

The Data Science of CEM

Analytics for Customer Experience Management

Nagendra C L, Chief Technology Architect for Cisco Webex Experience Management June 2020

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Introduction to Customer Experience Management (CEM)

What is CEM?

There are always two sides to a story.

One is the story that the brand narrates using marketing (“**the promise**”). The other side is that of the customer, on how the brand’s narration before purchase/experience of product or after purchase/experience have been actually perceived (“**the delivery**”) by its customers.

Studying the patterns found from macro experiences and stories from the customer point of view enables brands to weave an experience that sets them apart in the eyes of its customers and peers.

Why CEM?

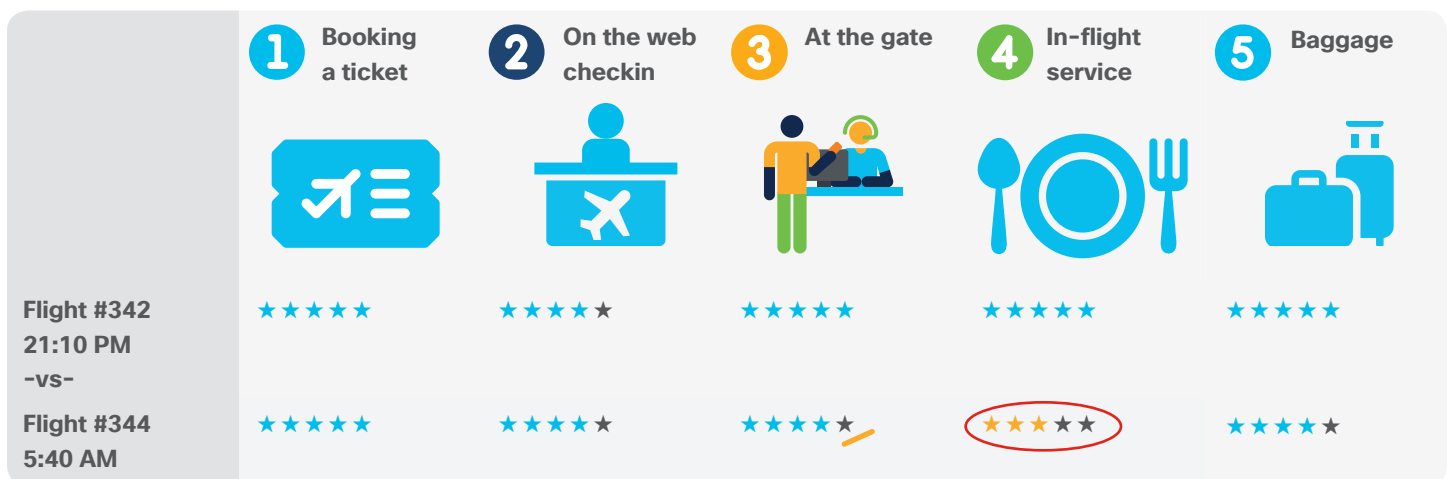
- Gain competitive differentiation in crowded industries among peers.
- Improve profitability, by being more effective with products, pricing and services.
- Proactively enable service recovery to minimize impact of exceptions

The customer’s journey map:

Customer experience involves multiple points of contact that a brand has with its customers. During each interaction with the products or service of the business, different individual customers will experience different levels of service at every touch point over a period of time; tracking Customer Experience (CX) across all touch points enable businesses to map the journey and optimize touch points.

Consistent exemplary CX across touch points can turn customers into advocates, resulting in a long-term relationship than merely a one-time transaction. This promotes word-of-mouth and turns the customer into a powerful touch point for the brand.

Sample customer journey for an airline:



Look at the typical CEM data record (Input)

CEM Data typically consists of anonymous/aggregate answers to a CEM Questionnaire as collectively perceived by customers of the brand. CEM Data is unlike data collected and stored on a CRM/Loyalty/HRM systems, which use specific data. In CEM, only aggregate data is useful for deriving macro analytics insights.

Sample CEM Records (Input):

Anonymous (Completely)	NPS®	Rating - Service	Rating - Value
	9/10	★★★★★	★★★★★

Analytical Insights: Actionable Discovery of Promoters, Detractors and Passive Ratios, Service Quality Measure on Rated Areas, Influence of value on Service.

Anonymous (Pseudonymity)	Customer ID	NPS®	Rating - Service	Rating - Value
	XX-1234	9/10	★★★★★	★★★★★

Analytical Insights: Above + Service Recovery Capability, External Ticketing(Contact Details looked up using CRM).

Anonymous (Aggregates)	Customer ID	NPS®	Rating - Service	Age group
	XX-1234	9/10	South West	25-30

Analytical Insights: Above + Regional and Demographics Grouping. (Useful is Age group vs Specific Age).

Anonymous (Transactional Aggregates)	Mobile/Email	NPS®	Region/City	Purchase range
	12345-1234	9/10	South West	500-2500

Analytical Insights: Above + Transactional Context to Customer Experience.

Unique ID (Contact Only)	Mobile/Email	NPS®	Region/City	Purchase range
	12345-1234	9/10	South West	1000-5000

Analytical Insights: Above + Respond Back Capability, NPS Loop Soft Ticketing.

