

# **DataWise Consulting**

**The choice for your research needs!**

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*Company Background*

*Research Process*



*Specialties*

*Research Techniques*

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# Company Background

# Who We Are

- We are a team of Ph.Ds with rigorous quantitative training and extensive experience in designing custom research and conducting advanced statistical analysis.
- Our sophisticated analysis and actionable recommendations will help our clients achieve success by targeting and segmenting customers, optimizing prices, bundling services, enhancing brand equity, measuring and improving customer satisfaction to improve retention.

# What We Offer

## ■ Following are our specialties:

- Profitability and margin optimization strategies
- Decision modeling and optimization
- Brand research
- Product-line optimization
- Population and market segmentation
- Advanced data analytics
- Customer and product satisfaction measurement and modeling

# Industry Experience and Some Project Examples

- **Automotive**
  - (revenue management, sales forecasting, customer loyalty)
- **Insurance/Banking**
  - (survey design, property value prediction, satisfaction analysis)
- **Consumer products**
  - (pricing for new products and line extension, bundling)
- **Pharmaceutical**
  - (message testing, segmentation)
- **Telecommunication**
  - (linking customer satisfaction to financial revenue)
- **Transportation**
  - (Discrete choice modeling for frequent flyers reward programs)

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# Research Process

# Steps in Research Process

**A research project is a multi-stage process in which every step needs to be designed carefully because the final results are only as good as the weakest link in the whole process.**

**The steps required to design a research project include:**

- Defining the objectives of the research
- Determining the analytical method
- Choosing the sampling group
- Writing the questionnaire
- Fielding the project
- Statistical analysis
- Interpretation of the results and recommendation

**We work closely with clients on each of the steps above to ensure the highest quality of work.**

# 1. Defining the Objectives of the Study

- **The importance of well-defined objectives can not be over emphasized. An ill-defined objective will collect useless data and reach inconsequential or even misleading conclusions.**
  
- **Following is a list of sample goals for some general areas:**
  - The potential market for a new product or service**
  - Ratings of current products or services**
  - Employee attitudes**
  - Customer/patient satisfaction levels**
  - Reader/viewer/listener opinions**
  - Market segments**
  - Corporate images**
  
- **Our work starts with helping clients to refine their objectives and recommend the best technique suitable for the objective. In general, objectives should be specific, stated clearly, measurable, and limited in scope.**

## 2. Determining the Analytical Method

With more than one method applicable to the same objective most of the time, the challenge is to choose the right one. For example, cluster analysis, discriminant analysis, CHAID, CART, conjoint, latent class can all be used to segment respondents. Each method has its own merits and limitations and there is no single method applicable to all scenarios.

The choice of the right technique depends on the objective, budget, sample size, time line, and the application of results.

Our expertise and experience in statistical techniques will enable us to design the most appropriate and efficient method for each individual study.

We will make the choice by comparing all possible candidates as well as considering factors such as sample size, time line, budget, and application of the results.

## 3. Sampling

**Sampling is the next step and there are two types of sampling:**

■ **Probability sampling**

- Simple random sampling
- Stratified sampling
- Systematic random sampling
- Multi-stage sampling

■ **Non-probability sampling**

- Convenience sampling
- Purposive sampling

- **We will recommend sampling method based on required sample size, cost, sample frame, and the nature of a study. In cases where the acquired samples are not representative of the target population, weighting can be applied to obtain desired proportions.**

## 4. Questionnaire Design

- **A poorly designed questionnaire is inevitably going to overlook important issues and compromise the quality of data. Too often the questions asked are either not the right questions or not tied strongly enough to critical decision issues.**
- **Each questionnaire will be designed with business objectives in mind. The questionnaire will be developed after extensive discussions with the client. Then it will be pre-tested to ensure proper wording and flow. The final version of the questionnaire will be the best instrument to meet the research objectives.**
- **We always recommend pre-testing the questionnaire because it has the following benefits:**
  - To test how long it takes to complete
  - To check that the questions and instructions are clear
  - To eliminate questions that do not yield usable data

## 5. Fielding Survey

We can field the survey using respondents provided to us or we can supply a targeted sample of respondents to fit your needs.

