Week-2&3 Notes

Here's a **detailed summary** and **key highlights** of the PowerPoint deck titled **"Product Life Cycle Management - POM510"** (customized lecture by Albert W. DeRitis, Drexel University):

Overall Objective

To provide a comprehensive framework for managing pharmaceutical products throughout their lifecycle—from R&D to end-of-life—by applying Value Stream Management (VSM) and Life Cycle Management (LCM) principles within the Janssen Supply Chain (JSC), part of Johnson & Johnson.

Key Components and Highlights

1. J&J/Janssen Supply Chain Overview

- **Global scale**: 58,000+ personnel, 125 internal sites, 650 external manufacturers.
- **Operations**: $20.4B COGS, 250,000 SKUs daily, 1 billion customers daily.
- **Systems**: 109 ERP systems, 600 distribution/customer centers.

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2. Product Life Cycle Structure

- **Matrix team setup**: Includes New Product (NP), Compound Development (CD), Chemistry Manufacturing Controls (CMC), and Value Stream (VS) teams.
- **Stage-gated development**: 12 stages from NME (New Molecular Entity) to Transfer of Ownership (TOO).
- **Milestones & Stage Gates**:
  - *Milestones* guide technical decisions.
  - *Stage Gates* are critical decision and investment points.

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3. SC Product Management Functions

- **New Product Introduction (NPI)**: Drives tech transfer and launch.
- **Life Cycle Management (LCM)**: Strategic roadmaps, end-of-life, and improvement initiatives.
- **Global Planning**: E2E planning, capacity, inventory, MRP, S&OP.

- **Reliability & Network Support**: Ensures quality, resilience, and network optimization.
- **Strategic Business Support**: Handles licensing, acquisition, and divestiture actions.

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4. Value Chain Management (VCM) Framework

- **Mission**: Deliver E2E integrated product strategies through cross-functional collaboration.
- **Organization**: Includes standard and extended members based on product needs.

VCL (Value Chain Leader) Key Responsibilities:

- E2E strategy development
- Annual inventory and capacity plan
- Business cases, product changes, risk updates

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5. Core Roles in the Value Chain Team (VCT)

- **Technical Owner**: Manages all technical aspects and project executions.
- **Quality Owner**: Oversees product quality and PPQS (Proactive Product Quality Scan).
- **Regulatory Affairs**: Manages compliance, filing strategies, and HA guidance.
- **Global Planning Lead**: Coordinates supply/demand, planning, and inventory.
- **Finance Lead**: Financial implications, CAPEX, valuation, and modeling.
- **Manufacturing Owner ("Make")**: Ensures site-specific supply execution.

VCM: 6 Key Processes

#	Process	Purpose
1.1	Product Strategy Roadmap (PSR)	Define and prioritize long-term strategy
1.2	Product Risk Management (SCRM)	Identify risks by revenue/complexity and develop mitigation
1.3	Sourcing & Network Business Cases	Approve strategic manufacturing transfers

#	Process	Purpose
2	Project Portfolio Management (PPM)	Intake and prioritize projects aligned with strategy
3	Operational Product Management	Dashboard and metrics tracking
4	Issue Management (IMT)	Structured escalation and resolution of supply/quality issues
5	Stakeholder Management	Communication across functions
6	Portfolio Optimization	Delisting, simplification, and resource reallocation

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6. Product Typing (Risk-Based Focus)

- **Type 1**: Critical, no alternatives, high revenue >3.6%.
- **Type 2**: Limited alternatives, mid-revenue 1.8–3.6%.
- **Type 3a/3b**: Alternatives available, low impact/revenue <1.8%.

Focus and effort of VSM/VCM is dictated by **product type classification**.

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7. Portfolio Optimization

- **Focus**: Remove complexity, improve profitability, redeploy resources.
- **Criteria**: Revenue thresholds, gross margins, medical alternatives.
- **Governance**: Aligns decisions with SC, CDT, and Commercial.

