Chair’s Message
by Bob Mitchell

First of all, let me extend a heart-felt “Thank-you” to Jacob Van Bowen and his leadership team. Van demonstrated impeccable leadership as Division Chair in a most difficult 2001-2002. The ASQ Statistics Division leadership successfully navigated very tumultuous times as the result of the events of September 11, 2001, a bearish stock market, and reduced corporate support – in terms of both financial and employee involvement in not-for-profit activities. Despite these challenges the Statistics Division continued to experience a resurgence in membership growth, and successfully met the requirements of Level 3 “Top Achiever” status of ASQ’s McDermond Division Management Program (DMP) recognizing excellence in division management.

All of us are experiencing change at a pace never before witnessed. The American economy has shifted from agriculture to manufacturing to information; the American worker has similarly undergone dramatic change from that of individual craftsman to high performing team contributor and value-added service agent. We truly live in a global village. Knowledge management is key to competitive advantage in today’s global economy. Notwithstanding, the quality movement is also changing. Jeff Jackson, ASQ National Director is quoted as stating, “Quality is not dying, Quality is transforming.” In order to more effectively reach the executive suites, the quality professional must think in terms of systems and processes to balance day-to-day with long-term thinking.

Success in today’s fast-paced, competitive market requires that we...
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

System Thinking  Statistical Methods

Process Variation Data Improvement

Philosophy  Analysis  Action

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.

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.)
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.

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.
is important that ASQ has your most up to date e-mail address. Concurrent to launching the e-news, the Statistics Division is also in the process of updating our website (http://www.asqstatdiv.org). This will allow us to better serve our members and better reflect who we are as a Division. Members will have convenient access to items such as meeting announcements, forums, hot topics, products and services, and of course the e-newsletter. This is a very exciting time for the Division as we march into a new phase of our growth. In the next few months, please contact us (chukarin@wellsfargo.com, rhmitchell@mmm.com), if you do not wish to receive new issue notice via e-mail, and please notify us of an alternative address. And as always, your suggestions and feedback are always welcome.

transform from passive consultants to proactive leaders, focused on performance improvement.

Paul Borowski, ASQ Executive Director, in a recent presentation to the ASQ Division Affairs Council (DAC) stated, “Our future success lies not in doing what we do today better, but to do new things.” We must continuously improve but also address breakthrough levels of improvement.

It’s all about leadership. The Statistics Division seeks to improve member value by offering new services; increase customer value through new partnerships and alliances in non-traditional areas of statistics and statistical thinking; and, achieve higher levels of performance excellence by deploying new technology, championing Section collaboration, and sustaining DMP “Top Achiever” recognition.

Our current Long-Range Plan, ‘LRP VI’, formulated in October 2000 during the Minneapolis Fall Technical Conference (FTC), identified 3 strategic thrusts for the next 3-5 years:

Strategic Direction: Improve our organizational effectiveness

1. Fix infrastructure
   Create a more responsive infrastructure. Clearly communicate our new Practical Vision and volunteer open opportunities; solicit and engage willing members to join in the accomplishment of the Vision.

2. Acquire change management skills
   Learn personal interaction and change management skills. Improve leadership discipline and accountability.

Strategic Direction: Educate statistical practitioners for business

1. Merge business needs with academic services
   Assist business and academia in developing applied statistics curriculum for statisticians and practitioners. Work with an MBA program to develop an introduction to Statistical Thinking in their curriculum. Assist statisticians and statistical practitioners to develop a personal improvement plan to become more effective as proactive leaders.

2. Understand and communicate with business
   Establish a board of advisors who have influential jobs in business. Use the board to help develop materials that will help us understand and communicate to management. Leverage Six Sigma and Statistical Thinking as a means to impact the bottom line.

Strategic Direction: Expand our influence

1. Grow customers & revenue
   Identify collaboration opportunities with target Sections to increase awareness of the Statistics Division. Identify revenue-generating opportunities supplemental to membership dues to fund our activities that support the Division Mission and Vision.
Past Chair’s Message

by Van Bowen

The coming year promises to be an exciting one. There are many new names on the committee roster and several new names beginning leadership positions. I have learned during the past year that our membership is one of the best. The officers have given of themselves in ways that could be called the benchmark for commitment. I must extend my thanks to all of them for their work and commitment.

Though many of you have stepped forward to fill positions, there are a few vacancies that still need to be filled. In order of priority:

1. Vice Chair – Products and Services Division Marketer
2. Deming Applied Statistics Conference Liaison
3. Glossary Editor
4. Short Course Development Chair
5. How-To / Series Editor
6. If you are interested in helping the Statistics Division by filling one of these positions or in becoming a Regional Counselor, please complete and submit a Member Interest Form to any of the Statistics Division officers.

If I were required to identify our greatest success this past year, I would have to say the development and presentation of the “From Consultant to Effective Leader” workshop. The feedback was good and there seems to be a substantial need among our membership to learn how to become proactive in increasing the value that statistical thinking can create. There are many systemic changes that are taking place in our discipline and the Statistics Division is evolving in ways to help our members.

CHAIR’S MESSAGE

Continued from page 3

2. Market our services
   Consider hiring a professional marketer to actively market our key products and services.

3. Develop alliances
   Identify a target partner / alliance opportunity and develop it.

4. Find and fill gaps in product and delivery
   Make sure that our conferences and publications do a satisfactory job of promoting & advancing the journey to our Practical Vision.

The AQC Tactical Planning Session - recently conducted during the Denver Annual Quality Congress (56th AQC, May 2002) - identified the following Statistics Division key tactics for 2002-2003 in alignment with LRP VI:

1. Launch our e-Newsletter
2. Re-design our website
3. Replicate the Statistician Workshop

4. Publish our 4th Special Publication
5. Initiate new alliances with ASQ Healthcare and ASQ Human Development & Leadership Divisions
6. Improve section collaboration
7. Develop a Short Course for the Kansas City AQC Strawman proposals have been adopted and committee leaders identified for items 1-4. The Statistics Division Council is meeting in Minneapolis this August for our annual Operational Planning Meeting where we address items 5-7, roll-up detailed project plans for all seven tactical plans, and address our annual operational activities. If you are interested in participating on any of these committees please submit a completed Member Interest Form to any of the division officers.

