Using Voice of Customer to Advance OI D – Giving The Customer a Vote In Improvement

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Northrop Grumman Corporation
Preview...

- Intent of Organizational Innovation and Deployment
- Definition of “Voice of Customer”
- Means to Gather Voice of Customer
- Translating VoC into Criteria to Select Improvement Projects
Quality and process-performance objectives that this process area might address include the following:

- Improved product quality (e.g., functionality, performance)
- Increased productivity
- Decreased cycle time
- Greater customer and end-user satisfaction
- Shorter development or production time to change functionality, add features, or adapt to new technologies
“Voice of the Customer” (VoC) means to describe the wants and needs of our Customers and their perceptions of quality.

I need!
VoC is important because...

- High maturity organizations recognize the tie between high quality and Customer loyalty, referenceability and its effect on business.
- Quality is all non-price attributes of a product or service, tangible and intangible.
- Only Customers define quality; should hear what they have to say.
- Organizations need process improvements that align to "quality that Customers can see."
Understanding quality is difficult...

- Customers don’t know all of their needs, or can’t articulate what they are, or assume that you know them.
- Customers often state their needs in fuzzy terms like, “Easy to Use.”
- Customers needs and wants frequently change.
- Quality is perceived, and not quantitatively measured.
Follow six steps...

1. Identify Customers/end-users
2. Discover Their Needs with Interviews
3. Categorize Needs
4. Prioritize Needs
5. Survey to Determine What Really Matters
6. Choose Improvements Based On Criteria
Gather Voice of Customer with Reactive or Proactive Systems...

Two basic types of VoC systems exist...

- Reactive Systems
- Proactive Systems
Reactive systems are those where Customer information comes to you whether you want it or not, *e.g.*, 

- Customer complaints
- Award Fee Letters
- Help Desk Calls
- Contractor Performance Assessment Reports
Proactive systems are... 

Proactive systems are those where we seek out information about Customers needs and wants, e.g.,

- Interviews
- Surveys
- Focus Groups
- Executive Visits
- Benchmarking
Customer interviews are good to discover needs...

- **Interviews** are proactive systems to discover Customers discover needs or wants
- Capture verbatim comments that describe needs or wants (on index cards or Post-It® notes)
Record Customers’ verbatim comments on cards...

- Give it to me faster
- For capturing comments...
  - Cards should have independent thoughts or ideas
  - Write large enough so that they can be seen from afar
  - Put initials on the card
The approach to interviews...

- Provoke images and listen
- Employ open ended questions that don’t imply a right or wrong answer
- Tailor questions to the situation
Find out about Customers’ current approach...

- How do you use the current system?
  - Tell us about the last few times.
  - How do you get service?
  - Who or what provides the service?
  - When is the service available?
  - How much time to respond?
  - What method to respond?
Explore what is working well...

Tell us what works well with the current approach?

- What not to change
- What advantages now
Probe problem areas...

Tell us about problems you have with the current system...

- Tell us about problems.
- Which most important to fix? Why?
- Any work-arounds?
- Any costs and negative consequences?
Ask about the ideal solution...

Describe what you see as an ideal system...

- What would it look like?
- How would you interact with it?
- Any other systems you’ve seen or heard about it?
- Who does it best?
Explore the future...

What changes do you anticipate in the next couple of years? Include changes in...

- Technology
- Your work
- Document types
- Presentation types
- Delivery formats
- Client demands or expectations
- World events
Needs Customers might tell you...

“I want it when I want it.”

“Make commitments that meet my needs.”

“I want fast and easy access to help.”

“Help me save time.”

“Meet your commitments.”

“If it breaks, fix it fast.”
More needs Customers might tell you...

“Help me save money.”

“Deliver irresistible value.”

“Treat me like you want my business.”
Even more needs Customers might tell you...

“Give me systems that meet my needs.”

“Give me systems that work right.”

“Make it easy to use.”

“Be accurate, right the first time.”

“Fix it right the first time.”
About affinitizing needs or attributes...

- The affinity diagram, or KJ method is one of the most widely used of the Japanese management and planning tools.
- The affinity diagram was developed to discover meaningful groups of ideas within a raw list.
- Important to let the groupings emerge naturally, using the right side of the brain, rather than according to preordained categories.
Start by posting all the verbatim comments...
Team sorts cards into groups with a common thread...

