

EMGT 835 Field Project Report

SIX SIGMA FOR NON-PROFIT ORGANIZATIONS

By

Diana L. Fiddick

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Dr. Robert Zerwekh
Committee Chair Date

Herbert Tuttle
Committee Member Date

Cliff Cross
Committee Member Date

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Executive Summary

Although non-profit organizations, such as healthcare, education, recreation, welfare, religious and culture agencies rarely think of themselves as business, they share a lot of traits with for-profit businesses. They must attract customers, must generate and manage income, manage staff, buildings, machinery, and provide services that the customer desires.

There has been recognition in the world for the need for quality management practices in non-profit organizations. The United States, United Kingdom, Europe, Austria, the Netherlands, Asia and Eastern Europe all have quality awards for non-profit agencies. The guidelines for the Baldrige National Award in the United States are very similar to the quality awards for non-profits throughout the world.

Six Sigma tools were chosen for use with Midwestern Church (not real name) in preference to ISO9001 and the Baldrige criteria. The desire was to start with a small project in which there was a good chance for success in hopes that future projects would be attempted. ISO9001 and the Baldrige criteria were too large of a scope for an organization without an initial quality management system.

A team of support staff at Midwestern Church chose inter-staff communications as their improvement project. When the communication process was mapped, it was found that e-mail

was the main method of communication and business was rarely discussed at staff meetings, rather Bible study occurred.

Three improvements were suggested:

- Time deadlines were added in the subject lines of e-mails of the team members
- MicroSoft Outlook training to optimize the e-mail system was offered to all staff members
- Staff meetings were structured to discuss business

The first two improvements were partially implemented and slight improvements in communications were made among the team members as a result. Because there was little support from upper management (clergy), there was limited success in the first two improvements and the third was never implemented.

Despite this it is believed that the project was successful. Some staff members who were not part of the first training have requested and received Outlook training. Two focus group using techniques similar to those used in this project are being formed to obtain attendee (customer) input concerning worship services that are losing attendance.

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List of Principal Symbols and Nomenclature

- Affinity Diagram – a diagram that shows the relationship between similar attributes
- ANOVA - Analysis of variance - a statistical technique for analyzing data that tests for a difference between two or more means by comparing the variances *within* groups and variances *between* groups
- Benchmarking – comparing an organization with similar organizations in order to strive for best in class results and to learn best practices from high achieving organizations.
- Best Practices – those practices that have been successfully implemented in organizations and shared with similar organizations
- Brainstorming – Team activity to generate ideas for further study
- Checksheets – Tool in which discrete events are recorded
- Control Chart - Statistical process control tool used to determine control limits of a process and monitor a process
- CTQ – critical to quality
- DFSS - Design for Six Sigma, the process is designed to produce a quality product as perceived by the customer
- DMAIC - Steps in a Six Sigma process, Develop, Measure, Analyze, Implement and Control
- DMADV - Define, Measure, Analyze, Design, Verify. Design for Six Sigma for new product/service introduction

- Design of Experiment – Using statistical tools to maximize the application of data in order to obtain the most information from the least amount of data
- Error Modes and Effects Analysis (EMEA) - A procedure in which each potential error made in every sub-process of a process is analyzed to determine its effect on other sub-processes and on the required accuracy of the process
- Hidden Factory - The notion that much of the endeavor of the company that is not quality minded is directed inadvertently to creating waste and performing wasteful tasks - examples of wasteful activities are the production of non-conforming products and the holding of excessive stock.
- House of Quality -the first matrix in a four-phase QFD (Quality Function Deployment) process. It's called the House of Quality because of the correlation matrix that is roof shaped and sits on top of the main body of the matrix. The correlation matrix evaluates how the defined product specifications optimize or sub-optimize each other. Called a matrix diagram in this application.
- Kaizen - Americanized as "Continual Improvement." A closer definition of the Japanese meaning of Kaizen is "to take apart and put back together in a better way."
- Lean Six Sigma - emphasizes things critical to quality, and gives less emphasis to things that are not a concern for the customer. The purpose is to provide speed, low cost and high quality.
- Likert Scale - A rating scale measuring the strength of agreement with a clear statement. Often administered in the form of a questionnaire used to gauge attitudes or reactions.

- Pareto - A bar chart that displays by frequency, in descending order, the most important defects. Proper use of this chart will have the cumulative percentage on a second y-axis (to the right of the chart).
- Outlier – value outside the control limits of a control chart. Generally due to special cause variations.
- Process Mapping – visually representing the steps in a process
- SIPOC - Suppliers, inputs, process, output, and customers
- Voice of the Customer – the preferences and dislikes of a customer as applicable to a product or service.

(The numerous sources of the definitions of and applications of these terms were found in ASQ publications and presentations as well as presentations at University of Kansas as noted in sources as well as the Six Sigma Quality Dictionary.)

Chapter 1

Introduction

The scope of project and reason to do this project

The goal of this project is to improve the processes of a non-profit organization using quality tools. The original idea for using Six Sigma to help non-profits came from the work of ASQ Outreach Chairman, Gene Kelly (Kelly). He, Heather McCain, a Six Sigma Black Belt Trainer for Hallmark Cards and national committee member of American Society for Quality - Quality Management Division, and others have worked to train the Topeka, Kansas Area United Way Agencies using a pilot project to teach Six Sigma tools. The project was well received and is continuing. Inspired by these efforts, the purpose of this paper is to investigate use of quality tools in other non-profit organizations.

Although non-profits rarely think of themselves as businesses, they share a lot of similarities with for-profit businesses. They must attract customers, must generate and manage income, manage staff, buildings, machinery, and provide services that the customer desires. Nonprofit organizations must compete in the marketplace for funds and for competent people. For this reason, the Six Sigma quality management system is applicable to non-profits.

By implementing and completing a Six Sigma project and training team members in the techniques so that they can tackle other improvement processes, the team members will be encouraged to design and complete improvement projects on their own.

What kind of organizations are typically thought of as non-profit?

In their journal article (Wilderom and Jodlerma), “The Netherlands in the Twenty-First Century: High-Quality Management of Private, Non-Profit Organizations”, Wilderom and Joldersma listed healthcare, education, recreation, welfare and culture agencies as typical non-profit organizations. Religious organizations should be included in this list. The Roman Catholic Church is considered the largest non-profit organization in the United States.

The economic impact of non-profits is tremendous. Allen Clyde (Clyde) reported in January/February 1994 *Foundation News* that non-profit organizations accounted for over 10.4% of the employment in the United States, providing more jobs than all US automakers and employing more workers than currently belong to labor unions in the US. The non-profit sector's employment earnings between 1977 and 1990 rose from \$75.9 billion to \$254.8 billion.

What are the traits of a successful non-profit agency?

The "customer", in the case of a non-profit, is defined both as a patron that might donate funds to the organization or the person using the services provided by the institution. For a hospital, for example, the patient would be a customer because he or she uses the services of the organization. In order to be successful non-profit organizations need to differentiate themselves in order to attract more supporters and please their patrons.

Non-profits also face challenges attracting and retaining quality employees since they may not be able or willing to compete with the salaries offered by their for-profit counterparts. Making the organization a satisfying place to work, therefore, becomes more important for non-profits.

How is a non-profit different from a for-profit business and how does this affect their approach to quality systems?

In his article (Parker), "Non-profit prophets: Strategy in Non-Commercial Organizations", Lee Parker discussed some of the key differences between for-profit businesses and not-for profit (NFP) organizations. In the article, published in the July 1998 issue of Australian CPA, he said:

“The most characteristic of an NFP, compared to a commercial organisation, is that its primary mission is to provide some form of human service activity which primarily impacts on the quality of life. Where shareholders in commercial organisations have a fair degree of ultimate control (especially institutional shareholders, and even small shareholders who are vocal at annual general meetings) over major strategic decisions taken by the latter, NFP 'ownership' can be quite complex and confused. The members of

an NFP may or may not be the actual owners; even if they are, the assets may constitutionally be destined for other groups if the NFP is wound up. If they are unhappy with an NFP organisation's strategic directions, the owners tend simply to leave rather than attempt direct intervention.”

As Parker indicates, in the real world of non-profits, members tend to change to a different church, patients to go to another hospital and parents tend to move or send their children to another school rather than try to effect change in the organization.

Because there are so many stakeholders in the non-profit, that is the staff, the patrons and those served, there are often quite different views about the mission and vision of the organization. For example, the mission and vision of the staff may correspond more with their personal beliefs than the overall vision of the organization. Because of pressures of the economy and competition from other non-profit organizations for funds, some non-profits are having to expand their revenue base to include steadier forms of income or cut back on programs. There is a natural conflict between wanting to provide the most service to the stakeholders possible and the need to be financially responsible.

Chapter 2

Literature Review – Quality and Non-profits

The worldwide recognition of the need for quality management systems for non-profits

Countries worldwide have recognized the need for quality management systems for non-profit organizations. Some of these countries are listed below.

United States

Recent Congressional legislation added a general non-profit category to the already existing education, healthcare and “normal business” categories of the quality award system of the United States, the national Malcolm Baldrige Award (Baldrige National Quality Program).

Implementation of this category is expected in 2006. This new category resulted from American legislators recognizing the need for quality in non-profits. (<http://www.quality.nist.gov>)

A score is given to the organization based on seven criteria:

- Leadership
- Strategic planning
- Customer and Market Focus
- Measurement, Analysis and Knowledge Management
- Human Resource Focus

- Process Management
- Business Results

United Kingdom

The UK Quality Award, originating in February of 1994, was an award designed only for “for-profit” organizations. Non-profit organizations were quickly added as eligible institutions in 1995. The main premise of the United Kingdom Quality Award is the use of self-assessment to lead to quality improvement. Because of its basis in self-assessment, even very small organizations can use the criteria to show improvement with limited resources. Regular and systematic internal audits are also essential in the UK system. Similar to the Malcolm Baldrige, the assessment has criteria and is scored with a maximum of 1000 points available. The UK Quality Award has nine criteria, including resource management, leadership, customer satisfaction and business results. Some UK non-profits that have benefited from the award are the Army Equipment Support Organization, the South Clamorgan County Council and the Benefits Agency, that administers government programs. (www.efqm.org)

Austria

It was reported in the Journal of Services and Marketing,(Anonymous) that the National Prize for Certified Quality, based on the European Total Quality Management Model was introduced in Austria in 1987. It was considered more of a quality mark, not unlike the Good Housekeeping

Seal of Approval, rather than a quality award. However, as a result of the prize, the local education authority in Austria began promoting Total Quality Management (TQM) concepts to foster improvements in primary, secondary and vocational schools.

The prize is administered by the Austrian Association for Promotion of Quality and evaluation is based on nine criteria: functional quality, aesthetic quality and design, environmental friendliness, energy efficiency, operational efficiency, innovativeness, quality assurance system, product presentation and exportability.

Europe

The Journal of Service Marketing (Goodman) reported that the European Foundation for Quality Management (EFQM) is developing European Quality Awards (TEQA) requirements for non-profits as well as small businesses. EFQM is a not-for-profit foundation headquartered in Belgium that manages and directs the prestigious European Quality Awards and Levels of Excellence.

EFQM, founded in 1988 by the Presidents of 14 major European companies (Bosch, BT, Bull, Ciba-Geigy, Dassault, Electrolux, Fiat, KLM, Nestlé, Olivetti, Philips, Renault, Sulzer, Volkswagen) with the endorsement of the European Commission, has grown to include over 700 members. The European Quality Awards were established to provide a European framework for

quality improvement systems similar to the American Malcolm Baldrige Award and Japan's Deming Prize.

The European Model for Business Excellence, now called the EFQM Excellence Model was introduced in 1991 and first awarded in 1992. Like the Baldrige Award, it is based on organizational self-assessment and like the Austrian prize there are nine criteria. These are Leadership, Policy & Strategy, People Management, Resources, Processes, Customer Satisfaction, People Satisfaction, Impact on Society, and Business Results. The maximum score for the TEQA is 500 points. Non-profit organizations are eligible for this award.

The Netherlands

In the past, non-profit organizations in the Netherlands (Townsend and Gebhardt) were supported financially and protected from market competition by the government. Financial support by the government typically constituted 65 to 95 per cent of the total support received by non-profits. The government began withdrawing from this role in the 1980s, leaving hundreds of thousands of private non-profit agencies at risk. Because of the withdrawal of support, non-profits had to become more market oriented in order to compete for scarcer funds. As a result the agencies found that they needed to listen to the desires of the customer more effectively to survive. The non-profits also had to become more process oriented, starting the process with the input, which was information from the customer. Research has shown that the effectiveness of the contact between the non-profit agency and the customer directly correlates to the perceived value of the non-profit to the customer.

Asia and Eastern Europe

Asian and Eastern European (Martinson and Hosley) health care systems have traditionally been government agencies but are transitioning to the status of non-profit agencies. In Hong Kong, for example, the Hospital Authority was established. The system consisting of nearly two dozen hospitals was studied as reported in the Journal of Systems Management (Martinson and Hosley). Martinson and Hosley protected the anonymity of the group by giving it an alias of “New Baltic Hospitals” It represented a typical hospital system within the new Hospital Authority. “New Baltic” had to adjust to drastic reductions in public subsidies and the need for greater accountability to the community that it served. “New Baltic” was drastically reorganized in order to increase quality through market focus, efficiency, cost-consciousness and better information management. The hospitals began to build a strategic information system to gather and analyze data on their processes, patients and donors. Because most of the stakeholders were involved in the process, there was little resistance to the massive changes and significant progress was realized.

Chapter 3

Literature review -Quality Systems

What are the choices of quality systems for use with non-profit organizations?

Three alternatives will be discussed:

- ISO9001
- Malcolm Baldrige
- Six Sigma Methodology

ISO9001 and Malcolm Baldrige fit within the general framework of the Total Quality Management system; therefore Total Quality Management will not be discussed as a separate system.

ISO9001

The most important thing to remember about ISO9001 is that it is a quality business management system not just a Quality management system. The requirements of ISO9001 apply to the entire organization and not just the quality department. The ideas incorporated into ISO9001 make good business sense for any business.

The first clause pertains to required documentation.

These document requirements include:

- Quality policy and objectives – this illustrates what is to be accomplished and how the organization intends to achieve the goals. This would include the mission and vision of a non-profit organization.
- Quality manual – this may be as little as three to five pages. It could be a map to connect the ISO standard to the organization’s documentation. It illustrates how the organization conducts business.
- Documented procedures – Often companies depend on tribal knowledge held by long-term employees. Processes are often not well understood. Documented procedures ensure that tribal knowledge is available and there is a documented process to improve. Also, mapping a process often reveals non-value-adding steps that might be eliminated. It is not unusual for stakeholders to have different views of the process and none of the views be completely accurate.
- Effective planning, operation and control of processes – Often the phrase “Failing to plan is planning to fail” is quoted. Effective planning, operation and control of processes are core to any business implementation and efficient use of resources.
- Controlled documents and records ensure that changes are controlled and approved.
- Management must be committed to establish, measure and control the business. If management is not committed then the system will not survive. People will resort to older more comfortable methods.

- Establish a relationship with customers and patrons and use the information to improve service and customer satisfaction. This makes good business sense in all instances.
- Assign responsibility and authority and communicate internally. If no one is responsible and no one has authority, there is chaos.
- Manage resources well.
- Employees are competent and well trained.
- Infrastructure shall be present to support service requirements. This might include a building, chairs, lighting and duplication machines, etc.
- Beginning to end of project models must be established that include planning, design and control of the project. Rushing with an underdeveloped project is a common problem. Often the process does not perform as desired or technical support is lacking.
- A process must be established to ensure that the service provided matches the requirements and the process must be under control.

Measurement and use of the information to continually improve processes is required in the following areas:

- Measurement of customer satisfaction is a key factor in the viability of an organization.
- Use of information from Internal audits – Determine if the organization is following the processes as documented. If not, the process needs to be followed or modified.
- Preventative and corrective actions – Determination is made as to whether problems are really solved. To paraphrase Einstein, it is silly to keep doing the same thing over and

over and expect different results. Mistakes become opportunities when learning results from them and can prevent them from occurring again.

- Continual improvement – Is there improvement or just status quo, or worse still, only fire fighting (crisis management) is occurring.

Malcolm Baldrige National Quality Award

Not unlike Sputnik decades earlier, a 1980 NBC television white paper, “If Japan Can Do It, Why Can’t We?” was a wake-up call to America. American business was being threatened by Japanese industry. Earlier opinion that “Made in Japan” indicated low quality was replaced by the opinion that Japanese products were of high quality and less expensive than domestic brands. Support grew for a national quality prize similar to Japan’s Deming Prize, first awarded in 1950. Tom Peters and Bob Waterman urged American business to follow the examples of other US business in the book In Search of Excellence.

Malcolm Baldrige, the Secretary of the Department of Commerce under President Ronald Reagan was concerned with quality (Grobman). Legislation designed to establish a national quality prize was introduced in early 1986 and remained in congressional committee. It was proposed by spring of 1987, that the National Bureau of Standards (now NIST) administer the award but no further action took place until the death of Baldrige on July 25, 1987, in a bull

riding accident at a rodeo. Legislation creating the award was enacted and named after the late Secretary of Commerce.

Dr. Curt Reiman of the National Bureau of Standards was chosen to help establish the Baldrige Award criteria. Dr. Reiman was a member of the American Society for Quality Control (ASQC) (now ASQ, American Society for Quality) and used his knowledge of quality systems to establish the seven categories for the criteria. Dr. Reiman also lobbied other quality subject matter experts for their input and endorsement. His dedication resulted in the release of the Baldrige Award criteria in January of 1988.

Joseph Juran and Armand Feigenbaum, noted quality experts, showed support for the award from the beginning. Juran felt that buying stock in Baldrige winners was a good investment. Later analysis of the financial achievement of the winners did indeed show superior financial results for the winners as compared to Standard and Poors stock market average performance.

The award had its critics. One of the most notable being Dr. W. Edwards Deming, who believed that no American organization was good enough and no one in America was knowledgeable enough to choose the prize winner. This is unlike the Deming Prize which has very prescriptive criteria. Deming believed that his method was the only one method that led to true quality.

The president of ASQC wrote an editorial in the March 1987 Quality Progress criticizing the new award. Philip Crosby objected to the self-nomination for the award in favor of customers nominating recipients.

Many companies would disagree with Crosby, saying that they learn and improve due to self-evaluations in preparation and as a result of the award.

The Malcolm Baldrige system (<http://www.quality.nist.gov>) is a graduated system – not a go-no go system like ISO. Scores are given for seven different categories with 1000 points possible.

The business results area is the most heavily weighted area. Many companies do self-assessments and are audited on a state level prior to applying for the award. With each iteration, the company learns more about how to improve through feedback reports.

Terrie Bauer, RN, BSN, CPHQ, Director of Quality Resources for St. Luke's Hospital in Kansas City, reported in a joint meeting of Kansas City chapters of the Institute of Industrial Engineers (IIE) and ASQ on December 7, 2004, that St. Luke's Hospital believes that their payback has been five to six fold for every dollar spent to earn the 2003 Malcolm Baldrige Award.(Bauer)

The Malcolm Baldrige Award is a continual improvement process. The goal is to continually increase the organization's score and as a result continuously improve. Scores of under 200 are not unusual for companies just beginning to implement Malcolm Baldrige and the goal of many companies is to improve their scores by improving their systems.

Six Sigma

Six Sigma is a continual improvement system of tools not just a basic system. The root meaning of the term of Six Sigma comes from statistics. Sigma is a standard deviation on a normal curve. Six Sigma is six standard deviations, from the mean to the nearest specification limit. If a process is in control to the Six Sigma level, there are only 3.4 defects per million opportunities.

The meaning of Six Sigma as a management system goes much deeper than that. Six Sigma takes quality tools and new concepts and unifies them into a system that is designed to improve and redesign processes in order to provide higher quality, lower cost and higher customer satisfaction.

One common Six Sigma method is known by the acronym “DMAIC”. It has five components.

- Define – map the processes
- Measure – determine a metric that makes sense to measure what needs to be measured.
Pre-change and post-change measurements are taken to determine the effect of the change.
- Analyze – use the data and process map to determine where and how improvements can be made

- Improve – try one or more ideas. Use Design of Experiment to test ideas most efficiently. Take post change measurements.
- Control – make sure that the process is controlled – otherwise employees slip into old habits.

Six Sigma has several subsets, for example:

- Design for Six Sigma – design quality into the product or process early in the development. It has been documented that as much as 80% of the life cost of a product, such as inspection, rework, warranty costs, etc. can be saved if quality is built into the product during design
- Lean – do first things first, use resources for maximum results. This might entail using a Pareto diagram to rank importance or a House of Quality matrix to incorporate cost, importance and likelihood of a specific event that affects quality.
- Measure - Improvements are often measured in dollars and cents in Six Sigma. Dollars and cents may not always be the correct measurement vehicle. Customer satisfaction can only be measured indirectly using money. Experiments are designed to get maximum information from a minimum of trials.
- Statistical process control and system capability– Is the process in control? Is the duplicating equipment capable of making the copies that are needed? If not, the process will need to be changed.

- Scoreboards and Kanban– Visible metrics – how is the company doing and what is needed? Often cards in the card shop have a cardboard insert that says “order now” or the last checkbook in the box has a cover sheet with ordering information. These are types of Kanban systems. It is an ordering reminder system.

Scoreboards can be posted results or may look like the dashboard of a car with arrows and gauges. They are easily seen indicators of how things are going.

Six Sigma Quality Tools

Most of the Six Sigma tools are traditional tools that have been used for years. The following tools have been used in this project:

Affinity Diagram

ANOVA

Benchmarking

Best Practices

Brainstorming

Checksheets

Control charts

Design of Experiment

House of Quality (Matrix)

Hidden Factory

House of Quality Matrix

Kaizen

Likert Scale

Pareto Diagram

Process Mapping

Statistical Analysis

Teams

Voice of the Customer

None of these ideas are really new but they are unified into the Six Sigma system of processes.