The Statistics Division has an excellent ensemble of dedicated, passionate individuals serving the needs of its members. I look forward to an exciting 2nd term as Statistics Division Chair.

Statistics Division Tactical Plan 2002 - 2003

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Incoming Chair-Elect’s Message

by Davis Balestracci

I feel so privileged to be Chair-Elect of the Statistics Division during this extremely difficult transition in the statistical practitioner’s profession. Bob and I are very unified in our vision and are going to do our best to bring together the many current conflicting elements and past rivalries—Ph.D. vs. M.S., Industrial vs. Academic, Degreed vs. non-Degreed, rigorous vs. “practical.”

Six Sigma may represent our best chance in years to gain back the respect our Division deserves. However, we must let go of nostalgia for the “good old days” – “We aren’t in Kansas anymore.” It will behoove us to identify and respect the needs of the Statistics Division members in planning our actions. There is no longer time to mourn -yet again - painful transitions or see ourselves as victims of “incompetent” management. The question for each of us becomes, “So…what can I do to make things better?”

“Culture eats strategic plans for lunch.”

–William Rupp, MD & CEO
Luther/Midelfort—Mayo Health System

Statistics…again?

Despite publicity and massive training, statistics isn’t driving many alleged Six Sigma miracles – not nearly as much as a 20-year Masters degree in industrial and healthcare quality statistic would want me to think. Now, like TQM, it is not uncommon to see a banner of Six Sigma being used to justify thinly disguised cost-cutting programs driven by undercurrents of fear.

Many early Six Sigma results have come from processes generating levels of waste that could literally no longer be tolerated. Such stellar results are best described - paraphrasing the late W. Edwards Deming - “All you’ve done is get your processes to where they should have been in the first place. That is not improvement! What took you so long?”

Here is our chance to show how to sustain such results.

TQM and Six Sigma emphasize: 1) work processes; 2) thinking and decision-making tools, and 3) quality of decision-making information. These design and infrastructure elements are an engine. They are necessary, but hardly sufficient. Engines need fuel resulting from the quality of: 4) personal feedback given to workers; 5) relationships transmitting organizational information; 6) perceptions and feelings influencing these relationships, and 7) each individual’s mindset.

Think of these elements as a seven-level pyramid, progressively widening and getting more fundamental from level one to seven.

An uncertain economy, job insecurity, and societal / technological upheavals have created unprecedented life stress. Emotional issues previously invisible in the workplace now lurk to create toxic coworker and customer relationships.

“Oh…so THAT’S What Deming Meant!”

Quality, when integrated into a business strategy, is present in virtually every aspect of every employee’s everyday work. I am still a firm believer in Brian Joiner’s very practical synthesis of Deming’s work, which he calls 4th Generation Management, and is summarized by his “Joiner Triangle”:

1) Nothing less than an organizational obsession with “quality” (and eliminating waste),
2) A “scientific approach” to solving everyday work problems (using data),
3) An “all one team” atmosphere to facilitate the needed breaking down of barriers for better (internal and external) customer service.

Can we just forget all these “How many angels can dance on the head of a pin?” arguments about the “true” number of “parts per million” defects represented by a specific number of “sigma”?

It all boils down to:

• Thinking in terms of processes - probably the most profound change in thinking, and automatically blame processes, not people, when things go wrong,
• Identifying the unnecessary complexity and waste in current work processes that result in costs, but no added value, to customers
• Using the Pareto Principle (the startling realization that 80% of job “heartburn” is due to only 20% of work processes), to better focus job improvement activity,
• Designing and using simple, efficient data collections to improve the effectiveness of processes,
• Communicating with a common language to depersonalize problems, break down current barriers between departments, and unify organizational quality efforts,

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Facilitating work teams to develop simple actions to study and prevent problems in everyday work that they currently and consistently find “frustrating as the devil.”

Only about 15 percent of [problems] can be traced to someone who didn’t care or wasn’t conscientious enough. But the last person to touch the process, pass the product, or deliver the service may have been burned out by ceaseless [problem-solving]; overwhelmed with the volume of work or problems; turned off by a “snoopervising” manager; out of touch with who his or her team’s customers are and what they value; unrewarded and unrecognized for efforts to improve things; poorly trained; given shoddy material, tools, or information to work with; not given feedback on when and how products or services went wrong; measured (and rewarded or punished) by management: Do your behaviors and organizational culture balance their needs with employees’ needs to motivate a choice to change?

Important lessons I’ve learned:

- People are already doing the best they can.
- The only person I can change and speak for is myself.
- How do I change to get people to volunteer to change?
- I must learn to swallow my ego 10 times before breakfast and another dozen times before lunch.
- Most human problems are permanent. My ever-present mantra needs to be, “Those darn humans – God bless ‘em!”

How do we avoid, or at least cope with, cultural “hidden land mines”? There is a rocky road from knowledge to wisdom to the ability to practice as an effective change agent in a culture loaded with hidden “land mines”, which is virtually all of them. As statistics developed as a profession in the ‘50s, it was fortunate enough to be able to practice through the filter of: “If we build it, they will come.” With a lack of computers and “intelligent” software, many industrial statistical groups flourished with radical new ideas of factorial designs, fractional factorial designs, and response surface methodology. More recently, the statistical profession has become a victim of today’s “Bigger… better… faster… more… now!” philosophy. There is the perception amongst potential clients that there is no time for rigor. Easy availability of software has allowed people to circumvent the “dreaded” statistical consultation. Formally very prestigious statistical consulting groups have been disbanded. Statisticians still want to “build it,” but no one wants to come! There is no choice but to take on a more aggressive, proactive leadership role.

Three mistakes statisticians can no longer afford to make

(With thanks to Jonathon Andell)

Mistake 1: Finding fault is a virtue-- a means of demonstrating one’s insights. Pointing out flaws is a form of brainstorming, which will lead ultimately to a better way of doing things.

