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ABSTRACT
         The objectives of the Pell Grant quality control (QC)
system and the general definition of QC are considered. Attention is
also directed to: the objectives of the Stage II Pell Grant QC system
design and testing project, the approach used to develop the QC
system, and the interface of the QC system and the Pell Grant
delivery system. The comprehensive and strategic approaches to QC
system development are compared using the following objectives for
the QC system as evaluative criteria: reduce error in the Pell Grant
program, maintain flexibility to add additional programs, pilot test
QC system components, and produce a sound QC methodology. The
following QC options are assessed with attention to feasibility,
potential for reducing error, developmental costs, and interface with
delivery system: a manual QC system with new data sources, a combined
automated/manual QC system with new data sources, a combined
automated/manual system with existing data sources, and a fully
automated, integrated system. A combined system with existing data
sources is recommended. Appended are preliminary descriptions of QC
subsystems that cover the Office of Student Financial Aid subsystem,
the institutional subsystem, the Pell processor subsystem, and the
student (applicant) subsystem. (SW)

QUALITY CONTROL [QC] SYSTEM DEVELOPMENT

FOR THE PELL GRANT PROGRAM:

A CONCEPTUAL FRAMEWORK

A Working Paper

March 1, 1982

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EXECUTIVE SUMMARY

At a February 12, 1982, meeting between Division of Quality Assurance [DQA] personnel and Advanced Technology quality control [QC] project staff, issues facing the Stage Two study were discussed. While tentative agreement was reached on these issues, DQA requested that Advanced Technology write a paper proposing a conceptual framework for the Stage Two QC system design and testing project. In response to that request, this paper considers:

- The objectives of the Pell QC system and the general definition of QC

- The purposes of the Stage Two QC system design and testing project

- Generic approaches to the development of the QC system

- Alternative configurations for the Pell QC system

The latter two areas--the approach used to develop the QC system and its ultimate configuration or interface with the Pell delivery system--are critical issues that need immediate resolution for the Stage Two study to proceed. Based on a detailed analysis of alternatives in both areas, Advanced Technology recommends:

- The use of a strategic and modular approach to QC system development that will facilitate the incremental development of the most essential subsystems

- Pending completion of the functional analysis in Stage Two, endorsement of a combined manual/automated QC system that uses existing data sources to the extent possible

The implications of these recommendations are also considered for these procedural issues:.

- The rationale for the Stage Two QC study
- The desirability of a general QC methodology
- Key areas for QC subsystem developments

Further discussion of these issues will be necessary as the Stage Two study progresses. At the present time, it is essential that approval be given for the interviews of ED personnel so that the Stage Two study can proceed.

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INTRODUCTION

Quality control [QC] systems are essential to the sound management of Federal student assistance programs. This is, especially true for the Pell Grant Program, one of the largest and most prone to error and abuse. The annual overpayment in the Pell program, due to various institutional, student, and processor errors, is estimated to be in excess of $300 million. The development of a QC system for the Pell program is complicated by these factors:

- The delivery system is subject to change as a result of administrative or legislative action.

- The current delivery system is already in operation and involves an extremely large number of primary actors.

- Many of the potential avenues for corrective action in the current system only recently have been identified as a result of the Stage One QC study.

QC Objectives for the Pell Program

This paper proposes a conceptual framework for the development of a QC system for the Pell Grant Program. Recognizing the constraints now evident, the development objectives of the proposed QC system are to:

- Reduce error, fraud, and abuse in the current Pell Grant Program.

- Maintain flexibility for adding new components to the QC system and for adapting to changes in the Pell Grant delivery system.

- Pilot test the QC system components in a reasonable time frame.

- Develop sound system development methodology for the Pell Grant QC system.

Definition of Quality Control

Quality control, while essential to almost any enterprise, is ambiguous and difficult to define precisely because, as a concept, it is applicable to such a wide range of activities. The essential element of a QC system, in either an industrial or social service setting, is the capability of detecting, preventing, and correcting errors or any tendency toward errors that occurs in an operational setting. Implicit in this definition is recognition that:

- It is essential to set standards for the output of a system.

- Standards must incorporate technical specifications prescribed by the provider of the service (or product) and expected by the recipient (or consumer).

- A system for monitoring standards and correcting errors is necessary for the implementation of an effective QC system.

- The purpose of a QC system is to increase the efficiency and effectiveness of the delivery system by reducing costly errors and increasing the quality of services (or products).

THE STAGE TWO QC STUDY

During Stage One of the QC study, Advanced Technology examined the applicability of quality control concepts and procedures to student financial assistance programs, in order to develop a QC concept for the Pell program. The project team:

- Reviewed relevant literature on industrial and governmental QC systems and practices

- Interviewed QC personnel from five social service agencies operating at the Federal, state, and local levels

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● Conducted a workshop/discussion with these personnel and ED staff.

