Value Based Project Selection

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Value Based Project Selection

Introduction

• Have you ever heard…
  – *All of the projects are top priority.*
  – *They are all equally important.*
  – *How long have you worked here...you should know what’s important by now.*
Priority Order

- Are your organizations projects in priority order? Risks? Issues?
- Is that order bought into and communicated to project stakeholders and project team members?
- Do people at lower levels arbitrarily decide what project is more important than another project?
Leadership

• Great Organizations
  – Know and communicate their values.
  – Select projects and/or allocate resources based on those values without exceeding workforce capacity.
  – Establish a priority order for their projects and activities so the work force knows what is most important.
    • Clarity.
    • A strong sense of direction.

This requires discipline and integrity!
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Multiple Project Overload

Too many projects → Too much interference

Exceeding 90% capacity for projects in an organization causes serious inefficiencies.
Decision Making

• The decision process should be
  – Credible.
  – Easy to use.
  – Easily understood.
  – Easy to communicate (internally & externally).
  – Defensible – logical, traceable.
  – Proven – successfully applied.
  – Have full buy-in by stakeholder community.
  – Linked to organizational values.
Before we get fancy…
Why Select This Project?

• Proposed projects should be able to answer the following questions with great clarity.
  – Why do this at all?
  – Why do it this way?
  – Why do it now?
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Financial Project Selection Measures

• Benefit Cost Ratios.
• Opportunity Costs.
• Time Value of Money.
• Internal Rate of Return.
• Economic Value Added.
• Return on Assets.
• Return on Sales.

Specialized Ranking Methods

• Pair-wise Comparisons.
• Ordinal Ranking.*
• Analytic Hierarchy Process.*
• Adversarial Proceedings.

* Typically based on organizational values/strategy.
Herbert Simon’s Three Phases of Decision Making

• Intelligence – The identification of the problem or opportunity.
• Design – Designing, developing or identifying alternative solutions.
• *Choice* – Choosing the best alternative solution or mix of alternative solutions.
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Decision Processes

• AHP is a subset of an overall decision process.
  – Input is viable candidates.
  – Output is prioritized viable candidates.

• AHP is used when priority order is needed for elements of a decision.
  – Selecting a course of action.
  – Selecting or prioritizing projects.
  – Selecting or prioritizing anything.
Decision Traps

- Currently out of print.
- Overview at http://www.nafri.gov/courses/m581/Unit_1/Decision_traps.pdf
Exercise – Decision Traps
Tools are good, but…

- A tool is just an input to the judgment process of decision makers.
- A tool should never dictate a decision.
  - There is no substitute for the human intuition.
- A tool should organize and structure information.
  - Intuition yields poor decisions in the absence of organization and structure.
Tool Rules

• Only use a tool or detail when detail or the tool is required.
  – Beware of blanket applications.
    • A major failure factor for tools.

• The middle ground is often where the tool or detail is required.
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Specialized Ranking Methods

• Pair-wise Comparisons.
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Ordinal Ranking

• Red, Yellow, Green – What does it mean?
• High, Medium, Low – What does it mean?
• Good, Better, Best – What does it mean?
• Whatever the description, it must be…
  – Clearly defined in written, paragraph form.
  – Agreed upon by all stakeholders.
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Multiple Stakeholder Advantages

• Why is it important in the multi customer, multi master environment.
  – Clear understanding of the problem and it’s attributes.
  – Keeps votes separately.
  – Puts accountability on the stakeholders.
  • Eliminates the blame game.
  • Minimizes politics.
AHP is versatile

• Can be used for decisions and prioritization.
• Can be used to create check lists for quick screening.
• Can be used for real time decision making.
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Are your values understood?

• Values are understood when…
  1. They are written down.
  2. You know them in context and comparison to each other.

• Values are not fully understood in isolation.
“Writing a thorough description of each criterion helps ensure understanding of the intent and expectations of data that must be supplied to fulfill it. One team of three or four people at HP reported spending a full five days working only on the criteria they were to use for decision making. And this was only the beginning, next they involved customers in the same discussion before reaching consensus and beginning to evaluate choices.

An “aha” occurred when people found they were wrong to assume everyone meant the same thing by such terms as packaging, some using wider definitions than others, and the misunderstanding only surfaced through group discussion. Asked if the selection process ever failed the team, its leader replied, “If the results didn’t make sense, it was usually because the criteria weren’t well defined”

Creating an Environment for Successful Projects, Graham, England
Too many values?

- Many organizations have too many factors in their decision process.
- A lot of factors may seem important until they are compared head to head.
  - This allows refinement and simplification.
  - It is common for two to three factors to dominate.
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Why are most weighting systems invalid?