Mistake 2: Credentials alone lead to acceptance, Success stories are effective in gaining acceptance for unfamiliar statistical tools, People will respond to assurances that an accomplished practitioner is at their disposal.

Mistake 3: Go for it, all or nothing!

Lessons learned People are entitled to commendation for the good in their efforts – even when there is plenty of room to improve. They deserve credit for recognizing these flaws without help. Statisticians should no longer be
so anxious to “do their job”. With the emphasis on decentralized consulting groups and cultural embracing of philosophies such as Six Sigma, getting people to bring up the issues and flaws is a subtle form of empowerment. Statisticians must learn to frame issues in a win-win context. An expert is “merely” a resource whose ego allows them to make sure that the organization gets the lion’s share of credit for their excellent work.

(Alternative: Improvements are accepted only when jammed down throats).

People are very threatened by their own very human limitations, especially when their careers have made them the ones to whom others turn for answers. Statisticians must be wary of flaunting expertise in ill-advised attempts to gain acceptance.

With the stress of today’s American industry and threat of job cuts, intimidated people will fiercely resist even well intentioned help. Since they can’t marshal actual facts to account for their resistance, negative campaign tactics will emerge that will contain enough whiffs of truth to be effective. Any natural, inevitable mistakes by the statistician naturally become fodder for this tactic. If management does not “walk the talk”, people will climb on this bandwagon “like rats boarding Noah’s Ark.” In such an atmosphere, mellower persuasion may help, but there will ALWAYS be another red herring.

Statisticians have been naively deluding themselves for the last few years with the rationalization that each “win” might persuade management to wade just an inch deeper into the sea of total quality. Bottom line: Phrases like “mortgage payments” and “medical insurance” make workers ignore statisticians’ sage advice, especially their “funny” sounding ideas that go against “common sense.”

What can statistical practitioners “build” that can affect: 1) current levels of waste; 2) time buffers; 3) vast variation in employee morale; and 4) customer frustration with recurring problems?

To quote Gandhi, “The only form in which democracy dare appear before the peasant is as food.”

So the challenge for us is to create “food”. Food for our management, teams we facilitate, and participants in our seminars. As a degreed statistician, I cringe when I see what is being taught to all the various “ninjas.”

Simple... obvious... and WRONG!

Over the next few Newsletters, Bob and I will try to show how the Division must rethink its past. We’ve heard you and realize that the words “statistical thinking” may engage the gag reflex. But, what exactly does it mean? Rest assured, we are by no means advocating an abandonment of core statistical tools that have made our profession what it is; however, “the times, they are a changin’... for all of us.

For those of you who are interested in my vision of things, please visit my web site: www.dbharmony.com.

JQT ARTICLE WINS BRUMBAUGH AWARD

Congratulations to Roger W. Hoerl, this year’s recipient of the Brumbaugh Award, awarded annually to the paper that has made the greatest contribution to the developments of industrial applications of quality control. Hoerl was honored for his article, “Six Sigma Black Belts: What Do They Need to Know”, which appeared in ASQ’s Journal of Quality Technology, (JQT) October 2001.

To read the article visit http://www.asq.org/asqwire/061802jqt33.html. To subscribe to the journal please visit http://www.asq.org/asqwire/061802jqtsub.html.

Bob’s most recent assignment was that of Six Sigma Deployment Manager for 3M where he helped develop and modify Six Sigma training materials, and implement Systems and Structures necessary for the successful launch of Six Sigma. Bob’s current role in Corporate Quality is to coach business units to implement effective quality management systems to sustain the gains of Six Sigma.

Throughout Bob’s diverse career the one constant has been his passion for quality.

Bob has a degree in Chemistry from the University of Minnesota-Morris and has continued his educational and professional development via internal-3M quality engineering and statistical training, as well as numerous external courses and seminars.

A member of ASQ since 1985 and active in the Statistics Division since 1987, Bob is a senior member of ASQ, a Certified Quality Engineer, and a Certified Quality Manager. Bob has volunteered to serve a second stint as Statistics Division Chair, having last served in 1999-2000.

Davis Balestracci has had a variety of experiences in his 20-year career. The first half was industrial, most significantly with 3M, where he was awarded two corporate quality awards and two process technology awards for his innovative teaching and uses of statistical methods.

His interests then evolved to utilizing the Deming philosophy in management and service contexts. For the past 10 years, he has functioned as a Deming statistical consultant for two major Minnesota Twin Cities-based multi-specialty health care clinics, one with 500 physicians and 20 locations.

Davis has a B.S. degree in chemical engineering, an M.S. degree in statistics, yet describes himself as a “right-brained” statistician (He has also done graduate work in orchestral and choral conducting!).

Davis is a regular speaker at the prestigious Institute for Healthcare Improvement National Forums and is also known nationally and internationally for his passionate, provocative, challenging, yet humorous and down-to-earth style. He is well aware of the daily realities of implementing statistical approaches to quality and cultural transformation - including the inherent frustrations of dealing with “those darn humans!”

This year, he made the decision to become an independent consultant. The name of his company, Harmony, reflects his melding of left-brain (analytical) and right-brain (psychological) approaches to quality as well as “the passion of Beethoven composing symphonies” with which he approaches his work – motivational and transformational consulting, seminars, retreats, and coaching.

In 1995, he was a member of a faculty team sponsored by the Harvard Institute for International Development that taught health care quality improvement methods in the Middle East to 80 health care leaders from Egypt, Palestine, Jordan, Morocco, and Israel. He subsequently acted as a consultant to the Palestinian Improvement Project in 1997 and at that time also presented a one-day seminar at The Technion in Haifa, Israel.

In summer 1998, he published a controversial special edition newsletter that was sent to 11,000 people, “Data ‘Sanity’: Statistical Thinking Applied to Everyday Data,” for the Statistics Division of the American Society for Quality.

He is the author of a book summarizing his ideas, Quality Improvement: Practical Applications for Medical Group Practice, which is published by the Center for Research in Ambulatory Health Care Administration (CRAHCA) and currently in its 2nd edition.