Purposes of the Student Aid QC System

From Stage One activities, a working concept of quality control was developed for student financial assistance programs, particularly the Pell Grant Program. It is essential that a QC system for student assistance programs enable ED to:

● Develop standards and measures for monitoring the delivery of student aid.

● Measure performance of student aid delivery against specified measures.

● Determine and monitor errors in eligibility determination and award processing.

● Identify sources and probable causes of errors to plan corrective actions.

● Develop corrective action procedures as an integral part of the processing functions.

● Develop standards and measures for monitoring the results of corrective actions.

● Ensure that various actors (e.g., processors or institutions) are operating in accordance with specified procedures, regulations, and standards.

● Report appropriate QC information to ED personnel on a timely basis.

This will make it necessary for ED to develop QC procedures performed on an ongoing basis as the award process is taking place (front end) and on a audit basis after the award process has been completed (back end). For the Pell Grant Program, it is desirable that front-end procedures be developed to reduce the amount of error prior to the disbursement of funds. It is also necessary to have a back-end component to ensure that these

corrections have actually taken place, as well as to perform
analysis and develop corrective actions for future years.

Conceptual Model for the QC System

At this early time it is not possible to provide a detailed
conceptual model of the Pell QC system, since this is an objec-
tive of the Stage Two study. However, it is possible to concep-
tualize the basic components of such a system. Conceptually, a
QC system for the Pell program would combine a core QC Management
Information System [QCMIS] for monitoring and tracking the award
process with a series of subsystems for the major actors in the
award process: the processor, OSFA (Central and Regional), insti-
tutions, and students. The subsystems would both monitor perfor-
mance against standards and determine error levels within each
subsystem. A simplified conceptual model is illustrated in
Figure 1.

Steps in Building a QC System

In practice there could be more than these four subsystems.
Each subsystem must interface with both manual and automated
systems and therefore must combine elements of both. The devel-
opment of a QC system for the Pell program will be a complex
process requiring:

- Detailed analysis of the Pell delivery system

- Development of a conceptual model for an overall QC
  system

- Systematic development of QC subsystems that integrate
  into the delivery system

- Development of a central monitoring and tracking sys-
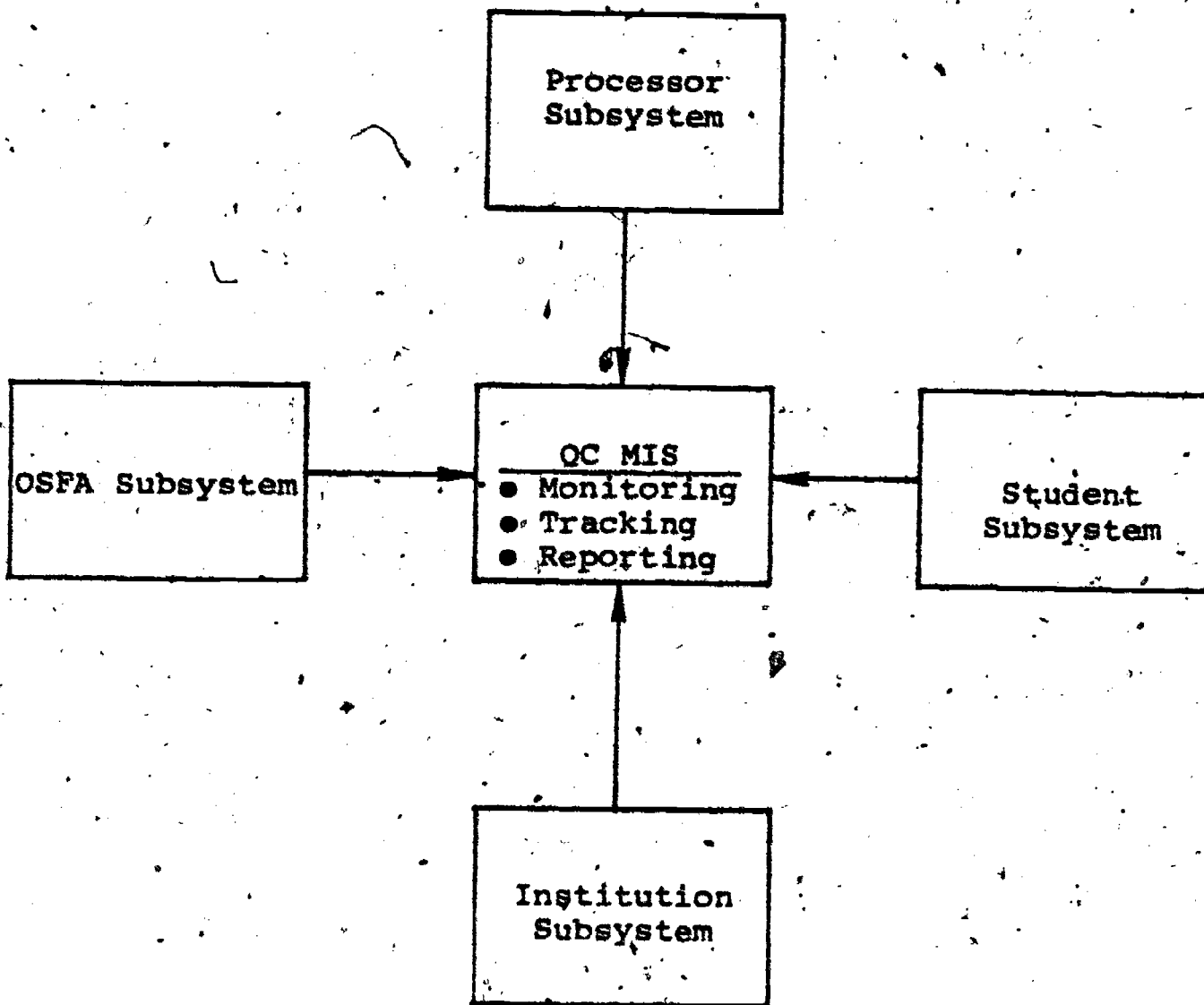 tem, the QC Management Information System [QCMIS]

