FEEDBACK TUTORIAL LETTER

2ND SEMESTER 2019

Assignment 1 & 2

QUALITY MANAGEMENT SYSTEMS (BQM612S)
Dear BQM612S students

It was a pleasure meeting all of you. You showed hunger for learning which is highly commendable. I am thankful for your participation during our vacation class and I wish you the very best in your exams and future endeavours. Herewith find the feedback for the two assignments.

Scholarly yours,

Dr Asa

Assignment 1

SECTION A

Question 1

1. T
2. A
3. C
4. A
5. D
6. A
7. E
8. A
9. A
10. T
1. Six sigma
   a) Plant Manager
   Can use Six Sigma to reduce waste improve product consistency solve equipment problems or create capacity
   b) Human Resource Manager
   To reduce the cycle time for hiring employees
   c) Sales Manager
   To improve forecast reliability, pricing strategies, or pricing variation
   d) Anyone
   To better understand their customers’ needs and tailor their services offering to meet customers’ wants.

2. Six Sigma is a performance improvement approach that seeks to:
   1. find and eliminate causes of defects and errors,
   2. reduce cycle times and cost of operations,
   3. improve productivity,
   4. better meet customer expectations, and
   5. achieve higher asset utilization and returns on investment in manufacturing and service processes.

Six Sigma focuses on
   • outputs that are critical to customers and
   • justifies improvements by demonstrating a clear financial return for the organization.

The Six Sigma Methodology is DMAIC which stands for:
   • Define
   • Measure
   • Analyze
   • Improve
   • Control
   • Incorporates a wide variety of statistical and process improvement tools
3. Sampling methods are:
- simple random sampling; every item in the population has an equal probability of being selected.
- stratified sampling; the population is partitioned into groups or strata
- systematic sampling; every nth (4th, 5th etc.) item is selected.
- cluster sampling; atypical group (division of the company for example) is selected and the random sample is taken from within the group.
- judgement sampling; export opinion is used to determine the location and characteristics of a definable sample group.

4. Excessive variation can result in various “evils,” including:

- *Variation increases unpredictability*. If we don’t understand the variation in a system, we cannot predict its future performance.
- *Variation reduces capacity utilization*. If a process has little variability, then managers can increase the load on the process because they do not have to incorporate slack into their production plans.
- *Variation contributes to a “bullwhip” effect*. This well-known phenomenon occurs in supply chains; when small changes in demand occur, the variation in production and inventory levels becomes increasingly amplified upstream at distribution centers, factories, and suppliers, resulting in unnecessary costs and difficulties in managing material flow.
- *Variation makes it difficult to find root causes*. Process variation makes it difficult to determine whether problems are due to external factors such as raw materials or reside within the processes themselves.
- *Variation makes it difficult to detect potential problems early*. Unusual variation is a signal that problems exist; if a process has little inherent
variation, then it is easier to detect when a problem actually does occur.

The evils of variation can be addressed by understanding the process and searching for, and eliminating, root causes.

5. Dashboards & balance score cards are used by many organizations to track key measurements at the operational & strategic levels, respectively. The dashboard concept is analogous to an automobile’s dashboard –a collection of indicators (speed, RPM, oil pressure, temperature etc.) that summarizes the performance. Dashboards often include graphs, charts, and other visual aids to communicate key measures and alert managers when performance is not where it should be. Overall, dashboards provide information needed on a daily management and control processes. The balanced scorecard was developed by Analog Devices in 1987 as a summary of broad performance measures across the organization. The purpose of the balanced scorecard is to “translate strategy into measures that uniquely communicate your vision to the organization”. A balanced score card defines the most important drivers of organizational success and consists of four perspectives; Financial perspective, Internal perspective, Customer perspective, Innovation & learning perspective. In summary the dashboard & balanced Scorecards provide rich sources of information for tracking progress. The results inferior to a competitor’s or that indicate adverse trends often suggest the need for six sigma improvement project.

6. -Value creation processes; sometimes called core processes, which are most important to “running the business” and maintaining or achieving a sustainable competitive advantage. They include design, production, delivery and other business processes.
- Support processes; are those that contribute to the successful performance of an organization’s value –creation processes employees, and daily operations. They provide infra structure for value –creation processes but generally do not add value directly to the products or services.
Because value-creation processes do not add value to products and services, they require a higher level of attention than support processes.

7. W. Edward Deming explained these concepts of variations using two simple yet powerful experiments in his four-day management seminars— the Red Bead & Funnel experiments. The Red Bead experiment leads to several important lessons about statistical thinking:

- Variations exist in systems, and if stable, can be predicted.
- All the variation in the production of red beads and the variation from day to day of any willing worker, came entirely from the process itself.
- Numerical goals are often meaningless.
- Management is responsible for the system.

Whereas, the funnel experiment, its purpose is to show that people can and do affect outcomes of many processes and create unwanted variation by tampering with the process or indiscriminately trying to remove common causes of variation.

8. a) \[ \text{Dpmo} = \frac{\text{Nr of defects discovered}}{\text{opportunities for error}} \times 1,000,000 \]

   \[ = \frac{3}{8000} \times 1.6 \times 1,000,000 = \frac{3}{12800} \times 1,000,000 = 234,375 \]

9. Quality costs can be organized into four major categories: prevention costs, appraisal costs, internal failure costs, and external failure costs.

