Why Continuous Improvement for an Accounting Information Systems Program?

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Abstract

Continuous improvement is a way of thinking. It is also a comprehensive approach to the activities of an organization. Shewhart and Deming have devised a systematic process for continuous improvement that is utilized by many world class organizations. The steps are referred to as Plan, Do, Check and Act (PDCA). The authors have utilized this technique in their curriculum development and improvement as it relates to the Accounting Information Systems program at their institution. This is due to the fact that changes in expectations placed on AIS programs create the need for a systematic and rational approach to address those expectations.

Introduction and Purpose

⫟he American Institute of Certified Public Accountants [AICPA 1988], the Bedford Committee [AAA Bedford 1986], the "White Paper" [Arthur Andersen et al. 1989] and the Accounting Education Change Commission [AECC 1990] have all emphasized the need for improvement in the quality of graduates of accounting programs. Similar expectations are placed on business programs by the American Assembly of Collegiate Schools of Business (AACSB), whose name recently changed to International Association for Management Education, and other regional accreditation bodies such as the North Central Association of Colleges and Schools and the Southern Association of Colleges and Schools [AAA 1993].

However, the expectations for accounting information systems (AIS) graduates appear

Readers with comments or questions are encouraged to contact the authors via e-mail.

to be even more profound than for traditional accounting graduates. Many of these graduates are hired for consulting assignments where the performance criteria are set not only by the employer, but the client as well. For those who choose corporate employment, the pressure is felt from the fast pace in technological changes. In this environment, the only options are being able to handle and cope with the client's and employer's expectations or leave such a demanding field. One of the determining criteria is, in fact, the quality of education that one has received. If an academic degree earned is looked upon as a product, does the product meet the customer's expectations?

To respond to such a question, one should keep in mind that in introducing any new product or service there are three cases. Your product could be "leading edge," which indicates that there are only one or two competitors for this product in your market. The product characteristics are substantially improved com-

pared to the existing products in the market. The product could also have "competitive advantage," which indicates that there are small numbers of competitors who offer such products. The product demonstrates improvement as compared to previous versions, and the customers want the improvement. In the last case the product could be "competitive requirement," meaning that the majority of our competitors are offering the product with improvements and most customers require the improvements [Enzweiler 1997].

The same paradigm is applicable to various degree programs offered by colleges and universities. Thus, it is imperative for faculty and college administrators to recognize what stage of product introduction the program offering is at. Being at the cutting edge may not be an advantageous position. However, based on AIS related conference attendance and available literature, it appears on the surface that the majority of programs offered are at the "competitive requirement" stage.

Looking at the graduates of accounting information systems programs as the product of an educational system, it may be conceivable to apply Total Quality Management (TQM) techniques to accounting information systems programs to achieve the same outcome as manufacturing systems. One such technique is continuous improvement, and this paper presents the ongoing efforts to implement this at the authors' institution.
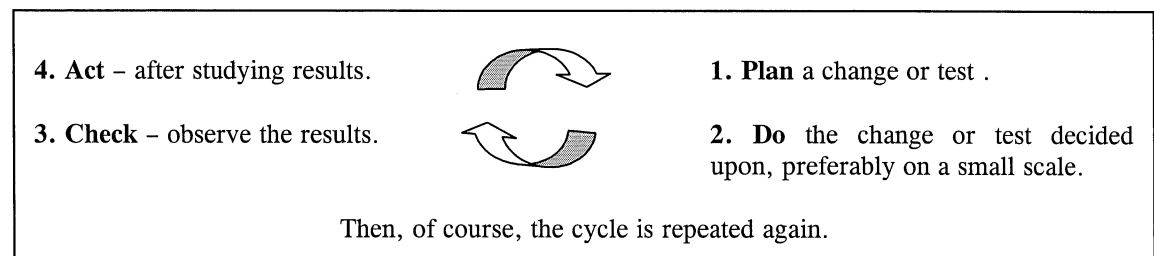
What is Continuous Improvement?

Continuous improvement is a compre-

hensive approach to the activities of an organization (in this case educational programs), and not restricted to specific activities of such an organization. However, in this paper we have attempted to report on a specific aspect of our efforts - the AIS program.