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FIGURE 1

CONCEPTUAL MODEL OF THE PELL GRANT QC SYSTEM

GENERIC APPROACHES TO QC SYSTEM DEVELOPMENT

To set the stage for ED decisions about the design and development of the Pell Grant Quality Control System, it is important to consider two generic approaches to QC system development. Both approaches are applicable to procedures already developed. The first is characterized as the comprehensive approach, the second as the strategic or modular approach. They are summarized and compared in the following sections.

Comprehensive Approach

The comprehensive approach assumes that anything that can go wrong with the operating system will go wrong; therefore, it is important to identify every possible error in the system and design corrective procedures. The basic steps involved in this approach are outlined as follows (with the application of each step to the Pell Grant Program considered in parentheses).

- Identify the major subsystems of the programs (for Pell Grants this would include eligibility determination, award processing, fund disbursements, and so forth).

- Identify the major actors or components for each subsystem (for the eligibility subsystem this would include students/parents, institutions, Pell processors).

- For each actor in each subsystem, identify acceptable standards of possible errors in the system (for students and parents in the eligibility system subsystem this will include identification of standards for application errors).

- Define measures for each set of standards (this would include identification of data elements and procedures for information collection).

- Determine the components of each subsystem that merit development and inclusion in the QC system (evaluate the feasibility of including the various information sources in a QC data base).

- Proceed with system development on the select subsystem (design and develop procedures for implementation of selected components of each subsystem).

For the Pell Grant Program, the comprehensive approach would result in an elaborate QC system that imposed new data collection procedures on top of the already existing system. It would permit the development of a separate or stand-alone QCMIS. It could also be used to produce QC manuals for training ED personnel (Central and Regional) and institutional representatives in the practice of QC in the Pell Grant and other student aid programs. To the extent that the system used automated data collection and analysis procedures, it would be labor intensive since an entirely new set of procedures would be needed for each component of each subsystem; and sophisticated data base management procedures may be needed centrally, depending on how much of the system is eventually implemented.

Strategic Approach

This approach assumes that the major sources of error in the Pell Grant Program can be identified and that corrective action should be made in these areas through the development of modular components of an overall QC system. The basic steps involved in the strategic approach are outlined as follows (with applications to the Pell Grant Program).

- Identify major sources of error in the program (for the Pell Grant Program this was accomplished in the Stage One QC study).

- Conduct a functional analysis of the operating system, including information requirements, linkage structures, and breakdown points (identify the places in the system where corrective action should be taken and monitor progress).

- Conceptualize a QC system with modular components designed to correct and monitor error prone functions (conceptual system design would consider modular subsystems that interface the QCMIS with subsystems of the Pell Grant system, e.g., Processor, PIMS).

- Select and prioritize modular subsystems for development (identify time frame for specifications, design, development, and installation of each selected subsystem).

- Proceed with systems development for selected subsystems (e.g., develop procedures and systems manuals, user manuals, system specifications, and software specifications, as necessary).

- Perform system tests on modular subsystems as they are completed (this would be determined as the work schedule was developed and approved).

