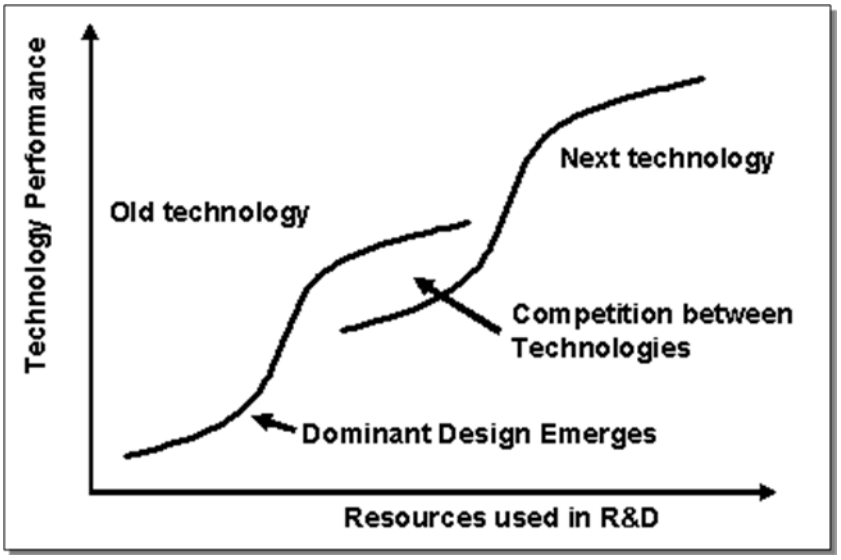
Feedback on tutorial 3 – EMA2602 – Semester 1 of 2018

CHAPTER 8 of the prescribed book

Total Quality Management



Dear EMA2602 Student

You were asked to answer the following questions from the workbook:

8C.1.1	8C.2.1	8C.3.1
8C.4.1	8C.5.1	8C.6.1
8C.6.2	8C.7.2	8C.8.1 (i)
8C.9.1	8C.10.1	8C.11.1
8C.11.2 ii)	8C.11.5	

I would like to thank JJ Brits for the answers uploaded to myUnisa. My suggested solutions follow.

Abbreviations used

METS-3: Third edition of Management for Engineers, Technologists and Scientists

Question 8C.1.1

List the fundamental principles of TQM. (7)

Answer 8C.1.1 (METS-3: 161)

1. Understand and answer the voice of the customer.
2. All people in an enterprise must be totally involved in quality improvement.
3. Continuously strive for zero defect.
4. Design and build quality into the product.
5. Focus on the process.
6. Suppliers are partners in quality.
7. Quality is free.

Question 8C.2.1

Please read through the case study on the Granite Rock Company (METS-3: 162-163)

Required

Discuss the TQM principles used by the Granite Rock Company. Describe how the company is applying them. Also choose an organisation of your choice and describe what it is being done to improve the quality of its products and services. Explain what can still be done to improve the quality of products and services of this company still further. (12)

Answer 8C.2.1

(METS-3: 162)

Note: students must get up to 7 marks for just mentioning the 7 TQM principles.

The seven fundamental principles of TQM	**Application of the TQM principles** at the Granite Rock Company

(METS-3: 161)	
Understand and answer the voice of the customer.	Granite Rock's customers demand high quality and the company responded to this need - "takes great pains to find out what customers want … and what needs improving" (METS-3: 163). Although Granite Rock is selling commodity products such as rock, sand and aggregates the company is using quality as a way to differentiate themselves from their competitors by means of their total quality programme. Granite Rock has improved its delivery of concrete on time from 70% to 98,5% (METS-3: 162) The company has systems in place to get feedback from customers and to handle the complaints of customers.
All people in an enterprise must be totally involved in quality improvement.	Granite Rock provides training and coaching to workers so that they know how to achieve high quality standards.
Continuously strive for zero defect.	Granite Rock tries to be ahead of its competition and actually reached the six-sigma level.
Design and build quality into the product.	Reliability has been built into the processes of Granite Rock.
Focus on the process.	By using computer-controlled processing equipment for mixing batches of concrete Granite Rock managed to cut out human error.
Suppliers are partners in quality.	Granite Rock buy materials supplied other manufacturers. It is not stated in the case study whether they require such suppliers to meet the same standards that they have put in place.
Quality is free.	Statistical process control has helped the company to reduce variable costs. Costs incurred in resolving complaints are about 0,2% of sales which is lower than the 2% of sales for their competitors.

