Linkage Analysis in your Voice of the Customer Program

Understanding the causes and consequences of customer loyalty

This paper discusses three types of linkage analyses in VoC programs: 1) Financial, 2) Operational and 3) Constituency. Linkage analysis is primarily an exercise in data management. Linkage analysis is illustrated using data models and real-life examples for each type of linkage analysis.

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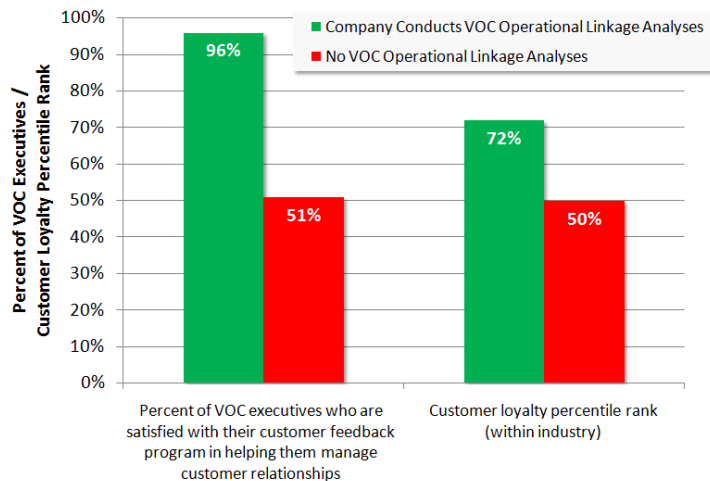# Linkage Analysis in your Voice of the Customer Program

Customer feedback provides useful information about the health of the customer relationship. Relationship and transactional surveys, commonly used to capture customer feedback, are used to assess and improve that health. While customer feedback metrics provide great value in and of themselves, when used with other types of business data, they can address meaningful business questions:

- Are the customer feedback metrics **predictive of future financial performance** and business growth?
- Do customers who report higher loyalty **spend** more than customers who report lower levels of loyalty?
- Where do we **set operational goals** to ensure we maximize customer satisfaction?
- Does **employee training** help improve the customer experience?

To answer these questions, companies look to a process called business linkage analysis.

Business Linkage Analysis is the process of combining different sources of data (e.g., customer, employee, partner, financial, and operational) to uncover important relationships among important variables (e.g., call handle time and customer satisfaction). For our context, linkage analysis will refer to the linking of other data sources to customer feedback metrics (e.g., customer satisfaction, customer loyalty).

Figure 1. Companies who adopt linkage analysis get the insight that drives customer loyalty

Business Case for Linkage Analyses

Based on a recent study on customer feedback programs best practices (Hayes, 2009), I found that companies who regularly conduct operational linkages analyses with their customer feedback data had higher customer loyalty (72nd percentile) compared to companies who do not conduct linkage analyses (50th percentile). Furthermore, customer feedback executives were substantially more satisfied with their customer feedback program in helping them manage customer relationships when linkage analyses (e.g., operational, financial, constituency) were a part of the program (~90% satisfied) compared to their peers in companies who did not use linkage analyses (~55% satisfied) (see Figure 1).

Linkage analysis appears to have a positive impact on customer loyalty by providing executives the insights they need to manage customer relationships. These insights give loyalty leaders an advantage over loyalty laggards. Loyalty leaders apply linkage analyses results in a variety of ways to build a more customer-centric company: Determine the ROI of different improvement effort, create customer-centric operational metrics (important to customers) and set employee training standards to ensure customer loyalty, to name a few.

Linkage Analysis: A Data Management and Analysis Problem

The term "linkage analysis" is actually a misnomer. Linkage analysis is not really a type of analysis; it is used to denote that two different data sources have been "linked" together. In fact, several types of analyses can be employed after two data sources have been linked together. Rather, you can think of linkage analysis as a two-step process: 1)

organizing two disparate data sources into one coherent dataset and 2) conducting analyses on that aggregated dataset. The primary hurdle in any linkage analysis is organizing the data in an appropriate way where the resulting linked dataset make logical sense for our analyses (appropriate unit of analysis). Therefore, knowledge in data management and research methodology are essential in conducting a linkage analysis study.

Once the data are organized, the researcher is able to conduct nearly any kind of statistical analyses he/she want (e.g., Regression, ANOVA, Multivariate), as long as it makes sense given the types of measurement scales (e.g., nominal, interval) you are using.