For the Pell Grant Program, the strategic approach to QC development would permit the incremental implementation and testing of modular QC subsystems designed specifically to reduce errors in the system. The modular approach could also permit the use of up-to-date electronic technology utilizing preexisting data sources, where appropriate, rather than developing new data sources and reporting procedures. In other instances it might result in more systematic analysis and reporting on data currently reported. The principal advantage of the modular design is the use of preexisting data sources with enhanced reporting

and monitoring capabilities. However, in some areas (e.g., application item error) new data sources would be needed.

Evaluation

This section compares the comprehensive and strategic approaches to QC system development using the following objectives of the proposed QC system as evaluative criteria.

- <u>Reduce Error in the Pell Grant Program</u>
- <u>Maintain Flexibility to Add Additional Programs</u>
- <u>Pilot Test QC System Components</u>
- <u>Produce Sound QC Methodology</u>

The two approaches vary in their <u>potential for reducing errors</u>, particularly the overpayments identified in the QC study Stage One. The comprehensive approach would build in an elaborate procedure for identifying all possible error, but would also introduce complicating factors such as possible overemphasis on less important issues and time delays in monitoring key factors e to the implementation and operation of new data collection procedures. This would severely constrain the implementation of front-end corrective actions. The strategic approach would be targeted at critical problems in the design stage; it would also attempt to use, wherever possible, preexisting data sources. This would ensure that systems development work would be targeted at the most critical problems and minimize the time delays required in obtaining timely information. This approach could also be oriented toward front-end and back-end correction.

Therefore, the strategic approach would maximize the potential for reducing program costs.

The two approaches also vary considerably in their <u>flexibility to add additional programs</u> to the QC system. With the comprehensive system it is possible to repeat the same procedure for other student aid programs or to modify the system and data correction procedures to include other student aid programs. In contrast, the strategic approach could be targeted at whatever parts of the student aid system ED decided to add. It would be possible, depending on the conceptual design finally selected, either to create new modular subsystems to an overall integrated QC system or to create new parallel systems for the other programs. In fact, the design of new subsystems could be staged to coincide with changes in the delivery system.

The strategic approach would also provide ED with the opportunity to <u>pilot test QC system components</u> at an earlier stage in the process. Inherent in the comprehensive approach is the design of new data collection procedures that involves defining new data elements and devising new collection procedures, which takes time to implement and test. The strategic approach emphasizes the use of existing data sources, a time saving procedure, and the phased development of QC subsystems. This should allow for pilot testing components of the QC system earlier in the development process.

Both approaches would <u>produce sound QC methodologies</u> but would have different results with respect to the type of

methodology developed and used. The comprehensive approach would result in the same methodology being applied to each subsystem of the Pell program, with critical subsystem components receiving more attention than less critical ones. Since it is an elaborate system review process, an elaborate and well-defined procedure would be necessary. It is possible to apply the same procedure to other student aid programs. The strategic approach would have to use sound system development procedures in the conceptual development of the QC system and modular subsystems. As a part of the overall functional analysis, the contractor would evaluate the value of the QC procedures already in use, for example, in manuals currently distributed to institutions, before developing new procedures. Therefore, the procedures developed as a result of the project would be specifically oriented toward the existing system, but the procedures used for the entire project would be applicable to all Title IV programs.

In summary, given the objectives of the QC system design and testing phase of the Stage Two QC study of the Pell Grant Program, the strategic approach to systems development increases the prospect of:

- Reducing errors in the Pell program
- Adding new Title IV programs to the QC system
- Pilot testing QC components earlier in the study
- Developing a sound generalized methodology

At a recent meeting on the QC system design, DQA officials expressed a desire to achieve these ends. Advanced Technology

concurs with this emphasis and recommends that the strategic approach be used in the Stage Two study. The approach can be easily adapted to the August 1981 work statement (see Appendix I).

ALTERNATIVE QC SYSTEM CONFIGURATIONS

While it is neither possible nor desirable at this early stage to provide a detailed description of what the QC system will actually include, since this is an objective of the QC system design and testing project now underway, it is important to speculate about what the QC system might look like and how it will interface with the Pell delivery system. It is particularly difficult, without undertaking the functional analysis of the Pell delivery system, to specify the extent to which the QCMIS will be a manual or automated system and the extent to which it will use new or existing data sources. Two issues help distinguish between optional configurations for the QC system:

- The extent to which the new system is manual or automated

- The use of new or existing data sources

These issues can be used to generate four discrete configuration options. The criteria used to evaluate these options are:

- <u>Feasibility of the system design</u> (Can it be done?)

- <u>Potential for reducing error</u> (Will it save money?)

- <u>Developmental costs</u> (How much?)

- <u>Interface with the delivery system</u> (Will it work?)

