor undertaken to create a unique product or service" [Duncan, 1996].

A number of professional organizations have developed around the world to address and foster this specific discipline. Most notable is the Project Management Institute (PMI, www.pmi.org) with about 80,000 members worldwide. Other major international organizations are the Association for Project Management (APM) and the International Project Management Association (IPMA) [Morris, 2001]. These organizations have recognized there is a distinct skill set necessary for successful project managers, and the organizations are devoted to assisting their members develop, improve, and keep current these skills [Boyatzis, 1982; Caupin, 1998].

Several universities have also recognized the fact that project management involves distinct skills, and that the traditional degree programs and courses in both business schools and other schools do not adequately cover and/or integrate these skills. The Chronicle of Higher Education recently reported that seven Philadelphia-area corporations established ties with four universities in that region to improve the business skills of computer science and IT students; most of these key skills involved the project management skill sets, which are specifically identified later in this document [Chronicles of Higher Education, 2001].

Perhaps self evident from the previous paragraph is the fact that the knowledge and training needed by project managers covers both traditional business disciplines and disciplines involved with building or making things. Often the skills involved with building or making things would be found in an engineering curriculum, and also in information technology or computer science curriculums.

Since the skill sets needed by project managers are extensive, and since these skills involve both business and engineering disciplines, and also since most candidate students are degreed working adults, most schools have developed their project management curriculums as graduate school programs. A number of universities also have a single "Project Management" course offered as a graduate or undergraduate course.

At our university, we have been encouraged by our stakeholders (discussed later) to explore the feasibility of developing such a graduate program. This paper reports on our research into this area.

TYPES OF GRADUATE DEGREE PROGRAMS

An analysis of universities currently offering graduate project management programs indicates several types of programs being offered:

1. A masters level general degree program (such as an MBA) with a specialization in Project Management.
2. A full masters level (generally MS) program in Project Management
3. A "certification program" of several Project Management Courses

Some universities offer more than one of these program types. Also in some universities the program is offered in the School of Business (or Management) and in some schools the program is offered in the School of Engineering. In most universities, many of the courses appeared to be shared with other graduate degree programs; in other words not all the courses in the program are focused on project management.

PMI (and the other international project management organizations) have a certification program, and for PMI the designation is "Project Management Professional" (PMP). To obtain PMP certification an individual must have 4500 hours of documented project management experience over a period of six years, have a BS level college degree, and pass a rigorous four hour examination. The first PMP exam was given in 1984 to about 30 people, and today there are over 30,000 PMP's worldwide [Foti, 2001]. Once the PMP status is obtained, an individual must earn 60 PDU's (Professional Development Units) each three years. Some universities offer a PMP Exam Preparation course or cover exam prep material in one of their project management courses. However most graduate programs do not cover exam prep; in fact the graduate programs are more geared to providing the PDU credits for PMP's.

Figure 1 summarizes our research into program types for most of the U.S. universities offering project management programs "certified" by PMI. The list of such schools is on the PMI website (www.pmi.org). Out of the 19 schools listed, 11 offer a certificate program, 6 offer an MBA/MS specialization, and 8 off a full Masters is Project Management. In 14 of the 19 schools, the program is entirely in the Business (or Management) school.

PROJECT MANAGEMENT KNOWLEDGE ORGANIZATION

The Project Management Institute has developed an index of project management skills and knowledge called the "Project Management Body of Knowledge" (PMBOK). The PMBOK has been developed through several iterations over many years; the first version was developed in 1976 [Cook, 1977]. The latest version (PMBOK 2000) was just released (for certification testing beginning 1/2002) [PMI, 2000]. It defines nine "Knowledge Area" which are organized into 37 "Processes". The processes are grouped into 5 "Process Groups". This is illustrated in Figure 2 (for PMBOK, 1996) [Duncam, 1996].

Since so many resources have been put into the development and refinement of the PMBOK and it has been so well received by the project management community, it seemed prudent to us to organize our graduate program courses around the processes defined within PMBOK. The issue then became how do we "slice and dice" the processes as shown in Figure 2 into distinct (but integrated) courses. The PMBOK document itself organizes its write-up by Knowledge Area. However, most classic overall project management books and textbooks are organized by process groups [Badiru, 1988; Cleland, 1988; Hajek, 1984; Kerzner, 1980; Meredith, 1989; Royce, 1998; Verzuh, 1999]. There are however a number of books concerning particular parts of project management and these cover particular Knowledge Areas, but they are not specifically written as "textbooks" [Fisher, 2000; Fleming, 2000; Pinto, 1999; Schuyer, 2001; Verma, 1996].