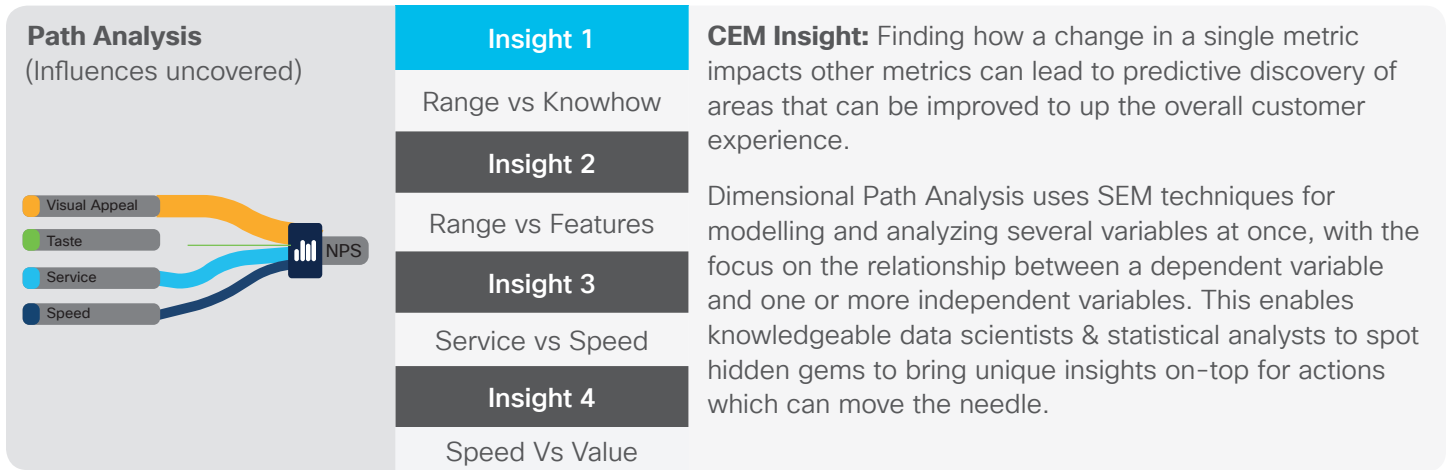
Data Not Found Nor Useful for CEM: Names, Addresses, DOB, PINs, Passwords, SSN/KYC, Credit Card Numbers/CHDs, History.

	CEM	CRM	Loyalty	HRM
Data Stored	Customer Opinions (Macro Level)	Detail Customer Profile (Micro Level)	Detailed Profile and Transaction Trail	User Profile, DOB, Address SSN, History and More
Example Record	<ul style="list-style-type: none"> NPS: 9/10 Staff: 4/5 Value: 5/5 Age Group: 25-30 Region: North 	<ul style="list-style-type: none"> Jon doe DOB: 30-01-1975 Lives at: #1 CRM Av. Phone: 555-1235566 Secret Answer: Go 	<ul style="list-style-type: none"> Jon doe Card: 4512-XXX-XXX Lives at: #1 CRM Av. Purchased: Widgets Value: \$250.25 	<ul style="list-style-type: none"> Jon doe DOB: 30-01-1975 SSN: 123-12345-123 Blood Group: B +ive Past History: Xyz

Look at the typical CEM analytics insights (Output)

Actionable analytics and insights are derived from the collected customer experience data. These include: NPS, CDM, Scorecards and Insights.

<p>Net Promoter Score® (NPS)</p> <p>0 1 2 3 4 5 6 7 8 9 10 Not at all Maybe Yes, Sure!</p>	<p>NPS® 65</p> <p>Promoters 80</p> <p>Passive 5</p> <p>Detractors 15</p>	<p>CEM Insight: NPS is a measure of the customer loyalty to a brand, and it has been found to correlate with revenue growth.</p> <p>NPS can be as low as -100 (everybody is a detractor) or as high as +100 (everybody is a promoter). An NPS that is positive (i.e., higher than zero) is felt to be good, and an NPS of +50 is excellent.</p> <p>The ability to measure customer loyalty is an effective methodology to determine the likelihood that the customer will buy again, talk up the company and resist market pressure to defect to a competitor.</p>
<p>Composite Scorecards (CDM)</p> <p>0 76 100</p>	<p>Delight Score 76</p> <p>Service Index 80</p> <p>Staff Index 82</p> <p>Value Index 72</p>	<p>CEM Insight: Customer Delight Meter (CDM) score is a multi-dimensional delight measure that can be customized by brands to fit their industry profile or to adaptively increase weights of certain metric more than others.</p> <p>Many times, a single item question such as NPS is much less reliable and more volatile than a composite index. By combining multiple dimensions of ratings, a composite delight score can be built so that it may perform significantly better in predicting customer recommendations and retention.</p>
<p>Insight ScoreCard What can we improve the most upon?</p> <p>Gift Wrapping 46.82% (160)</p>	<p>Gift Wrap 46.82%</p> <p>Music 28.54%</p> <p>Lighting 14.10%</p> <p>Parking 10.54%</p>	<p>CEM Insight: Not all the insight needs to be obtained the hard way, sometimes the best way to know - what action you can take today to make the most difference to your business is to just ask your customers that straight up.</p> <p>For example, asking a simple question “what can we improve the most upon?” can lead to a simple actionable answer that can be acted upon. Surprisingly, contrary to common wisdom of big budgets to improve satisfaction, improving upon the smallest of things can lead to a large increase in customer experience, in-turn leading to growth.</p>