At this point, consideration of the actual configuration of the QC system is speculative. However, it is possible to outline and compare a few options, using these as evaluative criteria. As a part of the system development project, a rigorous and detailed analysis is necessary. At this time, however, a brief analysis is called for to point out the types of decisions ED will confront in a relatively short period of time.

Option 1: Manual Enhancements

It is possible to develop a QC system that essentially provides manual enhancements to the existing Pell delivery system. In this case the system development activity would include detailed specification of reporting requirements for each of the major actors in the Pell Grant Program. The reports would be entered into a filing system in the Division of Quality Assurance and used as a means of monitoring and tracking progress on certain key areas identified during the system development process. Either the comprehensive or the strategic approach to the system development (outlined above) could be used to develop the manual enhancements, although the comprehensive approach is easiest to adapt to this option. The major problems with this option are that it would add to the reporting burden of the major actors and that excessive time delays would be built into the system.

Option 2: Combined Manual/Automated QC System Using New Data Sources

This option would essentially take the above-stated concept an additional step. Where appropriate data collected through the

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QC process could be automated, some files would be accessible for automated analysis and reporting. Others, particularly periodic summary reports using aggregated data, would remain manual. Compared to Option 1, this option would go an extra step, using automated technology as appropriate within the framework of creating a new data collection system. It has the potential of providing data on a somewhat more timely basis, but it would provide an additional layer of reporting on top of the existing delivery system. It would use either system development approach but is more adaptable to the comprehensive approach.

Option 3: Combined Manual/Automated QC System Using Existing Data Sources

This option would have some of the same features as Option 2 but would emphasize analysis of existing data sources in new ways rather than development of entirely new data collection procedures. This would involve utilizing, where appropriate, data the major actors currently generate or that could be generated relatively easily through modification of current practice. In some instances this might involve reporting progress in corrective actions and in the speed of handling certain types of problems. For example, if the IRS Form 1040 cross-check were built into the Pell processor contract, a system for monitoring and reporting on this activity could be built in as well. This approach would be flexible enough to add other student assistance programs as necessary. In this way a QCMIS subsystem could be constructed that dealt with critical points in the delivery system. This

option would be most adaptable to the strategic approach to QC system development.

Option 4: Fully Automated Integrated QC System Using Existing Data Sources

This option would take the approach just identified to the fullest possible degree of system automation. Such an option would integrate the core QCMIS with systems that interface with the major actors' operating systems. Monitoring, comparing results to specific standards, taking routine corrective actions, and reporting could be built into the system. Such an approach would be dependent on automation of most components of the Pell delivery system. Other student aid programs could be integrated into the system, depending on whether and how the student assistance delivery system was eventually redesigned. This option could use a variation of either the strategic or the comprehensive approach to systems development but would have to be done in combination with the redesign of the entire delivery system.

Assessment

A functional analysis of the Pell Grant system is required to fully evaluate these options. In the absence of such an analysis, only preliminary judgments are considered. Once the functional analysis of the program is complete, it will be possible to develop these and/or other options in greater detail, in which case it will be possible to provide a detailed evaluation. Table 1 summarizes the preliminary assessment of the four generalized options. This assessment uses the evaluation criteria just identified.

TABLE 1

PRELIMINARY ASSESSMENT OF QC SYSTEM OPTIONS

	OPTION 1	OPTION 2	OPTION 3	OPTION 4
Description	Manual QC System with New Data Sources	Combined Automated/ Manual QC System with New Data Sources	Combined Automated/ Manual QC System with Existing Data Sources	Fully Automated, Integrated QC System
Feasibility	Moderate (Can be Implemented with existing delivery system-- manual analysis may take too long to be useful.)	High (Can be implemented with existing delivery system.)	High (Can be implemented with existing delivery system system.)	Low (Requires delivery system redesign.)
Potential for Reducing Error	Low (Delays built into reporting limit monitoring front-end corrective action. Implementation may not lead to error reduction.)	Moderate (Delays built into reporting limit monitoring front-end corrective action.)	High (Integrated approach permits monitoring front-end corrective action.)	High (Integrated approach permits monitoring front-end corrective action.)
Developmental Costs	Moderate (Requires developing entirely new system.)	High (Requires developing entirely new system.)	Moderate (Uses existing data to the extent possible.)	Unknown (Included in delivery system redesign which would be costly.)
Interface with Delivery System	Not Integrated (Result is creation of new, parallel system.)	Not Integrated (Result is creation of new, parallel system.)	Partially Integrated (Result is integration of QC subsystems with Pell delivery system.)	Fully Integrated (Result is full integration of QC into Pell delivery system.)