Key Takeaways

- **VCM/VSM** integrates supply chain, regulatory, finance, and technical functions into one lifecycle strategy.
- **VCL is the SPOC (Single Point of Contact)** for lifecycle management and cross-functional coordination.
- **Product Typing and Risk Classification** ensure focus where it matters most.
- **End-to-End Strategy** (E2E) is crucial to optimize product value, quality, and supply continuity.

Week4-Notes

Here's a summarized version of **Chapter 2: Executing Strategy – Project Management** from the *POM610* PowerPoint slides:

Chapter Summary: Executing Strategy – Project Management

1. Strategic Role of Projects

- Projects are a key mechanism for executing organizational strategies.
- A company's **de facto strategy** is defined more by the **projects it chooses** than by statements or plans.
- Projects must align with the **business case** and provide measurable **strategic benefits**.

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2. Project Portfolio Management

- Projects are managed as part of a **portfolio**, also known as the **aggregate project plan**.
- Interactions among projects must be considered.
- **ROI alone is not enough** to select projects—strategic fit matters more.

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3. Project Selection & Ownership

- Not all projects can or should be executed—**selection is critical**.
- The **project owner** (on behalf of the CEO) ensures strategic alignment, stakeholder engagement, and assists the PM with issues.
- Project Managers (PMs) focus on delivering **outputs**, not benefits.

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4. Characteristics of Projects

- Unique, time-bound, goal-specific, with **limited budgets** and **high importance**.
- Require **flexibility**, minimal middle management, and direct communication between PM and team.

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5. Types of Projects

1. **Derivative**: Incremental improvements.
2. **Platform**: Mid-range enhancements.
3. **Breakthrough**: Next-generation innovations.

4. **R&D**: Research for new knowledge.

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6. Risk and the Iron Triangle

- Two risk phases: **Execution** and **Benefits Realization**.
- Execution risks involve the **Iron Triangle**:
  - Missing the **deadline**
  - Going **over budget**
  - Failing to meet **specifications**

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7. The Business Case

- Details goals, benefits, cost, timeline, risks, and alternatives.
- Aligns the project with the organization's **strategic vision**.

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8. Project Life Cycle

- Projects may follow **Stretched-S** or **Exponential** trajectories.
- These influence output timelines and response to budget cuts or delays.

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9. Project Planning Tools

- **Project Charter** includes: objectives, scope, milestones, budget, risks, stakeholders, and evaluation methods.
- Use of:
  - **Work Breakdown Structure (WBS)**
  - **RACI Matrix** (Responsible, Accountable, Consult, Inform)
  - **Gantt Charts**

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10. Scheduling and Critical Path

- **Planning**: What and in what order.
- **Scheduling**: When, how long, which tasks are **critical** and which have **slack**.

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11. Change Management

- Change Managers help teams adapt to new roles/systems.
- Tools include training, IT, behavioral and social science techniques.

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12. Project Management Software

- Tools range from simple to complex (e.g., **Microsoft Project**).
- Powerful tools are suited for large-scale projects.

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13. Agile Project Management

- Involves **sprints/iterations** of 1–4 weeks.
- Emphasizes team collaboration, adaptability, and customer feedback.
- Benefits: improved outcomes, morale, and satisfaction.

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14. Cost–Time Trade-Offs (Crashing)

- If timelines are tight, tasks can be **crashed** (faster execution by adding better or more resources).
- PMs manage these trade-offs to balance cost and completion time.

Key Takeaways

- Projects are strategic tools, not just tactical exercises.
- Successful execution demands structured planning, stakeholder involvement, risk management, and adaptability.
- Tools like WBS, RACI, Agile methods, and software help in precise execution.

Week-5 Notes

Here's a **summary** and **key highlights** from **Chapter 4: Capacity and Scheduling** of the *POM510* course slides:

Chapter 4 Summary: Capacity and Scheduling

1. Introduction to Capacity

- **Capacity** is the rate at which a system can produce output.
- Applies to both **manufacturing and service organizations**.
- Divided into **short-term** (e.g., staffing adjustments) and **long-term** (e.g., facility construction) decisions.