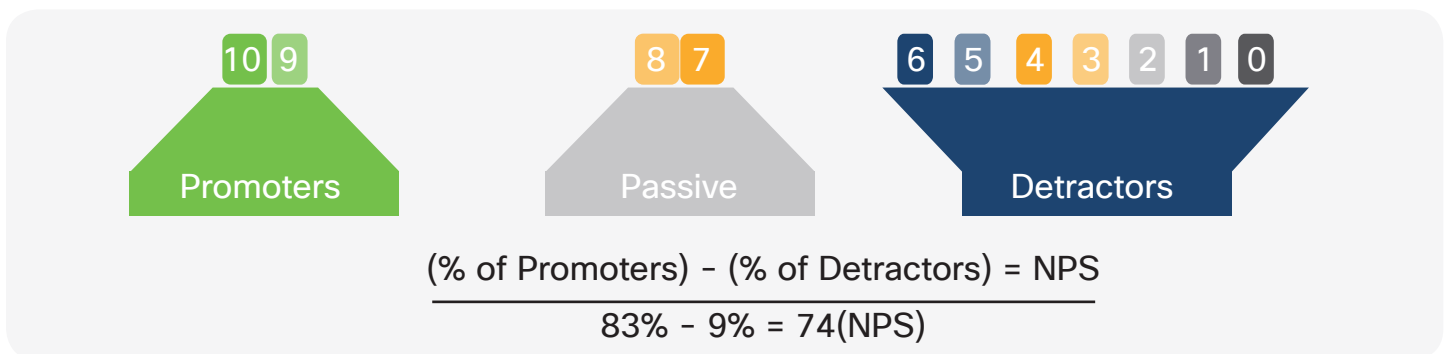
Net Promoter Score® (NPS)

How likely are you to recommend us to your friends and family on a scale of 0-10?



The above is the NPS question, that is used as a management tool to gauge the loyalty of a firm’s customer relationships. It serves as an alternative to traditional customer satisfaction research and is considered to be correlated with revenue growth.

Due to its simplicity and distinction of being the one and only question, NPS has been widely adopted as a single number that can decide effectiveness of customer experience management or service delivery for broad organizations at a management level.



NPS can be as low as -100 (everybody is a detractor) or as high as +100 (everybody is a promoter). NPS that is positive (i.e., higher than zero) is felt to be good, and an NPS of +50 is excellent. Different industries have different levels of scores which are considered good.

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NPS while being an excellent broad, high-level measure perfect for most of top management to track, has some limitations. For instance, NPS is not always effective across cultures, as often the word **“recommendation”** means different things in different continents or in different languages, making it hard to distinguish a customer who is a promoter and will talk about your brand across a dinner table with friends and family, or it could be when asked only for opinion about the specific brand, provide a recommendation.

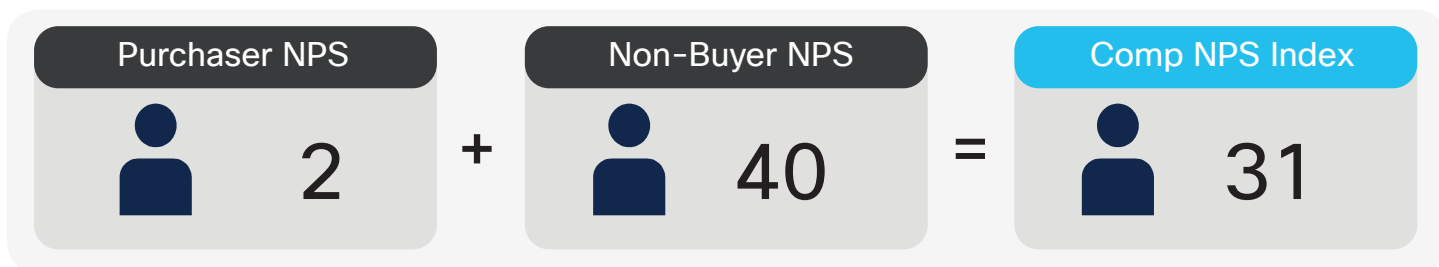
Overall, NPS provides a great start towards measuring customer experience. However, to decisively obtain actionable insights to move the needle on CX requires additional work.

Segmented NPS® Indices

Not all customers are the same, nor are they necessarily consuming the same service or product, neither at the same time, nor at the same location.

However, NPS is the same, which makes it an imprecise average of all segments put together to form a single number across lines of business, and thus not a measure that is more contextual to the actual customer experience or each segment of logical operation. For instance, purchasers vs non-purchasers or business class vs economy.

NPS Indices measure each segment as a different leg of NPS and then combine all of the constituents of the indices into a single composite NPS score that is more reflective of the constituents picked than the broad averaged NPS.



Segmented NPS Indices provides an opportunity to break-out the single number into numbers that matter in the context of each business line, which can enable NPS that is much more responsive at a department level, business line or a division level within the larger company.

