

# Smarter Forecasting & Planning

## Certified Professional in Demand Forecasting Workshop

(Three day combined I & II workshop)  
— Demand Forecasting Principles, Methodologies, Performance Measurement and Best Practices



### Key Learning Objectives:

1. Establish a framework for demand forecasting in the supply chain
2. Introduce a four-step process for streamlining the forecasting cycle
3. Define, interpret, visualize major demand forecasting techniques.
4. Identify appropriate accuracy measures for evaluating demand forecasting and forecasting models.
5. Complement non-traditional methods with established approaches in forecasting model development



Program is endorsed by  
International Institute  
of Forecasters (IIF)

## Day 1

### **Part 0 - Pre-course Computer Workshop**

### **Part I - The Demand Forecasting and Planning Cycle in the Consumer Demand-Driven Supply Chain**

What is demand forecasting?

Demand Forecasting and the Supply Chain Paradigms

Who will use the forecast and what are their data needs?

Forecasting as a structured process- The PEER Model

**Workshop A:** Defining the Target- How to Quantify Drivers of Demand for New and Existing Products and Services

### **Part II - Improving Data Quality through Data Exploration and Visualization**

Data exploration- Learning from actual examples

Judging the quality of data

Handling unusual events and outliers

What are forecasting models?- Quantitative vs. qualitative methods

Evaluating forecasts and forecasting models

Combining and reconciling the final forecast

**Computer Workshop B:** Exploring Trend and Seasonal Variation.

### **Part III - How To Use Components of a Time Series**

Moving averages for smoothing kinks out of data

Finding the lift in promotions with moving medians

Identifying day-of-week effects through ANOVA methods

Creating additive and multiplicative seasonal factors

Seasonal adjustment of time series

**Computer Workshop C:** Creating Seasonal Adjustments and Projections with the RMA Decomposition Technique.

### **Part IV - Forecasting with State Space Forecasting Models**

Why use Naïve forecasting techniques?

Types of smoothing weight

Forecasting profiles for exponential smoothing

Applying univariate time series techniques

Handling special events with exponential smoothing model

Scenario forecast

Product lifecycle

**Computer Workshop D:** Automated, Data-driven Baseline Forecasting with Exponential Smoothing Models

## Day 2

### **Part V - Big Data: Data Mining, Data Exploration and Data Quality**

Predictive Analytics- something new?

Methodologies for big data exploration

Basic statistical tools for summarizing data

Traditional and nonconventional measures of variability

Data framework for demand forecasting in the cloud

Identifying criteria for assessing data quality

Handling exceptions in large data sets

Data process frameworks and job checklists

**Computer Workshop E:** Data Exploration, Outlier Correction, and Predictive Analytics

### **Part VI - Forecasting with ARIMA Time Series Models**

Creating a flexible model building strategy

Detecting autocorrelation in time series

Identifying seasonal and non-seasonal ARIMA models

Diagnostic checks and ARIMA modeling checklist

**Computer Workshop F-** How to Create Short-term Trend/Seasonal Models

### **Part VII - How to Measure Forecast Accuracy**

Basis of accuracy measurement- Bias and Precision

Forecasting errors and waterfall charts

Goodness of fit versus forecast performance

Cost of inaccurate forecasts

Traditional and conventional accuracy measurement

**Computer Workshop G-** Root Cause Analysis and Exception Reporting

### **Part VIII - Graphical Tools for Forecast Process**

Ladder charts for monitoring forecast modeling results

Prediction- Realization diagrams and business cycles

Prediction intervals for controlling judgemental overrides

Cumulative tracking signals- Trigg's approach

**Computer Workshop H-** How to Use Predictive Visualization To Track and Monitor Forecasting Performance

### **Part IX - Implementing the Demand Forecasting Function Within an Integrated Business Planning Process**

The Delphi Method

The forecasting audit

A framework for setting forecasting standards

Planning for process improvement

Overcoming barriers and closing gaps

### **Part X – Practical Uses of Demand Forecast Modeling**

Marketing– Promotion planning  
Sales– Pricing: Elasticities  
Operations– Safety stock and inventory forecasting  
Finance– Rolling forecasts and budgeting

### **Computer Workshop I: Using a Time-phased Order Forecasting Model for Customer Replenishment Planning**

### **Part XI – Designing Regression Models for Demand Forecasting**

Finding a linear association between two variables  
Checking ordinary correlation with a nonconventional alternative  
What are regression model assumptions?  
What is a “best” fit?  
The least square assumption demystified  
The ANOVA table output for regression analysis  
Paring the output for use in forecasting  
Creating forecasts and prediction limits

