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Building Diversity: Using QFD to Involve Employees in the Corporate Innovation Process

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Abstract

With competition at an all time high, more and more companies, including Blue Cross Blue Shield of Florida (BCBSF), are seeking ways to capture that next "big" idea. BCBSF currently has over 9,000 employees within its walls, each with an idea on how the company can increase membership, reduce administrative costs, differentiate products and services from our competitors and expand our distribution channel. Random idea creations no matter how diverse the source, however, can become a drag on resources and lead to disappointment among those whose ideas are not utilized. When the Voice of the Customer is used to drive idea creation and selection process, then the diversity of our internal resources can be fully harnessed.

Key words

Quality Function Deployment (QFD), Analytic Hierarchy Process (AHP), diversity, concept innovation, employee involvement

Introduction

In the book *The Real Eve*, Stephen Oppenheimer cautions that without genetic diversity, species “lack the flexibility to survive and adapt to the various stresses imposed upon them.”¹ Does this also hold true for organizations? The American Society of Mechanical Engineers describes workplace diversity of the 21st century as encompassing such factors such as “age, culture, education, employee status, family status, function, gender, national origin, physical appearance, race, regional origin, religion, sexual orientation, and thinking style.”² Enlightened organizations encourage inclusion, not discrimination, because this diversity leads to value-adding differences in viewpoints about customers, solutions to problems, and ways of working together.

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Florida is a richly diverse state, ranking third in net population gains and also third in non-Hispanic Black and Hispanic Origin population gains. By 2025, non-Hispanic Whites are expected to comprise 58.9 percent of Florida's population, down from 70.7 percent in 1995. Non-Hispanic African Americans would comprise 14.8 percent of the state population in 2025, up from 13.9 percent in 1995. Persons of Hispanic origin, who may be of any race, are projected to increase from 13.8 percent of the 1995 state population to 23.9 percent of the 2025 state population.

With the projected increase in Florida's multicultural population from 36% in 2003 to 42% in 2025, maintaining our current penetration levels across ethnic groups would result in an overall penetration decrease. If we could achieve our current general market penetration level across all ethnic groups by 2025, BCBSF would realize a state-wide penetration increase over 25%. The business concept to achieve this is to deliver superior competitive value to Florida's multicultural markets through an array of consumer driven choices in products and services, and to become the market leader in creating loyal customers by providing an integrated, seamless and culturally relevant experience.

Reverse QFD

Since its beginning in Japan, QFD applications have been custom tailored to the needs of each organization and project.³ In Akao's case study book,⁴ several advanced deployments are introduced, including technology deployment, reliability deployment, and cost deployment. Technology deployment is used to assure the quality of new technology concepts as they are being developed, and one variation of this is reverse QFD. In reverse QFD, concepts are generated internally and then mapped back into customer needs, which can then be prioritized by customers using AHP.⁵ Once key needs are identified, they can be used 1) as criteria to select which concepts to pursue, or 2) to fine tune the new concepts for usability and better market acceptance. This paper will cover the former, which is diagrammed in **Figure 1**.

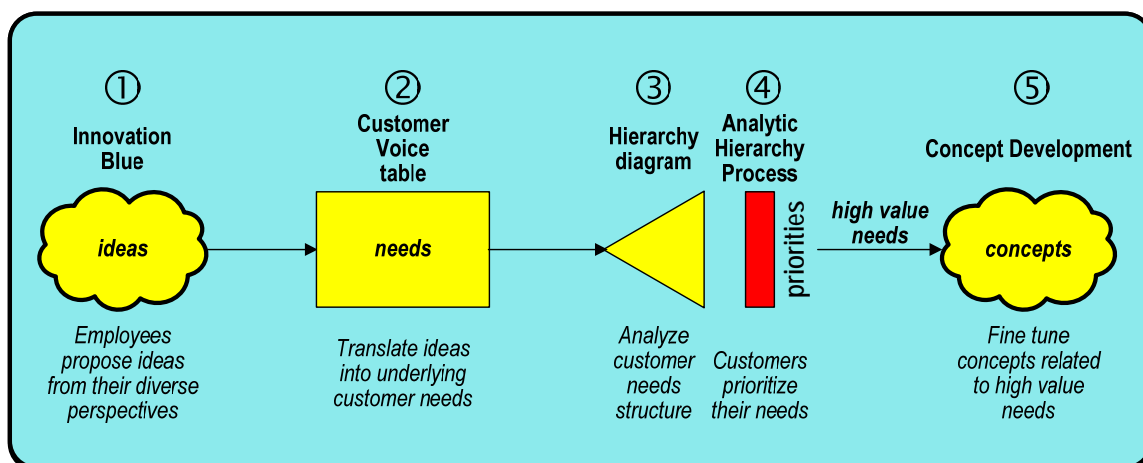


Figure 1. Reverse QFD process flow chart.

