

QUALITY IMPROVEMENT WITHIN THE IRS: A CASE STUDY

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I. INTRODUCTION

Statistics are being used more frequently in service organizations to give feedback to the employee. Our statistics must differentiate between the acceptable fluctuation of a process that is in control and the unacceptable fluctuation of a process that is out of control. The statistics we use do not have to be sophisticated. The interpretation, however, may not always be as simple, especially for complex multi-staged operations. The statistician may have to use their expertise to explain in non-threatening terms what the data show (Snee 1990).

It is easy to fall into the trap of thinking that statistical tools will automatically lead to improved quality. Our experience has been to the contrary, namely that the critical step is deciding what information to measure and deciding how to use the information to discover ways to improve the process. This requires regular close contact and communication between the quality assurance planners and production staff. It is of no use to produce elegant output that goes unused (Joiner 1985).

The role of the statistician involved with quality improvement should be to assist in the development of a plan for continuous improvement. The statistician should agitate the thought process and ask questions. Our role is to keep improvement a dynamic process. We need to ask the right questions to provide management with a measure of the process. You cannot manage what you cannot or have not measured (Shewhart 1986).

Before improving an administrative process we need to know the basic steps. In October 1991, the Coordination and Publications (C&P) Staff of the Statistics of Income (SOI) Division of the Internal Revenue Service (IRS) distributed a plan outlining the first steps to becoming a Total Quality Organization (TQO), Organizing for Change. The Statistical Support Team (SST) at that time was a team within the C&P staff with new people, new projects, new customers, and

some old problems. The C&P plan encouraged all of us to look more closely at what it is we do and how we do it and try to improve.

Briefly, the mission of the C&P staff is to provide support that assists the program branches in accomplishing their missions. This support consists of a wide range of activities including sample design, statistical support for other IRS divisions, design and implementation of quality measurement systems for SOI programs. Essentially the Statistical Support Team's purpose is to provide statistical consultation outside the Division.

This paper outlines the various steps that the SST has used to better understand: its own processes, our interactions with internal customers, and a systematic approach for improving the quality of our products. Two current projects are described and how this systematic approach has been instrumental in satisfying our internal customers.

II. APPLICATIONS

Two projects within the IRS that are using many of the ideas discussed in this paper are the Quality Management Information System (QMIS) with Taxpayer Service Division and the Telephone Routing Interactive System (TRIS) with Information Systems Development.

Quality Management Information System

The Quality Management Information System (QMIS) is a quality review process by which the IRS measures the quality of work products and services. These measurements give managers accuracy information to make decisions and feedback to the employees so that taxpayers receive the type of assistance they require. The QMIS review process is used in all of the IRS district offices (DOs) around the country. The review process provides accuracy estimates for several source of information categories: correspondence, walk-ins, adjustments, and referrals. Two of the categories are further divided into written and computer online.

Briefly stated, the sampling tables for these categories we redeveloped many years ago. The sampling instructions were vague and not clear to the production personnel in the DO. The sample design allowed for some inefficient sampling practices, especially in the smaller DOs.

A QMIS Future Directions Task Force was created in 1990 to review the QMIS plan. One of their goals focused on the sampling plan. They approached our Division for statistical support. At that point we had an established IRS project, a well defined and experienced task force with field representatives, but a new SOI project with new IRS staff assigned to the project.

The design objectives of the task force were:

- Simple sampling plan
- Reduction in oversampling by the smaller DOs, i.e., variable sampling rate by DO, by time of year by source of information category
- Reliable accuracy estimates for agreed upon time periods
- Reliable accuracy estimates for each source of information

Telephone Routing Interactive System

The second application, The Telephone Routing Interactive System is a project whose mission is, in part, to build systems to provide interfaces to support the Taxpayer Service telephone, walk-in, and correspondence operations of the future. The TRIS will permit Taxpayer Service to optimize its ability to provide accurate and responsive one-stop service to taxpayers and to reduce the labor-intensiveness of its current work systems. The TRIS project is in the prototype stage. The goal of the prototype is to determine the feasibility of the taxpayer service concept of operations for the toll-free telephone program. It will focus on the automated routing function and interactive systems for direct access by taxpayers. The prototype will also statistically validate the projected benefits outlined for the IRS.