The main difference between Six Sigma and other systems is that measurements are taken before making a change and measurements are also taken after the change to help decide if the change has been helpful.

These and new tools have been assembled in the Six Sigma sub-systems that design (DFSS), implements and improves (DMAIC, SIPOC and lean Six Sigma), using these tools in a systematic manner. DFSS - Design for Six Sigma, the process is designed to produce a quality product as perceived by the customer. DMAIC outlines the steps in a Six Sigma process, that is Develop, Measure, Analyze, Implement and Control. Design for Six Sigma of a new product or service introduction is called DMADV for Define, Measure, Analyze, Design, Verify. Inputs through outputs are illustrated using SIPOC - Suppliers, inputs, process, output, and customers.

Management Support

Over and over again sources for this study have emphasized that whatever system is to be implemented needs management support. Without management support, no system will be fully implemented. One vendor was attempting to obtain ISO9001/TL9000 certification and management was not supporting the changes that were required in the system. As a result, despite two years work in attempting to implement the system, the company did not meet certification criteria.

Chapter 4

Why Choose Six Sigma as a Quality System to Implement in Non-Profit Organizations?

Several non-profit organizations that have successfully used Six Sigma. A growing number of non-profit hospitals use Six Sigma to improve processes. The comments of Elizabeth Keim, the president of ASQ were recorded in the professional journal, *Hospitals & Health Networks* 77 (Scalise):

"People sometimes think the Six Sigma process is more complicated than it really is," says Elizabeth M. Keim, president of the American Society for Quality, Milwaukee, which, in conjunction with the National Institute of Standards and Technology, administers the Malcolm Baldrige National Quality Award and is developing health care-oriented Six Sigma materials. But Keim argues that the program is particularly

appropriate for reducing medical errors. "Health care is taught to look at the system. That's exactly what Six Sigma does," she says.

The number of hospitals using Six Sigma has increased significantly since 2000. One example is Franklin Hospital Medical Center, North Shore-Long Island Jewish Health System, Great Neck, N.Y. The system's Six Sigma teams have completed seven projects, resulting in a \$226,000 annual savings. Emergency Department hold-time for patients were reduced by implementing a notification system to alert staff to available beds. The lessons learned at Franklin Hospital Medical Center are also applicable to other non-profits. Dagmara Scalise reported the following lessons learned:

- Because many processes flow across functions, communication is vital.
- One department's issues impact other departments.
- Projects must be scoped down into manageable chunks.
- Monitoring is a critical step to sustaining improvement.

Six Sigma was used to improve the safety of anticoagulant use at Memorial Hospital, Virtua Health, Marlton, N.J. The purpose of improving the safety of anticoagulant use to reduce the number of catastrophic heparin dosing errors. The 92-step process was mapped, standard procedures to ensure that patients were weighed and initial lab results were reviewed and performance was measured. Once again poor communication was a factor in process variability. An average of 198 minutes was saved per case as well as \$166,000 to \$406,000 annually while increasing the safety of the process.

Fifteen SunHealth alliance hospitals in North Carolina, Texas, West Virginia, Louisiana, and Florida recently used Six Sigma tools to reduce delays in all steps of being treated at an emergency room (Davis and Patrick). They used benchmarking, process mapping, voice of the customer and measures of processes to decrease patient wait time, ensure that the patient is triaged, assessed and treated in order of need. Lessons learned were shared using the Six Sigma tool, Best Practices.

Saul (Groban) gives three examples of non-profit organizations using benchmarking and communicating Best Practices.

- The Museum of Contemporary Art in Chicago regularly benchmarks its fundraising events against other majority city museums.
- Care USA benchmarks from within and shares Best Practices
- Strive, a welfare-to-work program is considered the benchmark for similar service organizations.

The United Way Agency’s Eight Step Process is very similar to DMAIC, as illustrated in Table below :

United Way’s Eight Steps	DMAIC
Get ready	Define

Choose outcomes to measure	Measure
Specify indicators for the outcomes	Measure
Prepare to collect data on the indicators	Measure
Try out the outcome measurement system	Measure
Analyze and report the findings	Analyze
Improve the system	Improve
Use the findings	Control

Why a quality initiative at a church?

Philip Crosby, renowned quality expert, brought quality initiative to his own church. Dr. Larry Kennedy, assistant pastor at the church where he attended, was hired by Crosby to manage his philanthropic contributions. Kennedy attended many of Crosby’s classes and later consulted on quality issues for non-profits. Kennedy and Crosby’s efforts resulted in quality initiatives at their church. (Grobman)

Why Six Sigma At Midwestern Church?

Midwestern Church (fictitious name for a real organization) is a well established, large, mainline denominational suburban church. The weekly attendance averages 1,000 per week. There are typically seven services each Sunday. The church is very charismatic in its approach.

The sluggish economy made it especially important for the Midwestern Church to use good stewardship in the managing of their funds. In many cases giving has not increased sufficiently to cover needs. Therefore it is especially important for organization to manage its resources in order to be most effective using the funds that are available.

Since the costs to operate the church have increased faster than its donations, Midwestern Church is facing a possible significant shortfall in funding for 2005. At the same time the demographics of the customer base (worship attendance) has changed dramatically, increasing the need for services such as addition of service times, childcare, church school, educational and Outreach programs (such as Alpha, a basic Christianity course) due to needs of attendees. Increasing the efficiency of processes and increasing customer (attendee) satisfaction are ways to reduce costs and increase income.

The staff of Midwestern Church includes clergy, children's ministry, worship arts, parish nurse, support staff, pastor for small groups and Outreach ministries.

The Executive Pastor (the chief administrator, or business manager) and the support staff of Midwestern Church enthusiastically supported the idea of a project, but there was little support from ministry groups. Therefore, it was thought that a successful Six Sigma project might be the beginning of the implementation of many more improvement projects. The hope was that a simple, successful Six Sigma project could help persuade the other Midwestern Church ministry groups that Six Sigma projects could foster improvements.

Midwestern Church was in no way ready to implement a whole quality system, but was open to experimenting with one improvement project. For this reason, TQM, Malcolm Baldrige and ISO9001 were too ambitious for a beginning quality initiative for Midwestern Church.

Chapter 5 – The Project

Procedure and Methodology

Getting Started - Team Building

Just as management support is needed, so is teamwork. (Cooper and Noonan) A team can accomplish things greater than the sum of the works of all individual team members. After working many years with quality and teams, Nancy Cooper and Pat Noonan support the use of teams to accomplish quality objectives such as Six Sigma projects. They believe teams are an integral part of successful Six Sigma implementation. They concluded from their research that teams are critical to the success of Six Sigma projects. One example of success is Merrill Lynch in New Jersey, where Six Sigma was successfully incorporated into the firm's team excellence criteria. The interaction of team members leads to the best tactics and best practices possible.

For this reason the Six Sigma project at Midwestern Church began with a training in team building and quality techniques.

The first step was to define and assign roles and responsibilities for the team.

The Executive Pastor chose the members of the team. Most of the members were support staff.

The size of the team varied from five to seven members.

At the first meeting the following roles were defined and assigned as follows (Schhottes, Joiner, Striebel) (Tuttle) :

- Champion – Need management support
- Coach – Encouragement and guidance
- Facilitator or leader – leads the meeting
- Time keeper – start and stop on time, keeps team on track
- Notetaker – takes minutes, records commitments and meeting feedback
- Scribe – To write or draw on board or easel tablet
- Team members – member with specific talents to improve process

Next the members were taught techniques to come to decisions.

The techniques discussed were:

- Multi-voting – vote more than once, each time narrowing the choices
- Nominal Group techniques – give and take structured problem-solving or idea-generating strategy in which individual's ideas are gathered and combined in a face-to-face non-threatening group situation. Ideas might be written down or opinions might be given round robin.
- Consensus – come to a conclusion that is acceptable to the group.

The team must check for agreement of the person performing task so ensure that he/she has buy-in to the idea so he/she will support the team.

Next the team discussed proposed rules

The team decided on the following rules:

- Critique the idea and not the person.
- No “frogging, bogging, or hogging”. (no jumping from subject to subject, no dwelling on a subject and no monopolizing the conversation)
- Be on time.
- Send a delegate if you cannot attend.
- Ask items to be placed in the parking lot if they are better discussed off-line.
- Allow each member to give his or her opinion.
- Complete assignments on time.
- Base decisions on facts and not emotions.
- Abide by time constraints.
- Begin and end meetings with prayer.
- Have fun.

The next step in team building was getting to know something about each other.

Several options were considered such as an ice breaker, paired introductions, favorite hobby or recreation, learning to drive stories. The team decided to tell two truths and a lie (Tuttle) and guess which was which. Although, the team members had worked together for over a year, they were able to learn more about each other through the exercise. This exercise helped build team identity and cohesion.

The Team is Smarter than I – The Shipwreck Exercise

The purpose of the next step was to “prove” that the team together is smarter than the individual. There is a strong tendency to want to retain strong control on the area of work. This exercise was designed in order that the team members might be more open to trying team suggestions.

The teams were given an exercise, modified from a Sprint University of Excellence training, (see Appendix) in which individuals chose the most essential items from a list of materials available for surviving being shipwrecked in the tropics. After the individuals made his/her choices, the list was reviewed again as a team. The team then re-ranked the items in order of importance based on consensus. The individual and team results were compared with the Coast Guard’s ranking by adding the absolute value of the difference between the rankings of the individuals and the team when subtracted from the Coast Guard rank. The team scores for all teams in this

exercise was smaller, confirming that the team performed better than the individual. There is a similar exercise that was presented at the University of Kansas, Edwards Campus, during the Kansas City ASEM Chapter's Team Workshop, October 2004. That exercise concerned surviving in the Arctic. Generally in such exercises, unless an individual is a subject matter expert, the team is more successful.

DMAIC – Step 1 Define

Learning about and using Six Sigma Tool - Brainstorming

The team was asked to brainstorm ideas for a process improvement project for Midwestern Church. They were asked to:

- Brainstorm for three minutes what processes can be improved.
- Judge no ideas during brainstorming
- Be creative
- Consider that “crazy” ideas just might be the solution
- Write their ideas on Post-it® notes
- Improve processes – do not critique people using the following model for constructive feedback.

They were asked to use phrases when giving constructive feedback such as:

When you...

I feel...

Because I ...

I would like...

What do you think?

(Pause and listen)

The results of the brainstorming are included in the Appendix

Learning about and using Six Sigma Tool - Affinity Diagram

Next all the Post-It® notes were grouped together according to similar categories. It only took the group a few minutes to move the notes around until there was a consensus of what fit together. (see Appendix)

Learning about and using Six Sigma Tool - Decision Matrix (House of Quality)

Next the team members completed decision matrices. They were asked to pick the three processes that they wanted to improve and rank them for each of the three categories using a Likert (ranking from 1 to 5) scale below:

They assigned values from 1 to 5 for three categories

1. How important is it

1 - not very important

5 - very important

2. How often a problem will happen

1- rarely

5- almost all the time

3. How likely are we to fix it

1- not very likely

5- very likely

The products of the assigned value for the three categories were calculated and plotted a bar graph in the decision matrix that represented the value of the product. (see Appendix) Then the team labeled and cut the bar graphs to the representative size and taped the bars together onto a flip chart to represent visually the totals for each proposed process.

Although it was expected that the ideas would need to be considered in more detail, it became clear that the team overwhelmingly favored improving the internal communications process.

When the bars were placed end to end on a graph, the bars representing the internal communications process ran down below the bottom of the flip chart and rested on the floor below.

The results of the decision matrix were plotted using the Six Sigma tool, the Pareto diagram (Appendix)

Map and Understand the Process to be Improved

A survey of communications tools was done to determine what tools were being used. The survey is included in the Appendix.

Second Team Meeting - Definition phase continues

The purpose of the second Team Meeting was to determine what improvements to try and to determine metrics for the areas of improvement. First, the results of the survey detailing the means of communication used by the staff were reported.

Next the team considered which project to do. Guidelines were given for things to keep in mind when picking a project and things to consider in a first project (Schhottes, Joiner, Striebel)

(Tuttle) :

- Is important to the team.
- The first project should concentrate on “low hanging fruit”.
- The chances of early success are good, otherwise, the team would never consider a future project.

- Can be completed within six months
- Metrics should be easily obtained
- Should be financially feasible
- Should be within mission and vision
- Would have management support

Improvement Strategy

For three minutes the team brainstorm how they wanted to improve intra-staff communications.

The results are listed in the Appendix.

The team came to rapid consensus on three ideas to try. The suggestions were:

1. Conduct Outlook training
2. Enter deadlines for action on e-mails in the subject line of the e-mail
3. Conduct staff meetings in which staff business is discussed

DMAIC – Step 2 Measure

It would be easy to want to jump right into change but Six Sigma strategies require the establishment of metrics before and after so that it can be determined if the change resulted in improvement.

Checksheets with Likert Scales were established and team members were asked to rate communications using the following criteria:

1. I communicated and it had a positive affect
2. I communicated and it had a negative affect
3. I could have communicated but did not
4. Some one communicated with me and it had a positive affect
5. Some one communicated with me and it had a negative affect
6. Lack of communication to me had a positive affect
7. Lack of communication to me had a negative affect
8. I did not receive information on time (when I needed it).

The pre-survey can be seen in the Appendix.

Measurements were taken for two weeks prior to the change.

Then the Outlook training was conducted. The agenda and the notes used for the training are enclosed in Appendix.

The team was asked to use the techniques and information obtained for four weeks and then they were given post-change surveys that used the same criteria as the pre-survey.

DMAIC – Step 3 Analyze

The results of the pre- and post-changes metrics were used to construct control charts as seen in the Appendix. Note that due to retirement, resignation, illness and dismissals, the number of participants in the post-change metrics was smaller than the pre-change survey. These results are summarized in the following results:

Results:

- The positive aspects of communications improved.
- The negative aspects diminished in most cases.
- The average number of communications reported per person per day increased.
- Along with an increase in number of communications, there was a slight increase in the times when communication from another had a negative effect.
- There was also less people remaining silent when they had a contribution to make.
- Several outliers were seen in the control charts, which indicated that the process is not in control and special causes are influencing outcomes.

DMAIC – Step 4 Improve

As a result of the initial training, others requested and received Outlook training. More communication occurred and results showed positive effects from the increase in communications.

DMAIC – Step 5 Control

Management support is needed in order to implement and control more rapid replies to e-mail and staff meeting in which communications are stressed rather than Bible Study. A separate time for Bible study is suggested. Also the use of the new Six Sigma and Outlook tools must be encouraged or like the deadline on e-mail messages, it can be extinguished as staff slips into old habits.

Unofficial Step 6 – Celebrate

Although celebration was not found as a Six Sigma tool, a celebration was planned for the team.

Conclusions and Recommendations

- The project was successful in improving intra-staff communications.
- The results of the study should be presented to Midwestern Church for study and recommendations in hopes of getting management support for future projects.
- The answering of e-mails within 24 hours, which is general good business practice, should be implemented.
- Staff meeting should focus on staff business and a separate Bible study be made available at another time.
- Team training should be offered on how to resolve conflict.

Other Outcomes

Other encouraging outcomes have been seen since the conclusion of this project:

- As a result of the Outlook training staff members have reported using the feature of the system to save time and increase efficiency and control.

- Focus groups have been formed to study ways to improve two services that are losing attendees.
- Preparation is being done to study the impact of Alpha training (Basic Christianity course) using metrics.

Recommendations for further study

Some possible areas of further study would be:

- Application of Six Sigma to other types of non-profits
- Application of Baldrige and ISO9001 to churches and other non-profits
- Use of other Six Sigma techniques not employed in this project for non-profits
- Auditing of non-profit organizations for Baldrige and ISO9001
- Implementation of quality management systems in non-profit organizations
- Application of lessons learned from this study in other business settings.

Conclusion - Six Sigma Quality Tools are applicable to non-profit organizations.

In conclusion, the quality tools offered within Six Sigma can be used to choose a process, map it, try an improvement, measuring successes and diminished returns from changes. Then information learned can be applied in order to improve the processes in non-profit organizations as well as for profit organizations.

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Appendix

Shipwreck Exercise

Shipwreck Exercise - You are out at sea and your boat starts to sink. Between the passengers you have three dollar bills, matches, & a package of cigarettes. Rank the items below from most important to least important to put on your rubber raft with oars (no motor). Then work with the team to do a team ranking. Compare to the Coast Guard Ranking. Who did the best?

		Your Rank	Coast Guard Rank	Absolute Value of Difference	Team Rank	Coast Guard Rank	Absolute Value of Difference
1	Mirror						
2	Oil/Gas						
3	Water						
4	C- Ration						
5	Opaque plastic tarp						
6	Chocolate candy bars						
7	Fishing Kit						
8	Rope						
9	Seat cushion that can be used as a floatation device						
10	Shark repellent						
11	Bottle of rum						
12	Transistor radio (receive only)						
13	Maps						
14	Mosquito repellent						
15	Sextant						
			Sum			Sum	

adapted from Sprint University of Excellence Live, Structured Problem Solving, 8-12-2004, Mary Culver

Results of Affinity Diagramming of Brainstorming Post-It Notes (trademark) 8-18-04

Communications - Staff

Information from executive team to staff
Improve communication within staff
Intra-staff communications
Know of events coming up
Better communications between ministries
Internal Communications

Communications - Monthly and Weekly Bulletins

Tidings article editing
Weekly Tidings production - creation through ready to print
Selection of Tidings articles - weekly and monthly
Getting change information on time
Bulletin Preparation
Bulletin Printing and collating

Volunteers

Ways to value volunteers
Volunteer Coordination
Ways to maintain building appearance with volunteers
Get parish to "angel" projects
Communications - volunteers - getting schedules and readings to liturgical assistants and readers

Maintenance

Customer satisfaction - opportunities for positive feedback and not just negative feedback
Light bulb replacement
Carpet, ceiling tile, floor maintenance and painting
Closet maintenance - especially Founders Hall and Disciples Center

Office Supply

Office supply "cabinet"
Ordering paper responsibility
Office supply storage and reuse

Communications In-Parish

Communications to Parish
Better communications piece to parishioners

Rooms

Room Schedule Procedure
Room Set-up

Technology

Establish a computer problem reporting and fixing process
Establish a video production process

Preparation of Manuals

Flowers for Altar

Budget Preparation

Customary Process

MATRIX

1. Pick top three projects that you would like to see done

2. Get one matrix sheet for each of the three (Total of 3)

3. Rate process from not very important to very important

not important very important

1	2	3	4	5
---	---	---	---	---

Value importance

4. Rate how likely that a problem will occur in this process

not likely very likely

1	2	3	4	5
---	---	---	---	---

Value frequency

5. Rate your chances of fixing this process

not likely very likely

1	2	3	4	5
---	---	---	---	---

Value success

6. Multiply Value of importance times value frequency times value success

$V_i \times V_f \times V_s$

7. Write the name of the process you want to improve at the bottom of the column to the right that was identified during brainstorming and that is a category in the affinity diagram

8. Fill in the column to the level that is the product of the value factors
You can color it or put a pattern in it.

9. See example for clarification

125

100

80

75

64

60

50

48

45

40

36

32

30

27

25

24

20

18

16

15

12

10

9

8

6

5

4

3

2

1

Process to improve

MATRIX Example

1. Pick top three projects that you would like to see done
Project A

2. Get one matrix sheet for each of the three (Total of 3)

3. Rate process from not very important to very important

not important very important

1	2	3	4	5
---	---	---	---	---

Value importance

4. Rate how likely that a problem will occur in this process

not likely very likely

1	2	3	4	5
---	---	---	---	---

Value frequency

5. Rate your chances of fixing this process

not likely very likely

1	2	3	4	5
---	---	---	---	---

Value success

6. Multiply Value of importance times value frequency times value success

$3 \times 5 \times 1 = V_i \times V_f \times V_s$

7. Write the name of the process you want to improve at the bottom of the column to the right that was identified during brainstorming and that is a category in the affinity diagram

