ASQC STATISTICS DIVISION Newsletter ©

Volume 16, No. 4 **Fall, 1996**

Chair's Message

by Beth Propst

Well, summer is over and fall is upon us. When I was a kid, I remember summers as magical times that seemed endless. Now they fly by, each year seeming to move more quickly than the last. I also remember a heightened sense of anticipation when I knew that fall had arrived. True, it meant that summer was over and winter (a non-trivial event in Chicago) would soon be here. Even so, fall was always an exciting time, full of new beginnings – new clothes, new school supplies, new teachers, new friends, and (the year I went away to college) a whole new lifestyle.

Funny. All these years later, I can still recapture that sense of excitement that seems to float in on those crisp autumn breezes, and I pause to wonder what new beginnings are ahead. Just as now I wonder what new beginnings lie in the future for the Statistics Division. So, let me get out my crystal ball and make a few predictions.

I predict that the Statistics Division will aggressively enter the electronic age. This involves more than our new Web site (which will be previewed by the Council at the Fall Technical Conference and be up and running in November). In the summer newsletter, you also read about the Statistical Thinking Virtual Academy which is in the early stages, but I am predicting even more than that. I foresee that the Statistics Division will soon be using the Web in many new and exciting ways. This will not only enable us to reach all our members and better serve their needs, but will give the world access to the Statistics Division.

I predict that the Division will rethink its publication approach, especially the How-To booklet series. We may even start up a different series to support the objective of presenting the latest statistical technique in a form which is easily followed by the quality practitioner. This will be linked with new approaches to delivering publications and additional supplemental materials, like instructor guides, etc. Maybe interactive versions will be provided electronically.

I predict that the work of the Statistics Division will help people become more proficient in applying Statistical Thinking to their jobs and their lives. As a result, Statistical Thinking will be used to improve organizations around the world.

I also predict that campaigning for major elections will be limited to the 30 days immediately preceding the election, the Cubs and the White Sox will win the pennant in the same year, and that world peace will happen in my lifetime. Oops – I think my crystal ball went into overdrive!

Well, I'm no Jean Dixon, but I'm sure that work will begin on my first two predictions at the Fall Technical Conference. (Of course, I have an advantage – I control the agenda for both our Council meeting and our

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Inside This Issue

Editor's Corner

In this issue, you will find several opportunities to become more active in the Statistics Division and the statistics community as a whole. The Division is still searching for an Acquisitions Coordinator. The responsibilities of the Acquisitions Coordinator include identifying and contacting prospective authors for Division Publications, (Newsletter, How-to-Series, etc.) This person will be an integral part of recruiting the appropriate articles for the newsletter, and will be a driving force in the personal goal of publishing newsletters with a common theme.

Other Division activities include: Ways of utilizing the Internet as a medium for our readers, as well as, ways to infuse Statistical Thinking into the day-to-day activities of business, school and home. Each of these initiatives will be discussed in further detail during our Tactical Planning Session, which will be held in Scottsdale on Saturday, October 26, from 8:00 AM to 5:00 PM. Anyone interested in working on these initiatives is welcome to attend. (As a reminder, please notify one of the officers that you plan to attend this meeting, if you are not currently assigned to one of the Planning Teams.)

The National Science Foundation is sponsoring another very interesting and important project which will advance initiatives to Strengthen Partnerships among Academe, Industry and Government (SPAIG). The SPAIG initiative is multi-facitated, and will surely influence future trends in academic programs, and partnering with other disciplines, as well as industry.

Hope to see everyone at the FTC in Arizona!

Janice Δ

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. Δ

VISION

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

MISSION

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

STRATEGY

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

PRINCIPLES

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

CHAIR'S MESSAGE

Continued from front

Tactical Planning meeting.) I hope that the third prediction will also come true. I believe we have already made a start.

