**Scenario:** Manychip, Inc., is a specialty memory chip manufacturer located in Southern California with manufacturing plants located in the United States, Europe, Singapore, and Japan. Additionally, Manychip has branch sales offices located in major metropolitan areas across the globe. The market for Manychip's six key products included original equipment manufacturers of personal computers, cellular telephone manufacturers, electronics distributors, and government organizations. The market environment for Manychip's products is extremely volatile, with fluctuating demand and rapidly changing prices. The company uses short term contracts (less than one month) and spot pricing for irregular customers. Internally, the operation is capital-intensive, with depreciation running approximately $1.2 million per day (depreciation has an impact on revenue streams). The six key products had further specialized components, making the possible line mix total 24 distinct products. Further, the manufacturing process required high manufacturing lead times and various product yields. In the high technology memory arena, product life cycles were dramatically shortened because of rapid obsolescence. To coordinate the manufacturing activity, Manychip has an established process and system that helped optimize resource utilization, improve shop floor efficiencies, and manage customer demand.

Manychip is experiencing 10-15% growth in revenues and volume, primarily tied to increased worldwide demand, product type, and market variables. Most significantly, the company received a major pre-order for a new cellular phone memory chip that's schedule to come out in three months. This pre-order is scaled for up to 10 million units and management is concerned the existing process and system may not be suitably optimized for this order. Additionally, the forecast in sales figures for all six key product lines is higher than it has been in the past. With the increase in volume, management is concerned about the quality management process as well—can the existing processes maintain the highest degree of quality needed?

As a new member of the Production Planning Management staff, you'll be expected to help develop strategies to support the expanded growth plans. Your team faces several fundamental issues. First, are the individual plant layouts conducive to the expanded growth expected by the company? Second, are individual plant layouts optimized for the most efficient performance and lowest cost? Third, is the existing supply chain interaction among all the various components optimized in the same manner individual layouts are expected to be optimized? Finally, your group must consider capacity planning and workflow to ensure the company can meet its contractual obligations with the maximum revenue and profitability.