

Connecting the Dots

Julie A. Phillips

Associate Professor, Organizational Leadership and Supervision

Purdue University School of Technology Columbus

4601 Central Avenue

Columbus, IN 47203

(812) 348-7207

japhillips@puc.iupui.edu

Donna J. Evanecky

Assistant Professor, Organizational Leadership and Supervision

Purdue University School of Technology Kokomo

Kelley Center, Room 250

2300 South Washington Street

Kokomo, IN 46904-9003

(765) 455-9364

djevanecy@puk.indiana.edu

Abstract

Connecting the world of quality with computer information systems is essential for the future success of students in the workforce. At Purdue University School of Technology, the Computer Information Systems Department (CPT) has utilized quality and statistics course work in their curriculum. The idea behind this collaboration is not only for the student to be an expert in the computer field, but to also fill the gap that usually exists from non-systems thinking in organizations. When reflecting about systems thinking “all events are distant in time and space, and yet they are all connected in the same pattern. Each has an influence on the rest, an influence that is usually hidden from view.” (Senge, 1990) In order to fill this void, the course work focuses on systems thinking: which encompasses variation, customer focus, continuous improvement, communication, team work, etc. Once the students understand the concept of systems thinking they are better able to connect the dots and see the organization in its entirety and contribute to the optimization of the whole.

Introduction

Total quality management (TQM) was a major business trend in the 1990's. It was deemed that the quality of the product or service lie in the realm of responsibility of the quality department. However, organizations have since learned that quality is critical for success, not only for success, but survival in this competitive global economy. Hence in order to not only survive but to obtain the competitive advantage, organizations have made total quality management everyone's responsibility. Organizations are training current employees in every functional area in the body of knowledge of TQM, besides, hiring recent college graduates that already possess this skill. At Purdue University School of Technology the CPT department states, “Our discussions with college graduate recruiters suggest that an “obsessive” attitude toward quality management will become an essential characteristic of successful systems analysts (and all information technology professionals).” (Whitten, Bentley, and Dittman, 2001) Hence the CPT department has added

TQM to their curriculum. This paper will further delve into the specific quality topics that are covered in the curriculum for the Systems Analysts with specific emphasis on systems thinking and customer focus. Through further analysis of this relationship between quality and curriculum one can better understand their importance in determining the success or failure of any organization.

CPT Courses

Various courses within the CPT curriculum for Systems Analysts contain references to TQM and the importance for the Systems Analyst to understand and apply the methodology in order to be successful in the program and in industry. Specific courses include:

CPT 172 Database Application Development: This course introduces the development of information systems through the use of a database. Topics include business information systems, system and application development, database management systems, problem solving, logic, data types, and programming using database technology. Given a database design and application requirements, students design, construct, and test a personal computer information system.

CPT 280 Systems Analysis & Design Methods: Comprehensive introduction to information systems development. Topics include the systems analyst, the systems development life cycle, methodologies, development technology, systems planning, project management, systems analysis, systems design, systems implementation, and systems support. Introduction to tools and techniques for systems development.

CPT 380 Requirements Discovery and Modeling: This course is an advanced study of systems analysis and design focusing on object-oriented methods, techniques, and tools. Topics include object-oriented technology, object-oriented methods and techniques to analyze a business problem and design and implement a solution, use-cases, object models, requirements gathering, effective communications, project management, and cost-benefit analysis. Emphasis is placed on working in a team environment to model and design a solution to a “real-life” business problem.

CPT 480 Managing Information Technology Projects: This course introduces the application of knowledge, skills, tools, and techniques that project managers use to plan, staff, estimate, and manage information technology projects. Special emphasis is placed on learning and applying the concepts of managing scope, risk, budget, time, expectations, quality, people, communications, procurement, and externally provided services. Students will apply project management technology and techniques to business problems.

These courses focus on continuous process improvement, problem-solving skills, working with the customer, assessing the customer’s needs, communication with the customers, measurement, and systems thinking, all topics that are part of TQM. Also it is a theme that is reinforced and expanded on throughout the freshman, sophomore, junior, and senior years.

