Advanced Business Data Analysis

KCI
Knowledge Consultants Incorporated

This course is intended to provide you with the advanced ideas and techniques of enterprise data analysis.

Gain insight into issues involving risk, sensitivity, influence, decision making and patterns of performance.

Learn new techniques including Neural nets, decision trees, semantic analysis, cyber metrics,

For Analytic Excellence in Business Performance

Business excellence today means more than just process improvement or having a good quality program. It means having the capability and the skills to analyze various aspects of business performance and apply the appropriate actions for solution. The data to perform such analysis is more available now than at any other time in history. Coupled with the availability of data is the emergence of a variety of analytical techniques and methods designed to focus on remediation of problems, decisions or situations of Interest to the business.

Analytic techniques have evolved to solve certain types of business problems. Deciding between alternatives requires some form of decision analysis while ranking risk requires a method of quantifying and then ranking the risk. Even basic 4 –box techniques require thought and insight into their meaning and Interpretation. The methods and concepts needed to make these ideas definitive are discussed in detail.

Many tools are available for the advanced techniques. Some of them are quite sophisticated. Since various types of tools are used for this level of data analysis only a few can be used and shown during this seminar. While Excel can be used for many of the exercises it may be necessary to use neural net and tree diagramming tools for certain problem types.

Learning Outcomes

- Apply basic statistical techniques to business problems and identify the appropriate solution
- Select the best statistical techniques for a particular business problem
- Use correlation approaches on time series data to identify factors that move together for prediction
- Use regression analysis for prediction and trend extrapolation of time series data such as financial and quantitative factors
- Apply decision trees to situations that require evaluation and determination of alternatives such for internal investment opportunities
- Use basic formulas to assess best use of resources to maximize volume and profits or minimize cost and resources
- Use influence diagrams to identify and quantify the factors that influence key performance and key results indicators
- Apply semantic key word ranking techniques to identify common words in customer complaints and help inquiries
- Use basic techniques for converting 'soft' ranking such as high, medium and low into quantitative values

Understanding and Using Advanced Techniques

Introduction – Problem Solving and Data Analysis

- Problem solving in business
- About advanced techniques
- Tree structure approaches
- Semantic and predictive text analysis
- Pattern analysis – statistics vs. neural nets

Demonstration – What if analysis of business performance

Traditional data analysis techniques

- Statistical thinking
- Basic ranking approaches
- Dealing with missing data
- Data bridging techniques
- Statistical process control
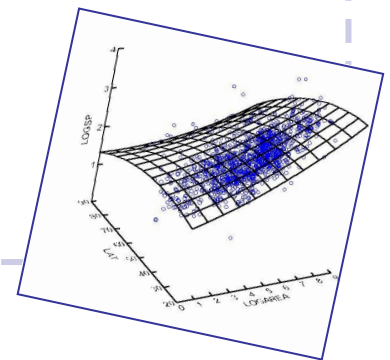- The 'Black Swan' idea

Exercise—Simple Statistical Process Control

Advanced Correlation and Regression Analysis

- Correlation technique
- Simple Regression
- Multivariate regression
- Step by Step regression
- Hierarchical regression
- Logical regressions—the 4-Box Analysis

Exercise – Using Regression, Correlation and 4-Box Analysis

Exam 1—First Day

Sensitivity Analysis

Understanding the Impact of Decisions

Sensitivity and linear programming

- The basic idea of LP
- What kind of problems does this address?
- The objective function
- Boundaries of a problem and changing values
- Interpreting results

Exercise – Resources for product production

Evaluating Alternatives with Simulations

- The idea of simulation
  - Uncertainty ideas
  - Random variables
  - Discrete events.
- Simulation concepts

- Simulation runs
- Simulation results
- The Monte Carlo Simulation Approach
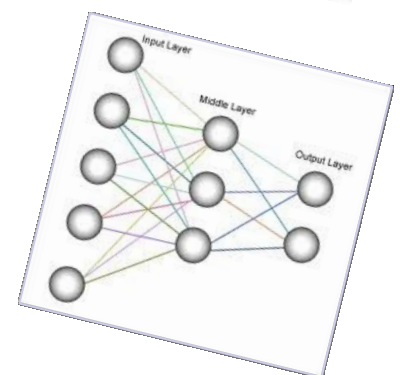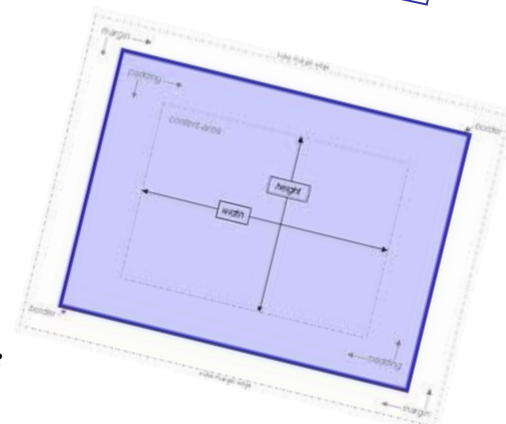- Reality – interpreting results

Exercise – Simple Monte Carlo Simulation

Neural nets – better than statistics?
- What is a neural net?
- Why do they work?
- Setting the net up
- Training a net
- Running a net

