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The Analytic Hierarchy Process

Methodologies and Application with Customers and Management at Blue Cross Blue Shield of Florida

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Abstract

The most important outcome of Quality Function Deployment (QFD) is a design and implementation activity list to assure customer satisfaction. Since most organizations cannot complete this list due to human resource, budget, and time constraints, some prioritization of the action items is necessary. Similarly, an important outcome of strategic planning is an activity list to assure fulfillment of business initiatives amid the same constraints. Prioritizing action items is critical to aiming the organization towards a shared vision. One widely accepted approach to planning, priority setting, and resource allocation in complex situations involving multiple criteria is the Analytic Hierarchy Process (AHP). This paper describes how Blue Cross Blue Shield of Florida has incorporated both QFD and AHP for concept innovation and strategic decision making, with support examples.

Key words

Quality Function Deployment (QFD), Analytic Hierarchy Process (AHP), prioritization, strategic planning, customer satisfaction

Introduction

Traditional quality approaches to assuring customer satisfaction focus on work standards and process improvement to empower employees to resolve problems. Organizations quickly learn that even performance consistency and an absence of problems are not sufficient to hold a competitive advantage in today's global economy. QFD is quite different from traditional quality systems which aim at minimizing negative quality (such as poor service, broken product). With those

systems, the best you can get is nothing wrong - which is not enough when other players in the market are also capable of this quality level. To create lasting value, one must go farther and also maximize positive quality (convenience, enjoyment, etc.). QFD is the only comprehensive quality system aimed specifically at satisfying the customer. It concentrates on maximizing customer satisfaction (positive quality) - measured by such metrics as acquisition and retention rates. QFD focuses on delivering value by seeking out both spoken and unspoken needs, translating these into actions and designs, and communicating these throughout the organization. Further, QFD allows customers to prioritize their requirements and benchmark us against our competitors, and then direct us to optimize those aspects of our organization that will bring the greatest competitive advantage.

Early QFD applications relied on simple A, B, C ordering[1,2] to quickly indicate which were more important. With experience, practitioners came to realize that prioritization could be applied not only to customer needs, but also to planning, design, manufacturing, and production stages to address problems in marketing, profitability, productivity, investment in facility and equipment, and other downstream decisions.[3] This led to a progression of linked matrices where the prioritized outputs of one became the inputs of the next. In order to cascade these linked priorities, several attempts were made to use numerical values so that more complex what-if analyses could be performed. Unfortunately, the limitations of the various mathematical scales tried were ignored and several bad practices emerged and were disseminated around the world.

Prioritization in multicriteria decision making was advanced by the research of Dr. Thomas Saaty in the 1970s at the U.S. Department of Defense and later at the Wharton School of Business at the University of Pennsylvania. Saaty found that decision makers facing a multitude of elements in a complex situation innately organized them into group sharing common properties, and then organized those groups into higher level groups, and so on until a top element or goal was identified. This is called a hierarchy and when making informed judgments to estimate importance, preference, or likelihood, both tangible and intangible factors must be included and measured.[4] The Analytic Hierarchy Process was created to manage this process in a manner that captures the intuitive understanding of the participants and also yield mathematically stable results.

Background

Blue Cross Blue Shield of Florida (BCBSF) has been using Analytic Hierarchy Processing (AHP) for 3+ years with different audiences and with different applications of the AHP methodology. In this paper, we will

- discuss the benefits of using AHP as a prioritization methodology
- describe the different applications of AHP
- recommend the best applications for different types of groups.

BCBSF began using AHP in 2004 to measure the importance of BCBSF's Members' (customers') attributes. The attributes came from our Voice of the Customer (VOC) work we had done in the previous year, and the attributes mostly discussed what our customers wanted our product to do. The attributes were derived from a process involving focus groups interviews with members across different segments such as age, and contract type (small group, large group or individual).

In the original VOC study, the preference of each attribute was measured using a cluster analysis to determine the structure of the hierarchy. Each participant (approx. 400) created his/her own hierarchy independent of the other people in the study. Cluster analysis created the most common structure. Each participant rated each grouping of "like attributes" in his/her structure on an ordi-

nal scale of 1 – 100 for importance. The result of the exercise showed very little difference in the importance of attributes, as shown in **Table 1**.

