Chair’s Message
by Rick Lewis

ASQC's Annual Quality Congress is being held May 22-24 in Cincinnati, Ohio and I would like to take this opportunity to invite you to attend STAT Division's Annual Meeting on Monday, May 22 from 5:30 pm until 7:30 pm; hors d'oeuvres and soft drinks will be provided. The meeting will begin with a review of the division's finances, membership and current activities, but over half of the meeting will be devoted to comments, suggestions and questions from the participants. Following the meeting we'll head out for supper, then enjoy STAT Division's hospitality suite from 9:00 pm until 11:30 pm. Please stop by our booth in the Exhibit Hall to learn the locations of the Annual Meeting and hospitality suite.

In addition to our Annual Meeting, STAT Division is sponsoring several other activities at the AQC. A complete list of STAT Division activities appears on page 10, but two notable activities are a pre-conference tutorial on Sunday, May 21 and a technical session on Tuesday, May 23. Many thanks to our AQC Conference Committee for putting together an outstanding program: Jose Madrigal (Division Session Manager), Bob Brill (Technical Paper Reviewer) and Dennis Brady (Short Course Chair).

The pre-conference tutorial features Soren Bisgaard of the University of Wisconsin's Center for Quality and Productivity Improvement; it is titled Designing Industrial Experiments. Quoting from ASQC's AQC Program:

"This tutorial takes a new approach to teaching experimental design and analysis. You will learn by doing, with the emphasis on representing information with graphics rather than numbers. Designed for engineers and scientists involved in all aspects of research and development, design, manufacturing, and quality, this tutorial will teach you how to design, conduct and analyze your own experiments. Gain a sound understanding of powerful statistical tools that can accelerate quality and productivity improvement."

The technical session will be moderated by Steve Bailey, and features Lynne Hare, Roger Hoerl and Ron Snee; it is titled Statistical Thinking for Business Improvement. Steve, Lynne and Roger are all Past Chairs of STAT Division, and Lynne and Ron are both Fellows of ASQC. Quoting once again from ASQC's AQC Program:

"Hear how experimental learning techniques are used to address root causes of inadequate content and delivery that keep training in experimental methods from reaching its potential."

Another notable event for STAT Division is the recent availability of How to Perform Continuous Sampling, Second Edition (also known as Volume 2 of our How-To series) by Kenneth S. Stephens. Many thanks to Ken, Ed Mykytka (How-To Series Editor) and all others involved in this effort. To order a copy call ASQC at 800-248-1946.

Finally, I would like to plug ASQC's Quality Information Center. This new service provides access to more than 3,000 ASQC-published documents, including the last five years of Annual Quality Congress proceedings; Quality Progress and Quality Management Journal articles; Quality Engineering, Journal of Quality Technology, and Technometrics abstracts; and Quality Press catalog items and tables of contents. For more information, call ASQC at 800-248-1946 and ask for extension 8693.

Inside This Issue

| Chair’s Message                      | p. 1 |
| Annual Evaluation of the Division    | pp. 4-5 |
| Mini Paper                          |     |
| Communication: The Key to an Engineer's Success | pp. 6-8 |
| Youden Address Figures              | p. 8 |
| Basic Tools                         |     |
| Three Variable Scatter Plot: An Example | pp. 9-10 |
| Annual Quality Congress Activities   | p. 10 |
| Ted Jackson's Acceptance of Hunter Award | p. 10 |
| Five Year Strategic Plan            | p. 11 |
| ASQC Quality Information Center     | p. 12 |
| Student Grants Available for '95 FTC | p. 12 |
| International Conference in Seoul, Korea | p. 12 |
| Division Job Openings               | p. 13 |
Editor’s Corner


In the last edition of the newsletter, three figures did not get printed in the Youden Address by Roger Hoerl. This error was caused by software problems and we apologize for any inconvenience. These three figures are printed elsewhere in this issue.

Software compatibility issues continue to be a problem. Many of you are IBM PC users whereas I am a Macintosh user. Most of the time, I am able to translate the submitted diskettes from the various platforms to my word processor, which is Microsoft Word. The most challenging problems usually involve translation of graphics. These translation difficulties have caused a number of frustrations, including inability to translate some files and missing print deadlines. The most recent problem, associated with this issue, occurred in the translation of graphics from Word Perfect 6.0 on the IBM to the Macintosh.

I now have both Microsoft Word and Word Perfect on my Macintosh. Both software packages are Macintosh versions. If you send me text information from either word processor, I should be able to translate it in most cases. If you send me diskette files from either of these two word processors, whether IBM or Macintosh, save the files in normal format. The normal format files will translate properly in most cases whereas the text format files do not always translate properly going across platforms. This is because of the special formatting such as tabs, etc., which are part of the software.

There are still some bugs to work out in the translation system. As I learn more about the idiosyncrasies, I will provide information so that we can minimize the translation issues. This will enable me to serve you more effectively, reduce potential errors, and minimize the possibility of late deadlines.

Larry

Letters to the Editor

(spring, 1995)

Dear Larry:

Only rarely article irritate me enough write a letter. Actually, very impressed with very impressed with Roger Hoerl’s Youden Address in the Winter 1995 Statistics Division Newsletter. Just that the editing is rather poor, Figure 2 missing, grammatical errors, missing words, and incorrect words. And it would be more considerate, of the reader to place the tables, at the points in the text at which they are referenced. You have a excellent publication, but this many errors can be quite distracting!

Richard M. Weed
Supervising Statistical Engineer
New Jersey Department of Transportation

Editor’s note: To emphasize his point, Mr. Weed typed his letter on letterhead stationery upside down.

Dear Larry,

I read with great interest the Youden Address, Enhancing the Bottom-Line Impact of Statistical Methods, by Roger Hoerl in the Winter 1995 ASQC Statistics Division Newsletter.

As an accounting researcher and former marketing manager, I must take exception with Mr. Hoerl's assertion that groups of consulting statisticians may become “easy targets for accountants in search of a ‘quick fix’ to high overhead.”

Accounting provides a measure of the economic activity of the firm and the role of accountants is to provide information which is used by management to make decisions. If statisticians fall prey to the budget ax, it is because they have failed to convince management that they provide value-added.

