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**The Effectiveness of Data Provision through Quality Management System:
Retooling for the Institutional Monitoring and Evaluation for Quality
Assurance in Higher Education (IQUAME)**

by

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ABSTRACT

Meeting international standards among Higher Education Institutions (HEIs) is no longer an option, it has become a necessity. CHED's mandate now is to monitor and evaluate the effectiveness of the quality assurance system, and the quality and efficiency of higher education through the Institutional Monitoring and Evaluation for Quality Assurance In Higher Education (IQUAME). However, it is not easy to undergo IQUAME, for it necessitates both quantitative and qualitative data. The process is more searching, because the account must be reflective and equipped with a justification to ensure that all programs are well designed and deliver appropriate outcomes. The monitoring and evaluation covers five key result areas: Governance and Management, Quality of Teaching and Research, Support for Students, Relations with the Community and Management of Resources. This paper, therefore aims to share the experiences of Capitol University of Cagayan de Oro City, the first school in the country granted the IQUAME Category A status, in the data provision of its Quality Management System (QMS). It will demonstrate through examples how it redesigned its QMS which has been instrumental in the provision of quality data that conform to international standards encompassing the quality policy, quality objectives and quality processes.

I. Introduction

Meeting international standards among Higher Education Institutions (HEIs) is no longer an option, it has become a necessity. The mandate of the Commission on Higher Education (CHED) now is to monitor and evaluate the effectiveness of the quality assurance system, and the quality and efficiency of higher education through the Institutional Monitoring and Evaluation for Quality Assurance In Higher Education (IQUAME). However, it is not easy to undergo IQUAME, for it necessitates both quantitative and qualitative data. The process is more searching, because the account must be reflective and equipped with a justification to ensure that all programs are well designed and deliver appropriate outcomes as reflected in the University's Vision-Mission-Objectives- Goals (VMOG). The monitoring and evaluation cover five key result areas: Governance and Management, Quality of Teaching and Research, Support for Students, Relations with the Community and Management of Resources. This paper, therefore aims to share the experiences of Capitol University of Cagayan de Oro City, the first school in the country granted the IQUAME Category A status, effectively ranking it as Class A- mature teaching institution. This paper will demonstrate through examples how it redesigned its Quality Management System (QMS) which has been instrumental in the provision of quality data that conform to

international standards encompassing the quality policy, quality objectives and quality processes.

II. The Retooling Process

In 1998 Capitol University (Cagayan Capitol College then) did put in place its Quality Standard System for its Maritime Programs and passed the Dets Norske Veritas ISO certification for its Maritime Programs. This initial stage enabled the institution to establish a guidepost that stirred its direction towards quality and excellence. Since 1998 until the present, the University has been successful in obtaining a zero non-conformance record for having implemented a very satisfactory quality standard system. In 2006 Capitol University initiated a retooling process through an institutionalization of a Quality Management System (QMS) for the entire University to provide education and training services a quality assurance that both consistently meet all customer needs and applicable statutory, regulatory and accreditation requirements with continual improvement and prevention of non-conformity. The Capitol University Quality Management System (CU-QMS) complies with the international standard ISO 9001: 2000, CHED, DNV RULES FOR MARITIME ACADEMIES and PACUCOA RULES. The CU-QMS covers all functions and processes needed in the provision of education and training in the fields of Arts and Sciences, Business Administration, Computer Science, Criminology, Teacher Education, Engineering, Maritime Education, Nursing and Graduate Programs. Its procedural policies require that top management shall establish, document and maintain a QMS as a means of ensuring that the products of the University conform to specified requirements for the satisfaction of its stakeholders. It is worthwhile mentioning that any document for that matter has to be supported with evidence needed to establish confidence among all concerned, that quality-related activities are being performed effectively and that the expected levels of quality will be reached.

To illustrate the flow of QMS, the 12 steps encompassed in the ISO 9001:2000 are as follows:

Step 1: Management Commitment (Responsibility - Top Management.)

The top manager (President./ CEO) shall provide a written statement as evidence of his commitment to the development and implementation of the quality management systems program, and to the continual improvement and effectiveness of the system.