Please improve this answer.

Question 8C.3.1

TQM is about gaining understanding of what customers need. List and briefly explain the approaches to understanding customers, their needs, expectations, perceptions, requirements and the forces that drive them. (12)

Answer 8C.3.1 (METS-3: 163);

1)	Informal customer research	Get information from customers by talking to them.
2)	Formal customer research	Identify, measure and understand customers expectations by means of qualitative and/or quantitative techniques (which follows).
3)	Qualitative research	Free format responses in which word and observations are used.
4)	In depth interviews	Face to face interviews conducted on 1-1 basis or in small groups.
5)	Focus groups	Group of 7-12 customers, meet for 2 hours to offer viewpoints about their requirements and expectations.
6)	Quantitative research	Develop statistically reliable information about customer needs from sample data that can be generalised to larger populations. Usually done by mail and telephone.

Question 8C.4.1

Briefly list and describe the steps in implementing TQM (total quality management) on an enterprise-wide basis. (7)

Answer 8C.4.1

(METS-3: 164; Any seven valid facts.)

- Set up a quality council (✓) to formulate and implement an enterprise-wide quality policy(✓)
- The quality council should develop a formal, documented quality policy (✓)that must be communicated to all employees (✓)
- All people in the organisation should be involved in quality and continuous improvement activities (✓)
- Everyone should be trained in (including senior management) TQM principles and techniques, particularly customer needs analysis and TQM tools. (✓)
- PIT's (process improvement teams) should be set up at shop floor level to improve processes and solve quality problems (✓)
- Sufficient time should be allocated to quality training and small group activity (✓)
- Quality improvements should be monitored(✓), and people and groups rewarded for quality achievements (✓)
- Quality specialists in the quality control department should facilitate quality improvement initiatives (✓)and constantly coach others in the organisation to implement TQM principles (✓)

Question 8C.5.1

Richard Sconberger has set up rules that sustain the habit of continuous quality improvement while aiming for zero defects. List these rules. (7)

Answer 8C.5.1

(METS-3: 165) (7)

- focus on the process
- make quality visible

- insist on compliance
- stop the line
- correct your own errors
- do a 100 percent check until the process is capable
- improve on a project-by-project basis

Question 8C.6.1

Explain how the new products development process can contribute to product quality. (6)

Answer 8C.6.1

(METS-3: 165-166) (6)

Quality must be built into the new product.

All participants in new product development must provide quality services to one another so that the customer can see the quality in the product.

When allocating resources for new product development, the focus should be on meeting customer requirements.

The prevention of future quality problems is the responsibility of the product development team.

It is much cheaper to avoid potential quality problems than it does to fix it once they are already embedded in the product.

Effective design control is therefore important to achieve TQM during product development.

Designs should:

- Be fit for purpose, reliable and serviceable
- Specify methods of measurement and testing
- Result in products that provide customer satisfaction

Question 8C.6.2

Study the “voice of customer” (VOC) chart below and explain the role of such a chart in the new product development process. (3)

Product: Steam Iron									
Importance: 3 = Most Important 2 = Moderately Important 1 = Least Important									
			Product Characteristic						
VOC Number	VOC	Importance	Light weight	Self-cleaning	Rotating cord connector	Teflon coated base	20 second warmup period	Intelligent controls	Transparent water reservoir
1	Saves time	3	3	3		3	3	3	
2	Right temperature for all types of fabric	3					3	3	
3	Plate clean at all times	2		2		2		2	
4	See when water is depleted	2							2
5	Heats up in a short period	2					2	2	
6	Cord does not twist and snag	2			2				
7	Optional manual temperature and steam control	2						2	
8	Easy to store	1	1		1				
		Total:	4	5	3	5	8	12	2

Answer 8C.6.2

(METS-3: 167) (3)

The importance that the customer places on various needs are rated (1 to 3).