Types of Linkage Analyses

In business, linkage analyses can be conducted using the following types of data (see Figure 2):

1. Customer Feedback
2. Financial
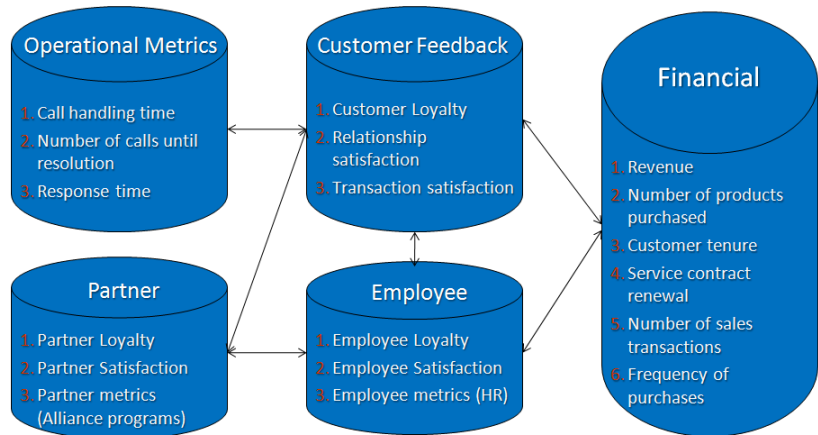3. Operational
4. Employee
5. Partner

Even though I discuss these data sources as if they are distinct, separate sources of data, it is important to note that some

Figure 2. Linking Disparate Business Data Sources Leads to Insight

companies have some of these data sources housed in one dataset (e.g., call center system can house transaction details including operational metrics and customer satisfaction with that transaction). While this is an advantage, these companies still need to ensure their data are organized together in an appropriate way.

With these data sources, we can conduct three general types of linkage analyses:

1. **Financial**: linking customer feedback to financial metrics

2. **Operational**: linking customer feedback to operational metrics

3. **Constituency**: linking customer feedback to employee and partner variables

Before we go further, I need to make an important distinction between two different types of customer feedback sources: 1) relationship-based and 2) transaction-based. In relationship-based feedback, customer ratings (data) reflect their overall experience with and

Figure 3. Common Types of Linkages among Disparate Data Source

loyalty towards the company. In transaction-based feedback, customer ratings (data) reflect their experience with a specific event or transaction. This distinction is necessary because different types of linkage analyses require different types of customer feedback data (See Figure 3). Relationship-based customer feedback is needed to conduct financial linkage analyses and transaction-based customer feedback is needed to conduct operational linkage analyses.

Next, I will talk about each of the three types of linkage analyses; for each type, I will present a data model to help illustrate how the disparate datasets can be merged together. Additionally, I will present examples of different types of linkage studies I have conducted.

Financial and VoC Linkage

Business linkage analysis is the process of linking disparate business data sources together for the purposes of understanding the relationships between them. For financial linkage analysis, we are interested in understanding the relationship between customer feedback metrics and financial business outcomes. Demonstrating the statistical relationship between customer feedback metrics and financial business outcomes is useful for three reasons:

1. **Strengthen business case for your VOC program:** Demonstrating your customer feedback metrics predict future bottom line metrics shows executives that tracking/measuring customer satisfaction/loyalty is important. Senior executives' support of the VOC program is paramount to its success, and a customer-financial linkage can quickly illustrate the reasons why you have a customer feedback program and the important business outcomes it predicts.

2. **Identify drivers of real customer behaviors:** In typical VoC programs, we measure customer loyalty via survey questions that let customers indicate their future loyalty behaviors (recommend, buy again, not churn). Using linkage analysis, we can use real customer loyalty behaviors in our analysis. Taking this approach, we can understand drivers of real customer behaviors (number of products purchased, sales amount).

3. **Determine ROI for customer experience improvement solutions:** Improving customer loyalty may require significant investment to improve the customer experience. Financial linkage analysis can help you understand the expected increases in financial performance given a specific improvement in customer satisfaction.

Financial and Customer Feedback Metrics

I use the term, "financial metrics," to include various types of business outcomes that can be used in linkage analyses. These metrics include:

- Customer tenure
- Customer defection rate
- Number of new customers
- Revenue
- Service contract renewal
- Number of sales transactions
- Number of products purchased
- Frequency of purchases

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It is important to note that the specific details of conducting linkage analyses may vary slightly for different metrics; the level at which the financial metric can be summarized (by geography, by time, by customer) reflects the level at which the datasets need to be merged. If you are able to track revenue for each customer, you can associate the customer feedback metric with each customer's revenue. On the other hand, if you are able to track defection rate at the group level, you can associate the customer feedback metric with each group's defection rate. The key here is to ensure the level of analysis (e.g., customer, geography, time-level) makes sense given the level of measurement of your financial metric.