The commitment includes the following :

- (a) communicating to the organization the importance of meeting customer, statutory and regulatory requirements,
- (b) establishing a quality policy,
- (c) ensuring that quality objectives are established,
- (d) conducting management reviews, and
- (e) ensuring the availability of resources.

Step 2: Organizational Structure (Responsibility by Quality Manager)

The Quality Manager ensures that a suitable organizational Structure (Chain-of-Command) exists. This is essential for an efficient and effective Quality Management Systems Program to function.

Step 3: ISO 9001:2000 Awareness Training (Overseen by the Quality Manager)

The quality manager shall conduct ISO 9001:2000 awareness trainings/seminars with all personnel/employees to provide them with general knowledge of what is required for a quality system.

Step 4: Internal Quality Assessment (Conducted by qualified personnel in the organization)

The Internal Assessors conduct an initial quality assessment to establish a baseline.

Step 5: Develop a Quality Manual (Involving input from key personnel)

A Quality Manual that identifies the management and the representative responsible for all applicable activities is developed.

The Quality Manual and related Procedures should include:

- (a) Quality Procedures,
- (b) Control Plans, and
- (c) Work Instructions

Step 6: Special Processes (Involving input from key personnel)

This phase prepares the organization to meet any unique process control requirements .

Step 7: Quality Management Systems In-depth Training (Overseen by the Quality Manager)

The Quality Manager ensures adequate and specific training of personnel regarding:

- (a) Quality Manual,
- (b) Procedures,
- (c) Work Instructions,
- (d) Special Processes,
- (e) Control Plans.

Step 8: Ongoing Quality Surveillance (Conducted by qualified personnel in the organization)

Ongoing Surveillance of the quality program should be conducted to ensure compliance with contractual and regulatory requirements.

Step 9: Internal Quality Audit In-depth (Conducted by qualified personnel in the organization)

An Internal audit of the QMS shall ensure compliance of the current implemented Quality Management System Program.

Step 10: Corrective Action (Conducted by the internal quality auditor.)

This phase resolves *Corrective Action* findings resulting from the internal audit.

Step 11: Conduct the Complete/General Audit (Conducted by an independent Quality Auditor)

A third party with the appropriate qualifications audits the Quality Management System to ensure its effectiveness and suitability .

The Audit :

- (a) conducts audit interviews.
- (b) evaluates objective evidence (using an audit checklist).
- (c) writes and communicates QMS audit report/findings.
- (d) indicates corrective action (if required).
- (e) continual actions.

Step 12: Improve the Program:

This phase involves the review of the effectiveness and suitability of the Quality Management Systems (QMS) Program in order to promote the principles of continual improvement

III. The Retooling Instruments

To ensure that top management is continually fulfilling the requirements of all the standards with which the Quality Management System (QMS) is based, Capitol University has reviewed its procedural policies in order establish the following:

- Quality Policy
- Quality Objectives
- Interactive Processes
- Quality Manual
- Documented Procedures and Work Instructions
- Documents needed to operate, monitor and control processes
- Quality Records

THE QUALITY POLICY. The quality policy of the university serves as the framework for establishing and reviewing institutional, functional and operational quality objectives .This is disseminated to all levels of the organization for their awareness and understanding. However, there is a need for top management to review the quality policy periodically to ensure suitability and relevance.

THE QUALITY OBJECTIVES . Quality objectives which are in consonance with the University Vision-Mission-Objectives-Goals (VMOG) are established at all levels of the organization to implement the quality policy and to give direction towards total quality.

INTERACTIVE PROCESSES. For the QMS to operate effectively and efficiently all the needed processes shall be established including their sequences, interfaces, applications, purposes and scopes and shall be presented in a separate documentation.

QUALITY MANUAL. The quality manual defines the scope of the QMS including details and justification of any exclusion.

DOCUMENTED PROCEDURES AND WORK INSTRUCTIONS. Clarity of the procedures and processes in undertaking one's work is strictly required coupled with corresponding documentation. This entails quality criteria and methods needed to ensure their effective performance/delivery.