### **Computer Workshop J– Using Causal Models for Advertising and Promotion Analysis**

### **Part XII– Working with Residuals and Forecast Errors to Improve Forecasting Performance**

Dealing with lack of normality in time series regression modeling  
Looking out for “Black Swans”  
How good was the fit and what does it say about forecasting ?  
Dealing with nonrandom patterns in residuals  
Impact of error term assumptions on prediction interval determination  
Creating prediction intervals for forecast monitoring  
Using prediction limits for quantifying uncertainty in forecasts  
A checklist for multiple linear regression

### **Computer Workshop K - Taming Uncertainty— Root Cause Analysis and Exception Handling**

### **Part XIII - Improving Demand Forecasts with Informed Judgment**

When to make judgmental adjustments to forecasts  
Judgmental traps in forecasting  
Melding quantitative and qualitative approaches for forecast development and process improvement  
Creating the final forecast with Change and Chance numbers

### **Computer Workshop L– GLOBL Case: Simulating The Demand Forecasting Cycle (You may bring your own data).**

Global Electronics Manufacturer (a fictitious company) provides consumer electronic technology products to a broad range of customers worldwide  
Participants will evaluate and reconcile forecasts and prediction limits for three product lines based on univariate exponential smoothing and multiple linear regression models.

### **Workshop Takeaways and Closing Remarks**

Each Level of the CPDF program consists of both instructor-led workshop training hours, and independent hours to be accomplished through self-paced e-learning environment. The successful completion of each level will qualify participants to earn a certificate, CPDF levels & certificates are described below:

**Basic Level : Certificate in Demand Forecasting**

90 Training Hours	15 hours hands-on workshop
	75 hours, 6 work sheets E-learning

**Master Level : Certificate in Demand Forecasting**

60 Training Hours	15 hours hands-on workshop
	45 hours, 6 work sheets E-learning

**Professional Level: Certificate in Demand Forecasting**

50 Training Hours	20 hours hands-on workshop
	30 hours, 6 work sheets E-learning

**Program Requirements:**

- College degree or Job experience
- Reasonable experience in MS Excel
- Acceptable level of English language

**Program Assessment:**

- Full attendance of hands-on workshops is required
- Successful submission of required worksheets through e-learning system
- CPDF is not a test-based program.

**It's a hand-on workshop. Please bring your own laptops to run the computer exercises!!**



**Who Should Attend?**

- Demand Forecasters
- Operational Specialists
- Demand planners
- Supply planners
- Production Managers
- Operations Managers
- Financial analysts
- Market analysts
- Researchers
- Forecasters
- Economists
- Strategists
- Marketing & Sales managers

**WHY STUDY WITH US?**

1. International trainers
2. Trainers have long and global experience in demand management and forecasting.
3. High quality and excellent style of delivery with participative debate and discussion, case studies.
4. E-learning service through a unique Online Web Platform designed exclusively for CPDF Students.
5. 100% Student pass rate, endorsed by past and present students in the region.
6. Abilities to enhance local demand data with international experience and theories.
7. Interchange demand forecasting experience management with local culture and knowledge.



## Our Training Partner

Delphus Inc. ([www.delphus.com](http://www.delphus.com)) is a privately held corporation, headquartered in Morristown, New Jersey. Established in 1987, the company has been dedicated to providing strategic market analyses, forecasting software tools and data mining solutions for sales and marketing managers, inventory and production planners in manufacturing, distribution, retail firms and hospital management operations.

Delphus clients list contains names like: Kodak, Lucent Technologies, IBM, TAP Pharmaceutical, Pfizer, and more.

## Program Leader

**Dr. Hans Levenbach** is the founder and President of Delphus Inc., which specializes in predictive-analytic solutions for demand planning in supply chain organizations. He is also an elected Fellow, former President and Treasurer of the International Institute of Forecasters (IIF). He is also a member of APICS, INFORMS, American Statistical Association and an elected member of the International Statistics Institute. Hans has been instrumental in designing the "Certified Professional Demand Forecaster" (CPDF<sup>®</sup>) curriculum ([www.cpdftraining.org/curriculum.htm](http://www.cpdftraining.org/curriculum.htm)). He is the author of the book: **Change & Chance Embraced: Achieving Agility with Demand Forecasting in the Supply Chain**



## What is CPDF<sup>®</sup>?

This is a certification program for demand forecasters and planners working in supply chain industries. The International Institute of Forecasters (IIF), a thirty-four year old non-for-profit membership organization whose purpose is to advance knowledge and research in forecasting, has endorsed it. The CPDF program is a 200 hours curriculum comprised of three modules, CPDF I, CPDF II, and CPDF III. A Certification designation can be earned at each of the three levels. The CPDF qualification will address multidimensional job roles in demand forecasting such as data display and validation, database management, dashboard display, understanding quantitative and qualitative projection techniques, model creation and execution, forecast accuracy measurement, model and forecaster performance analysis, organization, and collaborative planning.