One thing I don't need to use my crystal ball on is the addition of a new member on our council. It is my pleasure to announce our new Membership Chair, J. L. Madrigal. J.L. is an Associate Professor of Statistics and Strategic Decision Making at Brigham Young University. He earned his Ph.D. in Statistics from the University of Oxford, England. He is a Fellow and Chartered Statistician of the Royal Statistical Society and a member of ASQC, ASA, and INFORMS. J.L. has 15 years of consulting experience in industry, government, and academia. Most of his consulting practice is in quality science, decision making, biostatistics, and sampling. He is the coauthor of the book "Experimental Strategies for Quality Improvement" and has published several papers in the area of quality, customer satisfaction, and biostatistics. Currently, he is the President of the Utah Chapter of ASA. J.L. has served our Division previously as the 1994-1995 AQC Program Committee Chair. Congratulations and welcome, J.L. Δ

NSF-Sponsored SPAIG Planning Meeting Held in Gatlinburg

Bill Parr, University of Tennessee (wparr@utk.edu)
Bob Starbuck, Wyeth-Ayerst (starbur@war.wyeth.com)

Funded by the National Science Foundation, 13 statisticians from academe, industry, and government gathered August 23-24 in Gatlinburg, Tennessee, to further advance initiatives aimed at strengthening Statistics Partnerships among Academe, Industry, and Government (SPAIG), and to plan a major workshop involving the three groups targeted for May or June of 1997. (The workshop will be attended by several hundred invited key representatives from Academe, Industry, and Government, and will focus on long-term collaboration, industry/government input on academic programs and curricula, short-term visits, and partnering with other disciplines.)

The workshop planning meeting attendees were: Ron Bosecker (Dept. of Agriculture), Rex Bryce (Brigham Young Univ.), Tom Gerig (NC State Univ.), Lynne Hare (NIST), Bob Hogg (Univ. of Iowa), Ron Iman (Southwest Technology Consultants), Dean Isaacson (Iowa State Univ.), Bill Parr (Univ. of Tennessee), Ron Randles (Univ. of Florida), Bruce Rodda (Schering-Plough Research), Susan Schall (Dupont), Bob Starbuck (Wyeth-Ayerst), and Ray Waller (American Statistical Association).

Specific short-term initiatives launched at the workshop planning meeting included:

i. Increase academic knowledge of industry and government expectations
(Bill Parr, wparr@utk.edu)
ii. Increase presentations by academics to industry and government
(Ron Randles, rrandles@stat.ufl.edu)
iii. Increase student and faculty visits to industry and government
(Tom Gerig, gerig@stat.ncsu.edu).

The name listed under each initiative is the contact for those desiring to communicate ideas on that initiative.

This meeting was the most recent activity of the SPAIG initiative. Further details concerning SPAIG efforts and the products of this planning meeting can be obtained at:

http://funnelweb.utcc.utk.edu/~wparr/spaig.html

Browsers can be used to find a history of the SPAIG effort, academe and industry/government vision statements, and full proceedings and products of the workshop planning meeting.

Future articles will discuss the forthcoming workshop and other longer-term initiatives. Δ

1997 Fall Technical Conference Call for Papers

A Call for Papers has been issued for the 41st Annual Fall Technical Conference to be held October 16-17, 1997 in Baltimore, Maryland. The conference is co-sponsored by the Chemical and Process Industries Division and Statistics Division of the American Society for Quality Control, and the Section on Physical and Engineering Sciences of the American Statistical Association. The theme for the 1997 conference is **"Mining Data for Quality Improvement."**

Applied or expository papers are needed for parallel sessions in Statistics, Quality Control and Tutorial / Case Study. Request detailed submission instructions from:

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The submission process began on August 1, 1996 and will conclude on January 17, 1997. Papers should be strongly justified by application to a problem in quality control, or the chemical, physical, or engineering sciences. The mathematical level of papers may range from none, to that of the ***Journal of Quality Technology***, or that of ***Technometrics***. Δ

Annual Deming Conference on Applied Statistics
Merv Griffin Resort Casino Hotel, 13 Floor
Atlantic City

Sponsored by

American Statistical Association – Biopharmaceutical Section
American Society of Quality Control - Statistics Division
American Society of Quality Control - Metropolitan Section

3-Day Conference **December 9 - December 11**

Monday, December 9

Session A 8:30 - 11:30	**Planning What to Measure** Speaker: Professor William J. Latzko, Fordham University
Session B 8:30 - 11:30	**A Baysesian Approach to the Analysis of Clinical Trials** Speaker: Professor Joseph B. Kadane, Carnegie Mellon University
Session C 2:30 - 5:30	**Linear Models for the Analysis of Repeated Measurements** Speaker: Dr. Vernon M.Chinchilli, Penn State University
Session D 2:30 - 5:30	**Generalized Linear Models and Applications** Speaker: Professor James G. Booth, University of Florida