Insight scorecards or Key Performance Indicators (KPI)

Rate the below on how we performed?

Variety ★★★★★

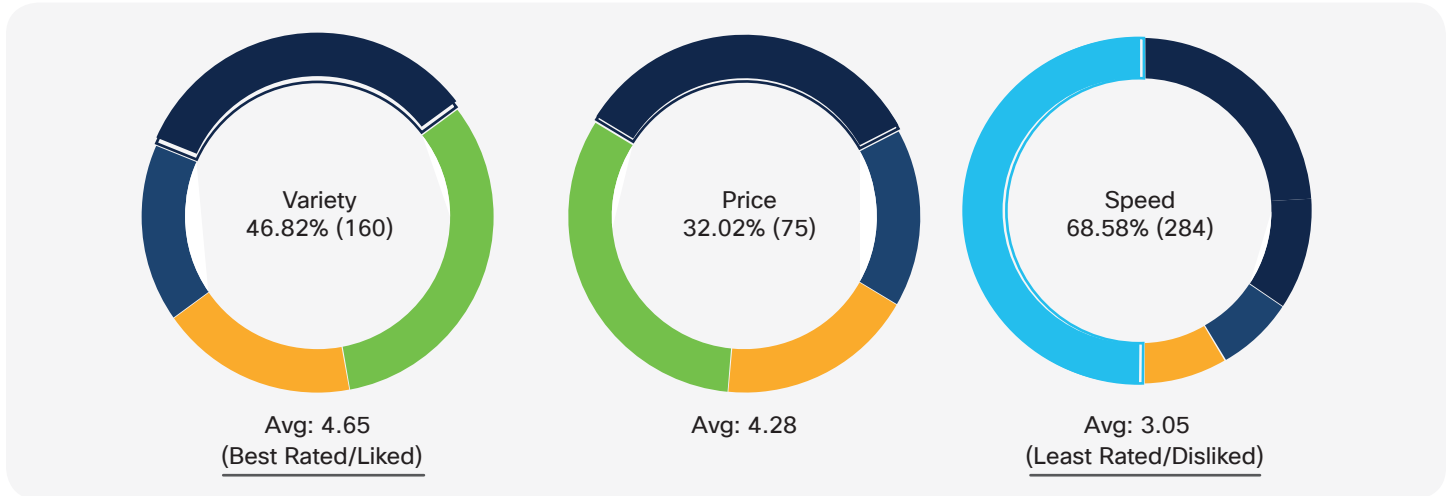
Price ★★★★★

Speed ★★★★★

The above is an example of 3 Key Performance Indicators.

It is considered that customers judge service or product delivered on a limited set of attributes and knowing how these are perceived can make a difference in ensuring customer experience remains high.

The easiest method to measuring experience across a wide set of attributes is via scorecards. Sometimes the best way to know what action you can take today to make the most difference to your business, is to just ask your customers straight up. And, scorecards help in doing just that.



Knowing average ratings can lead to discovery of what was favorably perceived (i.e liked) and what was less favorably perceived (i.e disliked).

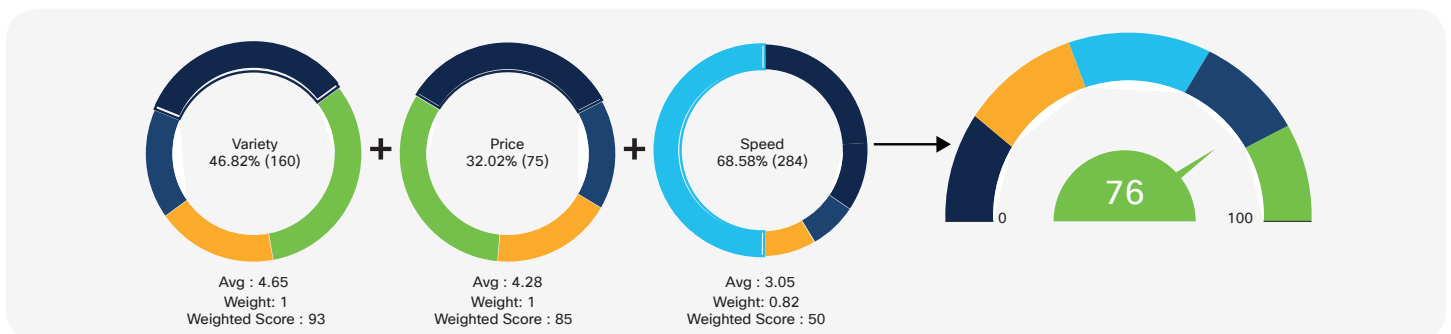
Simple KPIs are excellent to start driving details on to NPS[®] calculated. For instance, knowing NPS is x, tells us how the organization is doing broadly with just one number, however the “why”, can only be discovered with measuring attributes or KPIs. Scorecards have some limitations as they consider one attribute at a time in isolation. The question is to rate each in isolation, however the customer experience or product is usually not delivered in isolation.

Overall KPIs provide a great start towards measuring individual attributes of the service. However, to decisively obtain actionable insights to move the needle on CX requires additional work.

Composite Scorecard Index (CDM)

Often times, a single-answer question such as NPS[®] could be much less reliable and more volatile than a composite index. By combining multiple dimensions of scorecard ratings, a composite delight score can be built that may perform significantly better in predicting customer recommendations and retention.

