

# Survey Analysis Design: Keys to Making Sound Decisions From Survey Data

Learn how to lay the groundwork for better business decisions through accurate survey analysis design.

## CONTRIBUTING EDITOR

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## YOU WILL LEARN

- Why expert survey analysis design leads to better business decisions
- How proper regression analysis helped Acer become a global leader
- How expert survey analysis helped Sears reinvent its image, resulting in a \$11.5 billion merger
- About the tools you can use to make better business decisions
- Ways to protect the integrity of your data

## Executive Summary

To make sound business decisions, you need more than accurate data. Information only becomes actionable when it is analyzed correctly and placed in the proper context. This paper will help introduce you to modern data analysis so you can make sounder decisions with survey data.

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## How Survey Analysis Design Contributes To Better Research Results

Survey data is neither good nor bad, but the business decisions you can make from it can be. It's actually possible to interpret the same set of data differently, leading two well-meaning business managers to make radically different decisions based on the same information—and see radically different business results.

For example, when a San Antonio based coffee-flavored beverage manufacturer ran taste tests to determine which new flavor would be more popular among four potentials developed in the test lab, the results appeared clear— the caramel flavor had higher scores.

But when survey analysts factored in the order in which subjects tasted the four flavors, they determined that the order in which tasters experienced the flavors impacted their perceptions. When sweet flavors came before more bitter ones, the bitter ones fared worse, and when sweet flavors came after more bitter ones, the more bitter ones ranked better. By removing the bias in tasting order, the data revealed that hazelnut had a stronger absolute preference, and the coffee beverage producer launched a hazelnut flavor.

The key to honing in on the soundest business decisions based on survey data is to use proper survey analysis design.

### *Survey Analysis in Action: Sears*

In 2004, Sears, Roebuck and Company worried that its lagging image as "the hardware and tools store" was effecting sales. To break out of this image, they turned to their massive database, with information on more than 70% of U.S. households.

First, Sears developed an extensive process to ensure sure that their database had clean, valid data. Then, they executed a random survey of 3000 households from the database and used a specialized, methodological process to analyze the information to draw insight. Sears was then was able to identify the needs of their marketplace and adapt accordingly.

They spent \$4 billion renovating their stores, improving store layout, design and merchandising mix, and the effort paid off. Sears reported significantly higher sales and revenue per selling square foot than before their initiative. The success so impressed their competitor Kmart, that they announced an \$11.5 billion dollar merger with Sears in late 2004<sup>1</sup>.

## Ways To Protect the Integrity of Your Data

Proper data preparation ensures that the integrity of the study is protected while eliminating results that might create false impressions. Designing the right validation strategy is an essential step in a quality research process.

To protect the validity of a survey analysis, the integrity of the data must be ensured<sup>2</sup>. This process begins by checking the questionnaire for completeness and interviewing quality. Ideally, this process should be ongoing in order to continually increase accuracy and precision. In this stage, unanswered questions and illegible responses are identified and dealt with in turn.

Questionnaire responses must also be checked for internal consistency. If a respondent reports their income as \$30,000/yearly, but then lists extravagant purchases that appear outside of their means, and reports no outstanding debt, one may question the validity of that entire set of responses.

### *How to handle missing or questionable responses*

When a researcher faces questionnaires with missing or faulty responses, he or she has several options. Depending on the circumstances, traditionally the options are either:

- the questionnaires are returned to the field for further clarification
- the editor assigns missing values to the poor responses
- the unsatisfactory responses are discarded

or

- the survey instrument self-validates (if it is an online survey)

Online surveys can “self-validate” because they have the advantage of requiring responses, so that incomplete surveys cannot be submitted. This can save valuable manual labor in checking the survey instrument for completeness.

### *How to save time and money through online automation*

Data quality control issues can often be automated with modern, online survey research methods. Traditional methods use research assistants to check surveys for completeness and internal consistency—which can be a subjective and labor-intensive process. Then, conclusions are logged through manual data entry.

