

Capstone Project – Supply Chain Management

BigBasket's Evolution in E-commerce Supply Chain & Fulfillment – An Indian Market Perspective

1. Introduction to Big Basket

BigBasket, founded in 2011 and now a part of Tata Digital, is India's largest online grocery retailer serving over 40 cities.

It disrupted traditional retail by building a tech-enabled supply chain connecting farmers and FMCG brands directly to urban consumers.

The company operates both planned next-day delivery and instant delivery services (BB Now) using micro-fulfillment centers and dark stores.

Its core strengths are data-driven inventory management, efficient warehousing, and reliable last-mile fulfillment that ensure freshness and speed.

2. Operational Diagram of BigBasket E-commerce Supply Chain & Fulfillment

BigBasket's supply chain flows through five main stages:

1. **Suppliers / Farmers:** Fresh produce and FMCG goods are procured directly.
2. **Collection Centres:** Products undergo sorting and quality checks.
3. **Fulfillment Centres:** Goods are stored, picked, and packed for dispatch.
4. **Dark Stores / Mini Hubs:** Enable fast local deliveries for BB Now and slot orders.
5. **Customers:** Products are delivered to doorsteps through optimized last-mile networks.



3. Deep Dive into Each Stage of Operations

- **Supplier Procurement:** Direct sourcing from farmers and manufacturers ensures quality and reduces middlemen.
 - **Warehousing & Fulfillment:** Automated picking systems, temperature-controlled zones, and barcode tracking manage inventory and reduce spoilage.
 - **Distribution / Dark Stores:** Regional micro-hubs shorten delivery distances for express orders.
 - **Last-Mile Delivery:** Own and partner fleets use route optimization and slot planning to enhance on-time performance.
 - **Customer Interface:** Mobile app and CRM platforms provide real-time tracking, feedback collection, and return handling.
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4. Major Problems and Solutions

a) Last-Mile Logistics

Problem: High delivery costs and traffic delays reduce efficiency.

Solution: AI-driven route optimization, cluster-based delivery zones, and electric two-wheelers for dense areas.

b) Quick Commerce

Problem: Balancing 15–20 min delivery with inventory accuracy.

Solution: IoT sensors for real-time stock visibility and AI demand forecasting; place fast-moving SKUs in micro-warehouses.

c) Omnichannel Ops

Problem: Fragmented data between online and offline channels.

Solution: Unified inventory and order management system that syncs in real time across BB app, warehouse and partner stores.

5. Technology Integration and Architecture

- BigBasket uses IoT, ERP integration, and Power BI for visibility and decision support.
- A data pipeline collects orders and inventory data from ERP and IoT devices, cleans it through ETL tools, stores it in cloud warehouses (Azure / AWS), and visualizes it via Power BI dashboards.



6. Innovative Cold Chain Management Suggestion

- Adopt IoT-enabled smart refrigeration to track temperature and humidity in real time throughout transport and storage. Blockchain can record temperature logs and handling data for traceability.
- At rural collection centres, solar-powered cooling units can lower energy costs and maintain freshness without grid dependency.

7. Sustainable Initiatives without Profit Compromise

BigBasket can introduce reusable crates, eco-friendly packaging, and EV delivery fleets to cut carbon footprint. Optimizing delivery routes and sourcing locally reduces fuel use.

AI forecasting reduces wastage, aligning environmental goals with profitability.

The company can also launch “Green Delivery Slots” for customers who choose off-peak hours, reducing vehicle load and energy use.