Non CPT Courses

There are two additional courses that students take in the Systems Analyst curriculum for the Bachelor's of Science degree in CPT; they are a statistics course and OLS 484 Leadership Strategies for Quality and Productivity. OLS stands for Organizational Leadership and Supervision, a sister department in Purdue University School of Technology which works to educate and develop graduates who are career-ready for leadership roles in business, industry, and service agencies.

The statistics course is any basic statistics course that is offered on the campus. The purpose is for the student to understand frequency distribution, descriptive statistics, elementary probability, normal distribution, applications, sampling distribution, estimation, hypothesis testing, and linear regression.

OLS 484 Leadership Strategies for Quality and Productivity is a study of how organizational leaders create an environment conducive to high levels of employee self-motivation, quality, and productivity. The principles of TQM are presented from the work of Dr. W. Edwards Deming. Topics that are covered are: systems thinking, variation, profound knowledge, the red bead experiment, tampering, control charting, continuous improvement, PDCA model, Taguchi Design of Experiments, Kano Model of Customer Perceptions, problem solving tools, etc. These topics are covered to show what leaders do with the knowledge that they glean from the data that is generated from all of the above. It is an approach that the student is in a leadership role and he/she learns how to take the information that is given to them, analyze the data and listen to what the data is telling them, in order to make the most efficient and effective decisions.

This is the course work that emphasizes TQM in the curriculum for a Systems Analyst. This curriculum is evergreen, with updates and inputs added based on input from the industry and new research. Through this active approach to curriculum revision based upon research and industry needs, students will be on the cutting edge with regard to knowledge of quality. Students graduating with a Bachelor's of Science degree in CPT from Purdue University School of Technology have invaluable TQM skills that they will be able to utilize in their positions as Systems Analysts.

The authors' involvement in the above curriculum for CPT stems from their professorship of the OLS 484 Leadership Strategies for Quality and Productivity course, as well as previous work experience in the quality arena. The remaining section of this paper will discuss two topics in detail that are prevalent in understanding TQM. The topics include: systems thinking and the voice of the customer with specific emphasis on their relevance to the Systems Analyst.

Systems Thinking

For the Systems Analyst, as for any discipline, systems thinking is a useful and critical tool. If a Systems Analyst can see how the changes they make affect the rest of the organization, the more fruitful their decisions will be. Systems thinking is important for everyone in an organization to understand and be able to apply. Systems thinking means, "a system is a network of interdependent components that work together to try to accomplish the aim of the system." (Deming,

1994) For organizations to be managed effectively, they must think in terms of relationships between and among departments instead of independent components. By doing this they optimize the whole, instead of individual department within an organization, thus creating a win-win for all.

So what does this mean for the Systems Analyst? They must see themselves as part of the entire organization and what their contribution is to the overall good of the organization, not define themselves as solely “The Information Technology (IT) Department”. Once a department identifies themselves as “The IT Department”, they make themselves an individual profit center, only focusing on their needs. By doing this they lose sight of the overall mission/vision/purpose of the organization. Sometimes a particular department might take a loss or add an additional cost to their department’s budget, while the overall net effect for the corporation is great. Thus everyone wins. However, if the company is divided into profit centers, then no one wins.

One executive was shocked to find that his organization had 132 “profit” centers (most of which never had any revenues), each trying to optimize its own profit. It’s hard to image the destructive forces that were loose: time spent arguing about transfer prices, games played, moving inventory....He changed to one profit center so they could all work together. (Joyner, 1994)