Davis is a member of the American Society for Quality (ASQ), the Association for Quality and Participation (AQP), and is the past president of the Twin Cities Deming Forum. His web site is: www.dbharmony.com

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Van recently retired as a statistics Professor at the University of Richmond, where he has been a faculty member since 1968. Van has published and consulted in areas of applied statistics, quality applications, control charts, statistical thinking in the legal profession, and catalyzing change with data. For the last twelve years he has consulted in leadership and systems thinking, which he still teaches at the Jepson School of Leadership Studies at the University of Richmond.

Van is President of Applied Business Technologies, Inc. and consults with Strategic Solutions. Van received the M.S. & Ph.D. in Statistics from VT. At Richmond, Van taught a variety of statistics courses to undergraduate and graduate students. Van’s secret passion is that he plays tuba with a faculty traditional jazz band that has toured the world.

Most recently, Van served as Chair and was the team leader for developing the “From Consultant to Effective Leader” workshop. He is also a member of the American Statistical Association and the Systems Dynamics Society.

Jacob Van Bowen, Jr.
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Marcy Abate is a member of the Weapons Program Integration Department at Sandia National Laboratories. Since joining Sandia as an applied statistician in 1995, she has contributed to the quality and reliability of the nuclear weapons stockpile through statistical and quality analyses of various components. She has also supported projects for qualifying high precision measuring tools, statistically validating complex computer simulations, and verifying international treaties. Through Sandia, Marcey has actively worked with the Federal Aviation Administration (FAA) to evaluate aviation safety data, analyze safety inspection work processes, and develop system safety concepts. She currently provides technical management and systems engineering support to various weapon programs, and leads efforts to implement formal risk management within the Sandia Weapon Systems Engineering organization.

Marcy has a B.S. in Mathematics from Michigan State University, and M.S. and Ph.D. degrees in Mathematical Statistics from Purdue University. As a member of the ASQ Statistics Division, she previously served as Short Course Chair for two Annual Quality Congresses and as the Electronic Commerce Chair. She is currently in her second term as the Statistics Division Treasurer.

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Bill Rolfes is Quality Manager, 3M Personal Care and Related Products Division. Bill has been with 3M for 25 years, and has held various positions in process engineering, quality, and statistics. He holds a B.S. degree in Chemical Engineering from Case Western Reserve University. Bill is a former chair of the Oklahoma City Section of ASQ.
The Statistics Division of the American Society for Quality is offering 5 grants to cover the cost of registration, meals (up to $50) and lodging for students who wish to attend the Fall Technical Conference (FTC) that is sponsored jointly with the ASQ’s Chemical and Process Industries Division and the Section on Physical and Engineering Sciences of the American Statistical Association. This year’s FTC will be held at the Radisson Valley Forge Hotel, Thursday and Friday, October 17-18 in Valley Forge, PA. The theme for this year’s conference is “Learning and Discovery - Building the Future Through Quality and Statistics.”

Grants are available for currently enrolled undergraduate and graduate students of statistics and quality management. Travel costs are not covered. Recipients may be asked to serve as room monitors for a session at the conference and will be required to write a brief article about their conference experience for the Statistics Division Newsletter.

Applicants should send a letter of interest, together with a letter of recommendation from a major professor by September 20, 2002 to:

Todd R. Nelson
3M Company
Bldg. 230-3F-05, 3M Center
St. Paul, MN 55144-1000
trnelson3@mmm.com

Notifications will be mailed by September 27, 2002.

Dr. Edward Shilling, long standing member of the Statistics Division and Chair of its Standards Committee, has been rewarded for his service excellence by receiving the American Society for Quality’s 2002 Distinguished Service Medal. The inscription reads, “For exceptionally distinguished service through his sustained academic leadership in quality and applied statistics by his contributions in the fields of process management and acceptance sampling.” Few know how many long, long hours Ed had devoted to the Standards Committee and its interface with ASTM. This is a true labor of love, requiring much patience and perseverance.

Ed was both generous and risk-taking in displaying his gold medal around the room at the Division Business meeting in Denver on May 20. He did give the medal back!
46TH ANNUAL FALL TECHNICAL CONFERENCE
Learning and Discovery—Building the Future Through Quality and Statistics

Program

In the spirit of learning and discovery as a means of driving continuous improvement the FTC 2002 will focus on the essential elements of quality and statistics as we build the future.

This year’s conference will be held in historic Valley Forge, Pennsylvania. Conveniently located just minutes away from Philadelphia, Valley Forge offers its visitors a wide array of cultural activities, historical perspectives, and entertainment opportunities.

Sessions will offer the latest developments in statistical methods as they relate to quality and decision making. Applications, case studies, and tutorials focus on the chemical and process industries and the physical and engineering sciences.

Short Courses
Pre-Conference: Wednesday, October 16th • 8AM to 5PM
Better Industrial and Scientific Experiments: Overview and New Directions
Instructor: James M. Lucas

You will learn how to run better industrial experiments for quality and process improvements or scientific experiments to answer important questions (hypotheses) from a world-class experimenter. We emphasize experiments using industrial or scientific equipment such as production machinery. We show how to carry out the best experiments when there are hard-to-change and easy-to-change factors. Our proposed experiments are “super-efficient” because they are more efficient than “Optimum (computer generated) Designs.” We discuss the role of randomization, show when it is better not to randomize and tell when randomization is essential. We use the fact that many experiments using equipment are inherently split-plot experiments in our examples; we tell how to design and analyze split-plot experiments.

This course is designed for people who have run an experiment or who have taken a previous course on Experimental Design. All course participants should e-mail a description of a current experimental design problem to James.Lucas@ordnet.att.net; the course examples will be built on the problems of the participants.

Statistical Process Control
Instructor: Stephen Caffrey

This short course will cover the basic philosophical approach to using control charts. Instruction includes dealing with when to use Xbar/R charts, X/MR charts, various attribute charts, and the EWMA. During the class students would have an opportunity to construct some charts using a manual approach (calculators). The workshop will close with exploring various pitfalls that are encountered during control usage and how to overcome those pitfalls. Students registering for this course should bring a calculator.