Continuous improvement is also considered as the integration of organizational philosophy, technique, and structure to achieve sustained performance improvements in all activities on an uninterrupted basis. Shewhart and Deming [Deming 1982] have devised a systematic process for continuous improvement. It involves four steps to achieve the goals of continuous improvement. These steps are: Plan, Do, Check and Act (PDCA). Once the plan is devised and implemented, the information about the initiative at hand is collected and acted upon. The "act" step requires learning the situation and applying the improvement to the next cycle of PDCA. The following illustrates this (adapted from Deming p. 88, where he refers to this as the Shewhart Cycle): (see below)

Although one of the major objectives of continuous improvement in the private sector is cost reduction, there are other objectives, such as increasing the quality of services offered, and more recently reducing the cycle time, that are more potentially relevant for public higher education institutions to pursue. To be effective, the continuous improvement initiative should focus on customers, be shared by all employees, and be directed by the processes that should be continuously improved. Continuous improvement is more in line with the mode of public higher education institutions than -is reengineering. It is incremental in nature and not

4. Act – after studying results.		**1. Plan** a change or test .
3. Check – observe the results.		**2. Do** the change or test decided upon, preferably on a small scale.

Then, of course, the cycle is repeated again.

discontinuous like reengineering. That is, continuous improvement means small, ongoing efforts to make positive gains in the status of a given process / program / course. Once the improvements have been devised, they are made a part of the routine work process. Thus, all the faculty and staff could participate in the process without implications of major changes by administration. It would be difficult to make similar claims regarding reengineering due to the fact that reengineering is radical and disruptive, which is in contradiction to the operating mode of most colleges and universities.

Continuous improvement in education is the process of upgrading the performance of the academic unit or process on an incremental basis by achieving effectiveness and efficiency in continuous steps. This process should encompass all activities of an academic unit in a systematic manner. Once a systematic approach is adopted, it should become a part of day-to-day activities of the academic unit. The system will function properly once it is monitored and stabilized.

Applying Continuous Improvement to the AIS Program

In the following section, the authors present the steps that have been taken to create and establish the AIS program at their institution and continuously improve it over a period of a decade and a half. There is no general consensus as to who are the real customers of academic institutions. For purposes of this paper, we consider employers to be customers (external) for our product; however, students are also considered to be customers (internal) for the services that we directly offer to them.

A survey was conducted in 1982–83 to find out about the adequacy of the accounting education at the authors' institution. A questionnaire was sent to our alumni. The alumni were asked whether the accounting program should be specialized. If the answer to this question was positive, in their opinion, what area of specialization should be emphasized?

The respondents ranked computer-related specialization the highest.

To meet this challenge three options were explored: (a) an undergraduate in computer science plus an MBA degree; (b) building required computer courses into what would be a five-year program; and (c) redesign the existing program to meet the basic requirements of employers of accounting graduates.

The faculty chose the third alternative and a program was proposed with the following characteristics:

- General knowledge of accounting to satisfy the Certified Public Accountant certification requirements.
- A general familiarity with file processing techniques and data structures.
- Sufficient working knowledge of accounting software to use available standardized accounting packages.
- The ability to review and interpret systems documentation.

Exhibit 1 shows the core of the original proposed program and its relationship with business core courses. This step relates to Plan step of the PDCA cycle.

The program was approved through the normal university input process by 1984-85. Needless to say, the proposal was presented to the representatives of large accounting firms (formerly known as the "big eight") and industrial firms in the Detroit area. This step corresponds to Do step of the process.

The program was initially considered an interdepartmental program, since a sister department in the College of Business was offering computer courses such as Introduction to Computers, COBOL/Pascal Programming, Systems Development, Data Base Management Systems (DBMS) and Systems Implementation.