Additionally, composite scorecard index measure is a weighted index that can be customized by brands to fit their industry profile or to adaptively increase weights of certain metrics more than others. For example, a low cost airline excels in taking passengers from point A to point B. However, a full class airlines excels in delivering exemplary on-board service. Both of these while being in the same service industry have two different measures of customer experiences. For these, composite scorecards deliver a blended index to indicate accurate service levels.

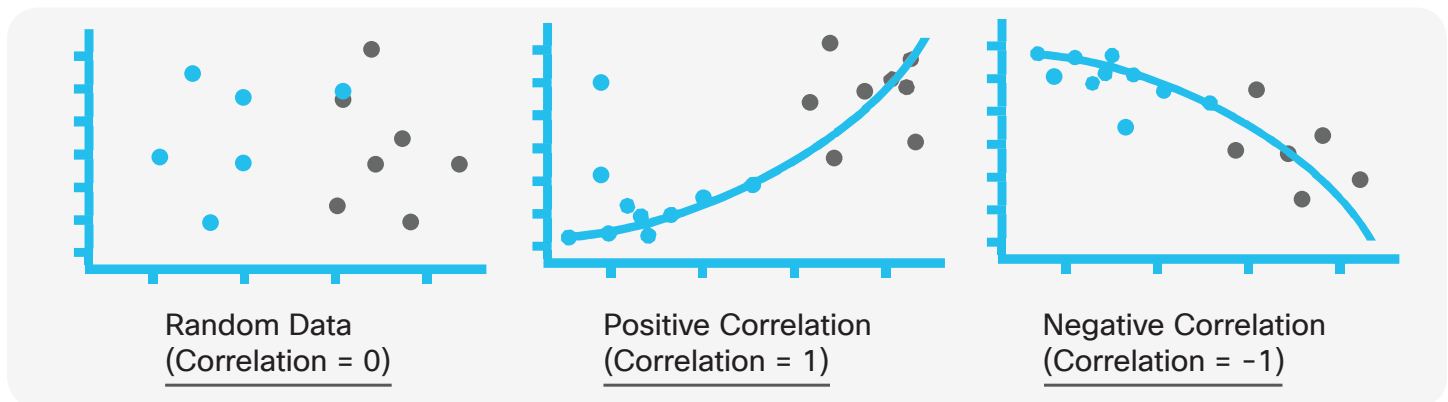


Customizing the weights helps obtain a composite index score from the score card.

Associations w/ Correlation

Connected data such as scorecards that were collected in association with a single experience contain connections, and discovering these associated pairs can move measuring experience from each isolated attribute at a time, to measuring experience of one attribute with another as a pair. For instance, knowing how the perception of speed impacts price, if the speed were faster, would a higher price sensitivity be possible?

When there is no relationship between two attributes, it will result in a zero correlation. For example, there may be no relationship between variety and speed. If an increase in perception of one attribute tends to be associated with a decrease in the other, then this will result in a negative correlation. If an increase in one attribute tends to be associated with an increase in the other, then this will result in a positive correlation.



While correlations are great at indicating how one attribute relates to another, correlation has limitations. Correlation can only occur on related data that is linear and could be skewed easily by outliers.

Correlations are often misinterpreted, as strong association between two variables cannot always be assumed to be caused by the other. For example, tall people weigh more, however heavy people may not necessarily be tall.

Overall, correlations provide a good start towards measuring two attributes of the service against each other. However, to decisively obtain actionable insights to move the needle on CX requires additional investigations.