Larry

continued on page 3

VISION

- Our customers’ needs will be continuously anticipated and met.
- Our members will be proud to be a part of the Division.
- Our Division’s operations will be a model for other organizations.
- We will be a widely influential authority on scientific approaches to quality and productivity improvement.

MISSION

- Promote statistical thinking for quality and productivity improvement.
- Serve ASQC, business, industry, academia and government as a resource for effective use of statistical methods for quality and productivity improvement.
- Provide a focal point within ASQC for problem-driven development and effective use of new statistical methods.
- Support the growth and development of Division members.

STRATEGY

- Our primary customers are Statistics Division members. Other key customers are:
  - Management,
  - Users and potential users of statistical methods for quality and productivity improvement,
  - Educators of the above customers.
- Our orientation to customers is customer focused.
- Our markets, within which we intend to offer products, are weighted as follows: greatest weight on intermediate statistical methods, nearly as much weight on basic methods, and much less weight on advanced methods.
- Our primary products are educational services.

PRINCIPLES

- Focus on a few key things.
- Balance short-term and long-term efforts.
- Recognize that we exist for our customers.
- Value diversity (including geographical and occupational) of our membership.
- Be proactive.
- View statistics from the broad view of quality management.
- Apply statistical thinking ourselves (that is, practice what we preach).
- Uphold professional ethics.
- Continuously improve.
Dear Larry,

I need to comment on our recent newsletter article, “How Do World Class Organizations Use Statistics?” The author, a university professor, referenced over 200 in-depth conversations with different companies over four years as a basis for his opinions. In addition comments from employees at four companies were solicited on the final article. There’s definitely a virtue in having a non-practitioner carefully survey an activity. Another useful perspective might be the direct version from individuals like myself. For over 20 years I have enjoyed roles as a working statistician from plant through corporate staff levels in two major companies. I’ve also had a variety of management (user) spots from direct line through corporate policy making levels. I’m now quality and reliability director for a medical electronics firm. In my opinion, there are three crucial questions facing both statisticians and other quality professionals today which relate to this article’s subject. The article itself offered a lot of a familiar advice, but I wonder from my own experience if it is widely practiced today. These comments come so often from folks in the academic or consultant worlds, and seem different from the industrial world I live in.

The three questions I hear from those who run companies today are:

1. How useful are statisticians as part of the actual operation of my company?

   This article advances the familiar theme of involving statistical experts heavily with decision making management, key work teams, and other key industrial mover/shaker groups. In many companies I see an emphasis instead to buy statistical methods in fragments through software or temporary consultants. Powerful new graphical methods and cheap computer resources are also being used directly more than traditional numerical evaluators or designers. The trend seems to be enabling the decision making person or group to do their own analysis, rather than take time to involve statistical experts on anything but an in/out basis. Of course management knows they must purchase intelligently, but if they can it seems correct to do so with today’s resource levels.

2. Has the traditional dedicated quality professional, often with statistical or measurement expertise, become a luxury we can do without in general?

   Outside of regulated industries and the project consultant firms just mentioned, evidence seems to support management’s belief this question can be answered yes. The reduction in new quality positions is clear. A scan through employment sections of major papers now compared to five years ago makes this point in spades. Ask any quality professional who has been ‘downsized’ recently how many opportunities they find in industry to reinforce this further. Everywhere quality organizations seem to be early victims in cutback programs, their duties combined with other departments. The end result usually is a tiny figurehead department used mainly for inter-company contacts. Let me introduce “our quality manager” without staff or independent operating duties. I meet fewer and fewer quality pros. It seems the major quality packaged programs of the past ten years like SPC (too often pushed by people with marginal statistical competence) and TQM (too often pushed by people with weak industrial organization skills) have compromised the value of quality professionalism in many top manager’s eyes. Perhaps the old tendency to use the quality group as a place to keep experienced managers a bit past their prime has contributed too.

3. Does ISO 9000 certification really check for statistical practices or total quality system adequacy, or is it just a review of your paperwork quality?

   I participated in several site certifications as a corporate representative when ISO was young, and more recently have both helped manage and (now) lead reasonably large company ISO programs. I’ve dealt with many people from audit firms and attended classes with others. From all these contacts I could count the number of auditors with any serious statistical competence on one hand. By this I mean they probably couldn’t master the final in a good first stat class. There’s no way these people could audit anyone’s statistical use, world class or otherwise. The same is true of Baldridge examiners, though my direct experience here is limited to just a few cases. These standards all purport to audit quality operations, but is statistical usage really a part of it if these are qualified auditors? So much of the real standards check against seem to involve records only, rather than technical competence or practices in professional quality expertise areas like statistics. If a top manager believes in the value of statistics as I do, this makes these audits of less true value to the business. If a manager places no advance value on statistical usage, the minor once over statistics get in these audits says they aren’t that important. Why else would likely unnecessary standards traceability to NIST cause major audit nonconformances but horribly inadequate sampling or process control practices be only a minor concern?

   Please do not take the questions I’ve listed to mean I believe in them myself. In many ways I feel we in US industry hurt ourselves badly by considering these questions, I do, however see them seriously considered more and more often, especially by the management of world class companies. My fear is that the greater battle for Dr. Deming’s profound knowledge is being lost (much to the detriment of all of us), and that this loss is going unopposed because we fear an open discussion of merits. Even if the newsletter article is 100% right, we must answer these questions convincingly before any of its suggestions will count for more than another publication.

   Bill Schultz
   Director of Quality and Reliability
   Beltone Electronics Corp.
Annual Evaluation of the Division

1. Introduction and Summary
   The annual evaluation is intended to "facilitate continuous improvement of the Statistics Division by measuring customer satisfaction and progress of the Division relative to McDermond guidelines and Statistics Division Vision, Mission, Strategy, Principles, Systems and Annual Tactical Plans" (Statistics Division Operating Manual).
   Previous evaluations have been done in May by the Chair Elect. The annual evaluation of the Division will now be conducted mid-year (December or January) by the Chair Elect with help from the Past Chair and Chair. Conducting the evaluation in this time frame allows the Chair Elect to become more familiar with the Division activities.
   The Division continues to make steady progress towards its vision and fulfilling its mission. A five-year plan was completed in September. Parts of this plan are discussed more fully in the tactical planning section. The recommended upgrades from previous annual evaluations have been discussed during conference calls but no formal plan exists for implementing appropriate recommendations.