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2. Long-Term Capacity Planning

- Strategic and expensive—**hard to reverse once implemented**.
- Requires careful analysis of demand, cost, and facility location.

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3. Key Capacity Concepts

- **Bottlenecks** limit overall system output.
- **Time dimension** must be considered in measuring capacity.
- **Capacity planning** must account for **multiple outputs** and **natural inefficiencies** like defects or waste.

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4. Capacity Strategies

- **Facility size planning**: Larger facilities lower costs (economies of scale), but only when run at optimal capacity.
- **Economies of scope**: Spreading fixed costs across a variety of outputs using flexible technologies.
- **Anticyclic output**: Adding products/services that offset seasonal or market cycles.

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5. Scheduling and Capacity Utilization

- **Scheduling** determines when tasks should start and finish.
- **Poor scheduling** can lead to perceived capacity problems.
- Tools: **Gantt charts**, **loading methods** (finite vs infinite), **operation splitting**, and **preemption**.

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6. Scheduling Services

- Focus shifts to **matching inputs (labor, materials, facilities)** with variable demand.
- Approaches include:
  - Floating workers
  - Overtime
  - Off-peak pricing
  - Use of tech (self-service, automation)

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7. Yield/Revenue Management

- Allocating **fixed service capacity** to maximize revenue.
- Used in industries like airlines, hotels, and subscription-based services.
- **Overbooking** strategies reduce cost of no-shows (based on the "newsboy problem").

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8. Short-Term Capacity Adjustments

Techniques to increase capacity: I. **Add Resources** – Overtime, part-time workers, leasing II. **Improve Resource Use** – Cross-training, shift staggering III. **Modify Output** – Standardization, partial self-service IV. **Modify Demand** – Pricing, promotions, demand partitioning

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9. Process-Flow Analysis

- Mapping product or service flow helps identify **bottlenecks**, **inventory build-up**, and **time delays**.
- **Utilization** = actual output vs expected output
- **Efficiency** = output/input

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10. Learning Curve

- Productivity increases as experience grows.
- Every time output doubles, labor time reduces to a predictable percentage.
- Critical in **new or complex process environments**.

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11. Queuing and Waiting Lines

- Waiting lines (queues) are a central challenge in service operations.
- **Perceived wait time** is affected by psychological factors:
  - Unoccupied time feels longer
  - Uncertainty or anxiety increases perceived wait
  - Group waiting feels shorter than solo waiting

Key Insights

- Capacity must be **proactively planned**, not just reactively managed.
- Both **technical efficiency** and **customer psychology** play major roles in service capacity.
- Effective scheduling and demand management improve resource utilization and customer satisfaction.

Here's a **detailed summary** of **Chapter 7: Monitoring and Controlling the Processes** from the uploaded PowerPoint presentation:

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1. Introduction to Monitoring and Control

- Monitoring and control are essential for ensuring that business processes and projects achieve their intended outcomes.
- Organizations must establish measurable indicators to track performance and intervene when necessary.

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2. Case Studies on Process Improvement

Columbus Air Mail Center

- Problem: 8.7% late deliveries
- Action: Six Sigma project using a p-chart
- Outcome: 14.3% reduction in late deliveries, $15,000 savings annually

Movistar / Telefónica

- Problem: Network service reliability
- Action: Six Sigma project
- Outcome: Dramatic reduction in service interruptions, $300,000 monthly savings, cost recovered in six months

North Shore-Long Island Jewish Health System

- Problem: Chronic errors in patient accessioning registration
- Solution:
  - Replaced addressograph labels with barcode readers
  - Added training
  - Created a lead accessioner role
- Outcome: Accuracy improved to 99%, capacity increased by 43%

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3. Process Monitoring

- Monitoring links **planning to control**.
- Requires:
  1. Identifying key control variables
  2. Determining relevant information to collect
- Caution: Too much data can obscure insights.