• People tend to give…
  – More weight to less important items.
  – Less weight to more important items.
  – The more factors there are the more the two bullets above hold true.

• No credible traceability for the creation of the structure.
  – “That seems about right” is not credible. 😊
Advantages of Value Based Project Selection/Prioritization

• Doesn’t allow the “squeaky wheel” to dominate.
• Establishes cooperation among different project leaders and stakeholders.
• Provides direction that helps clarify project goals.
• Minimizes sub-optimization.
  – Giving resources to one project at the expense of another more important project(s).
• A major benefit of AHP is the ability to focus on the precise area of disagreement or differing priorities.
  – Saves time.
  – Eliminates animosity.
  – The power of this cannot be underestimated.

…the real value is in the interaction of the folks and the result you get.

Harvey Paskin, May 10, 1999 Fortune Magazine.
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Focused Communication
Focused Communication

Value Based Project Selection
Value Based Project Selection

Check List Priorities for Quick Screening

Goal: Survey Equipment Health

- Equipment Reliability (G: .130)
- Equipment Repairability (G: .070)
- Equipment Supportability (G: .120)
- Equipment Repair Parts Availability (G: .120)
- Equipment Age and General Condition (G: .050)
- Collateral Damage (G: .270)
- Skills Availability (G: .240)
Pair-wise Comparisons

• Pair-wise comparisons involves comparing every alternative to every other alternative for head to head comparisons.

• Pair-wise comparisons.
  – Allows team participation.
  – Minimizes manipulation/inconsistency often found in other weighting structure methods.
  – Fast and easily understood by all.
Which of the items below pose the greatest risk to your continued existence on the planet?

<table>
<thead>
<tr>
<th>Item</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eating two Krispy Kreme donuts daily</td>
<td>1</td>
</tr>
<tr>
<td>Bird Flu Pandemic</td>
<td>2</td>
</tr>
<tr>
<td>Global Thermal Nuclear War</td>
<td>3</td>
</tr>
<tr>
<td>Flying commercially once per week</td>
<td>4</td>
</tr>
</tbody>
</table>
Analytic Hierarchy Process

- Uses pair-wise comparisons as a basis.
- Creates a value structure that is prioritized through pair-wise comparisons.
- Projects are selected through head to head comparison against the prioritized values.
- Can be implemented with Microsoft Excel.
The Analytic Hierarchy Process sounds complex but it is simple

• Saaty, inventor of the Analytic Hierarchy Process, got it from his Grandma.

... It dawned on Saaty that what he needed—and what Grandma had come up with in a rudimentary way—was a process that captured intensities of human feeling and assigned them numerical values.

May 10, 1999 Fortune Magazine.
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Why is AHP superior to most decision tools?

• Allows comparison of Quantitative versus Qualitative factors.
  – Ability to compare apples and oranges.
  – Ability to compare apples to apples.
• The hierarchal structure effectively manages complexity.
• Process has a history of success in government and industry.
Why is AHP superior to most decision tools?

• Measures consistency of decision maker(s) with respect to objectives and alternatives.
• Provides for complete analysis of decision.
  – Sensitivity Analysis.
  – Ability to separate individuals from group.
• Synthesizes judgment/data of experts and stakeholders.
  – Establishes “Buy In.”
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Analytic Hierarchy Process

- Money
- Job Security
- Benefits
- Salary
- Emotional Stress
- Consulting Firm
- Federal Executive
- Faculty Position
- Family Life
- Work Environment
- Travel
- People Quality

Focus

Attributes

Subattributes

Alternatives
An analytic hierarchy process (AHP) is a structured technique for organizing and analyzing complex decisions. It uses a pair-wise comparison of criteria and sub-criteria to determine relative priorities.

The method involves the following steps:

1. **Define the problem**: Clearly define the decision problem.
2. **Construct the hierarchy**: Organize the criteria and sub-criteria in a hierarchical structure.
3. **Pair-wise comparisons**: Compare each criterion against every other criterion (and sub-criteria against each other) using a scale of 1 to 9, where 1 means equal importance and 9 means one criterion is extremely more important than the other.
4. **Calculate the weights**: Use thepair-wise comparisons to calculate the weights of the criteria.
5. **Consistency check**: Ensure the consistency of the pair-wise comparisons through the consistency ratio.
6. **Synthesize the results**: Combine the weighted criteria to arrive at a final decision.

### Analytic Hierarchy Process

**Degrees of Preference.**

- 9 » absolutely more important/preferred.
- 7 » very strongly more important/preferred.
- 5 » strongly more important/preferred.
- 3 » weakly more important/preferred.
- 1 » equally more important/preferred.

