STATISTICS DIVISION Newsletter ©

Volume 19, No. 1 **Winter, 2000**

Chair's Message

by Bob Mitchell

In this issue of the Newsletter I will share my thoughts on the progress of several key Division tactical plans and other recent developments important to ASQ and the Statistics Division.

The 43rd Fall Technical Conference (FTC) has concluded with significant progress made on a tactical plan to develop an Orientation to acquaint new active members with the Division culture, and the tactical plan to develop and launch a STAT Division Balanced Scorecard (BSC). I had hoped to present the first BSC in this issue of the Newsletter but I feel it more important to ensure that the BSC process is documented, formalized, understood, and the steps incorporated into the respective job descriptions. The purpose of the BSC is to measure the effectiveness and communicate the progress of our strategic plans towards the Vision, "Statistical Thinking Everywhere". The Statistics Division leadership worked during the FTC Tactical Planning session to better define metrics for measuring Effective Leadership, Volunteer Satisfaction, Division Responsiveness, and Member Retention (refer to the STAT Strategy Map presented in the previous issue of the Newsletter).

How to measure Member Retention is also a concern shared by ASQ Headquarters; this topic was discussed in the November General Technical Conference (GTC) of ASQ's Division and Technical Committee Chairs.

A second team of STAT leadership began formulating a Division new active-member Orientation Packet. Such an instructional manual will help familiarize new potential leaders with the culture, Mission, and Vision of the Statistics Division and help kick-start our tactical plans.

Simultaneous to the start of the Houston FTC, most of us received our copy of the October issue of Quality Progress. I received many telephone calls and emails from Division members expressing their displeasure with the cover story on Mikel J. Harry of Six Sigma Academy ("Cowboy Quality", pgs 27 - 34). A "Letter to the Editor" drafted by the Statistics

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Editor's Corner

by Sandy Capone

Greetings. I hope you each had an enjoyable holiday season and all of your Y2K problems were small or non-existent.

I would like to congratulate Roger Hoerl for winning the 1999 William G. Hunter Award, and congratulate and thank David Bacon for this year's W.J. Youden Memorial Address (included in its entirety, in this issue). It was a thought provoking, and I believe, timely message.

And congratulations to the three winners of Student Grants for the Fall Technical Conference: Dean DeCook attended as many of the paper presentations as he could and said "…I

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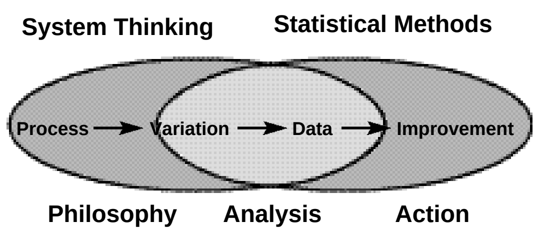
Inside This Issue

MISSION

- Promote Statistical Thinking for Quality and Productivity Improvement.
- Serve ASQ, business, industry, academia and government as a resource for effective use of Statistical Thinking for quality and productivity improvement.
    1. Our primary customers are Statistics Division members.
    2. Other key customers are:
        a. Management
        b. Users and potential users of Statistical Thinking
        c. Educators of the above customers
- Provide a focal point within ASQ for application-driven development and effective use of new statistical methods.
- Support the growth and development of ASQ Statistics Division members.

VISION

Statistical Thinking Everywhere



DESIRED DIVISION END-STATE

- Our members will be proud to be 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.

PRINCIPLES

- Our customers' needs will be continuously anticipated and met (i.e. customer focused rather than customer driven).
- Our market focus for products and services is weighted as follows:
    1. Greatest weight on intermediate level.
    2. Nearly as much weight on basic level.
    3. Much less weight on advanced level.
- Focus on a few key things.
- Balance short-term and long-term efforts.
- Value diversity (including geographical and occupational) of our membership.
- Be proactive.
- Recognize that we exist for our customers.
- View statistics from the broad view of quality management.
- Apply Statistical Thinking ourselves; that is, practice what we preach.
- Uphold professional ethics.
- Continuously improve.

STRATEGY

- Design and deliver selected useable products.
- Have a strong and vibrant Division infrastructure.
- Demonstrate the broad effectiveness of Statistical Thinking.
- Integrate Statistical Thinking into educational curricula.
- Develop a vibrant information communication system.
- Influence key decision makers.

Disclaimer

The technical content of material published in the ASQ Statistics Division Newsletter may not have been refereed to the same extent as the rigorous refereeing that is undergone for publication in **Technometrics** or **J.Q.T**. The objective of this newsletter is to be a forum for new ideas and to be open to differing points of view. The editor will strive to review all articles and to ask other statistics professionals to provide reviews of all content of this newsletter. We encourage readers with differing points of view to write to the editor and request an opportunity to present their views via a letter to the editor. The views expressed in material published in this newsletter represents the views of the author of the material, and may or may not represent the official views of the Statistics Division of ASQ.

Criteria for Basic Tools and Mini-Paper Columns

Basic Tools

Purpose: To inform/teach the "quality practitioner" about useful techniques that can be easily understood, applied and explained to others.

Criteria:
1. Application oriented/not theory
2. Non-technical in nature
3. Techniques that can be understood and applied by non-statisticians.
4. Approximately three to five pages or less in length (8 1/2" x 11" typewritten, single spaced.)
5. Should be presented in "how to use it" fashion.
6. Should include applicable examples.

Possible Topics:
New SPC techniques
Graphical techniques
Statistical thinking principles
"Rehash" established methods

Mini-Paper

Purpose: To provide insight into application-oriented techniques of significant value to quality professionals.

Criteria:
1. Application oriented.
2. More technical than Basic Tools, but contains no mathematical derivations.
3. Focus is on insight into why a technique is of value.
4. Approximately six to eight pages or less in length (8 1/2" x 11" typewritten, single spaced.)
   Longer articles may be submitted and published in two parts.
5. Not overly controversial.
6. Should include applicable examples.

General Information

Authors should have a conceptual understanding of the topic and should be willing to answer questions relating to the article through the newsletter. Authors do not have to be members of the Statistics Division.

Submissions may be made at any time to the Statistics Division Newsletter Editor. All articles will be reviewed. The editor reserves discretionary right in determination of which articles are published.

Acceptance of articles does not imply any agreement that a given article will be published.

CHAIR'S MESSAGE

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Division Officers – and co-signed by the Officers of the Quality Management Division – will appear in the January issue of Quality Progress. At issue is the possible conflict of interest by ASQ with its members, and the appearance that Quality Progress is being used as a marketing tool for Six Sigma Academy. The "Letter to the Editor" asks ASQ to disclose the terms of its contract with Six Sigma Academy, and takes issue with editor Miles Maguire's assertion that Mikel Harry is in the same league as Walter Shewhart and W. Edwards Deming.

To their credit, Ron Kingen - ASQ Chairman of the Board, and Paul Borawski - ASQ Executive Director, adjusted their personal schedules to answer questions about the "Cowboy Quality" article and the Six Sigma Academy partnership at the November 13 GTC meeting in Milwaukee. Per Ron Kingen, ASQ's alliance with Six Sigma Academy is a 5-year contract whereby ASQ pays small royalty to use Six Sigma Academy's materials to offer Six Sigma Breakthrough Strategy training materials to individuals and small businesses – a market segment not targeted by Mikel Harry. Though pursuit of new partnerships and alliances is in alignment with ASQ's Strategic Plan, it is the perception that ASQ is "open for sale" and the marketing of Six Sigma Academy has clouded its neutrality and objectivity as a professional not-for-profit society that most troubles its constituents. Look for additional response from ASQ in future issues of Quality Progress.

Per the profile of Mikel Harry on the cover of Quality Progress, Ron Kingen and Paul Borawski offered that this is the first of several issues of Quality Progress that will profile the new quality gurus, based on survey responses of business leaders. (How were these leaders selected? What are their qualifications to assemble such a list? What were the criteria to make the list as a guru?) A footnote to this effect would have helped clarify the reason for putting Mikel Harry on the cover and possibly avoided the appearance of a conflict of interest. (Though, I suggest a feature on Dr. Juran would have been a more appropriate choice as the initial profile).

Related to the discussion of Six Sigma training is news that ASQ is seeking division sponsorship of a new certification program. The Certified Quality Practitioner (CQP) is targeted for users of quality tools and techniques, but who do not consider themselves quality professionals. The CQP will be positioned at a level below the CQE in terms of statistics knowledge, and is an attempt to standardize 6 Sigma "green belt" training. The Statistics Division will participate in the development of the CQP Body of Knowledge. If you wish to participate in this effort, to develop questions for the CQP exam, please contact our Certification Chair, Nick Martino (nmartino@earthlink.net).