Tuesday, December 10

Session E 8:30 - 11:30	**Graphical Diagnostic Methods in Regression and The Analysis of Variance** Speaker: R.R. Hocking - Professor Emeritus, A&M University
Session F 8:30 - 11:30	**Adaptive Design and Analysis in Clinical Trials** Speaker: Dr. William F. Rosenberger, University of Maryland
Session G 1:00 - 4:00	**Probabilistic Analyses of a Mass of Evidence: The Case of Sacco and Vanzetti** Speaker: Professor David A. Schum, George Madison University
Session H 1:00 - 4:00	**Sample Size and Power Determination in Clinical Trials** Speaker: Dr. Janet D. Elashoff, Adjunct Professor of Biomathematics, UCLA; Director, Division of Biostatistics, Cedars-Sinai Medical Center

Wednesday, December 11

Session I 8:30 - 11:30	**Graphical Disasters: How to Construct or Avoid Them** Speaker: Dr. Howard Wainer, Educational Testing Service
Session J 8:30 - 11:30	**Applications of Multivariate Analysis** Speaker: Professor Alvin C. Rancher, Brigham Young University
Session K 1:00 - 4:00	**Improving Small Sample Behavior in Some Commonly Used Survival Analysis Procedures** Speakers: Robert L. Strawderman, University of Michigan, and Martin T. Wells, Cornell University
Session L 1:00 - 4:00	**How to Detect and Handle Outliers** Speaker: Boris Iglewicz, Temple University

Short Courses **December 12 - December 13**

Two Short Courses will be offered simultaneously. Registration includes (1) buffet ticket each day; (2) refreshment breaks per day; (3) handouts and, (4) textbook.

Short Course I 8:30 - 4:30	**Group Sequential Methods in Clinical Trials** Course Instructor: Dr. Kyung Mann Kim, University of Michigan
Short Course II 8:30 - 4:30	**Recent Developments in the Analysis of Mixed Models** Course Instructor: Professor Ronald R. Hocking, Texas A&M University

For more information, please call either Professor W. Latzko (201) 868-5338 or B. Graziano (908) 218-2762 or the Metropolitan Section ASQC.

Advancement to Grade of Senior

If you are currently an ASQC member who meets the following eligibility requirements, you should apply for Senior Member status. The constitutional requirements under Article II - Membership Section are:

Section 2.4 Senior Members:

2.4.1 A Senior Member shall have demonstrated growth and accomplishment in the quality profession or the allied arts and sciences and shall meet the following general requirements:

1) Have ten (10) years of active experience in the profession. Four (4) years of the requirement may be satisfied by graduation from an accredited institution.

2) Be a Member in good standing for at least the past one (1) year.

3) Have qualified in one of the ways described below:
   a) Administering engineering or inspection work applying the principles of quality control for at least two (2) years.
   b) Teaching quality control or the allied arts and sciences at an accredited institution for at least two (2) years.
   c) Being a Senior Member or comparable grade in a recognized professional engineering, technical or scientific society.

All eligible Members interested in advancing their membership status should contact ASQC at 1-800-248-1946. Ask the Customer Service Representative for item number BO130 to receive your application. Δ

Mini Paper

SMOOTH WORK FLOW LOWERS COMPLEXITY AND RAISES YOUR OUTPUT

By Tim Fuller and Annabeth Propst

Abstract

Is your operation plagued with high inventory, low productivity, late shipments, or missed project deadlines? Do you experience high variability in the length of time it takes to complete an order or finish a project? If so, the problem may be in the way you organize your resources to do the work. Work flow balancing may lead to significant reductions in the problems listed above. This paper presents some basic concepts for improving work flow and shows how two different organizations have implemented them.

Variation is the Root of all Evil

Many organizations have ignored the concept of variation when designing their work flow. Their resource capacities are designed assuming that everything will happen according to plan. That:

⇒ Machines will not break down,
⇒ Parts will not need to be scrapped or reworked (or the level of scrap or rework is predictable), or
⇒ Unexpected events will not occur.

In short, they act as if unexpected disruptions to the work flow do not happen. It is common to see organizations set resource capacities at the average expected workload in each step of a multi-step process.

In the real world, significant disruptions occur all the time. Shipments from suppliers are late, machines break down, key people become ill unexpectedly, and production levels vary constantly. When capacity is maintained for the average workload, management has a strong need to ensure this capacity is utilized so as not to lose production. In order to protect themselves from these unexpected variations, organizations add buffers (either time buffers or inventory buffers) to allow one operation to continue working even though other operations may be disrupted. However, buffers add significantly to the complexity of the operation, increase cycle time, and add costs. A careful analysis of a typical manufacturing or service organization usually reveals that the buffers are often unnecessary, too large, too small, or in the wrong place. These buffers often overload the system's resources.