Again we looked at the universities currently offering degree programs to see how their curricula were organized. We defined three general types of organization:

This paper appears in *Issues and Trends of Information Technology Management in Contemporary Organizations,* the proceedings of the Information Resources Management Association International Conference.

1. "Step" – Courses are organized in the traditional manner from less depth to more depth over most of the knowledge areas. For example the first course might be "Introduction to Project Management"; the next might be "Intermediate Project Management"; and the next would be "Advanced Project Management".
2. "KA" – Follows the PMBOK knowledge areas (Scope, Time, Cost, …)
3. "PG" – Follows the PMBOK process groups (Initiation, Planning, …)

Most programs did not fit entirely into one of these molds, but we categorized them according to the best fit. Overall out of the 19 schools, 10 use primarily the Step method, 6 use primarily the KA method, and two use the PG area.

For schools offering certification, 5 use the Step method, 6 use the KA method, and none use the PG method. For schools offering the MBA/MS specialization, none use the KA method, one uses the PG method, and the rest use the Step method. For schools offering the full MS in Project Management, 2 use KA's, one uses PG's, and the rest (5) use the Step method.

The university programs survey were all relatively new programs, so there is little or no data available for a statistical or comparative historical analysis at this time. In the future, one may be able to survey graduates from the different types of programs to determine the pros and cons of each type of program organization.

PROJECT MANAGEMENT CONTENT IN PROGRAMS

As can be seen from Figure 1, not all of the courses in a Project Management program are project management specific courses. For most schools, the certification offering is made up of mostly project management specific courses (the #PM in Figure 1 is the number of project management specific courses). For the project management specialization, most schools use three to six project management specific courses. For the full MS Project Management degree, the number of project management specific courses is abot one-third to one-half of the courses. These non-specific courses in the full MS degree program vary widely from school to school especially if the degree is in the Engineering school instead of the Business school. Some of these non project management specific courses are typically: General Management, Organizational Behavior, Leadership, Managerial Accounting, Information Technology, Finance, Human Resources, Quantitative Methods, Quality Assurance, Procurement and Contracting, and Risk Management.

DELIVERY

Some universities are offering some, all, or portions of their courses in the form of "distance learning". So the issue becomes where on the spectrum from "bricks to clicks" should a program position itself. There are many pro's and con's on both sides of this issue, and most of those pro's and con's depend on exactly how a course is made available "on-line" and the university's overall vision, mission, and tradition. This issue encompasses most degree programs (not just project management), so we are not going to further debate it here, except to indicate below some of our choices for our particular school mission and tradition. As discussed below, the potential students for such a graduate program are working adults, so attention has to be given to the best delivery for that market. Many schools are holding classes on weekends or evenings to accommodate the adult audiences for these types of programs [San Diego Business Journal, 2001].

PROGRAM STAKEHOLDERS AND THEIR NEEDS

We have discussed and surveyed the needs of the stakeholders of a graduate program in our region. The external stakeholders we identified were those companies who would benefit from such a program and also those individuals who would benefit. The companies would benefit by the introduction or reinforcement of the specific project management methodologies into their organizations; this has both an educational and training perspective.

Our individual stakeholders are primarily degreed working professionals. This is similar to the market served by the other universities we investigated, since those other universities like ourselves are located in large metropolitan areas. These individuals benefit from a "continuing education" perspective that makes them individually more valuable. Those individuals having earned PMI PMP Certification would have another way to earn PDU credits (a credit course at a university earns 15 PDU's per semester credit hour). Currency of methods and tools is also quite important to both corporations and individuals.

OUR CONCLUSIONS AND MODEL PROGRAM

For a program at our university, we have identified four dimensions to project management knowledge needed by our stakeholders. The PMI PMBOK focuses on the dimension of breadth of the Knowledge Area's (and the 37 processes) but intentionally does not go into much depth. Going into depth gets into method and tool specifics. Thus the first two dimensions we see necessary in our program are both the breadth and depth of these 37 processes.