Other news from the GTC is that the Statistics Division has been awarded the "Top Achiever" level of McDermond Recognition for Division management for the 1998-1999 fiscal year. This marks the 5th consecutive year that the Statistics Division has been recognized with the highest level of McDermond Recognition. A great job by all!

Speaking of recognition, congratulations to Dr. Joseph Voelkel (RIT Center for Quality and Applied Statistics) and Dr. William Woodall (University of Alabama) whom have been elected ASQ Fellow. Recently elected Fellows will receive their pin and certificate at the Fellows Brunch of the Indianapolis AQC (May 7, 2000). Congratulations too, to Roger Hoerl, a past chair of the Statistics Division, upon his recognition as the William G. Hunter Award winner at the FTC.

Other STAT activities that you should be aware of:

1. "Improving Performance Using Statistical Thinking" – the first booklet in our newest How To series is now available through Quality Press.
2. Our 3rd Special Publication (following "Statistical Thinking" and "Data Sanity") is due out this winter.
3. Our webpage is continuously updated and improved. ASQ has recently informed all Divisions that they must move their websites off the ASQ server by December 31, 1999 for Y2K issues. We have purchased our own domain name, so our server move should not affect your ability to find us on the World Wide Web.
4. ASQ Tutorials has accepted our Short Course proposal for the Indianapolis AQC. In addition, we plan to sponsor at least one topic session at the Indianapolis AQC. More information about the Indianapolis AQC and the Statistics Division – sponsored meetings and sessions will be published in the next regular issue of the Newsletter.

In closing, I wish you a safe and happy holidays, and look forward to seeing you in Indianapolis. As always, if you have an interest in serving the Division in a more active role please fill out the Interested Member form found elsewhere in this Newsletter and on our website.

EDITOR'S CORNER

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think the best was the Multivariate Process Monitoring paper by Svante Wold"; Karin Chu thought the technical program was very informative and said, "…the overall atmosphere at the FTC was relaxed and friendly"; and Ana Ivelisse eloquently shares her thoughts regarding the FTC with an article in this newsletter. Winners of these grants must be enrolled in an undergraduate or graduate statistics or quality management program. They receive the cost of registration for the FTC and two night's hotel, and $50 for meals. If these three young people are a representative sampling of today's students, our future statistician and quality manager professions are in good hands.

I would, at this time, like to ask each of you to consider sharing an idea, a tool, an experience or a suggestion, that is statistical in nature, with our newsletter readers. The criteria for doing so are given on page 2; submissions can be anywhere from a short paragraph to eight pages in length. What may seem obvious or simple to you, may well prove to be the answer others are looking for. Please send your contributions to me directly, either by e-mail or by regular land mail. My addresses and the deadlines for submissions, for the next several issues, are on the back cover.

And speaking about statistical in nature, I need help with a problem I face at work. When we try to determine whether a supplier's process is capable of meeting specification and quality requirements for part dimensions, someone invariably asks whether we should incorporate the plus and minus 1.5 sigma shift "idea" into our assessment. A decision one way or the other is rarely made with conviction. I bring this up because the idea is difficult to talk about, especially among statisticians and quality managers. The idea that all processes share a characteristic that its mean shifts, with some (unknown) frequency, by +/- 1.5 sigma on average, is accepted by some and is not by others.

At one point, I sat down at my PC and generated simulation data in an attempt to answer the question, "If a process was affected in such a manner that its mean shifted, could I uncover that fact by analyzing data (data, for example, that would normally be used to maintain a Shewhart Control Chart) and could I estimate the magnitude of the shift? I ran two simulations: in the first I assumed the mean shift takes place randomly, and much more quickly than a subgroup could be formed; in the second I assumed the shift takes place randomly, but slowly so that several subgroups are formed between shifts. It seems to me that these are the only two practical possibilities.

In the first case, it was not possible to detect mean shifts; the calculated process variability was greater than that used for the simulation because of the imposed, rapid, mean shifts. But for an "unknown" process, it would not be possible to tell the difference between the presence of rapid, random mean shifts that contribute to an increased process variability, or the case where there are no mean shifts and the process variability just happens to be as large as what is observed.

In the second case, the control chart did show what appeared to be data from a process that was out of control in mean level. But, certainly, when this situation is encountered in practice, traditional thinking would suggest searching for, and eliminating the cause of the process upsets.

Where I am coming out on this is that it may not be possibleto detect process shifts that are common to all processes, and this may be true regardless of the supposed magnitude. This is not a trivial concern. If we can not detect and estimate the magnitude of mean shifts, how do we know we are doing the right thing when we incorporate the +/- 1.5 sigma shift into our quality metrics? Can we afford the costs associated with underestimating process capabilities if mean shifts are not really present? Can we afford to ignore out of control signals by assuming mean shifts on a control chart are just the result of normal process behavior?

When quality systems talk about sigma shifts, the issue appears, to those not familiar with the intricacies of statistics, to be statistical in nature. This is an issue statisticians and others in the quality professions need to discuss, and somehow, come to consensus on. Any discussion and insight on this problem would be welcome.

STATISTICAL THINKING

Statistical Thinking is a philosophy of learning and action based on the following fundamental principles:

- All work occurs in a system of interconnected processes,
- Variation exists in all processes, and
- Understanding and reducing variation are keys to success.

Statistical Thinking is a way of thinking, a thought process, rather than a method for calculating. The Statistics Division Vision "Statistical Thinking Everywhere" incorporates the interaction and strong interdependence between the philosophy of Statistical Thinking and the body of knowledge called Statistical Methods.

W.J. YOUDEN MEMORIAL ADDRESS

Presented at the
43rd Annual Fall Technical Conference
Houston, Texas
October 14, 1999

INTEGRITY IN STATISTICS

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Brief Abstract

Definitions of integrity focus on three principal aspects: entirety, soundness, and honesty. Integrity in statistical practice, education and research are examined within that general framework. Some concerns are identified and recommendations for change are proposed.

Introduction

Thank you Bob, and my deep appreciation to those members of the sponsoring organizations of this Fall Technical Conference, the Statistics Division and the Chemical and Process Industries Division of the American Society for Quality and the Section on Physical and Engineering Sciences of the American Statistical Association, for inviting me to present this annual W.J. Youden Lecture. It is a great honor. Indeed, a review of the list of the many eminent individuals who have served in this capacity in past years is a humbling experience. However, because of the honor associated with being invited to deliver this address, and because I feel very keenly about the topic I have chosen, I accepted the invitation with pleasure.

I was not fortunate enough to meet Dr. Youden, but like most here today, I am familiar with some of his writings and methodologies, and I have heard anecdotes about him from individuals who did know him. From that evidence it is apparent that Dr. Youden served as an excellent role model for what I am addressing today; that is, he practised his profession as a chemist and statistician with integrity.

So what exactly is "integrity"? The Pocket Oxford Dictionary defines **integrity** as "entirety (in its integrity); soundness; honesty". Webster's New World Dictionary addresses the same three aspects in more detail: 1. The quality or state of being complete; unbroken condition; wholeness; entirety. 2. The quality or state of being unimpaired; perfect condition; soundness. 3. The quality or state of being of sound moral principle; uprightness, honesty, and sincerity.

Clearly, integrity is, or should be, an essential component in the development, dissemination and practice of statistical methodology. Although most of us do not wear an "Integrity" button on our shirts as we go about our daily activities, all of us tacitly accept the responsibility of performing with integrity in our professional careers and in our personal lives. Why then am I taking your valuable time at this conference to discuss this matter?

My reasons are, I hope, ones that are shared by all members of this audience. As a professional statistician and a professional engineer, I feel a profound obligation to ensure that my performance and the performances of those with whom I work, especially students at my university, carry out their tasks in a manner that will bring credit to them individually, to those with whom they work, and to the organizations with which they are affiliated. I also believe that it is also important for all of us, from time to time, to take a moment to reflect on what we do, why and how we are doing it, and the likely consequences of our actions.

Throughout this presentation I shall use the term "statistical professionals". I include in that category all those who regularly practice and advise in the field of statistical methodology, regardless of their formal qualifications.

Not long after I had chosen my topic for this Youden address and submitted a title and abstract to the Chair of this session, a draft report of the ASA Committee on Professional Ethics, entitled "Ethical Guidelines for Statistical Practice", appeared in the April 1999 issue of Amstat News. That draft report addresses many of the issues I had considered presenting today, and I commend it to you as a thoughtful and comprehensive analysis of the principal issues related to the topic of this address.