In financial linkage studies, we use customer feedback metrics from a relationship-based survey where responses indicate general levels of satisfaction and loyalty toward the company. Additionally, it is important to note that these customer feedback metrics need to be from respondents who are responsible for, or have an influence in, purchasing decisions. Customer feedback metrics from relationship-based surveys could include loyalty questions/indices or satisfaction with business attributes (customer experience).

**Linking Financial Metrics to Customer Metrics**

Once we have these two sources of business data, we organize the data so that each customer (or group or time period) has a score on the financial metric and the customer feedback metric. The example in Figure 4 represents the linkage at the customer level (For a B2B example, the merging can occur at the Account level). For each customer (account), we have two pieces of information, customer feedback (x) and a business outcome (y).

Loyalty metrics are forward looking (e.g., likelihood to behave in certain positive ways in the future). As such, financial linkage analysis needs to involve loyalty metrics measured at one time (Time 1) and financial metrics measured at later time (Time 2). The nature of the regular sales cycle will have an impact on loyalty behaviors, so careful thought needs to be given to the length between the two time periods.
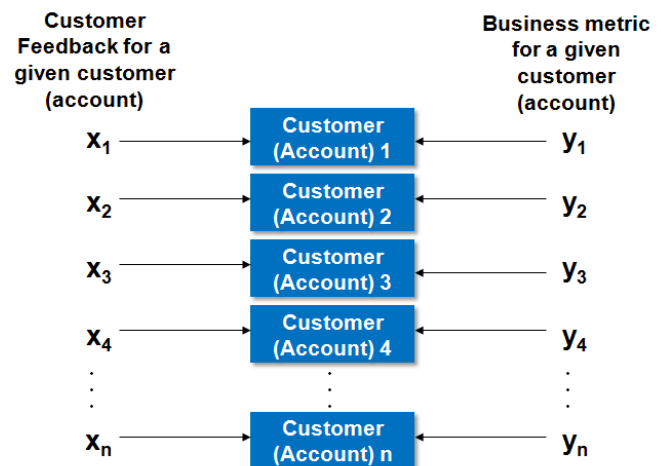
x_n represents the customer feedback for customer (account) n.
y_n represents the business metric for customer (account) n.

Figure 4. Data model for financial linkage analysis
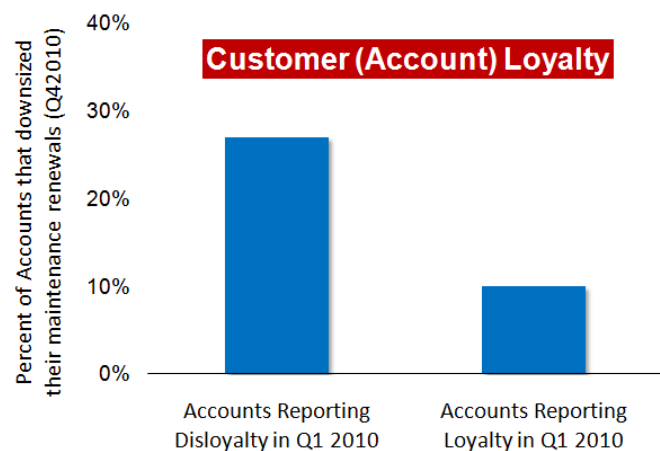
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Figure 5. Relationship between Customer Loyalty and Maintenance Renewals

Results

The output of the analyses will illustrate the relationship between customer satisfaction/loyalty and business outcomes. When presenting the results of the analysis, I like to illustrate the relationship in graphical form. Below are two figures that show the relationship between customer satisfaction/loyalty metrics and important business outcomes.

