has developed an expert system that checks sales orders for new computer systems and then designs preliminary layouts for those new systems. HP can now ship the computer to a customer in components for final assembly on site. This approach has enabled the company to cut back on its own final-assembly facilities.

**Strengths and Weaknesses of Planning Tools**

Like all issues confronting management, planning tools of the type described here have several strengths and weaknesses.

**Weaknesses and Problems**

One weakness of the planning and decision-making tools discussed in this appendix is that they may not always adequately reflect reality. Even with the most sophisticated and powerful computer-assisted technique, reality must often be simplified. Many problems are also not amenable to quantitative analysis because important elements of them are intangible or nonquantifiable. Employee morale or satisfaction, for example, is often a major factor in managerial decisions.

The use of these tools and techniques may also be quite costly. For example, only larger companies can afford to develop their own econometric models. Even though the computer explosion has increased the availability of quantitative aids, some expense is still involved and it will take time for many of these techniques to become widely used. Resistance to change also limits the use of planning tools in some settings. If a manager for a retail chain has always based decisions for new locations on personal visits, observations, and intuition, she or he may be less than eager to begin using a computer-based model for evaluating and selecting sites. Finally, problems may arise when managers have to rely on technical specialists to use sophisticated models. Experts trained in the use of complex mathematical procedures may not understand or appreciate other aspects of management.

**Strengths and Advantages**

On the plus side, planning and decision-making tools offer many advantages. For situations that are amenable to quantification, they can bring sophisticated mathematical processes to bear on planning and decision making. Properly designed models and formulas also help decision makers “see reason.” For example, a manager might not be inclined to introduce a new product line simply because she or he doesn’t think it will be profitable. After seeing a forecast predicting first-year sales of one hundred thousand units coupled with a breakeven analysis showing profitability after only twenty thousand, however, the manager will probably change her or his mind. Thus, rational planning tools and techniques force the manager to look beyond personal prejudices and predispositions. Finally, the computer explosion is rapidly making sophisticated planning techniques available in a wider range of settings than ever before.
The crucial point to remember is that planning tools and techniques are a means to an end, not an end in themselves. Just as a carpenter uses a hand saw in some situations and an electric saw in others, a manager must recognize that a particular model may be useful in some situations but not in others that may call for a different approach. Knowing the difference is one mark of a good manager.

### Summary of Key Points

Managers often use various tools and techniques as they develop plans and make decisions. Forecasting is one widely used method. Forecasting is the process of developing assumptions or premises about the future. Sales or revenue forecasting is especially important. Many organizations also rely heavily on technological forecasting. Time-series analysis and causal modeling are important forecasting techniques. Qualitative techniques are also widely used.

Managers also use other planning tools and techniques in different circumstances. Linear programming helps optimize resources and activities. Breakeven analysis helps identify how many products or services must be sold to cover costs. Simulations model reality. PERT helps plan how much time a project will require.

Other tools and techniques are useful for decision making. Constructing a payoff matrix, for example, helps a manager assess the expected value of different alternatives. Decision trees are used to extend expected values across multiple decisions. Other popular decision-making tools and techniques include inventory models, queuing models, distribution models, game theory, and artificial intelligence. Various strengths and weaknesses are associated with each of these tools and techniques, as well as with their use by a manager. The key to success is knowing when each should and should not be used and knowing how to use and interpret the results that each provides.

### Chapter Notes