2. Vision, Mission, Strategy and Principles
   Our vision is the desired end state the division is striving to achieve, and our mission is our reason for existence. The strategy defines our customers and markets. Our principles are rules to follow in the pursuit of our vision and mission. No changes have been made to these since the last evaluation. Based on last year's recommendation the vision, the mission, strategy and principles are reviewed at the beginning of every meeting. They are typically posted on flipcharts at meetings or distributed as handouts.

   Evaluation: The five-year plan is directed towards achieving our vision and fulfilling our mission.

   Upgrade: While the Division activities have been added to the annual evaluation, they have not been cross-tabulated with the vision and mission as suggested in the previous evaluation. The list of Division activities with key contacts should be published in the newsletter on a regular basis.

3. Customer Satisfaction
   The division membership continues to drop. A telephone survey is planned for later this year and should provide detailed information on customer satisfaction. It will be important for division leadership to fully review this information and continue to monitor division membership.

   Evaluation: The membership survey will be important in assessing members' needs. The booth activity at AQC has been used to provide information on how the division could be more responsive.

   Upgrade: Results from the survey and previous membership surveys should be included in the Operating Manual. Additional ways to measure customer satisfaction need to be identified. Information obtained from the booth activities needs to be reviewed.

4. Systems
4.1 Infrastructure Renewal
   Purpose: Continuously renew and improve the organizational structure of the Division.
   Procedure: Past Chair is responsible.
   Evaluation: Working well. New by-laws were approved in November. The organization chart has been modified to reflect these changes. Job descriptions are being developed for new positions and will be included in the next revision of the Operating Manual. The member interest record form has been generating many responses.

   Upgrade: Improve the process for listing open positions on the member interest record form. Develop a process for committee chair/project leaders to respond to interested members.

4.2 Communications
   Purpose: Facilitate communication among division leadership outside of scheduled meetings
   Procedure: Conference calls among division leadership are held on a monthly basis.
   Evaluation: Working well

   Upgrade: Include one tactical plan leader/committee chair on each conference call to provide updates to division leadership. Change the system name from Communications to Conference Calls. All other items previously in the communications systems should be captured in the appropriate job description.

4.3 McDermond Division Management Recognition Program
   Purpose: Encourage divisions to focus their efforts on meeting the needs of their members, customers and ASQC.
   Procedure: Documented in ASQC's policies and procedures. Chair is responsible for submitting the application.
   Evaluation: Statistics Division achieved the highest level - Level 3 for 1993-1994. We are applying for Level 3 in 1994-1995. The establishment of the publications committee should help facilitate the process.

   Upgrade: Procedure needs to be included in the Operating Manual.

4.4 Operating Manual
   Purpose: Provide the information needed to run the division.
   Procedure: Updated by Chair-Elect in June/July.
   Evaluation: The procedure for updating the manual has been revised. Section 2.0 - Organizations will be updated in June. The remainder of the manual will be updated so that copies are available at AQC. A prior recommendation was to

Continued on page 5
create a “Division History”. This will be the appendices of the next revision of the Operating Manual.

Upgrade: A list of revisions to the Operating Manual should be kept as part of the Action Item Notices.

4.5 Tactical Planning

Purpose: To develop and implement tactical plans supporting the division strategy.

Procedure: Planning meetings are held at the AQG and FTC. Follow-up meeting may be held as necessary.

Evaluation: With the development of the 5-year plan, tactical planning meetings are more focused. The tactical planning meeting at AQG has been moved up a day to allow for working sessions before the official start of the conference. Follow-up meetings are essential to completing tactical plans according to timelines.

Upgrade: Include tactical planning leaders on conference calls to provide updates to the division leadership.

The tactical plan on “Upgrading Certification Exams” has been completed. The Statistics Division participated in writing questions for the new body of knowledge for the Certified Quality Engineer exam. The tactical plan for creating an electronic bulletin board is nearing completion. The division plans to tie in with ASQC’s establishment of an electronic bulletin board. The tactical plan on “Assessing Members’ Needs” is nearing completion. A telephone survey of division membership is planned prior to last year’s long-range planning and tactical planning meeting.

The new tactical plans that were developed as part of last year’s long-range planning and tactical planning meetings are progressing according to their timelines. The definition of statistical thinking the division has been using was modified as part of the tactical plan on enabling the broad application of statistical thinking. This definition will appear in the next edition of the Glossary and Tables for Statistical Quality Control. The division sponsored session at the AQG will be on statistical thinking. The group working on the tactical plan on identifying target areas for education is gathering data to develop straw proposals for specific projects which will be presented at the May tactical planning meeting.

The tactical plans on the “How-To” series improvements have been developed but the progress on these plans is limited. At the October tactical planning meeting, it was determined that some of the “How-To” series tactical plans would benefit from the creation of a publications committee. While the division has been working on publications such as the “How-To” series and Glossary for many years, there has been no formal publications committee infrastructure. As part of the new by-laws the division must establish a publications committee. A new tactical plan on publications committee infrastructure is being developed and will be presented at the May tactical planning meeting.

4.6 Annual Division Evaluation

Purpose: See Introduction

Procedure: See Introduction

Evaluation: This is the fourth annual evaluation. There is still no clear process.

Upgrade: Include evaluation in the Operating Manual. Develop a process for the evaluation including a procedure for reviewing and implementing recommended upgrades.

4.7 Financial Requests

Purpose: Handle requests for donations in a manner consistent with our mission.


Evaluation: Working well. Donations done on an annual basis our now included in the budget.

Upgrade: Update the list of requests in the Operating Manual.

4.8 Maintenance System

Purpose: Ensure that action items resulting from meetings are completed.

Procedure: Keep a separate flip chart for action items at meetings. Review at end of meetings and assign responsibilities and timing. Include all action items in a single list and include at the front of the minutes. Secretary will send reminders at set intervals.