Information Systems Development (ISD) approached our Division for statistical support. At that point we had a new IRS project, still in the design stage, with multiple subject matter experts who would be affected by the toll-free telephone program. Several of the key personnel were relatively new to the service,

outside vendors with experience in automated routing systems were being hired, and again the project was new to SOI. However, SOI was involved at the ground level with this project.

III. STATISTICAL SUPPORT TEAM QUALITY MANAGEMENT PROCESS

We started with the C&P Total Quality Management Plan. The plan did not formally define Total Quality Management (TQM) in C&P, but adopted an "operational definition" that TQM is a process characterized by the following elements:

- Focus on the customer
- Work cooperatively with suppliers
- Set tangible objectives
- Measure our own work process
- Involve employees and managers
- Make continuous systematic improvements

The TQO plan appropriately stated that because of C&P's diversity it could not focus on improving a few processes that applied in general terms to all our projects and processes. Illustrating that diversity, the SST is somewhat unique within SOI because our customers are primarily outside the division and in some cases outside the National Office.

W. Edwards Deming's definition of quality is customer based, both the internal and external customers. Quality improvement requires advance planning and the desire to do it right the first time and the unwillingness to wait to repair it later (Deming 1986). In an attempt to tailor the processes listed in the C&P TQM plan to be more applicable to our team and our interactions with various customers we developed the following list of work process within a project:

- Request from customers
- Scheduling
- Contract Preparation
- Methodology
- Documentation of plan
- In-house review
- Data Collection and Tabulation
- Analysis of Results
- Evaluation/Revision
- Product Delivery
- Product Review

Many of these steps are repeated in any project with multiple reviews, revisions, and feedback. Figure 1, SST Processes, illustrates these steps in a circular flowchart with the customer as the hub of the wheel.

In our team's case, for many of the projects, we are either new to the division and/or the project is new to the division and we are reacting to requests from customers.

A customer is the most important visitor on our premise. He is not dependent on us; we are dependent on him. He is not an interruption on our work; he is the purpose of it. He is not an outsider on our business; he is part of it. We are not doing him a favor by serving him; he is doing us a favor by giving us an opportunity to do so.

---- Mahatma Gandhi

This appreciation for the customer is particularly applicable to our team. As previously stated our primary role is to provide statistical and quality support to other