Overall Importance

Able To Choose the Doctors and Treatment Options I Want	87	Higher Importance
Offer a High Quality Health Plan That I Can Afford	83	
They Ensure that Only the Highest Quality Doctors Are in Their Plan	82	
Emergency Care is Hassle-Free	81	
The Plan Doesn't Limit My Doctors' Ability to Provide Quality Care	81	
Trusted Hospitals with Experienced Staff and Efficient Administration	80	
Doctors with Good Communication Skills Who I Trust	79	
Doctors Who Make Me a Priority (Easy to Get an Appointment)	79	
An Insurance Company With an Excellent Reputation	77	
Covers All of My Prescription Drug Needs at a Reasonable Price	74	
Able To See a Specialist Without a Lot of Hassles	68	Moderate Importance
Provides Coverage Regardless of How My Needs Change (Health Status, Age, Location, Etc.)	68	
A Straightforward Plan that Clearly Shows What Is Covered	68	
Easily Accessible Customer Service	67	
No Surprises with Billing or Claims	67	
Customer Service Representatives Who Are Dedicated to Solving My Problems	66	
Doctors, Hospitals and Clinics Are Convenient for Me (e.g. Location, Hours, Etc.)	64	Lower Importance
Handle Paperwork, Questions And Disputes in a Timely and Fair Manner	63	
Doctors Who Act as My Advocate on Coverage Issues	63	
Can Customize My Plan to Pay Less or More Depending on My Intended Usage	62	
Able to Select the Insurance Products and Options that Best Meet My Needs	62	
Clear, Concise Information that Is Readily Available in a Variety of Formats	57	
Quick and Easy Enrollment Process	57	
Offers Information and Programs to Keep Me Healthy	56	
My Insurance Card Includes All of the Information I Need	55	

High and Low Group Means are significantly different from the grand mean at the 90% confidence level

n= (383)

Table 1. Overall importance of product attributes to Members resulting from cluster analysis.

Four factors contributed to the lack of difference in the importance of the attributes.

1. There was no interaction or agreement between participants on the structure, so one attribute could have been found in different groupings (with difference importance ratings) for each participant.
2. There was no forced comparison between groups of attributes. Each group could be rated the same.
3. Cluster analysis develops groupings based on distances between the attributes. Among the possible distance measures used in cluster analysis, the most common is geometric distance which is a countable unit on a ratio scale. Even mixing different countable units of measure can yield confusing results so it is recommended to transform the dimensions to a similar scale such as a percentage ratio scale. Unfortunately, the above analysis was done using an ordinal scale so the precise geometric distance between the participant assigned scores was unknown, thus degrading the precision of the results.[5]
4. Participants were asked to give a score on our product attributes (about which they may have personal assumptions) rather than on what they know most about – themselves.

For BCBSF, the lack of separation on importance between the attributes led to the thinking that everything is important. This thinking caused the organization to not be able to focus on a small set of attributes for improvement and the VOC work languished until we used the QFD tools to bring it to life by translating the verbatims into true customer needs. To do this, the BCBSF team used the Customer Voice table[6] to discuss each of the verbatims and hypothesize possible true customer needs. QFD defines needs as the customer's problems and opportunities – not product features. We were not worried about getting every need correct because the QFD process would

take us back to the customer to observe them *in situ* (gemba), have them create a hierarchy and then prioritize it with AHP. During the gemba visits and at these meetings, we are able to validate the true customer needs and determine if we have missed any needs. **Table 2** lists those needs which are quite different than the attributes in figure 1. Since customers are more knowledgeable about their needs than they are about our product, having them do AHP on their needs should yield more accurate priorities.

Table 2. Member needs prioritized by segment (current members).

Job	Early Retiree	Empty Nesters	Fams with Older Children	Mature Adults	Young Families	Young Independents
I want my family to be healthy	16%	26%	11%	11%	17%	8%
I want to be healthy	14%	13%	7%	8%	9%	11%
I want to grow old with my spouse	7%	11%	4%	10%	6%	
I want to feel good	6%	7%	6%	6%	8%	
I want to have an enjoyable lifestyle	6%	4%	7%	8%	7%	
I want to be important to my family	4%	5%	9%	9%	6%	
I want to provide for my family	4%	5%	4%		11%	6%
I want to perform well in my job	1%	2%	4%	6%	3%	9%
I want to spend wisely	3%	4%	3%	4%	3%	6%
I want good medical advice	7%		7%	4%	5%	
I want peace of mind	6%	6%			3%	6%
I want to look good	1%	3%	3%	3%	2%	7%
I want to save for the future	1%			4%	3%	8%
I want healthy relationships	3%					11%
I want to save time	2%		4%	3%	2%	5%
I want to be seen as a good parent	2%		4%		6%	
I want to be stress-free				6%		8%
I want good financial advice	1%		3%	3%	2%	4%
I want a simple life	3%	2%	3%	5%		
I want my parents to not worry about me		4%	4%	7%		
I am financially sound	5%					4%
I want to be stress free	4%		5%			
I want people to think that I make smart decisions	2%		3%	4%		
I want to be financially sound		7%				
I want to make good healthcare choices for my kids					7%	
I want to understand the healthcare choices my kids face			5%			
I want to have a good lifestyle						5%
I want to leave a legacy for my children and my grandchildren	2%		2%			
I want my parents to think well of me		3%				
I want to understand the healthcare choices my children face	3%					
I want to save for my future			3%			
Grand Total	100%	100%	100%	100%	100%	100%

