[Introduction to B-Box™]

Decisions

Where would be a good place move our factory?

I hear there is a statistics tool that helps with
decision making…
Anyone out there who can help?

So much information, but so difficult
to make a decision!

How about next year's sales volume?
Shouldn't we know this to plan our production
and supplies?

I hear there is a way to predict it…
Basic statistics? Regression? Time Series?
Clusters? Factor? Correlation?
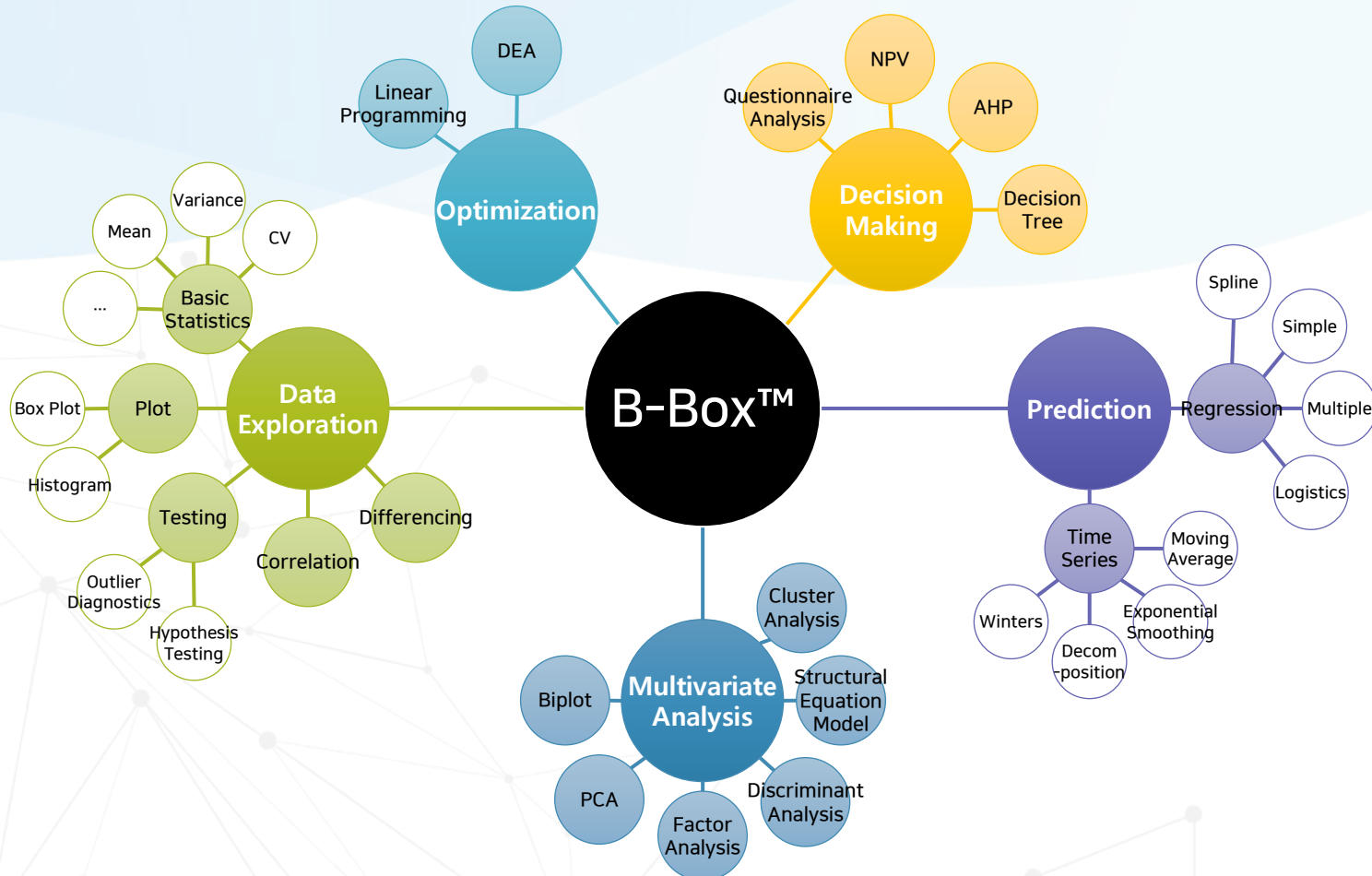
So many statistical techniques…
What do I do?

B-Box™

B-Box is an abbreviation of Black Box.
We aim to improve decision making processes.