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On the basis of this preliminary assessment it is possible to make an initial judgment about which QC system option is most desirable. Option 1 would probably have relatively modest results, with respect to its potential for reducing error, and moderate developmental costs; it would not be integrated with the delivery system. Option 2 would increase the potential for reducing error and the developmental costs. Option 3 has high potential for reducing error, would require moderate developmental costs compared to Options 2 and 4, and would be partially integrated into the delivery system. Option 4, while having the highest potential for reducing error, does not appear feasible at the present time. As the Stage Two QC study progresses, however, it could be further evaluated as part of the delivery system redesign. Of the four options, Option 3, a combined automated/manual system using existing data sources, appears to be the most desirable QC delivery system configuration.

While the preliminary assessment indicated that Option 3 is the desirable configuration for the Pell Grant QC, a full evaluation of which configuration is most desirable will not be possible until the functional analysis is complete at the end of Task 5. However, it appears that a combined manual/automated QC system using existing data sources is desirable. It is also highly compatible with the strategic approach to QC system development.

CONCLUSIONS AND IMPLICATIONS

On the basis of this analysis, it appears that:

- The strategic approach to QC system development should be used to design and test the Pell Grant QC system.

- Based on a preliminary assessment, a combined automated/manual QC configuration using existing data sources would be the soundest system design alternative.

It is also important to consider the implications of these findings for the design and development of a QC system for the Pell Grant Program. Three other practical issues confront the project:

- The rationale for the Stage Two study

- The development of a generalized QC methodology

- Determination of which QC subsystem should have the highest priority for development

These issues have emerged as a result of the February 12, 1982, discussions between Advanced Technology and DQA. The following is a review of their conclusions.

Rationale for QC System Development

While existing documents establish the parameters for the QC system design and testing of the Stage Two QC project, especially the work statement for Stage Two, there is a need for greater clarity about the rationale for these activities. Two factors contribute to this issue:

- Recent changes in the Department of Education relative to the eventual redesign of the student financial assistance delivery system

- The recent completion and dissemination of the Stage One report on corrective actions to the Pell Grant delivery system

There appears to be a relatively high probability of change in the student financial assistance delivery system in the not-too-distant future. Recently five senior-level task forces were initiated by ED to examine major aspects of the student financial aid delivery system, including quality control and delivery system redesign. While the current Pell Grant delivery system is not likely to undergo major revision in the short term, there is a significant possibility for minor changes in the short term and major changes in the medium term, i.e., three to five years. To the extent possible under the existing contract, the Advanced Technology project team is interested in modifying the system design and testing part of the Stage Two QC to meet the changing needs of ED. This will require flexibility in the system development approach used during Stage Two, an issue considered earlier, as well as recognition that the QC project now faces a different situation than it did a year and a half ago when the project began. Our assumptions about how this situation will influence the QC study are:

- The QC system should be designed for the current Pell delivery system, which should remain relatively stable during the next three to five years.

- The QC system design project should develop and test subsystems on a priority basis rather than test the entire system at the end of the project.

- Subsystems can be developed after the conceptual design phase of the project is completed.

- The conceptual design for the QC system should maintain flexibility to adapt to a changing Pell Grant delivery system.

- The QC system design, to the extent possible, should be adaptable to the eventual inclusion of other Title IV assistance programs.

- The QC system can be viewed as an effort to develop and pilot test some quality control and corrective action methodologies that could eventually be incorporated into a new student assistance delivery system.

Stage One of the Quality Control Study identified a wide range of recommendations for corrective actions in the Pell Grant delivery system. The report considered both <u>mechanical actions</u> to make marginal changes in the current delivery system and <u>major structural changes</u> in the way Pell grants and other Federal aid are delivered to students. These changes were considered for:

- The applicant and application component

- The institutional component

- Processor component

To the extent possible, the conceptual design of the QC system should facilitate the implementation of these recommendations, especially the mechanical actions. The major structural changes are subject to policy deliberations in the Department and therefore cannot be anticipated. However, the QC system design effort will maintain flexibility relative to these and other structural changes.

These interrelated factors--the prospect for change in the student aid delivery system and the recent completion of the Stage One QC study recommending corrective actions--provide a major input to our ongoing deliberation with ED about the QC system development activities. A primary concern of the project team is that the deliverables developed during the project be

useful to the Department of Education, not call for an exhaustive effort to develop a full-blown system that will have a short life once it is implemented. This situation is a key factor in our effort to adapt Stage Two of the project to meet the changing needs of the Department.

General Methodology

The methodological aspects of the system development phase of Stage Two are critical to the success of the project. In fact, the methodology component could be one of the most important projects of Stage Two. In discussions on Stage Two, DQA personnel expressed interest in a general QC methodology that could be used for training purposes and adapted to diverse organizational settings. A large number of actors, including many of the approximately 6,000 institutions, need to improve QC practices. A general QC methodology could be disseminated through the OSFA/DQA.