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YOUDEN ADDRESS

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As a long-time academic researcher, this is not the first time I have been “scooped”!

That draft report identified eight areas in which professional integrity of statisticians is essential:

a) professional conduct
b) responsibilities to funders, clients and employers
c) responsibilities in publications and testimony
d) responsibilities to research subjects
e) responsibilities to research team colleagues
f) responsibilities to other statisticians or statistical practitioners
g) responsibilities regarding allegations of misconduct
h) responsibilities of employers, including organizations, individuals, attorneys, or other clients employing statistical practitioners.

Certain categories in this group are of more direct concern to some individual statistical professionals than to others. But the comments included for each category are thought provoking and sobering to any responsible professional who is engaged in statistical activity.

The AmStat News report dealt primarily with only the second and third of the three aspects of integrity offered by the dictionary definitions, namely “soundness” and “honesty”. I will expand on the content of that report by including issues related to all three aspects of integrity, including “entirety”, and offering some personal insights into ramifications of these aspects in the two areas of statistical activity with which I am most familiar, namely statistical education and research and statistical consulting in industry. My focus will be on five of the eight areas identified in the report:

1) professional conduct
2) responsibilities to funders, clients and employers
3) responsibilities in public communications
4) responsibilities to team colleagues from other disciplines
5) responsibilities to other statistical professionals.

Professional Conduct

At the 52nd Session of the International Statistical Institute, held two months ago in Helsinki, Finland, Professor A.F.M. Smith made a presentation on the topic “Public policy issues as a route to statistical awareness”. He began by emphasizing the acute need for an evidence-based society. Members of today’s audience are well aware of the critical importance of an evidence-based company, and so extension of this idea to society at large is a logical extrapolation. Professor Smith then expanded on his theme by identifying the need for “integrity of evidence”, which he defined as “reliable and comprehensive information available as a basis for arriving at rational decisions for the development and modification of public policy.” His presentation then moved on to the use of cost/benefit analysis in arriving at public policy decisions and the probabilities associated with expected outcomes of those decisions.

Although I suspect that most of us here today have relatively limited opportunities to directly influence the development of public policy, most of us do have considerable potential influence on the development of industrial products and processes, and we have an obligation to maximize the realization of that potential to the full extent that we are able. We are also acutely aware of the critical role “integrity of evidence” plays in arriving at decisions within our organizations. Some of us also get involved in estimating the costs and benefits associated with those decisions.

How do we go about this? First, we try to gain an understanding of the process or product development procedure. Then we attempt to distill relevant information from existing test and/or operating data. The next step may be formulating a design for collection of additional data to answer specific questions. This would be followed by analysis and interpretation of all accumulated data to identify robust optimum settings for the process, and finally using all of those previous results to design control schemes to maintain consistent performance at those optimum settings.

This is a comprehensive approach to process development that satisfies “completeness”, the first aspect of “integrity”. Some useful tests of the second aspect, namely the “soundness” of an approach, may be provided by criticisms from clients, and ideally also from statistical peers, but the ultimate responsibility for the soundness of our approaches rests with us.

The ASA report identifies a number of other issues related to professional conduct which I will address in subsequent sections of this presentation, some of which are common to all professions (e.g. competence, sound judgement, self-respect, worthiness of the respect of others), but two issues merit special mention at this point.

The first is the distinction between practical significance and statistical significance. I wish that all students were introduced to this distinction in their statistics courses in colleges and universities. Statistical educators

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still maintain a curious fascination with hypothesis testing, too often to the exclusion of more useful topics such as exploratory data analysis and experimental design. Great emphasis is focused on the statistical significance of results of certain tests. It can be a rude surprise, therefore, when a client sometimes responds that, despite the clear statistical significance of a result, its practical significance is negligible. Making such a distinction will usually require interpretation of the results by a subject matter expert from the client's organization. Indeed, expertise in the subject area should contribute to each stage of the investigation. However, care must be taken to ensure that the subject matter expert does not, either deliberately or inadvertently, introduce subjective bias into the plan for data collection nor into the analysis and interpretation of the resulting data. Better still, effective checks should be included at each stage to assess the validity of that background knowledge.

The second issue is the need for statistical professionals to maintain awareness, and ideally a competence, in new statistical methodologies, and new applications of existing methodologies. The technical program of this conference is an excellent example of opportunities available to practicing professionals to retain currency in a rapidly expanding field.

Responsibilities to Funders, Clients and Employers

A statistical professional's responsibilities to his/her employers or clients or to funding agencies can be extremely complex. Beyond the general issues related to professional conduct which were discussed in the previous section, there are several additional matters, specific to the practice of statistics, to be considered.

First is the desirability of identifying alternative approaches to the collection and analysis of data and explaining them to clients wherever appropriate. One of the recurrent messages I attempt to convey to my students is that in statistics, as in many other disciplines, there is usually no single "best" approach to dealing with a problem. It is important that potential alternative procedures be presented to a client, so that the client can participate in formulating an appropriate plan of action. Of course, the menu of alternatives should include only those methodologies you believe to be appropriate for the situation under consideration.

The assumptions, limitations, cost and effectiveness of each of the candidate approaches, along with the anticipated needs for further investigation, should be included in these deliberations. Also critical to those decisions are clear explanations of the expected consequences of departures from an agreed-upon plan, and the importance of including a verification stage in the investigation wherever possible. These same issues should also be addressed in university and college courses in statistics.

From time to time during those early deliberations a statistical professional can expect to encounter ill-informed attitudes and opinions about statistics and statistical methods. I have found it helpful to keep an open mind to such attitudes, not only because of the need for maintaining effective working relationships with such individuals, and the wonderful opportunities for enhancing their understanding and appreciation of the power of statistics, but also because occasionally they are right! For example, some statistical terminology is obscure and/or ambiguous (e.g. "attribute data" and "variables data") and some concepts are distinctly non-intuitive (e.g. "random variable"). Statistics is not yet a completely user-friendly discipline.

Reports to clients, employers and funding agencies must be succinct yet complete. A conscious effort must be made to use language that is familiar to the target audience. Graphical summaries can be particularly helpful. During my consulting career I have found that the importance of providing graphical summaries in a report is directly proportional to the level of responsibility of the individual(s) to whom the report is directed. I am not implying that senior executives are intellectually deficient, rather that the time they have to digest information demands the most efficient means of communication possible. Of course, more detailed technical information must also be provided, but more appropriately in an appendix.

More challenging is the necessity to present a candid and objective interpretation of the results of an investigation, particularly when the statistical consultant knows that the report will be disappointing to the employer, client or funding agency. Nevertheless, a professional has an obligation to himself/herself, as well as to the client, to "tell it like it is", and to accept full responsibility for his/her professional performance. Rejoice in successes, address complaints sympathetically but candidly, and be prepared to propose courses of action to remedy shortcomings in the results that have been obtained.

I believe that another objective for a consultant should

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be to assist clients in becoming self-sufficient in statistical practice as soon as possible. That is, a consultant should resist the attractive temptation of maintaining a comfortable arrangement with a client organization solely for personal gain and satisfaction.

Primary among the issues related to the "honesty" aspect of integrity is a frank admission of the extent of your knowledge, skills and experience in dealing with an application of the type under consideration. I discovered very early in my academic career that students attached a very high premium to an instructor's frank admission that he/she did not know the answer to a particular question. Of course, there was a mutual recognition that the instructor would make a concerted effort to find an appropriate answer, preferably before the next lecture!

As a consultant to a client organization it can be more difficult, and potentially costly in the short term, to admit that your knowledge in a particular area is limited. Yet, I have found that such an admission is generally well received, especially if I am able to recommend another consultant who does have expertise in that area.

Undisciplined use of ideas and materials created by other statistical professionals seems to be occurring with greater frequency these days, as accessibility to information becomes easier through networking, both personal and electronic. It is obvious that information, which a client has designated as confidential, must not be shared with any other party, and there are legal recourses for violation of such agreements. But what about instructional materials (textbooks, course notes, teaching aids, training materials) in universities or professional development programs? Copyright laws can protect against direct copying of sections of such materials, but it is often tempting to "borrow" good ideas and develop them in one's own personal style. Is this illegal, or unprofessional, or simply wrong? I have found that simply asking permission from the authors or publishers of printed or electronic materials to use specific items usually results in a favorable response. After attributing those items to the appropriate sources, I then feel comfortable in shaping them to my particular needs.