Post-Conference: Saturday, October 19th • 8AM to 5PM
Introduction to Linear Regression Analysis
Instructor: Geoffrey Vining

Linear regression analysis is an important data analysis tool that uses linear models to explain the relationship between a characteristic of interest (the response) and one or more explanatory variables (regressors). This relationship provides a basis for process characterization and prediction.

This one-day short course introduces the students to the basics of linear regression analysis. It presupposes some background in basic statistics, but it does not presume any previous background in regression analysis. This course makes extensive use of MINITAB. The courses primary objective is to ensure that the students are able to read and to interpret the output from standard regression analysis software. The text for this course is “Introduction to Linear Regression Analysis, 3rd Ed.” by Montgomery, Peck, and Vining.

Statistical Tools Used in Data Mining
Instructor: James Wiznowski

Data mining is currently a popular term in trade journals and the public media. While there are many aspects and definitions of data mining, the basic idea is to find patterns in potentially large databases. This course explores the different statistical tools and graphical techniques used in data mining. It will cover the most popular tools such as linear regression, generalized linear models, regression/classification trees, and neural networks. We will emphasize the use of tree methods for variable selection, classification, and modeling to include discussions of bias-variance tradeoff and current “state-of-the-art” tree methods such as multiple adaptive regression trees (MART) and ensembles of trees. This is accomplished through the combination of lecture and examples using commercially available software.

Council Meetings

On Wednesday, October 16th, the ASQ Chemical and Process Industries and Statistics Divisions, and ASA Section on Physical and Engineering Sciences will hold council meetings from 3:00-9:30 PM. We invite everyone to attend these open meetings. This is a great opportunity to learn about division/section activities and to get involved.

Non-Technical Activities

The Delaware Valley Region has many historic and scenic attractions and a great set of entertainment opportunities. Information about many of these activities is included in the FTC web site.

Hospitality Suite

The Fall Technical Conference and the officers of the sponsoring organizations host a hospitality suite every year. Please join your fellow conference attendees and the officers in a friendly, informal atmosphere in Room 1411, Wednesday and Thursday night.

Travel Information

By Plane: Philadelphia International Airport is served by all major airlines and is located approximately 25 miles from Valley Forge. Tropiano (1-800-559-2040) provides limousine service every hour. Please make reservations at the same time you reserve your hotel room. Upon arrival contact Tropiano in the baggage claim area of the airport.

Lehigh Valley International Airport, Allentown, PA also serves the Valley Forge area. They can be reached at 1-800-FLYLVA or at www.liala.org. Tropiano also provides limousine service from this location.

By Train: AMTRAK (1-800-USAIRL) provides service to Philadelphia from major metropolitan areas throughout the US. Trains arrive at the 30th Street Station in Philadelphia. SEPTA Bus #225 leaves the station every half hour on weekdays. Tropiano (1-800-559-2040) provides limousine service every hour. Please make reservations at the same time you reserve your hotel room.

By Car: Valley Forge is located approximately 25 miles west of Philadelphia and is accessible from the PA Turnpike, Routes 76, 202 and 422.

Accommodations

A block of rooms has been made available at the Radisson Hotel Valley Forge. Located at 1160 First Avenue, King of Prussia, PA 19406.

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Rooms will be held until September 25th, 2002. For reservation call 610-337-2000. Please mention that you are attending the FTC/ASQ.

Cancellations and Refunds

Cancellations prior to September 25, 2002 will be refunded in full. No refunds after September 25, 2002.
Conference Registration Form

Mail to: Fall Technical  
1304 Delaware Avenue, Unit 1  
Wilmington, DE 19806

Please Check the sessions that you will most likely attend:
Thursday, October 17  
Friday, October 18

Name: .................................................................  

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Company: ............................................................  

Address: ..............................................................  

City/State: ..............................................................  

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I am currently not a member of any of these organizations. Please send the membership information.  

I am a:  

[ ]  Member  

[ ]  Fellow of ASQ  

[ ]  Fellow of ASA  

[ ]  ASQ-STAT  

[ ]  AASQ  

[ ]  ASQ-SPES  

Registration Fees:  

Thursday, October 17 only ........................................$180.00  

Friday, October 18 only ...........................................$180.00  

Student (ID Required) .............................................$100.00  

Short Courses: Pre Conference, Wednesday, October 16  

Statistical Process Control ....................................$220.00  

Better Industrial and Scientific Experiments .............$220.00  

Short Courses: Post Conference, Saturday, October 19  

Introduction to Linear Regression Analysis ...............$220.00  

Statistical Tools Used in Data Mining ......................$220.00  

Late Registration Fee (after September 25th) ............$25.00  

TOTAL DUE (All in U.S. currency please) .................$  

Method of Payment:  

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Cindy Dorrindy (cindy.dorrindy@gecapital.com)  

Fax (202) 655-1399  

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Introduction

Required “Statistics from Hell 101” courses are virtually worthless...and perpetuate myths that statistics can be used to “massage” data and prove anything. Common uses on organizational data—variance tables, trends analysis, rankings, stretch goals, tougher standards—can actually sabotage improvement!

Whether or not you understand statistics, you are already using statistics! The key skill needed is the ability to respond to variation appropriately so as to ask better questions—mathematical skills aren’t necessarily the focus!

Data “Sanity”: Statistical Thinking Applied to Everyday Data

People generally do not perceive that they need statistics—the need is to solve their problems.

Given the current rapid pace of change in the economic environment along with the “benchmarking,” “re-engineering,” “total customer satisfaction,” and, most recently, “Six Sigma” crazes, there seems to be a new tendency for performance goals to be imposed from external sources, making improvement efforts flounder when:

• Results are presented in aggregated row and column formats complete with variances and rankings,
• Perceived trends are acted upon to reward and punish,
• Labels such as “above average” and “below average” get attached to individuals/institutions,
• People are “outraged” by certain results and impose even “tougher” standards.