Black Box

Input

Transformation

Output
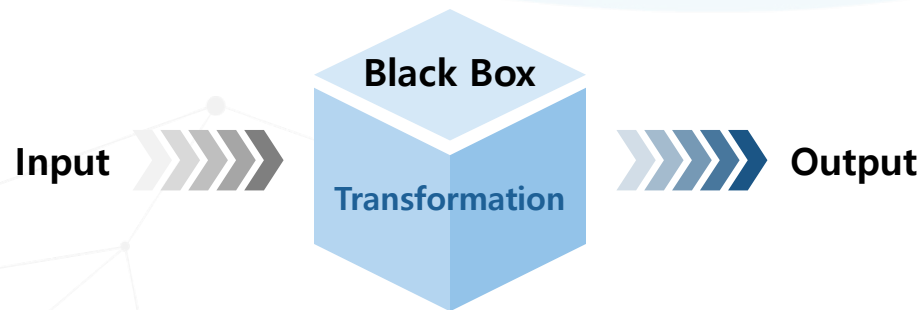
Analytic Techniques

As a decision-making support tool, we provide various statistical and operations research techniques.

Methods of Analysis

Linear Regression	• Analysis of the influence of independent variables on a dependent variable (y=f(x)+e). • A number of features that help you to easily find the optimal model • Recommendation of the optimal model via the "all possible models" method • Alternative optimal models by transforming the x and y variables • Identification and automatic removal of outliers, and generation of regression models based on the data after the removal of outliers • Testing of basic assumptions of linear regression analysis (normality, multicollinearity, linearity, homoscedasticity, autocorrelation) • Testing of predicting power of the model via test data, and simultaneous review of a number of models using a Z variable
Spline Regression	• Splitting of the independent variable into regions, and generation of a separate regression model for each region • Model generation via manual assignment of the splitting points (knot points) on the graph • Model generation via automatic calculation of the optimal knot points • Immediate calculation of predicted values according to the estimated model • Simultaneous review of a number of models using a Z variable
Logistics	• Analysis of the influence (eg. Expected probability and classification criterion) of independent variables on a categorical dependent variable ($logit(\pi)=f(x)+e$) • A number of features that help you to easily find the optimal model • Recommendation of the optimal model via the "all possible models" method • Automatic identification of outliers • Analysis of residuals and their scatter plot • Simultaneous review of a number of models using a Z variable • Estimate the probability (π) and its confidence interval for new data

Methods of Analysis

Time Series Analysis	• Identification of characteristics and prediction of future values from a set of data observed with time-dependent. • B-Box contains the moving average, exponential smoothing, decomposition and Winters models. • Simultaneous execution and review of every model via the auto execution feature • Immediate execution of one of the models on the "All possible" results screen for more detailed results • Automatic calculation of smoothing constants in Exponential Smoothing and Winters models for user's convenience • Testing of predicting power of the model via test data • Simultaneous review of a number of models using a Z variable
Cluster Analysis	• Grouping of data points which share similar characteristics • Equipped with the PAM technique, a non-hierarchical method that is robust in dealing with outliers • Entering a range of numbers of clusters via the All possible feature, for user's convenience • Calculation of silhouette scores, and simulation of changes in silhouette scores with changes in clusters
Discriminant Analysis	• Determination of the category to which a data point belongs • Discriminant analysis of every possible combination of variables (all possible models) • Review of the apparent error rate of every possible model and immediate execution of any one of the models to view more detailed results • Categorization of new data points, and the visualization of the current categorization
Factor Analysis	• Identification of hidden relationships between variables and grouping them • Prompt results after selecting the variables and defining the number of factors • Visualization of the results of rotation on a graph, for cases with 2 factors.

Methods of Analysis

PCA & Biplot	• Reduction of the number of variables, to enable simpler explanation of the data • Prompt results after selecting the variables • Scatter plot between PCs and between PCs and observed variables, and a scree plot to determine the number of principal components to consider • Biplot: visualization of the relationships between data and multidimensional variables, obtained from principal component analysis
Structural Equation Modeling	• Analysis of various causal relationships between variables in a single model • Generation of variables and basic model generation, for user's convenience in defining a model • Validation of the model, to check whether the model as defined is mathematically solvable • Review of results at a glance via path diagrams, including the results of significance tests for the estimated coefficients
Outlier Diagnostics	• Detection of outliers by checking whether each data point falls within a specified standard deviation range from the mean • Basic statistics for the variable before and after the removal of outliers • Simultaneous review of a number of models using a Z variable
Hypothesis Testing	• Mean and variance tests for each variable, difference of the means, ratio of the variances and paired difference tests for two variables and difference of the means test for 3 variables • Simultaneous review of a number of models using a Z variable
DEA	• Analysis of efficiency of each data point (called Decision Making Units, or DMUs, in this context) by considering input and output variables • Efficiency score for each DMU, along with possible reductions in input variables and possible increases in output variables. • Variables with negative values can also be considered. • Introduction of the concept of super efficiency, enabling absolute evaluation of the efficiency of DMUs, as well as relative comparisons • Simultaneous review of a number of models using a Z variable