Most common survey modes:

- **Mail survey**
  - Pros: low cost and can reach out to large audience
  - Cons: low response rate, taking longer time to finish
  
- **Phone survey**
  - Pros: fast, higher response rate, can handle complex questionnaires and automatically enter data
  - Cons: more costly, can not show pictures of products
  
- **Web survey**
  - Pros: inexpensive, fast and instant data collection, complex questionnaires are easily handled
  - Cons: low response rate, respondents need to have internet access and internet users are not representative of general public in demographics

## 5. Fielding Survey -- continued

The choice of survey method depend on several factors listed below

- |                   |  |
|-------------------|--|
| <b>Speed</b>      | Web page surveys are the fastest methods, followed by telephone interviewing. Mail surveys are the slowest.  |
| <b>Cost</b>       | Telephone survey is the most expensive followed by mail. Web surveys are the least expensive for large samples.                                      |
| <b>Complexity</b> | Web and phone surveys questionnaires can program complex question, skipping logic, randomizations and other features not possible with mail surveys. |
| <b>Sample</b>     | Web survey results may not be generalized to the whole population.   |
| <b>Format</b>     | Web surveys can incorporate video, sound, and graphics to seek audience reaction. Mail surveys can show pictures and phone surveys and play video.   |

## 6. Deliverables

**Deliverables can be in one or all of the following formats:**

- Written reports
- In-person presentation
- Customized seminars for management
- Real time tabulated results from for on-line survey
- Simulators for certain products such as conjoint analysis or predictive modeling
- Data files in ASCII or other formats for analysis by the client

**Our responsibility does not end with the interpretation of results and delivery of reports. We will always be available to answer any further questions in regard to the research or help clients to utilize the data in other ways.**

# 7. Project Management

**For larger projects we also provide an on-line project management tool.**

- **The on-line management tool allows you to:**
  - Track progress of subtasks with an agreed upon deadline
  - Do issue and resolution tracking
  - Download final and partial results available
  - Get access to survey before fielding
  - Have an on-line discussion forum for everyone involved with the project
  - Track hours used if the project is billed hourly.

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# Specialties

# Market Segmentation

- Market segmentation is a process to identify homogeneous subgroups within a larger heterogeneous market. This is usually the first step needed for the development of a targeted marketing and positioning strategy.
  
- **Benefits:**
  - More effective use of marketing dollars.
  - Clearer understanding of the needs and wants of selected customer groups.
  - More effective positioning and differentiation.
  - Greater precision in developing effective marketing strategies.
  
- **Applicable techniques**
  - cluster analysis, discriminant analysis, CHAID, CART
  - latent class modeling, conjoint analysis, perceptual mapping

# Pricing

- From a strategic perspective, pricing has more impact on positioning and ultimate profitability than any other item in the overall marketing mix. The key to effective strategic pricing is to leverage market based understanding of how customers value new and existing offerings in a competitive marketplace.
  
- **Key questions addressed in pricing:**
  - How do I insure that my pricing decisions will support the overall long term positioning of my product?
  - When introducing a new product, or a extension, what will be the impact on existing products?
  - How can I develop and price package offerings to enhance overall profitability?
  - How do I tailor pricing and package offerings to meet the unique needs of my most valuable customers?
  
- **Applicable techniques:**
  - Willingness to pay questions, the van Westendorp technique, conjoint analysis, and discrete choice.

# Product/Benefits Optimization

- Product/benefits optimization identify the best combination of product attributes from the consumer's perspective, showing the trade-offs consumers would be willing to make among product features. Applications include, but are not limited to:
  - **Products.** Decide on benefit claims, product features, options, labeling, and pricing.
  - **Services.** Decide on optimal service bundles (for example, credit card annual fees, interest rates, and rewards).
  - **Employee Benefits.** Decide on optimal benefit packages such as paid time off, 401k plan matching, health insurance, compensation plan, etc.
  
- **Applicable techniques:**
  - Discrete choice, conjoint analysis, genetic algorithm

# Brand Equity

## Factors in brand equity:

- **Monetary Value.** Additional income from a branded product over and above from an identical, but unbranded product.
- **Intangible.** Buyers are willing to pay high price premiums over lesser known brands.
- **Perceived Quality.** The overall perceptions of quality and image attributed to a product, independent of its physical features.
  
- Most evaluations of brand equity involve utility estimation. Specifically, the difference between total utility and the utility of the product features is the value of the brand.
  
- Besides utilities, it is useful to measure other major forces driving brand equity: product features, price, market awareness, market perceptions and expenditures to build and support those brands.
  