These are very well meaning strategies that are simple, obvious...and wrong! They will mislead analysis and interpretation...and insidiously cloud decisions everyday in virtually every work environment.

Realities:

• Taking action to improve a situation is tantamount to using statistics,
• “Traditional” statistics have severely limited value in real world settings,
• Understanding of variation is more important than using techniques,
• Statistical thinking gives a knowledge base from which to ask the right questions,
• Unforeseen problems are caused by the exclusive use of arbitrary numerical goals, “stretch” goals, and “tougher” standards for driving improvement,
• Using heavily aggregated tables of numbers, variances from budgets, or bar graph formats as vehicles for taking meaningful management action are many times futile and inappropriate,
• There is poor awareness of the true meaning of “trends,” “above average,” and “below average.”

Key Concept: Process-Oriented Thinking

• The statistics needed for quality improvement are based in the context of process. What is a process? All work is a process! Processes are sequences of tasks aimed at accomplishing a particular outcome by processing inputs to produce some type of output. Everyone involved in the process has a role of supplier, processor or customer. A group of related processes is called a system.

Process-oriented thinking is built on the premises of:

• Understanding that all work is accomplished through a series of one or more processes, each of which is potentially measurable,
• Using data collection and analysis to establish consistent, predictable work processes yielding desired outcomes, and these outputs go to both internal and external customers,

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STATISTICS AND REALITY – PART I

Continued from page 14

- Reducing inappropriate and unintended variation by eliminating work procedures that do not add value (i.e., only add cost with no payback to customers),
- Process inputs falling into the six general categories of “people,” “methods,” “machines,” “materials,” “measurements (data),” and “environment,” each of which is a potential source of variation,
- Improving quality = improving processes,

Aside from the new perspective of looking at your jobs and workplaces as processes and systems, process-oriented thinking must also be applied to a quality professional’s data collection process.

How a Quality Professional “Adds Value”:
Recognizing the Use of Data as a Process

People, Methods, Machines, Materials, Environment and Measurements inputs can be a source of variation for any one of the measurement, collection, analysis or interpretation processes!

The use of data is really made up of four processes – Measurement, Collection, Analysis, and Interpretation – each having “people, methods, machines, materials, measurements (data inputs via raw numbers), and environment” as inputs. (See Figure below) Any one of these six inputs can be a source of variation for any one of these four processes – They lurk to contaminate your data process and mislead you as to what is going on in the actual process you are trying to improve!

So, any process produces outputs that are potentially measurable. If one chooses, one can obtain a number (a piece of data) characterizing the situation via a measurement process. If the objectives are not understood or people have varying perceptions of what is being measured, the six sources of variation will compromise the quality of this measurement process.

These individual measurements must then be accumulated into some type of data set, so they next pass to a collection process. If the objectives are clear, the designed collection process should be relatively well defined – the appropriateness of an analysis depends on how the data were collected. If the objectives are not clear, the six sources of variation will once again act to compromise the process (Actually, from the author’s experience, it is virtually guaranteed that the six sources will compromise the collection process anyway!).

If the objectives are passive and reactive, eventually someone will extract the data and use a computer to “get the stats.” This, of course, is an analysis process (albeit not necessarily a good one) that also has the six sources of inputs as potential sources of variation. Or, maybe more commonly, someone extracts the data and hands out tables of raw data and cursory, computer-generated summary analyses at a meeting that becomes the analysis process, which is affected by the variation in perceptions and abilities of people at the meeting.

Ultimately, as you now are starting to realize, it all boils down to interpreting the variation in the measurements. So, the interpretation process (with the same six sources of inputs) results in an action that is then fed back in to the original process.

Now, think back for a minute to the many meetings you attend. How do unclear objectives, inappropriate or misunderstood data definitions, unclear or inappropriate data collections, passive statistical "analyses," and shoot-from-the-hip interpretations of variation influence the agendas and action? In fact, how many times are people merely reacting to the variation in these elements of the DATA process – and making decisions that have NOTHING to do with the process being studied?

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Another danger inherent in this data process is: Data not collected specifically for the current objective can generally be “tortured” to “confess” to someone’s hidden agenda!

Research vs. Improvement
So, if the data process itself is flawed, many hours are spent “spinning wheels” due to the contamination from the “human” variation factors inherent in the aforementioned processes—People make decisions and react to their perceptions of the data process and not the process allegedly being improved!

Many physicians will argue that the process-oriented approach is invalid because it doesn’t follow “established” procedures of clinical research. However, let’s look at research as a process.

In research, all input variations are tightly controlled such that observed differences in the “control” and “treatment” groups can be attributed to the “methods” input and no other. The protocol is also excruciatingly detailed as to how measurements are defined, collected, and analyzed so as to reduce variation in the data process. Controlling variation is expensive, which is why research is expensive.

Hence, research statistics is actually a very specialized subset of process-oriented statistics! It makes the assumption and has the luxury of “ignoring” the everyday factors lurking to compromise results in busy uncontrolled practice environments.

However, after a significant result is published, do the researchers have any control over how clinicians use it? The “rigor” is gone, and human variation in interpretation and use of the protocol virtually guarantees that they won’t achieve the same results as reported. This variation, usually either inappropriate or unintended, could be present in any or all of the six inputs... of five processes (actual & data measurement, collection, analysis, and interpretation)!

So, in understanding any variation between the research results and actual results, it becomes necessary to expose the variation between individual use and the research use of the protocol and reduce any inappropriate and unintended variation. As will be discussed in the next sections, traditional statistical methods are, for the most part, invalidated.

Do not underestimate the factors lurking in the data process that will contaminate and invalidate statistical analyses. Objectives are crucial for properly defining a situation and determining how to collect the data for the appropriate analysis. Statistical theory can interpret the variation exposed by the analysis to take appropriate action.

(I am indebted to the work of David Kerridge for much of the following explanation as well as those in the subsequent sections Prediction and Unknown & Unknowable)

There are actually three kinds of statistics, and they can be summarized as follows:

Descriptive – “What can I say about this individual patient?”