How Overloading a System Leads to Excess Complexity and Cuts Throughput [1]

In the early 1980s, Hewlett Packard's Computer Systems Division assembled printed circuit boards for HP3000 computers. The various assembly departments -- automatic insertion, hand component assembly, wave soldering, hand soldering, touch-up, test, and repair -- had the capacity to handle the average work load and could use overtime in order to expand capacity and catch up after a disruption. When bottlenecks appeared and could not be handled with overtime, capacity was added to the operation in which the bottleneck occurred, growing the department, piecemeal, over time. Each work area in the assembly department held several days worth of work-in-process inventory (WIP) as a buffer to ensure production workers were never idle.

Work orders for 20 to 200 circuit boards began, based on the start date from the MRP system. Often however, industry shortages caused one or more components to be missing when the kit of components was given to the workers. Standard procedure was to complete as much of the work as possible and then hold partially assembled circuit boards until the missing parts arrived. Supervisors spent a significant amount of time expediting late parts to keep the work flowing so due dates could be met. Cycle time for an order of circuit boards was 20-25 days on average. Figure 1 gives a representation of the situation.

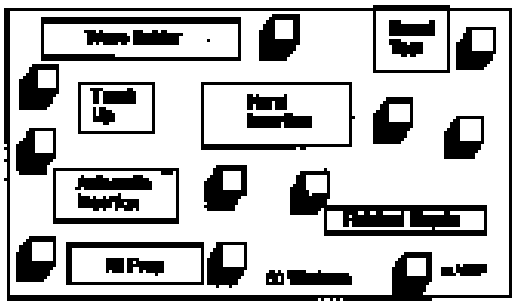

Figure 1. Printed Circuit Assembly – Old Policy

After a 1981 visit by Dr. Deming, managers became convinced that long manufacturing cycles were a significant source of variation in the process and should be shortened. Management decided to study work order cycle time to learn more about how the process was operating and the causes of the long cycle time. They found that for most of the 25 days of the manufacturing cycle, partially completed boards were waiting for backordered parts or busy resources. The managers decided that if they waited to start production until all the parts were in hand, the cycle time could be significantly reduced. They asked the workers who made up kits to hold the kits in front of the assembly process until all component backorders were cleared. This meant that assembly would start much later than before. Production Control was concerned that this would result in many late deliveries. Management pushed ahead, believing that a later start would actually improve the situation.

The new plan was implemented and incomplete kits were no longer delivered to the assembly department. The immediate effect was a large queue of incomplete kits waiting for backordered parts. After one week, most of the work-in-process inventory in the department had been used up. Now, many production workers were idle as they waited for complete kits to be delivered; some were loaned to work in other parts of the division as everyone waited nervously to see what happened.

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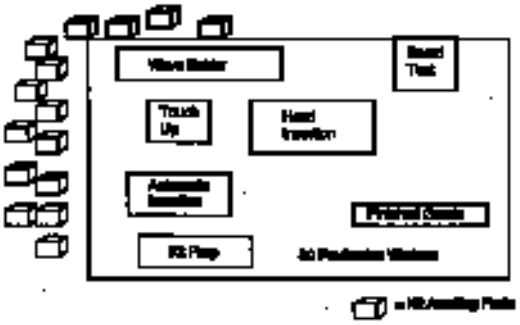
After three weeks, the system had stabilized (approximately the same number of work orders were being completed as were being started) and the following effects were observed:

1. When a complete kit was received, people started work on it immediately and kept working on it until it was done. Cycle time was reduced to 5 days or less and the variation between actual and required completion date was greatly reduced. Even though orders were started two to three weeks later there were fewer orders behind schedule.
2. A large number of incomplete kits surrounded the assembly department.
3. Expediting inside the department had stopped.
4. Empty work-in-process shelves were being dismantled and removed. An effort to create a computerized WIP tracking system was now unnecessary and was abandoned because virtually all the work in the department was being worked on.
5. Although the volume of shipments remained unchanged and 15 of 60 production workers were being loaned out to other departments, there was still significant idle time in the department. The manager performed a quick study and found that it took only half as many people as before to do the work!



