**1.3.**Select a specific product or service, and discuss how the eight dimensions of quality impact its overall  acceptance by consumers.

Product: Modern Smartphone

Dimensions of Quality

1. Performance – Customers will value a smartphone that’s responsive, quick to execute their instructions, and does not lag even when multiple applications are making use of its processing power simultaneously.
2. Reliability – Customers trust their smartphone to reliably store their data. Any loss of data from a software or hardware failure will likely not be viewed as acceptable, especially as consumers store more and more personal information in their phones.
3. Durability – While the intricacies of modern smartphones make them fall short of the notorious invincibility of the old-school Nokia phones, customers will still expect the effective service life of their smartphones to range in the years (perhaps 2-5 years). With the advent of better Gorilla glass, Sapphire Crystal displays, and water/dust-proof features, the durability of modern smartphones has improved considerably in recent years.
4. Serviceability – People expect smartphone companies (or telecom companies if the device was bought through one such as Verizon) to offer quick and effective servicing when needed. Services such as transfer of information from an old phone to a new one, automatic cloud backups, repair or replacement of individual parts or even the entire phone to be standard services offered in any warranty package for a smartphone.
5. Aesthetics – Aesthetical preferences obviously vary from person-to-person, but there are also clear trends in the mainstream market for smartphones. Despite Blackberry’s recent attempt to reintroduce the physical tactile keyboard on a smartphone, the trend has clearly been in the favor of a software keyboard within as large a screen as possible onto the device. For about the past decade, making smartphones as thin as possible was a huge marketing strategy. Now that phones are already relatively thin and sleek, some companies are beginning to advertise greater battery life even at the expense
6. Features - At the bare minimum, customers will expect their smartphone to be able to make/receive calls and text messages and to access the Internet. They will likely also expect a robust offering of applications downloadable onto their phone.
7. Perceived Quality – A great example of how a company’s reputation can affect the perceived quality of their products would be Samsung’s recent fiasco with their Galaxy Note 7 batteries catching on fire and/or exploding. Even though the problem only affected the Note 7 line of Samsung’s smartphones specifically, it dissuaded many from purchasing Samsung phones for some time. Some customers of other Samsung phones such as the Galaxy S6/S7 even went as far as to return their phone and buy a different phone out of fear of the battery issue affecting theirs even though all evidence indicated the problem only affected Note 7 phones.
8. Conformance to Standards – This is critical to the reliability/performance of a smartphone. A lot of the circuitry, computer chips, and other components that make up a modern smartphone allow for a tiny degree of acceptable variability in order for them to perform as intended.

**1.9.**What are the three primary technical tools used for  quality control and improvement?

1. Statistical process control (SPC)
2. Design of experiments
3. Acceptance sampling

**1.15.**What is a Six Sigma process?

A Six Sigma process is intended to “reduce the variability in the process so that the specification limits are at least six standard deviations from the mean.” This corresponds to roughly a rate of .2 ppm being defective by expectation. The Six Sigma concept accounts for the assumption that, regardless of how much effort is put into minimizing the variability of the process, the process mean can still be subject to unpredictable or unpreventable disturbances that could cause its value to shift by as much as 1.5 standard deviations from its expected value. Thus, a Six Sigma process expects to produce about 3.4 ppm defective.

**1.21.** Explain why it is necessary to consider variability around the mean or nominal dimension as a measure of quality.

Variability in a product offering makes it difficult for the organization to provide their customers that have quality characteristics that are at levels that match their expectations. The nominal or target value of a quality characteristic is the value of a measurement that corresponds to the desired value for that characteristic. The producer wants to optimize the percentage of their products created whose quality characteristics fall within some given range of values that is typically believed to be sufficiently close to the nominal value so as to not significantly impact the function or performance of the product from the perspective of the customer. Off-the-wall techniques that do not adequately consider the inherent variability that exists in materials, processes, and other parts of the system can result in nonconforming products that fail to meet one or more of their desired range of specifications. These products are considered defective. Thus, considering variability around the mean or nominal dimension is vital to forming a sound statistical estimate for the rate of defective products and consequently to measuring quality of a product and making sound business decisions.

**1.22.** Hundreds of companies and organizations have won the Baldrige Award. Collect information on at least two winners. What success have they had since receiving the award?

1. Sutter Davis Hospital (2013 Award Recipient, Health Care)
   1. 2016 Winner of Modern Healthcare's inaugural Healthiest Award for providers and insurers
      1. Recognizes employers that promote wellness within their workforce through access to fitness programs and facilities, the structure of the organization's benefits plan, and a culture that promotes a healthy work-life balance
2. MidwayUSA (2015 Award Recipient, Small Business)
   1. 2017 Winner of the Peter Hathaway Capstick Hunting Heritage Award
   2. Founders established a 501(c) public charity – MidwayUSA Foundation.