Methods of Analysis

LP	• Finding the optimal solution of an objective function under linear constraints, using solution algorithms for linear programs
AHP	• Determination of an order of importance between factors considered in a decision making process, and evaluation of the alternatives for each factor • Placing of weights on each factor in a subjective decision making process, following Professor T. L. Satty's AHP methodology • Consistency test, in order to ensure reliability of the results
NPV	• Support of financial decision making, considering the present value by discounting future cash flows to take into account the time value of money
Questionnaire Analysis	• Provide various statistics for each question and respondent group (mean, variance, cv, etc) • Visualize the result of analysis by displaying plots • Test on the reliability of questionnaire based on Cronbach's Alpha • Test on equal mean / variance between two selected groups based hypothesis testing
Decision Tree	• Visualization of decision-making process in a tree plot using CART algorithm • Variable selection feature to easily find the optimal model • Recommendation of the optimal model through "All possible model" method • Multiple model creations by Z variable • Model validity check with test data function

B-Box™ Main Features: One Click

A single click enables you to have 7 different analyses
- Linear Regression, Time Series Analysis, Cluster Analysis, Biplot, Outlier Diagnostics, Hypothesis Testing, Correlation Analysis

To reduce the time taken, user can select the variables to use.

One Click

A single click enables you to have 7 different analyses.

Methods of Analysis

Method	Process
Linear Regression	Regression equations are calculated for every possible case, with all the variables taking turns to act as the Y variable and the other variables acting as the X variables. Then the model with the largest value of R^2 is displayed.
Time Series Analysis	Time series analysis is executed with the multiplicative Winters model, assuming all the variables to be time series data. Seasonal period is automatically set to 12.
Cluster Analysis	Cluster analysis is performed on all the selected variables. Setting the number of clusters to be in the range 2~5 and using the PAM (Partitioning Around Medoids) method, every possible model is generated, and those with average silhouette value greater than 0.5 are displayed.
Outlier Diagnostics	Outliers are detected from all the selected variables. Outliers are defined to be data points which lie outside the range mean$\pm3\sigma$, where σ is the standard deviation of the variable.
Hypothesis Testing	Population mean tests are carried out on all variables against the null hypothesis that the population mean is 0. Difference of means tests and variance ratio tests are carried out on every possible pair of variables, against the respective null hypotheses that the difference in the means is 0 and the ratio of variances is 1.
Biplot	The eigenvectors of the first and second principal components from Principal Component Analysis are represented on biplot as blue arrows, and the principal component scores of the data points are represented on biplot as dots.

B-Box™ Main Features: Quick

You can obtain prompt results from 9 methods of analysis by setting minimal conditions.

- Linear Regression, Logistic Regression, Spline Regression, Time Series Analysis, Cluster Analysis, Discriminant Analysis, Factor Analysis, Principal Component Analysis, Biplot, Outlier Diagnostics

Quick

A few ticks on conditions lead you to prompt results.

B-Box™ Main Features: Optimal Model

The optimal model is recommended after all possible models have been reviewed.

Choice

Best option is provided among all possible solutions.

Linear Regression

Time Series Analysis

Cluster Analysis

Discriminant Analysis

Caliber

This decision-making tool contains 20 years of consulting experience, in the fields including management, accounting, operations research and statistics.