8. Fill in the column to the level that is the product of the value factors
You can color it or put a pattern in it.

9. See example for clarification

125

100

80

75

64

60

50

48

45

40

36

32

30

27

25

24

20

18

16

15

12

10

9

8

6

5

4

3

2

1

Process to improve

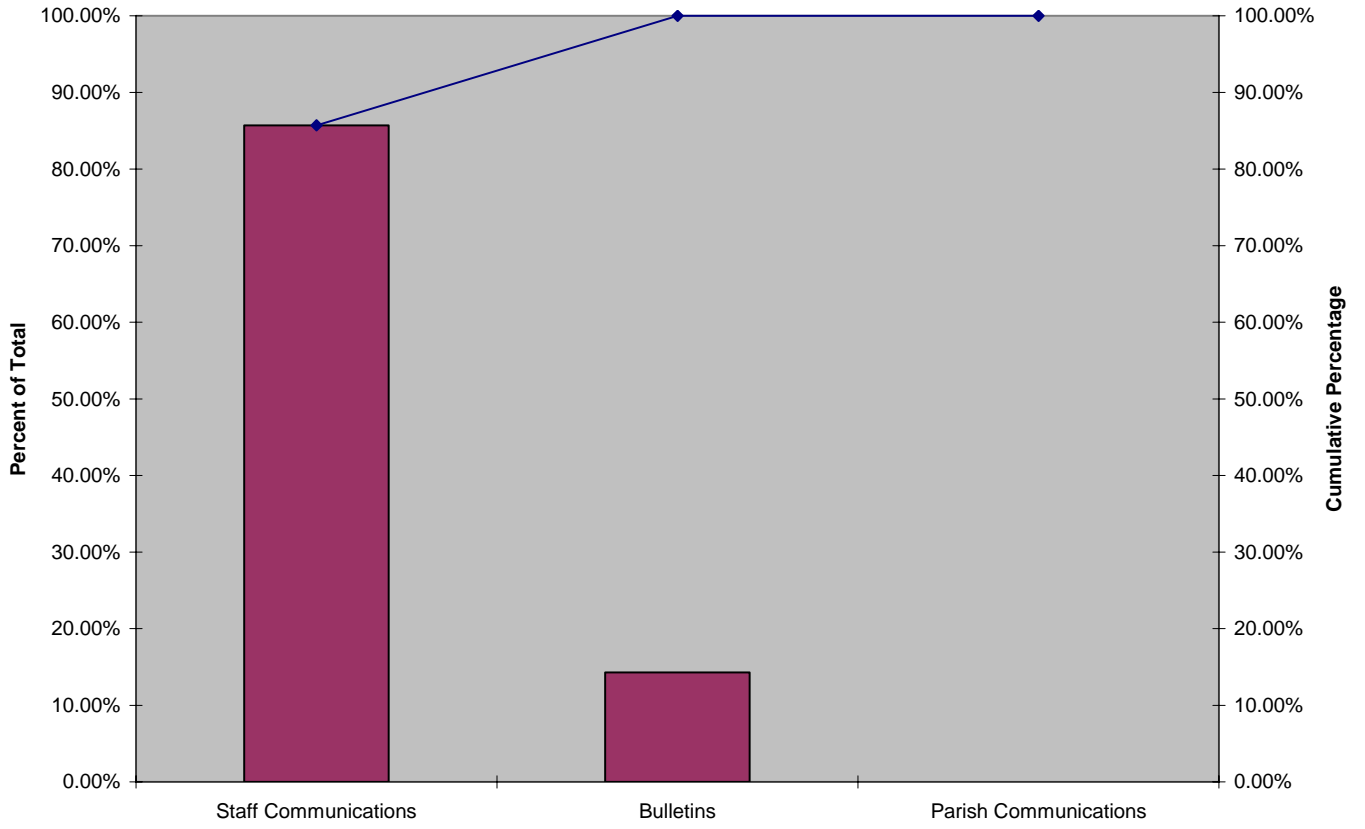
Results of Priority Matrices 8-18-04

Raw Numbers		Percentage	Cumulative
610	Communications	38.83%	38.83%
365	Bulletins	23.23%	62.06%
245	Volunteers	15.60%	77.66%
163	Maintance	10.38%	88.03%
138	Office Supplies	8.78%	96.82%
50	Rooms	3.18%	100.00%
1571	Sum	100.00%	

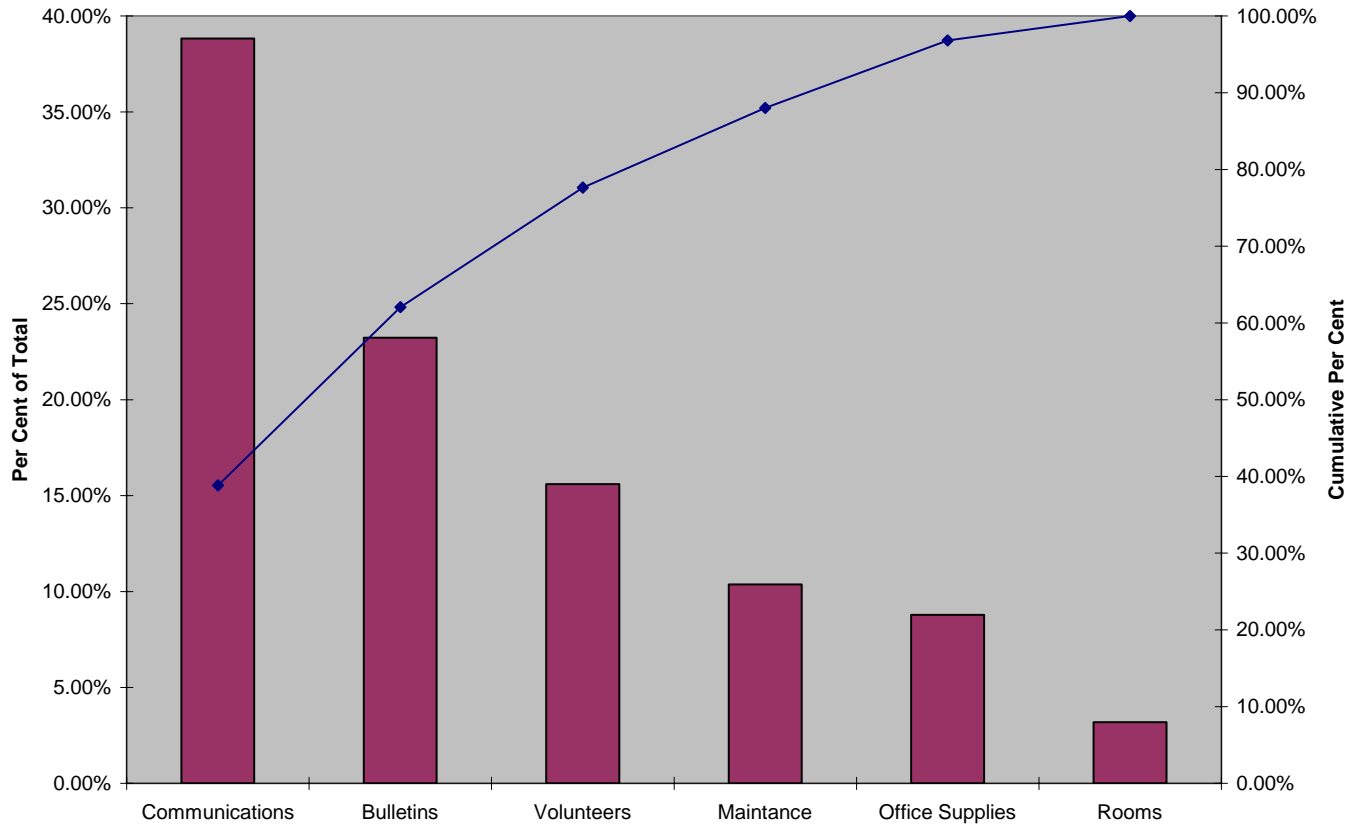
Results of Multi-voting

Raw Numbers		Percentage	Cumulative
6	Staff Communications	85.71%	85.71%
1	Bulletins	14.29%	100.00%
0	Parish Communications	0.00%	100.00%
7	Sum	100.00%	

Results of Multi-Voting



Results of Priority Matrices



MAPPING THE PROCESS

On Wednesday, August 18, 2004, a team of seven Midwestern Church staff members met with me in order to choose a process to improve. Midwestern Church has agreed to help me do a project for my Masters in Engineering Management of applying Six Sigma quality techniques to a non-profit organization. The hope is that the project will be a win-win situation.

The team overwhelmingly choose internal staff communications as a process to improve. The next step is to understand how communications are occurring between staff members at Midwestern Church now. In order to do that I am asking every one on the staff to please complete the following survey.

You may e-mail back your results, call me at XXX or fill out the form and seal it in an envelope and send it back to me. I will not share your specific answers, but will do a summary of the results. Please complete and return the survey by August 31, 2004.

What methods do you use to communicate something to others on the staff – check all that apply

1. e-mail
2. voice-mail
3. phone
4. teaching
5. one-on-one meetings
6. small group meetings
7. staff meetings
8. signs, posters, bulletin, white or blackboards
9. newsletter
10. website
11. chat room or instant messenger
12. make my calendar available to others
13. social – lunch, ball games, dinner, etc.
14. incidental – at copy machine, coffee maker, in bathroom, etc.
15. purposely walk around and talk to people
16. notes or letters
17. other – please specify _____

What methods do you use to get information from others on the staff – check all that apply

1. e-mail
2. voice-mail
3. phone
4. be a student
5. one-on-one meetings
6. small group meetings
7. staff meetings
8. signs, posters, bulletin, white or blackboards
9. newsletter
10. website
11. chat room or instant messenger
12. consult the calendars made available by others
13. social – lunch, ball games, dinner, etc.
14. incidental – at copy machine, coffee maker, in bathroom, etc.
15. people come talk to me
16. notes or letters
17. other – please specify _____

Once we decide what changes to test, we will collect 30 days of pre-change data and 30 days of post-change data. This would consist of a checksheet and should not take over about 5 minutes a day to complete. There would be a short training on how to use the check sheet. I will work with XXX to determine who to ask to complete check sheets. We might ask you to use or not use a specific method during the post-change period. For now, please complete the above survey. Your help is appreciated. Thank you in advance for your help.

Mapping Survey

From You			To You		
Raw Numbers		Percentage	Raw Numbers		Percentage
19	E-mail	100.00%	19	E-mail	100.00%
18	One-on-one meetings	94.74%	19	Phone	100.00%
17	Phone	89.47%	19	Voice Mail	100.00%
16	Voice Mail	84.21%	16	One-on-one meetings	84.21%
14	Staff meetings	73.68%	15	Incidental	78.95%
14	Incidental	73.68%	15	People come talk to me	78.95%
14	Walk around and talk to people	73.68%	14	Staff meetings	73.68%
9	Notes or letters	47.37%	11	Newsletter	57.89%
7	Small Group meeting	36.84%	10	Notes or letters	52.63%
7	Social	36.84%	10	Signs, posters, etc.	52.63%
4	Newsletter	21.05%	8	Small Group meeting	42.11%
3	Teaching	15.79%	7	Social	36.84%
3	Signs, posters, etc.	15.79%	7	Website	36.84%
3	Website	15.79%	3	Consult a non-personal calendar made available by others	15.79%
1	Other	5.26%	2	Be a student	10.53%
0	Chat rooms, instant message, blog	0.00%	1	Other	5.26%
0	Make my non-personal calendar available to others	0.00%	1	Chat rooms, instant message, blog	5.26%
19	Sum	100.00%	19	Sum	100.00%

**Results of Brainstorming
Improving Intra-Staff
Communications**

1. Weekly newsletter for staff only
2. Staff Coffee Hour- Social/Business
3. Carbon Copy rules for e-mail
4. Posted rules of use of contact information
5. Establish phone and e-mail standard operating practices and rules of etiquette.
6. Use correct communications channels to decrease hurt feelings
7. Remove superfluous wording from documents
8. Be precise in communications
9. Establish common office hours for all staff
10. Establish home network connectivity for those who are not in the office Monday through Friday
11. Write detailed project plans with expectations and due dates and e-mail to delegate
12. Send changes immediately
13. Outlook/Exchange training
14. Decision matrix for calling a meeting
15. One on One versus Group Meeting Standard Operating Procedures
16. Field trip around the building to look at common areas
17. Response deadlines on communications (3 people)
18. Pay attention to deadlines
19. Instant messaging
20. Broadcast voice mails
21. Everyone reads and responds to own e-mail (2 people)
22. Real staff meetings and not Bible study (5 people)

Midwestern Church
Basic Outlook Training
December 7, 2004

- 1) Outlook 2000 vs. Outlook 2003
 - a) Training is on 2000, 2003 is similar
- 2) Knowledge assessment
 - a) Who knows what
 - b) List topics to be covered – check what is needed
 - c) Skip items that everybody already knows
 - d) Schedule individual follow-up as needed
- 3) Private Folders vs. Public Folders
 - a) How to browse, etc.
 - b) Find/search
 - c) Adding Folders
 - d) Folder Maintenance
 - i) Archiving
 - ii) Deleting/cleaning-up
- 4) Remote Access
 - a) Outlook Web Access
 - b) Handout
 - c) Example/Navigation
 - d) Practice as necessary
- 5) Adding Contacts
 - a) Global Address Book vs. Contacts folder
 - b) Individuals
 - c) Distribution Groups
- 6) Calendar
 - a) Adding appointments
 - b) Showing “busy” time
 - c) Recurring events/appointments
- 7) Scheduling Meetings
 - a) Composing meeting invitation
 - b) Checking others calendars
 - c) Sending invitation/receiving acceptances
 - d) Accepting automatically adds to your calendar
 - e) Accept or decline
 - f) Changing a meeting
- 8) Sharing folders/calendars, etc.
 - a) Levels of permission
- 9) Hints and Tips
- 10) Questions and additional examples

OUTLOOK 2000 FACT SHEET

Outlook 2000 Setup can be changed using Tools/Options/Reconfigure Mail Support to be:

- No e-mail
- Internet Only
- Corporate or Workgroup

Service provider affects:

- How you log on
- How the interface appears
- How mail is addressed, delivered and stored

To begin

Click Outlook Icon or left click Start/Programs/Outlook

You may have to pick a profile if more than one user uses that computer

Help options

- Contents – browse list
- Index – type in keywords
- Answer wizard – write questions in plain English

Change your assistant

- Click Help/Show Office Assistant/Options/Gallery
- Use back or next to choose
- When done close using “Start using Outlook”

Outlook Today – an overview of the days events

- Can open tasks and use it to alert you to tasks
- Can click on tasks to see detail

Can customize Outlook Today

- Click on Customize Outlook Today
- Choose Folder display
- Set number of days to be displayed on the calendar
- Organize the display of your tasks
- Choose style of Outlook Today
- Then save changes

Short Cuts

- Outlook shortcuts have Icons for Inbox, Contacts, etc.
- My Short Cuts is another group of shortcuts that are in your personal folder
- Other shortcuts can be used to navigate to your computer and any network drives you are connected to.

You can display all of your Outlook folders in a Folder list using View and clicking on Folder list

You can create and customized mail messages in a variety of ways.

To do a new messages or new item

- Action/New mail
- File/New – Mail message or New Mail Button
- Can click down arrow by new and create other items
 - Mail message
 - Post in Folder

Appointment
Meeting Request
Contact
Distribution List
Task
Note
Choose Form

Can select stationary like chess, chicken soup using Action/New Mail Message Using/More Stationary Actions lets you create a message using existing templates

- Action/New Mail Using
- Microsoft Office
- Access
- Excel
- PowerPoint
- Word

Find

- Find/Advanced Find
- Put in Search Criteria
- Click Find Now

Sort

- Can click on heading such as To, Subject, From, Date and will arrange in order.
- You can reverse the order by clicking the heading again.

Auto-archive a folder

- Right Click the folder
- Select properties
- Click Auto-archive tab
- Select Clean out older than check box
- Select time frame
- Click OK

Calendar

Pick a date

- By default on current date, current and next month calendar and tasks
- You can see a specific date by clicking on it
- You can see a whole week by clicking on the ^...
- You can change the view from day to week to month, etc. by clicking the options on the toolbar
- You can scroll to different months using the left and right pointers in the months

New meeting

- Click New in Calendar view or
- Click Actions/New Appointment
- Or double click the time on the calendar
- Enter data into the Appointment tab view such as time, place, subject, reminder, reminder recurrence time, show busy, write information or attach files
- Can make the meeting recurring using recurrence button on the toolbar and entering day of week or month, time, place, etc. then hitting OK to apply.
- Check the availability of others using the Attendee availability tab and invite them to the meeting using invite others for internal attendees. You can have Outlook suggest a time that shows availability using

- Auto Pick and choose if you need all persons and resources available or just required. You can use the greater than and less than arrows to find the next best choices.
- If you check attendee status, you can see whether or not the person has responded and how they responded
 - You can specify equipment needed for the meeting in Resources
 - When ready, you click OK and send and a meeting invitation is sent.
 - If the meeting changes in any way, you can go back in and update the request and send it again. You can open options if you want to make changes.
 - When you are done, you click on send to send the invitations

If you arrange a meeting, it will show up in your calendar.

It will also appear in the calendar of those that responded that they would attend, but is not in the calendar of those that declined unless they choose to enter it manually.

You will receive an e-mail if you have been invited to a meeting.

You will be given the option to accept, accept tentatively or decline. When you click your choice, you may edit a response, send status only or send no response. You can click on the appointment to find out the attendee status.

To change the meeting you can double click to open or right click.

If you choose to remove an attendee, you click on their name and hit delete, then OK. You are given the option to send an update whenever you OK a change in a meeting.

The calendar view can be individualized using View on the Taskbar.

View – Current View – Customize Current View.

- You can change fields, etc. You can add and remove fields using Add or Remove. They can be moved up in the list. When you are done you click OK.
- You can group appointments and show grouping.

You can drag and drop calendar items to your task list, etc.

To make your calendar available to others using File Save as Web Page.

You can specify a start date and end date, add details and name the calendar and select the folder to save to. Be sure to click the open saved web page in the browser then save. (Check with system administrator to ensure that this option has been installed.)

Contacts

You can include the following types of information on contacts:

- General
- Details
- Activities
- Certificates
- All Fields

You can add a contact by:

- Clicking on Contacts and then new
- Clicking on Down arrow of New and click on New Contact
- Click on File/New/Contacts

Fill in information and save and close. You can choose home or business using the address drop down arrow.

You can change a contact by double-clicking on it, making changes and save and close.

You can send contact information as an item attachment in an e-mail or by clicking Actions/Forward while in the Contacts list.

You can send a message to the contact by clicking on the New Message to Contact button on the toolbar or Action/New Message to Contact.

You can change the view using View /Current View/Customize Current View and you can use this field to sort contacts

You can rearrange the order of the phone numbers using the drop down arrow.

You can click on the alphabetical list on the right of the contacts to go to the contact information for those contacts beginning with letter that you select.

You can delete a contact using the X button on the task bar or the delete key on the keyboard.

Distribution List

File/NewDistribution List

Tasks

Add task using File/New/Task or clicking down point arrow on New and clicking on Task or clicking in a field in Task and typing in a simple task or clicking new in the task screen.

You can also drag a task in from another aspect of Outlook.

On the tabbed task page you can add details like due date and time started, status, percent complete.

Reminder will be enabled if there is a due date. You can change the reminder date and time though.

You can click on the Categories box near the bottom middle to choose a category.

If you click private, others can not view it.

You can enter details using the details tab.

Must save and close task when finished. Can double click on it to update it.

You can assign the task to someone else using “Assign Task”. You need to put in their e-mail address and hit send. They can either accept it or reject it.

You can specify to be keep an updated copy in the folder and to send notifications of any changes.

<http://office.microsoft.com/en-us/assistance/HA010552291033.aspx>

Frequently asked Questions

<http://support.microsoft.com/default.aspx?scid=%2Fsupport%2Foutlook%2Ffaq%2Fol20%2Fdefault.asp>

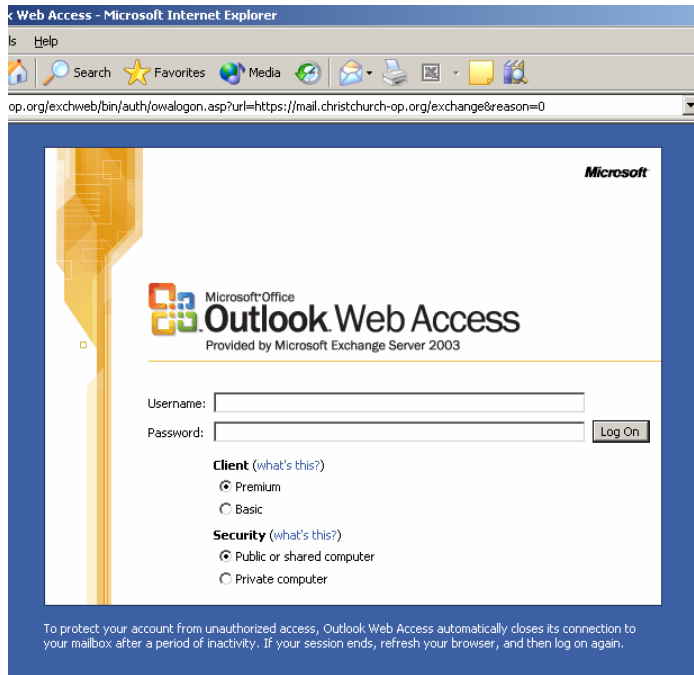
Outlook 2000 Tour

<http://download.microsoft.com/download/4/c/0/4c0fa364-7012-440b-9828-4c9ff6a8cbe3/OutlookTour.doc>

Based on personal notes of author taken while completing on-line Beginning Outlook training course through the University of Kansas and SmartForce.

Instructions for using Outlook Web Access to open your Exchange Server account remotely:

1. From any computer connected to the internet, open your web browser (usually Internet Explorer)
2. Type in the following URL in the Address dialog at the top of the screen:
https://mail.midwestern.org/exchange
3. If you get a dialog box about certificates, answer “yes”



4. At the login screen (see example above) enter the following:
 - a. User name = your Church Logon (usually your first initial and last name)
 - b. Password: enter the same password you use to log into your computer at work.
 - c. Client: Generally, you should select “Premium”. The “Basic” version of OWA reduces the features available and is for very slow dial-up or other low-bandwidth connections.
 - d. Security: If you are using a computer at home, select “Private Computer”. If you are using a computer that other people have access to, select “Public or shared computer”.
5. Once you are logged in, you can access your E-mail, all your personal folders, and all public folders. Any E-mail you read, send, or other calendar or contacts entries you make will be immediately reflected on your desktop at work. You need not shut down your desktop Outlook client to use Outlook Web Access.