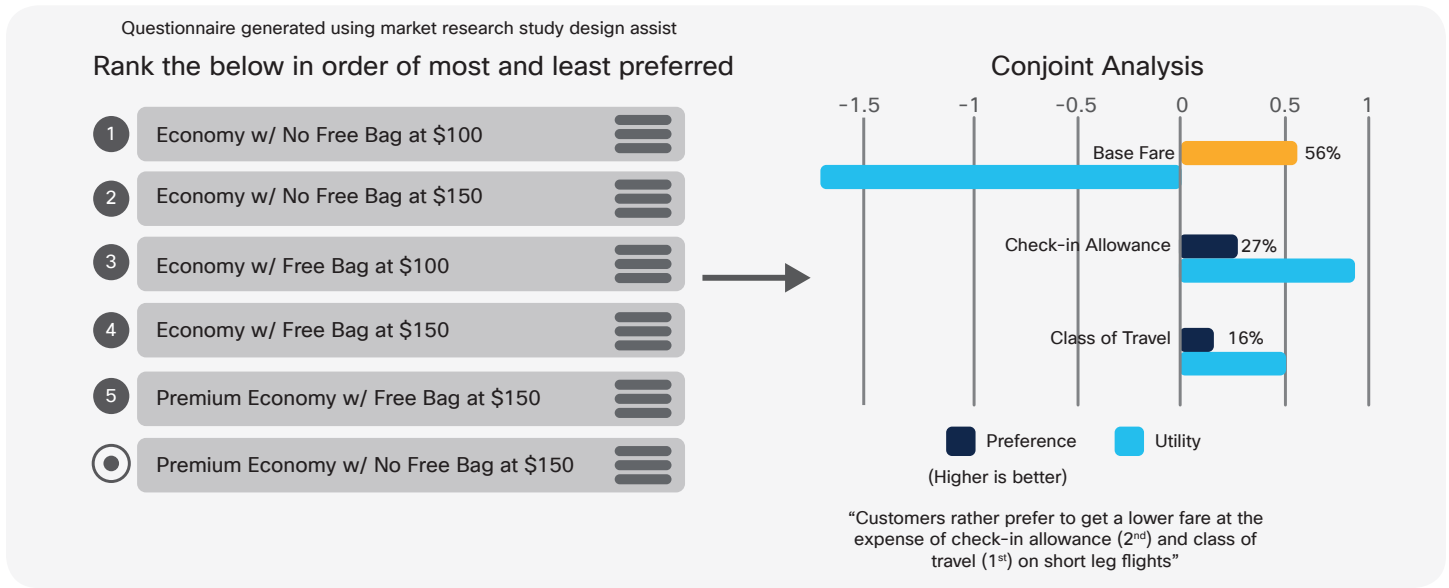
Trade-Offs w/ Conjoint

Sometimes asking questions straight up do not always yield the right answers. For instance, data may indicate “everything is important”, however knowing everything is important isn’t as helpful as knowing how important things are next to each other. This is where trade-off analysis can be effective. Asking people to make trade-offs just as they would do in real-world, enables us to understand what is driving the decisions by observing their choices in specific context. For instance, if an airline were to ask what is the price the customer will pay for a superior service, they may choose the lowest price, at the highest possible service level. This is great for the customer, however not a profitable route for the airline.

A conjoint study involves a complex, multi-step analysis that helps study complex trade-off scenarios to answer questions such as:

- How do customers choose services?
- Are they willing to pay for a specific feature?
- Should we market x or y feature of a product/service?
- Between two different features to announce or market, which one would have the most impact on customer satisfaction?
- Which customer segments are overly price sensitive?
- How do they drive their purchase decisions?

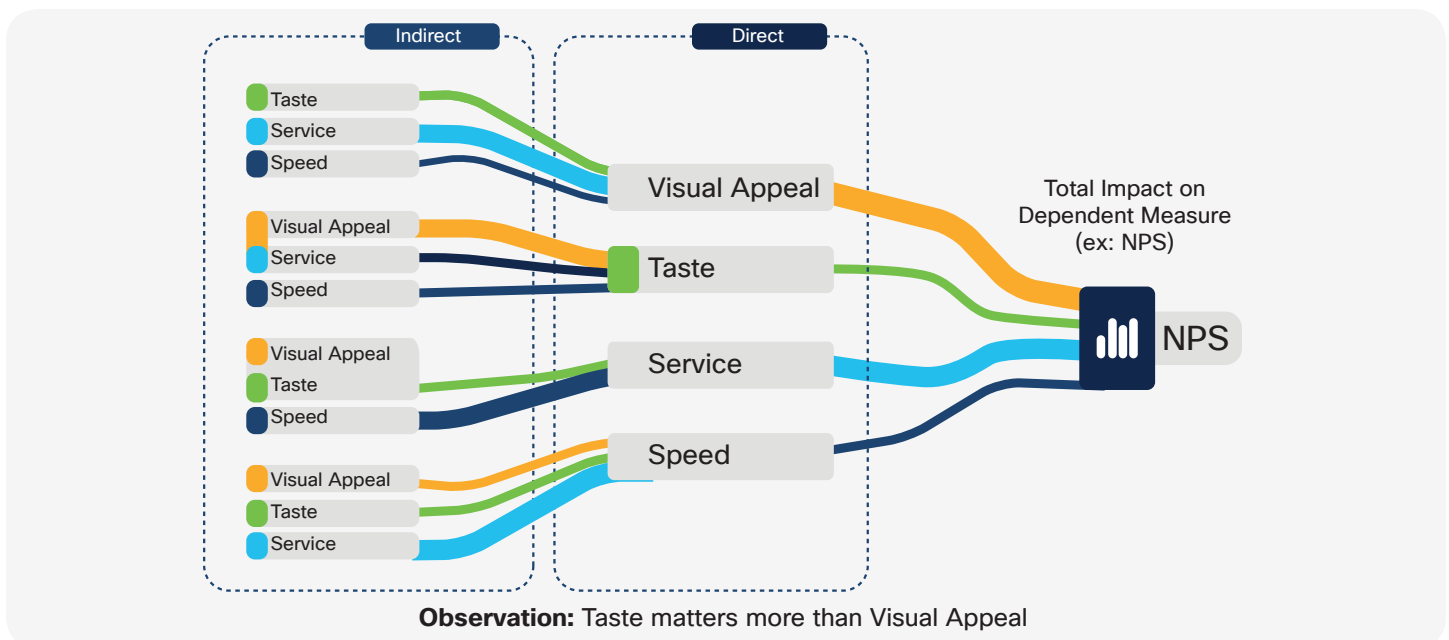
The first step is to design the study itself by describing few items to “trade-off”, setting purpose and specifying the attributes that are being investigated (ex: Class of Travel or Check-in allowance for an airline) and their dimensions (Economy or Premium Economy or even the price).