Evaluation: Working well. Modifications have been made to the system. All action items even those from conference calls are captured on one list. Thus the action item list changes on a regular basis as new items are added and others are completed.

Upgrade: Action item notices should be reviewed by officers in conference calls. Change the system name to Action Items Notices.

4.9 Budgets

Purpose: Ensure that expenses which the division incurs have been included in the annual division budget.

Procedure: Committee chairs and tactical plan leaders provide a budget to the treasurer by April 15 of each year.

Evaluation: The first budget following this system are due to be submitted April 15.

Upgrade: Include this system in the Operating Manual along with a sample budget form.

4.10 Reimbursement Policy

Purpose: Ensure that expenses are reimbursed in a standard manner.

Procedure: Reimbursement for expenses incurred as described in the policy.

Evaluation: Policy was approved at the 1994 AQG and appears to be working well.

Upgrade: Include this system in the Operating Manual along with reimbursement form.
We communicate to exchange information and opinions. Our ability to voice our knowledge and opinions resulting in others changing their behavior often times determines whether or not we are successful.

We should, therefore, not underestimate the value of effective communication. No one argues that technical competence is essential for an engineer to be successful. The most successful engineers are not only technically competent, but have excellent communication skills. If we are technically competent as well as have the ability to communicate our knowledge, then we are more likely to be successful than someone who is technically competent and lacks good communication skills.

There are four key aspects to successful communication:
1. Understand and be understood before acting.
2. Communicate with all stakeholders.
3. Use communication encouraging behaviors.

UNDERSTAND AND BE UNDERSTOOD BEFORE ACTING

One of the truly exciting things about the world we live in is that each one of us is unique. We come into an organization or relationship with a unique set of life experiences and resulting values. No one else on earth has experienced everything, good and bad, that we have. Each one of us is special.

Because we are special, this adds an interesting dimension to communication. The way communication occurs, is that someone speaks, we hear what they say, we interpret what was said based on our unique set of life experiences and we act based on our interpretation of what was said. Unfortunately, the way we interpret and act on what someone said, may not be the result that the speaker intended since there is a high degree of probability that his or her unique set of life experiences is not very closely aligned with ours. Let's look at an example.

I have a colleague who went into an organization as a Quality Manager. He asked his boss, the General Manager, for direction. The General Manager said that the organization needed to grow the business and he should focus in this area. The Quality Manager assessed the situation, noted the organization did not have a process to identify the reasons for scrap and yield improvements to support growth of the business.

The Quality Manager proceeded to develop and implement this process which was received by the various stakeholders with a great deal of resistance. Three months later, he went to the General Manager with the data from the new process to demonstrate what he had done to support growing the business. The GM looked at him and asked what did he do with the data?
If we are going to effect change, we need to communicate with all the stakeholders to get buy in. Buy in is best gotten by their participation in developing and implementing the change. As Mary Kay Ash, founder of Mary Kay Cosmetics said, “People will support that we they help to create.” Effective communication is vital for the stakeholders participation and support.

**USE COMMUNICATION ENCOURAGING BEHAVIOR**

Once we develop an understanding of what needs to be done and have identified the key stakeholders in the process with whom to communicate, we then need to consider our communication style, or behavior.

Another key to successful communication is encouraging, not stopping communication. This aspect of communication has to do not only with what we say but how we say it.

Dr. Jack C. Gibb, author of *Trust: A New View of Personal and Organizational Development* identifies six communication encouraging behaviors; descriptive, equality, openness, problem orientation, positive intent and empathy; and six communication discouraging behaviors; judging, superiority, certainty, controlling, manipulation, and indifference.

Most of us would never consciously use one of the discouraging communication behaviors. The fact is that we often engage in these behaviors unintentionally and unknowingly. In addition, to what we say, the tone of voice and our body language can also encourage or discourage communication.

The following is a comparison of each of the communication encouraging behaviors and their opposite discouraging behaviors. It is valuable to review some examples of the kinds of phrases that we use because we are probably not conscious of how they may discourage or encourage communication.

A person who applies **description** would ask for information to attempt to more fully understand the situation. They would present feelings or perceptions that what others have to say is valuable.

The opposite of description is **judging**. The person applying this behavior would gather data in such a way as to imply that the information supplied by others is wrong and that they will need to change. For example; “You have got to pay more attention to the way you collect data. The data you collected can’t be right because it doesn’t fit the model that I developed.”

**Equality** is another communication encouraging behavior. Often times we need to communicate with people at various levels in the organization and with different levels of expertise. A person who wants to encourage communication with a diverse group might say “We are all in this together. So, let’s put our heads together and look at this situation and see what we can come up.” What we are communicating is “I value your opinion. We are equals in approaching this problem.”

The opposite of equality is superiority. Using this behavior, we might make a comment like, “I have been around here a long time and I know a lot about this problem.” In other words, “I am better that you” because of my experience. How many times have we innocently said this to someone? Or how many times have we heard it? And, how did it make us feel?

When applying **openness**, we are seen as investigating a situation openly as opposed to debating each comment offered. We welcome diverse ideas and accept information freely from others as opposed to challenging each idea that does not agree with our own.

**Certainty**, the opposite of openness, would be applied by someone who has a high need to be right. Someone who speaks with certainty might say “I heard everyone’s comments and I’ve made the decision. We will proceed as I suggested.”

**Problem orientation** would cause us to focus on problems and see solutions together as a team. We might say something like “How can we approach this problem? We are going to have to develop a solution together or there will not be one.”

The opposite of problem orientation is **controlling**. This is portrayed by someone who needs to control the outcome. “No one listened to me. Now we are in a bind and will not meet the deadline if we don’t do what I suggested. So clear your calendars and lets focus all of our attention on this project.”

**Positive intent** implies that we do not have any hidden agendas. Free and spontaneous behavior encourages communication as opposed to **manipulation** which implies hidden motives.

For example, we might say “I was really counting on everyone to work together to bring in this project on time, but, if you can’t handle it—” a long pause allowing time for everyone to nod their heads that they can do it.” Great! I’m glad to see that you all think that we can meet the deadline. Now, let’s get busy.” How many times have we heard this? Or, maybe even used this?