Xbar/R Control Charts

Note that these Xbar/R Control Charts are based on the limited data available

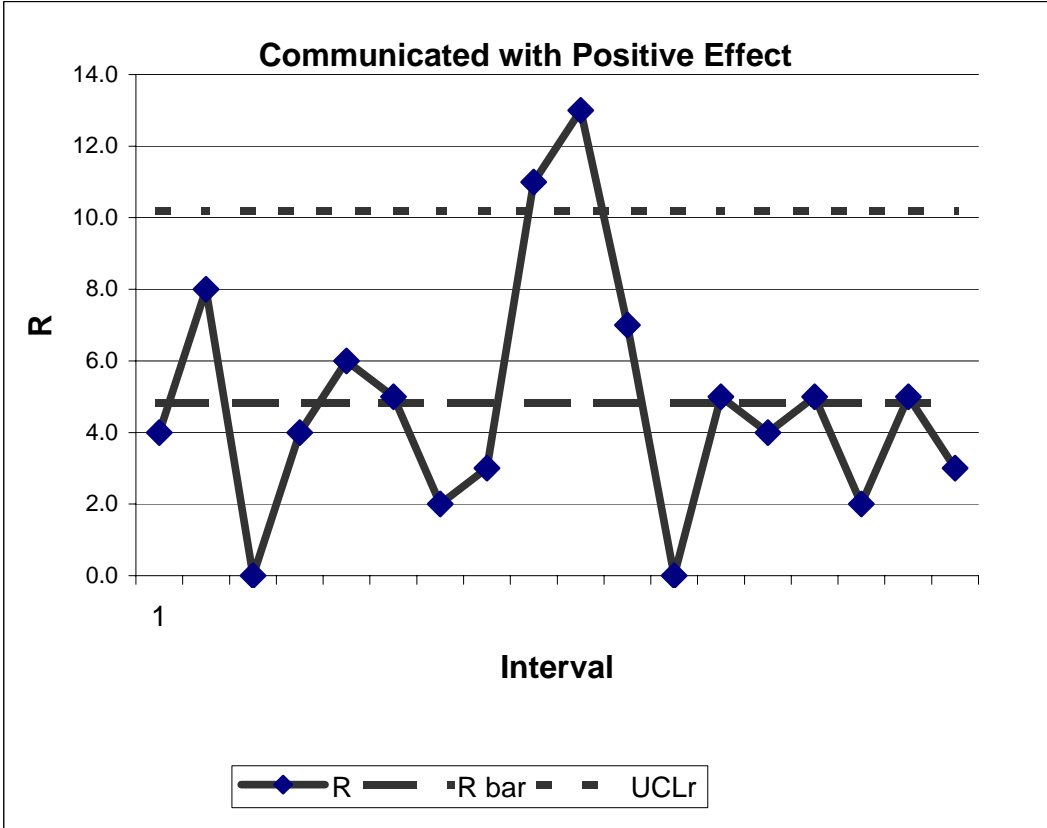
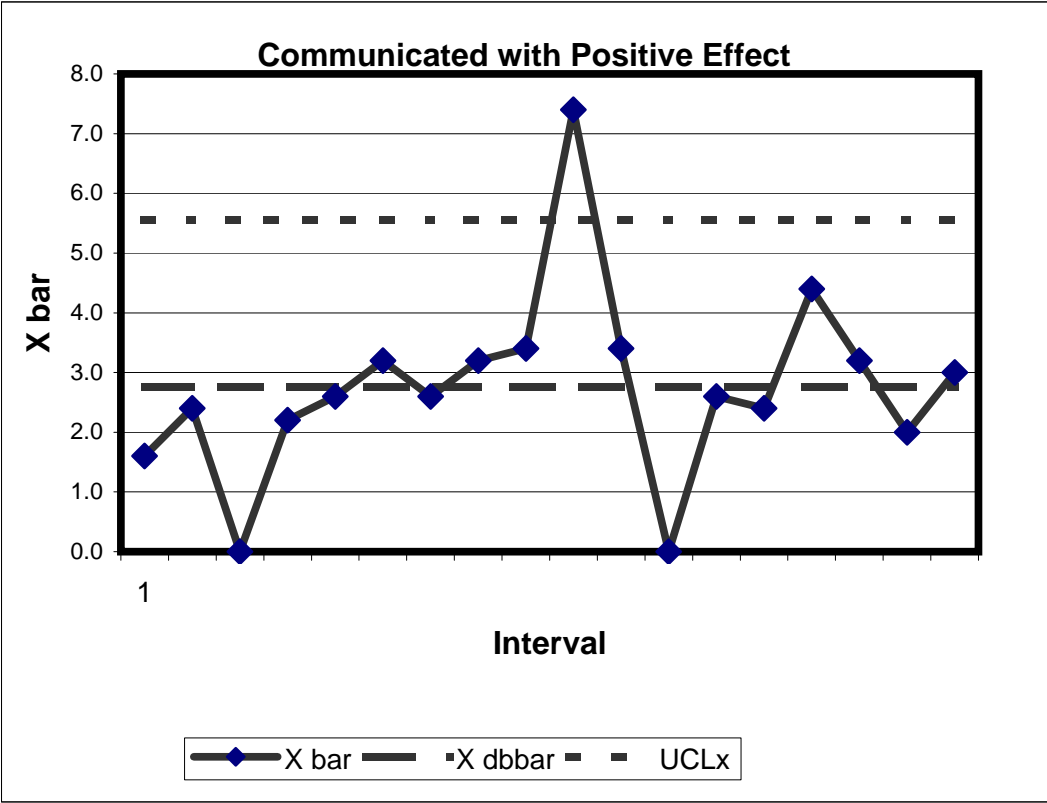
1. I communicated and it had a positive effect

No.	W!M	W1T	W1W	W1R	W1F	W2M	W2T	W2W	W2R	W2F
1	NA	2	1	4	0	11	3	13	15	NA
2	NA	1	3	NA	NA	2	4	3	1	NA
3	NA	NA	8	NA	NA	NA	NA	8	NA	NA
4	1	0	0	0	0	3	2	3	0	0
5	0	0	0	0	0	0	0	0	0	0
6	3	4	4	6	2	5	3	5	5	3
7	2	3	0	3	1	2	1	1	7	NA
8	4	6	2	NA	NA	NA	5	5	2	3
9	4	2	2	3	2	4	2	2	4	NA
10	NA	3	2	3	3	NA	4	0	3	2
11	5	3	0	0	NA	5	0	3	5	NA

Interval	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sum	X bar	R
1	2	1	4	0	1	8	1.60	4
2	3	8	1	0	0	12	2.40	8
3	0	0	0	0	0	0	0.00	0
4	0	0	3	4	4	11	2.20	4
5	6	2	2	3	0	13	2.60	6
6	3	1	4	6	2	16	3.20	5
7	4	2	2	3	2	13	2.60	2
8	3	2	3	3	5	16	3.20	3
9	3	0	0	11	3	17	3.40	11
10	13	15	2	4	3	37	7.40	13
11	1	8	3	2	3	17	3.40	7
12	0	0	0	0	0	0	0.00	0
13	0	0	5	3	5	13	2.60	5
14	5	3	2	1	1	12	2.40	4
15	7	5	5	2	3	22	4.40	5
16	4	2	2	4	4	16	3.20	2
17	0	3	2	5	0	10	2.00	5
18	3	5	2	1	4	15	3.00	3
Total						248	X dbbar 2.76	R bar 4.83

$UCLx = Xdbbar + A2 * Rbar$ $UCLx$ 5.56
 $LCLx = Xdbbar - A2 * Rbar$ $LCLx$ -0.05 0.00
 $UCLr = D4Rbar$ $UCLr$ 10.20
 $LCLr = D3Rbar$ $LCLr$ 0.00

$A2 = .58$
 $D3 = 0$
 $D4 = 2.11$



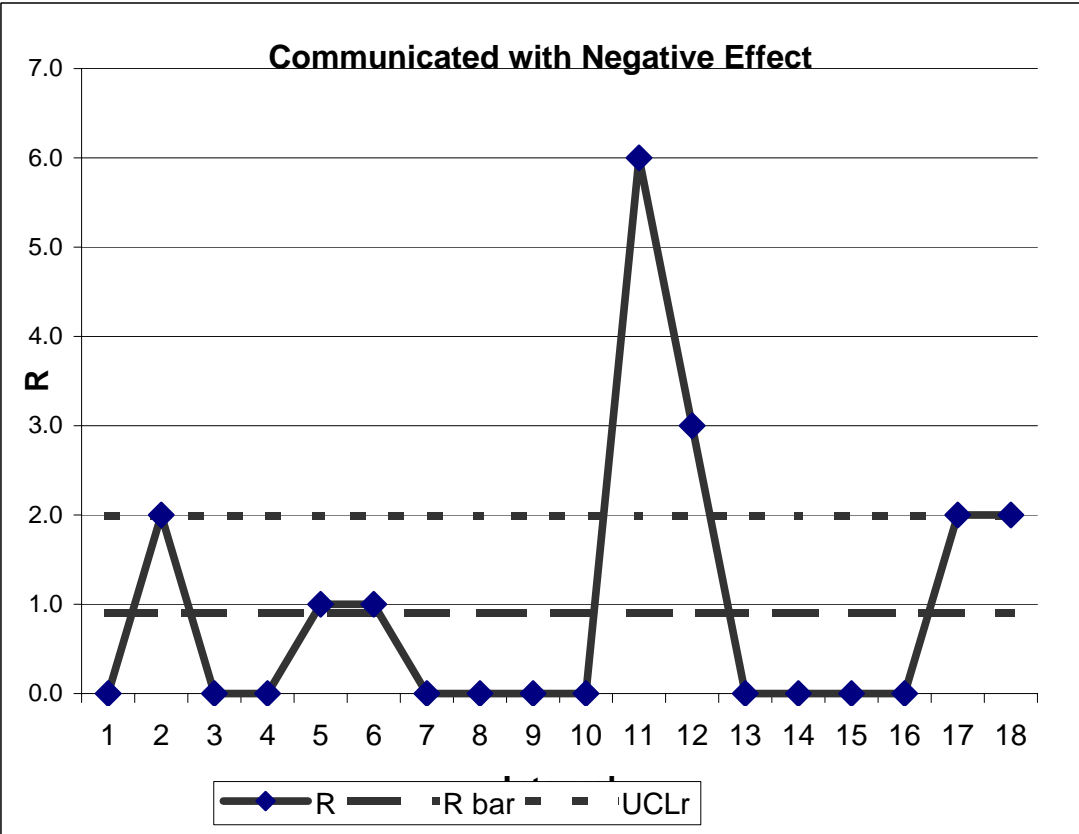
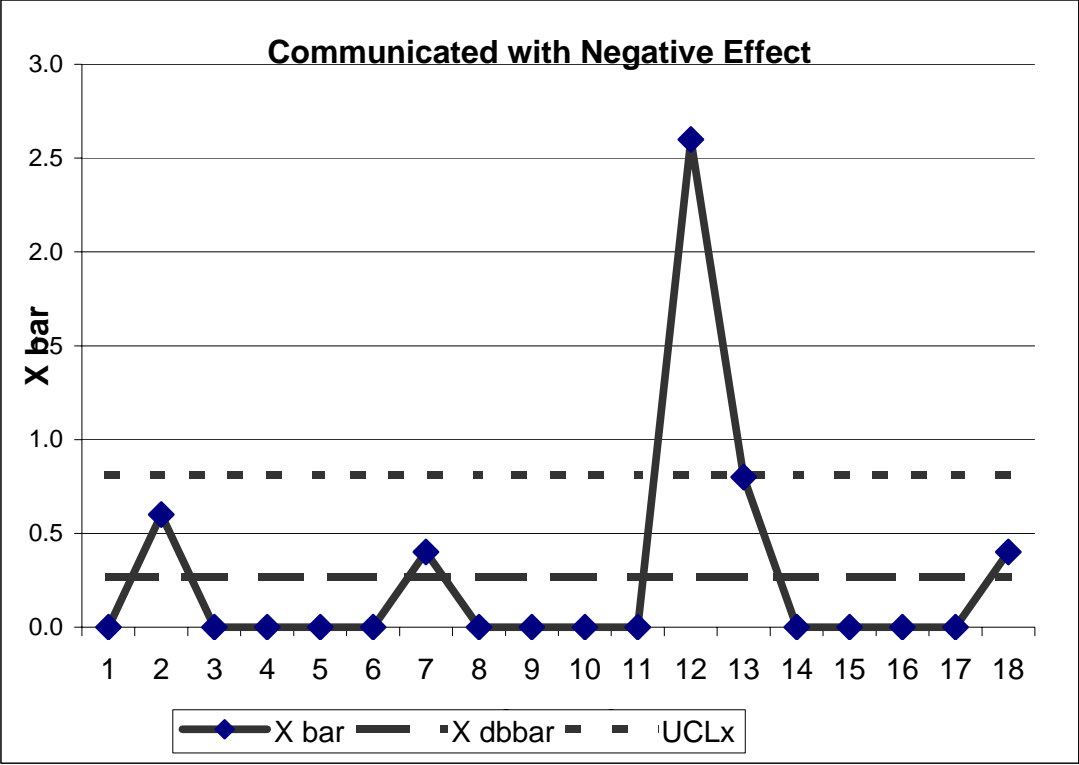
2. I communicated and it had a negative effect

Participant	W!M	W1T	W1W	W1R	W1F	W2M	W2T	W2W	W2R	W2F
1	NA	0	0	0	NA	0	0	0	0	NA
2	NA	0	0	NA	NA	0	0	0	0	NA
3	NA	NA	1	NA	NA	NA	NA	0	NA	NA
4	2	0	0	0	0	6	2	5	3	1
5	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0
7	0	0	1	1	1	0	0	0	0	NA
8	0	0	0	NA	NA	NA	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0
10	NA	0	0	0	0	NA	0	2	0	0
11	0	0	0	0	NA	0	0	0	0	NA

Interval	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sum	X	R
1	0	0	0	0	0	0	0.00	0
2	1	2	0	0	0	3	0.60	2
3	0	0	0	0	0	0	0.00	0
4	0	0	0	0	0	0	0.00	0
5	0	0	0	0	1	0	0.00	1
6	0	0	0	1	1	0	0.00	1
7	0	0	0	0	0	2	0.40	0
8	0	0	0	0	0	0	0.00	0
9	0	0	0	0	0	0	0.00	0
10	0	0	0	0	0	0	0.00	0
11	0	0	6	2	5	0	0.00	6
12	3	1	0	0	0	13	2.60	3
13	0	0	0	0	0	4	0.80	0
14	0	0	0	0	0	0	0.00	0
15	0	0	0	0	0	0	0.00	0
16	0	0	0	0	0	0	0.00	0
17	0	2	0	0	0	0	0.00	2
18	0	0	0	0	0	2	0.40	2
Total						24	X dbbar 0.27	R bar 0.9

$UCLx = Xdbbar + A2 * Rbar$ $UCLx$ 0.81
 $LCLx = Xdbbar - A2 * Rbar$ $LCLx$ -0.28 0
 $UCLr = D4Rbar$ $UCLr$ 1.99
 $LCLr = D3Rbar$ $LCLr$ 0.00

$A2 = .58$
 $D3 = 0$
 $D4 = 2.11$



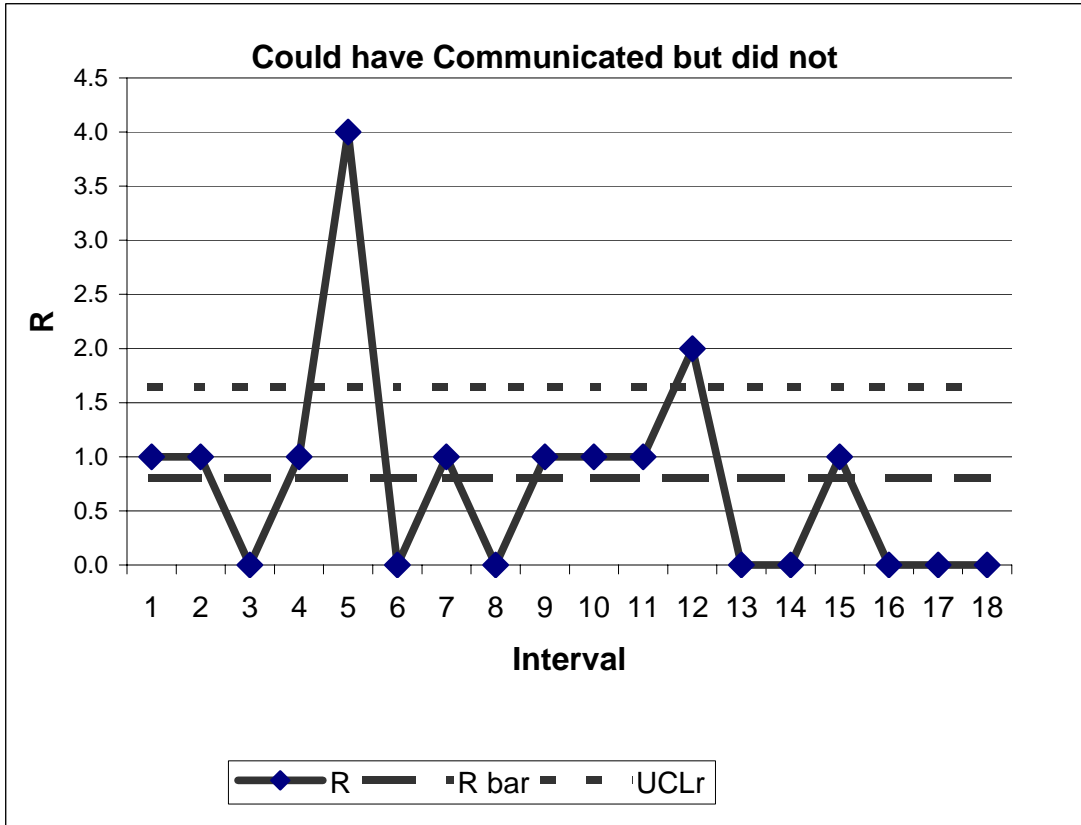
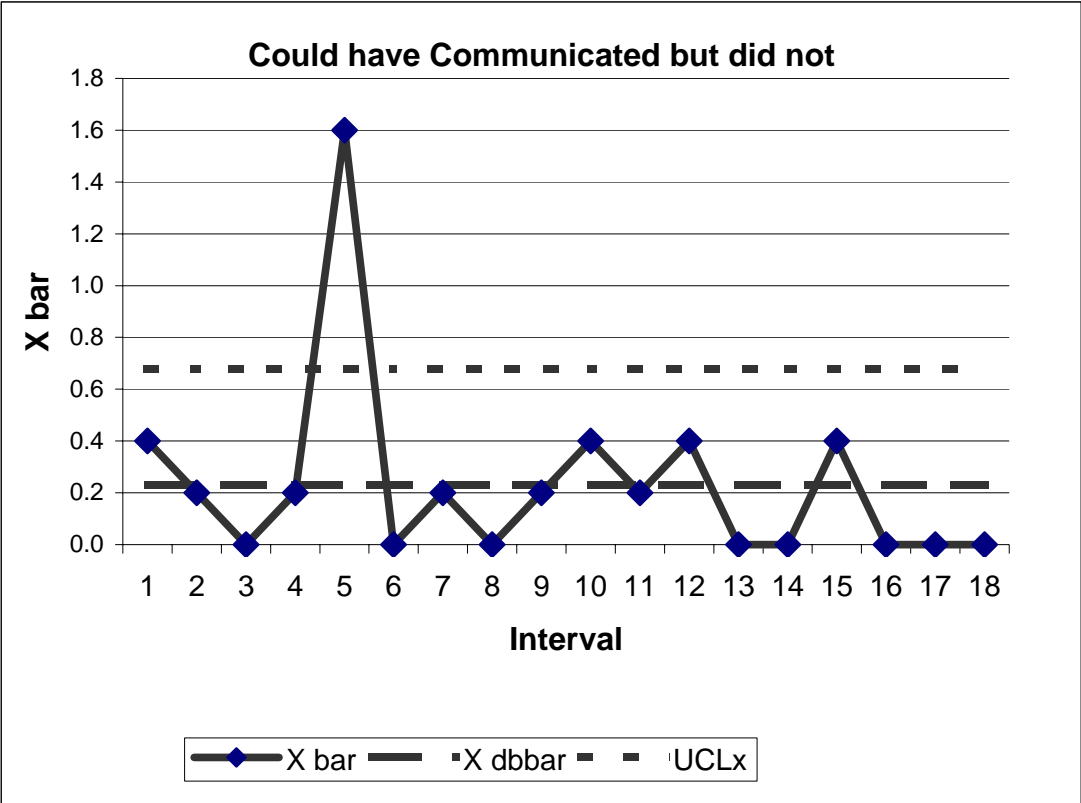
3. I could have communicated but did not

Participant	W!M	W1T	W1W	W1R	W1F	W2M	W2T	W2W	W2R	W2F
1	NA	0	0	0	NA	1	0	0	0	NA
2	NA	1	1	NA	NA	1	1	0	0	NA
3	NA	NA	1		NA	NA	NA	1	NA	NA
4	0	0	0	0	0	0	0	0	0	2
5	0	0	0	0	0	0	0	0	0	0
6	0	1	0	0	0	0	0	0	0	0
7	4	2	0	2	0	0	0	0	0	NA
8	0	0	0	NA	NA	NA	0	1	0	0
9	0	1	0	0	0	1	0	0	0	0
10	NA	0	0	0	0	NA	0	0	0	0
11	0	0	0	0	NA	0	0	0	0	NA

Interval	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sum	X	R
1	0	0	0	1	1	2	0.40	1
2	1	0	0	0	0	1	0.20	1
3	0	0	0	0	0	0	0.00	0
4	0	0	1	0	0	1	0.20	1
5	0	4	2	0	2	8	1.60	4
6	0	0	0	0	0	0	0.00	0
7	1	0	0	0	0	1	0.20	1
8	0	0	0	0	0	0	0.00	0
9	0	0	1	0	0	1	0.20	1
10	0	1	1	0	0	2	0.40	1
11	1	0	0	0	0	1	0.20	1
12	2	0	0	0	0	2	0.40	2
13	0	0	0	0	0	0	0.00	0
14	0	0	0	0	0	0	0.00	0
15	0	1	0	0	1	2	0.40	1
16	0	0	0	0	0	0	0.00	0
17	0	0	0	0	0	0	0.00	0
18	0	0	0	0	0	0	0.00	0
Total						21	X dbbar 0.23	R bar 0.8

$UCLx = Xdbbar + A2 * Rbar$ $UCLx$ 0.68
 $LCLx = Xdbbar - A2 * Rbar$ $LCLx$ -0.22 0
 $UCLr = D4Rbar$ $UCLr$ 1.64
 $LCLr = D3Rbar$ $LCLr$ 0.00