Influences w/ Path analysis

Path analysis is a statistical technique originating as a method to solve simultaneous equations to disentangle genetic influences across generations (“path analysis”). Thus the name path, finding which genes protein contribute to what is a complex topic, and understanding what path an influence takes, helps in understanding the impact drivers.

Path Analysis enables solving for multiple predictions of multiple variables in a model. To simplify, impact across dimensions is uncovered with path analysis.



Let's consider a real situation where a scorecard's analysis said it is "Visual Appeal" that's best rated (liked), and correlation also found that Visual Appeal is highly correlated to higher NPS scores. So is it really visual appeal that matters the most?

Both of these are conflicting and true? Not necessarily, as the real world with real humans are much more complex than single dimensional simple averages or paired correlation, it consists of more-than-one dimension to every story. To uncover subtle but significant influences is where dimensional path analysis comes into play. Paths measure total impact, a sum of both direct impact + indirect impact. Visual Appeal indirectly impacts Taste, as tasty food often looks good to customers who enjoy it. While the other way is not always true - good looking food will not always be tasty.

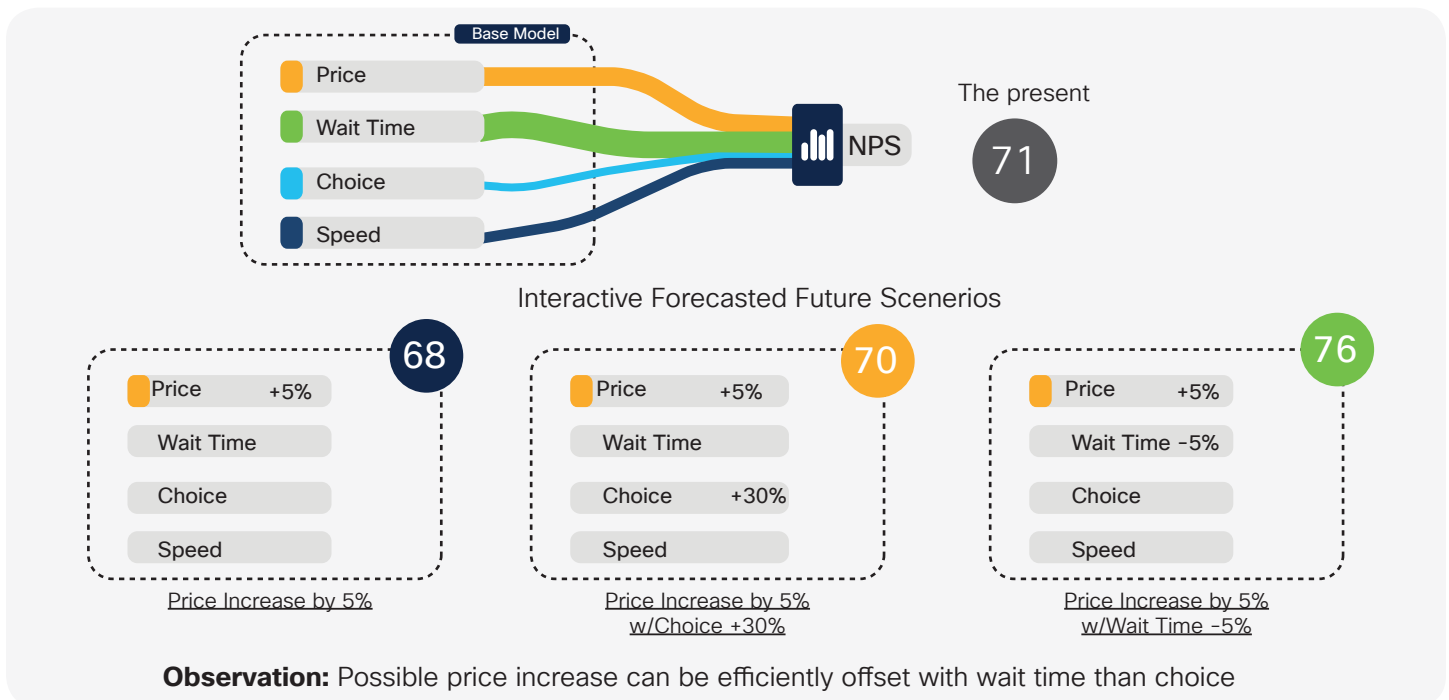
Overall, path analysis provides a perfect way to test for hypotheses and support business decisions with real data. However, this depends upon a real human to start with a hypothesis that can lead to actionable insights to move the needle on CX.

Predictive forward forecasting

SEM capabilities make it possible to operate a strong data science-driven predictive analytical CEM program that can not only help understand the present, but interactively forecast the future.

Interactive forecasts can be made using the direct and in-direct relationships that are found between any of the influences. These forward forecasts can be applied in optimization, maximizing desirable outcomes, while minimizing others for use to develop decision logic or rank a set of business modifications based on the impact of the outcomes enabling data-driven knowledge-based decision making.

SEM model representation of the interactions between the different influences contributing to the present score can be interactively modified to create various possible future scenarios.



Effective application of predictive analytics can lead to more proactive business decision making, and improve predictability around business decisions impacting customer experience.