Figure 5 illustrates the relationship between customer loyalty and future maintenance renewals. We found that

Figure 6. Relationship between Satisfaction with Technical Account Manager (TAM) and Revenue

accounts who reported they were disloyal in Q1 2010 are more likely to result in downsizes in maintenance renewals for Q4 2010 compared to accounts who reported they were loyal in Q1 2010.
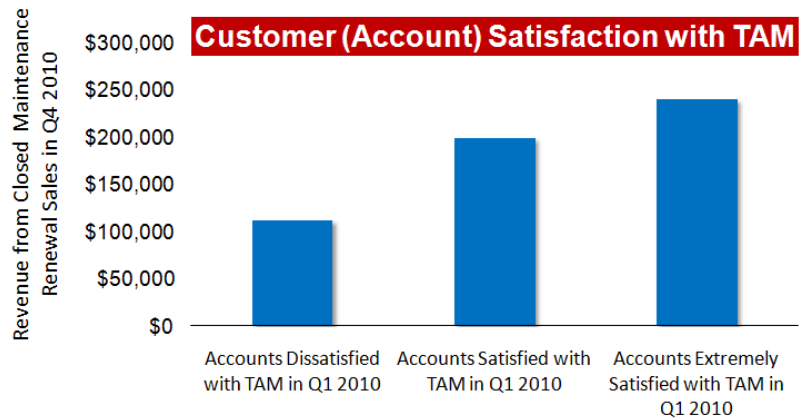
Figure 6 illustrates the relationship between customer satisfaction with technical account managers (TAMs) and revenue. Accounts that are more satisfied with Technical Account Management (TAM) performance in Q1 2010 have significantly higher revenue from maintenance renewals in Q4 2010 compared to account that are dissatisfied with TAM performance in Q1 2010.

Using the results of these analyses, senior executives were able to estimate the increased revenue they would expect (additional revenue and saved revenue) given improvements in customer satisfaction.

Operational and VoC Linkage

For operational linkage analysis, we are interested in understanding the relationship between customer feedback metrics and operational metrics. Demonstrating the statistical relationship between customer feedback metrics and operational metrics is useful for three reasons:

1. **Build/Identify customer-centric business metrics:** Operational linkage analysis helps you identify/create key operational metrics that are statistically linked to customer satisfaction.

2. **Manage customer relationships using objective operational metrics:** Driving business growth now becomes a process of using the operational metrics to manage customer relationships. Linkage analysis will help in setting appropriate operational performance goals (using operational metrics) that ensure customers will be satisfied.

3. **Reward employee behavior that will drive customer satisfaction:** Because of their reliability and specificity, operational metrics are good candidates for use in goal setting and employee incentive programs. Rewarding employee performance based on customer-centric operational metrics ensures employees are aligned with the needs of the customers.

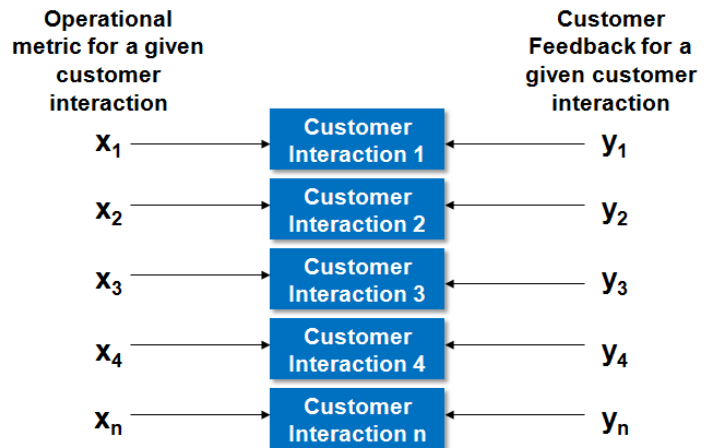**Operational and Customer Feedback Metrics**

There are many types of operational metrics that are commonly tracked in support and call centers. These metrics include:

- First Call Resolution (FCR)
- Number of calls until resolution
- Call handling time
- Response time
- Abandon rate
- Adherence & Shrinkage
- Average talk time
- Average speed of answer (ASA)

In operational linkage studies, we use customer feedback metrics from a transaction-based survey where responses are associated

x_n represents the operational metric for customer interaction n.
y_n represents the customer feedback for customer interaction n.