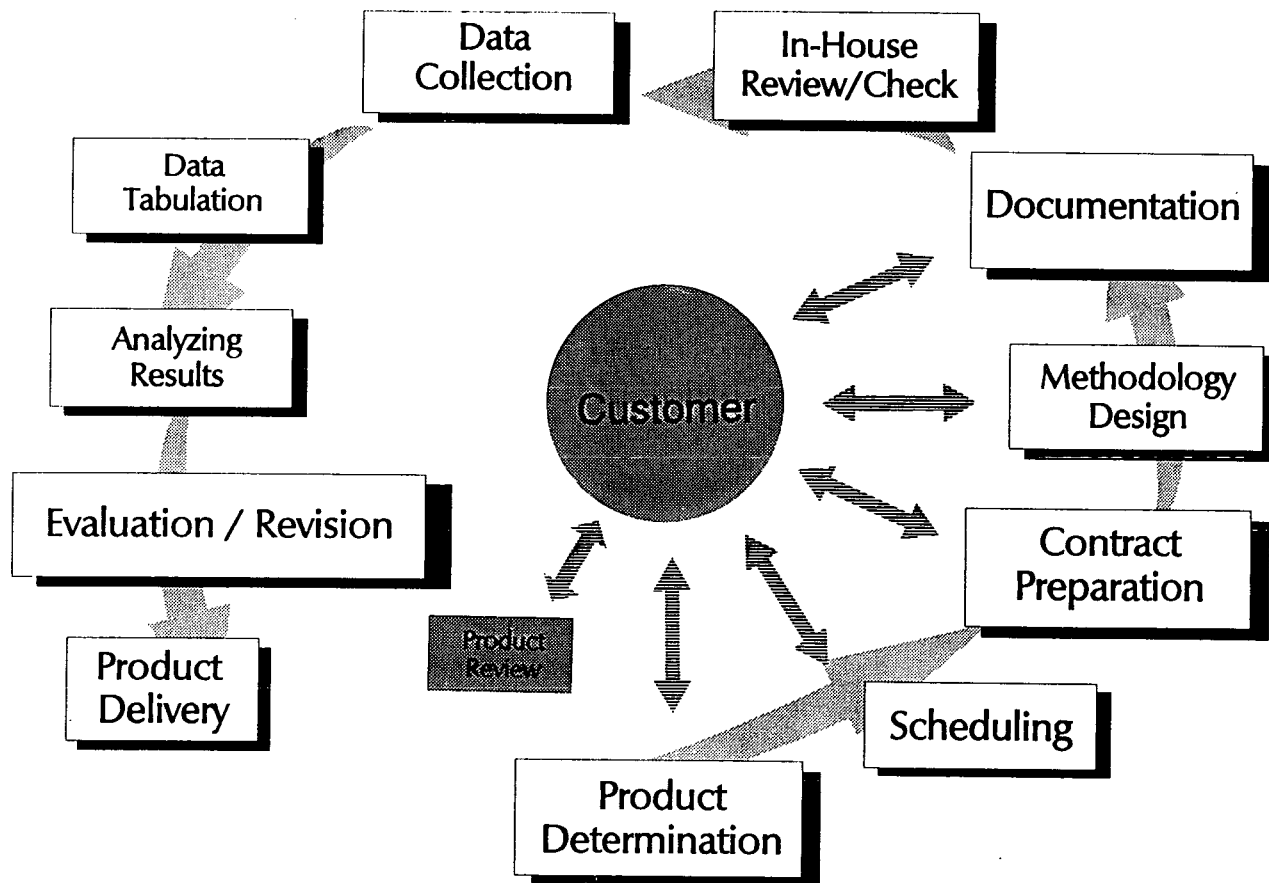
areas of IRS, namely: Taxpayer Services, Returns Processing and Accounting, Information Systems Development, the Service Centers and District Offices across the United States.

Because of the educational and experience diversity within our team and our customers we each have found ourselves in slightly different stages of attempting to educate ourselves about what our customers want and educating our customers about the statistical support team. Dr. Juran uses the definition of quality as fitness for use. We have to ask; use for what? What the customers want? What I need? (Juran 1964 and Aubrey and Felkins 1988)

Improving our efforts in a systematic manner requires us to:

- Define and describe our steps;
- Identify problem points that we can change;
- Develop tools to aid that change;
- Implement the tools; and
- Evaluate the tool and/or changed problem.

Figure 1
SST Processes



Many of the perceived difficulties/rework in administrative/statistical projects have their apparent source during the initial contact with the customers. The 19th century English author and critic, John Ruskin wrote, "Quality is never an accident, it is always the result of intelligent effort." We determined that our intelligent effort would start by focusing on tools to aid our interactions with our customers. Our next step was to look at: requests from our customers, information gathering, and developing specifications. Within these topics, several specific ideas were formulated that were considered important to the TQO effort:

- Educating the customer about key points
- Educating ourselves about customer needs
- Defining the problem clearly (echoing)
- Stating objectives in writing
- Customer changes well documented
- Avoid incomplete beginning from the customer
- Recognize four types of change:
 - Type a - lack of understanding
 - Type b - trivial
 - Type c - revision based on feedback
 - Type d - ground rules change due to external force
- Negotiation of a schedule
- Capabilities and system limitation
- Communication and interaction

Several specifics will illustrate and clarify these ten ideas.

Educating our customers on key points involves several different concepts. This means educating them about our product and the proper use of the product. In most cases they are not statisticians and are unaware of what statistics can show or tell them about their service or process. The customer must be educated on the process necessary to fulfill their request, so they can have a better understanding of what requests can be satisfied and the appropriate amount of time necessary to fulfill a request (Godfrey 1991).

The customer must also be educated on how to use the product, so as to avoid misuse. Proper use of the product by the customer can be achieved by educating the customer on the interpretation of the results. This is especially noteworthy when discussing measures of quality using a statistical sample.

Finally, education of the customer on key points can be accomplished by documentation of the process and subsequent products, so the customer can always refer back to this hard copy for future reference.