Advanced Technology can explore the possibility of and need for a generalized QC methodology as part of the functional analysis. It will be necessary to review documents now disseminated to institutions to evaluate whether QC methodology is already covered in these documents. If not, then the systems design activities could be modified to include this.

One viable strategy for achieving this would be to adapt a proven MIS planning and evaluation methodology to a general QC methodology. Detailed specification could be for specific organizational settings, ranging from large universities with

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automated financial aid systems to small institutions with manual systems. The top-down approach to MIS planning and evaluation, pioneered originally by IBM, has been widely adapted to MIS planning problems for both manual and automated information systems. This method emphasizes:

- Top-down MIS planning with the possibility of bottom-up implementation

- Viewing data as a resource and an information system as a support for functional processes

- A proven, structured methodology for MIS assessment and evaluation

The combined top-down, bottom-up technique is highly compatible with the modular approach considered earlier. The methodology requires adherence to a procedure which generally includes the following six steps, the actual elements of each varying according to which adaptation of the procedure is used.

- Survey of current systems

- Functional analysis of management requirements

- System conceptualization

- System design

- System installation

If the strategic approach is adopted, then these basic procedural steps will be used by Advanced Technology in the QC design and testing activity. A generalized methodology based on this procedure could be developed, with appropriate instrumentation and detailed specifications for different organizational environnments. Currently the project is entering the functional analysis step. As a part of this step, Advanced Technology can

evaluate the need for a generalized methodology. If ED considered it desirable to have such a methodology, it could be developed as part of the system conceptualization phase. This issue will require more discussion between Advanced Technology and the DQA.

Key Areas for QC Subsystem Development

At this time it is difficult to move beyond the initial conceptualization of the QC system (Figure 1), since the functional analysis has not been completed and the system conceptualization has not yet been initiated. However, it is important to add some initial impressions about what might be included in the system to:

- Provide a framework for the system development process.

- Provide a basis for discussion between Advanced Technology and the DQA about priorities for system development.

As the earlier discussion indicated, the Pell QC system could have four basic subsystems:

- OSFA subsystem

- Institutional subsystem

- Application processor subsystem

- Student (applicant) subsystem

It is important to facilitate a dialogue about system development priorities. A brief description of what might be included in each subsystem is included in Appendix II. These descriptions will no doubt be modified as the project evolves.

Summary

This paper has identified and analyzed several decisive issues that need clarification and resolution. Two of these issues must be resolved in order to proceed with the QC system design. Their resolution will help provide a framework for this activity. Based on this analysis, Advanced Technology recommends:

- A strategic approach for the development of the QC system

- Pending the completion of the functional analysis, a combined manual/automated QC system using existing data sources

Procedural issues are also raised and addressed in this paper. While definitive answers are not required at this time, dialogue about them can clarify the Stage Two system development effort. The issues are:

- The changing rationale for the Stage Two study

- The development of a generalized QC methodology

- Priorities for QC subsystem development

In this section we have suggested a framework for resolving these issues and hope that our analysis will help focus future discussions about the QC study.

APPENDIX I

QC SYSTEM DELIVERABLES/SCHEDULE

ITEM	DATE DUE
1. Management Objectives and QC Standards	March 15, 1982
2. Operational Environment and Resources Report	April 16, 1982
3. Potential QC Linkage with Other Title IV Programs	July 31, 1982
4. Functional Requirements and Conceptual Design	May 31, 1982
*5. System/Subsystem Specification	August 2, 1982
*6. Preliminary Implementation Plan	August 16, 1982
7. Data Base Specifications/Data Element Dictionary	September 1, 1982
8. Interface Requirements and Specifications	September 15, 1982
9. Detailed Specification and Test Plan	October 15, 1982
10. Detailed Implementation/Installation Schedule	November 15, 1982
11. Conversion Plan	November 15, 1982
*12 Draft Processor User Manual	December 8, 1982
*13. Final User Manuals	December 31, 1983

*If the strategic approach is selected by OSFA, the Deliverables/Schedule will be based on OSFA component priorities.

APPENDIX II

PRELIMINARY QC SUBSYSTEM DESCRIPTIONS

OSFA Subsystem

Control of funds for the Pell Grant Program, as well as the accounting of institutional expenditures, is accomplished through the Pell Grant Program Information and Monitoring System [PIMS]. This system is the responsibility of the Division of Program Operations [DPO]. Funds are initially authorized (budgeted) to individual institutions through the annual initialization process. Institutions request modifications to the authorization via progress reports submitted each October, February, and June. As needed, institutions submit ad hoc progress reports. These reports also include expenditures to-date which are processed by PIMS. Student Eligibility Reports [SERs] for individual recipients are submitted with the progress reports and processed through the PIMS SER subsystem. Funds are disbursed to institutions via EDFMIS and EDPMTS systems after validation of institutions' requests against PIMS authorization level.