$A2 = .58$
 $D3 = 0$
 $D4 = 2.11$



4. Someone communicated with me and it had a positive effect

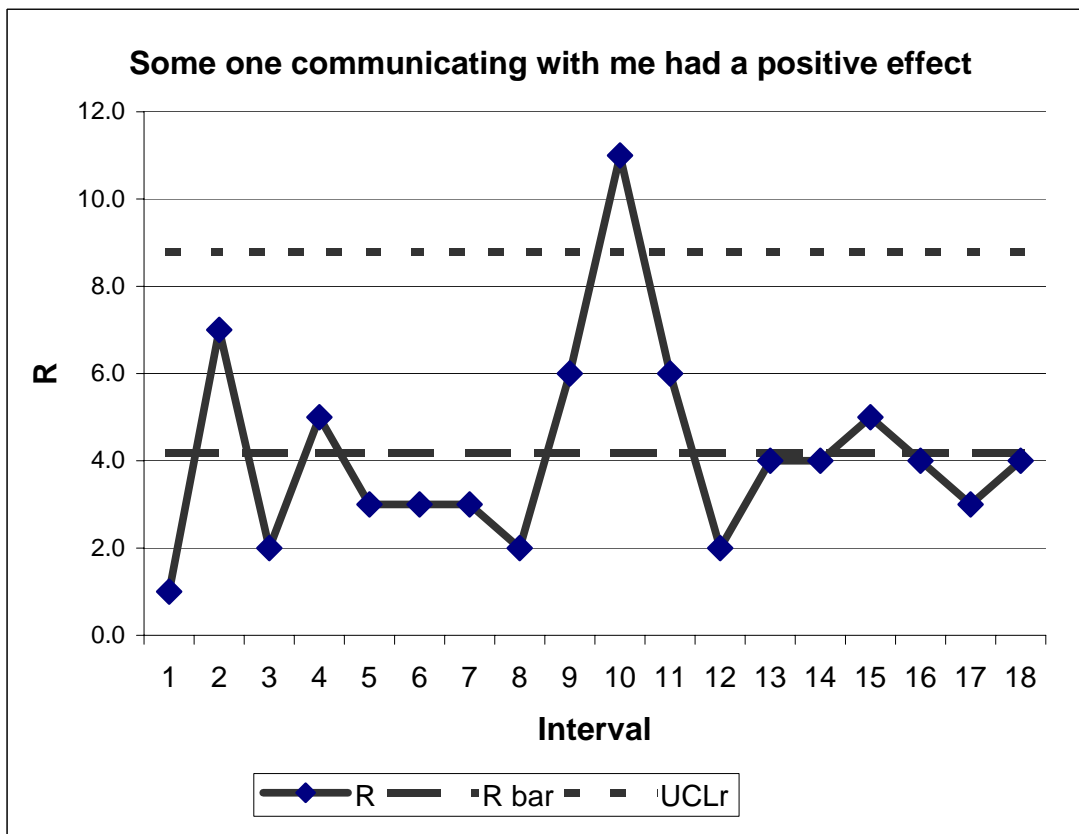
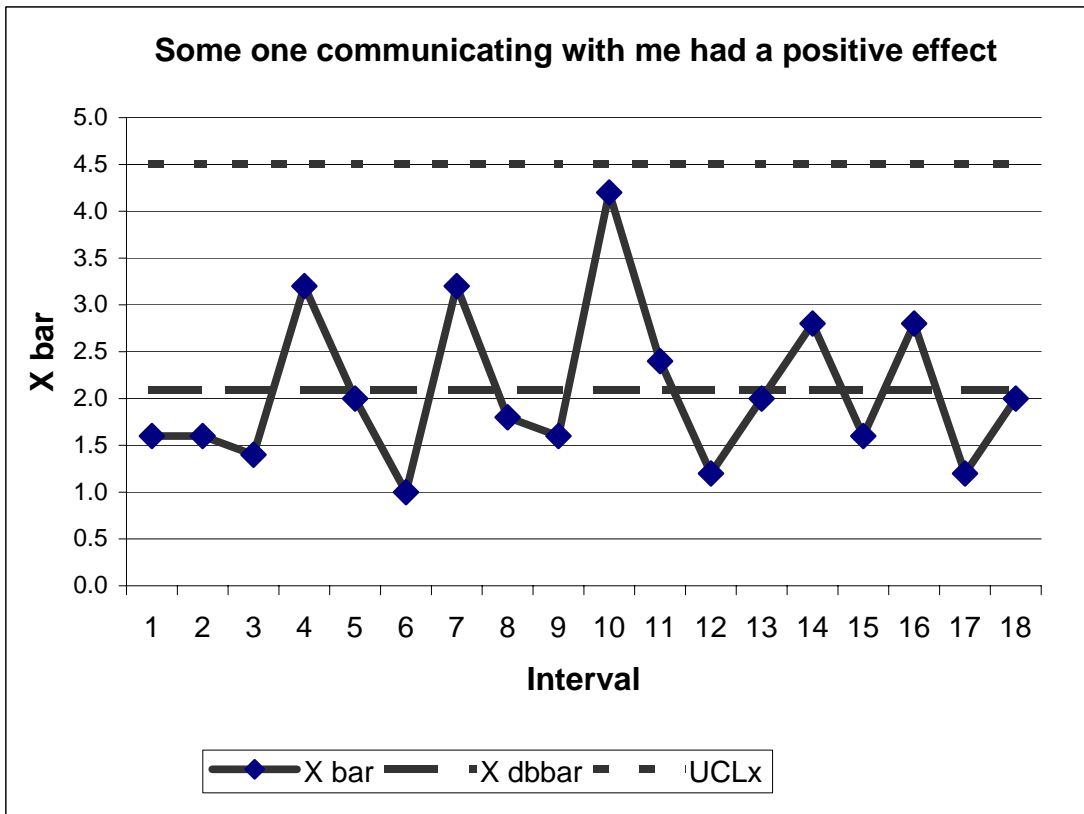
Participant	W1M	W1T	W1W	W1R	W1F	W2M	W2T	W2W	W2R	W2F
1	NA	1	2	2	NA	7	1	11	6	NA
2	NA	2	1	NA	NA	0	3	1	3	NA
3	NA	NA	7		NA	NA	NA	6	NA	NA
4	1	0	0	0	0	3	0	0	0	2
5	2	2	2	1	0	1	2	1	0	0
6	4	5	3	4	4	4	2	4	3	4
7	1	1	2	2	1	5	1	1	5	NA
8	1	0	0	NA	NA	NA	2	1	0	0
9	3	3	4	4	4	4	3	3	4	0
10	NA	1	1	2	2	NA	2	0	3	1
11	3	0	0	0	NA	0	3	0	4	NA

Interval	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sum	X bar	R
1	1	2	2	2	1	8	1.60	1
2	7	1	0	0	0	8	1.60	7
3	0	2	2	2	1	7	1.40	2
4	0	4	5	3	4	16	3.20	5
5	4	1	1	2	2	10	2.00	3
6	1	1	0	0	3	5	1.00	3
7	3	4	4	4	1	16	3.20	3
8	1	1	2	2	3	9	1.80	2
9	0	0	0	7	1	8	1.60	6
10	11	6	0	3	1	21	4.20	11
11	3	6	3	0	0	12	2.40	6
12	0	2	1	2	1	6	1.20	2
13	0	0	4	2	4	10	2.00	4
14	3	4	5	1	1	14	2.80	4
15	5	2	1	0	0	8	1.60	5
16	4	3	3	4	0	14	2.80	4
17	2	0	3	1	0	6	1.20	3
18	3	0	4	1	2	10	2.00	4
Total						188	X dbbar 2.09	R bar 4.17

$UCLx = Xdbbar + A2 * Rbar$
 $LCLx = Xdbbar - A2 * Rbar$
 $UCLr = D4 * Rbar$
 $LCLr = D3 * Rbar$

$UCLx = 4.51$
 $LCLx = -0.33$ 0
 $UCLr = 8.79$
 $LCLr = 0.00$

$A2 = .58$
 $D3 = 0$
 $D4 = 2.11$



5. Someone communicated with me and it had a negative effect

Participant	W!M	W1T	W1W	W1R	W1F	W2M	W2T	W2W	W2R	W2F
1	NA	0	0	0	NA	0	0	0	0	NA
2	NA	0	0	NA	NA	0	0	0	2	NA
3	NA	NA	0	0	NA	NA	NA	0	NA	NA
4	4	0	0	0	0	3	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	1	0	0	0	0
7	0	0	1	1	0	0	0	0	0	NA
8	0	0	1	NA	NA	NA	0	0	1	0
9	0	1	0	0	1	0	0	0	0	0
10	NA	0	0	0	0	NA	0	0	0	0
11	0	0	0	0	NA	0	0	0	0	NA

Interval	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sum	X bar	R
1	0	0	0	0	0	0	0.00	0
2	0	0	4	0	0	4	0.80	4
3	0	0	0	0	0	0	0.00	0
4	0	0	0	0	0	0	0.00	0
5	0	0	0	0	1	1	0.20	1
6	1	0	0	0	1	2	0.40	1
7	0	1	0	0	1	2	0.40	1
8	0	0	0	0	0	0	0.00	0
9	0	0	0	0	0	0	0.00	0
10	0	0	0	0	0	0	0.00	0
11	2	0	3	0	0	5	1.00	3
12	0	0	0	0	0	0	0.00	0
13	0	0	1	0	0	1	0.20	1
14	0	0	0	0	0	0	0.00	0
15	0	0	0	1	0	1	0.20	1
16	0	0	0	0	0	0	0.00	0
17	0	0	0	0	0	0	0.00	0
18	0	0	0	0	0	0	0.00	0
Total						16	X dbbar 0.18	R bar 0.67

$UCLx = Xdbbar + A2 * Rbar$

$LCLx = Xdbbar - A2 * Rbar$

$UCLr = D4 * Rbar$

$LCLr = D3 * Rbar$

$UCLx = 0.56$

$LCLx = -0.21$ 0

$UCLr = 1.41$

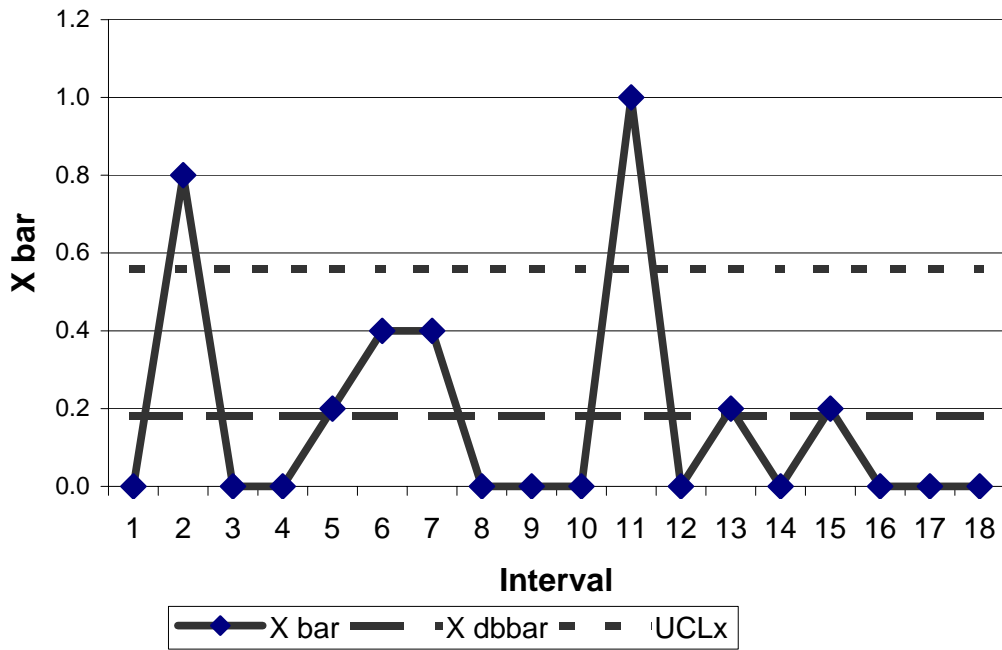
$LCLr = 0.00$

$A2 = .58$

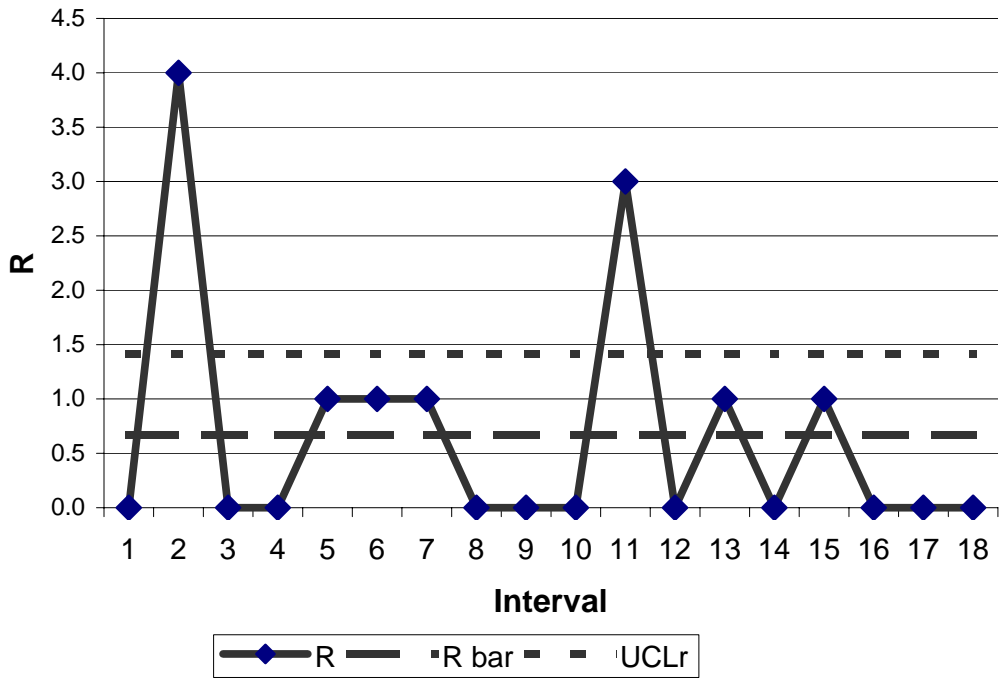
$D3 = 0$

$D4 = 2.11$

Some one communicating with me had a negative effect



Some one communicating with me had a negative effect



6. Lack of communication to me had a positive effect

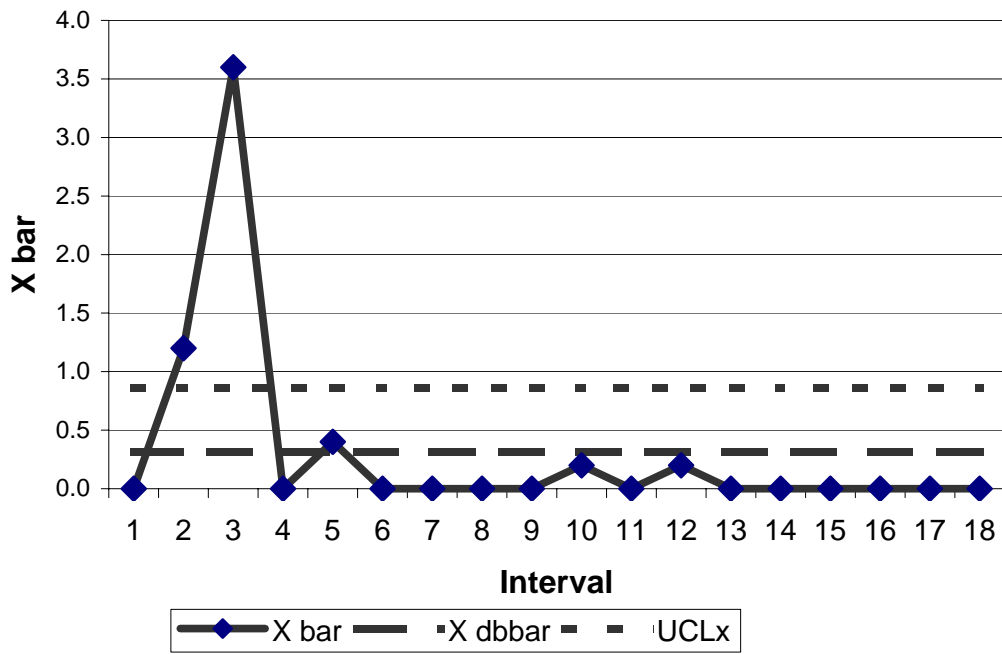
Participant	W!M	W1T	W1W	W1R	W1F	W2M	W2T	W2W	W2R	W2F
1	NA	0	0	0	NA	0	0	0	0	NA
2	NA	0	0	NA	NA	1	0	0	0	NA
3	NA	NA	0	0	NA	NA	NA	0	NA	NA
4	6	3	5	8	2	0	0	1	0	0
5	0	0	0	0	0	0	0	0	0	0
6	0	0	1	0	0	0	0	0	0	0
7	1	0	0	0	0	0	0	0	0	NA
8	0	0	0	NA	NA	NA	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0
10	NA	0	0	0	0	NA	0	0	0	0
11	0	0	0	0	NA	0	0	0	0	NA

Interval	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sum	Xbar	R
1	0	0	0	0	0	0	0.00	0
2	0	0	0	0	6	6	1.20	6
3	3	5	8	2	0	18	3.60	8
4	0	0	0	0	0	0	0.00	0
5	0	1	0	0	1	2	0.40	1
6	0	0	0	0	0	0	0.00	0
7	0	0	0	0	0	0	0.00	0
8	0	0	0	0	0	0	0.00	0
9	0	0	0	0	0	0	0.00	0
10	0	0	0	0	1	1	0.20	1
11	0	0	0	0	0	0	0.00	0
12	0	1	0	0	0	1	0.20	1
13	0	0	0	0	0	0	0.00	0
14	0	0	0	0	0	0	0.00	0
15	0	0	0	0	0	0	0.00	0
16	0	0	0	0	0	0	0.00	0
17	0	0	0	0	0	0	0.00	0
18	0	0	0	0	0	0	0.00	0
Total						28	X dbbar 0.31	R bar 0.94

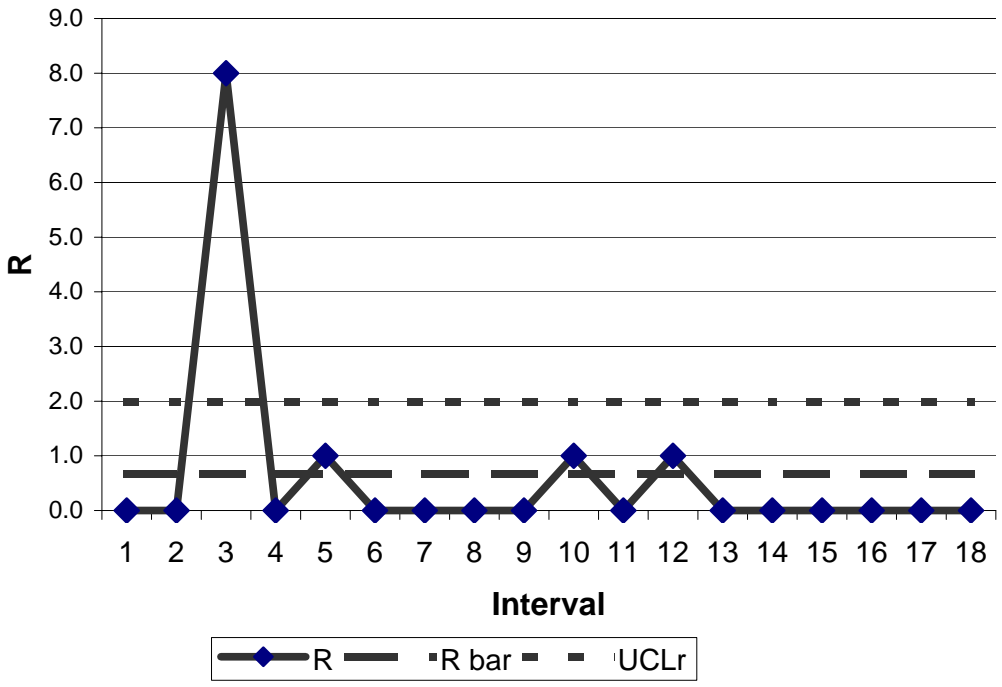
$UCLx = Xdbbar + A2 * Rbar$ $UCLx = 0.86$
 $LCLx = Xdbbar - A2 * Rbar$ $LCLx = -0.24$ 0
 $UCLr = D4Rbar$ $UCLr = 1.99$
 $LCLr = D3Rbar$ $LCLr = 0.00$

A2=.58
 D3=0
 D4=2.11

Lack of Communication had a positive effect



Lack of Communication had a positive effect



7. Lack of communication to me had a negative effect

Participant	W1M	W1T	W1W	W1R	W1F	W2M	W2T	W2W	W2R	W2F
1	NA	0	0	0	NA	3	0	0	0	NA
2	NA	0	0	NA	NA	0	0	0	0	NA
3	NA	NA	0	0	NA	NA	NA	0	NA	NA
4	10	5	3	6	5	6	10	6	4	1
5	1	0	0	0	2	2	1	0	1	3
6	1	1	1	0	0	0	0	1	0	0
7	0	2	3	3	2	0	0	0	0	NA
8	0	0	0	NA	NA	NA	0	0	0	0
9	1	0	0	1	0	0	0	3	1	0
10	NA	1	0	1	0	NA	0	1	0	0
11	0	0	0	0	NA	0	0	0	0	NA