When we show **empathy** to another person, we are saying “I understand your frustration,” or “I know how you feel, I’ve been there before.”

The opposite behavior is **indifference**. Indifference shows a lack of concern for the other person’s feelings. For example, someone might say “I have a concern about getting the data in time to meet the commitment we made.” To which we might reply, “I don’t care what you have to do to get the data, just get it. We have a deadline to meet.” With empathy, we might say “I understand your concern, is there anything I can do to help your get the data?”

We also need to be conscious of the tone in our voice, the way we sit and our nonverbal expressions. Communication discouragers include frowning, not making eye contact, continuing to write when someone addresses us, leaning back in our chairs and folding our arms.

Communication encouraging nonverbal behaviors include smiling, giving full attention when someone is speaking, making eye contact, leaning forward in our chair, arms open and sticking to the subject being discussed.

These six communication encouraging and discourag-
MINI PAPER

Continued from page 7

ing behaviors are explained in more detail in Creating the High Performance Team by Steve Buchholz and Thomas Roth. We may be communicating with the right people, but if we turn them off by either our verbal or nonverbal communication, we are likely to not be successful. They will not be motivated to understand what we are saying, internalize it and, as a result, change their behavior.

COMMUNICATE IN THE LANGUAGE OF YOUR AUDIENCE

Another key to successful communication is the language we use. We need to understand our audience and speak in a language that they can understand. For example, if we are speaking to managers, they are interested in the bottom line. They want to know how what you are doing is going to allow them to make more money. They are not interested in statistics. They want to know how those statistics will affect the bottom line.

The solution is to take the statistics and apply them to the business and communicate how, for example, less variation in a process will result in improved yields. Improved yields in turn result in monthly or annual savings in dollars.

If we are speaking with machine operators, we might address how reduced process variation will mean better yields resulting in less sorting and data recording.

In summary, there are various aspects to communication that we need to understand to be successful. We need to know how to understand and be understood, know with whom to communicate and when, and know how to encourage communication while speaking in the language of our audience.

If we can incorporate these aspects into our daily communication, then we will be more likely to be successful in our ability to influence others to change.

The fruit of positively influencing others can be a lot of personal satisfaction and fun.

Communication Encouragers/Discouragers

<table>
<thead>
<tr>
<th>Encourages</th>
<th>Discourages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication</td>
<td>Communication</td>
</tr>
<tr>
<td>Description</td>
<td>Judging</td>
</tr>
<tr>
<td>Equality</td>
<td>Superiority</td>
</tr>
<tr>
<td>Openness</td>
<td>Certainty</td>
</tr>
<tr>
<td>Problem-Oriented</td>
<td>Controlling</td>
</tr>
<tr>
<td>Positive Intent</td>
<td>Manipulation</td>
</tr>
<tr>
<td>Empathy</td>
<td>Indifference</td>
</tr>
</tbody>
</table>

(The Communication Loop)

THE COMMUNICATION LOOP

LISTENING

FEEDBACK

CLARIFYING

INTERNALIZING

(Figure 1)

REFERENCES


Youden Address Figures

In the last issue of the newsletter (Winter, 1995), the following figures referenced in Roger Hoerl's Youden Address did not get printed because of software problems. We apologize for the error and include them here to complete the article for those of you who have either requested or desired them.
Basic Tools

Three Variable Scatter Plot:
An Example

by Richard A. Olson
Penn Racquet Sports, Phoenix, AZ

Scatter Plots

We can learn much about the relationship between variables by making a simple plot of the data. For this reason plotting is often recommended as the first step in analysis of most data sets. Strong relationships become obvious, and even if the relationship is weak, the plot usually suggests the next step in the analysis.

In the case of one variable, the simplest case, the plot may be a histogram, a dot plot, or a stem-and-leaf display, all of which show the distribution of data. One axis shows the level of the variable, the other the frequency of occurrence. Data may also be transformed prior to plotting to obtain a more symmetrical distribution and make analysis easier.

In the case of two variables, we can extend from showing simply the distribution of the data to the relationship between the two variables. One variable is plotted on the x axis, the other on the y axis. Two common textbook examples are the relationship between height and weight, and that between smoking and heart disease. As can be seen from the examples, the data may be either discrete or continuous.

Three Variable Scatter Plot

In a two variable scatter plot, useful information about a third variable can be added by using a different symbol for each point or sets of points, thus giving a pseudo third dimension. For example, we can compare numerous products or suppliers for product performance vs. cost, how competitors’ products compare with respect to two important design properties, or how different pairs of process variables affect product properties.

PC Magazine routinely uses such a scatter plot, which they call “Price/Performance Index”, or “Value Analysis”, to compare various brands of PC hardware with respect to performance and price. The x axis is scaled in order of increasing performance based on some accepted industry standard test, and the y axis in order of decreasing cost. The points, one of which represents each piece of equipment, show how the various competitors compare. The upper right corner of the graph is labeled “most bang for the buck”, the lower left corner, “least bang for the buck.” Clear differences performance can be seen within a given price range.

An Example

One of the important quality characteristics in the playability of a tennis ball is retention of hardness as perceived by the player. Once balls are removed from the pressurized storage container they begin to soften through loss of the pressurizing gas through the rubber by a process called permeation. In addition, the balls soften more during play through fatigue of the rubber core.

Softening becomes apparent to better players, who don’t like it, during long matches. It is quite important in countries where tennis balls are routinely used for months by many players because of high cost, or in teaching bas- kets, where the balls may be used extensively for practice over long periods of time.

Distinct differences among the various brands on the market are reported by players. Penn was interested in determining how various brands on the market compared with respect to hardness loss by each of the two mechanisms.

Quantities of a number of brands were purchased and an experiment performed to separate the above two causes of softening. The resulting data is plotted on the adjacent three variable scatter plot (see Figure 1), where the x axis is the softening due to rubber fatigue, the y axis is softening due to permeation, and each point represent the one of the purchased varieties.

Two conclusions are immediately evident:

(1) There are measurable differences in ball softening among brands on the market. Whether these differences are the same as those reported by players must be verified with other data;

(2) Some brands have more to gain from reducing the softening due to rubber fatigue than from reducing that due to permeability.