Different Constituencies, Different Segments – Different Hierarchies?

At BCBSF, we think of our customers as four different constituent groups

1. Members – people who use the product
2. Business Decision Makers (BDMs) – the person at a company that makes the buying decision for group insurance
3. Agents – the people who sell the product
4. Providers – the doctors, hospitals, clinics, labs, etc. that serve the members.

Inside each of these constituent groups, there are segments. For example, with Agents, we have Blue Diamond Agents (top sellers), Contracted General Agents (CGAs), consultants, brokers, etc. For Members, there are multiple segment strategies, such as attitudinal, life-stage, behavioral, value, and ethnicity. Each of the segmentation strategies has archetypes, and we target specific archetypes, so it's important to understand the most important needs of our targeted archetypes.

For example, within our life-stage segmentation strategy (Under 65 Years Old), we have six archetypes.

i. Young Independents
ii. Mature Adults
iii. Parents with Young Children
iv. Parents with Older Children
v. Empty Nesters

vi. Early Retirees

We have experimented with using different hierarchies with each of these archetypes, but we've found using one hierarchy for the entire segmentation strategy is much less confusing, and this compensates for any loss of precision. **Table 2** also shows which needs each segment shared and their priorities based on their using AHP. As you can see, many of the needs are the same or similar. Some archetype's needs were not expressed by other archetypes, but those missing needs could have been included. The missing needs could have, in fact, been unspoken needs. But even if they were not unspoken needs, they would be prioritized low in the AHP exercise, so they would not show up as potential tactics.

Another benefit of using a common hierarchy template in a life-stage segmentation strategy is that we will be able to see the migration of the importance of the needs over a person's lifetime. This knowledge allows the Marketing department to anticipate customers' needs as they age and create marketing programs designed to retain them.

The Benefits of the Analytic Hierarchy Process

Once the hierarchy is in place, AHP provides an accurate and efficient methodology to find the relative importance of each of the needs in the hierarchy. The word "relative" is the key point of distinction. The importance percentages delivered by the AHP methodology are mathematically sound. The percentages can be added, subtracted, multiplied or divided with accuracy. If Need A is 20% of the goal, and Need B is 10% of the goal, we can say, with great confidence, that Need A is twice as important as Need B. This precision allows our business to focus on the most important needs of the customer.

The precision in the ratio scale that AHP delivers is preferred over ordinal scales produced by other methodologies. For example, in the past work shown in Table 1, we used ordinal rating methodologies that ask the user to rate needs on a scale of 1-100. This methodology is easy for the user to understand, but it does not require the user to make any tradeoffs. In other words, the user can rate all of the needs with the same level of importance. For example, each need can be rated a 75. The result is that the overall importance ratings for the needs end up with a few needs at the top, a few needs at the bottom, and most of the needs bunched in the middle.

Likewise, ordinal scales of 1-5 produce similar results. Most of the needs will bunch in the middle with averages like 4.2 or 4.3. These averages are not mathematically sound either because we cannot calculate an average or mean with ordinal scale numbers. So, while you can make some inferences about the top needs, we are unable to specify the amount of importance the customer places on the attribute or the amount of importance difference between the attributes.

Another reason that the ratings are bunched in the middle is because survey participants will suffer from "survey fatigue" from trying to accurately gauge the amount of importance for each attribute in a large list. AHP solves the survey fatigue problem by only asking participants to compare the importance of two needs at a time. These comparisons are called judgments. A judgment of only two items is much easier for participants to complete than comparing a list of 20 items. Pairwise comparisons generate more information and so improve judgment consistency when attributes may be close in value[7] which is one reason why optometrists use this approach when prescribing corrective lenses. Plus, when the items are arranged in a hierarchy, we can start at the most general level, and only pursue with the participants, those branches that have high importance.