Enumerative – “What can I say about this specific group of patients?”

Analytic – “What can I say about the process that produced the result in this group of patients?”

An enumerative study always focuses on the actual state of something at one point in the past – no more, no less. For example, one can literally summarize the results of all the participants in any clinical trial once it is completed. Now what?

An analytic study usually focuses on predicting the results of action in the future – in circumstances we cannot fully know. It is this predictive way of thinking that is fundamental to quality improvement.

Both kinds of statistics count or measure samples. However, suppose it is desired to know which of two antibiotics is better in treating a certain disease? It is impossible to take a random sample of all the people who will be treated in the future. It isn’t even known who specifically will get this disease in the future!

This can be described as sampling from an imaginary population. The practical difference is that we must not rely on what happens from the results of any one experiment: We must repeat the experiment under as many different circumstances as we can to
establish an increasing degree of belief in the result. This is in very strong contrast with what is normally taught in most statistics textbooks, where it describes the problem as one of “accepting” or “rejecting” hypotheses.

The famous Walter Shewhart stated the difference by means of an example:

“You go to your tailor for a suit of clothes and the first thing that he does is to make some measurements; you go to your physician because you are ill and the first thing he does is to make some measurements. The objects of making measurements in these two cases are different. They typify the two general objects of making measurements. They are:
(a) To obtain quantitative information
(b) To obtain a causal explanation of observed phenomena”

**Prediction**

The distinction between enumerative and analytic studies means we must look for repeatability over many different populations consistently over time. Analytic thinking relates to sampling from a process, rather than a well-defined, finite population. Furthermore, most mathematical statisticians state statistical problems in terms of repeated sampling from the same population under circumstances where nothing changes over time! This leads to a very simple mathematical theory, but does not relate to the real needs of the statistical user. Especially in medicine, one cannot take repeated samples from the exactly same population, except in the rare cases.

Getting back to comparing two antibiotics in the treatment of some infection, suppose a conclusion is made that one did better in tests. How does that help?

Suppose that all testing was done in one hospital in New York in 1997; however, someone may want to use the antibiotic in Africa in 2002. It is quite possible that the best antibiotic in New York is not the same as the best in a refugee camp in Zaire. In New York the strains of bacteria may be different; and the problems of transport and storage really are different. If the antibiotic is freshly made and stored in efficient refrigerators, it may be excellent. It may not work at all if transported to a camp with poor storage facilities.

And even if the same antibiotic works in both places, how long will it go on working? This will depend on how carefully it is used and how quickly resistant strains of bacteria build up. The effectiveness of a drug may also depend on the age of the patient, or previous treatment, or the stage of the disease. Ideally it is desirable to have one treatment that works well in all foreseeable circumstances, but this may not be possible.

**Unknown & Unknowable**

There are usually no difficulties with carrying out the objectives of an enumerative study, which usually involves estimation, other than how to choose the sample; however, in process improvement, an analytic process, a number of subsequent practical problems still remain.

Random sampling is often used in analytic studies, but this is not the same as sampling in an enumerative study. For example, consider a chosen group of patients who attend a particular clinic and suffer from hypertension. Either a random method or some complicated method involving random numbers is used to determine who is to get which treatment. But the resulting sample is not necessarily a random sample of the patients who will be treated in the future at that same clinic.

Still less are they a random sample of the patients who will be treated in any other clinic. In fact the patients who will be treated in the future will depend on choices that you and others have not yet made! And those choices will depend on the results of the study currently being done and on studies by other people that may be carried out in the future.

So with an analytic study, there are two distinct sources of uncertainty. The first is similar to an enumerative study, that due to sampling. The second is due to the fact that one is predicting what will happen at some time in the future – to some group that is different from the original sample. This uncertainty is “unknown and unknowable.” It is rarely

*Continued on page 18*
known how any produced results will be used, so all one can do is to warn the potential user of the range of uncertainties that might affect different actions.

This is rarely done. Furthermore, how does one even express it? But the uncertainties of this kind will in most circumstances be an order of magnitude greater than the uncertainty due merely to sampling - making it very dangerous to pretend to be more certain than warranted. Such false certainty many times leads to wrong choices, but the result, in most statistics courses, has been a theory in which the unmeasured uncertainty has just been ignored.

“Statistics” in a Quality Improvement Perspective

So, it can be seen that statistics is not merely the science of analyzing data, but the art and science of collecting and analyzing data. Given any improvement situation (including daily work), one must be able to:

1) Choose and define the problem in a process/systems context,

2) Design and manage a series of simple, efficient data collections to expose inappropriate and unintended variation,

3) Use comprehensible methods presentable and understandable across all layers of the organization, virtually all graphical and NO raw data or bar graphs (with the specific exception of a Pareto analysis), and

4) Numerically assess the current state of an undesirable situation, assess the effects of interventions, and hold the gains of any improvements made.

Summary

As quality professionals, it is important to realize that data analysis goes far beyond the routine statistical “crunching” of numbers. The greatest contribution to an organization is getting people to understand and use a process-oriented context in analyzing situations as well as principles of good, simple, efficient data collection, analysis, and display. This cannot help but enhance the health care quality professionals’ credibility. It will also help gain the confidence and cooperation of organizational culture during stressful transitions and investigations.

It will be vital to put a stop to many of the current well meaning but ultimately damaging ad hoc uses of statistics - Whether or not people understand statistics, they are already using statistics...and with the best of intentions.

Useful References


Berwick DM. “Controlling Variation in Health Care: A Consultation from Walter Shewhart.” Medical Care. 1991; 23(12). [Shows “statistical thinking” applied to medicine]

“Run to Space” and “Why the VASA Sank: Managing for World Class Improvement” (video of keynote addresses to the 7th and 9th, respectively, Annual National Forums on Quality Improvement in Healthcare). Boston, MA: Institute for Healthcare Improvement (call (617)-754-4800 or visit www.ihi.org for purchase information). [Brilliant videos!]