Exhibit 1- Original AIS Program Model (1984)

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                                                              ┌──────────────┐
                                                              │  Accounting  │
                                                              │  Principles  │
                                                              └──────┬───────┘
                                                                     │
                                                                     ▼
     ┌──────────────┐                                          ┌──────────────┐
     │ Introduction │                                          │  Accounting  │
     │      to      │                                          │  Principles  │
     │  Computers   │                                          └──────┬───────┘
     └──────┬───────┘                                 ┌───────────────┼───────────────┐
            │       │                                 ▼               ▼               ▼
            │       ▼                          ┌──────────┐   ┌───────────────┐  ┌──────────────┐
            │   ┌─────────┐                    │ Taxation │   │Cost Accounting│  │ Intermediate I│
            │   │  COBOL  │                    └──────────┘   └───────┬───────┘  └──────┬───────┘
            │   │   or    │                                           │                 │
            │   │ Pascal  │                                           │                 ▼
            │   └────┬────┘                                           │          ┌──────────────┐
            ▼        │                                                │          │Intermediate II│
     ┌──────────┐    │                                                │          └──────┬───────┘
     │ Systems  │    │            ┌───────────────┐                   ▼                 │
     │Development│   │            │     DBMS      │           ┌──────────────┐          │
     └────┬─────┘    │            │      or       │           │  Financial   │          ▼
          │          └──────────▶ │Data Structures│           │ Information   │  ┌──────────────┐
          │                       └───────┬───────┘           │  Systems     │  │   Auditing   │
          │                               │                   └──────┬───────┘  └──────┬───────┘
          ▼                               │                          │                 │
     ┌──────────┐                         │                          ▼                 │
     │ Systems  │                         │                  ┌──────────────┐           │
     │Implement.│                         └─────────────────▶│  Auditing    │◀──────────┘
     └──────────┘                                            │      &        │
                                                             │     EDP       │
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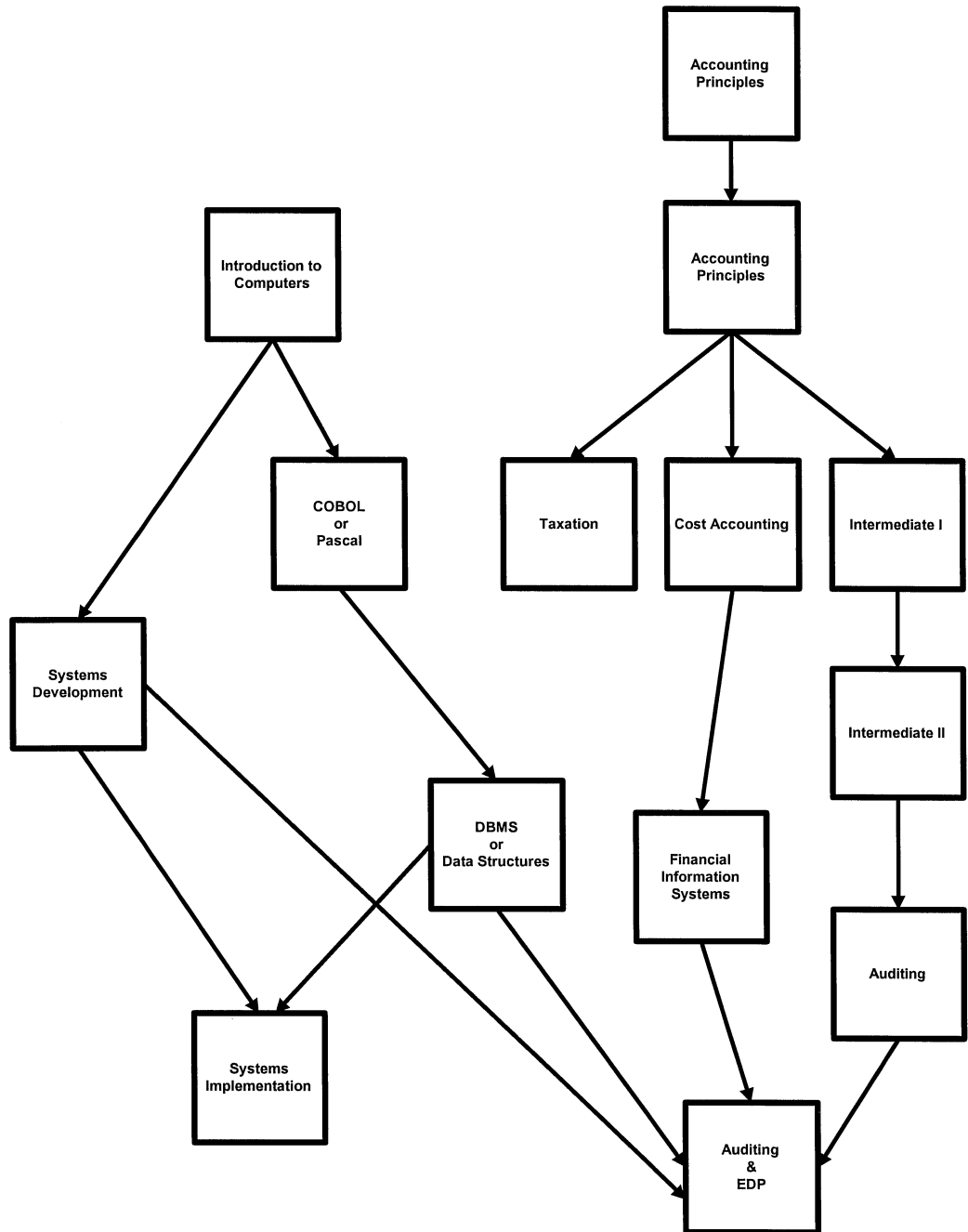
The next step was to look at our customers and see if the product would meet their expectations. This step is comparable to the Check step of Shewhart cycle. The feedback collected from our customers ranged from overwhelming to encouraging. It appears that our product, at that time, was on the "leading edge," indicating that only one or two schools (if any) were offering such a program. Due to the difficulty of placing graduates with a few of the accounting firms, in some cases we had to educate the prospective employers (or our customers / stakeholders). We had to assert that the graduates of the AIS program were accountants too and that they were qualified and prepared to sit for the CPA examination.