With modern online survey techniques, missing information, validation, and consistency checks can occur automatically, which greatly enhances accuracy—and cuts costs by saving time and labor. Research administrators can be immediately notified of any inconsistencies or extreme values, so that corrective action can be taken if necessary.

Through an online question format, field codes can be also assigned automatically to each response in the questionnaire, minimizing the need for manual data entry or coding responses.

Even with popular methods such as computer-assisted telephone interviewing (CATI) or computer-assisted personal interviewing (CAPI), an interviewer still needs to perform data entry tasks in order to code respondent answers. But with online surveys, information is automatically coded once the response is completed. This can often save researchers thousands of dollars, in addition to assuring the integrity of the data at every stage of the survey process.

## Three Tools to Help You Make Better Business Decisions

Once the survey data is as clean and as accurate as possible, and all quality checks have been performed, it's time for the data analysis stage.

Data Analysis is the event that transforms information into actual intelligence that can be put to good use by an organization. It's this evolution from raw data into valuable insight that can build the competitive edge that most companies are searching for.

The desired end goal of any

### *Survey Analysis in Action: SeaMist*

SeaMist Oceanfront Resort approached Infosurv with a goal of measuring and increasing customer satisfaction and loyalty. Infosurv helped to determine key areas for improvement, including accommodations, dining, and pricing. Now, SeaMist can access its ongoing survey results 24/7—and respond to any results that require immediate attention utilizing an automated process that saves valuable time.

### *Survey Analysis in Action: MasterCard*

When Infosurv designed a custom-tailored survey instrument for MasterCard in order to learn more about small business owners, the survey was simultaneously delivered in 10 different languages and 18 countries.

Part of the survey analysis process included weighting responses equally so that Infosurv could engineer a statistically valid respondent sample of decision-makers in businesses with less than \$10M in annual revenue.

The results included valid information from over 3,000 respondents—enough true information to lead MasterCard in their product development efforts for the small business market.

successful survey analysis is to produce coherent, relevant data that is helpful in management-level decision-making. In other words— actionable information.

To meet this goal, there are three key tools every research project director should understand.

## *Frequency Distribution Finds Trends*

**Frequency distribution** is a mathematical process that counts the number of responses associated with different values of one variable (such as responses to a question). A frequency distribution for a variable produces a table of frequency counts, percentages, and cumulative percentages, for all values associated with that variable. Frequency distribution helps to explain trends and market visibility, such as:

- The percentage of customers that take advantage of a promotional offer
- The market breakdown of heavy users, medium users, light users and non-users of a product
- Customer familiarity with a product brand
- Income distribution of customers

Frequency distributions are used to calculate descriptive or summary statistics, which enable the researcher to determine if the observed distribution is consistent with the expected distribution of responses.

This type of analysis also helps to identify illegitimate responses, so the researcher can take corrective action when needed.

One of the most common methods of interpreting frequency distribution is to perform a **mean analysis** and examine **standard deviation**. Mean analysis identifies the central tendency of a distribution; the mean is a robust measure and remains relatively stable as data values change.

### *Survey Analysis in Action: GTECH*

When GTECH, a lottery game producer, wanted to evaluate potential lottery game concepts, they hired Infosurv to assist with every stage of the research process, including survey analysis design. Collecting nearly 900 responses, Infosurv was able to provide statistically valid results at the 95% confidence level with a confidence interval +/- 3%, and GTECH could move forward with new games that had a high likelihood of pleasing consumers.

Once the mean is identified, the difference is measured between the mean and an observed value. This is known as the *deviation from the mean*. The standard deviation is a calculated measurement that delineates how clustered or spread the deviation is around the mean value. This allows the researcher to measure how the data points vary<sup>3</sup>.

## **Regression Analysis Uncovers Decision Drivers**

Regression analysis identifies the variation in a dependent variable in terms of a set of independent variables. The **dependent variable** includes desired goals such as market share, sales or brand preference, while the **independent variables** are factors like advertising, price, distribution, product quality, and market demographic values.

