Root Cause Analysis

by Dave Wells

Module 0. About the Course (5 min)

Module 1. The Nature of Cause and Effect (24 min)
- *Definitions and Distinctions*
  - Correlation
  - Coincidence
  - Confounding Variables
  - Contributing Variables
  - Influence
  - Complexity and Complications
- *A First Look at Cause and Effect Models*
  - The Five Why's
  - Fishbone Diagrams
  - Causal Loop Models
- *Cause and Effect Misconceptions*
  - Simple vs. Complex
  - Linear vs. Circular
  - Close vs. Distant
  - Immediate vs. Delayed
  - Ordered vs. Non-Ordered

Module 2. RCA Concepts and Principles (22 min)
- *The Purpose of RCA*
  - Root Cause Analysis Defined
  - Root Cause Defined
  - Root Cause Criteria
  - Root Cause Criteria Examples
- *The Process of RCA*
  - Five Steps of RCA
  - The Problem Description
  - Data Gathering
  - Causal Modeling
  - Root Cause identification
  - Recommendations
- *Practical Application*
  - Beyond RCA
  - Implement Solutions
  - Measure and Monitor
  - Watch for Side Effects
  - Correct Existing Issues

Module 3. Basic Causal Modeling Techniques (55 min)

- *The Five Why's Method*
  - Drill Through the Symptoms
  - Data Quality Example
  - Business Analysis Example
  - Data Quality and Business Impact Example
  - Five Why's as a Team Process
  - Tools and Technology
- *Fishbone Diagramming*
  - Data Quality and Business Impact Example
  - Business Analysis Example
  - Process Overview
  - Describing the Problem
  - Main Branches
    - MORT
    - Balanced Scorecard Model
    - The Four M's of Manufacturing
    - Service Industry Model
    - P.E.S.T. Analysis
    - Additional Thoughts
  - Branch Causes
    - MORT
    - Balanced Scorecard
  - Root Causes
  - Recommendations
  - Diagram Layering
  - Diagram Layering Example
  - Tools and Technology
- *Five Why's and Fishbone Together*

Module 4. Complex Causal Modeling Techniques (61 min)

- *Systems Thinking Concepts*
  - Rethinking Cause and Effect
  - Systems Thinking Defined
  - The Basic System Construct
  - Directional Influence
  - Feedback
  - Loop Polarity
  - Reinforcing Loops
  - Balancing Loops
- *Causal Loop Modeling*
  - Nodes and Links
  - Feedback Loops
  - Time and Delays
  - Gaps and External Variables
  - Side Effects
  - Multiple Loops
  - Scope of the Model
  - Intersection Nodes
  - Modeling Tips

- *System Archetypes*
    - Recurring Behaviors
    - Accidental Adversaries
    - Drifting Goals
    - Escalation
    - Fixes that Fail
    - Limits to Success
    - Growth and Under-Investment
    - Shifting the Burden
    - Success to Successful
    - Tragedy of the Commons

Module 5. Verifying Cause and Effect Conclusions (57 min)
- *Nonsense and Logical Fallacies*
    - A Short Reasoning Exercise
    - Nonsensical Thinking
    - Nonsense and Distortion
    - Seeing What We Want to See
    - Logical Fallacies
    - Fallacies of Relevance
    - Component Fallacies
    - Fallacies of Ambiguity
    - Fallacies of Omission
- *Fallacies and Thinking Styles*
- *Critical Thinking*
    - Facts and Logic
    - Bias of Facts and Logic
    - Evidence and Assumptions
    - Inference and Conclusions
    - Mental Models – Testing Interference
    - Assumption and Interference Exercise
    - Critical Thinking and Causal Models
- *Lateral Thinking*
    - Challenging
    - Disproving
    - Provocation
    - Random Input
    - Brainstorming
    - Scamper
    - Six Hats
    - Blue Sky
    - Green Field
    - Concept Fans
    - Mind Maps
    - Reframing
- *Course Summary*
- *Final Thoughts*