**Operations Management**

**NMIMS Centre for Distance and Online Education (NCDOE)**

**Internal Assignment Applicable for April 2025 Examination**

**1. Discuss the importance of an effective layout design in operations management and compare the various layout types commonly implemented in manufacturing and service industries, outlining their advantages and disadvantages. Then, evaluate the specific challenges and opportunities related to both electric vehicle (EV) assembly plants and traditional automotive assembly lines. Conclude by recommending the most appropriate layout for each, justifying how the chosen layout optimally addresses the distinct requirements and operational challenges of each format.**

**Answer:**

**Introduction:**

An effective layout design plays a critical role in maximizing operational efficiency and productivity. EV assembly plants should adopt a **cellular layout** to handle the specialized needs of electric vehicle production, while traditional automotive assembly lines are best suited for a **product layout** to capitalize on high-volume, standardized production. Each layout type addresses the unique challenges and opportunities faced by their respective manufacturing environments.

**Importance of an Effective Layout Design in Operations Management**

**Common Layout Types in Manufacturing and Service Industries**

**Challenges and Opportunities in EV Assembly Plants and Traditional Automotive Assembly Lines**

**Recommended Layout for EV and Traditional Automotive Assembly Lines**

**This is partially solved sample answer**

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**2. Amazon Fresh is a prominent online grocery delivery platform that has gained popularity for its seamless operations and timely deliveries. A crucial factor contributing to its success is its advanced inventory management system. Discuss the concept of Amazon Fresh and how it differs from traditional brick-and-mortar grocery stores. Highlight various inventory management techniques commonly used in the e-commerce grocery industry and evaluate the key components and strategies implemented by Amazon Fresh to ensure operational efficiency and enhance customer satisfaction.**

**Answer:**

**Introduction:**

Amazon Fresh stands out as a leader in the e-commerce grocery industry due to its innovative inventory management techniques, advanced technology integration, and customer-centric approach. The use of real-time tracking, demand forecasting, automated replenishment, and efficient distribution systems allows Amazon Fresh to deliver a seamless and efficient shopping experience to customers. By continuously adapting to customer needs and leveraging the vast Amazon ecosystem, Amazon Fresh remains highly competitive in the online grocery delivery market.

**Amazon Fresh: Concept and Differentiation from Traditional Brick-and-Mortar Grocery Stores**

**Key Differences from Traditional Brick-and-Mortar Grocery Stores**

**Inventory Management Techniques in the E-commerce Grocery Industry**

**Key Components and Strategies Implemented by Amazon Fresh**

**Enhancing Operational Efficiency and Customer Satisfaction**

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**3. A renowned artisanal coffee shop chain is planning to open a new mid-sized outlet in your locality. Leveraging their expertise in brewing and branding, they are confident about efficiently managing the new coffee shop's operations. The shop’s offerings and the associated requirements are as follows:**

* **Standard single orders (e.g., cappuccinos, lattes): Require 1 barista for 5 minutes per order.**
* **Extended multiple orders (e.g., group orders): Require 2 baristas, each working for 8 minutes per order.**
* **Custom beverages (e.g., personalized drinks): Require 3 baristas, each working for 10 minutes per order.**

**The demand forecast for the next four weeks is as follows:**

|  |  |
| --- | --- |
| **Order Type** | **Anticipated Demand (Next 4 Weeks)** |
| **Standard single orders** | **3000** |
| **Extended multiple orders** | **1500** |
| **Custom beverages** | **500** |

**a. Estimate the aggregate capacity required to fulfill the anticipated demand for the next four weeks. If the coffee shop employs 15 baristas, working 6 days a week for 8 hours per day, calculate the current capacity available. Compare the required capacity with the available capacity to determine if the shop can meet the demand. If not, calculate the additional capacity needed.**

**Answer:**

**Introduction:**

The scenario involves a renowned artisanal coffee shop planning to open a new outlet and meet the demand for various types of coffee orders. This analysis estimates the aggregate capacity required to fulfill the forecasted demand and compares it with the available capacity based on the number of baristas employed.

The shop has sufficient capacity to meet the anticipated demand. Therefore, no additional capacity is needed. The current available capacity is far above the required capacity.

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**b. Propose strategies to address the issue of underutilization of capacity and calculate the number of baristas required to meet 100% capacity utilization.**

**Answer:**

**Introduction:**

The coffee shop faces potential underutilization of its barista workforce due to the relatively low total demand compared to its staffing levels. This analysis proposes strategies to optimize capacity usage and calculates the minimum number of baristas required to achieve 100% utilization while meeting the forecasted demand for the next four weeks.

Strategies to address underutilization include flexible scheduling, cross-training, expanding the menu, targeted marketing, and technology integration.

For 100% capacity utilization, 5 baristas are needed, which is significantly lower than the available 15 baristas. Therefore, the coffee shop is overstaffed based on the current demand forecast.

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