The OSFA subsystem to the QCMIS could integrate quality control procedures on these processes into the Pell Grant Quality Control System after discussion with DPO personnel. Possible automated Quality Control procedures include:

- "Early warning reports" when overall institutional authorizations exceed stated percentages of the program budget

- "Early warning reports" when individual institution expenditures exceed stated percentages of the authorization

- Monthly reconciliation of PIMS expenditures with the disbursement systems

- Timeliness audits of PIMS processing

- Comparison of PIMS SER subsystem data with processor data

Institutional Subsystem

OSFA currently monitors institutions through the Division of Certification and Program Review [DCPR]. This division conducts Program Reviews and reviews Financial Aid Audits of Postsecondary Institutions. The audits are performed by either independent auditors, institutional internal auditors, or state auditors. A comprehensive audit guide for the Pell Grant Program has been developed jointly by the American Institute of Certified Public Accountants [AICPA] and ED. All postsecondary institutions participating in the Pell Grant Program are required to have a biennial audit covering two years or annual audits. Results of these audits are forwarded to ED's 10 regional offices for review.

These monitoring procedures are back-end quality control procedures that could be integrated into the Pell Grant Quality Control System. Our strategy for integration of these existing procedures begins with discussions with DCPR and selected ED Regional Offices. These discussions will enable the project team analysts to fully understand the procedures and existing information flow. We could then recommend modifications to:

- Enhance the existing program review process, as required.

- Modify existing information flow-to integrate Program Review results into the Pell Grant Quality Control System.

- Develop information flow to integrate results of Financial Aid Audits into the Pell Grant Quality Control System.

Additionally, the Pell Grant Quality Control System could eventually provide OSFA with:

- A "front-end" warning list of institutions that have not submitted audits

- Selection of institutions for program review, based on error prone profiling

Pell Processor Subsystem

While the processor does not contribute significantly to the errors in the Pell program, there is room for improvement in this aspect of the delivery system. The role of the processor component of the QC system is complicated by unresolved issues such as the possibility of including an IRS check for income and possible family support in the processor contractor. In spite of these uncertainties, it is possible to specify areas of the processor functions that can be reviewed in order to:

- Develop an automated processor subsystem as part of the QC system.

- Develop new QC specifications for the Pell processor contract.

These issues deserve exploration as they relate to the automated and manual functions of the Pell process. For example, the automated subsystem could include:

- A system for testing and monitoring all possible errors in the processor system

- Routine reports on the number of applications and the time required to issue SERs to students

- Routine reports to identify students matching error prone profiles

Several hundred people are involved in the processing of Pell applications. Advanced Technology could examine the possibility of introducing stricter QC procedures in this function. This could result in a mechanism for monitoring the cost of the processor contract which might be incorporated into the RFP for the processor contract. The essential elements might be:

- Clear definition of every step of application processing and development of detailed instructions for each contingency

- Identification of controls for each key step to ensure applications are not lost, misplaced, or delayed

- Elimination of duplicaton of effort by streamlining the process

- Setting of time standards for mailing SERs and establishing monitoring procedures

Student (Applicant) Subsystem

The student subsystem is the most difficult to conceptualize without conducting the functional analysis. In practice, the subsystem will probably involve a direct interface between the processor system and the PIMS to ensure, to the extent possible, funds are disbursed to students (through their institutions) in a proper manner. These could be handled through routine reports

from the existing system or the development of an automated sub-system that would perform a variety of cross-checks of student files.

It is possible to create a student subsystem to monitor front-end corrective actions by the Pell processor and perform back-end follow-through with PIMS and ADS disbursement. Such a system would be especially useful if the IRS check were built into the Pell contract. If this were the case it would be possible for the student subsystem to incorporate the following steps:

- Develop dual data entry of the Pell application and the IRS 1040 (if submitted with application)

- Develop separate edit checks on both files to reduce key entry error

- Machine check for IRS match with SER

- Monitor IRS check with routine summary reports to OSFA (could be transmitted electronically)

- Create a QC student file with corrected SER information (this could be done by DQA)

- Match of the QC student file with the PIMS SER subsystem to check flagged students

- Eventually incorporate back-end review and audit of the student file with the current validation procedure (could be done by ED regional offices)

A student subsystem generated by the award processor and cross-checked with PIMS could potentially provide a system for routinely monitoring errors and identifying areas for corrective action. It might also use data from other sources, such as the Social Security Administration, to enhance the potential of the QC system to identify errors.