We can also see how our product compares to the competition and what we have to do, if anything, for

Continued on page 10
Acknowledgment

superior results. In this case, as opposed to the PC Magazine plot, the upper right corner is the worst place to be, and the lower left corner the best.

Constructing 3-V Scatter Plots

Construction of a three variable scatter plot is very simple:

1. Collect good data. No technique yields good conclusions from bad data.
2. Select the three variables you wish to compare. Decide which is x, which is y, and which to represent with a symbol.
3. Plot. Use of a good graphics package, such as Minitab for Windows is very helpful here.

In Conclusion

Three variable scatter plots are a very powerful tool for visually analyzing data and presenting the analysis to others in a very understandable way. It is intuitive and simple to do.

Incidentally, the technique can be extended to four variables, but that’s a topic for a different day.

Acknowledgment

I want to thank Patrick McKerr and his colleagues of Penn Racquet Sports (Ireland) for an excellent data set.

References


Ted Jackson’s Acceptance of Hunter Award

In the Winter, 1995, edition of the newsletter, there is a writeup mentioning that the 1994 William G. Hunter Award was presented to J. Edward Jackson (known as Ted) at the Fall Technical Conference in Birmingham, Alabama. Due to space constraints, we were unable to print Ted’s remark in that edition. Because of the interest in Ted’s remarks, his remarks are being included in this edition. - Editor

“When Steve Bailey informed me that I had been chosen to receive this year’s Bill Hunter Award, he also said it was customary for the honorees to say a few words. When I asked him what the custom was in the past, he replied that some reminiscences might be useful. For someone who took his first statistics course in 1945 and first computer course a year later, that could be dangerous. However, my career pretty much reflects the ebb and flow of statistical quality control. As a result of World War II, the late forties and fifties were exciting years in this field. My Masters degree from North Carolina included an SQC course using Grant’s book (first edition and probably first printing), another one in sequential analysis (Wald’s book, first edition—the previous class had mimeographed notes), a thesis topic on acceptance sampling and exposure to Harold Hotelling, who had recently been doing some pioneering work in multivariate quality control. I joined Eastman Kodak in 1948 in an organization that was enthusiastic about SQC and was already experimenting with multivariate methods. When I went back to school at Virginia Tech in the late fifties, a part time job with Hercules Powder Company lead to my dissertation topic in multivariate quality control.”

“However, after I returned to Kodak, interest in these fields began to wane nationally in favor of ‘getting the product out.’ It was not until the early 1980’s that I got back into serious SQC work, which fortunately carried over after I retired from Kodak in 1985. What is so different now from almost 50 years ago is the tremendous computational power at our fingertips. During the mid-1920’s, my father watched what was doing on my 128K Apple II, he made some remarks about ‘being born 60 years too soon.’”

“And so it is in our field. It was fun—and still is. Now that SQC is an acceptable term again, there are still lots of worlds to conquer out there. I still have hopes of a least nudging an asteroid or two. Although I am pretty much retired, I find that I am popular as a referee of technical papers because, being retired, I can now get the reports back on time. (Maybe I am just keeping asteroids in orbit.) It is getting exciting again. Go for it!”

“Although these activities were most enjoyable, my fondest memories are the people with whom I have been associated in the workplace, academia and professional organizations. Success in any statistical endeavor involves people as much as it does techniques, good students make good courses and professional endeavors are best accom-
plished by people who work towards a common goal and enjoy each others company; with regard to all these activities, I have been thrice blessed. All of the nice things said about me today would be impossible without these people. My publications involve twenty-three co-authors. I do not miss the daily commute to work but I do miss the camaraderie."

"I never served on any committees with Bill Hunter but I did see him a lot at meetings. It was always a pleasure to hear him give a paper because it would be on a useful topic, would have been clearly thought out and well delivered—a model for us all. Some of my fondest memories of Bill are somewhat less professional and relate to some of the 'entertainment' that took place on those famous Thursday nights at the Gordon Conferences."

"It is appropriate that the Bill Hunter Award is presented at the Fall Technical Conference. The citation for this award characterizes the sort of person Bill was and characterizes the level of activity with which this Conference is associated. I am grateful my peers have deemed that I have accomplished these goals. Thank you very much." △
ASQC Quality Information Center

If you want to Access quality-related information from a database that includes more than 3,000 ASQC-published documents, the place to call is the Quality Information Center. Our database includes the past five years of the Annual Quality Congress proceedings; Quality Progress and Quality Management Journal articles; Quality Engineering, Journal of Quality Technology, and Technometrics abstracts; and Quality Press catalog items and tables of contents. Additions to the database are ongoing.

The QIC staff will work with you to define your inquiry, search through its database for the materials that satisfy your request, and deliver the information to you verbally or via fax, mail, or express delivery. Database search results are "scored" by keywords. This means the more frequently a keyword is cited in an article, the higher the "score" in the results list. Research services of external sources including on-line databases are available for an hourly fee and the costs of on-line search time and document delivery.

For more information, call ASQC at 800-248-1946 or 414-272-8575 and ask for extension 8693.

<table>
<thead>
<tr>
<th>Service</th>
<th>QIC Fee Schedule</th>
<th>Member Price</th>
<th>Non-Member Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>QIC Database Search</td>
<td>FREE</td>
<td>$25.00</td>
<td></td>
</tr>
<tr>
<td>Includes results list and abstracts.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Article Copies</td>
<td></td>
<td>$10.00</td>
<td>$15.00</td>
</tr>
<tr>
<td>1-10 pages:</td>
<td></td>
<td>$10.00</td>
<td>$15.00</td>
</tr>
<tr>
<td>Additional pages:</td>
<td>.50/page</td>
<td>1.00/page</td>
<td></td>
</tr>
<tr>
<td>Research*</td>
<td>$60.00/hour</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$100.00/hour</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Plus actual charges of on-line database search or use of other research services and document delivery charges.

