Aggregated Planning and Chase Strategy

Posted on September 16, 2018

Introduction

Aggregate planning is a medium-term process for balancing expected demand with available capacity at an acceptable cost. It translates strategic decisions about facilities, products, and markets into plans for workforce size, production rates, inventory, backlogs, overtime, subcontracting, and demand management. The planning horizon is commonly several months to approximately eighteen months, long enough for demand to vary but usually too short to build major facilities easily. Managers work with product families or capacity units rather than scheduling each individual item. (Brandimarte)

The original essay correctly identifies cost reduction, demand forecasting, capacity, and the chase strategy as important. It requires two corrections. First, aggregate planning does not necessarily mean purchasing or producing the entire horizon's requirements in bulk; doing so could create excessive inventory and obsolescence. Second, make-to-stock, make-to-order, assemble-to-order, and engineer-to-order describe order-fulfillment positions, not variants of the chase strategy. A firm can use level, chase, or mixed capacity policies within different fulfillment systems. (Jacobs)

The Role of Aggregate Planning

Organizations make decisions at several levels. Long-range strategy determines plants, technologies, broad workforce capabilities, and supply-network design. Short-range scheduling determines specific jobs, shifts, materials, and delivery dates. Aggregate planning connects these levels. It asks how total capacity should change across periods so that the organization can meet forecast demand without unnecessary cost or unacceptable service failure. (Silver)

The plan should support the organization's competitive strategy. A low-cost manufacturer may tolerate inventory to stabilize production. A customized service may prioritize response time and flexible labor. A hospital cannot inventory unused treatment in the same way a manufacturer inventories products, while an airline cannot store an empty seat after departure. The appropriate aggregate plan therefore depends on whether output is storable, how demand fluctuates, and what customers value.

Required Inputs

Demand Forecasts

Managers need forecasts by period for product families or service categories. Forecasts should include uncertainty rather than one apparently exact number. Seasonal patterns, promotions, price changes, economic conditions, weather, competitor actions, and known orders can all affect demand. Scenario ranges help planners test whether a strategy remains workable when demand is higher or lower than expected.

Capacity and Productivity

The plan requires information about regular-time capacity, overtime limits, workforce skills, machine availability, maintenance, supplier capacity, and productivity. Capacity should be expressed in a meaningful common unit, such as labor hours, standard cases, patient visits, room nights, or equivalent units. A theoretical maximum is less useful than effective capacity after downtime, changeovers, quality loss, and normal variability.

Cost Data

Relevant costs include regular labor, overtime, hiring, layoffs, training, inventory holding, stockouts, backlogs, subcontracting, expedited freight, idle capacity, and lost goodwill. Some costs are difficult to quantify. Frequent workforce reductions may damage morale and knowledge even when the immediate accounting cost appears low. A plan should therefore include service and human consequences rather than choosing the smallest spreadsheet total automatically.

Policy and Operational Constraints

Collective agreements, legal requirements, minimum staffing, safety rules, supplier contracts, storage limits, shelf life, and service targets constrain the solution. Managers may also set limits on workforce change, backlog, or outsourcing to protect long-term capability.

Level Strategy

Under a level strategy, the organization maintains a relatively stable production rate or workforce while demand changes. When output exceeds demand, inventory accumulates or employees perform other useful work. When demand exceeds output, inventory is reduced, orders may be backlogged, or customers may wait. The central advantage is stability. Employees retain jobs and develop proficiency; schedules and supplier requirements are predictable; and hiring or layoff costs are reduced.

The disadvantage is the cost and risk of buffering demand. Inventory requires storage, working capital, insurance, handling, and protection from damage or obsolescence. In services, inventory may be impossible, so a level strategy can lead to queues, reservations, or lost demand. Stable capacity is therefore attractive when workforce adjustment is costly and output can be stored economically.

Chase Strategy

A chase strategy adjusts capacity or output to follow demand from period to period. This can be achieved through hiring and layoffs, varying employee hours, using temporary workers, overtime, subcontracting, or flexible shifts. The strategy reduces finished-goods inventory because production remains close to demand.

Chase is suitable when output cannot be stored, demand is highly variable, and capacity can change quickly without excessive cost or harm. Hospitality, call centers, retail, and some food services vary staffing by anticipated activity. However, the restaurant example in the original essay confuses chase planning with make-to-order production. Preparing a meal after the customer orders is a fulfillment method. The restaurant still needs an aggregate staffing and purchasing plan based on expected demand.

The risks of chase include recruitment and training costs, unstable income, lower morale, quality inconsistency, and loss of organizational knowledge. Capacity may also respond more slowly than demand. A firm cannot always hire skilled employees immediately or obtain supplier capacity at short notice.

Mixed Strategy

Most organizations use a mixed strategy. They maintain a core workforce, build limited inventory before predictable peaks, schedule overtime during high demand, use subcontractors selectively, and influence demand through pricing or promotions. A mixed plan can balance costs that a pure strategy treats separately.

For example, a manufacturer may keep monthly regular production nearly level, use overtime during two peak months, and permit a small seasonal inventory rather than either carrying large inventory all year or repeatedly hiring and laying off workers. The quality of a mixed strategy depends on coordination. Marketing should not launch a promotion that operations cannot support, and procurement should know when subcontracting will change material needs.

Demand-Management Options

Aggregate planning is not limited to changing supply. Demand can sometimes be shifted through seasonal pricing, reservations, promotions during low periods, complementary products, appointment systems, or communication about lead times. A hotel may offer lower weekday rates; an energy utility may use time-of-use pricing; a health clinic may send reminders and distribute appointments across available hours.