Interval	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sum	X	R
1	0	0	0	0	0	0	0.00	0
2	0	0	10	5	3	18	3.60	10
3	6	5	1	0	0	12	2.40	6
4	2	1	1	1	0	5	1.00	2
5	0	0	2	3	3	8	1.60	3
6	2	0	0	0	1	3	0.60	2
7	0	0	1	0	1	1	0.20	1
8	0	1	0	0	0	1	0.20	1
9	0	0	3	0	0	3	0.60	3
10	0	0	0	0	0	0	0.00	0
11	0	6	10	6	4	26	5.20	10
12	1	2	1	0	1	5	1.00	2
13	3	0	0	1	0	4	0.80	3
14	0	0	0	0	0	0	0.00	0
15	0	0	0	0	0	0	0.00	0
16	0	3	1	0	0	4	0.80	3
17	0	1	0	0	0	1	0.20	1
18	0	0	0	0	0	0	0.00	0
Total						91	X bar 1.01	R bar 2.61

$UCLx = X\bar{dbbar} + A2 * R\bar{bar}$

$LCLx = X\bar{dbbar} - A2 * R\bar{bar}$

$UCLr = D4R\bar{bar}$

$LCLr = D3R\bar{bar}$

$UCLx = 2.53$

$LCLx = -0.50 \quad 0$

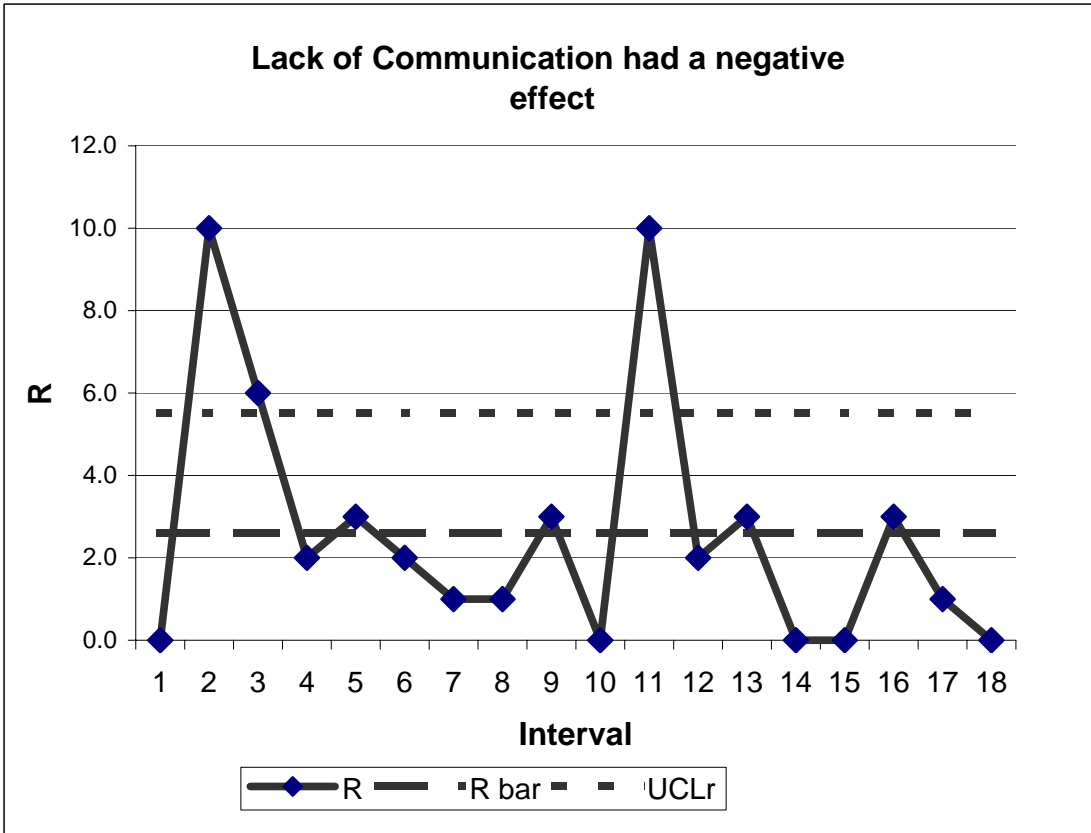
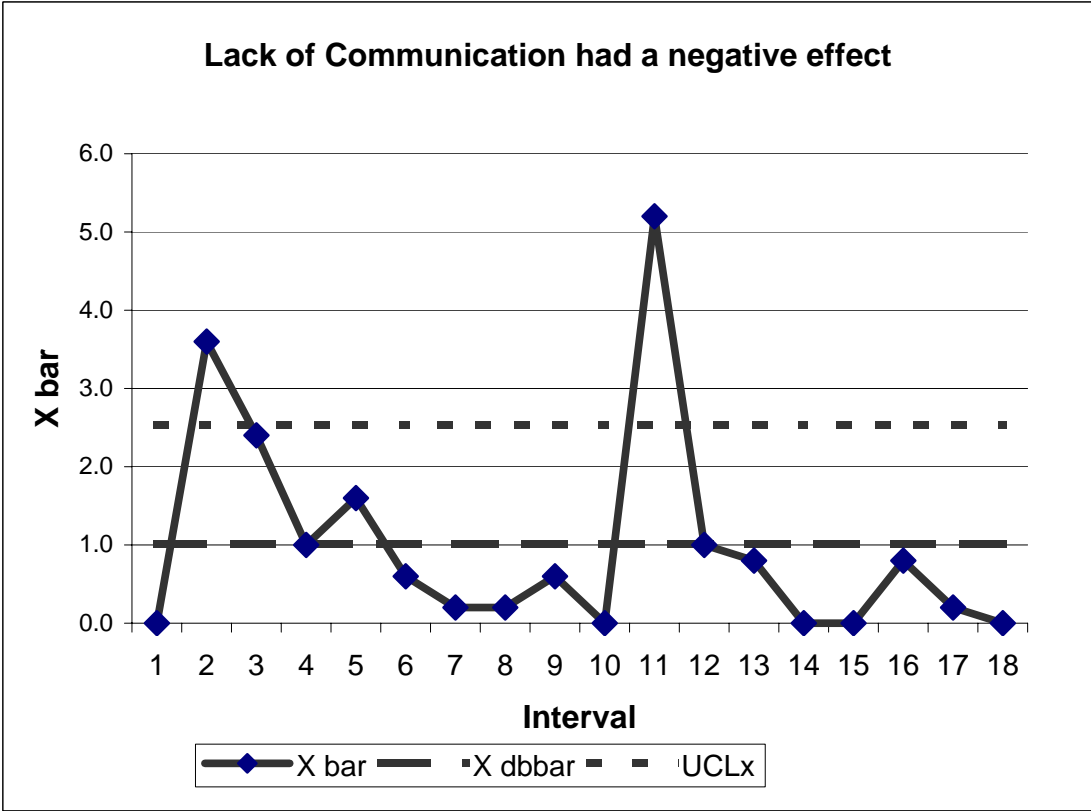
$UCLr = 5.51$

$LCLr = 0.00$

$A2 = .58$

$D3 = 0$

$D4 = 2.11$



8 I did not receive information on time (when I needed it)

Participant	W1M	W1T	W1W	W1R	W1F	W2M	W2T	W2W	W2R	W2F
1	NA	0	0	0	NA	0	0	0	1	NA
2	NA	0	0	NA	NA	0	0	0	0	NA
3	NA	NA	0	0	NA	NA	NA	0	NA	NA
4	2	0	0	2	0	2	1	0	2	3
5	0	0	0	0	0	0	0	0	0	0
6	0	1	0	0	0	0	0	0	0	0
7	0	0	1	3	1	2	0	2	3	NA
8	0	0	0	NA	NA	NA	0	0	0	0
9	1	0	0	0	0	0	0	3	1	0
10	NA	1	0	0	0	NA	0	1	0	0
11	0	0	3	0	NA	0	3	0	0	NA

Interval	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sum	X	R
1	0	0	0	0	0	0	0.00	0
2	0	0	2	0	0	2	0.40	2
3	2	0	0	0	0	2	0.40	2
4	0	0	0	1	0	1	0.20	1
5	0	0	0	0	1	1	0.20	1
6	3	1	0	0	0	4	0.80	3
7	1	0	0	0	0	1	0.20	1
8	1	0	0	0	0	1	0.20	1
9	0	3	0	0	0	3	0.60	3
10	0	1	0	0	0	1	0.20	1
11	0	0	2	1	0	3	0.60	2
12	2	3	0	0	0	5	1.00	3
13	0	0	0	0	0	0	0.00	0
14	0	0	2	0	2	4	0.80	2
15	3	0	0	0	0	3	0.60	3
16	0	0	3	1	0	4	0.80	3
17	0	1	0	0	0	1	0.20	1
18	3	0	0	0	0	3	0.60	3
Total						39	X bar 0.43	R bar 1.78

$UCLx = Xdbbar + A2 * Rbar$

$LCIx = Xdbbar - A2 * Rbar$

$UCLr = D4 * Rbar$

$LCLr = D3 * Rbar$

$UCLx = 1.46$

$LCIx = -0.60$ 0

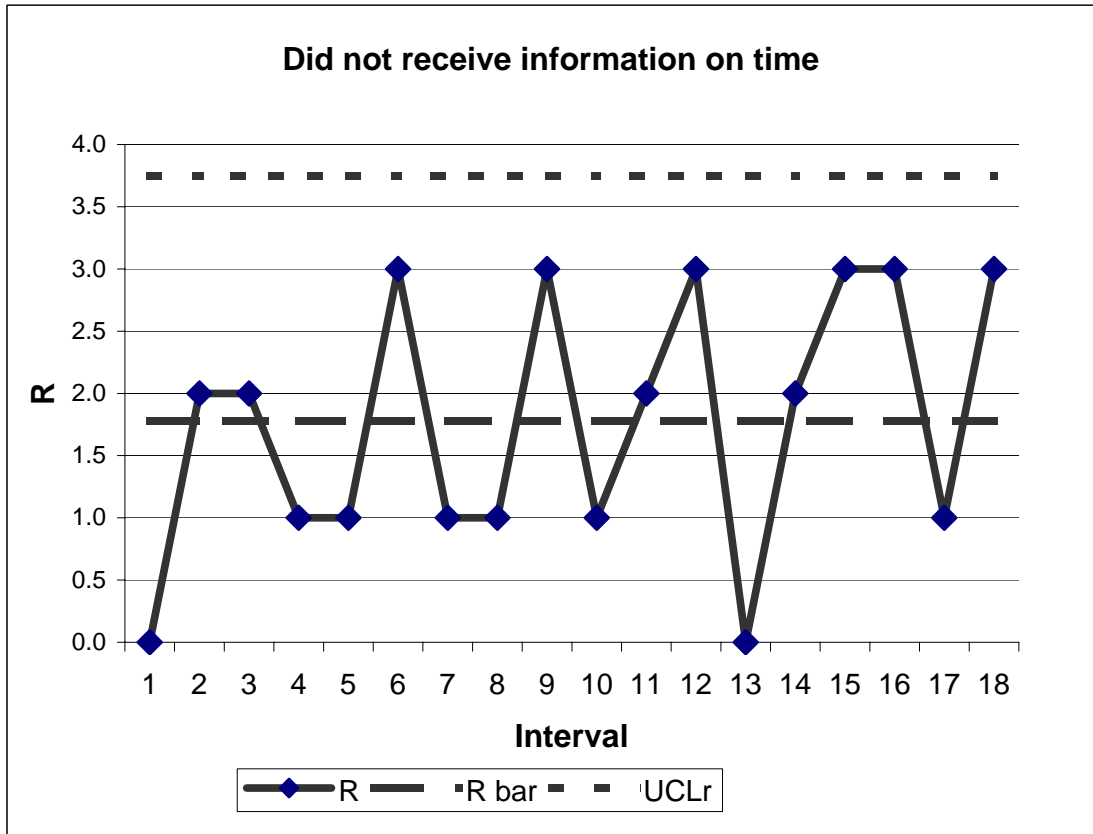
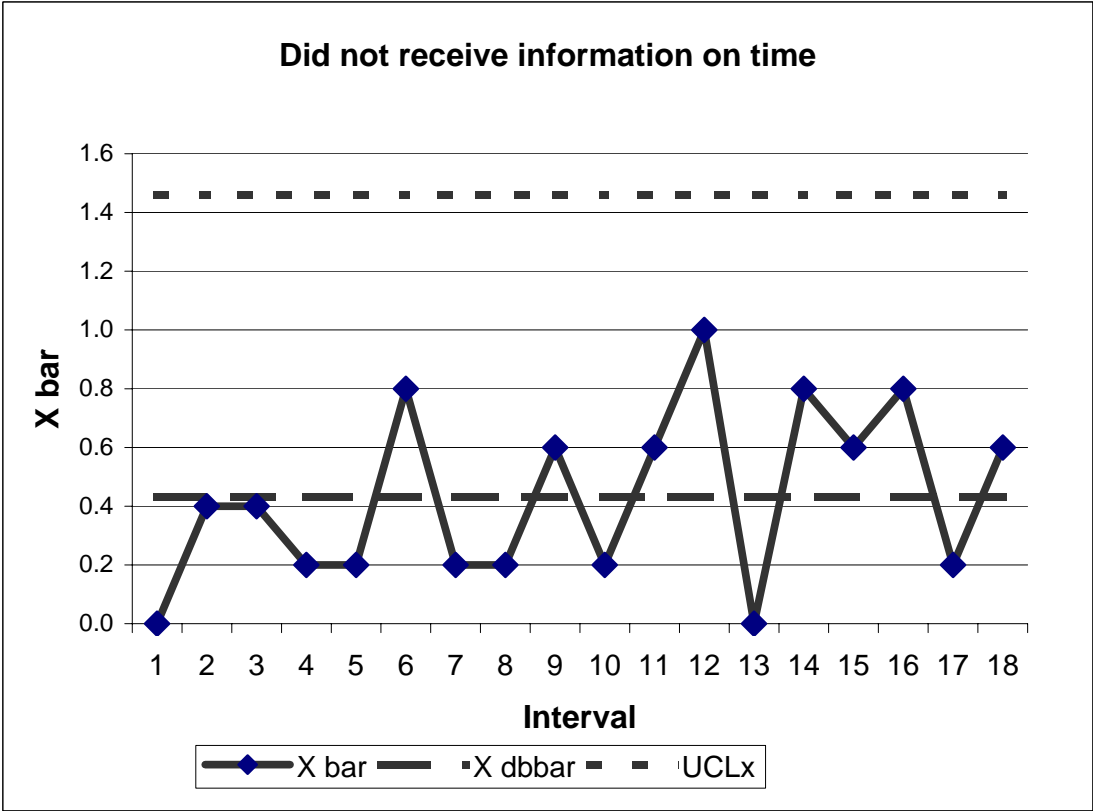
$UCLr = 3.75$

$LCLr = 0.00$

$A2 = .58$

$D3 = 0$

$D4 = 2.11$



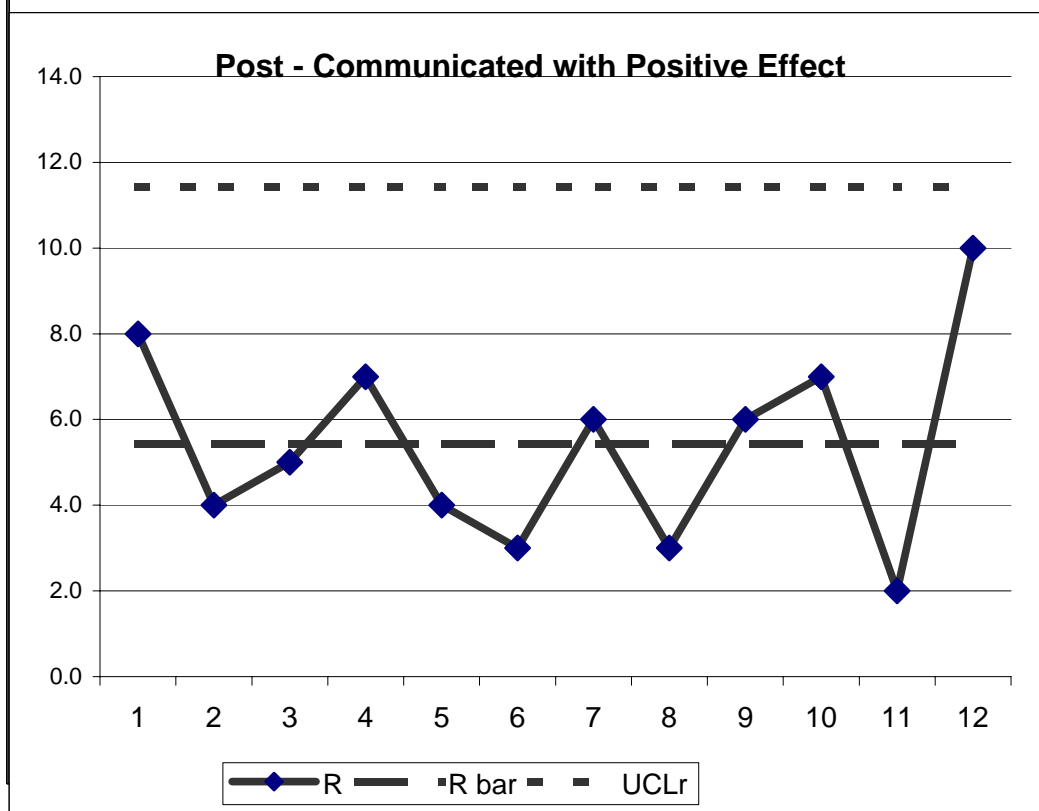
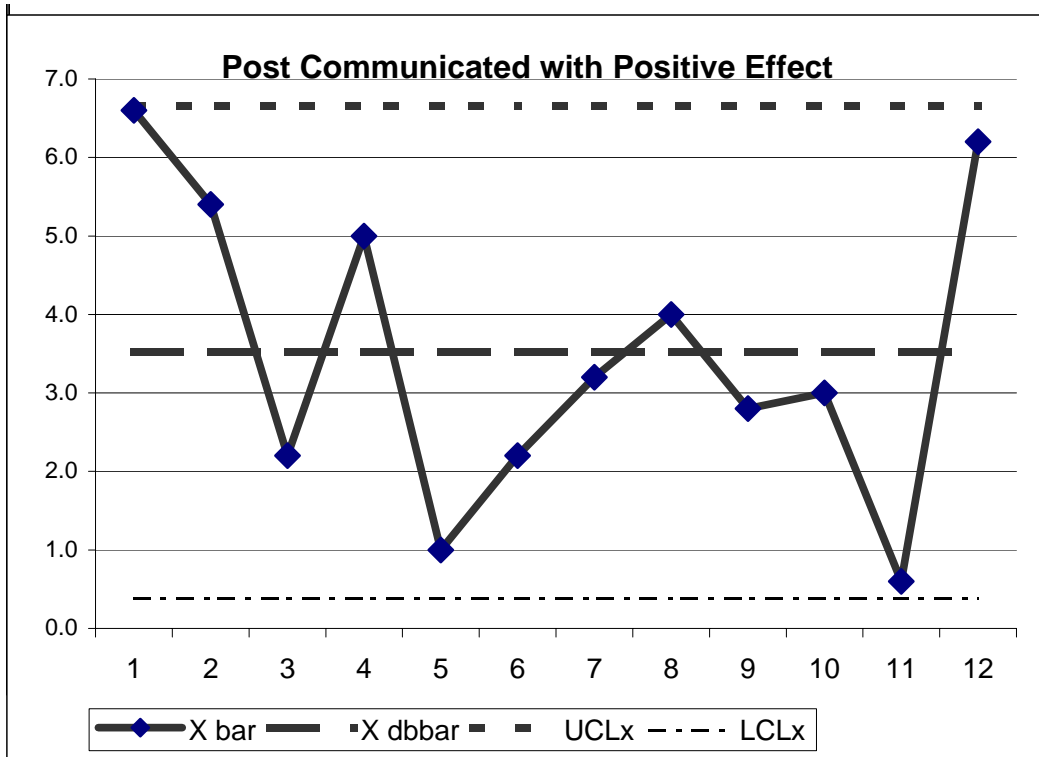
1. I communicated and it had a positive effect - POST

Participant	W1M	W1T	W1W	W1R	W1F	W2M	W2T	W2W	W2R	W2F
1	7	10	6	8	2	3	7	4	2	1
2	7	4	3	7	NA	2	4	4	2	NA
3	6	4	5	0	0	5	5	5	3	NA
4	2	NA	NA	7	NA	NA	NA	6	0	0
5	6	NA	7	5	NA	5	0	3	7	NA
6	0	1	0	0	0	0	0	0	1	0
7	4	2	1	3	2	2	0	NA	NA	NA

Interval	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sum	X bar	R
1	7	10	6	8	2	33	6.60	8
2	7	4	3	7	6	27	5.40	4
3	4	5	0	0	2	11	2.20	5
4	7	6	7	5	0	25	5.00	7
5	1	0	0	0	4	5	1.00	4
6	2	1	3	2	3	11	2.20	3
7	7	4	2	1	2	16	3.20	6
8	4	4	2	5	5	20	4.00	3
9	5	3	6	0	0	14	2.80	6
10	5	0	3	7	0	15	3.00	7
11	0	0	1	0	2	3	0.60	2
12	0	7	10	6	8	31	6.20	10
Total						211	3.52	5.42

$UCLx = X\bar{dbbar} + A2 * R\bar{bar}$ $UCLx = 6.66$
 $LCLx = X\bar{dbbar} - A2 * R\bar{bar}$ $LCLx = 0.38$
 $UCLr = D4R\bar{bar}$ $UCLr = 11.43$
 $LCLr = D3R\bar{bar}$ $LCLr = 0.00$