Besides being able to build models to predict customer satisfaction measures such as NPS and CSAT, these interactive models can also forecast service quality, customer retention or traditional financial metrics such as average revenue per customer, when one of these targets are picked as the criterion used to build the SEM model.

CX in contact centers analytics

What Makes Contact Centers Tick?

Contact Centers are complex environments with customer service agents who are hourly workers handling a steady stream of calls and contacts under challenging conditions, while attempting to deliver great customer experiences on behalf of their brand. Contact centers usually gain their efficiency through a mix of standardization and measurement. They can design routines for agents to execute and they can easily monitor whether agents are sticking to those plans. Agents are consequently constrained in what they can do.

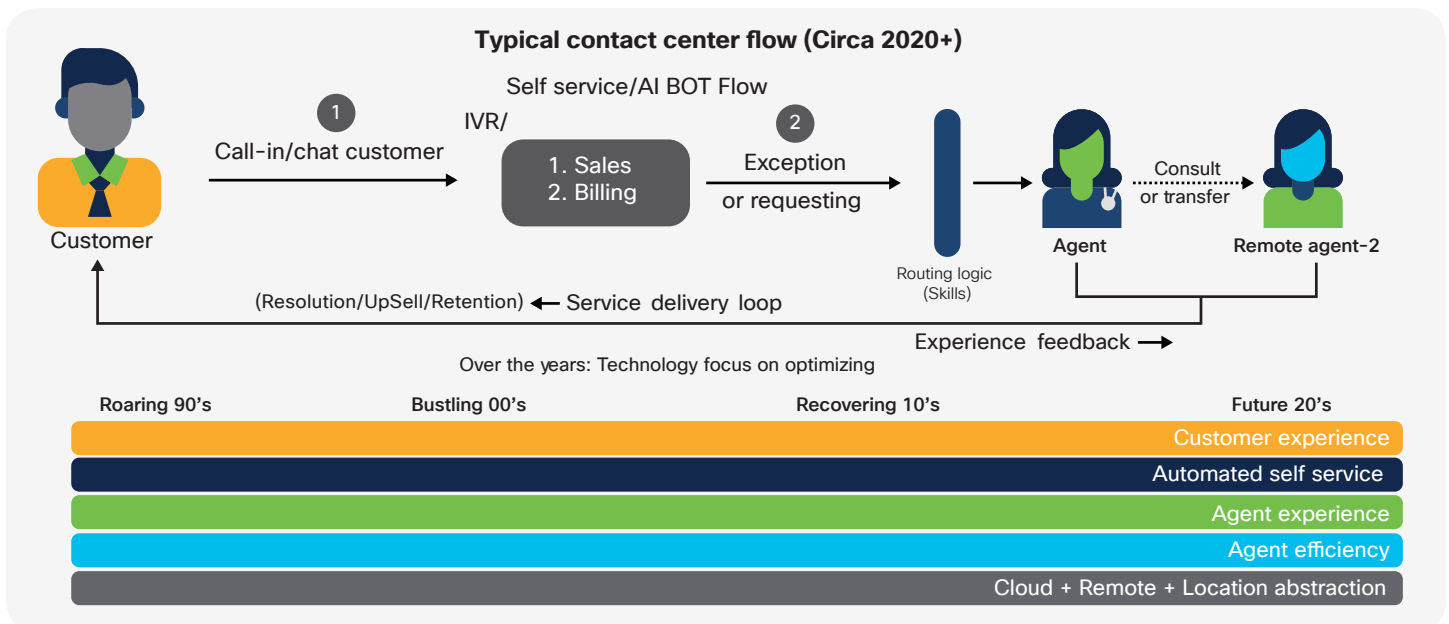
For agents, in theory working in a call center would be a great job compared to other options. However in reality it is not, as agents are at the other end of the equation where they are in day long transactional interactions with more power on the customer's side than the contact center worker's side which can create tension, stress and burnout.

The Curious Case of

Farm Worker	-vs-	Contact Agents
Outdoor Labor	▪	Indoor Work
Weather Exposed	▪	Air Conditioned
Heavy Lifting	▪	Being on Phone
Hourly/Low Pay	▪	Low Pay/Hourly
Median Attrition		
<12%		<80%

Contact center evolution over the years

Non-standard work has been an ever-growing part of the transactions in most customer service call centers today. Basic things like address changes or tweaks to account settings can now largely be done online or with a self-service virtual agent. However, when a customer is calling, it is mostly because they cannot easily do this themselves. What's more, things are complicated by a lack of options. A goal of contact centers is to reduce the footprint needed to serve customers. That is, companies opt for contact centers so that they can have fewer physical locations and fewer workers in those locations.



Applied contact centers analytics

Moving The Needle With CX Analytics

Contact centers can become more operationally efficient through a mix of CX standardization and measurement, such as tracking drivers of customer satisfaction per agent, which enables organizations with fresh capabilities to run and operate:

- Agent assessments that tie directly to customer satisfaction
- Operationalizing sophisticated pay-for-performance system
- Upgraded training using evidence and establish new career paths with data
- Predictive upskill training topics to stay ahead of the attrition curve

For instance, a savings of 5% attrition could be worth \$1.5M per year saved on staffing at an average size of just 10K agents.