Figure 1 shows an example of pairwise comparison of two needs at a time, using a popular software program called Expert Choice®. Here, a group of physicians is asked to judge two needs in relation to the goal of physician satisfaction. A judgment on the left means the physician felt the need, "I want to have long-term financial strength" was important than the need, "I want to be a highly respected physician." The letters correspond with the amount of importance placed on the need. The farther the judgment is to each end of the spectrum, the more strongly felt the judgment. As you can see, there was disagreement, but it was still an easy decision for each physician to make for himself or for herself. **Figure 2** shows participants using a remote control voting box to register their votes while viewing the results. The AHP can be approximated in Microsoft Excel® by calculating the "row average of normalized columns." A template is provided in the QFD Green Belt® and QFD Black Belt® course of the QFD Institute.

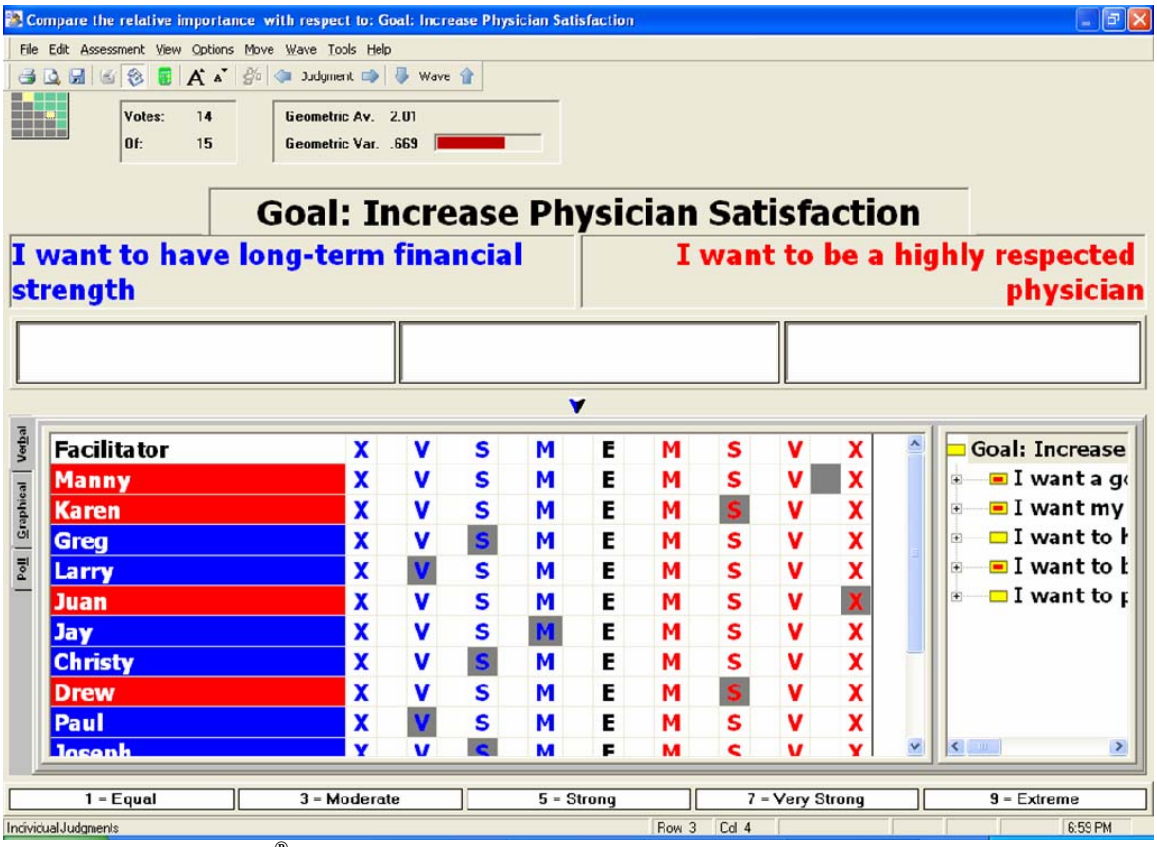


Figure 1. Expert Choice® screenshot showing pairwise comparisons by physician providers.

Figure 2. Participants vote using Expert Choice® remote control voting boxes.

At the end of the exercise, the participants are shown the results of the group's judgments, and they can be shown their individual judgments. **(Figure 3.)** This ability to check the results gives them the opportunity to correct any misjudgments they may have made.