DOCUMENTS NEEDED TO OPERATE, MONITOR AND CONTROL PROCESSES. The QMS values the importance of obtaining actual measures of process performance; thus, suitable performance parameters and methods of review at specified frequency are imposed. This aims to report non-conformities in systems and processes to ensure timely detection and disposition. The end-in-view is non-recurrence of non-conformities and continual improvement. This therefore, requires the University to establish and maintain documented procedures.

QUALITY RECORDS. Evidence of conformity to the requirements of the ISO 9001 : 2000 standards require that all records and documents are identified, stored, properly indexed and retained for a reasonable time in a suitable environment to enable effective access, retrieval and reference. The CU-QMS quality records follow a standard format with specified retention period and disposal method.

IV. The Quality Efforts

Recognizing the need for zero-error or zero non-conformance, all colleges and supporting units have been working as a team. Organizational unit heads are responsible in monitoring and controlling non-conformities in their respective organizational units. They are responsible in implementing appropriate dispositions and determination and submission on non-conformance reports including the appropriate corrective action plans. To provide for an independent system that will ensure collection of objective evidence that the CU-QMS is

consistently relevant and effective and that the procedural requirements of the ISO 9001:2000 are continuously implemented, the Quality Assurance Manager (QUAM) together with audit team conducts Internal Quality Audit. In the instance of a non-conformance, the root causes are ascertained and a corrective action is determined. What is beautiful in this process is the commitment to implement the corrective action on a specified date. When such corrective action proves effective, a closure is attained which closes out the non-conformance. A QMS Management Review looks into the status of process performance and products/service conformity and it creates full awareness on the offices and the members on the said status. A surveillance external audit (the DNV) is conducted once a year and it is responsible in certifying the institution as compliant to the ISO 9001:2000. All these procedures serve as strong indicators that the CU-QMS has met the IQUAME's objectives of ensuring a continuous improvement and drawing on best practices in delivering, monitoring and improving the quality of learning outcomes that are responsive to the changing needs and comparable to international standards.

More quality efforts were introduced such as the institutionalization of 5S and quality circle. The latter is dubbed as CU CREATIVITY CIRCLE. It is composed of small group of employees from the same work unit who meets regularly to identify, select and analyze to discuss workplace improvement, and make presentations to management with their ideas. Its philosophy is based on the concepts of participative management and humanistic management. It is also anchored on the following approach which constitutes a cycle:

$$P+D +C + A = WI$$

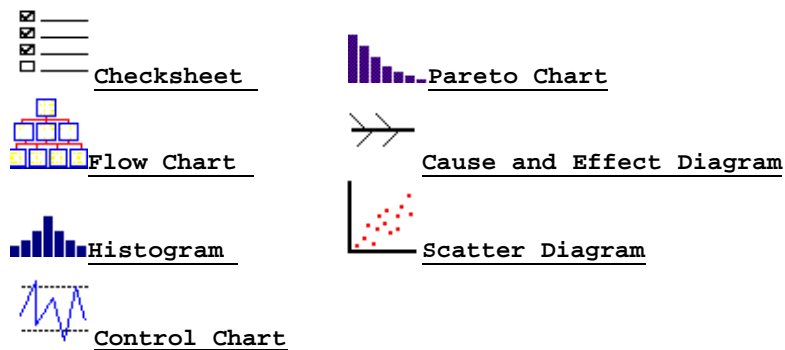
Where P means Plan, D means Do, C means Check, A means Action and WI means Work Improvement.

Looking at this simple formula, one will immediately see how the CU-QMS responds to one of the IQUAME's objectives, that is, "to enhance institution's capacity in designing, delivering, and managing programs and services (CHED Memorandum Order No. 16,s. 2005) through its creativity circles. However, a question may rise on how does the CU-QMS assure its data quality?

V. The Data Quality

In the framework of the QMS, data are of high quality "if they are fit for their intended uses in operations, decision making and planning. The data are deemed of high quality if they correctly represent the real-world construct to which they refer (Wikipedia). This entails

the totality of features and characteristics of data that bears on their ability to satisfy a given purpose; the sum of the degrees of excellence for factors related to data (Glossary of Quality Assurance Terms). For the purpose of documenting the various data, several quantitative tools are employed in the course of identifying problems and seeking solutions and suggesting avenues for continuous improvements. To give a closer view, the QMS has been successfully operating on the "**Seven Tools of Quality**" which are illustrated below :



For the benefit of the end –users of this paper, the data provision through QMS as a retooling for IQAME will be dealt with in a concise manner on selective tools of quality.