Regression analysis helps define:

- How strongly sales are related to promotional expenditures
- The association between market share and the size of the sales force
- If consumers' perceptions of product quality is related to their perceptions of product price

Regression analysis builds a picture of why things happen and helps to determine:

- if a **relationship** exists
- the **strength** of the relationship
- the **structure** or form of the relationship
- the **values** of the dependent variable

## **Survey Analysis in Action: Acer**

Taiwan-based Acer was once known as a no-name computer-cloning firm. But they wanted to break out of that image. So, they launched an international study of global consumer preferences to gain insight into their market. Great care was taken to compensate for the variables that shifted from country to country. Using regression analysis and a host of other techniques, what surfaced were eight common attributes that contributed to brand preference on a worldwide basis: price, ease of installation and use, service and support, features, performance, reliability, scope of usage, and compatibility on a network.

With this insight in mind, Acer began a major image renovation, so that by 2003, Acer was rated by Reader's Digest as the Gold-Award-Winning Computer "SuperBrand" in Asia. One of Acer's products received the Best Choice Award of Computer Taipei in 2004. And the company has since become the 7<sup>th</sup>-largest personal computer manufacturer in the world and a major supplier to Dell.

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Regression analysis also helps to provide a **control set** for other independent variables when evaluating the contributions of a specific variable or set of variables<sup>4</sup>.

### *Qualitative Analysis Creates Context*

Survey formats that provide the opportunity for essay responses, or free-form information, can also yield measurable data and provide insight into interactive relationships.

When this type of data is imported into a specialized computer program, codes are assigned to different data segments to facilitate examination of the data. These codes are defined by the researcher, and are used to identify key phrases or responses. Then, searches are run so that all material containing a specific data segment can be accessed and reviewed. These complex searches can be correlated to more than one data segment, so that researchers can examine the unique relationships between data variables<sup>5</sup>.

This technology is further enhanced when used in an online environment. In this approach, respondents fill out interactive essays that allow them to put down their thoughts in the privacy of their own home, without the pressure of sitting across from an interviewer. This data is then automatically coded, and posted for analysis by the researcher at his or her convenience. This type of automated qualitative analysis is particularly helpful when performing exploratory research<sup>6</sup>.

### Sounder Decisions

In conclusion, research that allows you to make clear decisions is much more than just knowing how to ask the right questions. Survey analysis design creates a means of mining the real information from your data, so your organization is empowered with insights that achieve your goals.

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- <sup>6</sup> For more information on the technological applications associated with qualitative analysis, see the Infosurv white paper titled: "Survey Research Design: Delivering Actionable Intelligence."
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### *Jared Heyman*

Jared Heyman is the founder and president of Infosurv, a full-service market research firm specializing in design, administration, and analysis of online and telephone employee, customer, and other market research studies. He leverages years of marketing research expertise to build for his clients the high-value, actionable intelligence they are searching for to facilitate the success of their strategic-level decisions.

Jared Heyman is the one companies listen to when they are planning their own marketing initiatives. He is quoted as a marketing research industry expert in everything from trade publications such as Quirks and Marketing News, to marketing research blogs such as Web Analytics World, to major media outlets such as the Chicago Tribune. Marketing professionals often rely on Jared Heyman's keen insights into the marketing research industry.

Jared Heyman is a fourth-generation entrepreneur, with a lineage of successful start-up companies contained within the family scrapbook. Heyman administered his first market research survey while at Collective Technologies in 1998. It was this experience that made him realize that there was definitely room for improvement in the marketing research arena. Jared Heyman left Collective to launch Infosurv just months later.

With an initial startup cost of less than \$3K, Infosurv has since experienced exponential growth over the past nine years. Infosurv currently has a client base of over 200, including dozens of Fortune 500 and major government agencies, and continues to specialize in market research, customer surveys, employee surveys, and online surveys.

Jared Heyman graduated from the University of Texas at Austin with a BBA, double majoring in Business and Marketing Research. He also has an extensive international profile, with cultural experience in Greece, Turkey, Spain and Southeast Asia.

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