As a part of the Check step we surveyed our students (also our customers / stakeholders). They indicated that some of the courses offered were not meeting the objectives of the AIS program. For instance, there were duplications between the knowledge presented in the Financial Information Systems course and the Systems Development course. Further, the Systems Implementation course as offered by our sister department was heavily directed toward non-accounting students.

The AIS faculty acted on the feedback collected and met with the faculty of the Computer Information Systems (CIS) Department (then Operations Research and Information Sys-

tems). As a result of several meetings, a new program was proposed and offered. In the new program, the Financial Information Systems course was redesigned to meet the objectives of AIS. Further, a new course was developed by the accounting faculty, called Systems Implementation and Projects. This course is exclusively offered to AIS students and engages the students in the implementation of financial systems in a realistic setting. This stage is comparable to the Act phase of the Shewhart cycle.

This cycle has been repeated several times so far and has led to many changes and improvements of the AIS program. Exhibit 2 shows the summary of our efforts with PDCA, chronologically listing the changes (improvements) made to date.

Historically not all accounting graduates choose to go the CPA route. New business environments have created great opportunities for expertise in other areas such as internal auditing, computer security specialists and management accounting. Thus, it appears that in addition to the traditional accounting path, it is feasible to establish specialized paths for those students who have no desire to join public accounting. Responding to this need and the Information Systems Audit and Control Association's model curriculum [ISACA 1998; McCombs and Sharifi 1997], a new version of the curriculum evolved that will satisfy the needs of information sys-

Exhibit 2 - Changes Resulting from Continuous Improvement Since Inception of AIS Program

1	Redesigning Financial Information Systems course into an Accounting Information Systems course and dropping Systems Development course
2	Requiring COBOL programming course
3	Requiring Pascal programming course
4	Creating a Systems Implementation and Project course and dropping Systems Implementation offered by other department
5	Requiring a Data Structure course as a prerequisite to Data Base course
6	Requiring an Expert Systems course as an alternative to the Data Structure course
7	Selecting the Systems Implementation course as an assessment device
8	Changing the Pascal programming course to C programming
9	Requiring a Data Communications course
10	Redesigning the program to satisfy the needs of information systems auditing and control area

tems, as well as internal, auditors. Our program model is presented in Exhibit 3. This program meets the goals set by ISACA and is in the process of being implemented at the authors' institution.

New educational and information systems challenges are always occurring, and the continuous improvement model can assist in making appropriate changes and modifications. The advent of 150-hour programs and the introduction of Enterprise Resource Planning (ERP) systems are examples of newer challenges we are facing. We have recently modified our MSA (Master of Science in Accounting) program to allow an AIS focus. To satisfy the demand in the ERP area, the accounting department is contemplating how to integrate this skill into various courses within the department, and across the university. This expertise is no longer "leading edge" or "competitive advantage." In fact, offering ERP related courses appears to us to have become a "competitive requirement;" i.e., lack of exposure to such knowledge will push the school and its graduates out of the competition.