Of course there are many other types of potential conflicts of interest. One that I have encountered recently concerns the prospect of preparing and presenting professional development courses at different times to the same client organization on behalf of two training companies. Before agreeing to accept either assignment, I advised each of the two training companies of the situation, and was pleased that both agreed to proceed as they had originally planned.

Responsibilities in Public Communications

In addition to privileged communications to clients and employers, many statistical professionals, particularly those in academe, also engage in public communications, which can include written articles, oral presentations and formal testimony before courts and specially designated committees. Many of the issues addressed in the two foregoing sections apply to such presentations, especially the importance of obtaining appropriate permission for use of printed or electronic materials, and making full disclosure of the sources of such materials. More generally, we should pay careful attention to the complete and accurate acknowledgement of the contributions of others, whatever the forms of those contributions: illuminating case studies, novel techniques, profound thoughts, wise sayings, or clever ideas. As an educator, I find that too many students fail to exercise sufficient care in this regard until I have pointed out the significance of complete attribution.

Among additional points that merit discussion is the importance of voluntary public communication. Because this activity is one of the two principal criteria (the other being teaching) on which the performance of academic staff members are assessed, those individuals need little encouragement to engage in this activity. However, there continues to be a need for more participation from statistical professionals in industry. I hasten to acknowledge the fine contributions from industrial participants to the technical program of this conference and to other conferences, and the splendid role models provided by Gerry Hahn, Bill Hill, Ron Snee and others outside of academe who have demonstrated leadership in this regard. It is widely recognized that students of statistics at all levels, from elementary school to graduate school, are stimulated much more effectively by "real world" examples than by descriptions of card deals or tosses of dice (which regrettably still appear in some new textbooks). Some of the most interesting sections of certain statistical publications are the "Letters to the Editor" and "Question and Answer" columns that encourage such submissions.

Turning to another issue, are there readily accessible venues for reporting what I call "instructive failures", that is, investigations in which existing statistical methods have failed to provide satisfactory results? Sharing such

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experiences would produce two immediate benefits: 1) attracting responses from other statistical professionals who may have dealt with a similar situation in a different manner with more encouraging results, and 2) stimulation of statistical research in directions that would be of immediate use to practitioners. A common criticism of some statistical journals is that they contain too high a proportion of papers describing techniques in search of an application. Members of this audience, while recognizing the desirability of theory continuing to advance ahead of practice, are primarily more interested in techniques developed to deal with existing problems.

Manuscripts and articles, which include examples, should always include all of the data obtained during the study being presented, along with any data that were not included in the analysis, with an explanation of the reasons for their omission.

Statistical professionals are regularly asked to provide opinions based upon their expertise, in the form of expert testimony before courts and committees, recommendations to clients, evaluations of project proposals, and assessments of manuscripts. The ASA Committee on Professional Ethics has suggested that such testimony always be offered in a manner such that the statistical professional would be willing to be identified and subjected to peer review in the open literature. A rigorous test indeed!

Referees' reports on manuscripts submitted for publication should be presented with respect for the authors of those manuscripts, even in cases in which a referee believe the submitted material to be essentially nonsense. Even in those extreme cases, the referee should try to be as helpful as possible to the authors in ways that will assist them in "seeing the light", and should also offer suggestions that will assist the authors in improving their future manuscripts.

Statistical professionals should also be vigilant in detecting misleading quantitative claims, especially by organizations with which they are associated. I recall an advertisement in an automobile magazine some time ago that proudly proclaimed the vastly superior specifications of a well-known automotive lubricant in comparison with those of corresponding products of its competitors. I happened to know a member of the quality assurance staff at that company and when I asked for details supporting the claim, I was disappointed to learn that what was being quoted was essentially a 75 percent confidence interval for the product characteristic in question. Was this ad untruthful? Probably not, but clearly some critical evidence was missing.

Responsibilities to Team Colleagues from Other Disciplines

There are a number of inherent barriers to effective communication between statistical professionals and professionals from other disciplines who are working as members of the same team. An effective interdisciplinary team requires mutual respect and recognition of the particular cultures associated with the relevant disciplines. I support the recommendation in the ASA Committee on Professional Ethics that statistical members of a team should inform those team members from other disciplines about relevant aspects of statistical ethics. In addition to creating respect for statistical practice, that action can promote better understanding of some of the recommendations that the statistical team members may subsequently make. Working as a member of an interdisciplinary team provides a statistical professional with wonderful opportunities for promoting responsible use of statistical methods.

The obvious primary role of a statistical professional as a member of an interdisciplinary team is to ensure that the team's use of statistical methods is appropriate, effective and efficient. This is essential not only in the planning and execution of the team's tasks, but also in reports and presentations of the team's activities. This responsibility will often require patience on the part of the statistical professional in explaining the limiting assumptions of statistical methods he/she may be advocating, and the limitations of the interpretations that can be drawn from the evidence collected. However, there must be no compromise on issues of statistical validity associated with the reported results, interpretations and recommendations.

If that primary role of the statistical professional is achieved, then the ASA Committee on Professional Ethics recommends that he/she should "accept (or insist upon) appropriate authorship or acknowledgement for professional statistical contributions to research and the resulting publications or testimony", but "avoid undertaking work or co-authoring publications for which (he/she) would not want to acknowledge responsibility". This is a sensible recommendation that is consistent with the responsibilities of a professional.

Continued on page 10

YOUDEN ADDRESS

Continued from page 9

As a long-time educator I cannot resist adding one further objective for statistical professionals serving on interdisciplinary teams, namely assisting team members from other disciplines in identifying one or two (or hopefully more) statistical "messages" or "lessons" to be derived from the investigation.

Responsibilities to Other Statistical Professionals

Despite the impressive growth in numbers of practicing statistical professionals over the past four decades, our profession is still a relatively small one. Thus there is a special need for mutual support among us in keeping abreast of new ideas and techniques, promoting responsible use of statistical methods in the public and private sectors, being vigilant in detecting and correcting inappropriate use of those methods, and attracting the best and brightest students to our field of study. For individual statistical professionals this requires a continuing appetite for new learning, and an eagerness to assist other statistical professionals in expanding their knowledge and skills. The short courses that are being presented in association with this conference are splendid examples of excellent opportunities for this type of professional development.

Because we are human, we are subject to commonly occurring human shortcomings. These can take many forms: professional jealousies, frustrations arising from failures to convince those from other disciplines of the value, importance and overall common sense of proper design, execution, analysis and interpretation of an investigation, perceptions of inadequate recognition of one's contributions, and so on. Sometimes these shortcomings can cloud our judgement and jeopardize our dealings with other statistical professionals. Just as we should respect the opinions of professionals from other fields, we should also respect opinions of other statistical professionals that may not be in harmony with our own. Taking time to discuss such disagreements can often be enlightening, even if the differences remain unresolved.

My earlier comments pertaining to careful and complete recognition of contributions of others in oral and written presentations take on special significance when those others are statistical professionals. We cannot expect to be treated with respect by other members of our profession if we violate those basic guidelines.

All of us have an obligation to encourage and support new members of our professional community, young and old. I recall with enormous gratitude my good fortune almost forty years ago, when I was beginning my career as a statistical professional, in being warmly welcomed into conversations with some of my professional heroes, such as Stu Hunter, Ted Jackson and Don Marquardt, to name only a few. Such encouragement can take many forms: sharing of our experiences, recommending helpful books and articles, offering opinions about the relative merits of various statistical software packages, or suggesting professional development courses that we have found to be particularly beneficial.

Taking an active role in professional organizations, such ASQ and ASA, is another way of discharging our responsibilities to other statistical professionals. Participation provides wonderful opportunities to strengthen the profession, and to assist each other in becoming more effective statistical professionals. Through these organizations we can also enhance the public's understanding and appreciation of the importance of statistical methodology in all aspects of our lives.

Summary

Statistics is still a young discipline. To merit more widespread recognition as a profession we must, individually and collectively, demonstrate ever more clearly the value of our contributions to private enterprise and public life and our unequivocal commitment to the highest standards of professional conduct. Integrity, in all three of its aspects, entirety, soundness and honesty, is a cardinal element in achieving that goal. From my perspective as a longstanding member of this profession, I am greatly encouraged by what we have achieved so far. And because all of us are committed to the principle of continuing improvement, I am confident that even greater success will be realized in the years ahead.

References

American Statistical Association Committee on Professional Ethics, (1999) "Ethical Guidelines for Statistical Practice", Draft Report, Amstat News, April 1999, 12-15.

Smith, A.F.M., (1999) "Public policy issues as a route to statistical awareness", Proceedings of the 52nd Session of the International Statistical Institute , Helsinki, Finland, August 10-18, 1999, Book 1, 129-131.