Do this as a silent activity. Anybody can move any card any number of times.
Someone works with the team to paraphrase the essence...

Team paraphrases the main theme of each group
About surveys…

- Surveys are another proactive system to collect information about Customer needs
- Combined with Likert scaling, surveys can prioritize needs
A Likert scale is a type of survey question where respondents rate the level at which they agree or disagree with a given statement, e.g.

|----------------------------|-------------------|---------|-------------------|------------|---------------------|------------|---------------------|
Likert scales are effective to:

- Measure “soft” things like perceptions, attitudes, or satisfaction
- Capture the state of information about process performance where only notions of performance exist.
- Verify Customer’s perception of differences in “before” and “after”
- Validate that “hard” measures are good predictors of what Customers’ see
Especially in software...

- In software evaluation, we can often objectively measure efficiency and effectiveness with performance metrics such as time taken or errors made.
- But, Likert scales and other attitudinal scales help get at the emotional and preferential responses people have to the design.
Steps to survey...

1. Determine the “Money Question”
2. Compose questions from interviews
3. Administer the survey
4. Analyze with logistic regression
Determine the “Money Question”...

The “Money Question” is a question that addresses the overall trait of interest, *e.g.*, 

- “Overall, I am satisfied with the systems and services that Northrop Grumman delivers”
- “Overall, this training will help me do my job better”
- “Overall, I am satisfied with Northrop Grumman as a place to work”
Good practices…

- Frame all questions as positive statements even if you are looking for problems
- Use the same scale on all questions
- Choose the number of cells on the scale, that is, five or seven, so that you will get at least five responses in each cell
- More cells are better, subject to the constraint of five in a cell
Several types of Likert scales exist...

Likert scales exist for:
- Quality
- Importance
- Agreement
- Frequency
- Likelihood
Scales for agreement...

- Strongly Disagree
- Disagree
- Somewhat Disagree
- Undecided
- Somewhat Agree
- Agree
- Strongly Agree

Scales need equal opportunity for positive and negative responses.
Examples of scales for frequency...

Never  Seldom  About Half the Time  Usually  Always

1  2  3  4  5  6  7

None  Rarely  Seldom  About Half the Time  Occasionally  Frequently  Always

1  2  3  4  5  6  7
Examples of scales for likelihood...

- Not At All True
- Only Slightly True
- About Halfway True
- Mostly True
- True

- Never
- Very Probably Not
- Unlikely
- Flip of the Coin
- Probably
- Frequently
- Definitely

Scale: 1 to 7
Example of scales for quality:

- Extremely Poor
- Below Average
- Average
- Above Average
- Excellent
- Very Poor
- Poor
- Barely Acceptable
- Good
- Very Good
Example for importance…

- Unimportant
- Of Little Importance
- Moderately Important
- Important
- Very Important

1 2 3 4 5 6 7
Sample survey...

**Customer Satisfaction Survey**

1. Northrop Grumman provides systems that are easy to use.

<table>
<thead>
<tr>
<th>Agreement</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Undecided</th>
<th>Agree</th>
<th>Strongly Agree</th>
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<tbody>
<tr>
<td>Frequency:</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

2. All in all, I am satisfied with the products and services that I receive from Northrop Grumman.

<table>
<thead>
<tr>
<th>Agreement</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Undecided</th>
<th>Agree</th>
<th>Strongly Agree</th>
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<tr>
<td>Frequency:</td>
<td></td>
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</tr>
</tbody>
</table>

3. Northrop Grumman makes commitments that meet my needs.

<table>
<thead>
<tr>
<th>Agreement</th>
<th>None</th>
<th>Seldom</th>
<th>About Half the Time</th>
<th>Usually</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency:</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

4. When my system goes down, Northrop Grumman restores it quickly.

<table>
<thead>
<tr>
<th>Agreement</th>
<th>None</th>
<th>Seldom</th>
<th>About Half the Time</th>
<th>Usually</th>
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<tbody>
<tr>
<td>Frequency:</td>
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</table>

5. Northrop Grumman provides systems with the functionality I need.

<table>
<thead>
<tr>
<th>Agreement</th>
<th>None</th>
<th>Seldom</th>
<th>About Half the Time</th>
<th>Usually</th>
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</thead>
<tbody>
<tr>
<td>Frequency:</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

6. Northrop Grumman delivers on their commitments.

| Frequency:      | Never | Seldom | About Half the Time | Usually | Always |

7. Northrop Grumman provides us with systems that work as they should.

| Frequency:      | Never | Seldom | About Half the Time | Usually | Always |

8. Northrop Grumman provides us good value with their systems and services.

<table>
<thead>
<tr>
<th>Likelihood:</th>
<th>Not At All True</th>
<th>Only Slightly True</th>
<th>About Halfway True</th>
<th>Mostly True</th>
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<td>Frequency:</td>
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Northrop Grumman treats me like they want my business.

