Governmental pressure is likely to force more health-care enterprises to become operationally efficient. Most enterprises will be compelled to practice many of these OE tools due to marketplace competition. Continuous improvement requires a commitment to learning. It is highly advisable for STEM professionals and leaders to constantly look out for opportunities to advance the level of OE of their enterprises.

## QUESTIONS

1. How are URLs, domain names, and search engines defined? Use examples to explain the relationship between them. How can one make use of web pages to promote business?
2. What are the Internet, an intranet, and an extranet? How are they being used by numerous large and small companies today?
3. What are the standard markup languages used in the design of web pages?
4. What are some of the legal issues related to the Internet and web-based business transactions that remain unresolved at this time?
5. In implementing a computerized maintenance management system to reduce maintenance costs, what steps are taken?
6. What is data mining, and how significant is it in generating useful results to support management decision-making?
7. For the development of software products, the software configuration management (SCM) process is closely followed as a way to ensure performance and reliability while controlling costs. Explain what SCM can do and in what ways it is important that both developers and intended customers insist on SCM.
8. Although marketing and sales are not functions of engineering, they have a direct impact on product development and CRM. Which web-based applications are currently available to facilitate marketing and sales?
9. The business environment in the new millennium will continue to be fast paced, Internet enhanced, and globally oriented. Name a few factors that will affect the business successes of any companies in such a challenging environment.
10. The "Design for Lean Six Sigma (DFLSS)" is a methodology known to be particularly useful for designing new services that are in close alignment with customer and business needs. Explain the key phases the DFISS methodology goes through.
11. Services are known to have many wastes, which, if not removed, will increase costs and erode service quality, leading to customer dissatisfaction. Name a few of the typical wastes encountered in service offerings.
12. The Lean principle focuses on the improvement of process speed. It is thus particularly useful to service enterprises, which need to shorten customer response time. Explain the basic concepts involved in Lean to improve process speed.
13. There are two types of web services. The first type offers software applications that are accessible to human users. The second type provides software applications that can be accessed by other applications. Explain the basic requirements of building web services to create applications, which can be accessed by human users.
14. As SOA service vendors are likely to be consolidated over time, an IT utility will emerge. In that scenario, most businesses will "buy" computing services instead

of maintaining their own in-house computing data centers, much like how business, commercial, and residential customers buy electricity today. What are the potential concerns to service enterprises, which become dependent on the IT utility, insofar as operation and financial risks are concerned?

## Appendix: "Service" Model

Lean Six Sigma may be usefully applied to service-related work processes by following the seven-step SERVICE model described in this section:

1. *Study customer value:* Select those tasks/processes and activities that are likely to invigorate customer satisfaction. Lovelock and Writz (2014) illustrate the service value package as consisting of a core benefit supported by eight supplemental service elements (see Figure 12.A1). For a service to be appreciated by customers, both the core and its supplemental elements should be fresh and well formulated, because all of them will affect the overall perception registered by the customers. This model fits well with different service value packages, although not all supplemental service elements are equally important to different core services. Some supplemental service elements engage the customers directly, thus having a more profound impact on influencing the customer's perception than others. A useful way to prioritize the target activities for applying Lean Six Sigma is then to look at the core and the supplemental elements of the service value packages offered by the enterprise.

   Processes that go into a service can also be classified into the types of highly customized, mass customized, and standardized. Among these three types, the best candidates for applying Lean Six Sigma are the standardized processes,

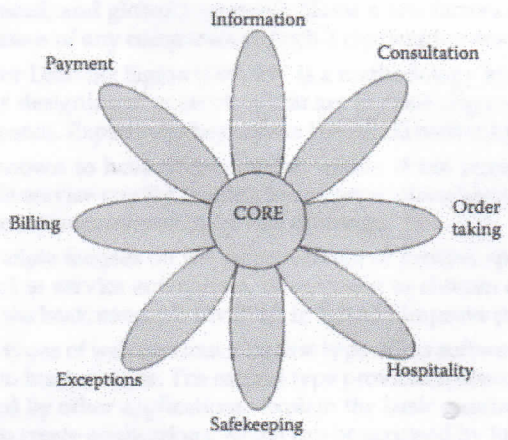


FIGURE 12.A1
Service elements.

assemble computers quickly and reliably in the United States, negating some of the cost advantages of moving plants offshore.

e. Cultivate visions with originality and a global orientation, and demonstrate leadership in strategic planning.

f. Maintain a broad business network that can be tapped into to add value for challenging situations.

g. Avoid attaching yourself for too long to functions or activities that are readily outsourced. Study the industry. Stay away from labor-intensive "grunt" work—tasks that can be performed by following well-specified procedures and are more or less mechanical or operational in nature. Such work is easily learned and performed by other engineering graduates in low-wage countries. Examples include low-level engineering design, assembly operation, customer service, procurement, project management, troubleshooting equipment, engineering analysis using canned software programs, and laboratory tests.

## 13.13 Conclusion

Globalization continues to be an inevitable business trend in the twenty-first-century economy. Three of the top-five economies in the world are likely to shift to Asia by 2020.

Globalization creates ample value-added opportunities to those engineering managers who are properly prepared and equipped with the required global mind-set, knowledge, and savvy. Having a global orientation is no longer opulence, but a necessity for economic survival in any industry.

Adjustments are needed for American managers to become effective in the global arena. They need to become more tolerant of, and adaptive to, that which is foreign and different. Past experience can serve as a useful basis for guiding future progress.

Engineering managers are encouraged to continuously follow the globalization process, to become sensitized to all issues involved in globalization, to make useful contributions to high-value work, and to prepare to lead in the global economy.

### QUESTIONS

1. For products intended for global markets, customers' wants and needs are different from one market to another. How can a centralized global team build up a product to serve as a "platform" for the global market?
2. Japanese companies face challenges similar to those faced by U.S. companies in that low-cost manufacturing capabilities are readily available in such countries as China, India, the Philippines, and Mexico. How can the Japanese companies plan to deal with these challenges?
3. It can be argued that democracy and capitalism are concepts that are fundamentally incompatible with each other. Democracy is built on the principle of equality—one person, one vote—regardless of the individual's intelligence, wealth, work ethic, or any other features that may distinguish one individual from another. Capitalism, on the other hand, fosters inequality. It uses incentive structures to encourage hard work and wise investment to realize differences in

economic returns. Because future income from investments (in human or physical assets) depends on current income, wealth tends to generate wealth, and poverty tends to constrain the individual's economic growth. The cycle is self-reinforcing: success breeds success, and failure compounds failure. "The economically fit are expected to drive the economically unfit out of existence. Thus, there are no equalizing feedback mechanisms in capitalism" (Thurow 1997).

What are some of the remedies capitalistic countries have introduced to mitigate such inequality? Would globalization compound this condition in a capitalistic and democratic country? Why, or why not?

4. Globalization, which causes the countries involved to become more interconnected, clearly has tremendous social and political implications. It also has a cultural dimension to it, due to worldwide communications that facilitate the global connections. Cultural globalization may lead to a more civic global society with a greater consensus on civic values. It may also diminish the rich diversity of human civilization, as the Asian, Islamic, South American, and other non-Western values become increasingly generic. For many, the preservation of distinct cultural traditions is a very serious matter.

   Is globalization a form of Western imperialism that may homogenize non-Western values? Why or why not? Can homogenization be avoided or mitigated?

5. During the new century, increased flows of products, services, technologies, capital, and workers across national borders will affect the economical, social, and political life of everyone involved. The UN is expected to play a critical role in this increasingly dynamic environment.

   In your opinion, what should be the major missions of the UN in addressing these issues?

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