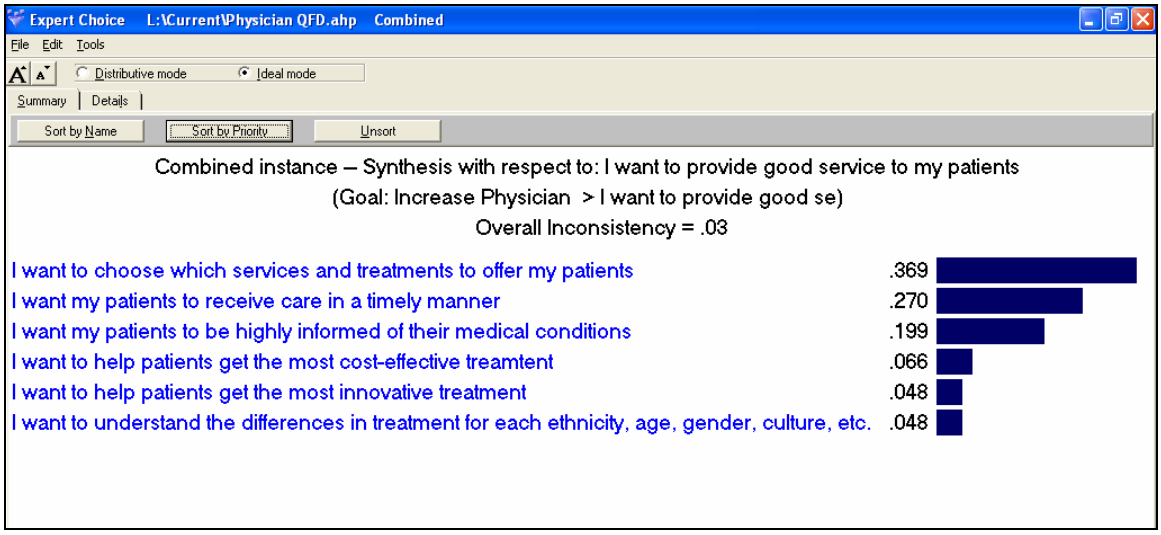


Figure 3. Expert Choice screenshot showing ratio scale priorties derived from group using AHP.

Different Channels and Audiences for AHP

We have used AHP in various modes of communication, and each has advantages and disadvantages as shown in **Table 3.**

Table 3. Advantages and disadvantages of different modes for conducting AHP.

Method	Advantages	Disadvantages
In Person	• Answer questions • Correct Inconsistency • Discuss Points of View	• High Cost per participant • Smaller Sample Size • Group Think
US Mail	• Lower Cost • More accessible than Web or In-Person • Accommodate large sample size	• Analysis more difficult • Inconsistency • No conference on questions or differing points of view
Telephone	• Can survey difficult-to-reach audiences • Answer questions • Correct Inconsistency	• 2nd Highest Cost per Participant • No discussion on differing points of view • No visual reference for judgments
Web	• Lowest Cost per participant • Accommodates large sample size • Fastest results	• Not accessible to all segments of population • No discussion on differing points of view

We have several constituencies at BCBSF, so we've incorporated all of these survey methods at one time or another. **Table 4** lists the constituencies, their behaviors, and the recommended survey mode. **Figures 4 and 5** show sample survey instruments.

Table 4. BCBSF constituencies and preferred mode of AHP.

Constituency	Behaviors	Recommended Mode
Members and Non-Members (Younger)	• Easiest Group to reach via web • Normally use Web Panels due to lack of internal e-mail addresses • Generally need a large sample size	• Web
Members and Non-Members (Older)	• Not as web-savvy • Generally need a large sample size	• Web if available • Mail as a backup
Physicians	• Very difficult to find	• In-Person • May have to attend a conference to find a group • Require a large honorarium
Business Decision Makers (BDMs)	• Difficult to survey • Smallest segment	• Telephone • Require a larger honorarium
Internal	• Requires discussion and explanation of AHP	• In-Person • Can be web if complexity of project is low
Agents	• Politically-sensitive constituent group • Requires much explanation of purpose of the work	• In-Person • Must guard against "group think"