International Conference on Statistical Methods and Statistical Computing for Quality and Productivity Improvement, Seoul, Korea

Date: August 17-19, 1995
Place: The Swiss Grand Hotel, Seoul, Korea

This is a satellite meeting to the ISI 50th Session in Beijing, and the Second Asian Conference on Statistical Computing sponsored by the ISI (International Statistical Institute). The goal of this conference is to promote research and applications on statistical methods and computing for quality and productivity improvement in all areas of society, and to exchange ideas and information on recent research directions. It is organized by the Korean Statistical Society, and supported by the National Statistical Office of Korea. There will be industrial tours to see the statistical applications in industry. For further information, contact the Program Chair: Prof. Sung H. Park, Department of Computer Science and Statistics, Seoul National University, Kwanak-ku, Seoul, 151-742, Korea. Fax: 82-2-883-6144, Phone: 82-2-880-6569, e-mail: PARKSH@KRSNUCC1.BITNET

Student Grants Available for '95 FTC

The statistics Division of the American Society For Quality Control is offering 5 grants to pay for the registration, meals and lodging (if needed) of students (undergraduate or graduate) attending the 1995 Fall Technical Conference in St. Louis, Missouri, October 19-20, 1995. Recipients will be responsible for their own travel expenses. These grants are available to students currently enrolled in an undergraduate or graduate program with emphasis in statistics, quality or productivity improvement. Applicants might be asked serve as room monitors for one session at the conference or to write a brief article about the conference for the newsletter.

Interested students should submit a letter of interest and a letter of recommendation from a major professor. Applications must be received by August 1, 1995. Please send applications to Nancy Belunis, Merck & Co., Inc., One Merck Drive, P.O. Box 100, WSPF-45, Whitehouse Station, NJ 08889-0100; (908) 423-3423. Applicants will be notified by September 1, 1995.

Nomination Forms

Nominations are being solicited for the 1995 William G. Hunter Award. Nomination forms for the award can be obtained from the William G. Hunter Award Committee Chair:
Steven R. Bailey
DuPont Engineering
Quality Management & Technology Center
Nemours 6543
1007 Market Street
Wilmington, DE 19898
Phone: 302-774-2375
Fax: 302-774-2458
e-mail: BAILEYS@ENGG.DU.PONT.COM

△
The Statistics Division has several job openings for which we are seeking members willing to do some work for the Division. The openings are as follows:

1. Authors for Basic Tools and Mini Paper articles for the Newsletter.
2. Authors for “How To” booklets related to process improvement.
3. Standards committee members - Immediate need for revising SPC Standards.

If you have an interest in any of these openings please fill out the form below and return it to Galen Britz, 3M Center, 220-9W-08, St. Paul, MN 55144-1000

<table>
<thead>
<tr>
<th>NAME</th>
<th>DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMPANY</td>
<td>POSITION</td>
</tr>
<tr>
<td>ADDRESS</td>
<td></td>
</tr>
<tr>
<td>PHONE (WORK)</td>
<td>(HOME)</td>
</tr>
<tr>
<td>FAX</td>
<td></td>
</tr>
<tr>
<td>MEMBER NUMBER</td>
<td>STATUS (MEMBER/SENIOR)</td>
</tr>
<tr>
<td>REG. COUNCILLOR</td>
<td>EDUCATION COM.</td>
</tr>
<tr>
<td>STANDARDS COM.</td>
<td>REVIEW NEWSLETTER ARTICLES</td>
</tr>
<tr>
<td>OTHER</td>
<td></td>
</tr>
</tbody>
</table>

RELEVANT EXPERIENCE/EDUCATION

MEMBER TIME AVAILABILITY/COMPANY SUPPORT/TRAVEL ETC.

DATE

OTHER COMMENTS
| **Chair** | Rick Lewis  
Monsanto Company  
Mail Zone 04B  
800 N. Lindbergh Blvd.  
St. Louis, MO 63167  
Phone: (314) 694-7735  
FAX: (314) 694-5614 |
|-----------------------|
| **Chair Elect** | Nancy Belunis  
Merck & Company, Inc.  
One Merck Drive  
P.O. Box 100  
WS1E-45  
White House Station, NJ 08889-0100  
Phone: (908) 423-3423  
FAX: (908) 735-1107 |
| **Treasurer** | Beth Propst  
3M Center  
230-8W-08  
St. Paul, MN 55144-1000  
Phone: (612) 736-6499  
FAX: (612) 736-9780 |
| **Secretary** | Don Emeding  
3M Center  
230-25-26  
St. Paul, MN 55144-1000  
Phone: (612) 737-2606 |
| **Past Chair** | Galen Britz  
3M Center  
220-9W-08  
St. Paul, MN 55144-1000  
Phone: (612) 736-6499  
FAX: (612) 736-9780 |
| **Membership** | Bob Mitchell  
3M Consumer Products Plant  
Highway #22 South  
Hutchinson, MN 55350  
Phone: (612) 234-4000, Extension 1864 |
| **Newsletter Editor** | Larry Sue  
Motorola SPS  
2100 East Elliot Road, M/D El. 609  
Tempe, AZ 85284  
Phone: (602) 413-8299  
FAX: (602) 413-5748 |
| **"How To" Series Editor** | Ed Mykytka  
AFT/ENS  
Wright-Patterson Air Force Base  
Dayton, OH 45433-0585  
Phone: (513) 255-3362, Extension 4333  
FAX: (708) 291-4279 |
| **Liaison with ASA Section on Quality & Productivity** | Roger Hoerl  
Scott Paper Company  
Scott Plaza II  
Philadelphia, PA 19113  
Phone: (215) 522-5011 |
| **"Glossary" Editor** | Jim Bosser  
Eastman Kodak Company  
Building 6, 7th Floor  
Kodak Park MC23401  
Rochester, NY 14652  
Phone: (716) 477-3857 |
| **Standards** | Ed Schilling  
Rochester Institute of Technology  
Center for Quality and Applied Statistics  
1 Lomb Memorial Drive, Building 14  
P.O. Box 9887  
Rochester, NY 14623-0887  
Phone: (716) 475-6129 |
| **Examining** | Bob Perry  
Pillsbury Company  
330 University Avenue S.E.  
Minneapolis, MN 55414  
Phone: (612) 689-0309 |
| **Certification** | Don Williams  
Process Improvement Consultants  
2515 Jamestown Lane  
Denton, TX 76201-2212  
Phone: (817) 382-5992 |
| **William G. Hunter Award** | Steve Bailey  
DuPont Engineering  
Quality Management & Technology Center  
 Nemours Building, Room 6543  
1007 Market Street  
Wilmington, DE 19898  
Phone: (302) 774-2375  
FAX: (302) 771-2158 |
| **Education** | Chris Ayres  
Hamilton Beach/Proctor-Silex, Inc  
4421 Waterfront Drive  
Glen Allen, VA 23060  
Phone: (804) 527-7158  
FAX: (804) 273-9825 |
| **William G. Hunter Award** | Steve Bailey  
DuPont Engineering  
Quality Management & Technology Center  
Nemours Building, Room 6543  
1007 Market Street  
Wilmington, DE 19898  
Phone: (302) 774-2375  
FAX: (302) 771-2158 |
| **1994 Fall Technical Conference - Program** | Mike Wincek  
Mathematics Department  
General Motors  
30500 Mound Road  
Box 9055  
Warren, MI 48090-9055  
Phone: (313) 987-1103 |
| **1994 Fall Technical Conference - Short Courses** | Andy Kirsch  
3M Center  
519-2S-08  
St. Paul, MN 55144-1000  
Phone: (612) 736-0618 |
| **1994 Conference on Applied Statistics - Program** | Frank Alt  
University of Maryland  
College of Business & Management  
College Park, MD 20742  
Phone: (301) 405-2231 |
| **1995 Annual Quality Congress - Program** | Jose Madrigal  
Department of Statistics  
222 TMBB Building  
Brigham Young University  
Provo, Utah 84602  
Phone: (801) 378-7357 |
| **1995 Annual Quality Congress - Short Course** | Bob Brill  
Monsanto Company  
Mail Zone 11B  
800 N. Lindbergh Blvd.  
St. Louis, MO 63167  
Phone: (314) 694-1684 |
| **ASQC Divisions Liaison Coordinator** | Joe Pignatelli, Jr.  
Texas A&M University  
Dept. Of Industrial Engineering  
Zachary Engineering Center  
College Station, TX 77845-3151  
Phone: (409) 862-2081 |
Regional Councilor Coordinator
Ed Hansen
47 Tamarack Road
Westwood, MA 02090
Phone: (617) 762-8065
FAX: (617) 551-8918