$A2 = .58$
 $D3 = 0$
 $D4 = 2.11$



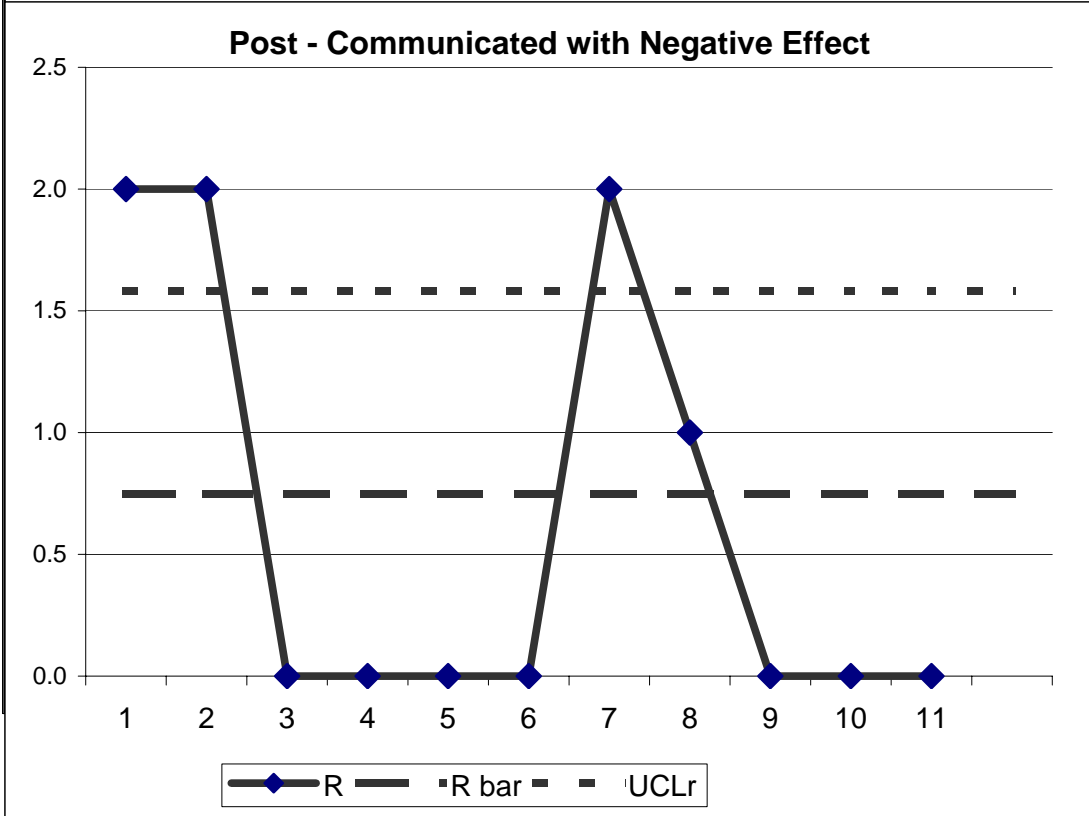
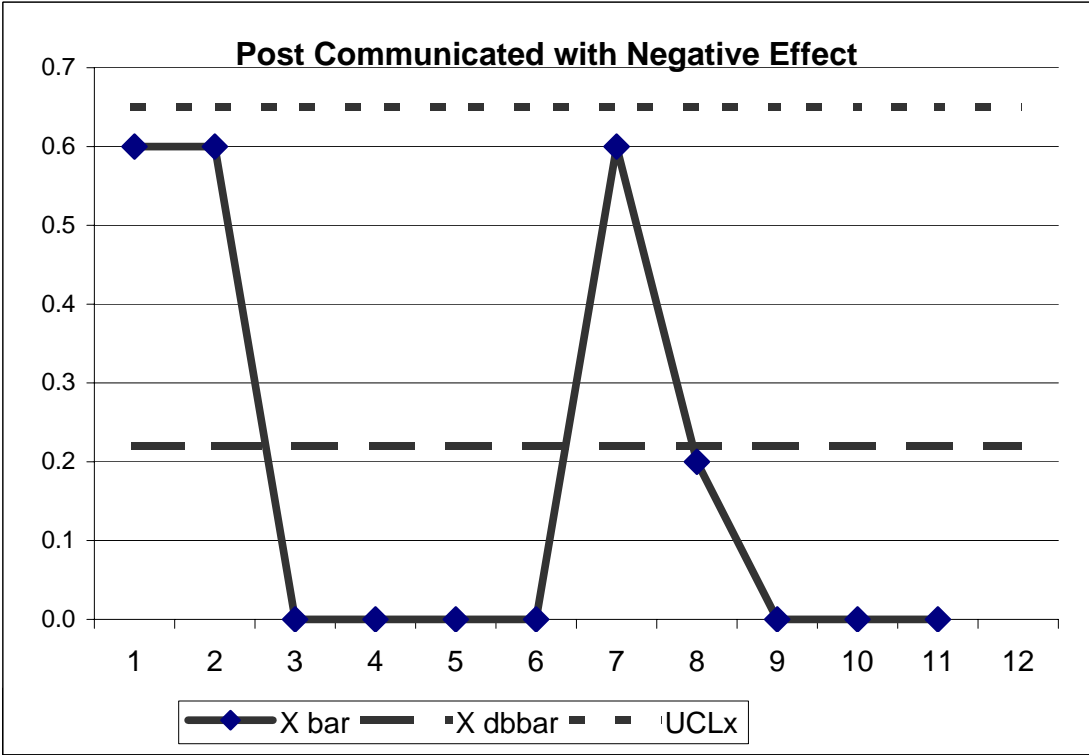
2. I communicated and it had a negative effect -POST

Participant	W1M	W1T	W1W	W1R	W1F	W2M	W2T	W2W	W2R	W2F
1	0	2	0	1	0	0	0	0	1	2
2	2	1	0	0	NA	0	0	1	0	NA
3	0	0	0	0	0	0	0	0	0	NA
4	0	NA	NA	0	NA	NA	NA	0	0	0
5	0	NA	0	0	NA	0	0	0	0	NA
6	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	NA	NA	NA

Interval	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sum	X	R
1	0	2	0	1	0	3	0.60	2
2	2	1	0	0	0	3	0.60	2
3	0	0	0	0	0	0	0.00	0
4	0	0	0	0	0	0	0.00	0
5	0	0	0	0	0	0	0.00	0
6	0	0	0	0	0	0	0.00	0
7	0	0	1	2	0	3	0.60	2
8	0	1	0	0	0	1	0.20	1
9	0	0	0	0	0	0	0.00	0
10	0	0	0	0	0	0	0.00	0
11	0	0	0	0	0	0	0.00	0
12	0	0	2	0	1	3	0.60	2
Total						13	X dbbar 0.22	R bar 0.75

$UCLx = Xdbbar + A2 * Rbar$ $UCLx = 0.65$
 $LCLx = Xdbbar - A2 * Rbar$ $LCLx = -0.22$ 0
 $UCLr = D4Rbar$ $UCLr = 1.58$
 $LCLr = D3Rbar$ $LCLr = 0.00$

$A2 = .58$
 $D3 = 0$
 $D4 = 2.11$



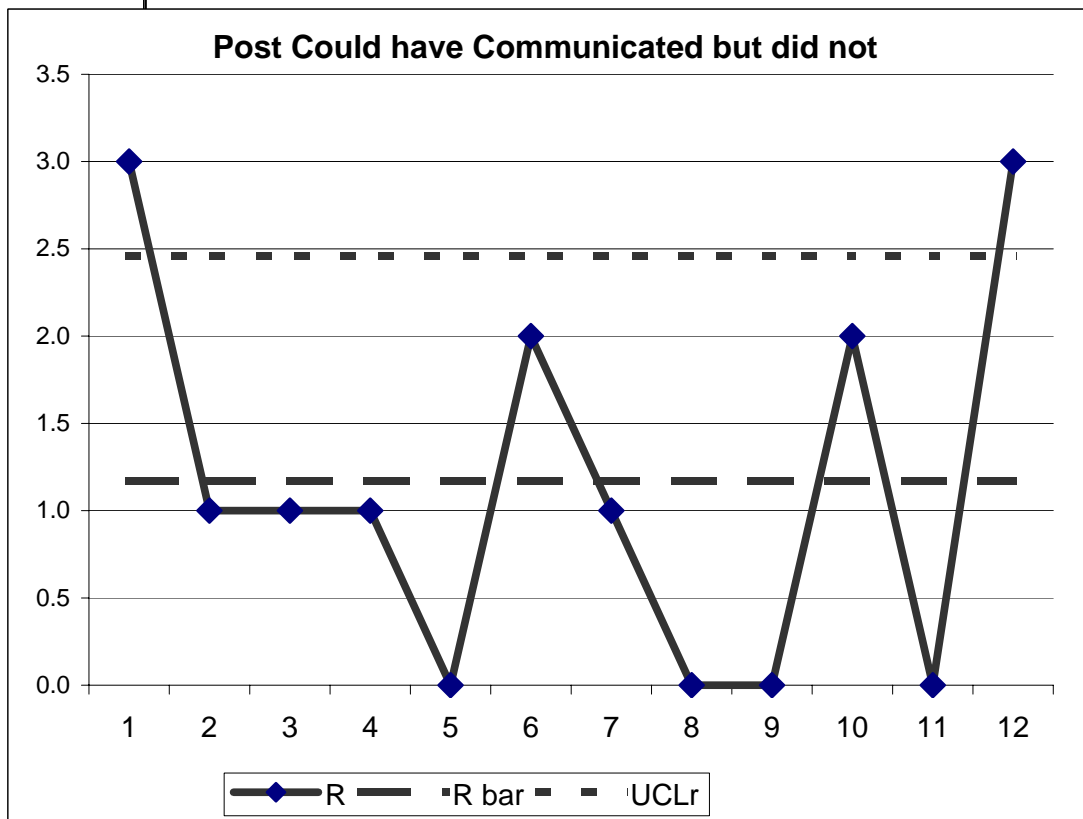
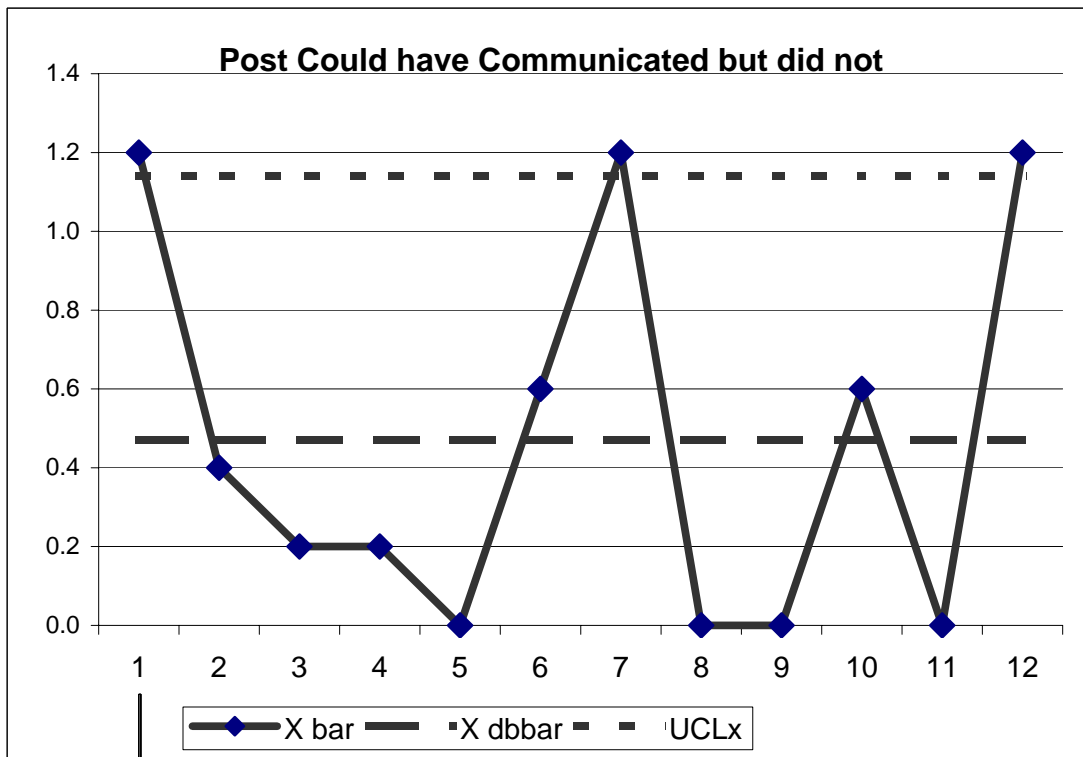
3. I could have communicated but did not - POST

Participant	W1M	W1T	W1W	W1R	W1F	W2M	W2T	W2W	W2R	W2F
1	3	2	1	0	0	1	1	1	2	1
2	1	0	1	0	NA	0	0	0	0	0
3	0	1	0	0	0	0	0	0	0	0
4	0	NA	NA	1	NA	NA	NA	2	0	0
5	0	NA	0	0	NA	0	1	0	0	NA
6	0	0	0	0	0	0	0	0	0	0
7	0	1	2	0	0	0	1	NA	NA	NA

Interval	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sum	Xbar	R
1	3	2	1	0	0	6	1.20	3
2	1	0	1	0	0	2	0.40	1
3	1	0	0	0	0	1	0.20	1
4	1	0	0	0	0	1	0.20	1
5	0	0	0	0	0	0	0.00	0
6	0	1	2	0	0	3	0.60	2
7	1	1	1	2	1	6	1.20	1
8	0	0	0	0	0	0	0.00	0
9	0	0	0	0	0	0	0.00	0
10	2	0	0	1	0	3	0.60	2
11	0	0	0	0	0	0	0.00	0
12	0	0	1	3	2	6	1.20	3
Total						28	X dbbar 0.47	R bar 1.17

$UCLx = Xdbbar + A2 * Rbar$ $UCLx = 1.14$
 $LCLx = Xdbbar - A2 * Rbar$ $LCLx = -0.21$ 0
 $UCLr = D4Rbar$ $UCLr = 2.46$
 $LCLr = D3Rbar$ $LCLr = 0.00$

$A2 = .58$
 $D3 = 0$
 $D4 = 2.11$



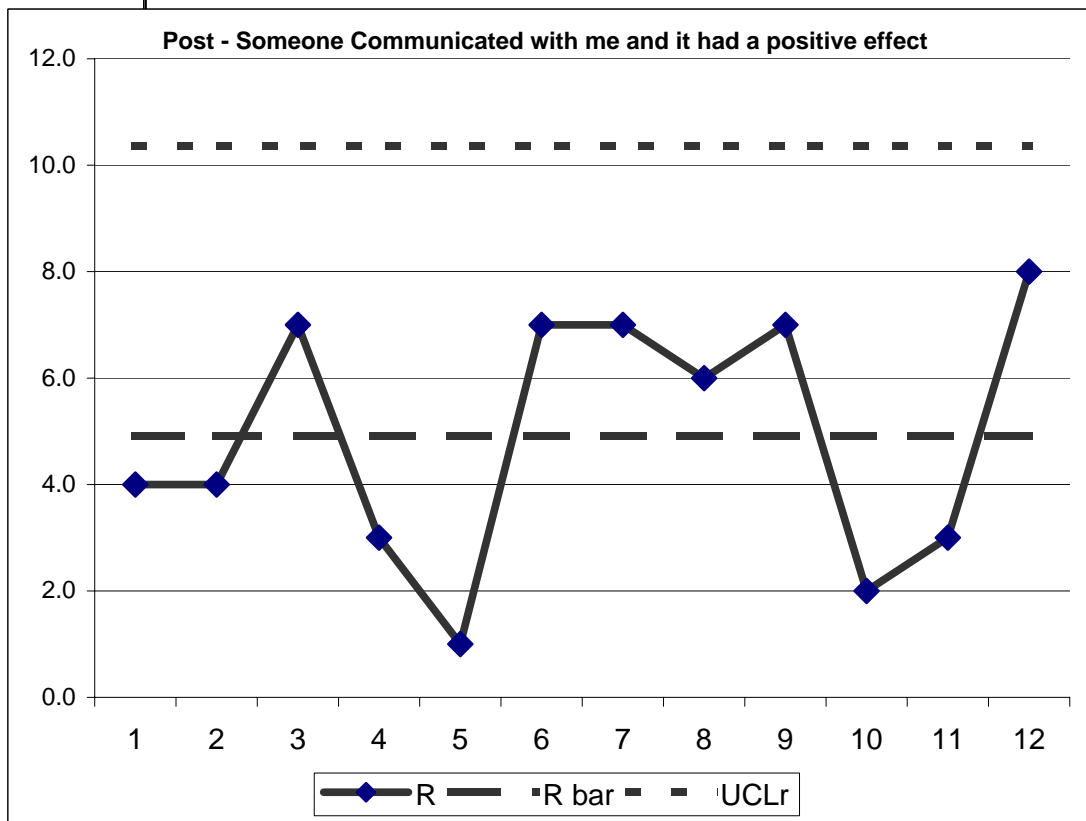
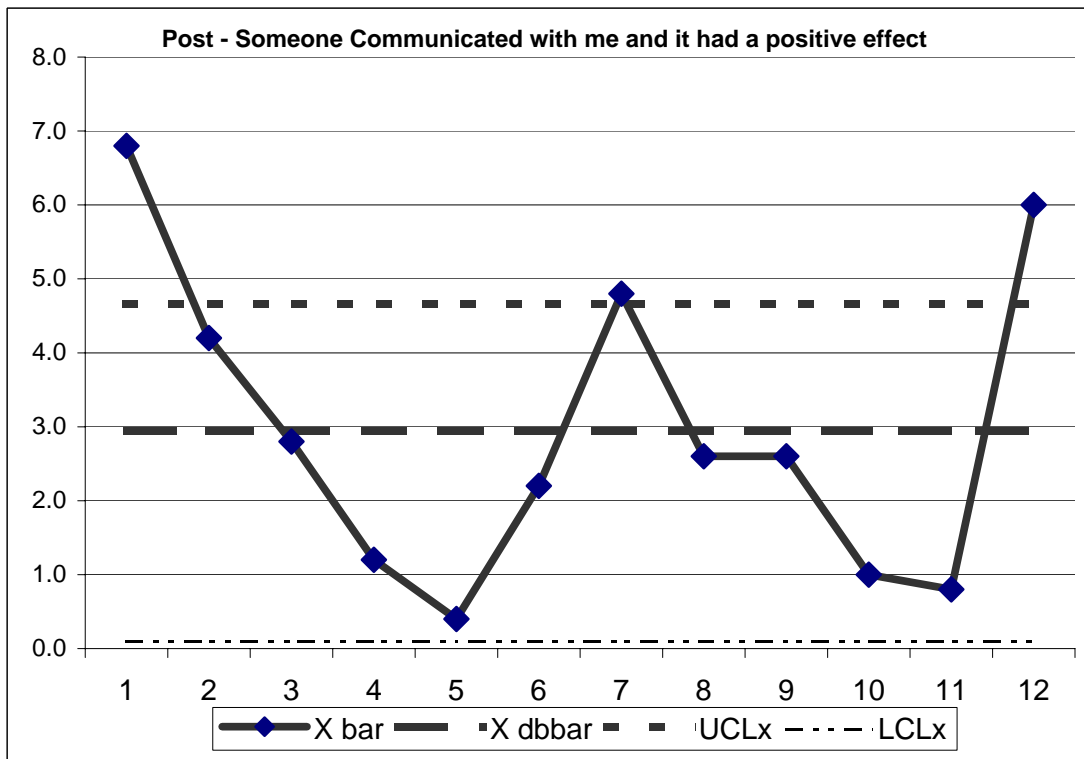
4. Someone communicated with me and it had a positive effect - POST

Participant	W1M	W1T	W1W	W1R	W1F	W2M	W2T	W2W	W2R	W2F
1	7	7	8	8	4	7	8	6	5	4
2	6	2	3	5	NA	1	0	0	2	NA
3	5	7	7	0	0	6	5	7	3	NA
4	0	NA	NA	3	NA	NA	NA	3	0	0
5	3	NA	0	0	NA	1	2	2	0	NA
6	0	1	0	0	0	0	0	0	1	0
7	1	0	2	0	0	3	0	NA	NA	NA

Interval	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sum	Xbar	R
1	7	7	8	8	4	34	6.80	4
2	6	2	3	5	5	21	4.20	4
3	7	7	0	0	0	14	2.80	7
4	3	3	0	0	0	6	1.20	3
5	1	0	0	0	1	2	0.40	1
6	0	2	2	0	7	11	2.20	7
7	8	6	5	4	1	24	4.80	7
8	0	0	2	6	5	13	2.60	6
9	7	3	3	0	0	13	2.60	7
10	1	2	2	0	0	5	1.00	2
11	0	0	1	0	3	4	0.80	3
12	0	7	7	8	8	30	6.00	8
Total						177	X dbbar 2.95	R bar 4.92

$UCLx = Xdbbar + A2 * Rbar$ $UCLx$ 4.66
 $LCLx = Xdbbar - A2 * Rbar$ $LCLx$ 0.10
 $UCLr = D4Rbar$ $UCLr$ 10.37
 $LCLr = D3Rbar$ $LCLr$ 0.00