**Prevention costs** are investments made to keep nonconforming products from occurring and reaching the customer, such as:

- *Quality planning costs*, such as salaries of individuals associated with quality planning and problem-solving teams, the development of new procedures, new equipment design, and reliability studies.
- *Process control costs*, which include costs spent on analyzing production processes and implementing process control plans.
**Appraisal costs** are those associated with efforts to ensure conformance to requirements, generally through measurement and analysis of data to detect nonconformance. Some appraisal costs include the following:

- *Test and inspection costs* associated with incoming materials, work-in-process, and finished goods, including equipment costs (instruments and computers) and salaries
- *Process measurement and control costs*, which involve the time spent by workers to gather and analyze quality measurements

**Internal failure costs** are incurred as a result of unsatisfactory quality found before the delivery of a product to the customer; some examples include the following:

- *Scrap and rework costs*, including material, labor, and overhead
- *Costs of corrective action*, arising from time spent determining the causes of failure and correcting production problems
- *Process failures*, such as unplanned machine downtime or unplanned equipment repair

**External failure costs** occur after poor-quality products reach the customer, for example:

- *Costs due to customer complaints and returns*, including rework on returned items, cancelled orders, and freight premiums

*Product recall and liability costs* and *warranty claims*, including the cost of repair or replacement as well as associated administrative costs and damages

**ASSIGNMENT 2**

1

a. manufactured goods/products

Product characteristics can generally be classified as:
1. **Performance:** A product’s primary operating characteristics. Using an automobile as an example, characteristics would include such things as acceleration, braking distance, steering, and handling.

2. **Features:** The “bells and whistles” of a product. A car may have power options, a tape or CD deck, antilock brakes, and power seats.

3. **Reliability:** The probability of a product’s surviving over a specified period of time under stated conditions of use. A car’s ability to start on cold days and frequency of failures are reliability factors.

4. **Conformance:** The degree to which physical and performance characteristics of a product match pre-established standards. A car’s fit and finish and freedom from noises and squeaks can reflect this dimension.

5. **Durability:** The amount of use one gets from a product before it physically deteriorates or until replacement is preferable. For a car it might include corrosion resistance and the long wear of upholstery fabric.

6. **Serviceability:** The speed, courtesy, and competence of repair work. An automobile owner might be concerned with access to spare parts, the number of miles between major maintenance services, and the expense of service.

7. **Aesthetics:** How a product looks, feels, sounds, tastes, or smells. A car’s color, instrument panel design, control placement, and “feel of the road,” for example, may make it aesthetically pleasing.

b.

1. **Reliability** – The ability to provide what was promised, dependably and accurately

2. **Assurance** – The knowledge and courtesy of employees, and their ability to convey trust and confidence.

3. **Tangibles** – The physical facilities and equipment and the appearance of personnel.

4. **Empathy** – The degree of caring and individual attention provided to
customers.

5. **Responsiveness** – the willingness to help customers and provide prompt service.

c. **Japanese Professor, Noriaki Kano classified them into three categories. Name and describe them.**

Kano developed the following concepts that may be applied to CTQ characteristics:

1. **Dissatisfiers:** Requirements that are expected in a product or service. In an auto-mobile, a radio, heater, and required safety features are examples, which are generally not stated by customers but assumed as given. If these features are not present, the customer is dissatisfied.

2. **Satisfiers:** Requirements that customers say they want. Many car buyers want a sunroof, power windows, or antilock brakes. Although these requirements are generally not expected, fulfilling them creates satisfaction.

3. **Exciters/delighters:** New or innovative features that customers do not expect. The presence of unexpected features, such as a weather channel button on the radio or separate rear-seat audio controls that allow children to listen to different music than their parents, leads to high perceptions of quality.

2 A project is a temporary work structure that starts, produce an output or outcome and then shuts down. Projects are driven by teams. Project management involves all activities associated with planning, scheduling, and controlling projects. Good project management ensures that an organization's resources are used efficiently and effectively. Such management is particularly important from Six Sigma because projects generally cut across organizational boundaries and require the coordination of many different department's and functions.
The characteristics of individuals who make Six Sigma teams are:
- Champions, who are senior managers who promote & lead the deployment of Six Sigma in a significant area of the business
- Master Black belts, fulltime Six Sigma experts who responsible for Six Sigma strategy, training, mentoring, deployment and results. They are advanced technical expertise in Six Sigma tools and methods.
- Black Belts, are fully trained Six Sigma experts with up to 160 hours of training. They perform much of the technical analysis required of Six Sigma projects, usually on a full time basis.
- Green Belt, are functional employees who are trained in introductory Six Sigma tools and methodology and work on projects on a part time basis, assisting black belts while developing their knowledge & expertise. They conduct basic analysis of data and provide ideas for improvement.

The five stages of the project life cycle are as follows:
- Initiation; Define directions, priorities, limitations, and constraints
- Planning; create a blueprint for the scope of the project & resources needed to accomplish it
- Assurance; use appropriate qualified processes to meet technical project design specifications
- Control; use appropriate communication and management tools to ensure that managerial performance, process improvements and customer satisfaction is tracked.
- Closure; evaluate customer satisfaction with project deliverables and assess success and failures that provide learning for future projects and referrals from satisfied customers.

Process map/ flow chart identifies the sequence of activities or flow of materials and information in a process. They help people involved in the process to
understand it much better and more objectively by providing a picture of the steps needed to accomplish a task. The process map helps to identify appropriate metrics for process control.

6
Basic questions that an organization must ask in order to collect accurate data is that;
-what questions are we trying to answer?
-what type of data will we need to answer the question?
-who can provide the data?
-how can we collect the data with minimum effort and minimum chance of error?

7
They are simple to use and easily interpreted by shop personnel. They include information such as specification limits, number of nonconforming items easily identifiable and provides an immediate indication of quality of the process. The types are as follows;
-check sheet for data collection
-defective item check sheet (defective item illustration)
-defective location check sheet (bubble investigative check sheet)

8
Sampling is the basis for many measurement activities; therefore several factors should be considered before making this study;
-what is the objective of the study?
-what type of sample should be used?
-what possible error might result from sampling?
-what will the study cost?

The End