Region 1
Bob Gillies
32 Dartmouth Drive
Mystic, CT 06355
Phone: (203) 445-3145

Region 2
Mary Garfield
205 Bryant Street
Rochester, NY 14613
Phone: (716) 722-2392
FAX: (716) 722-4415

Region 3
Rich Christy
American Premier, Inc.
901 East 8th Avenue
King of Prussia, PA 19406
Phone: (215) 337-1100

Region 4
Michael Cohen
Satisfied Brake Products
650 100th Ave.
Chomedey Laval
Quebec, Canada 117W-3Z6
Phone: (514) 357-3280

Region 5
Joe Troxell
LaSalle University
Box 374
20th Street and Olney Avenue
Philadelphia, PA 19141
Phone: (215) 951-1031

Region 6
Marilyn Hwan
LSI Logic, MS J-202
3115 Alfred Street
Santa Clara, CA 95050
Phone: (408) 433-6362

Region 7
Tom Vaden
Consultant
5765 Grand Avenue
Riverside, CA 92504
Phone: (714) 382-5525

Region 8
Bill Bleau
Picker International Inc.
1130 Stonecrest Drive
Tallmadge, OH 44278
Phone: (216) 473-2385

Region 9
Carlos Moreno
Ultramax Corporation
1251 Kemper Meadow Drive
#900
Cincinnati, OH 45215
Phone: (513) 825-7794

Region 10
Greg Gruska
The Third Generation, Inc.
4439 Rolling Pine Drive
West Bloomfield, MI 48323
Phone: (313) 363-1654

Region 11
George Marrah
Department of Mathematics and
Computer Science
James Madison University
Harrisonburg, VA 22807
Phone: (703) 568-0534

Region 12
Bob Dovich
Ingersoll Cutting Tool Company
505 Fulton Avenue
Rockford, IL 61103
Phone: (815) 987-6542

Region 13
Rick Schleusener
Kodak Colorado Division
Building C-42, 3rd Floor
Windsor, CO 80551-1672
Phone: (303) 686-4530

Region 14
Oz Godsey
303 Ridgebriar Drive
Richardson, TX 75080
Phone: (214) 690-1744

Region 15
Bill Woodall
Department of Management
Science and Statistics
University of Alabama
P.O. Box 870226
Tuscaloosa, AL 35487-0226
Phone: (205) 348-6085
The ASQC Statistics Division Newsletter is published quarterly by the Statistics Division of the American Society for Quality Control.

All communications regarding this publication, EXCLUDING CHANGE OF ADDRESS, should be addressed to:

Larry Sue, Editor
ASQC Statistics Division Newsletter
2100 East Elliott Road
M/D EL609
Tempe, AZ 85284
Phone: (602) 413-3299
Fax: (602) 413-5748

Other communications relating to the Statistics Division of ASQC should be addressed to:

Rick Lewis
Monsanto Co.
Mail Zone 0111
800 N. Lindbergh Blvd.
St. Louis, MO 63167
Phone: (314) 694-7735
Fax: (314) 694-5014

Communications regarding change of address should be sent to ASQC at:

American Society for Quality Control
P.O. Box 3005
Milwaukee, WI 53201-3005

This will change the address for all publications you receive from ASQC including the newsletter. You can also handle this by phone (414) 272-8575 or (800) 248-1946.

UPCOMING NEWSLETTER DEADLINES

<table>
<thead>
<tr>
<th>Issue</th>
<th>Vol.</th>
<th>No.</th>
<th>Due Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summer '95</td>
<td>15</td>
<td>4</td>
<td>June 1, '95</td>
</tr>
<tr>
<td>Winter '95</td>
<td>16</td>
<td>1</td>
<td>Aug. 15, '95</td>
</tr>
<tr>
<td>Fall '95</td>
<td>16</td>
<td>2</td>
<td>Nov. 15, '95</td>
</tr>
</tbody>
</table>