To better serve the customer, we must educate ourselves about that customer. In most cases we are not subject matter experts about the process details that affect their product. Figure 2, Project Assessment Sheet, presents our summary of key points to be addressed to better meet our customers' needs. First, we must understand clearly and completely the objectives, purposes, and goals of the customer. All future objectives must be uncovered, whether stated or hidden. We must find out why the customer wants the requested item to supply a product tailored to that desire. By educating ourselves about the customer's needs, we can insure that we are providing the best possible product for their particular need. This is critical, given that many of the customers/processes are new to the division or our team.

Defining the problem clearly involves having a good understanding, from the beginning, of exactly what the customer wants and what this product's use will be in the future. Echoing is a technique whereby a customer's request is repeated back to the customer, usually in some form of written documentation, to be sure there are no misunderstandings in the request. This is an excellent tool when some of the participants and/or projects are new. Echoing can also give a customer the opportunity to modify their task without loss of efficiency. Furthermore, when the objectives, and any subsequent changes, are stated in writing, communication breakdowns can be avoided.

In examining change as part of the process we found that change can be classified into four levels:

- Type a - lack of understanding
- Type b - trivial
- Type c - revision based on feedback
- Type d - ground rules change due to external force

Type a and b changes can be minimized by echoing, documentation and education of the participants. The revisions based on feedback, type c, are in some cases an outgrowth of an effective communication process. This is especially true when the changes

Figure 2

Statistical Support Team

Project Assessment Sheet

for

Who is the customer	List all levels of customers & stakeholders and whether they are active or passive customers. Who is the ultimate customer? Who is the decision maker?
What do we currently know about the customer(s) and stakeholders?	
What should we know about the customer(s)?	
What does the customer want?	What does the customer want out of the process?
Why does the customer want it?	List purpose, objective, goals (any unstated goals?) Such knowledge will influence product, content, method and style of presentation, etc.
When does the customer want it?	

What does the customer know about us?	
Our product?	Does (will) the customer understand: its proper use? its interpretation? How to minimize its misuse?
Our processes?	
Our resources (and the timeliness of any data which may be involved?)	
Our limitations (number of personnel, other current commitments etc.)?	

occur before implementation or in a prototype stage. Revisions based on feedback are not unexpected when the product or process is new and/or complex.

Changes caused by external forces are often unavoidable. In some cases the impact can be minimized by having clear documentation up to that point so efficient revisions can be made or assumptions changed. It is even possible that the external change can be subsequently reduced after the documentation has been presented to the external force.

The importance of a negotiated time schedule, or timetable, is vital to customer satisfaction. Only through the negotiation of a schedule will a customer realize the capabilities and system limitations, and know when to expect their product.

It is generally imperative to know the real customer, and/or stakeholder, and their needs. Only then can the product best be developed to satisfy the needs of the end or ultimate users. Finally, the process and products must be documented for accountability and future improvement efforts.

IV. COMMUNICATION

Communication channels, mechanisms, and skills as negotiators are critical elements in the delivery of any product that is "fit for use." We have been following this path with a sense that we can make some improvements, knowing full well that it is virtually impossible to fully bring under control. We are pursuing videos, books, and internal training to identify mechanisms for improving our negotiating skills (Forsha 1992). Concurrently, we are looking at the mechanisms for communication channels. We have developed three levels where communication problems can occur:

- Within our team
- Directly from the customer
- Interaction between our team and our customer

Some of the areas we have identified as potential problems within our team are inadequate workload management, poor documentation, incomplete or missing meeting notes and telephone logs. We have found the lack of standard distribution lists can cause communication problems. We need to keep focused on what the customer is saying and asking.

There is nothing so useless as doing with great efficiency that which should not be done at all.

---- Peter Drucker

From the customer we have experienced conflicting statements, unknown and hidden agendas. In some cases the customer does not know exactly what they want or what information is correct.

In our interaction with the customer we have found potential communication problems when we are not talking to the correct customer, or to the representative with the correct and proper information. In some cases we get our information second hand and are unaware of who the real customer is. In other cases communication problems are the result of having to get decisions from individuals several levels away from the immediate customer or initiator.