As mentioned earlier, the monitoring and evaluation framework of IQAME dwells on the five key result areas within which judgments are made about the performance of the institutions, viz:

- Governance and Management
- Quality of Teaching and Research
- Support for Students
- Relations with the Community
- Management of Resources

Within each key results area there is a number of indicators. Because it is an outcome-based evaluation, it deals with direct assessment of the individual programs that lead to the outcomes and does audit of the quality systems of the institution. One unique feature of IQAME is its more searching process, because the account must be reflective, and provide a justification why things are done, and why they are done in the way that has been chosen. It demands that effectiveness of process has to be demonstrated, in relation to intended outcomes (IQAME Implementing Rules and Regulations). This implies that in the self-evaluation prior to the IQAME assessment, the institution needs to reflect in a constructive self-critical manner on its performance against the criteria in the CHED monitoring and evaluation framework. For instance, in the area of *Quality of Teaching and*

Research, one indicator sought for is the cohort survival ratio which can be readily obtained through the following formula:

$$SR_{g,i}^k = \frac{\sum_{t=1}^m P_{g,i}^t}{E_g^k} * 100$$

Where:

$$P_{g,i}^t = E_{g,i+1}^{t+1} - R_{g,i+1}^{t+1}$$

i = year level (1, 2, 3,...,n) t = year (1, 2, 3, ...,m) g = student-cohort.

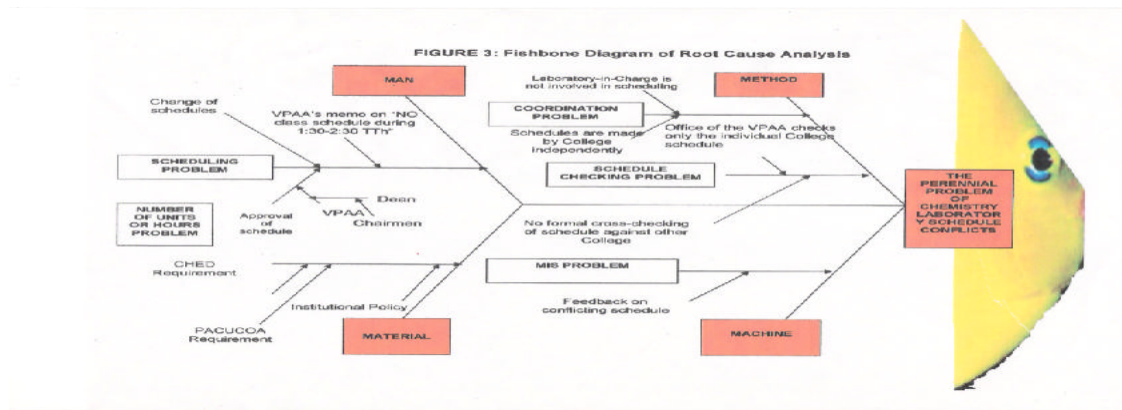
$SR_{g,i}^k$ = Survival Rate of student-cohort **g** at year level **i** for a reference year **k**.

E_g^k = Total number of students belonging to a cohort **g** at a reference year **k**.

$P_{g,i}^t$ = Promotees from E_g^k who would join successive year level **i** throughout successive years **t**.