A **WIN-WIN STRATEGY** FROM A JR. COLLEAGUE'S PERSPECTIVE

By Ana Ivelisse Avilés
Northwestern University

I am currently enrolled in the Ph.D. program in Industrial Engineering and Management Sciences at Northwestern University, where I am doing research on experimental design with Dr. Bruce E. Ankenman. My goal is to become a valuable member of the quality engineering and statistics communities, developing applied research projects and teaching sound statistical methods to young engineers. Sponsored by the Statistics Division of the American Society for Quality and the Richard A. Freund International Scholarship, I attended the 43th Fall Technical Conference in Houston. I will share my most significant FTC experience and what I believe is a strategy from which we all can benefit.

I was very impressed with the collegiality among all attendees. I enjoyed very much the opportunity of meeting well-known individuals and I got the impression it was mutual. I am glad to see that my colleagues are very willing to work as a team because we have a name to live up to. You made me feel welcomed to your community and I felt right at home. To me this means that there still is a pure passion for teaching, learning, and serving and not a self-centered desire for recognition and fame. I am happy to find that the doors are widely open for the Jr. Colleagues because there will always be a lot that needs to be done.

As an undergraduate student, I worked in the pharmaceutical industry. This experience gave me a solid grasp on the need for statistical tools in industry. It also showed me how a quality effort cannot only improve yields, but also raise morale and instill pride in a work force. This is why my main research interest is statistical design of industrial experiments. I am convinced that practitioners and researchers can accomplish more when working together.

A talented fashion artist can nicely design garments regardless of size and shape. And successful will be those who can satisfy changing demands. When solving a problem, it is the researcher's job to consider its shapes and sizes so that he can provide clearer guidelines for the accurate implementation of his work. Researchers in statistics have the challenge of providing better tools for practitioners. Practitioners should recognize the importance of integrating statistical methods into their systems and should communicate their needs to researchers. This will result in better products, fewer accidents, less failures, more satisfaction, good economy, and hence, better quality of life for all. Indeed, this is a win-win strategy.

I am sure there are many who share my vision and mission. The implementation and results of teaming-up researchers and practitioners is up to us. That things can always be improved can be a motivation for all.

Professors, encourage your students to attend events like the Fall Technical Conference because there is a lot to offer and to benefit from. I am thankful to my advisor, who, besides working WITH me, has given me all possible opportunities to develop as scholar, researcher, and future faculty member. Students, do not only depend on your departments and advisor. Invest some time in applying for grants to attend these conferences. You will never lose by being self-sufficient. Also, manage your time so that you can get involved in scholar and service activities. It is our responsibility and duty to contribute, too. Again, a win-win strategy!

I believe that attending the Fall Technical Conference has given me unique and advantageous opportunities as a doctorate candidate and researcher. I thank the Statistics Division of the American Society for Quality for the support and interest in the development of their student colleagues.

I am really looking forward to meeting you all in future conferences.

Roger Hoerl Receives ASQ Statistics Division's Hunter Award

by Galen Britz

The 1999 William G. Hunter Award was presented to Roger W. Hoerl at the Fall Technical Conference (FTC) in Houston, Texas. The Statistics Division of the American Society for Quality (ASQ) established the Hunter Award in 1987 in memory of the Division's founding chair to promote, encourage and acknowledge outstanding accomplishments during a career in the broad field of applied statistics. The attributes that characterize Bill Hunter's career – consultant, educator for practitioners, communicator, and integrator of statistical thinking into other disciplines – also characterize Roger's career.

Roger currently works at General Electric Company as Quality Leader for Corporate Audit Staff with primary responsibility for implementation of a Six Sigma approach to design of new non-manufacturing processes.

At the award presentation Roger was described as follows: Roger Hoerl is one of the most influential industrial statisticians in the world today. Most members of the professional quality community know of Roger because of his broad leadership role, his innovative contributions to statistical thinking, his thought-provoking publications, and his numerous and outstanding presentations at society meetings. However, that is only half the story, Roger has also been a strong influence in driving Six Sigma quality in the GE Company. In this role he is well known and highly respected by both key company leaders and by literally thousands of practitioners throughout GE. His specific contributions have included demonstrating how Six Sigma quality concepts can be applied to commercial transactions and design, as well as manufacturing, applications – both by the development and presentation of innovative course materials, and by mentoring numerous key Company projects. He made similar contributions during his time at Scott Paper Company.

Roger made the following remarks when he accepted the award:

I would like to thank the Hunter Award Committee, and the Statistics Division, for considering me for this award. I was a big fan of Bill Hunter, and had the privilege of meeting him personally. Bill was certainly from a different mold. From the time he spent teaching in Africa, to working with the motor pool for the City of Madison, to his insistence on using real projects for DOE classes long before it became fashionable, Bill genuinely cared. He cared not only about the statistics profession, but more importantly, about people themselves. There have been many famous and noteworthy statisticians over the years, but none that could be described as "just like Bill Hunter".

While I am deeply appreciative of receiving the Hunter Award, I certainly do not feel worthy to be compared to him. If we look at the type of person Bill Hunter was, beyond his many professional accomplishments, I'm not sure who would be worthy of such a comparison. I can take pride, however, in my involvement with an award that keeps alive the memory of Bill, and what he stood for. He remains a role model for all of us. Thank you again.

Roger Hoerl and Galen Britz

The committee is soliciting nominations for 2000. Nominations must be received by June 30, 2000. Forms for the 2000 award are available from the William G. Hunter Award Committee Chair:

Nancy Belunis
Merck & Co, Inc.
One Merck Drive
P.O. Box 100 WS3DE-20
Whitehouse Station, NJ 08889-0100
(908) 423-3423
(908) 735-1107 (Fax)
belunis@merck.com

The 43rd Annual Fall Technical Conference

by Bob Brill

Once again the people, procedures and resources of the CPID and Statistics Divisions of ASQ and the SPES Division of ASA have come together to pull off another Fall Technical Conference. When you consider that all the required effort to stage this production is taken from the spare time of those involved (we all have our day jobs to worry about) it is impressive what gets accomplished each year. Many thanks to Stephen Caffrey (overall conference chair) and the local CPID organization for all their work.

The Fall Technical Conference is a unique event. It is an inexpensive gathering of applied statisticians from industry, academia and government where we can share the latest findings, methods and ideas in our fields. It is a time to expand our mind tools, corner the experts to get some help on a nagging problem, network with our fellow practitioners and, last but not least, to party. This year, as in years past, all the above were covered.

The conference was officially started with the Plenary Address. The speaker scheduled for this was Stuart Hunter. Unfortunately, a few days before the conference there was a medical emergency in his family. Fortunately for us Lynn Hare agreed to step in quite literally at the last moment. He presented a talk on “Burning the Brownies”. This was a statistical/DOE version of the adage “if you’re going to work in the kitchen you’ve gotta break a few eggs”. We are thankful to Lynn for his good talk and his willingness to fill in on very short notice. Also, we wish the best for Stu Hunter and hope to see him at the next conference.

David Bacon presented the Youden address. His talk was on “Integrity in Statistics”. He spoke on a number of issues related to the proper role of the statistician in business and society. Whether or not you agreed with all of his recommendations, the questions asked were thought provoking and stimulated many side bar discussions.

Our luncheon speakers were Ron Asbury (President ASQ) and Ray Waller (Director of the ASA). Ron rallied the troops around the call for quality in the next century. Ray presented an engaging (and sometimes amusing) talk on the history and uses of the US Census.

The technical papers were varied and well done. In all, 32 papers were presented. These include the invited papers for the JQT and Technometrics sessions. This year we continued a session on Chemometrics that was filled with two invited papers.

Many thanks to all our speakers. It takes a lot of work to put together a talk and a lot of perspiration to present it. The challenge is out for more of our members to educate us with their findings by presenting a paper at the next FTC in October 2000.

The theme for 1999 was “Applied Statistics in the 21st Century”. In point of fact, even though the theme is sent with the call for papers most of the submissions are going to be on the current projects of the authors regardless of the theme. The Technical Program Committee (Malcolm Hazel, Connie Borror and Bob Brill for the 1999 FTC) has a little freedom to ensure that the theme is partially addressed. The intent behind this year’s theme was to present methods and concepts that are not in our standard bag of tools but might deserve our attention in the coming years. Toward that end Svante Wold talked on wavelett compression and orthogonal signal correction. On Thursday two talks were presented on neural networks (ranging from a cautious endorsement to unbridled enthusiasm). In the chemometrics session the following day Dick De Veaux was more critical of the method with the message of user beware. Also in the chemometrics session Andrew Rusinko (a co-winner of the 1999 award for the best paper combining statistics and chemistry) spoke on using recursive partitioning to analyze large structure-activity data sets.