1. Innovation Blue

In order to capture the intellectual capital of employees, the company launched a new website called Innovation Blue. Darnell Smith, one of the company's Group Vice Presidents, says "I, too, am a Marketeer," inferring that every individual in the company has a responsibility to contribute to the next big product or service for consumers. The website's opening page is a welcome to employee innovation and finally a way for employees to get their ideas heard. The website provides an inclusive environment where all employees regardless of age, gender, position, etc. can have their suggestions considered. This non-biased forum will allow BCBSFL to tap into the diversity of our employees, yielding a rich tapestry of creative and innovative ideas. The website reads as follows:

Innovation Blue is a website for BCBSF employees to make suggestions for marketing ideas. This is the place where YOU, the valued employee, can help BCBSF become a Superior Marketing Company. (Innovation Blue Website, **Figure 2.**)

The "Submit an Idea" page is the crux of the site. As one could imagine, the health insurance industry is extremely complex; therefore, there are numerous opportunities and challenges to address to ensure optimal success. However, in an effort to focus resources on critical business needs and optimize Innovation resources, the site offers one business challenge at a time. The site's inaugural launch included a question on ways to increase membership in the African American and Hispanic markets. Employees submitted ideas on this challenge through January 2007. The top three ideas submitted were rewarded at the end of the first quarter. **Figure 3** includes an excerpt from one minority employee submitted to Innovation Blue.

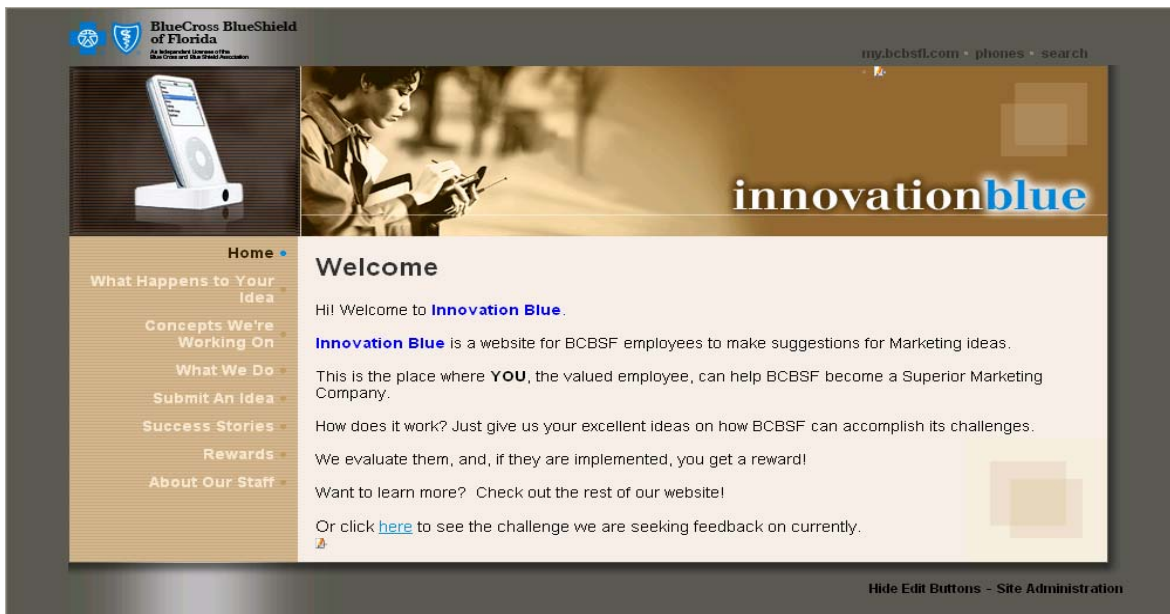


Figure 2. Innovation home page with welcome message.

“include membership benefits at a health club (again, accountability), highlight diabetic nutrition education benefits, add a benefit for attending an education program (such as Josylin and others), provide a method for diabetics to report their A1Cs (through their doctor/s) and give an incentive for ones lower than 8, lower than 7, and lower than 6, provide 3 months of free testing supplies. Make it easier for patients to comply with healthy lifestyles based on their diagnosis. Don't penalize patients for their diagnosis...”

Figure 3. Excerpt of a minority employee submission.

2. Customer Voice table

Since employees are also healthcare consumers, their verbatims also represent others in their community. As with any consumer verbatim, a suggested action, product, or solution should be simplified and translated back into underlying needs, which we define in QFD as a customer problem, opportunity, or image issue, and in some cases a desired outcome or a “job” the customer must do. The Customer Voice table is recommended to aid this analysis, and a simple one, shown in **Table 1**, was used. This difficult exercise is best done with the employee who submitted the suggestion so that we can understand all the nuances and unspoken outcomes implied in the statement.