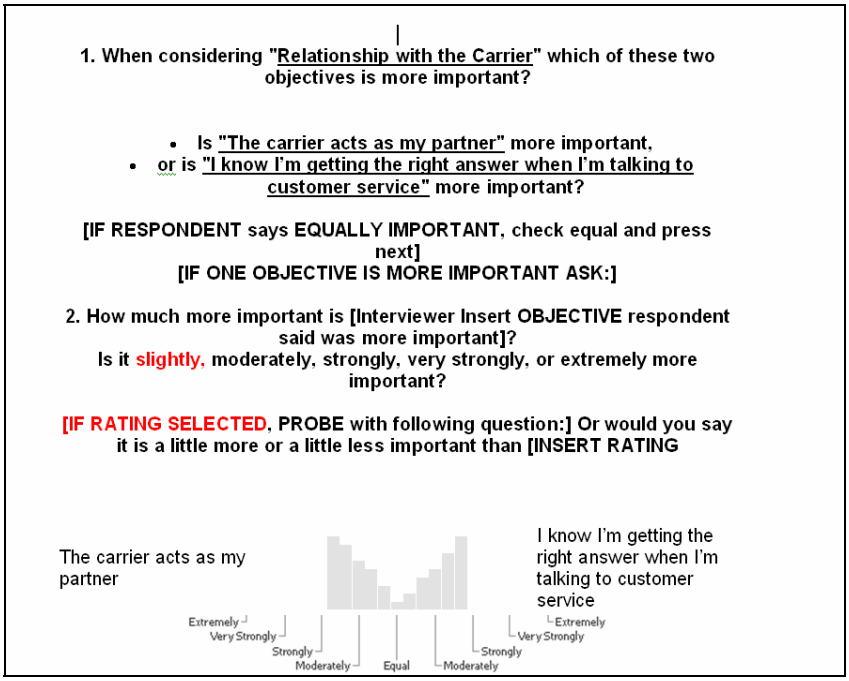


Figure 4. Sample telephone script.

Figure 5. Sample mailed AHP survey.

Members and Non-Members – In Depth Analysis

Members (customers) and Non-Members (non-customers) make up all consumers. The Internet and, more specifically, Internet panels have made the job of reaching consumers faster and cheaper. In the past, meeting with consumers required either a focus group or meeting consumers in a gathering place such as a worksite or a tradeshow. Today, there are numerous Internet panels with thousands of consumers that actually get paid to take surveys such as AHP, Conjoint Analysis, or other types of preference surveys. The cost per participant ($7-$10) is significantly lower than in-person traditional focus group honorariums of $40 - $75.

The Internet panels have an ample amount of demographic data about the participants, so you can narrow your panel by selecting attributes from categories such as:

- Age
- Gender
- Occupation
- Geography
- Presence of children in the home
- Insured or Uninsured
- Race and Ethnicity

BCBSF has its own Internet panel (Blue Collaboration) made up of our members, so we can mine further data such as length of tenure, product, claims history, etc. when identifying panel participants.

The speed of the survey is also greatly improved by use of the Internet. Participants are sent an e-mail with a link to the survey. The survey will take participants from15-30 minutes, and it can all be done from the comfort of their homes. In November 2006 we launched 10 surveys (25 participants each) at one time on the Friday before Thanksgiving week. By the following Friday, all of the surveys were complete. The total cost, from survey design, recruitment, and honorariums, was $13,000. Had we gone the traditional route of using focus groups, the cost would have been greater than $60,000.

The Expert Choice® web tool, Comparion shown in **Figure 6**, is easy for participants to use, and even 50+ pairwise judgments does not leave them with too much survey fatigue. We have not gone too far beyond this number of judgments, so we cannot caution the maximum number for this method. The Internet panels are able to require the participants to complete the survey before paying them, so the incompletion rate is less than 5%.

There are a few drawbacks with a web-based tool. First, participants cannot ask questions of a moderator as they would be able to in a focus group, so the participants' understanding is only as good as your instructions and your scripts. The second drawback has a silver lining. Since there is no collaboration between participants because everyone is taking the survey from their individual homes, a participant cannot hear another person's good idea. However, the separation does not allow one person's opinion to dominate a group as you often have in a focus group setting. Also, the isolated judgment is more often a truer gauge of how a person makes a decision about a product or service, since most decisions are made without the benefit of conference with several peers.