This year we were pleased to offer three short courses. Two were on the day before the conference and one on the day after. The standard practice will now be four short courses. The Stat Division will coordinate the course offerings and will be responsible for two courses. The CPID and SPES Divisions will each be responsible for one.

In addition to the expanded course options look for software vendor booths in upcoming conferences. Much of what we do professionally is computationally intense and requires computers. Now we will have a chance to see what is the latest and greatest in statistical software. This also gives us the opportunity to fill the

Continued on page 14

TECHNICAL CONFERENCE

Continued from page 13

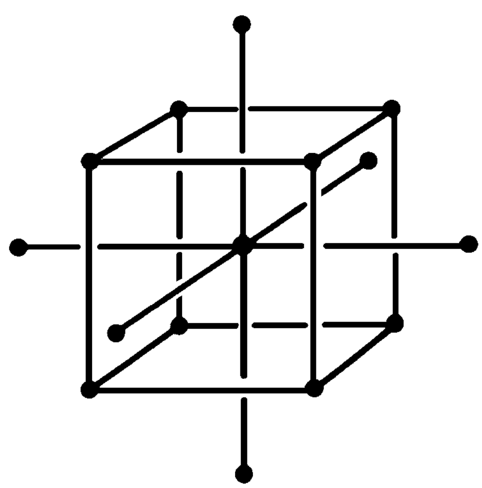
ears of the vendors with what they need to include in their next versions. This has been approved for the next five conferences and may make a presence in the 2000 FTC.

There were a couple of issues that surfaced at this conference that will have to be dealt with. One concerns the use of computer projectors. These are rapidly becoming the standard media for presentations. They are also expensive to rent or buy. The effort to secure these for the next conference will be high on the committee's list.

Another issue was the declining number of submissions to present papers. This year, of the 32 slots for presentation, invited speakers covered 5. This left 27 to be filled by submissions. We received enough qualified papers to fill 23-25 of these. This worked out OK because it gave us the freedom to solicit speakers on selected topics. However, we really need a higher submission rate to ensure the quality of the technical program. Attracting more papers appropriate for the FTC audience will be a major agenda item for future conference committees.

Now for a few unofficial numbers on the conference. 201 people registered. About 63% were from industry, 21% from academia, 12% were consultants, 3% from government and 1% from service organizations. We had good representation from outside the USA (accounting for about 10% of the registrants). The demographics were Canada (10), Denmark (4), Norway (2), Mexico (2), Sweden (1), England (1) and Israel (1). A number of the ex US people learned about the conference from the web sites where it was posted.

The year 2000 FTC will be in Minneapolis, Minnesota on October 12-13. The theme is “Statistical Thinking, Statistical Methods and Standards for Decision-Making in the next Millennium”. The overall conference chair will be Jim Stuart (CPID). The technical program chair will be Malcolm Hazel (CPID). The short course coordinator will be Bob Brill (Stat). We are looking forward to a continuation of a great technical gathering and hope to see you there.



STATISTICS DIVISION COUNCIL MEETING

Respectfully, Van Bowen, Sec.
10/27/99

Houston, Texas
October 13, 1999
8:41 p.m. Texas Time

Present:

- Don Williams, Current Past Chair
- Bob Mitchell, Chair
- Janice Shade, Chair-Elect
- Sandy Capone, Newsletter Co-Editor
- Van Bowen, Secretary
- Ed Shilling, Standards Chair
- Galen Britz, Hunter Chair
- Karin Chu, Student Scholarship
- Don Emerling, Past Chair
- Joe Voelkel, Past Chair
- Mark Kiel, AQC Session Mgr
- Stu Janice, 2000 AQC SC Chair
- Cliff McCormick, 99 FTC SC Chair
- Wayne Fisher, member
- Dean DeCock, Student Scholarship

Bob Mitchell opened the meeting with introductions, a revised agenda, and a review of the Mission, Vision, Strategy, Principles, Market Weighting Diagram, and the Ground Rules.

Moved and approved AQC Council Meeting ’99 minutes.
Treasurer’s report moved and approved.

Recognition:

McDermond recognition for 1998-1999 – Past Chair Williams was all smiles.
Service awards – Bob Brill, Prog. Rep. FTC 2 years; Cliff McCormick, Short Course Chair; Paula Sommer, Div. Session Manager, AQC in Anaheim.

Information Sharing:

Reviewed Anaheim Tactical Planning and GTC activities.
We are now in Group 2 and our contacts are:

Wendy Finnerty, GTC Group 2 Deputy Chair, (finnenw@basf.com)
Anniekay Erby-Newell, GTC Group 2 Administrator, (aerbyÆasq.org)

TREASURER'S REPORT

Statistics Division

10/01/99 YTD 1999/2000 Fiscal Year Financials

Income (as of 10/01/99)	**TD Actual**	**Budget**
Dues (6,996 members)	52,085.00	79,000.00
Interest	NR	2,000.00
AQC Short Course	NR	0.00
FTC Short Course	NR	8,000.00
Retail Sales – Sp. Pub	NR	7,000.00
Total	**52,065.00**	**96,000.00**
Expenses (as of 10/01/99)	**TD Actual**	**Budget**
New Member Mailings	856.32	3,000.00
Teleconferences	180.18	2,500.00
Labels	NR	2,500.00
Metagraphix	NR	500.00
General Fund	**1,036.50**	**8,500.00**
Hunter Award	NR	2,000.00
FTC Student Grants	225.00	1,500.00
FTC Honorarium	NR	1,000.00
Awards	**225.00**	**4,500.00**
Tactical Plan Mtg	NR	11,000.00
AOO Mtg	NR	4,000.00
AQC Travel	NR	2,000.00
FTC Mtg	NR	3,000.00
FTC Travel	NR	2,000.00
Long Range Plan Mtg	NR	0.00
Officers Planning Mtg	2,277.14	3,000.00
Strategic Planning	**2,277.14**	**14,000.00**
Auditing	NA	0.00
Bylaws	NA	0.00
Certification	NA	0.00
Examining	NA	0.00
Membership	NR	8,000.00
Exhibitor Fees	NR	4,000.00
Phone Survey	NR	1,000.00
Promotional Items	NR	3,000.00
Newsletter	8,969.74	46,900.00
Printing	8,969.74	22,500.00
Postage	NR	7,800.00
Sp Pub Printing	NR	10,000.00
Sp Pub Postage	NR	2,100.00
Sp Pub Reprints	NR	4,000.00
Sp Pub Honorarium	NR	500.00
Nominating	NA	0.00
Programs	NA	0.00
Publications	NA	2,000.00
Standards	NR	3,000.00
Committees	**8,969.74**	**59,900.00**
Stat Thinking	NR	4,000.00
Education	NR	1,000.00
Stat Clearinghouse	490.00	3,500.00
Tactical Plans	**490.00**	**8,500.00**
TOTAL	**12,998.38**	**95,400.00**

Accounts Payable pending additional information	
ASQ Division Ballot Billing	2,333.25
ASQ AQC Expenses	2,480.00

Ott Scholarship

Income (as of 10/01/99)	**YTD Actual**	**Budget**
Scholarship Fund	NR	260,000.00
Expenses (as of 10/1/99)	**YTD Actual**	**Budget**
Scholarship (2)	10,000.00	20,000.00

Ending Balances		
Checking	13,630.62	
Money Market	52,837.00	228/99
Accounts Receivable	56,935.00	
ASQ	4,870.00	
ASQ Dues	52,065.00	
Capital Assets	6,301.00	
Current Assets	123,402.62	
Long Term Assets	285,471.00	2/28/99
Total Assets		**$415,174.62**

STATISTICS DIVISION

'99 FTC Tactical Planning

Wyndham Greenspoint – Saturday, October 16 – 7:30am – 5:20pm

AGENDA

I. General

Introductions

Present were: Don Williams, Past Chair
Bob Mitchell, Chair
Janice Shade, Chair-Elect
Sandy Capone, Newsletter Co-Editor
Galen Britz, Hunter Chair
Greg Gruska, Treasurer
Mark Kiel, AQC Session Mgr.
Harry H. Koval, 2000 FTC Local Chair
Van Bowen, Secretary

Review Mission, Vision, Strategy, Principles, and Ground Rules
Assign Scribe, Timekeeper, Facilitator
Review, revise Agenda
Gather everyone's expectations

II. Working Meeting on Selected Tactical Plans

Depending on the number of participants, select 3-4 tactical plans from the list below to work on.