Demand management should not manipulate customers unfairly or create misleading scarcity. It should align demand with genuine capacity while preserving transparency and access. Some essential services cannot simply price vulnerable users out of peak periods.

Order-Fulfillment Strategies

Make to Stock

Make-to-stock firms produce standard items before receiving individual orders. Forecast accuracy and inventory management are central. Aggregate plans determine family-level output, while later scheduling converts it into specific products.

Make to Order

Make-to-order firms begin production after receiving an order. Finished-goods inventory is low, but capacity and lead-time management are critical. A chase policy may be used, but it is not inherent; the firm could maintain stable capacity and quote longer lead times during peaks.

Assemble to Order

Assemble-to-order firms stock common components and configure them after demand becomes known. This postponement balances variety with responsiveness. Fast-food customization may resemble assembly to order, but many restaurants also prepare common items in advance and combine several fulfillment approaches.

Engineer to Order

Engineer-to-order work includes substantial design after the customer requirement is known. Aggregate planning focuses on scarce engineering and project resources rather than unit inventory.

A Worked Aggregate-Planning Example

Assume a small manufacturer expects demand of 900, 1,100, 1,400, and 1,000 units over four months. Regular capacity is 1,050 units per month. Beginning inventory is 200 units, and management wants at least 100 units ending inventory. Overtime can produce 250 units per month. Regular production costs less than overtime, but inventory has a monthly holding cost.

A pure level plan producing 1,050 units monthly creates the following rough flow. Month one begins with 200 units, produces 1,050, and ships 900, leaving 350. Month two leaves 300 after shipping 1,100. Month three requires 1,400 and would reduce inventory below zero unless overtime or backlog is used. Month four demand falls. A mixed plan might produce regular capacity throughout, schedule 150 units of overtime in month three, and use inventory built earlier. This preserves workforce stability while avoiding a large backlog.

The example illustrates why the plan must be calculated period by period. Producing the total forecast at the beginning would require storage, cash, and capacity that may not exist. The objective is coordinated timing, not simply bulk production.

Mathematical Formulation

An aggregate-planning model can minimize total cost subject to balance and capacity constraints. A basic inventory equation is:

Ending inventory in period t = beginning inventory + regular production + overtime + subcontracting − demand − backlog reduction.

Decision variables can represent workforce, hiring, layoffs, regular output, overtime, inventory, backlog, and subcontracting. Constraints limit capacity, storage, workforce change, service level, and ending inventory. Linear programming is common when costs and relationships can be approximated linearly. More complex models may include uncertainty, multiple products, nonlinear productivity, or integer decisions.

Sales and Operations Planning

Aggregate planning is frequently conducted within sales and operations planning, often called S&OP or integrated business planning. Finance, sales, marketing, operations, procurement, and human resources compare one set of demand assumptions with one feasible supply plan. The process identifies gaps early and assigns decisions to accountable leaders. (Stevenson)

A useful monthly cycle reviews actual performance, updates the forecast, checks capacity, develops alternatives, reconciles financial implications, and approves an executive plan. The goal is not to

eliminate forecast error. It is to respond coherently rather than allowing departments to operate from conflicting numbers.

Uncertainty and Rolling Horizons

Aggregate plans should be updated through a rolling horizon. As one period ends, actual demand replaces the old forecast, new periods are added, and later decisions are revised. Near-term commitments may be fixed, while distant periods remain flexible. This prevents the organization from treating a twelve-month forecast as if all months were equally certain.

Scenario planning and safety capacity can improve resilience. A firm may test baseline, high-demand, and supply-disruption cases. Excess capacity has a cost but can also function as insurance. The appropriate buffer depends on uncertainty, customer consequences, and recovery speed.

Human and Ethical Considerations

A chase strategy based on repeated layoffs may appear efficient while transferring volatility to workers and communities. Unpredictable schedules can create childcare, transport, and income problems. Overuse of overtime can increase fatigue and safety risk. Subcontracting can shift work to suppliers with weaker labor or environmental standards.

Responsible planning considers stable employment, fair notice, safe workloads, and workforce development. Human resources should participate before capacity changes are treated as abstract cost coefficients. A plan that damages the skills needed next year may be cheaper only in the narrowest short-term sense.

Performance Measurement

Managers should track forecast accuracy, service level, fill rate, backlog, inventory turns, overtime, capacity utilization, schedule stability, employee turnover, quality, and total cost. Metrics can conflict. Maximizing utilization may produce long queues; minimizing inventory may increase stockouts; minimizing labor cost may increase turnover. Balanced measures help reveal these trade-offs.

Conclusion

Aggregate planning determines how an organization will match medium-term demand and capacity through workforce, output, inventory, backlog, overtime, subcontracting, and demand-management decisions. A level strategy emphasizes stability, a chase strategy adjusts capacity with demand, and a mixed strategy combines tools. The best choice depends on storage, service expectations,

adjustment costs, workforce consequences, and uncertainty.

Make-to-stock, make-to-order, assemble-to-order, and engineer-to-order describe fulfillment positions rather than chase techniques. Recognizing this distinction improves the original analysis. Effective planning is a continuing cross-functional process supported by forecasts, realistic costs, constraints, scenarios, and rolling review. Its purpose is not merely to reduce expense but to create a feasible balance among customers, employees, capital, and operational risk.

Bibliography

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