For example, the idea of “including membership benefits at a health club” suggests what Blue Cross should offer. It is about the product, not the customer. So, the employee is asked to explain what health benefits club membership would give a customer. The health club membership would improve member accountability for their physical activity which is important in the treatment of diabetes. A health club offers training on equipment that will give the member safe, yet adequate physical activity appropriate for the condition of the member. Thus, the benefit to the member is “I need help with appropriate physical activity.”

These benefits or customer needs are more abstract than the initial suggestion, but they serve an important purpose in QFD in understanding what is most important to customers. Customers can make better judgments about what they know best – their needs. If asked to prioritize product features, they still have to translate them into benefits, but this process is not visible, so we don't know why the feature is important. Further, customers can have false assumptions about the benefits of a feature and still end up being dissatisfied.

The Customer Voice table for this project yielded just over 100 customer needs from 14 Innovation Blue submissions. How could so few ideas yield so many needs? In the translation process, one idea might lead to five or more needs. Sometimes the same need will be generated from different ideas. Other needs are less obvious than the example given in Table 1. In one case, the employee (who works in our building) requested she be called if more information was needed and gave her full telephone number, including area code, instead of just the 4 digit internal extension. This could easily be dismissed as nothing more than a courtesy, but a good VOC (voice of customer) analyst might probe deeper. Giving her full phone number could imply that she believes the Innovation Blue program may be run by some organization outside

BCBSFL, outside the area, outside Florida's telephone area codes, and perhaps even outsourced outside the U.S. What customer need could we translate from this? Perhaps, "I want to do business with a company that cares about my community," "I need to understand health issues common to my ethnicity," etc.

Another employee submission was closed with the words "in my humble opinion." Perhaps this merely reflected the text messaging acronym "IMHO" common among young people. But it might also imply a sense of feeling small and powerless, afraid of saying something wrong. What customer needs could we translate from this? Perhaps, "I want to be comfortable asking personal questions related to health and finances," "I want to feel valued by my carrier," etc.

Table 1. Customer Voice table is used to translate Innovtion Blue ideas into customer needs.

customer needs	characteristics & capabilities	functions	reliability	technology	information	communications
I need help with appropriate physical activity.	member accountability for their physical activity			health club membership		
I need help with appropriate nutrition.	member accountability for their nutrition			diabetic nutrition education (Josylin)		
I need to know the progress of my condition.	diabetes progress reportability	patient self-reporting AIC		incent patient A1C reduction		
I need up-to-date information on my condition.				provide free testing supplies for 3 months		
I need to know do's and don't's to stay healthy.	healthy lifestyle compatibility	provide healthy lifestyle compliant programs				
I need to know the progress of my condition.			Don't penalize patients for diagnosis			

3. Hierarchy diagram

In a standard QFD, the next step would be to take the customer needs to actual customers to have them structure the needs with the affinity diagram. The goal is to get the customer's structure so that we can analyze it with a hierarchy diagram to check for agreement of levels of abstraction and to look for missing data. This is necessary because we want to later innovate concepts first on important needs, and unspoken missing needs create an opportunity for competitive differentiation. In reverse QFD, the concepts are already created at the start, so the affinity diagram may not be necessary. However, correcting the levels of abstraction is critical for the next step, prioritization with AHP.

4. Analytic Hierarchy Process (AHP)

Early QFD applications relied on simple A, B, C ordering^{6,7} 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.⁸ 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.⁹ 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. Blue Cross Blue Shield of Florida (BCBSF) has been using Analytic Hierarchy Process for 3+ years with different audiences and with different applications of the AHP methodology.

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. Before AHP, 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 value¹⁰ 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.

Since we want customers to tell us which of their needs are most important (so we know which ideas to pursue), it is best to have the customers do the AHP. There are different ways in which customers can be surveyed, including personal interviews, by telephone, by mail, or even by web. The preferred way will depend on the ethnicity, age, etc. of the community, and employees who are members of that community can make recommendations. The web-based software Comparison[®] has been used for AHP in other BCBSF QFD projects¹¹ with great success and will be used here. In these other projects, representative employee groups, code named HOLA and ENAABLE, were established to do the Affinity diagram exercises, and we plan to use their participation in the AHP prioritizations. Employee networking groups such as HOLA (Hispanic Organization for Leadership and Advancement and ENAABLE (Empowering Network of African-Americans: Building, Leading, Embracing) are one of the ways BCBSF is responding to the challenges of consumer demands and Florida’s changing demographics. Employee networking groups also will put BCBSF one step closer to achieving its vision of increasing the company’s ability to provide customized, culturally relevant products and services to increase new sales in the African-American and Hispanic markets. HOLA and ENAABLE leverage one of the company’s assets — its Hispanic-American and African American employees and those employees not of Hispanic or African American descent who are knowledgeable of the experience — by providing opportunities to increase Hispanic and African American market share, learning more about our own differences, and promoting career growth, employee retention and positive social interaction.¹²