The next dimension we identified is industry particulars. While there is much commonality to project management in all industries, there is also much that is specific to each area. For example task estimation for an IT project is much different than task estimation in a construction project. So we would add this as a dimension to our program, certainly not for all industries but for the major ones in our region.

The next dimension we identified was that of time or "currrency". This not only includes the use of current tools, but the practice of project management in the current business and technical environment. Issues such as "virtual teams", international coverage, and web based systems are included in this dimension.

In regard to distance education, we have decided on a program that is mid-way on the spectrum from "bricks to clicks"; in other words our program would have about a 50% distance education component. This is consistent with the vision and mission of our university, and consistent with the tradition of our private school to provide quality in-person education with relatively small class sizes. We feel that much student learning will be derived from the project experiences of other students, so at least a 50% "face-to-face" component was desired.

Surveys of potential students and discussions with corporations led us to the conclusion that night and weekend delivery of courses would best satisfy the stakeholders. At our university we currently have an MBA program which offers courses on week nights and weekends, and an MEM (Masters in Engineering Management) which offers course on weekends.

In the area of programs we would offer both a Graduate Certificate Program and a full Masters in Project Management. The certificate program would be composed of 4 to 6 project management specific courses, and the full masters program would be composed of those same project specific courses plus another 6 courses. The other 6 courses would be several required and several optional courses from our existing MBA and MEM programs, courses most appropriate to project managers. We would start with the certificate program, and "evolve" into the full master's program over two years. Each year we would evaluate the program in terms of economics, student opinion, educational outcomes, and stakeholder fulfillment.

The issue of course material organization is a difficult one for us. As discussed above, universities offering these programs are taking different approaches in this area. We feel the "Step" approach is only useful for programs that have 2 or 3 project specific courses. The

"KA" approach requires much more "course preparation" time, textbooks are limited, and instructors need depth in these skills. Our curriculum design at this time is to use a combination of "PG" and "KA". For "PG", we would separate into two process "super-groups": project planning and project control; both covering scope, time, and cost. Separate "KA" courses would likely involve: Procurement, Risk, Quality, and Human Resources/Communications.

REFERENCES

Badiru, A. B., Project Management in Manufacturing and High Technical Operations, Wiley Interscience, 1989

Boyatzis, R., The Competent Manager: A Model for Effective Performance, Wiley, 1982

Caupin, G., Knopfel, H., Morris, P., ICB IPMA Competence Baseline, Zurich: International Project Management Association, 1998

Chronicles of Higher Education, 8/10/2001, Volume 47, Issue 48, p A45

Cleland, D. I. And King, W.R., Project Management Handbook, Van Nostrand Reinhold, 1988

Cook, D. L. Certification of Project Managers – Fantasy or Reality, Project Management Quarterly, 8(2), 32 - 34

Duncan, William. A Guide to the Project Management Body of Knowledge, Project Management Institute, 1996

Fisher, K. and Fisher, M., The Distance Manager: A Hands On Guide to Managing Off-Site and Virtual Teams, McGrW-Hill, 2000

Fleming, Q. and Koppelman, J., Earned Value Project Management, PMI, 2000

Foti, R., The Case for Certification, PM Network, September 2001

Hajek, V.G., Management of Engineering Projects, McGraw Hill, 1984

Kerzner, H., Project Management, A Systems Approach to Planning, Scheduling, and Controlling, Van Nostrand, 1980

Meredith, S.R. and Mantel, S.J., Project Management, A Management Approach, John Wiley and Sons, 1989

Morris, P., Updating the Project Management Bodies of Knowledge, Project Management Journal, September 2001

Pinto, J. and Trailer, J., Essentials of Project Control, PMI, 1999

PMI. A Guide to the Project Management Body of Knowledge, Project Management Institute, 2000

Royce, Walker. Software Project Management, Addison-Wesley, 1998

San Diego Business Journal, 8/6/2001, Volume 22, Issue 32, p 23

Schuyler, J., Risk and Decision Analysis in Projects, PMI, 2001

Verma, V. and Thamhain, H., Human Resource Skills for the Project Manager, PMI, 1996

Verzuh, Eric. Fast Forward MBA in Project Management, John Wiley & Sons, 1999