- It has been used extensively in management consulting, performance evaluation designs, department "management by objectives" projects and various policy research projects.
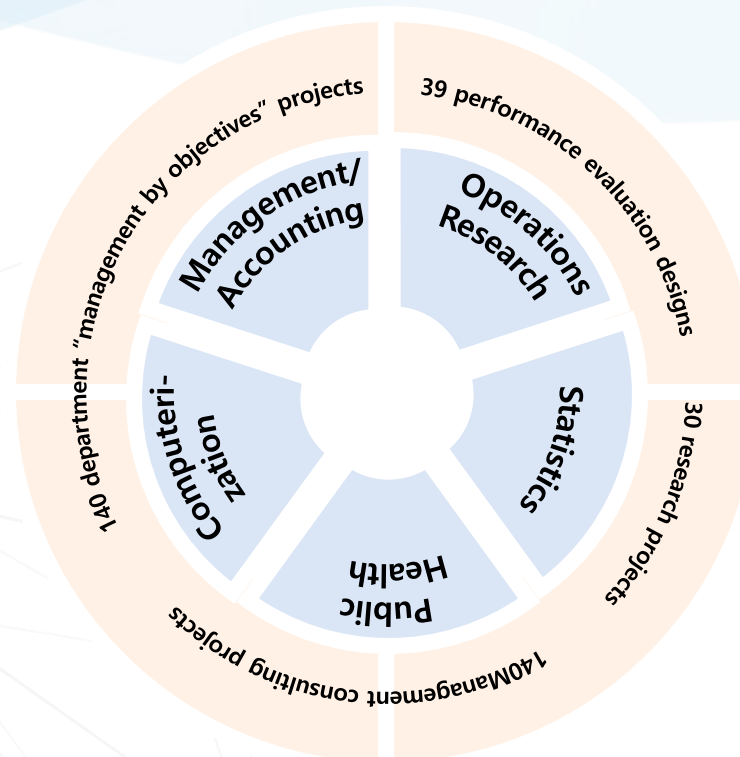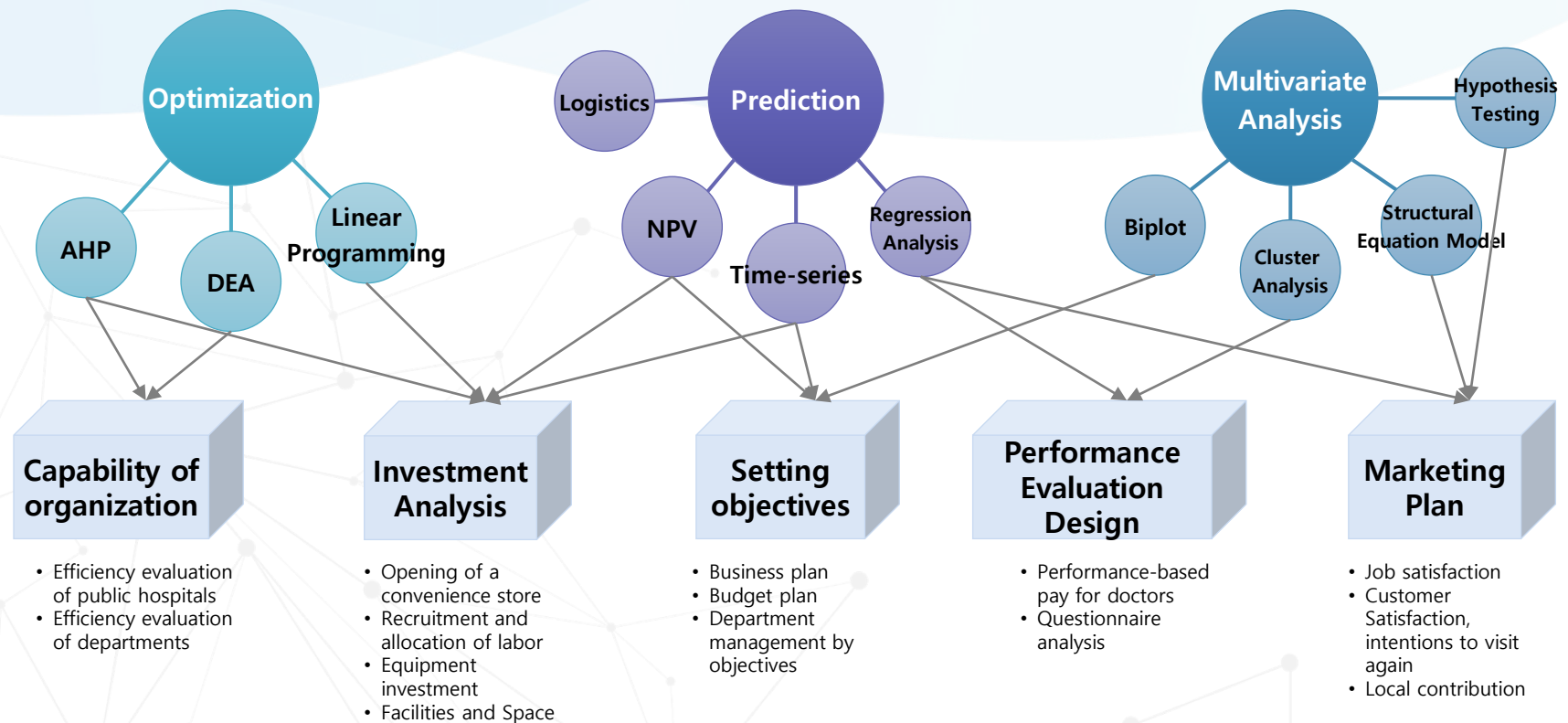
Case Studies

We help practical decisions to be made in a scientific manner, including investment projects or setting management objectives.