Another aspect of systems thinking is the concept of blaming the process not the person. When problems arise it is standard practice to find the “who” and not the “what”. In systems thinking, the “who” is not part of the vocabulary. The focus is on the “what”, what caused this to happen, now let’s work together to get rid of the “what.” In systems thinking the “what” is analyzed in detail in order to put in a short-term fix to protect the customer, while pushing for the long-term fix to alleviate the problem. In order for this to work effectively, cross-functional teams work on the causes of the problem, not the symptoms of the problem. “ Even though contemporary society has the tendency to divide the world into neat arbitrary subdivisions, life comes to us whole and must be looked at through the systems lens.” (Senge, 1990)

The Voice of the Customer

The Voice of the Customer is what the customer is saying about their needs and their perceptions of how well the organization is meeting those needs. “ In order to fully listen to the customer’s needs, an organization needs to adopt a philosophy that the customer belongs to the organization, not a particular functional area within the organization.” (Joyner, 1994) Once a customer has adopted this philosophy, they need to define, “Who is a Customer?”. A good starting point is based on the work of Brian L. Joyner. An organization needs to ask itself the following:

- Who are our major customers or categories of customers?
- How do our products or services reach our customers?
- What characteristics are most important to various customers and how each step in the customer chain adds value?
- How does our organization work as a system? (Joyner,1994)

Once this is developed and understood, all functional areas, IT included, can determine their input in the customer value chain. Thus, meeting the customers needs.

There are two models that can be used to better understand the needs of the customer, Kano's Model of Customer Perceptions and Taguchi Loss Function. Kano's Model of Customer Perceptions is based on three categories of customer perceptions:

1. **Must Be's** – characteristics or features that we take for granted. If they are absent we are dissatisfied, however if they are present we are only neutral.
2. **More is Better** – in this category we are disappointed if a need is poorly met but have increasing satisfaction the better the need is met.
3. **Delighter** – these are the characteristics or features that surprise customers. Since they are unexpected, there is no negative effect if they are absent; but when present they have a positive effect. (Joyner, 1994)

Since the above model deals with customer perceptions, the organization needs to thoroughly understand what about the product or service that is provided to their customers are the "must be's" and the "more is better", while continually working to "delight" their customers. By understanding this model all departments in the organization, IT included, understand their part of the customer value chain. Thus they are better able to set priorities in their own work, and measure how well they are meeting the customers' perceptions.

Understanding the customers "must be's", are sometimes difficult to determine. A model that can be used is the Taguchi Loss Function. The premise behind the Taguchi Loss Function is organizations must determine what the customer wants. Taguchi defines this as the target. It is important to understand that the target is defined by the customer, not the supplying organization. Taguchi goes on to state that the further away from the target that the product or service is, the greater the loss to society. Simply, if the customer wants the target, that is what they want. Anything that deviates from this is a loss. "To deliver world-class quality to our customers, we must understand their perceptions of value." (Joyner, 1994)

Both of these models can help organizations better understand the voice of the customer. By listening to the voice of the customer and making continuous improvements based on the customer's voice, organizations will put themselves at a competitive advantage over organizations that choose not to. Thus, the IT department needs to determine their piece of the customer value chain, and work diligently to satisfy the voice of the customer.

Conclusion

This paper has only skimmed the surface as to quality's role and importance in every discipline. If one understands the system they work in and the customers effected by that system they are better able to have a positive influence on the outcome. Having employees that possess the skills to understand the system and the customers related to a given systems is the foundation in any organization. Hiring employees with these skills no matter what field of expertise is critical to the organization's success and bottom line.

Building TQM principles into every curriculum has merit and can benefit the individual as well as the organization as a whole. In order for organizations to meet the challenges of a global economy, quality must be designed into, built into, and maintained at all levels.

References

- Deming, W. E. (1994). The New Economics. (2nd ed.). Massachusetts: Massachusetts Institute of Technology.
- Joyner, B. L. (1994). Fourth Generation Mangement. New York: McGraw-Hill, Inc.
- Senge, P. M. (1990). The Fifth Discipline. New York: Currency and Doubleday.
- Whitten, J. L., Bentley, D. L., & Dittman, K. C. (2001). Systems Analysis and Design Methods. (5th ed.). New York: McGraw-Hill.