The product characteristics that the customer values are identified.

The relationship between the VOC and product characteristics can be identified.

Question 8C.7.2

It is important that companies produce products and offer services that are consistently of an appropriate quality level. Differentiate between common and special causes of variation. Why is it important to differentiate between these two types of cause? (7)

Answer 8C.7.2 (METS-3: 168, 169)

Common causes	**Special causes**
Variation due to chance	Can be linked to a specific cause. E.g. incorrect tool setting; operator not following procedures.
Cannot easily be eliminated because it	Can be traced to a specific source and then

cannot be traced to a specific source.	eliminated.
To be addressed by employees in charge of the process.	Can be addressed by front-line workers.
94% of all causes	6% of all causes

Process variation is when the quality of the output produced by processes varies. Variation due to chance is called variation due to common causes. Other variations are due to special causes. A key objective of TQM is to identify special causes of variation so that it can be eliminated. This means that special-cause and common-cause variation must be separated. Special-cause variation can usually be traced to a specific source. **[7]**

Question 8C.8.1

i) List 3 advantages of establishing single sources of supply (of raw materials, components and sub-assemblies). (3)

Answer 8C.8.1

i) (METS-3: 177-178) {Any 3 relevant facts}

- Better service can be expected – all the business is provided to one supplier.
- You can develop a more collaborative and information sharing relationship – because you are dealing with one supplier only.
- A better price can be negotiated.
- Monitoring of purchased goods can be reduced.
- If your company wants to provide quality products then the inputs used must also be of good quality.

Question 8C.9.1

Discuss what is meant by “quality is free”. (5)

Or (when asked from another angle)

Discuss the terms prevention costs, appraisal costs and failure costs, and indicate how they can relate to the term “Quality is free”.

Answer 8C.9.1 (METS-3: 178) (5)

“There is a cost attached to doing things wrong, this is called the cost of quality, or COQ. COQ can be thought of as the cost of achieving conformance to quality standards plus the cost of non-conformance. It is the cost of rework, scrap, inspection, warranty claims, testing and similar activities to ensure conformance to quality standards.

Costs related to quality are usually separated into at least three areas:

1. Prevention costs. These costs are associated with all the activities that focus on preventing defects or non-conformance with quality standards. In many organisations this includes all the people in the quality department who inspect the product, as well as the cost of operators who do their own inspection. Also included in this group are activities to assure supplier conformance.
2. Appraisal costs. These costs are associated with measuring, evaluating or auditing products to assure conformance with quality standards and performance requirements.
3. Failure costs. These costs are associated with evaluating and either correcting or replacing defective products, components or materials that do not meet quality standards. Failure costs can be either internal failure costs that occur prior to the completion or delivery of a product or service; or external failure costs that occur after a product is delivered or a service is provided.

The basic relationship between the three types of cost is that money invested in prevention and appraisal can substantially reduce failure costs. In addition to reducing expenses, the reduction in external failures results in fewer, dissatisfied customers resulting in fewer product returns, less customer complaints and greater customer loyalty. As a rule of thumb, in a well-managed enterprise, the cost of prevention and appraisal should be one third of the cost of failure. This leads to the conclusion that “quality is free. It’s not a gift, but it is free”.

Question 8C.10.1

Define the ISO 9000 quality standards. (2)

Answer 8C.10.1

A written set of standards that define the basic elements of a management system and organization should use to ensure that its products and services meet or exceed customer needs and expectations. (2)

Question 8C.11.1

Explain why all people in an organisation should be involved in quality improvement. (4)

Answer 8C.11.1 (METS-3, Chapter 8) (4)

Total quality management is a company-wide responsibility.

Quality is not something that can be added at one point in the value chain – it must be integrated with all the processes through which products and services are produced and distributed.

A quality control department cannot solely be held responsible for quality.