Demonstration – Neural Nets

Exam 2—Day 2

Decision Analysis Part 1

## Making the Right Choices Between Alternatives

Decision trees
- What is a decision tree?
- When do you use them?
- Setting up a tree – phrasing the questions
- Adding the values to the tree
- Drawing conclusions

Exercise – Understanding alternatives—preparing a decision tree

Decision Tables
- Defining a decision table
- Identifying conditions
- Identifying alternatives
- Creating the table
- Drawing conclusions

Exercise – Analyzing a decision tree with a decision table
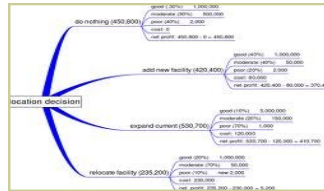
Applying Decision Trees to Business Situations
- Structuring a business problem
- Example 1 – Choosing between locations for business
- Maximizing and minimizing
- Example 2 – What alternative is the highest profit? Least cost?
- The value of information - Determining payoff
- Example 3 – Understanding investment choice

Exercise – Choosing a product or service strategy

Exam 3—Day 3

Decision Analysis Part II

Understanding the Impact of Performance Indicators

Preparing an influence diagram
- What is an influence diagram?
- Diagramming techniques
- What is the decision problem?
- Defining decision utility
- Results expected – identifying sensitivity

Exercise – Creating a diagram and adding influences

Influence diagrams - Evaluating alternatives
- Understanding decision nodes in a diagram
- Determining the alternate choices
- Placing the nodes in the diagram
- Valuing the policy tree
- Interpreting the results

Exercise – Identify the alternative of value in a product decision

Influence diagrams – Assessing sensitivity to analyzing results
- Using Tornado diagrams
- Selecting values for an assessment
- Adding ranges to the values
- Interpreting the results
- Doing multiple sensitivity runs

Exercise – Using the influence diagram for profit sensitivity analysis

Exam 4—Fourth Day

Semantic Analysis

Core semantic analysis
- What is semantic analysis and why we do it
- Semantic models
- Semantic nets
- Simple analytics
- Drawing conclusions

Exercise – Semantic comparisons— Consolidating Processes

Cyber metrics - a quantitative view of semantics
- Where did this come from?
- Qualitative analysis
- Fuzzy rankings
- Composite analysis of rankings
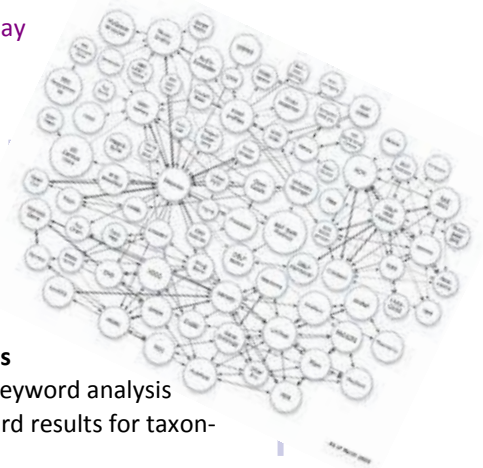- Drawing conclusions from fuzzy data

Exercise – Creating a composite ranking

Keyword Analysis
- Purpose of keyword analysis
- Using keyword results for taxonomies
- Analyzing words and phrases
- Interpreting results
- Semantic repositories and corporate language

Demonstration – Simple Keyword Analysis

Exam 5—Last Day

Knowledge Consultants, Inc. is a professional services firm founded in 1984. KCI provides consulting and professional education services. With over 30 courses taught worldwide, KCI provides the opportunity to develop core strengths in the following certification areas:

- Process Management
- IT Management
- Business Performance Management
- Business Analysis
- Analytical Techniques for Business
- Business and IT Architecture

KCI has expanded its training and consulting efforts internationally into Europe, Southeast Asia and the Middle East. KCI has an outstanding list of current and past clients including many of the Fortune's 100 companies.

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Meet the Expert - Frank Kowalkowski

Frank Kowalkowski is President and CEO of Knowledge Consultants Inc., a professional services firm founded in 1984 with practice areas in knowledge management, business intelligence, and performance, business and system architectures, supply chain manage-ment, and application design and development.

With more than three decades of management consulting and industry experience under his belt, Frank's spectrum of expertise mainly lies in manufacturing, distribution, insurance, financial services and the public sector.

He has also played key roles in a wide range of projects, including e-Commerce, Application Integration, ERP and Supply Chain Management,. Knowledge Management, Artificial Intelligence, Benchmarking, Business Performance Measurement, Business and Competitive Intelligence, Technology Deployment, Data Warehousing, and Process Improvement.

Prior to his presidential post at Knowledge Consultants, Inc., Frank was the Director of Consulting for the Spectrum Group, responsible for reengineering consulting, process improvement and operational systems consulting. His engagements also included senior management presentations, audits, assessments, organizational studies, and methodology development and implementation.

In addition to being a keynote speaker at international conferences as well as a conference chair, he has written numerous papers and spoken at conferences on a variety of subjects such as technology forecasting, process analytics and management, business analysis, management disciplines, and enterprise performance management.

Frank is also the author of a 1996 book on Enterprise Analysis and over 70 papers. He is currently working on a BPM book for managers and a new edition of the enterprise analysis book.

Frank focuses on training and con-sulting efforts internationally in regions such as North America, Europe, Southeast Asia and the Middle East.