Later analysis showed that the old policy of starting work with incomplete kits added a tremendous amount of work to the department. Some activities that had been eliminated through improved work flow included checking kits for missing parts, determining partial assembly plans, putting unfinished work aside (this was a major chore because each circuit board had to be placed into a plastic bag to protect it), re-setting up a job, and prioritizing and scheduling the backlog. The cumulative effect of the department's original policy of overloading the system (in hopes of keeping everyone busy and getting work out on time) was to reduce the productivity by 50% (see figure 2).

The department now needed only 30 production workers instead of 60. In the short term, extra people were put to work on quality improvement projects or cross-trained to help in other parts of the division. Over time these extra people were absorbed into other jobs within the division.

Goldratt's Theory of Constraints Model

In the mid-1980s, The Goal and other works by Eli Goldratt helped people focus on constraint management as a way to maximize throughput and minimize costs and inventories given existing variation in the production system. Goldratt's models are helpful in explaining how such dramatic results were achieved in the previous example with a minor change in operating policy.

According to Goldratt, the goal of any production operation should be to increase throughput (He defines throughput as sales minus the costs of raw materials and categorizes direct labor as an operating expense). He suggests that if you want to increase profits, you should focus on raising throughput rather than on reducing costs or cutting inventories. Goldratt's system helps by placing buffers in the right places, making them the right size, and eliminating the complexity associated with overloading the system. His model also identifies the specific points in a process that should be improved first to provide the greatest impact on the system. Companies that follow Goldratt's principles of constraint management report decreases in cycle time and more consistent delivery times. In The Goal Goldratt presents his five focusing steps to improve work flow.

1. ***Identify*** the system's constraint(s).
2. Decide how to***exploit*** the system's constraint(s)
3. ***Subordinate*** everything else to the above decision.
4. ***Elevate*** the system's constraint(s).
5. ***Warning***!!!! If in the previous steps a constraint has been broken, go back to step 1, but do not allow INERTIA to cause a system's constraint.

Identification of the constraint requires finding the resource that is limiting the throughput of the operation. A key indicator is a constant backlog of ready-to-process work (recall from the previous example that under the old policy, much of the WIP was waiting for components and was not ready to process). To exploit the constraints, ensure that the constraint is always busy processing "real" work. Subordination of the other resources may require additional capacity in some departments or protective buffers. A meter or artificial constraint matching the capacity of the real constraint may be placed in the process to avoid overload if the level of incoming work varies significantly. (Metering ramps on freeways are an example of this principle.)

Elevation of the constraint may be achieved by purchasing more of the resource, reducing non-productive time, or off-loading some tasks to non-constraint resources. In some cases it may be desirable to always operate with the same constraint. In these cases, non-constraint capacities should be adjusted prior to adjusting the constraint. In the printed circuit board example, the new policy elevated the capacity of all the resources so there was no constraint inside the department.

If you implement Goldratt's model, you create a production system that balances the flow of the work rather than balancing the capacity of the various resources. The effects of designing your system in this way can be dramatic – production up, costs and assets down. You can easily construct simple simulations to demonstrate the effectiveness of Goldratt's principles in increasing throughput and decreasing inventories and costs.

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Theory of Constraints Applied at Malloy Lithographing

Malloy Lithographing, a book printer in Ann Arbor, Michigan, has adopted these principles to improve their service to customers. They have selected the expensive presses as a permanent, logical bottleneck and organized the other resources to supply a consistent flow of work to keep the presses busy. In the press room, the watchword is "keep the presses busy printing high quality pages." In other departments, the goal is to keep the work moving along. A WIP backlog is maintained in front of the presses to ensure they are always busy. There is no focus on keeping non-bottleneck resources busy. If there is no work to process in these departments, employees switch to back-up projects or help out in other areas. In addition, Malloy has added a sophisticated metering system at the beginning of the operation to control the flow through the entire operation and avoid overloading the system during busy periods.

The change to this new system was no easy task and required cooperation from everyone in the plant. Staff members needed education about the purpose of the new system and the underlying principles. Project teams in each non-constraint department had to figure out how to process all the work they received within 24 hours to keep the work flowing to and from the constraint without large buffers. Press operators worked on projects to reduce set-up time, reduce scrap, and take other actions to keep press output as high as possible. Many discussions were held and experiments performed to develop a metering system that served customer needs and worked well internally.