Quality is of strategic importance and therefore top management should lead TQM initiatives that should focus on preventing quality problems from happening.

The only way for an enterprise to reach world-class quality standards is for everyone in the enterprise to be totally committed to and involved with quality improvement.

Question 8C.11.2 ii)

Japan's economy was completely devastated by World War II, which ended in 1945. Various Japanese leaders knew that the country had to produce exports in order to survive. At the time Japanese products were, however, associated with poor quality. To improve the quality of Japanese products, various programmes had to be introduced and quality gurus such as Deming, Juran, Ishikawa and Taguchi were consulted at a time when various theories, practices, principles and concepts such as "quality is free", "continuous process improvement", quality control circles, statistical process control and total quality management were developed. By the 1970s and 1980s, after years of hard work, Japanese companies had managed to change the world's perceptions of customers regarding the quality of their products for the better.

References

- Davis, M.M., Aquilano, N.J. & Chase, R.B. 2003. Fundamentals of Operations Management. Boston: McGraw-Hill Irwin. pp. 214-229.
- Finch, B.J. 2003. OperationsNow.com: Processes, value and profitability. Boston: McGraw-Hill Irwin. pp. 568-572.
- Schonberger, R.J. & Knod, E.M. 1994. Operations Management: Continuous Improvement. Burr Ridge: Irwin. pp. 26-34

Required

You have been appointed as the Engineering Manager at a local company who has plans to market its products in developed countries in the near future. Management knows that the customers in such markets require good quality products. Write a short essay for management in which you provide them with ideas on how the quality at the company can be improved.

{Any 20 facts related to quality theory and practice will be accepted} (20)

Answer 8C.11.2 ii)

Any TQM / quality relevant theory and practice will be accepted.

Students may use the whole of chapter 8 as a source of information.

Question 8C.11.5 (TQM definitions)

Match each of the following quality management terms on the left of the table with the correct definition on the right starting with term number 2. In your answer book, write down the number of each term, and next to it the letter representing the correct option e.g. 1. z. (13)

1. Process chart		a. It is based on the 80/20 rule.
2. Process improvement team		b. It is also known as the cause-and-effect diagram.

3. Pareto analysis		c. It indicates the frequency of various events/causes.
4. Appraisal cost		d. Costs associated with all the activities that focus on preventing defects or nonconformance with quality standards.
5. Ishikawa diagram		e. It is used to map activities involved in the manufacturing of a product or delivery of a service so that value-adding and wasteful activities can be identified.
6. Histograms		f. It is used to identify relationships between events and time and between problems and causes.
7. Run charts and correlation diagrams		g. It is used in statistical process control.
8. Control charts		h. A small group of employees (at shop-floor level) that improve processes and solve quality problems.
9. ISO 9000 quality standards		i. Identify, measure and understand customers expectations by means of qualitative and/or quantitative techniques
10. Formal customer research		j. It defines the basic elements of a management system an enterprise should use to ensure that its products and services meet or exceed customer needs and expectations.
11. Process		k. A repetitive set of interacting activities that uses resources to transform a defined set of inputs into outputs that are of value to a customer.
12. Prevention costs		l. Costs associated with evaluating and either correcting or replacing defective products, components or materials that do not meet quality standards.
13. Failure costs		m. Costs associated with measuring, evaluating or auditing products to assure conformance with quality standards and performance requirements.

Answer 8C.11.5 (TQM definitions)

1. e; (METS-3: 169)

2 h; (METS-3: 164)

3. a; (METS-3: 172)

4. m; (METS-3: 178)

5. b; (METS-3: 172)

6. c; (METS-3: 172)

7. f; (METS-3: 172)

8. g; (METS-3: 173)

9. j; (METS-3: 178)

10. i; (METS-3: 163)

11. k; (METS-3: 168)

12. d; (METS-3: 178)

13. l; (METS-3: 178)

Remember to consider the number of marks allocated to a question when answering it. It will give you an idea of how much information to provide.

Remember to read the answers given by other students. You are welcome to comment on their answers (and mine).

I wish you the very best with your studies

Wilhelm (Willie) P. Nel