



presents:

# DEMAND PLANNING AND INVENTORY OPTIMIZATION

## Onsite Four Day Workshop

Mark Chockalingam Ph. D &  
David Rivers CFPIM, CSCP

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# Demand Planning & Forecasting Workshop Outline

## Demand Planning & Inventory Optimization

This program has been developed to communicate industry best practices in the area of inventory management and demand planning to Supply Chain professionals. This workshop aims to provide the necessary technical background to enable attendees to develop & implement new practices & procedures in supply chain management into their own business units.

The objective of this workshop is to empower Supply Chain Managers to leverage the power of demand planning and to incorporate the best practices in materials management. This workshop will holistically present the best practices in creating a demand plan and explain the concepts and calculations for optimizing your inventory parameters. We preach true inventory optimization - help you to establish the right parameters your process and systems may need to run a lean machine with just optimal inventories to deliver the service and fill rates.

This is a hands-on, practical workshop with many exercises and case studies and excel based work out problems. Every planner and material manager will leave the training hall with a diverse skill set to do their day to day jobs.

## Who Should Attend?

1. Demand Planners
2. Forecast Analysts
3. Forecasting Managers
4. Director of Forecasting and Demand Planning
5. Director of Value Chain
6. Analysts in the Supply Chain
7. Inventory Planners
8. Operations Planners
9. Financial Analysts
10. Director of Logistics
11. Director of Customer Service

## Insightful information on...

- Demand Planning and Management
- Purpose of Inventory – Introduction to Inventory Management Principles –
- Developing the Demand Consensus Process
- Toolkit for Materials Management
- Principles of Inventory Management
- Inventory Optimization
- Manage by Exception
- ABC Classification for Inventory
- Modeling and Graphical Decomposition
- Introduction to Forecast Modeling
- Work-site Inventory Management Techniques Including Kanban
- Multi-echelon distribution
- Measurement and KPIs for Inventory Management
- Forecast Accuracy





# Agenda

## DAY ONE

**8:00 am — 8:45am** Global Demand Planning and Material Management Strategy - Introduction to the Four-Day Program by Mark Chockalingam

**8:45 am — 9:45am** Group Introduction

**10:00am — 12:00pm** Introduction to Demand Planning - The Big picture in Demand Planning and Analysis - Cash-to-Cash Cycle – Key Terminology in Demand Planning.

**1:00pm — 2:00pm** Individual Case Study assignment and discussion

**2:00pm — 3:15pm** Introduction to Inventory Management Principles - Inventory Categories – Inventory Strategies – Developing the Service Strategy

**3:30pm — 4:30pm** Demand Consensus Process and the Sales and Operations Planning Process – Marketing and Sales Input – Field Input – Financial consensus Demand & Supply Integration using a monthly demand planning cycle - Brief Introduction to S&OP

## DAY TWO

**8:15am — 8:30am** Recap of Day 1

**8:30am — 10:15am** Toolkit for Materials Management Data analysis for Modeling, Forecasting and inventory optimization – statistical concepts including variance, co-efficient of variation, and Outliers.

**10:30am — 12:00pm** Principles of Inventory management, EOQ and Purchase Quantity Discount - Economic Order Quantity - Determinants of EOQ - Ordering Costs versus Carrying Costs

**1:00pm — 3:00pm** Inventory Optimization and Management Safety Stock calculations – Determinants of Safety Stock – The perils of variability in Supplier lead time – Min-Max – Re-order Point

**3:15pm — End of day** Work on Individual Case study

## DAY THREE

**8:15am — 8:30am** Recap of Day 2

**8:30am — 10:00am** Manage by Exception Using Exception management to cut through the complexity of your organization with Product segmentation and ABC analysis – SKU segmentation for forecast modeling

**10:15am — 11:00am** ABC Classification for Inventory Strategies – Pareto Classification and Item Criticality – Frequency of Usage – Excess, Obsolete and Slow-moving – A model classification based on your dataset (or similar example)

**11:00am — 12:00pm** Modeling and Graphical Decomposition Define demand forecast models – Components of Demand – Modeling with Decomposition

**1:00pm — 3:15pm** Introduction to Forecast Modeling – Model Diagnostics – Time Series vs. Multi variate Models – Exponential smoothing Models and Event Models.

**3:30pm — End of day** Work on individual case study - Q & A with the facilitator

## DAY FOUR

**8:15am — 8:30am** Recap of day 3

**8:30am — 10:30am** Work-site Inventory Management Techniques including Kanban

**10:30am to 12:15pm** Multi-echelon distributions

**1:15pm — 2:30pm** Measurement and KPIs for Inventory Management

**2:45pm — 4:00pm** Forecast accuracy - MAPE, Bias and SKU Mix – Calculation Exercise - Relationship between Schedule Adherence, Customer Service and Inventory Availability

**4:00pm — 4:30pm** Feedback session

# Details

## DAY ONE

7:45am — 8:00am Registration

8:00am — 8:45am

- Introduction by Corporate Sponsor
- Global Demand Planning and Material Management Strategy
- Importance of workshop
- Introduction to the Four-Day Program by Mark Chockalingam