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4. Operational Effectiveness: Maturity Stages

- **Internally Neutral**: Aim to avoid issues
- **Externally Neutral**: Match industry standards
- **Internally Supportive**: Operations align with strategy
- **Externally Supportive**: Operations influence strategy

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5. Balanced Scorecard Approach

- Developed to address limitations of relying solely on financial metrics.
- **Purpose**: Provide a holistic organizational performance view.

Benefits:

- Clarifies and communicates strategy
- Aligns departmental/personal goals with corporate strategy
- Links strategic objectives to budgets
- Provides timely feedback

Four Perspectives:

1. Financial performance
2. Customer satisfaction

3. Internal processes
4. Learning and growth

Strategy Maps:

- Visual tools showing cause-effect links among the four perspectives.
- Help monitor strategic business processes (Figure 7.1 shows a sample map).

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6. Quality Standards and Tools

ISO 9000

- A checklist of good business practices covering design, manufacture, and service
- Certification assures standardized practices

ISO 14000/14001

- Focuses on environmental management systems (EMS)
- ISO 14001 is certifiable and evaluates EMS performance

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7. Failure Mode and Effects Analysis (FMEA)

- A structured method to identify, evaluate, and prioritize risks in a process
- Steps:
  1. Identify failure modes
  2. Rate **Severity (S)**, **Likelihood (L)**, and **Detection (D)**
  3. Calculate Risk Priority Number: $\mathbf{RPN = S \times L \times D}$
  4. Reduce RPN by lowering S, L, or D
- Illustrated with a fast-food concept example (Table 7.2)

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8. Process Control

- Goal: Minimize the gap between planned and actual performance.
- Requires **both technical and human interventions**.

Features of Good Control Systems:

- Flexible
- Cost-effective
- Simple
- Timely

- Precise
- Ethical
- Easy to maintain and extend

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9. Statistical Process Control (SPC)

- **Variables Inspection**: Quantitative (e.g., weight, length)
- **Attributes Inspection**: Qualitative (e.g., defect/no defect)

Variation Types:

- **Chance Variation**: Natural, random
- **Assignable Variation**: Due to specific issues, must be corrected

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10. Control Charts

- Tool to distinguish between assignable and chance variation
- Assume normal distribution of repeated measures
- Process is in control if distribution remains stable

Examples:

- **Figure 7.2**: Chart with +-3sigma control limits
- **Figure 7.3**: Shows patterns of process distribution change
- **Tables 7.3–7.5**: Sample data and calculations
- **Figure 7.4**: Control limits for a bank monitoring mortgage application age

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11. Attribute-Based Control Charts

- **p-Chart**: Proportion of defects in a binary process
- **c-Chart**: Number of defects per unit (e.g., scratches)

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12. Service Quality Control

- Controlling service processes is more difficult due to intangibility
- Techniques include:
  - Standard operating procedures
  - Customer satisfaction surveys
  - Strategy maps and control charts

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13. Managing Service Defections

- Understanding why customers leave can reveal systemic issues
- Feedback helps in recovery strategies
- Change in defection rate is an early warning metric

Here is a **detailed summary** of **Chapter 8: Process Improvement – Six Sigma** from your presentation:

Overview

Chapter 8 focuses on the application, methodology, and strategic value of **Six Sigma** in improving business processes. Real-world examples, tools, and the DMAIC framework are used to explain how organizations drive quality improvement and achieve competitive advantage.

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1. Real-World Six Sigma Applications

Hewitt Associates

- **Problem**: Nearly 100% turnover among customer service (CS) reps.
- **Action**: Six Sigma project using DMAIC tools.
- **Findings**: High turnover cost the company $14.5M/year. Key factors—growth, pay, recognition, etc.
- **Solution**: Improved pay—cost $600K, saved $1.9M.