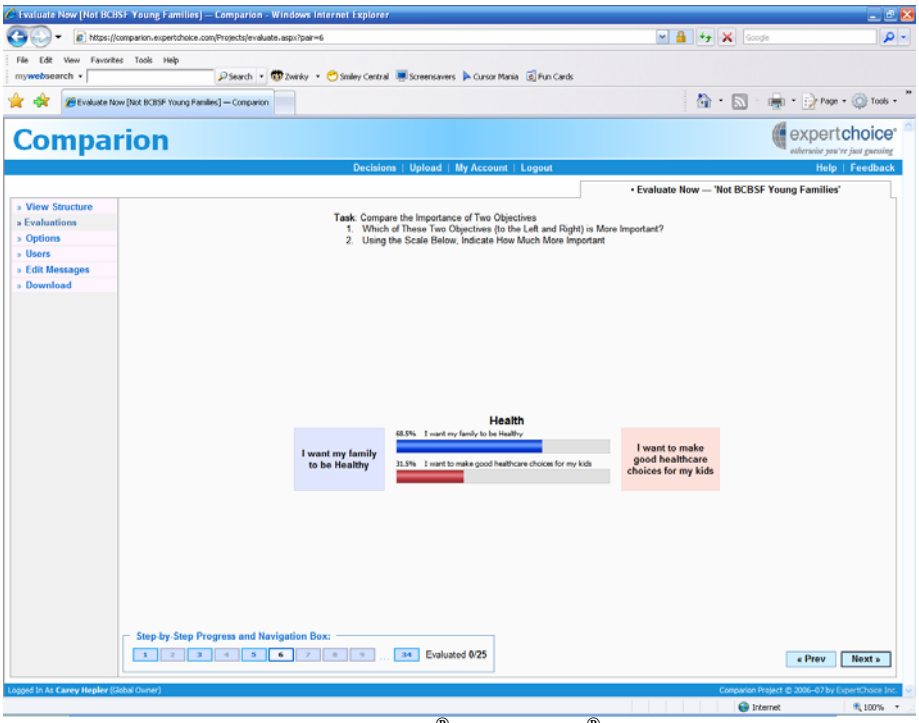
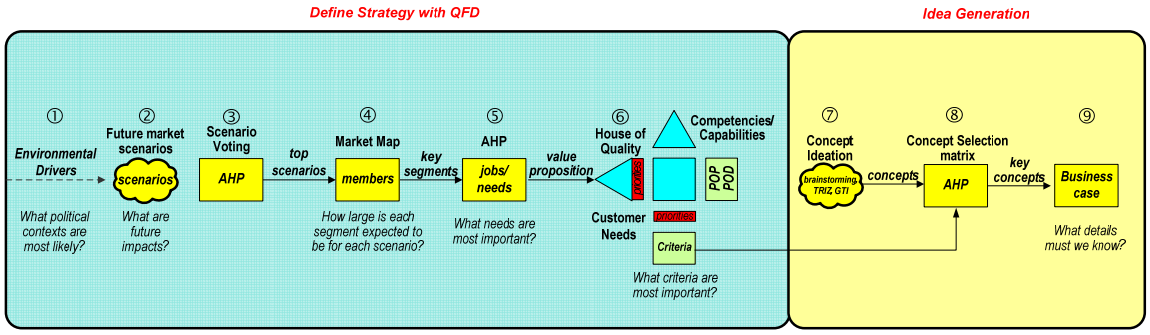


Figure 6. Screenshot of Expert Choice® Comparion® web-based AHP tool.

AHP in Strategy and Management Meetings

AHP was originally devised to help decision makers allocate resources. Its application to customer needs prioritization was identified by Yoji Akao, co-founder of QFD, and one of his graduate students, Satoshi Nakui, in 1990.[8] In addition to the above customer related examples, BCBSF has used AHP in strategy and management meetings. While the details are confidential, a recent example can be cited. The upcoming 2008 U.S. presidential election race has begun and in televised debates, the candidates have put forth their ideas on how to improve healthcare in the U.S., especially for the 60 million who have no health insurance and either receive little or no care or rely on hospital emergency rooms for treatment.

BCBSF wants to anticipate how the future administration might set new healthcare policy so that we can begin planning for and implementing new processes for our members, providers, and business decision makers. We have used a combination of QFD, AHP, and other forecasting tools to look at possible election and policy outcomes and what new opportunities they will create to service both our traditional members as well as these new constituents. **Figure 7** shows the process developed by the authors.



Role of the Moderator in Management Meetings

The AHP moderator has several tasks to accomplish when conducting an exercise in person.

1. Discuss the software and judgment process ahead of time.
Most participants will have many questions and are so excited about "voting" that they will need to hear the instructions a few times to understand the job they are being asked to perform.

If you are using Expert Choice® with remote control voting boxes, do a test run by asking everyone to hit the "Number 5" key. You want to make sure the boxes are working. Next, have them hit a different number key, so they can see how to change a judgment. Have them hit the Star key (*), so they can see how to move back and forth. Many people will be shy about asking questions about basic procedures once the judgments begin, so you want to make sure people are comfortable at the beginning.

If I have more than four judgments in a node, I ask participants to rank the criteria or alternatives from 1 to n. Although this instruction violates the discussion regarding ordinal scales, I have found that when there are five or more criteria, participants will get confused on their priorities and the inconsistency ratio will go up. Higher judgment consistency is a key advantage of the AHP.