Figure 7. Data Model for Operational Linkage Analysis

with a specific transaction (typically, in a call-center environment) and reflect satisfaction with a that specific transaction (or satisfaction with other components of the transaction - knowledge of call center rep). So, for any given transaction, we have two kinds of information, 1) the operational metrics surrounding that transaction and 2) customer's satisfaction with that transaction.
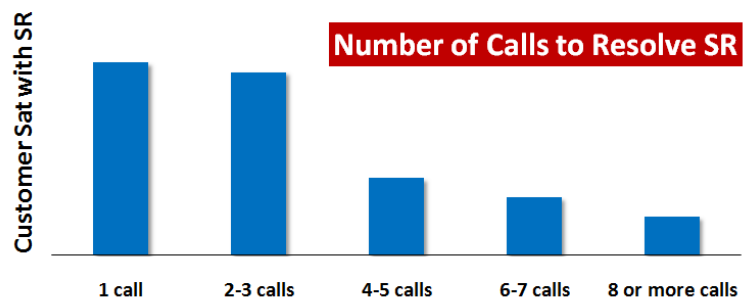
Linking Operational Metrics to Customer Metrics

Once we have these two sources of business data, we organize the data so that each transaction (or group or time period) has a score on the operational metric and the customer feedback metric. The example in Figure 7 represents the linkage at the transaction level. For each transaction (interaction), we have two pieces of information, operational metric (x) and customer feedback (y).

Figure 8. Number of calls to resolve Service Request (SR) is related to customer satisfaction with that SR
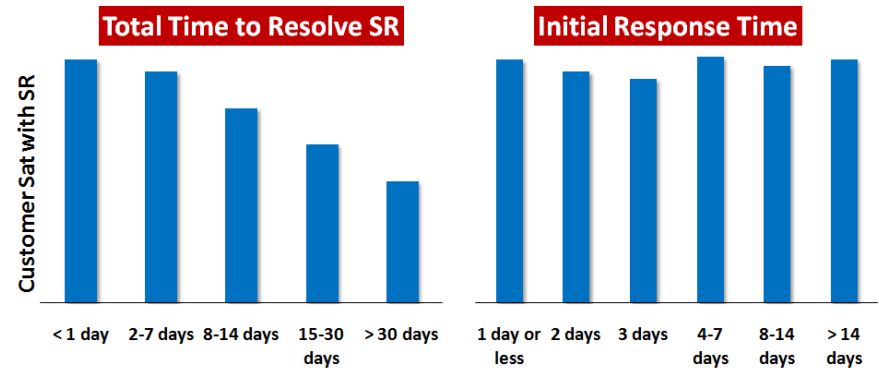
Results

The output of the analyses will illustrate the relationship between operational metrics and customer satisfaction. When presenting the results of the analysis, I like to illustrate the relationship in graphical form. Below are two figures that show the relationship operational metrics and customer satisfaction.

Figure 8 illustrates the relationship between number of calls to resolve the service request (SR) and customer satisfaction with that SR. We found that SRs that required more calls from the customer resulted in lower levels of satisfaction with SRs compared to SRs that required fewer calls from the customer. Specifically, customers were satisfied until they had to call four times. As a result, senior executives were able to implement a performance standard for SR resolutions (Resolve SRs within 3 telephone calls).

Figure 9 illustrates the relationship of two operational metrics (initial response time and total time to resolve SR) with customer satisfaction with SRs. A client wanted to identify which operational metric was more important to customers (e.g., predicted customer satisfaction better). As you can see in the figure, initial response time had no impact on customer satisfaction; customers were just as satisfied with SRs that had a long initial response time as they were with SRs that had a shorter initial response time. On the other hand,

Figure 9. Linkage analysis used to identify which operational metrics are important to customers

total time to resolve the SR had a large impact on customer satisfaction with the SR. Customers were significantly more satisfied with SRs that were resolved within one week compared to SRs that took longer to resolve. From these results, it appears that only one of these metrics were important to customers (Total time to resolve SR).

Using the results of these analyses, senior executives were able to identify the call center operational metrics that impact customer satisfaction. As a result, senior executives wanted to understand how other operational metrics impacted customer satisfaction with the SR process in order to build a performance dashboard where only the important, customer-centric, operational metrics are displayed and tracked.

