**Location and Transportation Decisions**

**Knowledge Check**

**Weekly Learning Objectives:**

1. Explain how location decisions relate to the design of value chains

2. Identify factors affecting location choices

3. Understand the role of GIS in making location decisions

4. Understand single facility location techniques

5. Understand how to apply quantitative tools in the location selection

decision process.

**Key Concepts:**

**1. Trends in globalization and deglobalization:** Expansion or contraction of supply chains that follow changes in strategies of offshoring production and development of consumers’ market.

**2. International trade:** enabled by passage of trade agreements such as NAFTA.

**3. Backlash:** local job losses and the lack of replacement of these jobs by other jobs that pay the same wages.

**4. The objective:** of location strategy: to maximize the benefits of location to the firm. These decisions are made infrequently and may determine as much as 50% of operating expenses.

**5. Factors in location selections:** labor productivity and skill level, foreign exchange, culture, social cost, economic and political risk, proximity to markets and suppliers, suitable transportation networks, competitive ecosystem.

**6. Tangible costs:** readily identifiable costs that can be measured with some precision.

**7. Intangible costs:** a category of location costs that cannot be easily quantifies, such as quality of life and the impact of government’s policies.

**8. Clustering:** the location of competing companies near each other, often because of a critical mass of information, talent, venture capital, or natural resources.

**9. Labor productivity:** a combination of labor productivity and the wage rate. Employees with poor training, poor education, or poor work habits may not be a good choice even at low wages. Labor cost per unit is sometimes called the labor content of the product.

**10. Factor rating method:** A location decision method based on perceptions of value used of hard-to-evaluate variables.

**11. Location break-even analysis:** A cost-volume analysis to make an economic comparison of location alternatives.

**12. Location options:** expending an existing facility, maintaining current site while adding another facility elsewhere, closing the existing facility and moving to another location.

**13. Location costs:** Location greatly affects the fix and variable costs. It is a significant cost and revenue driver and can often make or break a company’s business strategy. Once management is committed to a specific location, many costs are firmly in place and difficult to reduce. Location decisions to support a low-cost strategy require particularly careful consideration.

**14. Facility location:** the process of determining geographic sites for a firm’s operations.

**15. GIS:** Geographic Information System, a system of computer software, hardware, and data that the firm’s personnel can use to analyze and present information relevant to location decisions. By combining population, age, income, traffic flow, and density figures with geographic maps, a firm can locate the best location for retail or distribution facilities.

**16. Industrial locations:** are typically addressed via a factor rating, location break-even, center-of -gravity, and liner of programming.

**17. Load-distance method:** a mathematical model used to evaluate locations based on proximity factors

**18. Center of gravity:** a starting point to evaluate locations in the target area using the load-distance model. A mathematical technique used for finding the optimal location for a single distribution point that serves aligned end point facilities.

**19. Transportation method:** a transportation approach that can help solve multiple-facility location problems. Typically, it uses a class of linear programming problems. The transportation method finds an initial feasible solution and then makes step-by-step improvements until an optimal solution is found.

**20. Transportation model:** The objective of the transportation model is to determine the best pattern of shipments from several points of supply (sources) to several points of demand (destinations) so as to minimize total production and transportation costs. An iterative procedure for solving problems that involves minimizing costs of shipping products from a series of sources to a series of destinations.

**21. Heuristics:** solution guidelines, or rules of thumb, that find feasible-but not necessary the best-solutions to the problem

**22. Simulation:** a modeling technique that reproduces the behavior of a system.

**23. Optimization:** a procedure used to determine the “best” solution, generally utilizes an approximation algorithm of the problem.