- **Applicable techniques:**
  - Conjoint analysis, multivariate analysis

# Data Mining

- **With an enormous amount of data stored in databases and data warehouses, it is increasingly important to develop powerful tools for analysis of such data and mining interesting knowledge from it. Data mining is a process of inferring knowledge from such huge data.**
  
- **Data mining stages:**
  - Gathering data
  - Cleansing data
  - Feature extraction
  - Pattern extraction and recognition
  - Visualization of data
  - Evaluation of results
  
- **Applicable techniques**
  - Cluster analysis, CART, CHAID, Neural Network, Regressions, Genetic Algorithms, MARS (Multivariate Adaptive Regression Splines)

# Customer/Employee Satisfaction

- It is increasingly apparent that the financial value of a firm depends on intangible assets (e.g., brands, customers, employees)
- Satisfied customers bring more profits to a company by being loyal and recommending the products or services to others. Happy employees can do higher quality work, be more productive, be more committed to the company, and create happy customers.
- With customer/employee satisfaction measurement, companies can focus on issues that truly drive customer/employee satisfaction for better resource allocation.
- We can also link employee satisfaction with customer satisfaction, and ultimately with financial data to estimate the precise impact of employee satisfaction on the revenues.
- **Applicable techniques:**
  - Structural equation modeling, partial least squares regression, multiple regression

# Forecasting

- **Forecasting is typically used to to predict the unknown future, but sometimes we make predictions about differences among people, firms, or other objects (cross-sectional).**
  
- **Application**
  - Predict the growth of economy or a company
  - Predict whether customers will defect
  - Predict the group membership of people and how they will behave
  
- **Techniques**
  - Time Series Analysis, linear and non-linear regressions, discriminant analysis, neural network, genetic algorithms, migration simulation using loyalty and conquest rates.

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# Research Techniques

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<b>Factor Analysis</b>	<b>Latent Class Models</b>	<b>Multiple Regression</b>	<b>Optimization</b>
<b>Perceptual Mapping</b>	<b>Structural Equation Models</b>	<b>T.U.R.F Analysis</b>	<b>Van Westendorp</b>

## **CHAID**

CHAID, for Chi-square Automatic Interaction Detection, is a tree classification method useful for market segmentation. CHAID will "build" non-binary trees (i.e., trees where more than two branches can attach to a single root or node), based on an algorithm that is particularly well suited for the analysis of larger data-sets. For example, it may yield a split on a variable Income, dividing income into 4 categories and groups of individuals in those categories that are different in some important consumer behavior (e.g., types of cars most likely to be purchased).

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## Cluster Analysis

In market research, clustering types of customers can lead to very useful market segmentation. The correct classification of customers is essential for successful marketing strategies or product development. Customers can be classified on demographics or their needs (defined by usage, values, etc) by latent class.

For example, pharmaceutical companies need to classify the symptoms of mental diseases such as paranoia, schizophrenia for targeting at different groups of patients. Or telecommunication companies need to develop plans to satisfy the varying needs of different customers.

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## Conjoint Analysis

Conjoint analysis is used to determine how people value different features that make up an individual product or service. The objective of conjoint analysis is to determine what combination of attributes is most influential on respondent choice or decision making. A controlled set of potential products or services is shown to respondents and by analyzing how they make preferences between these products, the implicit valuation of the individual elements making up the product or service can be determined. These implicit valuations (utilities or part-worths) can be used to create market models that estimate market share, revenue and even profitability of new designs.

This technique is most frequently used to design new products and services, estimate price sensitivity, segment markets, measure brand equity, and develop competitive strategies. For example, a coffee maker manufacturer developing a new product wants to know the optimal price and the market share of the new coffee maker. A conjoint exercise would ask respondents to choose their products varying in prices, brand names, sizes, functions, and styles. By analyzing their preferences between products, respondents' implicit values or utilities on the features and prices can be derived and these utilities can be used to determine optimal price and market share

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## **Discriminant analysis**

Discriminant analysis is to predict group membership based on a linear combination of the interval variables; the results from the procedure can give insight into the relationship between group membership and the variables used to predict group membership.

For example, a CRM manager may divide customers into two groups: loyal and disloyal customers. Discriminant function analysis could be used to predict loyal customers based on combinations of demographic variables and product/price preferences. The predictor variables might include age, gender, income, occupation, price sensitivity and product preferences, etc. The prediction model might provide insights into how each predictor individually and in combination predicted whether a customer will switch or not.

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## Factor Analysis

Factor analysis is used to reduce the number of variables by combining two or more variables into a single factor. For example, satisfaction with a product or service, repeated purchase of the product or service, recommendation of the product or service to friends and family could be combined into a single factor such as overall satisfaction. Employee satisfaction can also be summarized in their satisfaction with pay, work environment, supervisors, coworkers, etc.

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## Latent Class Models

Latent Class (LC) models is a new tool to identify market segments in target marketing. LC models differ from the traditional modeling in the following ways:

- Do not rely on assumptions which are often violated in practice. Hence, they are less subject to biases associated with data not conforming to model assumptions.
- Can include variables of mixed scale types (nominal, ordinal, continuous and/or count variables).
- Demographic and other variables can be analyzed simultaneously for the identification of clusters.