Constraint management techniques have helped Malloy make a significant reduction in the time it takes to complete all the steps necessary to prepare, print, bind, and ship a book. Cycle time has decreased by one third; on-time delivery performance has nearly doubled. Dave Booth, Manager of Quality and Systems at Malloy, feels their new system is helping and makes these comments about their experience:

> "In order for people in non-bottleneck areas to adjust in response to what's happening in the system, they need both good information and a good understanding of how the whole system works. Recognizing and providing this has been management's biggest challenge."
>
> "Our ability to understand what's going on in our system is better because work moves faster and feedback is more apparent. When we make a change, we see the results more clearly and quickly. This allows us to make better use of experimentation, which lets us improve more rapidly."
>
> "The impact of problems is greater now because there is less work in process to absorb the resulting variation. On the other hand, this fact serves to increase our commitment to find and eliminate the sources of problems rather than work around them."

Final Thoughts

This article does not cover all of the possible techniques for work flow management and only briefly covers implementation of constraint management principles. Goldratt's model helps to maximize throughput with minimum costs at a given level of process variation. Variation reduction in every intermediate process and process input quality will provide further gains. (This includes variation in product quality, process time, and production rates.) This will allow you to reduce the size of your buffers and, in certain situations, help you increase throughput.

Another technique, alluded to in the Malloy case study, is to design a logical constraint into your organization, rather than allowing it to happen. You then design your operation around the desired constraint and grow or shrink the organization in a coordinated way. In organizations where a particular resource is very expensive, it may be advantageous to consider this approach.

Although the two case studies discussed in this paper are about manufacturing, these techniques work just as well in non-manufacturing settings. The need for work flow management may, in fact, be even greater in the service industries because the flow of work is "invisible." However, the lack of visibility makes the identification of constraints much more challenging.

About the Authors

Tim Fuller is a work flow consultant with Fuller Associates and Annabeth Propst is a business improvement consultant with Quality Transformation Services.

[1]Fuller, F. Timothy "Eliminating Complexity From Work: Improving Productivity by Enhancing Quality." National Productivity Review (Autumn 1985): 327-344.
[2]Goldratt, Eliyahu M. The Goal. Croton-on-Hudson, NY: North River Press, 1984.
[3]Goldratt, The Goal, 307.

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ASQC Statistics Division
Job Openings and Member Interest Form

Job Openings

We currently need volunteers to serve in the following positions:

1. Publications Committee – Acquisitions Coordinator

If you are interested in volunteering for one of these positions, please fill out the form below and send it to:

Past Chair Nancy Belunis
Merck & Company
One Merck Drive 735-1107
Whitehouse Station, NJ 08889-0100

In addition, proposals for newsletter Mini-Papers and Basic Tools articles are always welcome.

Member Interest Form

Name:_____ Date: _____

Title:_____ Member No. _____

Address:_____

_____

_____

Phone_____ Fax: _____

E-mail: _____ Membership: ___ Reg. ___ Sr. ___ Fellow

Education/Certifications/Experience:_____

Time Availability/Company Support:_____

Please check or circle all areas of interest:

___ Education Committee
___ Examining Committee
___ Membership Committee
___ Awards Committee
___ Certification Committee
___ Program Committee
___ Standards Committee
___ Newsletter Committee

Positions include: Annual Quality Congress (AQC) Division Session Manager, AQC Short Course Chair, AQC Technical Paper Reviewers, AQC Topic Session Manager, Fall Technical Conference (FTC) Technical Program Chair and FTC Short Course Chair.

___ Publications Committee

Positions include: Acquisitions Coordinator, Glossary Editor, Briefings Editor, How-To Series Editors and New Products Coordinator.

___ Other: _____

_____

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UPCOMING NEWSLETTER DEADLINES

Issue	Vol.	No.	Due Date
Winter '97	16	5	Nov. 18, 1996
Summer '97	16	6	May 27, 1997
Fall '97	16	7	Aug. 16, 1997

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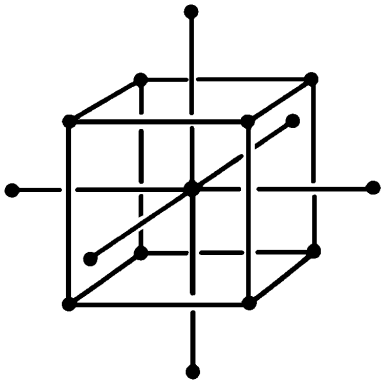

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