$A2 = .58$
 $D3 = 0$
 $D4 = 2.11$



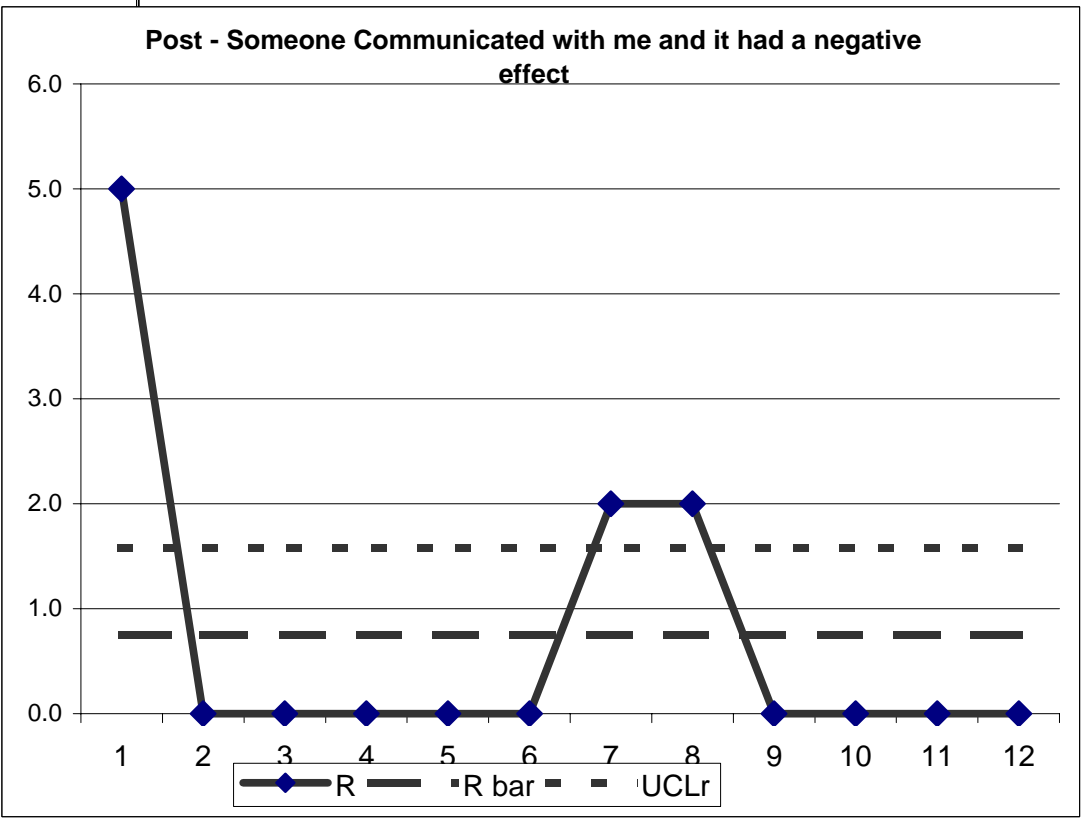
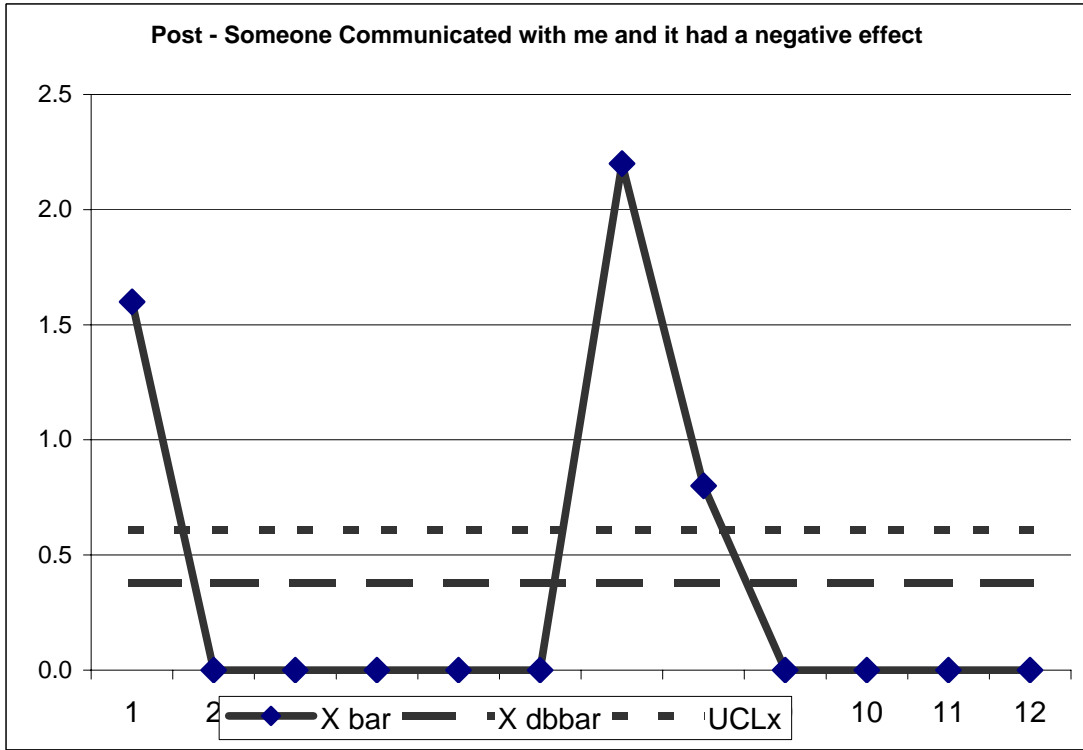
5. Someone communicated with me and it had a negative effect - POST

Participant	W1M	W1T	W1W	W1R	W1F	W2M	W2T	W2W	W2R	W2F
1	0	3	0	5	0	3	2	2	3	1
2	0	0	0	0	NA	1	1	2	0	NA
3	0	0	0	0	0	0	0	0	0	0
4	0	NA	NA	0	NA	NA	NA	0	0	0
5	0	NA	0	0	NA	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	NA	NA	NA

Interval	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sum	Xbar	R
1	0	3	0	5	0	8	1.60	5
2	0	0	0	0	0	0	0.00	0
3	0	0	0	0	0	0	0.00	0
4	0	0	0	0	0	0	0.00	0
5	0	0	0	0	0	0	0.00	0
6	0	0	0	0	0	0	0.00	0
7	3	2	2	3	1	11	2.20	2
8	1	1	2	0	0	4	0.80	2
9	0	0	0	0	0	0	0.00	0
10	0	0	0	0	0	0	0.00	0
11	0	0	0	0	0	0	0.00	0
12	0	0	0	0	0	0	0.00	0
Total						23	0.38	0.75

$UCLx = Xdbbar + A2 * Rbar$ $UCLx = 0.61$
 $LCLx = Xdbbar - A2 * Rbar$ $LCLx = -0.05$ 0
 $UCLr = D4Rbar$ $UCLr = 1.58$
 $LCLr = D3Rbar$ $LCLr = 0.00$

A2=.58
 D3=0
 D4=2.11



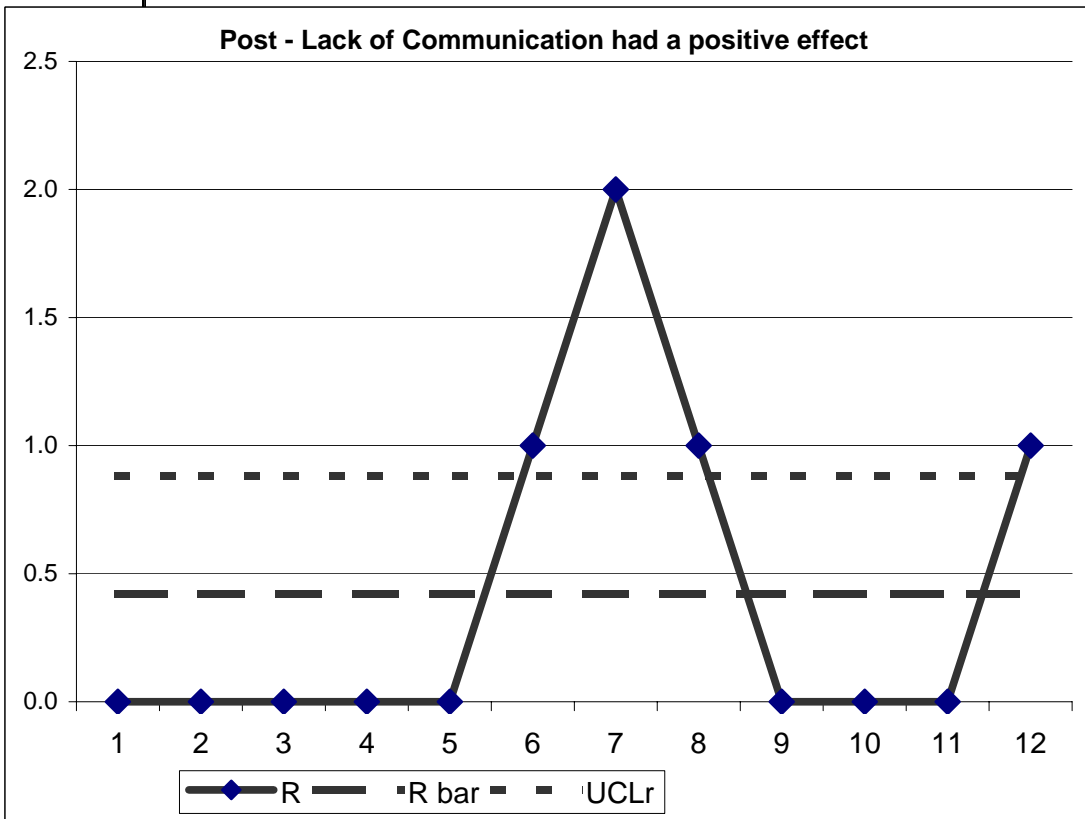
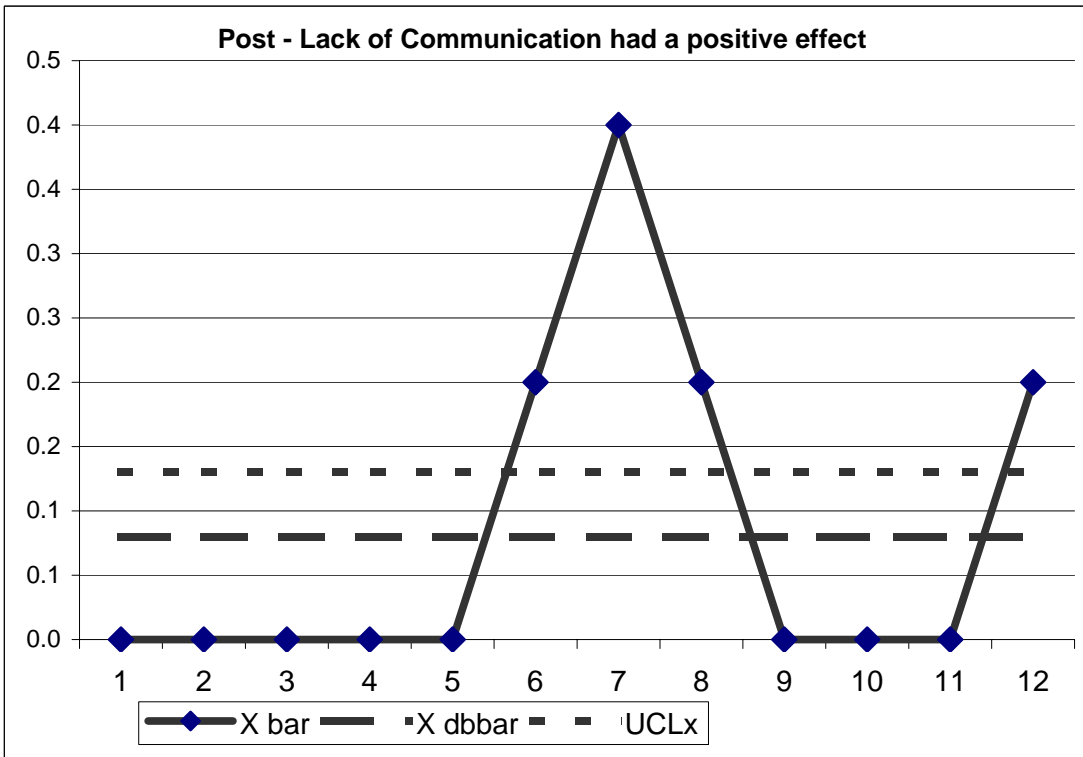
6. Lack of communication to me had a positive effect - POST

Participant	W1M	W1T	W1W	W1R	W1F	W2M	W2T	W2W	W2R	W2F
1	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	NA	1	0	0	0	NA
3	0	0	0	0	0	0	0	0	0	0
4	0	NA	NA	0	0	NA	NA	0	0	0
5	0	NA	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0
7	1	0	0	0	2	0	1	NA	NA	NA

Interval	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sum	Xbar	R
1	0	0	0	0	0	0	0.00	0
2	0	0	0	0	0	0	0.00	0
3	0	0	0	0	0	0	0.00	0
4	0	0	0	0	0	0	0.00	0
5	0	0	0	0	0	0	0.00	0
6	0	1	0	0	0	1	0.20	1
7	2	0	0	0	0	2	0.40	2
8	0	1	0	0	0	1	0.20	1
9	0	0	0	0	0	0	0.00	0
10	0	0	0	0	0	0	0.00	0
11	0	0	0	0	0	0	0.00	0
12	0	0	0	0	1	1	0.20	1
Total						5	X dbbar 0.08	R bar 0.42

$UCLx = Xdbbar + A2 * Rbar$ $UCLx = 0.13$
 $LCLx = Xdbbar - A2 * Rbar$ $LCLx = -0.16$ 0
 $UCLr = D4Rbar$ $UCLr = 0.88$
 $LCLr = D3Rbar$ $LCLr = 0.00$

$A2 = .58$
 $D3 = 0$
 $D4 = 2.11$



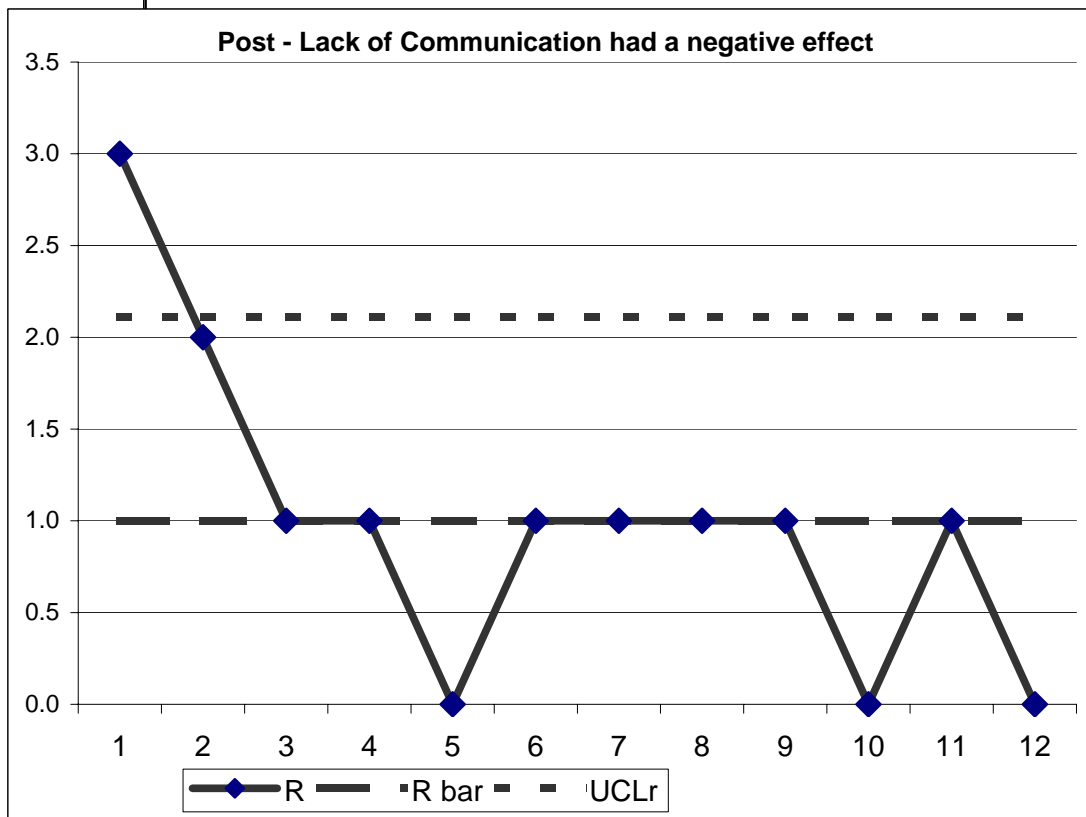
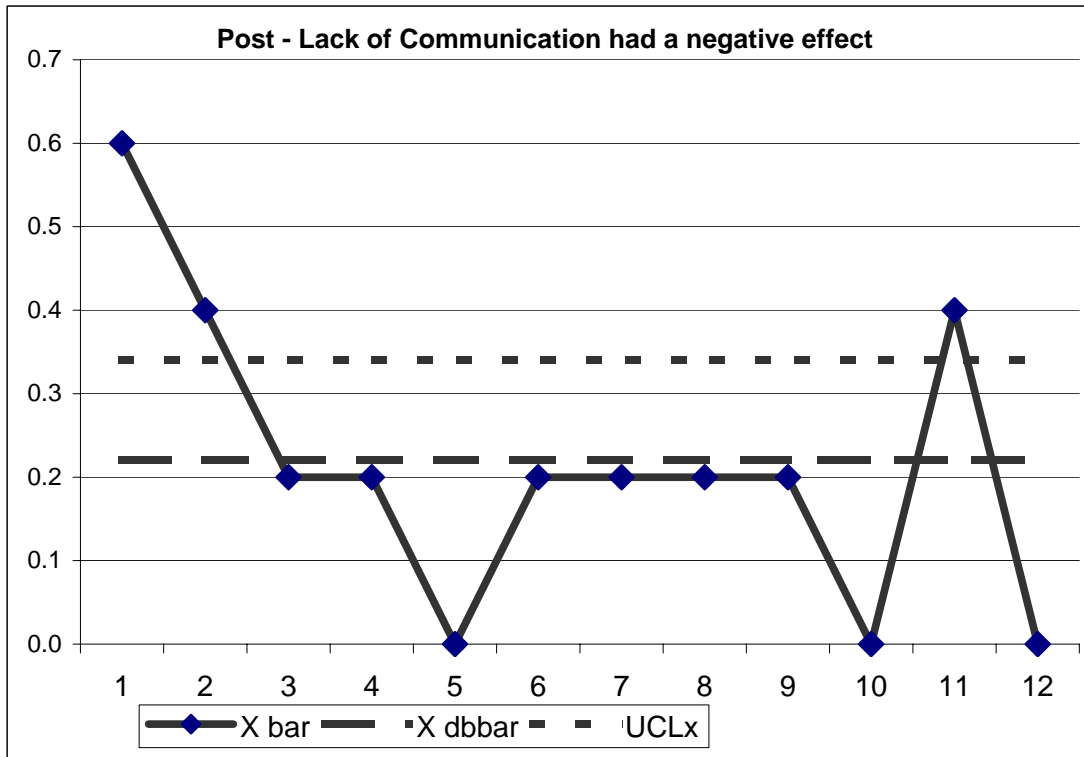
7. Lack of communication to me had a negative effect -POST

Participant	W1M	W1T	W1W	W1R	W1F	W2M	W2T	W2W	W2R	W2F
1	0	3	0	0	0	1	1	0	0	0
2	0	0	0	2	NA	0	0	0	0	0
3	0	0	1	0	0	1	0	0	0	0
4	0	NA	NA	0	NA	NA	NA	1	0	0
5	1	NA	0	0	NA	0	0	0	1	NA
6	0	0	0	0	0	0	1	0	0	0
7	0	0	0	0	0	0	0	NA	NA	NA

Interval	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sum	Xbar	R
1	0	3	0	0	0	3	0.60	3
2	0	0	0	2	0	2	0.40	2
3	0	1	0	0	0	1	0.20	1
4	0	1	0	0	0	1	0.20	1
5	0	0	0	0	0	0	0.00	0
6	0	0	0	0	1	1	0.20	1
7	1	0	0	0	0	1	0.20	1
8	0	0	0	0	1	1	0.20	1
9	0	0	0	0	1	1	0.20	1
10	0	0	0	0	0	0	0.00	0
11	1	0	1	0	0	2	0.40	1
12	0	0	0	0	0	0	0.00	0
Total						13	X dbbar 0.22	R bar 1.00

$UCLx = Xdbbar + A2 * Rbar$ $UCLx = 0.34$
 $LCLx = Xdbbar - A2 * Rbar$ $LCLx = -0.36$ 0
 $UCLr = D4Rbar$ $UCLr = 2.11$
 $LCLr = D3Rbar$ $LCLr = 0.00$

A2=.58
 D3=0
 D4=2.11



8 I did not receive information on time (when I needed it) - POST

Participant	W1M	W1T	W1W	W1R	W1F	W2M	W2T	W2W
1	2	1	1	0	0	0	0	0
2	0	1	1	0	NA	0	1	2
3	0	1	0	0	0	0	0	1
4	0	NA	NA	0	NA	NA	NA	0
5	0	NA	0	0	NA	1	0	0
6	0	0	0	0	0	0	0	0
7	2	1	0	1	1	0	1	NA

Interval	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sum	Xbar	R
1	2	1	1	0	0	4	0.80	2
2	0	1	1	0	0	2	0.40	1
3	1	0	0	0	0	1	0.20	1
4	0	0	0	0	0	0	0.00	0
5	0	0	0	0	2	2	0.40	2
6	1	0	1	1	0	3	0.60	1
7	0	0	0	0	0	0	0.00	0
8	1	2	0	0	0	3	0.60	2
9	1	1	0	0	0	2	0.40	1
10	0	1	0	0	0	1	0.20	1
11	0	0	0	0	0	0	0.00	0
12	0	1	2	1	1	5	1.00	2
Total						23	X dbbar 0.38	R bar 1.08

$UCLx = Xdbbar + A2 * Rbar$ $UCLx$ 0.61
 $LCIx = Xdbbar - A2 * Rbar$ $LCIx$ -0.25 0
 $UCLr = D4Rbar$ $UCLr$ 2.29
 $LCLr = D3Rbar$ $LCLr$ 0.00

$A2 = .58$
 $D3 = 0$
 $D4 = 2.11$

CC-31

X bar Interval X dbbar Interval UCLx