8:45am — 9:45am Group Introduction

9:45am — 10:00am Coffee break

10:00am — 12:00pm Demand Planning and Management

- Introduction to Demand Planning
- Service – cost – Balance Model
- Key components of demand
- Local vs. Strategic Demand
- Revenue and Margin perspective and the Stock Holder Value Model
- Profitability vs. Productivity
- Cash-to-cash Cycle and Financial Analysis
- Operational efficiency and Profitability
- Key Concepts in Demand Planning
- Forecast Horizon, Buckets & Periodicity

12:00pm — 1:00pm Lunch Break

1:00pm — 2:00pm Case Study

- Assignment of Individual case study
  - Formation of three to four person teams
- Description of case study
- Case study of operations at a warehouse
  - Management's pain point and how to scientifically control it
  - Attendees will be get transaction data of 50 SKUs from one warehouse
  - Submit case study solution: Calculation and analysis of inventory parameters expected

(Due by 8 PM on day three (By Email))

2:00pm — 3:15pm Purpose of Inventory – Introduction to Inventory Management Principles – Developing the Service Strategy

Inventory Categories

- Direct materials
- Indirect Materials
- MRO OEM
- MRO Industrial

Purposes of inventory

- Buffering
- Hedging
- Decoupling
- Economies of scale

Inventory Strategies

- Make to Order
- Make to Stock
- Assemble/Build to Order
- Postponement
- Mass customization
- Engineer to Order

3:15pm — 3:30pm Coffee Break

3:30pm — 4:30pm Demand Consensus Process

- Symptoms of a Fragmented Corporate Planning Process
- Bottom Line Effects of Fragmented Planning
- Sales & Operations Planning
- Demand and Supply Balancing
  - Volume Planning
  - Item Level Exceptions
  - Service Planning Model
- Demand Planning vs. Demand Management
- Sales & Marketing Input
- Demand Consensus





## DAY TWO

8:15am — 8:30am Recap of Day 1

8:30am — 10:15am Toolkit for Materials Management

- Data Requirements/Analysis for Demand Forecasting
  - Data cleaning challenges
  - Graphical Review of Data
  - Data filtering
  - Structural Changes and data shifts
- Demand volatility
  - Measuring volatility
  - Central Tendency
  - Co-efficient of Variation (CV)
- Outliers and Missing Data
  - Process to Identify Outliers
  - Outlier Correction

10:15am — 10:00am Coffee Break

10:30am — 12:00pm Principles of Inventory Management

- why carry inventory?
- Elements of carrying cost
- Average Inventory
- Economic Order Quantity
- Purchase Quantity Discounts

12:00pm — 1:00pm Lunch Break

1:00pm — 3:00pm Inventory Optimization

- Independent Demand vs. Dependent Demand
- Establishing Safety Stock & Reorder Point
  - Max Min
  - Reorder Point
  - Dynamic Lot sizing
  - Effect of lead time
  - Effect of intermittent demand
  - Cycle time
  - Average Inventory
  - ROP vs. EOQ
  - Lifetime buys and pitfalls to avoid

3:00pm — 3:15pm Coffee Break

3:15pm — End of day Work on Individual Case study

## DAY THREE

8:15am — 8:30am Recap of Day 2

8:30am — 10:00am Manage by Exception

- Product Segmentation for Forecast Modeling
- Volume Volatility Criteria to Segment SKUs
- Pareto Analysis of volume
- Measurement of Demand volatility using CV
- Process Flow for the Segmentation Strategy
- Classification using a 2x2 matrix
- Differential Modeling Strategy using segmentation

10:00am — 10:15am Coffee Break

10:15am — 11:00am ABC Classification for Inventory

- ABC analysis – Classification philosophy
- Pareto analysis of SKUs based on dollar usage
- Frequency of Usage – Excess, Obsolete and Slow-moving
- Alignment with product lifecycle
- Process flow for segmenting skus using the above techniques
- Example using a three dimensional matrix; ABC / Volume / Critical / Status: excess, obsolete

11:00am — 12:00pm Modeling and Graphical Decomposition

- Forecast Model
- Key Components of a Demand Plan
- Illustration of Demand components
- Demand Volatility
- Predictable and Unpredictable Volatility
- Understanding the components
  - Trend
  - Seasonality
  - Cyclical
- Forecast Modeling by Decomposition

12:00pm — 1:00pm Lunch Break

1:00pm — 3:15pm Introduction to Forecast Modeling

- Introduction to Forecast Modeling
  - Qualities of a good Statistical Forecast
  - Balancing between Model Fit vs. Robustness
  - Ex-post forecasting for Modeling
  - Optimal Model Selection using Diagnostics
- Time Series versus Multi-Variate Methods
  - First Order Exponential Smoothing Models
  - Holt Winters Models to model trend and seasonality
  - Baseline vs. event forecasting
- Forecast Modeling with software
- Forecast model examples with your dataset