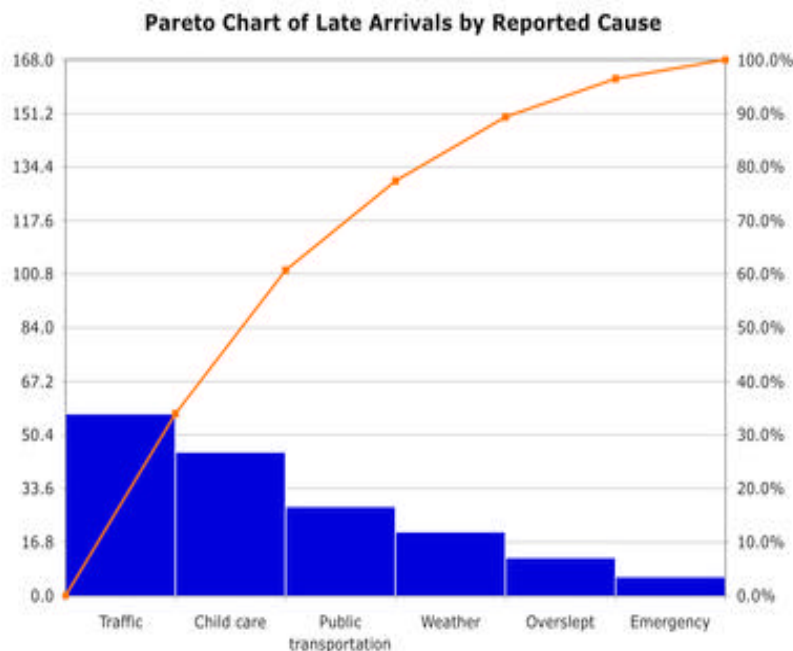
R_i^t = Number of students repeating year level **i** in school-year

However, it will not be adequate to deal with quantitative data alone, because the reflective aspect needs more analysis why only a particular number could finish it through fourth year level. This is now where the Ishikawa (also known as **fishbone diagram** or **cause and effect diagram**) can come in to explore possible causes that will provide additional insight into process behavior. It displays all contributing factors and their relationships to the outcome to identify areas where data should be collected and analyzed. The major areas of potential causes are shown as the main bones, e.g., "Materials", "Machines", "Manpower", and "Methods. Later, the sub-areas are depicted. Thorough analysis of each cause can eliminate causes one by one, and the most probable root cause can be selected for corrective action (Tague,2004). The following figure shows the process applied by the Mighty Eagle Creativity Circle of the CU College of Engineering in determining the cause and effect that gave rise to the conflicts of laboratory room use in the Chemistry subjects offered across the curriculum. After the application of the Ishikawa Diagram, the root cause was determined and the corresponding undesirable effects were overcome which was instrumental in improving the quality of the teaching and learning process. This therefore helped to meet the IQUAME's requirement of drawing upon robust internal review procedures of the institution.



In some situations, the **Pareto Chart** which is a special type of bar chart where the values being plotted are arranged in descending order is used to graphically summarize and display the relative importance of the differences between groups of data. The next figure is a sample of Pareto Chart (http://en.wikipedia.org/wiki/Pareto_chart).

Sample Pareto Chart Depiction



Typically on the left vertical axis is frequency of occurrence, but it can alternatively represent cost or other important unit of measure. The right vertical axis is the cumulative percentage of the total number of occurrences, total cost, or total of the particular unit of measure. The purpose is to highlight the most important among a (typically large) set of

factors. In quality control, the Pareto chart often represents the most common sources of defects, the highest occurring type of defect, or the most frequent reasons for customer complaints, etc. Their use gives rise to the 80-20 Rule --- that 80 percent of the problems stem from 20 percent of the causes.

The Flow Chart which is a schematic representation of an algorithm or a process which is commonly used in business/economic presentations to help the organization visualize the content better, or to find flaws in the process has also been used. This technique allows the analyst to locate the responsibility for performing an action or making a decision correctly, allowing the relationship between different organizational units with responsibility over a single process. Such quality tool has helped improved the CU enrolment procedure and the curriculum design.

VI. Conclusion

The pursuit of quality in higher education which meets the changing needs and comparable to international standards needs a retooling of process and instruments through an institutionalization of a quality management system that has to conform to the requirements of International organization standards. However, there must be no stop to the quality effort .With or without IQUAME, the QMS should stand true to its objectives and to keep track of the effectiveness of the system. In doing so, the institution can readily declare without fear of contradiction that its quality effort to produce quality service is not a mere lip service, rather it has realized its vision-mission –objectives-goals along its core values with quality performance.

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