**Key Assignment**

During the course, the combined week’s assignments will be your final Key Assignment deliverable, which is depicted in the following flow diagram:



**Problem-Based Learning Scenario**

TriState Solar Group (TSG) is a small public company that retains and cultivates high technical skills in a niche market, namely solar solutions for energy generation. Because of increased business interest for sustainable energy sources, the market for customized solar solutions has witnessed continuing growth throughout its history. The future is expected to further stimulate explosive growth because of increasing costs for energy from fossil fuel sources. Corporations in all businesses are monitoring energy costs, with consideration for the integration of alternative sources. Solar technology does not have geographic limitations, but it is really a business with global interests and unlimited markets.

The chief executive officer (CEO) is a strong evangelist for the support of a solid network infrastructure base to the business operations of TSG. However, the increased demand for its services has resulted in large investment in its data center to accommodate the added servers and network equipment supporting its applications. Over the last year, the data center has doubled in size, and it currently hosts 10,000 servers in a 45,000-square-foot data center at 80% capacity. The power and heating, ventilation, and air conditioning (HVAC) are also increasing and consuming a large share of the operational budget. The data center consists of different variants of Windows and Linux servers, some of them approaching their end of vendor support. For example, 100 servers still have XP, and their applications cannot be migrated to more modern hardware, forcing the information technology (IT) administrators to maintain older equipment. The cost of upgrading the old servers could be much less than the current budget allocated to old server maintenance, but the applications cannot be ported to more modern equipment. The network administrator has complained that the older equipment is taking too much of his time, and the IT manager agrees. Recently, TSG outsourced support of legacy systems as a stop-gap measure to keep the older systems operational. The IT manager estimates that if the legacy applications could be migrated to newer hardware, the support budget would be greatly reduced.

The executive team has requested a study to maintain the legacy systems while reducing the maintenance cost of the older equipment. In addition, the chief financial officer (CFO) informed the executive team that the owner of the building indicated that the cost of leasing the data center would increase next year, especially if more square footage is required to sustain the company’s growth, as predicted. The CEO, CFO, and chief information officer (CIO) recently had an off-site meeting to discuss ways to keep growth under control without sacrificing their customer services. At the top of their list was addressing the following conflicting requirements:

* Address the need for a 20% increase in servers in the data center.
* Reduce the data center lease and expenditures in power and HVAC.
* Reduce the maintenance costs of the legacy systems.
* Decrease the number of contractors supporting obsolete equipment.

You have been contracted to study the current environment and to address the current issues. The contract includes a plan to migrate the current environment to a more modern, greener infrastructure that requires minimal investment while ensuring that the current levels of support for production systems are maintained. The ideal outcome would be to finance the upgrades with the savings realized by taking advantage of virtualization.

**Strengths, Weaknesses, Opportunities, and Threats**

* **Strengths:** It has significant experience in a high-tech business with a solid reputation supported by a prolific list of successful projects, happy clients, and published research.
* **Weaknesses:** It has a small corporate size compared to market current and growing demand for solar energy solutions.
* **Opportunities:** In addition to growing the current markets, new paths such as training and certification would expand the TSG image with sustainable energy technologies.
* **Threats:** Success stimulates the emergence of competition, the narrowing of profit margins, and the demand for accepting change.

**Problem-Based Learning Perspectives**

* **Cecil, CEO:** “We are a leader in the use of solar power for solutions of sustained energy sources. Experience at TSG has been accumulated through many phases of solar technologies. Our business drives cutting-edge research and design. Our business is growing, and our network infrastructure must be the best of the breed. We must find options to reduce our data center expenditures if we are to survive in our industry.”
* **Cindy, CIO:** “IT is no longer an organization that is a business island or silo of its own. IT must be an organization with working-group ties providing IT services to TSG across the enterprise. We must develop and grow our business, taking advantage of greener technologies.”
* **Imara, IT Manager:** “The Enterprise Architecture upgrade was a great success, but I am faced with decreasing budgets and increased requests for production support. We must find a way to reduce costs while keeping up with the expectations from the executive team.”
* **Nadine, Network Administrator:** “With so many servers in the data center, I cannot keep up with the maintenance and troubleshooting required. Most of my time is spent keeping the systems up, and I do not have time to improve our environment. I need help with network administration, but we cannot hire more people to maintain the hardware.”
* **Jose, CFO:** “Our data center expenditures keep increasing, and I do not see a downward trend anytime soon. There has to be a way to optimize our limited resources. IT has to keep costs under control.”