Even numbers may be used to break ties.
Analytic Hierarchy Process

• The successful AHP process establishes “buy in” and is typically characterized by:
  – Brainstorming.
  – Structure.
  – Evaluation.

• All stakeholders should be included in the process above.

• Several iterations may be necessary.
Building a Model

- **Top Down Structuring.**
  - Use the top down structure methodology when there is knowledge about your objectives.

- **Bottom Up Structuring.**
  - Use the bottom up structure methodology when there is more information or knowledge about the alternatives.
  - Use alternative pros and cons to lead to objective development.
## Value Based Project Selection

One School District’s Example

### Table: New: Project Costs & Available Revenues

<table>
<thead>
<tr>
<th>AHP Score</th>
<th>Ranking Order</th>
<th>Current Budget</th>
<th>Relative Benefit to Cost Ratio</th>
<th>Running Total of Value Ranked Projects</th>
<th>Number of Projects</th>
</tr>
</thead>
<tbody>
<tr>
<td>31.2%</td>
<td>24</td>
<td>$700,000</td>
<td>14.263</td>
<td>$700,000</td>
<td>1</td>
</tr>
<tr>
<td>39.4%</td>
<td>16</td>
<td>$1,500,000</td>
<td>8.405</td>
<td>$2,200,000</td>
<td>2</td>
</tr>
<tr>
<td>35.3%</td>
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<td>$1,500,000</td>
<td>7.531</td>
<td>$3,700,000</td>
<td>3</td>
</tr>
<tr>
<td>51.6%</td>
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<td>$2,452,683</td>
<td>6.732</td>
<td>$6,152,683</td>
<td>4</td>
</tr>
<tr>
<td>31.2%</td>
<td>24</td>
<td>$1,500,000</td>
<td>6.656</td>
<td>$7,652,683</td>
<td>5</td>
</tr>
<tr>
<td>38.6%</td>
<td>18</td>
<td>$2,200,000</td>
<td>5.615</td>
<td>$9,852,683</td>
<td>6</td>
</tr>
<tr>
<td>7.5%</td>
<td>38</td>
<td>$500,000</td>
<td>4.800</td>
<td>$10,352,683</td>
<td>7</td>
</tr>
<tr>
<td>47.5%</td>
<td>9</td>
<td>$3,500,000</td>
<td>4.343</td>
<td>$13,852,683</td>
<td>8</td>
</tr>
<tr>
<td>32.4%</td>
<td>21</td>
<td>$2,439,570</td>
<td>4.250</td>
<td>$16,292,253</td>
<td>9</td>
</tr>
<tr>
<td>19.2%</td>
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<td>$1,500,000</td>
<td>4.096</td>
<td>$17,792,253</td>
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</tr>
<tr>
<td>8.2%</td>
<td>37</td>
<td>$800,000</td>
<td>3.280</td>
<td>$18,592,253</td>
<td>11</td>
</tr>
<tr>
<td>49.2%</td>
<td>7</td>
<td>$5,227,303</td>
<td>3.012</td>
<td>$23,819,556</td>
<td>12</td>
</tr>
<tr>
<td>31.2%</td>
<td>24</td>
<td>$3,975,288</td>
<td>2.512</td>
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</tr>
<tr>
<td>7.5%</td>
<td>38</td>
<td>$1,000,000</td>
<td>2.400</td>
<td>$28,794,844</td>
<td>14</td>
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<tr>
<td>38.7%</td>
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<td>$5,747,581</td>
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<tr>
<td>45.5%</td>
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<td>$7,282,638</td>
<td>1.999</td>
<td>$41,825,063</td>
<td>16</td>
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<td>$13,964,012</td>
<td>1.490</td>
<td>$55,789,075</td>
<td>17</td>
</tr>
</tbody>
</table>
Common Pitfalls

- Failure to KISS.
- Poor communication during development.
- Predetermined outcomes.
  - Let's make a model to justify our decision.
- Lack of “buy in.”
  - People excluded from the process.
  - Rushing the process.
  - Poor facilitation skills.
Positive Outcomes

• Establishment and communication of values lead to projects being brought forward that truly warranted consideration.

• The project selection process went from a “black box” to a credible process that is traceable.

• Stakeholders understand why their project was not selected.
Summary of Positive Outcomes

• Bottom Line
  – Once the value structure is defined the selection process is fast.
  – The amount of time spent politicking and dealing with politics is minimized.
  – Provides the three C’s of a good decision.
    • Consistency, Credibility, Consensus.
Questions

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