Bank of America

- **Problem**: High error rates and inefficiencies.
- **Action**: Quality journey started in 2001, CEO-led.
- **Impact**: 10,000 employees trained by 2004. Estimated savings: $2B in 3 years.

Southside Hospital

- **Problem**: Long turnaround time for stress tests.
- **Solution**: Six Sigma reduced time by 50%, increased capacity, and cut costs by $34K.

TRW Corporate Law Department

- **Problem**: High cost in global trademark renewals.
- **Solution**: Eliminated unnecessary renewals; saved $1.8M.

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2. What is Six Sigma?

- A **disciplined, data-driven** approach to eliminate defects.
- Developed by **Bill Smith at Motorola (1986)**.
- "Sigma" refers to standard deviation; "Six Sigma" implies near-perfect quality (3.4 DPMO).
- It's a **flexible system** for achieving and sustaining business success through process improvement.

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3. Six Sigma Methodology: DMAIC

Define

- Identify customer requirements, project goals, problem/opportunity.
- **Tools**: Benchmarking, QFD (Quality Function Deployment).

Measure

- Collect performance data, define metrics (e.g., DPMO, process sigma).
  - Understand variation:

$$\sigma_T^2 = \sigma_p^2 + \sigma_m^2$$

Total variation = Process + Measurement variation

Analyze

- Identify root causes of variation using:
  - Brainstorming
  - Cause-and-effect (Fishbone/Ishikawa) diagrams
  - Process capability analysis

Improve

- Develop and test solutions (e.g., **Design of Experiments (DOE)**).
- Use **Taguchi methods** to optimize design while minimizing variability.

Control

- Sustain improvements using monitoring systems and procedures to prevent regression.

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4. Tools and Concepts in Detail

Benchmarking

- Compare with best-in-class practices, products, or services.
- Industry-independent and proactive.

Quality Function Deployment (QFD)

- Translates customer needs into product/service specifications.
- Tools like the "House of Quality" matrix (Figure 8.4, 8.5).

Process Capability Analysis

- Evaluates whether a process meets specifications.
- Uses capability index (Cpk) and natural variation analysis (Figure 8.9, 8.10).

Design of Experiments (DOE)

- Goes beyond "one factor at a time" testing.
- Determines the interaction effects and optimal factor settings.

Measurement System Analysis

- Examines **bias**, **linearity**, and **stability** in data collection.

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5. Creativity and Team Dynamics

- **Enhancing Team Creativity**:
  - Use analogies, brainwriting, NGT (Nominal Group Technique)
  - Employ trained facilitators
  - Encourage diversity and playful environments
- **Threats to Creativity**:
  - Social loafing, conformity, production blocking, downward norm setting

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6. Organizational Roles in Six Sigma

Role	Responsibility
Master Black Belt	Strategic Six Sigma leader with deep expertise
Black Belt	Leads Six Sigma projects
Green Belt	Supports projects part-time
Yellow Belt	Has basic awareness
Champion	Senior exec who sponsors projects
Process Owner	Operational manager responsible for the process

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7. Certification & Customization

- Six Sigma certification is available through:
  - Employers
  - Consulting firms
  - Universities and professional societies
- Programs must be **customized** to an organization's goals and operations.

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8. Business Process Design (Reengineering)

- Used when incremental changes aren't enough.
- Key Themes:
  - **Radical Redesign** (not minor tweaks)
  - **Customer Focus**
  - **Team-based execution**
  - **Technology Integration**
- **IBM Credit Example**:
  - Original process: multi-department, 6–14 days.
  - New process: consolidated into one role ("deal structurer"); turnaround time = **4 hours**, throughput ↑ 100x.

Conclusion

- Six Sigma is a powerful methodology for driving **quantum-level improvements**.
- It enhances **customer satisfaction**, reduces **costs**, and builds **organizational capability**.
- Combined with tools like DMAIC, QFD, and DOE, it provides a comprehensive approach to quality and performance.