There are three major kinds of LC models:

- LC Cluster Models will provide probability-based classification of segments. It is particularly useful for the development of a behavioral based and other segmentations of customers and prospects.
- LC Factor Models identify factors which group together variables sharing a common source of variation. Its marketing applications include the development of perceptual mapping which relate product and brand usage to behavioral and attitudinal measures.
- LC Regression Models classifies cases into segments and develops regression models simultaneously. They are useful to identify segments whether in mix of product attributes or in customer satisfaction.

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## Multiple Regression

Multiple regression, one of the most widely used research techniques, is to learn about the relationship between several independent variables and a dependent variable. It allows the researcher to ask the general question "what is the best predictor of ...". For example, a market researcher might want to know the best predictors of customer satisfaction or customer loyalty. If quality and price are used to predict customer satisfaction, the results will show that a certain amount of improvement in quality or lowering of price will lead to the fixed amount of improved customer satisfaction score. In a similar way, customer satisfaction score change can be used to forecast the increase of revenue or financial performance.

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## Optimization

The real value of any study is the use of the results for decision making and we have experience with a wide range of optimization techniques that will help you arrive at the optimal decision and get the most value out of your analysis.

In addition to applying an optimal solution, optimization is a great test to the validity of your model. Nothing is more efficient than optimization when it comes to expose weaknesses in your model. The optimization will expose any weakness or inconsistencies in your model and substantially improve your understanding of how the model behaves.

Example of optimization:

Product line optimization: a discrete choice preference model optimizes your product line for market share, revenue or profit.

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## Perceptual Mapping

Perceptual mapping analyze and understand consumer perceptions of products. It produces a map of a market to show how products are perceived on specific features or attributes such as reputation, price, quality, etc. Perceptual maps show which products compete in the consumer's mind and suggests how a product can be positioned to maximize preference and sales. They provide valuable insights for a number of marketing decisions. Some major applications include:

### Positioning and Segmentation

Identify which products, companies or services compete in a market. Maps provide a clear description of the structure of a market and suggest possible segmentation strategies.

### Identifying Product Weaknesses

Maps show how products are viewed or rated on specific attributes or dimensions. Analysis of maps can identify weaknesses on attributes and suggest new advertising and/or positioning strategies.

### Identifying Differences Among Groups

Companies often want to determine whether distinct groups of people (i.e. users vs. non users, men vs. women) perceive their products differently. Product mapping is an excellent way to determine if differences exist between the perceptions of distinct groups.

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## Structural Equation Models

Structural equation models (SEMs) describe relationships between variables. They are similar to combining multiple regression and factor analysis. SEMs also offer some important, additional benefits over these techniques including an effective way to deal with multicollinearity, and methods for taking into account the unreliability of consumer response data.

In addition to examine cause and effect relationship, SEMs can measure and model not directly observable variables such as brand attitudes, customer satisfaction, perceived value, repurchase intentions and perceived quality. The modeling results provide valuable insights as to what an organization can do to most improve quality, perceived values and customer satisfaction.

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## T.U.R.F Analysis

- Total Unduplicated Reach and Frequency Analysis

It was originally based on the needs of media schedulers to maximize reach and frequency of media spending across different vehicles (print, broadcast, etc.). In a research context, TURF provides estimates of market potential (i.e., number of users reached and/or their frequency of usage) – typically in the context of a line configuration problem. For example, there may be 10 possible flavors for a new yogurt, but the retail trade will only take three. The TURF algorithm identifies the optimal product line to maximize the total number of consumers who will purchase at least one SKU and, at the same time, minimize consumer overlap across all the flavors. TURF provides marketing managers with answers to three questions:

- *How many consumers will use each offering (reach) in the product line?*
- *What is the volume (frequency) of usage for each offering in the product line?*
- *What is the nature of consumers' usage overlap (duplication) among offerings in the product line?*

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## Van Westendorp

It was created by Dutch economist Peter H. van Westendorp to assess consumers' price perception. It is based on the premise that there is a range of prices bounded by a maximum that a consumer is prepared to spend and a minimum below which credibility is in doubt. It is a price sensitivity meter based on respondents' answers to four price-related questions:

1. *At what point do you begin to perceive the product as so expensive that you would not consider buying it? (Too expensive)*
2. *At what price do you begin to perceive the products as so inexpensive that you would feel that the quality cannot be very good? (Too inexpensive)*
3. *At what price do you perceive that the product is beginning to get expensive, so that it is not out of the question, but you would have to give some thought to buying it? (Expensive)*
4. *At what price do you perceive the product to be a bargain – a great buy for the money? (Inexpensive)*

The responses to the above four questions will be plotted and the key intersections on the curves can be used to interpret price perceptions.

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