Constituency and VoC Linkage

Constituency linkage analysis allows us to better understand how employees and partner relationships impact the health of the customer relationships. The service delivery model depicted in Figure 10 (I added a partner variable and expanded customer loyalty) supports the idea that employee and partner management is key to ensuring customer loyalty and business growth. As this model illustrates, business growth is dependent on customer loyalty (and perceived customer value and satisfaction), which is, in turn impacted by employee satisfaction/loyalty and partner satisfaction/loyalty. In fact, empirical studies to support this model employ linkage analysis as a way of identifying and quantifying the linkages among the constituencies.
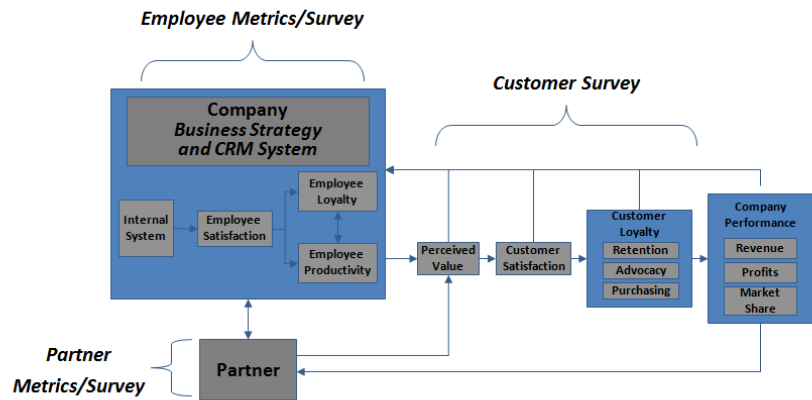
Demonstrating the statistical relationship between customer feedback metrics and constituency metrics is useful for three related reasons:

1. Understand the impact of employee and partner experience on the customer experience: Constituency linkage analysis helps you identify which employee/partner metrics are statistically linked to customer satisfaction.

2. Improve the health of the customer relationship by improving the health of the employee and partner relationship. Managing customer relationships does not occur in a vacuum. Understanding how these other constituencies impact customer satisfaction and loyalty helps senior executives allocate the right resources across the entire ecosystem to drive business growth. For a company to grow, they need to manage all different types of

Based on the book, The Service Profit Chain: How leading Companies Link Profit and Growth to Loyalty, Satisfaction and Value (Heskett, Sasser & Schlesinger, 1997)
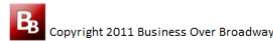
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Figure 10. Service Delivery Model Highlights the Impact of Employees and Partners on Customer Loyalty and Business Growth

relationships (employee, partner, customer); a problem in one could impact the rest.

3. Help build a customer centric culture. Constituency linkage results can help executives communicate the importance of the entire ecosystem in driving customer satisfaction and loyalty. Evangelizing how important the employees and partners are in helping ensure customers receive a great customer experience can be supported with these linkage studies.

Constituency and Customer Feedback Metrics

There are many types of constituency metrics that are commonly measured. Any metric tracked by human resources (HR) are candidates for employee metrics that we can use in linkage analysis. Additionally, many partner metrics (e.g., certification status, revenue) are candidates for partner metrics. Some example metrics used in constituency linkage analysis include:

- Satisfaction metrics (employee sat and partner sat)
- Loyalty metrics (employee loyalty and partner loyalty)
- Employee training metrics
- Partner certification status
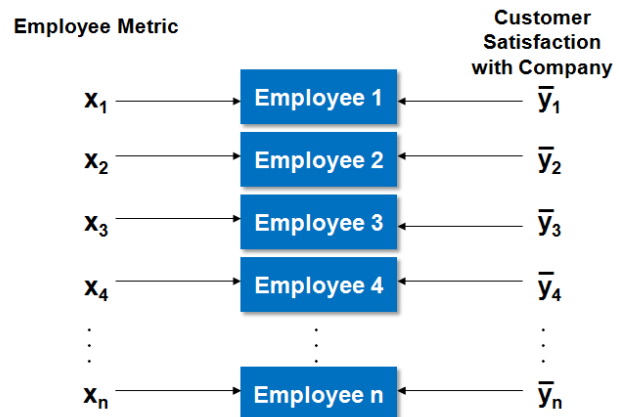
Analysis typically conducted for B2B customers where a given employee (sales representative, technical account manager, sales manager) is associated with a given customer (account)

x_n represents employee satisfaction score for Employee n.

$\bar{y}_n$ represents average customer satisfaction scores across survey respondents for Employee n.

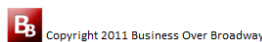Copyright 2011 Business Over Broadway

Figure 10. Data Model for Constituency - Customer Linkage

In constituency linkage studies, we can use customer feedback metrics from either a relationship-based or a transaction-based survey, as long as customer

metrics can be aggregated at the appropriate unit of analysis (typically at the employee or partner level).   So, for any given constituency, we can have two kinds of information, 1) their employee/partner metric (sat, loyalty, objective) and 2) customer's satisfaction/loyalty metric.