[Materials are very well designed and use a context of health care. The “Variation” video and the series “Data planning,” “Data Collection,” and “Pareto Analysis” videos are particularly outstanding—brief and to-the-point]


[A composite of 25 one-page absolute “gems” from his columns in Quality Digest]
The Statistics Division, in partnership with the Statistics Department at Virginia Tech, sponsored a conference on Statistical Leadership in Roanoke, Virginia, April 26th and 27th, 2002. The purpose of the conference was to discuss the significant changes going on in the environments of statisticians, and to identify how we can best adapt to these changes. Specifically, the intent was to determine key areas where change is needed, and develop action plans at both the professional and individual levels to begin the needed changes. A key conclusion identified by the participants was our environment is changing whether we like it or not, so significant changes in the roles we play are required to prosper in the future. In particular, the participants and presenters identified the need for statisticians to move beyond passive consulting roles into more proactive leadership roles.

The conference was structured to be a mix of formal presentations and breakout sessions in which participants could hold discussions and develop action plans in smaller groups. One of the presentations was a report from Geoff Vining (Virginia Tech), Bill Parr (University of Tennessee), and Van Bowen (University of Richmond) on a series of interviews held with CEO’s and other executives to discuss their perceptions of statisticians in their organizations, including potential changes needed. The other formal presentations included:

- Why We Need to Be Leaders, Roger Hoerl (GE)
- Results of a Survey of Recent Graduates on Changes Needed, Angie Patterson (GE)
- Developing Leadership Skills, Ron Snee (Tunnell Consulting)

The breakout sessions were led by the participants in the conference, and facilitated by the conference organizers. Sessions included:

- Brainstorm and Prioritization of What Needs to Change
- Developing Action Plans for Industry and Academia (separate groups)
- Developing Personal Action Plans (each individual participant)

Feedback from the participants were quite positive overall, and included the following comments:

- What a GREAT conference! Possibly the best job-related conference that I have ever gone to. Not that I go to tons of conferences, and those I go to tend to be technical methods oriented, but this stuff is exactly what I need right now for where our stat group is at in our company’s evolution...
- Exceeded my expectations. As facilitators, the presenters' guidance proved invaluable in developing detailed personal action plans for leadership development.
- By the end of the conference, I left with a much better understanding of the essential qualities of leadership. I also recognized more clearly the need to change statistician’s image as passive consultants, and actively participated in developing the action plans to bring about change in the profession.
- Boy this is great! Stat Div. did a great job in sponsoring this timely conference.

Due to the success of this initial conference, two additional leadership conferences are planned. The first will be next May at the Annual Quality Congress in Kansas City (Stat Division organizing), and the second will be in conjunction with the Making Statistics More Effective in Schools of Business (MSMESH) conference, to be held at the University of Tennessee in June (Bill Parr organizing).

More details on the initial conference, including the agenda, each presentation, and the action plans developed, can be found at www.billparr.org/Leadership/index.htm.
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<td><strong>Membership Needs</strong></td>
<td>Co-Chair Marcey Abate</td>
<td>Treasurer</td>
<td>570469</td>
<td><a href="mailto:mlabate@sandia.gov">mlabate@sandia.gov</a></td>
<td>505-844-9424</td>
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<tr>
<td></td>
<td>Co-Chair Mark Kiel</td>
<td>Vice Chair – Outreach</td>
<td>617887</td>
<td><a href="mailto:mkkiel@uss.com">mkkiel@uss.com</a></td>
<td>219-888-7583</td>
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<tr>
<td></td>
<td>Voting Member John Murphy</td>
<td>Membership Chair</td>
<td>23883</td>
<td><a href="mailto:jmurphy412@aol.com">jmurphy412@aol.com</a></td>
<td>317-823-4309</td>
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<tr>
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<td>Voting Member Ed Schilling</td>
<td>Standards Chair</td>
<td>29108</td>
<td><a href="mailto:egscat@rit.edu">egscat@rit.edu</a></td>
<td>585-475-6129</td>
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<tr>
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<td>Voting Member Harry Koval</td>
<td>Certification Chair</td>
<td>18974</td>
<td><a href="mailto:hkoval@aol.com">hkoval@aol.com</a></td>
<td>651-776-9503</td>
</tr>
<tr>
<td><strong>Awards</strong></td>
<td>Chair Lynne Hare</td>
<td>Awards Chair</td>
<td>15152</td>
<td><a href="mailto:HareL@nabisco.com">HareL@nabisco.com</a></td>
<td>973-503-4154</td>
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# TREASURER’S REPORT

## Statistics Division

### 5/31/02 YTD 2001/2002 Financials

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<th>Expenses</th>
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### 2000-2001 Carry-Over Expenses

- **Total** $11,489.95

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### Ott Scholarship

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### Ending Balances

- **Total** $398,619.55

- Checking $50,257.04
- Money Market $64,637.86
- Accounts Receivable $10,947.60
- ASQ $10,947.60
- Dividends $367.83
- Prepaid Exp - Conf $125,842.50
- Capital Assets $6,413.24
- depreciated to $367.83
- Long Term Assets $272,409.22
- from reserve fund 51,341.20
- Ott fund 221,068.02

| Total Assets           | **$398,619.55** |
## TREASURER’S REPORT

**Statistics Division**

Approved 2002/2003 Budget

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<td>Retail Sales</td>
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| **Total**                 | **$67,000.00** |

### Ott Scholarship

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<tbody>
<tr>
<td>Scholarship (6)</td>
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All communications regarding this publication, EXCLUDING CHANGE OF ADDRESS, should be addressed to:

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ASQ Statistics Division Newsletter
Phone: (480) 858-8951
Email: chukarin@wellsfargo.com

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Bob Mitchell
Bldg. 224-06-S-03, 3M Center
3M Company
Maplewood, MN 55144-1000
rhmitchell@mmm.com

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

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www.asqstatdiv.org

Other Periodicals for Applied Statistics
http://www.asq.orig/pub/jqt/

UPCOMING NEWSLETTER DEADLINES FOR SUBMISSIONS

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