1999 – 2000 STAT Tactical Plans	ASQ Strategy
Demonstrate the Broad Application of Statistical Thinking	**D1**
Publish new series, "Improving Performance using…"	
Integrate Statistical Thinking into Education & Training	**B2**
PDCA the Pegasus process; repeat with new school principals	
Develop a Vibrant Information & Communication System	**A2**
Develop a "Web vs. Newsletter" policy and strategy	
Develop an e-commerce system for Special Publications	
Design & Deliver Selected Useable Products	**B5**
Beef-up our Short Course offerings; more variety; regional	
Identify and start no more than 3 new publications	
Have a Strong and Vibrant Division Infrastructure	**C3**
Develop a Division "Balanced Scorecard"	
Design an Orientation packet for new, active members	
Influence Key Decision Makers	
Develop a Division Marketing Plan	

III. Other Added Agenda Items

Statistical Thinking Committee recommends a new motif.
Statistical Thinking screen saver
TPC Request
FTC Short Course request
AQC CEO promotion

Wrap-Up

Team Reports
Review To Do's
Meeting Evaluation

Comments/Other

- Bob Brill was given an award for the 2-year FTC Program Chair work and it was noted that he will be the Statistics Division FTC Short Course Chair next year.
- Reviewed the Vision etc., captured expectations, reviewed '99-00 Tactical Plans shown on the agenda
- The need for a Virtual Academy Editor (implementor) was added to the bucket list - (p 5)
- Handouts included an orientation process - see page 4; and a Balanced Scorecard strategy map - see page 6-7.
- The group generally agreed to support Bob Brill's work on k-12 curriculum study, esp. in Missouri
- The TPC requests a second session at AQC - our response was "yes" with provisions. Mark Kiel will report.
- Two tactical planning work teams were identified:
  - Completion of the balanced score card and leading indicators for the division
  - Develop an orientation process for improved continuity of new officers

Respectfully, Van Bowen, Sec.

Call for Papers

44th Annual Fall Technical Conference

Statistical Thinking, Statistical Methods, and Quality Standards: Decision Making in the New Millennium

October 12-13, 2000
Marriott City Center
Minneapolis, Minnesota

Co-sponsored by
Chemical and Process Industry Division, ASQ
Statistics Division, ASQ
Section on Physical and Engineering Sciences, ASA

Statistical Thinking is a philosophy of learning and action based on the following fundamental principles: 1) all work occurs in a system of interconnected processes, 2) variation exists in all processes, and 3) understanding and reducing variation are keys to success.

If you are interested in presenting an applied or expository paper in any of three parallel sessions (Statistics, Quality Control or Tutorial/Case Studies) contact one of the Program Committee members (see Instructions for Authors below). Work should be strongly justified by application to a problem in engineering, process/chemical industry or physical sciences. The mathematical level of the papers may range from none to what is used in the Journal of Quality Technology or Technometrics.

Instructions for Authors

Some of the conference papers are invited while others are selected from contributed papers. The Program will be determined in late February 2000 and we will notify selected speakers by early March. In previous years we have only been able to select 1/3 to 1/2 of the submitted papers. Each selected paper is allotted 40 minutes. The conference waives registration fees for one speaker per talk. We are not able to pay for transportation, lodging, or meals. <u>All the information requested on the next page must be received by January 21, 2000</u>. It is highly preferred that the submissions be via e-mail; FAX and surface mail are discouraged but acceptable.

It is important to follow the abstract format described on the next page. Papers are selected based on subject matter, technical correctness, usefulness, interest, clarity, and readability.

The program committee welcomes any suggestions for special session topics or speakers. If you have ideas, please contact one of the Program Committee members.

STATISTICS DIVISION OFFICERS

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Email: Gruska.GF@ci-ttgi.com

SECRETARY
Van Bowen
Tel: (804) 289-8081
Email: vbowen@richmond.edu

44th Annual FTC Program Committee

Bob Mitchell (STAT)	rhmitchell@mmm.com	**(651) 736-8684** **(651) 733-8124 FAX**
Malcolm C. Hazel (CPID)	malcom_hazel@campbellsoup.com	**(609) 342-6463** **(609) 342-4783 FAX**
Connie Borror (SPES)	conni@asu.edu	**(602) 847-0840** **(602) 965-8692 FAX**

Abstract Format

***** IMPORTANT: USE ONLY A SINGLE PAGE *****

Title of Presentation

First Author	**Second Author**	**Third Author**
affiliation	affiliation	affiliation
phone number (day)	phone number (day)	phone number (day)
FAX number	FAX number	FAX number
paper mail address	paper mail address	paper mail address
e-mail address	e-mail address	e-mail address

Presenter
Name of presenter

Keywords
Include 3 to 5 key words or phrases

Purpose
One sentence to derive, prove, synthesize, review, present, inform, encourage, motivate, enlighten, exemplify, and highlight.

Abstract
Try to include the following 3 components in the abstract

1. Motivation or background:
2. A description of the work done.
3. Significance (improvements, applications, new ideas or abilities)

Session Preference: (choose one)
____ Statistics
____ Quality Control
____ Tutorial/Case Study

Where did you learn about the Call for Papers?
____ Quality Progress ____ ASQ-CPID newsletter ____ On Q
____ ASQ-STAT newsletter ____ AMSTAT news ____ ASA-SPES newsletter
____ Web Page? (where?)____
____ other (please explain) ____

Call for Interested Members

The Statistics Division has the following openings in key positions that need to be filled for us to achieve our strategy and Vision:

- **2001 AQC Technical Committee (Charlotte)**
  We seek volunteers to serve as Topic Session Managers (2), a Division-sponsored Session Manager (1), and Technical Paper Reviewers (6) for the 2001 AQC in Charlotte, NC.

- **Short Course Development Chair**
  One of our tactical plans is to develop and provide more regional short courses, workshops, seminars, and Section dinner presentations. The objective is to reach members whom otherwise cannot attend the AQC or FTC short courses. This person will network with our Regional Councilors and Section Liaisons to select the right instructors to deliver Statistical Thinking and statistical methods training.

- **Virtual Academy Editor**
  The VA Editor is responsible for finding authors to develop web-based training sessions in basic statistical methods, geared for K-12 students, for our Virtual Academy site. These materials need not be developed from scratch if previously designed materials can be found and linked.

- **Glossary Editor**
  We seek someone to edit the current edition of the Glossary and Tables of Statistical Terms.

- **Support existing Committees**
  Our Publications, Program, Education, and Membership committees are always looking for volunteers to support ongoing activities and help implement tactical plans. Examples include Section Liaisons, Glossary Editor, Short Course Chairs, Deming Applied Statistics Conference representative, and ASA Q&P liaison.

For more information and job descriptions for the open positions please see the STAT Operating Manual on our website. If you are interested in active membership in the ASQ Statistics Division please complete the "ASQ Stat Division Volunteer Interest Form" that is provided here and on the website, and mail it to Don Williams, our Past Chair (address provided on the form).

ASQ STAT DIVISION VOLUNTEER INTEREST FORM

If you wish to volunteer for any of the positions described, or included in the listing below, please complete this form and return it to:

Don Williams
2515 Jamestown Lane
Denton, TX 76201
Tel: (940) 243-1147
Email: d.r.williams@asqnet.org

Name:________________________________Date:__________

Title: _______________________Member No: _____________

Address:____

____

Phone: ____________________ Fax:____________________

Email: ______________Membership: __ Reg. __ Sr. __Fellow

Education / Certifications / Experience:__________________

____

Time Availability / Company Support: ___________________

____

Please check all committees of interest:

__ Education __ Publication __ Electronic __ Membership

__ Standards __ Awards __ Examining __ Certification

__ Program

A Primer on Surveys

Maureen S. Heaphy
The Transformation Network, Inc.
Gregory F. Gruska
The Third Generation, Inc.

Surveys are experiencing an increased popularity in many fields of study including quality, organizational development, and marketing. This is partially due to the Malcolm Baldrige National Quality Award criteria. More organizations are now asking, "How do we know our efforts are effective?" Whether this means are customers delighted with a product or service, do employees feel their opinion is important, or are teams getting the support they need, organizations are turning to surveys to obtain the answer.

Unfortunately with many surveys, data is first collected then someone tries to make sense of it all. Instead of being a science, the construction and conducting of a survey is slighted. The 80/20 rule should be applied. That is, planning should be 80% of effort and conducting and analyzing should be 20% of the effort. Remember the Deming cycle (also referred to as the Shewhart cycle) of Plan Do Study Act. If the planning stage is thorough then the analysis should have been decided upon before any data is even collected.