Linking Constituency Metrics to Customer Metrics

Once we have these two sources of business data, we organize the data at the employee/partner level (each employee has a score on the constituency metric and a customer feedback metric. Linking an employee metric to a given employee is straightforward. There is a 1 to 1 ratio of employee to employee metric (Employee 1 has Employee 1 Metric; Employee 2 has Employee 2 Metric).

Considering the customer feedback metric, a given employee could have more than one customer response associated to him/her. There is a 1 to many ratio of employees to customer feedback responses. The customer metric for each employee, then, would be the average of the customer responses for that employee. In large B2B enterprise companies, a specific employee (Account Managers, Technical Account Managers, Consulting Services) can be assigned to specific Accounts. Therefore, each Account Manager could have multiple customer feedback responses associated to him/her; the customer metric for this employee would be the average rating across all his/her responses. In a B2C environment, call center agents can be linked to several, specific customer interactions; each employee's customer metric would be the average rating across all his/her interactions.
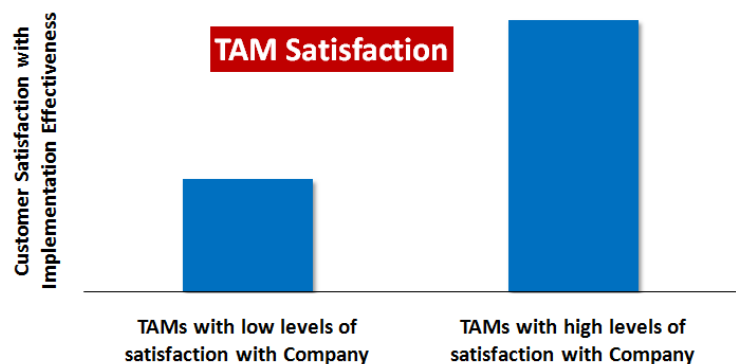
Figure 11.   Employee who are satisfied deliver a better customer experience

The bottom line is that employees/partners can have feedback from multiple customers. If you are able, obtaining all relevant customer data points for each employee/partner results in more reliable measures of customers' attitudes. So, if an employee had customer satisfaction ratings from 10 customers, his customer metric would be the average of those 10 customers. The data model in Figure 3 represents the linkage at the employee level. For each employee, we have two pieces of information, constituency metric (x) and customer feedback (y - average over the different customers the employee served).

Results

The output of the analyses will illustrate the relationship between the constituency metrics and the customer metric. When presenting the results of the analysis, I like to illustrate the relationship in graphical form the segment the constituency metric into homogeneous segments (e.g., low employee satisfaction / high employee satisfaction) and compare the customer metric across each employee group. Below are three figures that show the relationship constituency metrics and customer metrics.

In an enterprise software company, the Technical Account Managers (TAMs) are responsible for implementing the software into the company's infrastructure. Figure 11 illustrates the results of a linkage study that examined the how

Technical Account Managers' attitudes toward the company impacts customers' satisfaction with the implementation. We found that TAMs that were highly satisfied with their company also had customers who were more satisfied with their implementation. It appears that, to ensure customers are satisfied with their implementation, the company needs to ensure their TAMs are satisfied.

Figure 12 illustrates the impact of training on customer satisfaction. Employing a linkage study, this company was able to link training metrics and customer satisfaction metrics for specific TAMs. The company was spending much money on employee training and wanted to determine its effectiveness on improving customer satisfaction. As you can see in Figure 5, TAMs who completed 4 or more courses for a given quarter had customers who were more satisfied with their performance than TAMs who completed 1-3 courses.
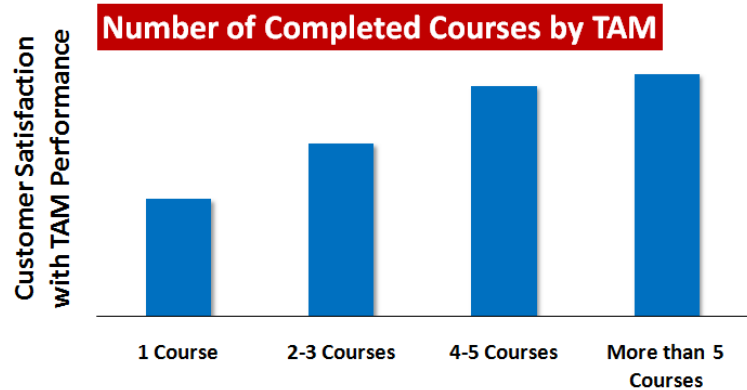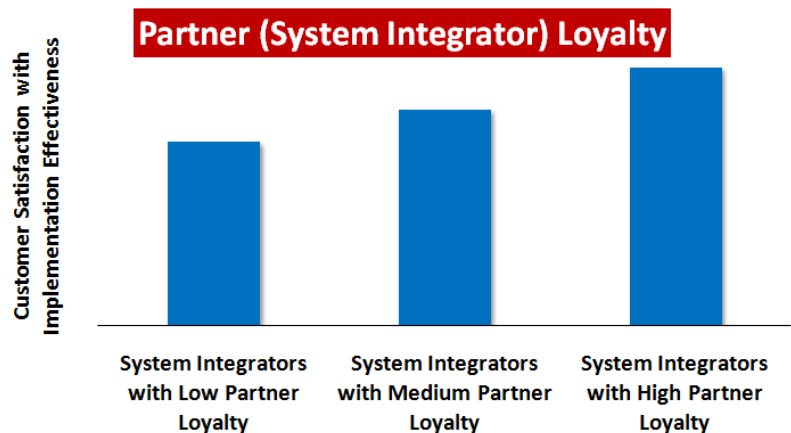