Applying Continuous Improvement to the Accounting Department

The faculty members are also engaged in other aspects of our operations, as suggested by continuous improvement requirements. Therefore, a wide-ranging, comprehensive approach is required, and this paper will present several examples. As a starting point a team of faculty and staff are organized to handle the project using a systematic problem solving approach. In this case the team develops a list of initiatives that are to be part of the continuous improvement process. Among the efforts, for instance, could be that the department intends to improve the faculty and staff attitudes toward students majoring in the department of accounting and intends to encourage helping students with their professional needs. The team calls this the plan of action. The department at this stage trains faculty and staff as to how to interact with students and what type of information they
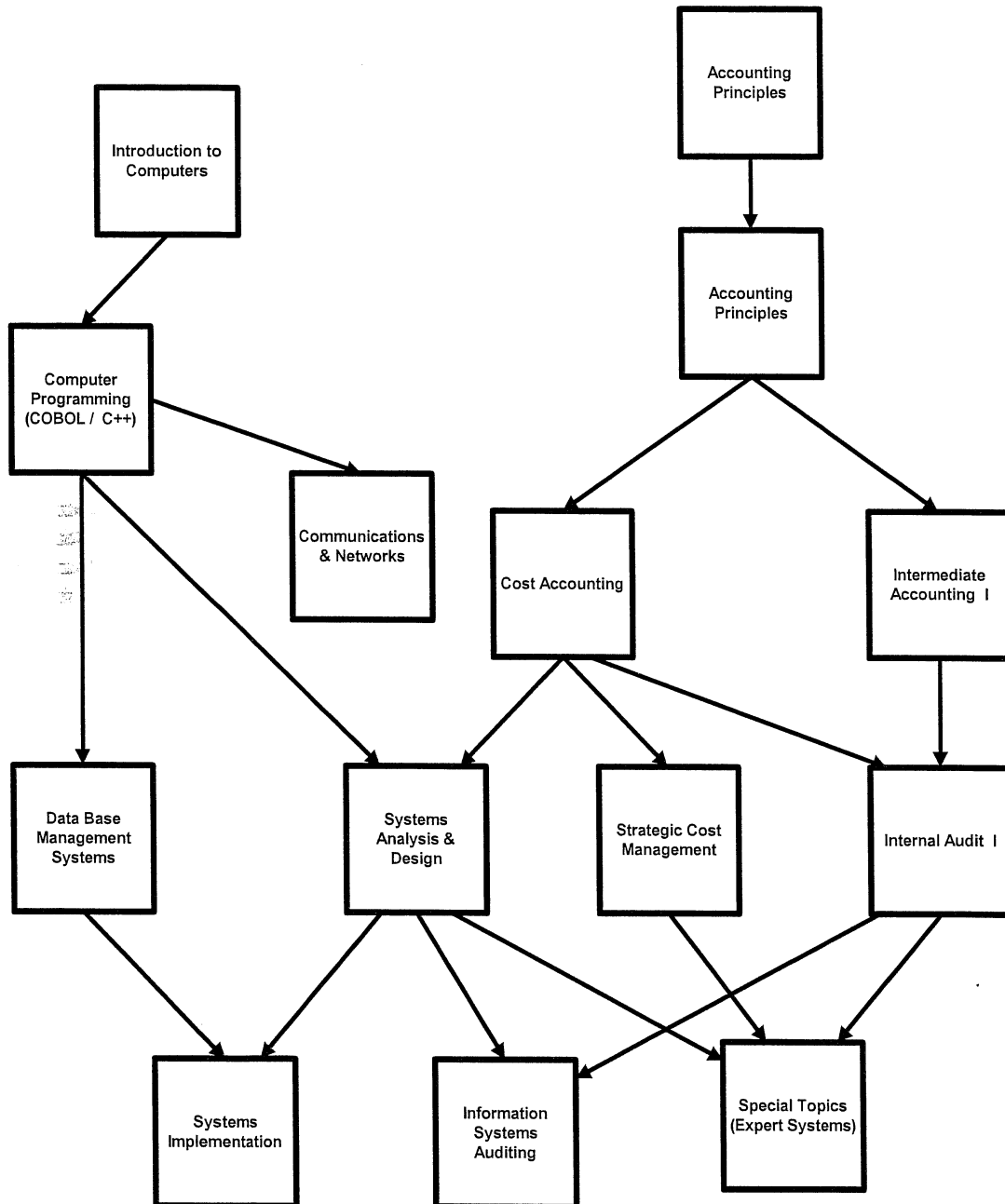
should have available to be helpful. The training in this area could be formal, such as inviting consultants to faculty and staff meetings. However, due to the lack of adequate resources, most of the objectives of the training could be accomplished in a general faculty meeting or in a retreat. This corresponds to the do step of the PDCA of Shewhart.