2. Start with easy judgments

Depending on the topic, we will either evaluate the outer ring (most abstract level) of the criteria, or if it makes the task simpler, we will evaluate the lowest level of a hierarchy (with four or fewer criteria), so the participants can get comfortable making judgments. If the outer ring of criteria appear to be vaguely worded for the participants to understand the underlying criteria, it is better to start with the lower level. If there are too many criteria for the participants to evaluate in a reasonable amount of time, start with the outer ring, and then drill down on the criteria that are most important. This supports a fundamental principle of QFD to focus the company's efforts on the needs most important to the customer, or in a management group, on the criteria most important to the goal.

3. Get people to move – Get people to stick

Before beginning the exercise, I make two points regarding judgments. The first is that participants should make judgment based on their expertise in their field. I quote the book, *The Wisdom of Crowds*[9] to validate that the best decisions are made by the collective intelligence of the entire organization. The exercise is not designed to force collaboration – just discussion and decisions. If you have a high-ranking officer in a management meeting and you notice that people are watching to see where she votes, tell her to vote last. This will send a subtle message that everyone should vote his or her conscience.

The second point is that it is OK for people to change their minds. I tell people that if someone makes a good point, feel free to change your position. So often, people will get locked into judgments and feel they will lose face if they move. Congratulate the first person you see move and more people will be willing to do the same.

4. Be impartial

In most settings, I play the role of the impartial observer. I don't vote, and I try to play both sides of the fence to draw out the discussion. If someone has a vote of "Very Strong" or "Extremely Strong," I ask him or her to explain his or her reasons. Then, I ask folks with an opposite judgment for their opinions. I encourage other people to chime in. This routine continues through the first set of comparisons (diagonal view) until the participants have seen all of the criteria or alternatives. Once the redundant comparisons begin, the discussion ebbs as people have made their points and they are ready to move on and see the results. I try not to reveal my feelings on any judgment so I don't skew the results.

5. Get buy-in for from the participants

I review the group's collective judgments at the end of the first node, and I ask them if they agree with the results. I ask anyone if they are surprised, and I ask if anyone wants to change their judgments. It rarely occurs that anyone wants to change a judgment. In cases where there is great debate and great differences of opinion, I'll review each of the judgments the group made on the outer ring of the hierarchy and ask if anyone wants to make a case for his or her position or change his or her judgment. Again, it rarely happens, but it's a great opportunity to show the participants that AHP is a not a "black box" of algorithms; there is rational thought behind the end results.

Conclusions

AHP is a powerful, mathematically elegant, and efficient way to understand your customers and to help your business make decisions.

AHP's power is in its capability to

1.) Capture all of the criteria required to make a decision,
2.) Evaluate alternatives against those criteria, and
3.) Make the required decisions in an open and simple manner.

In the end, any decision can be traced back to the judgments made by the participants in the panel. AHP provides an artifact of the work and of the decision. The mathematical soundness of AHP allows us to say, with a high degree of confidence, that a need with 30% importance is twice as important as a need with 15% importance. This certainty allows our business to focus its efforts on the critical few needs of customers rather than the trivial many. The efficiency of AHP allows our business to make hard decisions, complete with difficult discussions, in a timely manner while giving every participant a voice in the result. We have, on numerous occasions, been able to swiftly move business partners and customers to make decisions on topics that, left to traditional means, would have resulted in numerous meetings with a result favoring the boisterous few. AHP gives everyone a voice and creates better "buy-in" of the decision to be implemented.

About the Authors

Carey W. Hepler has been using QFD and AHP at Blue Cross and Blue Shield of Florida for the past two years as he works to attain his QFD Black Belt. Carey is Innovation Director in BCBSF's Marketing Department. Previous projects include improving member satisfaction, and his future projects will focus on physician satisfaction and on agent satisfaction. His undergraduate degree and is MBA are from the University of Florida. **Carey.Hepler@bcbsfl.com**

Glenn H. Mazur has been active in QFD since its inception in North America, and has worked extensively with the founders of QFD on their teaching and consulting visits from Japan. He is a leader in the application of QFD to service industries and consumer products, conducts advanced QFD research, and is the Conference Chair for the annual North American Symposium on Quality Function Deployment. Glenn is the Executive Director of the QFD Institute and International Council for QFD, Adjunct Lecturer on TQM at the University of Michigan College of Engineering (ret.), President of Japan Business Consultants Ltd., and is a senior member of the American Society for Quality (ASQ), and the Japanese Society for Quality Control (JSQC). He is a certified QFD Red Belt® (highest level), one of two in North America. **Glenn@Mazur.net**

Notes

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