3:15pm — 3:30pm Coffee Break

3:30pm — end of day

- Work on individual case study
- Q & A with the facilitator

## DAY FOUR

8:15am — 8:30am Recap of Day 3

8:30am — 10:30am Work-site Inventory Management Techniques including Kanban

- Cycle Counting
  - Need for timely / accurate on hand data
  - Cycle counting process
  - Determining the cycle count load
- Kanban systems
  - Kanban & Pull systems concepts
  - Determining Kanban container quantity
  - Determining Kanban container safety stock
  - Determining the total number of Kanbans
  - Kanban parameters: Min-Max, re-order point, and average inventory

10:30am — 10:45am Coffee Break

10:45am — 12:15pm Multi-echelon distribution

- Definition
- Common multi-echelon models
- Determining inventory location: hub or end of spoke
- Inventory in Multi-echelon Distributions
- Square Root Law of Inventory management
- Exercises

12:15pm — 1:15pm: Lunch

1:15pm — 02:30pm Measurement and KPIs for Inventory Management

- Service Level measurements
  - SC Reliability
  - Fill-Rate and On-time Delivery
  - Order complete
  - Average order process time
  - Flexibility
  - Adaptability
- Inventory Performance Measures
  - Inventory Accuracy
  - Inventory Turns
  - Days on Hand
  - At-Risk

02:30pm — 2:45pm Coffee Break

02:45pm — 4:00pm

- Forecast accuracy - MAPE, Bias and SKU Mix
  - Calculation exercise
- Supplier Performance Measures
  - Schedule Adherence
  - Lead Time Adherence
- Relationship between Schedule Adherence, Customer Service and Inventory Availability

4:00pm — 4:30pm  
Feedback session

# BIOGRAPHY

## Mark Chockalingam Ph. D. Founder & President

Dr. Mark Chockalingam is the President and Founder of Demand Planning LLC, a Business Process and Strategy Consultancy helping clients across industries: Pharmaceuticals, Consumer Products, Chemicals and Fashion Apparel. His specialty consulting areas include Sales forecasting, Supply Chain Analytics, and Sales and Operations Planning.

He has conducted numerous training and strategy facilitation workshops for a variety of clients in the US and abroad. Mark has worked with a number of companies from the Fortune 500 such as Wyeth, Miller SAB, FMC, Colgate-Palmolive, Teva, Eastman Kodak to the small and medium size companies such as Au Bon pain, Multy Industries, Ticona, a division of Celanese AG, North American Breweries etc.

With significant expertise in business forecasting and modeling, he is a frequent speaker at major supply chain events on topics ranging from demand management to sales and operations planning.

Prior to establishing his consulting practice, Mark has worked with manufacturing companies in important supply chain positions. Mark was Director of Market Analysis and Demand Planning for the Gillette Company, now part of Procter and Gamble. Before Gillette, Mark led the SunCare, Footcare and OTC forecasting processes for Schering-Plough Consumer HealthCare in Memphis.

Mark has a Ph. D. in Finance from Arizona State University, an MBA from the University of Toledo and is a member of the Institute of Chartered Accountants of India. Mark currently serves as the President of the Boston Chapter of APICS.

## David Rivers CFPIM, CSCP Senior Consultant

Mr. Rivers is a senior consultant with Demand Planning. Prior to this position, Dave was employed within the medical device industry at two Johnson & Johnson Companies: Codman & Shurtleff 1980-1995, DePuy Orthopaedics 1995-2006. Additionally, Dave has over ten years experience within the electronics industry.

Mr. Rivers' extensive background in training and education has been focused within the certification education curriculum for APICS; The Association for Operations Management. Dave has served as a subject matter expert on the APICS Curriculum and Certification Council for over fifteen years. This group of twenty five to thirty people comprised of experts from Academia, Consulting, and Industry develops and maintains the body of knowledge and exam content for the APICS CPIM and CSCP Certification programs.

Dave is a Certified Master APICS Instructor for the APICS CSCP and CPIM certification programs. He has served as an instructor at Northeastern University and Middlesex Community College. Dave has also presented at a number of APICS venues, including: local Chapter Professional Development Meetings, The Northeast Supply Chain Conference (NE-SCON), APICS Region 1- Seminar 1, APICS Volunteer Workshops, public and private classes in Hong Kong and Shanghai and at APICS National Conferences on a variety of topics a number of times.

Mr. Rivers received his Bachelor of Science from Northeastern University, and his Master of Science in Applied Management from Lesley University.

Dave has been an APICS member for over 30 years, and has most recently served as President for the Boston Chapter of APICS.

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## About Us

Demand Planning, LLC is a consulting boutique comprised of seasoned experts with real-world supply chain experience and subject-matter expertise in demand forecasting, S&OP, Customer planning, and supply chain strategy.

We provide process and strategy consulting services to customers across a variety of industries: pharmaceuticals, CPG, High-Tech, Foods and Beverage, Quick Service Restaurants and Utilities.

Through our knowledge portal Demand Planning.Net, we offer a full menu of training programs through in-person and online courses in Demand Forecast Modeling, S&OP, Industry Forecasting, collaborative Forecasting using POS data.

Demand Planning.Net, also offers a variety of informational articles and downloadable calculation templates, and a unique Demand Planning discussion forum.

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