<table>
<thead>
<tr>
<th>Agreement</th>
<th>None</th>
<th>Seldom</th>
<th>About Half the Time</th>
<th>Usually</th>
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<td>Frequency:</td>
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When I need help, Northrop Grumman responds quickly.

<table>
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<tr>
<th>Agreement</th>
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<th>Seldom</th>
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Done >>

* Survey created on SurveyMonkey.COM
### Sample Results...

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<th>Q3</th>
<th>Q4</th>
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</tbody>
</table>

These are dummy data for purposes of illustration.
Analyze with ordinal logistic regression...

- Conventional least squares regression doesn’t work on this kind of data
- Question #2 is set as the response variable, i.e., the y-variable
- All others are set as predictor variables, i.e., the x-variables
- Question #3 shows a significant relationship as its p-value is less than .05; all others are “noise.”

* Regression is performed with Minitab® Release 14.2

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Coef</th>
<th>SE Coef</th>
<th>Z</th>
<th>P</th>
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<tbody>
<tr>
<td>Const(1)</td>
<td>25.2405</td>
<td>14.2487</td>
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<tr>
<td>Q5</td>
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<tr>
<td>Q6</td>
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</table>
Throwing out all the “noise” leaves a prediction equation based on Q3...

Response Information

<table>
<thead>
<tr>
<th>Variable</th>
<th>Value</th>
<th>Count</th>
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<td>Q2</td>
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Logistic Regression Table

<table>
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<tr>
<th>Predictor</th>
<th>Coef</th>
<th>SE Coef</th>
<th>Z</th>
<th>P</th>
<th>Odds Ratio</th>
<th>95% CI Lower</th>
<th>95% CI Upper</th>
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<tbody>
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<td>-3.86</td>
<td>0.000</td>
<td>0.00</td>
<td>0.00</td>
<td>0.06</td>
</tr>
</tbody>
</table>

Log-Likelihood = -7.642
Test that all slopes are zero: G = 36.648, DF = 1, P-Value = 0.000
Q3 proves to be a good predictor of the response to Q2...

\[ P(Q2) = \frac{e^{-5.60 \times Q3 + 13.56}}{1 + e^{-5.60 \times Q3 + 13.56}} \]
Choose improvements with a Pugh concept selection matrix...

<table>
<thead>
<tr>
<th>Concept Selection</th>
<th>Direction of Improvement</th>
<th>Importance</th>
<th>Status Quo</th>
<th>Proposal #1</th>
<th>Proposal #2</th>
<th>Proposal #3</th>
<th>Proposal #4</th>
</tr>
</thead>
<tbody>
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<tr>
<td>Worse ★</td>
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<td>-1.0</td>
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</tbody>
</table>

Direction of Improvement:
- Maximize ✪ 1.0
- Target ✡ 0.0
- Minimize ★ -1.0

<table>
<thead>
<tr>
<th>Addresses Commitment Fidelity</th>
<th>Direction of Improvement</th>
<th>Importance</th>
<th>Status Quo</th>
<th>Proposal #1</th>
<th>Proposal #2</th>
<th>Proposal #3</th>
<th>Proposal #4</th>
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<table>
<thead>
<tr>
<th>People to Implement</th>
<th>Direction of Improvement</th>
<th>Importance</th>
<th>Status Quo</th>
<th>Proposal #1</th>
<th>Proposal #2</th>
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* Pugh Matrix is produced with QFD/Capture Professional Edition
Summary...

- Since Customers are the only ones that define quality, it’s useful to get their “Voice” in selecting improvement projects.
- Statistic methods like logistic regression can be used to infer Customer’s importance from survey responses.
- Combine VoC with other factors in a Pugh matrix to aide selections.
the End.