Discussing and listing these potential communication problems has helped our team to be aware of these possible shortcomings. Figure 2, Project Assessment Sheet, prompts us with several questions to help

reduce the likelihood of some of the more critical communication problems from developing.

Improving internal communications, among the members of the team, is one aspect of improving communications overall. One activity we undertook as part of developing better understandings of ourselves to improve our communication and teamwork, was to take the Myers-Briggs Type Indicator as a group and to do some exercises in understanding the different strengths and unique needs of the various types.

V. DELIVERY OF THE PRODUCT

From the work process list in Section III, we then focused on Product Delivery. At a team brainstorming session we developed the following components. The delivery of the product can be divided into four stages: working with the customer, documentation, review or verification, and final delivery or presentation of the product to the customer.

Working with the customer must be a frequent and on-going process from the first contact to the end. The process should guarantee the highest level of communication and cooperation possible. For this to be accomplished the following guidelines are useful:

- Discuss with the customer the need for unlimited opportunities for communication. List all possible contact points and their descriptions. Encourage discussion which will assure that the documentation will be understood and easily used by the customer and those who may use the product.
- Assure that instructions for use and avoidance of misuse of the product will be complete, detailed, and clear. Provide the customer with drafts of products at various stages of completion for commentary and discussion.
- Be aware of ways in which the data may suggest the product should be changed or adjusted and provide appropriate recommendations to the customer.

To assist the preparation of appropriate documentation make a list/outline of all possible source materials to be used. Prepare a statement on how the documen-

tation will be prepared. Previous related work should be used and an awareness of ways to assure continual improvement should be sought.

Within the documentation include a statement of what the product is, or a restatement or reiteration of the original request. Also include: instructions for use, avoidance of misuse, distribution of statistical methodology where appropriate, limitations, and assumptions.

A review or verification should not be delayed until the last step but rather be done at frequent and convenient intervals throughout the project's life to minimize the chance of last minute changes and surprises.

Prepare a review package to include among the documents a list or other aid of materials needed for an efficient and effective review. Instructions on locating and collecting the necessary information and documentation should be included in these review instructions. Evaluate not only the data sources but the processes and assess the product's quality with these factors in mind. Discuss what are the best ways for the delivery or presentation of the product to the customer.

VI. CONCLUSION

Where are we? In our continuing effort of process review the team has finished identifying communication mechanisms and development opportunities. Our next step is to begin drawing up a team development plan for improving our negotiating skills and some tools for improving our communication mechanisms. After this is complete, we will revisit the delivery of the product to the customer.

In the two previously described applications, we attended several of the QMIS Future Directions Task Force meetings. We also held many discussions and meetings with our customer, the Taxpayer Service Division, to get an understanding of the current system and implications of the redesign. We used the meetings to describe various sampling methodologies and services we could provide. We documented each meeting, echoing back decisions and pending actions with assigned responsibilities to minimize misunderstandings. Additionally, we discussed timetables, implementation and prototype scenarios.

We presented the plan to the task force for approval. We carefully explained what data we would

need to design a system that would provide them with the accuracy information they desired. We sought out contacts, referenced by the task force who had the necessary information or data for us to design the desired plan.

Currently, the sampling manual has been revised and reviewed. Final data for estimating sampling intervals has been obtained. Training is being held with the Quality Assurance Coordinators from around the country to introduce them to the new sampling methodology. Implementation is set for later this year. We are working with the computer staff to perform the weighting of the data for national and regional accuracy estimates after each DO transmits their quality review cases to the computing center.

Our role as a partner in the development of the Telephone Routing Interactive System with Information System Development has been to demonstrate statistically the potential to resolve a portion of the total toll-free call site volume without direct assistance from a Taxpayer Service staff member. We have focused our analysis on Tax Law, Refunds, Accounts, Forms Ordering, and Procedures. We have also been asked to project the impact on productivity with the automated routing. We have been involved with each step of the design from the ground level. Documentation and regular communication channels have been instrumental in the smooth relationship thus far.

Currently, testing on a small number of participants with the draft scripts is being conducted. As the number of participants increases, we will provide statistical support with the evaluation of the data. A complete implementation schedule is still being developed.

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