- There is a wide range of practical case studies.

Optimization
- AHP
- DEA
- Linear Programming

Prediction
- Logistics
- NPV
- Time-series
- Regression Analysis

Multivariate Analysis
- Biplot
- Cluster Analysis
- Structural Equation Model
- Hypothesis Testing

Capability of organization
- Efficiency evaluation of public hospitals
- Efficiency evaluation of departments

Investment Analysis
- Opening of a convenience store
- Recruitment and allocation of labor
- Equipment investment
- Facilities and Space

Setting objectives
- Business plan
- Budget plan
- Department management by objectives

Performance Evaluation Design
- Performance-based pay for doctors
- Questionnaire analysis

Marketing Plan
- Job satisfaction
- Customer Satisfaction, intentions to visit again
- Local contribution

Education Programs

We help you to carry out scientific decision making processes by yourself.

- We aim to improve analytic capacity of members according to the needs of each organization, through various curricula.

Benefits for Students

- Strengthen analytic skills
- Employment and promotion opportunities
- Tool is free for personal users

Various Curricula

- Analysis of influencing factors and predictions via linear regression
- Predictions and usage rate control via time series analysis
- Survey analysis using Structural Equation Modeling
- Investment decision-making based on financial analysis
- Marketing plan via geographical analysis
- Productivity analysis via DEA
- Optimal allocation of resources via linear programming
- Design of performance evaluation via statistical analysis

Benefits for Educational Institutions
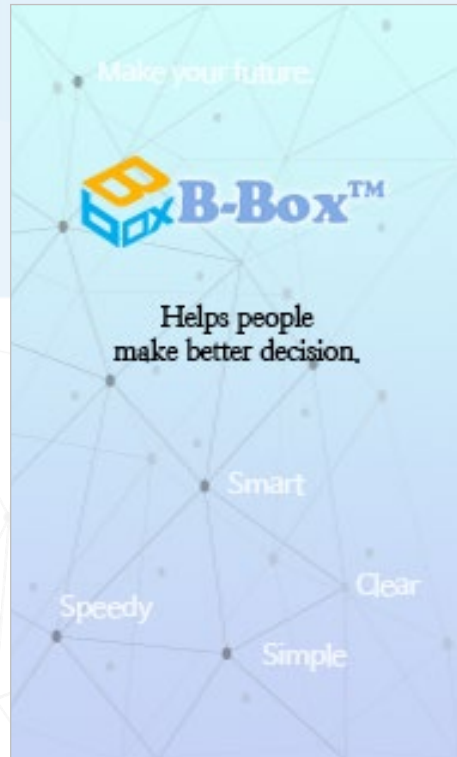
- Novel education program
- Strengthening of practical skills
- Employment insurance benefits

Purchase Guide

For personal users, B-Box^{TM} is provided for free.

Category	Company	Academic	Lectures (Computer labs)
Annual license	Single-user license: 240.00 USD	Single-user license: 120.00 USD	▸ **Lectures (Computer labs) :** - Where multiple users use the same computer ▸ **Up to 49 computers :** - 1000.00 USD ▸ **Up to 99 computers :** - 1500.00 USD ▸ **For 100 computers or more :** - 2000.00 USD
Technical Support	Upgrade of B-Box™ and technical support are provided without additional fees. Operating systems for which technical support can be given: (WindowXP 32/64bit, WindowVista 32/64bit, Window 7 32/64bit, Window 8 32/64bit, Window 8.1 32/64bit, Window 10 32/64bit) For the following types of problems, we can identify the cause and guide you in solving the problem. (Technical problems in the installation process, error messages that occur during use, irregularity in operation, etc.)		
Discount	10% discount is provided for two or more customers VAT is not included in the price.		N/A
Other information	Refund Policy : You can request full-refund within 7 days of your purchase. [B-Box™ Partnership] For commercial use of B-Box please contact us via email (bbox@calebabc.com) or give us a call at (82-2-322-1342).		

Decision Making

Everyone finds decision-making tough,
but we all have to make decisions.

B-Box™ will guide you along the way.
We can help your decision-making
process with a single click.

갈렙ABC

B-Box™
http://bboxworld.com