The department then collects information to validate the effective implementation of the initiative(s). This is the check part of the cycle. In our case a formal questionnaire has been developed to collect appropriate information (and is evolving over time). The last step of the cycle is the act part in which the information collected is processed and shared among faculty and staff. At this stage the necessary changes are initiated. This technique is being experimented with at the authors' institution with very positive results. This has been accomplished in conjunction with the assessment process and has provided a large amount of useful information for that task as well.

A comprehensive questionnaire was developed with the help of several faculty members. The questionnaire has several sections. In the first part, specific qualitative questions are asked about the personnel of the department, including administrative personnel. In the second section, the activities of the accounting department are scrutinized. In sections three and four of the questionnaire, the college's and university's activities and facilities are evaluated, and some recommendations by the students are solicited. As noted in Miller [1991, p.22], this is necessary because the "quality of the college experience extends beyond the classroom."

The entire senior class completes the questionnaire in the last semester of course work. To receive the best response, no name or identification number is attached to the questionnaire. Hittman [1993] points out that typically "standards are established without input from the students (i.e., the customers)." Therefore, this survey is believed to be targeted to an appropriate respondent group. The department head

Exhibit 3- Current AIS Program Model (1999)

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Introduction to                              Accounting
Computers                                    Principles
     |                                           |
     v                                           v
Computer                                     Accounting
Programming                                  Principles
(COBOL / C++)                                    |
     |         \                              /     \
     |          \                            /       \
     |           \  Communications      Cost        Intermediate
     |            \ & Networks          Accounting   Accounting I
     |             \                        |             |
     v              v                       v             v
Data Base        Systems          Strategic Cost    Internal Audit I
Management        Analysis &       Management
Systems           Design
     \            /    \              /    \        /
      v          v      v            v      v      v
   Systems        Information          Special Topics
   Implementation  Systems             (Expert Systems)
                   Auditing
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ducts the session, and all the questionnaires are analyzed to create a basis for the implementation of the new initiative. Other important outcomes of the questionnaire are the metrics created by processing the variables.

In private manufacturing and service organization various metrics collected regarding different aspects of the operations are posted in a visible location. The employees can immediately see the impact they are making on the system. These metrics are the basis for continuous improvement. Academic departments could follow the same technique. For example, results of student attitudes are summarized and distributed to faculty.

Although some educators have suggested that students are not customers of the educational process, we have concluded that our students are one of the major stakeholders. Thus, their reactions to our initiatives are valuable and important. The department has used this information and made many changes in the areas that have been important to the well being of the program, such as scheduling and sequencing of courses. The department is extending this to other areas, such as computer resource utilization and extracurricular activities (e.g., Beta Alpha Psi and accounting clubs).

Although some effort has been involved, very little cost has been incurred, an especially important consideration for the typical tight budget environment of most colleges and universities. The process is easy to start and implement, but does require continuous involvement. Schmoker [1996] encourages prompt action, as he feels perpetual preparations are a waste of both time and money.

Conclusion

"Continuous improvement is a way of thinking, not a one time reform effort." [Richardson, et al. 1997, p. 59] The endeavor by the authors' institution to apply TQM techniques, specifically continuous improvement, to accounting education and to its accounting in-

formation systems program is presented with specific information on the process used, as well as perceived improvements in quality. The continuous improvement process and techniques described herein may be of interest to those faculty and institutions wishing to pursue similar implementations. Changes in expectations placed on accounting education and its graduates and also on AIS create the need for a systematic and reasoned approach to evaluating educational approaches in accounting departments. The authors believe that using the continuous improvement model is an approach that fits well with the environment of academic accounting.

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Notes

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