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Figure 12. Employee training has a positive impact on customer satisfaction

In the same enterprise software company, business partners (system integrators) were used to help integrate the software into joint customers' accounts. To understand how partner relationships impact joint customer relationships, the company wanted to examines the linkage between partner and customer metrics. Because a given Account had only one system integrator, we could easily link partner metrics and customer metrics via partners (system integrators). Figure 13 illustrates this relationship. The company found that customers were much more satisfied with the implementation when the system integrator report high loyalty to the company.

The results of these analyses helped senior executives evangelize the importance of employees and partners in delivering great customer service. The senior executives were able to determine the value of employee training on customer satisfaction and set appropriate training goals that ensured customers were satisfied with the implementation of their solution. The partner-customer linkage study supported the need for a formal partner relationship program. The company implemented a more formal partner program in which partner survey results were used to improve partner satisfaction.

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Figure 13. System integrators (partners) who are loyal to the company have customers who are satisfied with the implementation.

Summary

Linkage analysis is the process of combining/managing disparate data sources to understand the relationship among the variables across different data sets. The application of linkage analysis in VoC programs unlocks much value from customer feedback metrics, by helping you understand the causes and consequences of customer satisfaction and loyalty.

Financial linkage analysis helps show the consequences of customer satisfaction and loyalty and demonstrate the value of the VOC metrics. In my examples, the linkage analyses showed us that customer feedback metrics (customer satisfaction with tech support and satisfaction with technical account managers) were, in fact, predictive of future business metrics (maintenance renewals and revenue, respectively).

Operational linkage analysis helps show the causes of customer satisfaction. In my examples, the linkage analyses showed us that not all operational metrics are created equal. Companies turn to operational linkage analysis to identify those objective, measurable aspects of the transaction that drive customer satisfaction. Once identified, operational metrics can be used to manage customer relationships by incentivizing employees on operational metrics that matter to the customer.

Constituency linkage analysis helps show how customer loyalty is a function of the entire ecosystem; successfully managing customer relationships includes effective employee relationship management and partner relationship management. In the examples, the linkage analyses showed us that employee and partner metrics are leading indicators of customer satisfaction and loyalty.

Biography

I am Business over Broadway (B.O.B.). My professional life is dedicated to sharing my knowledge of customer feedback programs (VOC, customer experience/loyalty programs) and the scientific method to anybody who wants to listen and learn. I conduct research on customer feedback programs, customer experience / satisfaction / loyalty measurement and have published books on these topics (**Beyond the Ultimate Question** and **Measuring Customer Satisfaction and Loyalty**). I provide consultation services to companies to help them improve the customer experience, maximize customer loyalty and accelerate business growth.

I have over 20 years of consulting and research experience in enterprise and midsize companies, including Oracle, Agilent Technologies, Sophos, Virtual Instruments, Netsmart Technologies and Genstar Capital. I have managed customer satisfaction research as an employee to Fortune 500 firms, and as an independent consultant. I have published numerous articles in both scientific and trade journals and presented research at national and international conferences on the measurement of customer satisfaction, employee empowerment, and employee perceptions of workplace safety.

When I am not staring at a monitor, I spend my time exercising, cooking, creating, taking pictures, visiting friends and family and catching an occasional show at a local club.