Planning

The first step in planning is to make the decision whether a survey is the correct tool to use. It has been said that, 'A person, given a hammer, discovers that many things need pounding'. This is true about the use and misuse of surveys as well as other statistical tools. A written statement of purpose should be developed to aid in making in a decision whether to conduct a survey or not. And then to determine what conclusions are to be drawn based on the survey results and by whom.

Critical review of some economic surveys showed many were useless because they:

- started with no particular hypothesis
- did not have structure
- could not support the conclusions

General steps in survey work are listed in Figure 1.

Decide to conduct survey
- purpose
- target population
- who will conduct

Formulate questions
Determine analysis to be done
- what to do about non-returns and
- non-responses
- Validate questions with pilot, interviews

Conduct survey
Analyze results
Take action

Figure 1. General Steps of a Survey

All too often, professional assistance is called in after a survey has been conducted and help is requested in making sense out of a poorly constructed survey. To avoid this, get professional assistance before a decision is even made to conduct a survey. The focus here is on preventing problems, not reacting to them.

Terminology

Some definitions are appropriate at this point. The **target population** refers to those people or entities that need to be surveyed to address the identified issue, whereas the **population** refers to the entire group of interest. The **sample** is those people or items selected to be included in the study. There may be **random and stratified samples.**

Random – everyone in the population has an equal chance of being selected.

Stratified – the population is divided into groups (strata) and then random samples are select from each group. This requires subject matter knowledge, not statistics.

For example, if a company is considering changes to their employee benefits program and they want input from their employees, the company may decide to use a stratified sample. Perhaps age and length of service are the two factors used in creating the strata. This would be based on subject matter, not statistical knowledge.

Uncertainties

Recognize that in any survey there are uncertainties or errors. The types of survey errors are listed in Figure 2.

Sampling Error
- sample too small
- sample not representative

Non sampling Error
Random error
- misinterpretation of question attitude

Bias
- non response bias
- response bias (untruth)
- administrative

Figure 2. Survey Errors

A statistician can provide assistance in this area by calculating the associated errors with certain sample sizes. This information, combined with the subject matter experts' opinion of expected differences, can be used in selecting the appropriate sample sizes. This raises a whole new issue of analytic versus enumerative situations, which is beyond the scope of this paper. (See Gruska in the

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bibliography for additional information on analytic versus enumerative).

Tips

In developing questions for a survey there are some common sense tips of things to do.

In formulating the questions, use terms common to the target population, keep the choices short, provide operational definitions, place easy, interesting or short questions at the beginning of the survey and be sensitive to gender words.

Before developing a survey some general observations should be considered. One such consideration is that people have a tendency to agree with statements. This was demonstrated by having two contradictory statements in a survey and a certain percentage of respondents agreed with both statements. Another consideration is that strong negatives have strong effects. It is best to avoid words such as: control, forbid, restrict, restrain, oppose. More people are willing to "not allow" than are willing to "forbid". For example, if you asked people if public demonstrations should be allowed regarding abortions and later asked if public demonstrations should be forbidden, more people are willing to say "not allow" than are willing to say "forbidden".

A third point addresses the issue of personal or impersonal wording of questions. That is, do you want general perceptions or individual opinion? For example, if you asked "Are the reference materials in the library sufficient?" you should be clear if you want to know if the respondent finds them sufficient for their own use or does the respondent think they are sufficient for people in general in the department.

Just as there are things to do, there are things to avoid. In developing questions avoid leading or biased questions, double negatives, and multiple questions in one. The double negative comes about when a question has a negative in it such as "Managers should not be required to review their employees reports" and then the answers to choose from are agree or disagree. If someone disagrees that managers should not have to do the task then they are agreeing that mangers should have to do the task. The confusion here should be apparent now.

The issue of having multiple questions in one deserves additional explanation. If a survey is being done as a coarse filter to assist in determining where a closer look is needed, then multiple questions may be combined into one, BUT the instructions must be clear on how to answer it. For example, consider a survey that has the following question: "We listen to our customers, respond to their requirements and have well trained customer contact employees who have the authority to resolve problems quickly." The answers to choose from range from strongly agree to strongly disagree. If a company does listen to their customers but the customer contact employees are not authorized to resolve issues quickly, should the respondent pick a middle of the road answer since half is yes and half is no? Or do both criteria need to be met to agree with the questions? Without further instructions, it is not clear how to answer.

Likert Scale

A common response scale was used in the above example. It is called a Likert scale, developed by Rensis Likert. It is used for assessing opinions and is usually 5 or more response categories. For example, the choices might be stated as follows:

strongly agree
agree
undecided
disagree
strongly disagree

Generally, it is recommended that a Not Applicable (NA) choice be made available in addition to the Likert scale.

This semi-variable approach does provide more information than the simple attribute (yes-no) question. Because many people are "reluctant" to make a firm decision or stand, the center response may be selected by default. Some surveys will use an even number of responses (4 or 6) to force a position.

Since the Likert scale is not usually an interval scale, traditional variables analysis must be used with caution.

Behavioral Assessments

With American management transforming their behavior to coaching, there are many behavioral surveys being done. Often times this involves a pre and post survey; i.e. before and after some event such as training. Proceed with extreme caution before conducting a behavioral assessment. An example is a survey chat your peers complete regarding your behavior before and after you attend a leadership class on "Leadership for Diversity" or some such tide. It is expected that you will have higher scores showing increased sensitivity to issues 3 to 6 months after completing the class. There could in fact be no observable change in the metric (numeric answer) but it may occur for a variety of reasons. Perhaps your behavioral did change (so your scores should have been higher), but this is offset because the awareness level of your peers completing the survey changed (so they became harsher in scoring).

Consider a particular issue such as a question pertaining to "trust" in the survey. The behavioral pattern is discussed in class so the participants are more observant of those patterns and their value system has changed. You and your peers have participated in the class. Suppose your behavior does improve but your peers are harsher in their evaluations. The net result is no noticeable change in your score. There are ways to handle this complication, and the first step is to be aware of this situation during the planning stage.

The discussion above does not include measurement system repeatability as a source of variation. If a survey is completed today and again tomorrow the answers may

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change somewhat even though nothing in the system has changed. But this is a topic for another paper.

Pilot

An important step in the survey process that is often overlooked is the activity of validating questions. This could be accomplished by conducting a pilot study. The steps involved are as follows:

- select participants to participate in pilot
- have participants complete the survey
- have the team that designed survey review results
- participants individually interviewed by design team

During the interview conducted for the pilot a typical discussion would include questions such as "What did the question mean to you?", "How would you say it?", "What did ______ make you think of?", "What was it you had in mind when you said _____?". For example, if terms such as empowerment or robust designs were used in the survey, you do not want to find out after the survey is completed that some people interpreted the words differently than intended.

A classic example is taken from an automotive company survey conducted back in the late 1970's. Survey results showed that door-closing effort was a major complaint, yet the automotive company felt it had resolved that problem. A follow up clinic was set up in a major city and people who had complained about the door closing efforts were invited to participate. People were asked to come to a dealership for one-half hour so the engineers could measure the door closing effort and talk to the owners. In return the owners would get a car wash and tank of gas for their efforts. The engineers quickly discovered that the real complaint was the door to fender gap was unacceptable. Since the survey did not have any questions related to fit of sheet metal and since the door was involved, people checked the only item listed relating to doors.

One result of the pilot study should be an estimate of the expected response rate of the full survey.

Response Rates

The percent of questionnaires returned will vary depending on numerous factors such as:

Interest level
- strong feelings

Perceived impact
- action will be taken based on results

Length of questionnaire
- time it takes to complete
- delay responding indefinitely

Level of obligation response is required

Certain factors may dominate in the decision to respond. For example, suppose everything was done "by the book" but the response is low. It may be due to a low interest level or people felt nothing would be done with results. On the other hand, a questionnaire that is considered to be too long by many experts may have a high response rate because the subject is of such great interest.

In Closing

Be sure the planning stage of a survey is given full attention. Do not wait and then try to make sense of the data after the survey has been conducted. You may find yourself with data that cannot be converted into information.

As a last note, when a survey is conducted, the expectations of the respondents as well as the clients are often raised. If someone indicated they were unsatisfied with the work environment, they now expect something will be done about the situation. Feedback of the plans based on the survey results to the respondents is important. The Plan Do Study Act cycle should be used on an ongoing basis.

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The ASQ Statistics Division Newsletteris published quarterly by the Statistics Division of the American Society for Quality.

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