5. Concept Development

Once the customer needs have been prioritized, we can use them to identify which Innovation Blue ideas should be developed into concepts, fine tuned, and deployed through the organization into the market. If there are a small number of needs and ideas, the simplest way may be to use the Customer Voice table to identify which ideas generated the most important needs, and then to evolve those into workable concepts. If the data set is large, we can use the needs and their ratio scale priorities as selection criteria in AHP’s “alternative selection mode.” In either case, this work is done by the QFD team.

Conclusions

Diversity should be considered an asset to an organization. It provides the rich variety we need to advance in this ever and ever global society and economy. In the coming decades, Florida expects to attract people from all over the world who want to share in and contribute to our wonderful communities, climate, and entertainment complexes. Serving the health needs of

these diverse communities is an overarching goal of Blue Cross Blue Shield of Florida, and we are counting on our employees who are members of those communities to use their intimate knowledge and experience to guide us through. While some ideas may be ahead of their time, some unfeasible, some too costly, we expect that all have merit and will help us maintain our leadership. The QFD process gives us a way to harness all the creative energy of our employees in a way that is efficient, transparent, and gives equal voice to all.

Internal diversity may only be the beginning. While BCBSF is focused on providing services to the residents of the State of Florida, it is not inconceivable that the methods described in this paper could be applied to any organization seeking to improve the diversity of their staff, customers, suppliers, and communities. Merrill Lynch Managing Director Kerry Cannella was recently quoted, “The world is getting smaller.... Borders basically don’t exist anymore.”¹³ Furthering that idea is Anita Zanchettin, director of diversity at consultant Aperian Global, “It is a very reality in every country... the business environment, the languages, the needs of the marketplace and consumers.”¹⁴ This can be expected to include diversity in religion and generations such as Baby Boomers (born between 1946 and 1964), Generation X’ers (born between 1965 and 1977), Millennials or Gen Y (born 1978 and after).¹⁵

Whatever slice you wish to take, diversity is now to be regarded as an asset. Treated as such, it will help to make organizations stronger and closer in touch to all the people it counts on to be successful.

About the Authors

Kathy Hines has been employed by Blue Cross Blue Shield of Florida for ten years. She has supported the membership and billing functions, customer service, product development and most recently the marketing function in a variety project and leadership roles. She currently serves as an Innovation Leader, of which her primary responsibilities include capturing deep customer insights and translating those into actionable products, services, and capabilities to attract and retain customers; including members, providers, and agents/brokers. BCBSF uses the QFD methodology in its innovation process of which Kathy currently holds a provisional QFD Black Belt®. kathy.hines@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

¹ Oppenheimer, Stephen. 2003. *The Real Eve: Modern Man's Journey Out of Africa*. Carroll & Graf. ISBN 0-7867-1334-8

² <http://www.professionalpractice.asme.org/communications/diversity/index.htm>

³ Mizuno, Shigeru and Yoji Akao, ed. 1994. *Quality Function Deployment: The Customer-Driven Approach to Quality Planning and Deployment*. Translated by Glenn Mazur. Tokyo:Asian Productivity Organization. p. 94. ISBN 92-833-1122-1

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⁵ Hepler, Carey and Glenn Mazur. "The Analytic Hierarchy Process: Methodologies and Application with Customers and Management at Blue Cross Blue Shield of Florida." *Transactions of the 19th U.S. and 13th International Symposia on QFD*. QFD Institute. ISBN 1-889477-19-2. 2007.

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⁸ *ibid.* p 126

⁹ Saaty, Thomas L. 1990. *The Analytic Hierarchy Process*. Pittsburg:RWS Publications. p. x., 1. ISBN 0-9620317-2-0

¹⁰ *ibid.* Saaty 1990. p. 6-7.

¹¹ *ibid.* Hepler and Mazur, 2007.

¹² Quick Connections June 16, 2006 – Weekly electronic communication to BCBSF employees

¹³ Iwata, Edward. "Companies find gold inside melting pot." *USA Today*. July 9, 2007. p. B1.

¹⁴ *ibid.* Iwata p. B2.

¹⁵ Hymowitz, Carol. "Managers Find Ways To Get Generations to Close Culture Gaps," *The Wall Street Journal*. July 9, 2007. p. B1.