A Multi-Objective Market Assessment Process

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Obligatory Dilbert

Uh-oh, someone wants me to make a decision.

I summon the dark demon of ineffective management to smite the person who wants this decision!!!

Maybe I could help you make the decision.

I requested smiting.
BFGoodrich Aerospace Engineered Polymer Products (EPP) Division had developed a new product, FyreRoc that has a significant number of market applications.

Specific target market sectors/applications for FyreRoc had been identified.

EPP management realized that internal resources are not available to immediately exploit every attractive opportunity.

- A complex range of business objectives and technology factors (decision elements) come into play when evaluating the set of market sector candidates.
- The EPP management team needed a way of optimally integrating the decision elements in order to prioritize the market segments, yielding a portfolio of opportunities aligned to maximize corporate return at an acceptable level of investment risk.
Market Assessment Objective & Strategy

- Determine the best market opportunities for the FyreRoc product

- Build a multi-objective market assessment model that incorporates the decision elements identified by EPP management
  - Facilitated sessions with the management team

- Weigh the decision elements based on their importance to individual market sector success
  - Use the Analytic Hierarchy Process – Team Expert Choice for collaborative weighing

- Rate the candidate market sectors against the weighted decision elements
  - Collaboration - Team Expert Choice

- Identify high value opportunities that may be exploited through tactical investing
  - Facilitated session to review results and determine action items/next steps

- Output - prioritized market opportunity profile that will maximize corporate return at an acceptable level of investment risk
  - Build credible investment “Story” for corporate management
Market Assessment Approach

- Markets & Competition
- Internal Competencies
- Financial Analytics
- Market Opportunity Model
- Prioritized Market Opportunities
Market Assessment – 2D Decomposition

- Market Attractiveness
- Competitive Position

Decision Drivers
Market Attractiveness
Structuring

Market Attractiveness Drivers

<table>
<thead>
<tr>
<th>Elements</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market Size</td>
<td>Current size of available market in $ or units</td>
</tr>
<tr>
<td>Growth Rate</td>
<td>Compounded annual market growth rate (%)</td>
</tr>
<tr>
<td>Profitability</td>
<td>Preferred financial measure</td>
</tr>
<tr>
<td>Technology Fit</td>
<td>Existing company technical competencies or strengths</td>
</tr>
<tr>
<td>Strategic Fit</td>
<td>Existing company strategy/mission</td>
</tr>
<tr>
<td>Competition</td>
<td>Preferred competitive environment</td>
</tr>
<tr>
<td>Suppliers/Partners</td>
<td>Bargaining power, quality/availability of suppliers/partners</td>
</tr>
<tr>
<td>Externalities</td>
<td>Ability to deal with external factors (gov't regs, laws, trends, unions, environment)</td>
</tr>
</tbody>
</table>
Competitive Position Structuring

Competitive Position Drivers

<table>
<thead>
<tr>
<th>Elements</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MARKET SHARE</td>
<td>PERCENT SHARE OF THE MARKET COMPARED TO COMPETITORS</td>
</tr>
<tr>
<td>GROWTH RATE</td>
<td>% GROWTH RATE OF SHARE OF MARKET COMPARED TO COMPETITORS</td>
</tr>
<tr>
<td>PROFITABILITY</td>
<td>FINANCIAL SUCCESS COMPARED TO COMPETITORS</td>
</tr>
<tr>
<td>TECHNOLOGY FIT</td>
<td>FIT OF YOUR TECHNICAL COMPETENCIES COMPARED TO COMPETITORS</td>
</tr>
<tr>
<td>STRATEGIC FIT</td>
<td>FIT OF YOUR EXISTING STRATEGY/VISION COMPARED TO COMPETITORS' STRATEGY</td>
</tr>
<tr>
<td>COMPETITION</td>
<td>ABILITY TO DEAL WITH COMPETITIVE ENVIRONMENT COMPARED TO COMPETITORS</td>
</tr>
<tr>
<td>SUPPLIERS/PARTNERS</td>
<td>ABILITY TO GAIN ADVANTAGE WITH SUPPLIERS/PARTNERS COMPARED TO COMPETITORS</td>
</tr>
<tr>
<td>EXTERNALITIES</td>
<td>ABILITY TO DEAL WITH EXTERNALITIES COMPARED TO COMPETITORS</td>
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</tbody>
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Market Assessment Weighing Process

Prioritized market attractiveness criteria

- EPP management determines the relative importance of the attractiveness criteria.
  - Paired comparison process identifies high impact decision elements and focuses discussion of the team.
  - Communicates strategic direction throughout the organization.

Prioritized competitiveness criteria

- EPP management determines the relative importance of the competitiveness criteria.
  - Identifies the organization’s most effective weapons to win in this marketplace.
  - Determines how the organization positions itself in the marketplace.
AHP Model Hierarchy

Objectives and structure determined by the management team

Facilitated through structured collaboration: pro/con assessments, affinity diagramming

Team Expert Choice software used for model management
Group Weighing of Market Attractiveness

“It’s the process not the product – most of the time...”

- R&D
- Finance
- Manufacturing
- Sales & Marketing
- Management

Pairwise comparisons derive individual and collective weights – isolates contention for resolution

Group Polling
Weighed Market Attractiveness Objectives

Weighed average of group inputs

Individual models automatically generated and maintained
Weighted Competitive Fit Objectives
Attractiveness/Competitive Rankings

### Market Candidates

- Aerospace/Defense
- Industrial Ceramics
- Naval Vessel Bulkheads
- Commercial Marine
- Power Industry Thermal
Competitive Position vs. Market Attractiveness

2 D Market Assessment

Quads
1. Dogs
2. Low Hanging Fruit
3. No Brainers
4. Tactical Opportunities
Competitive Fit - Leveraging Opportunities

Opportunity Chart For each Market Segment

- Illustrates the opportunity to improve EPP’s competitiveness in each market relative to each competitiveness criterion.
  - The longer bars indicate the attributes that should be emphasized in the market communications strategy.

- Provides the necessary direction to formulate strategies in the individual sectors.
  - The shorter bars pinpoint areas of opportunity to improve EPP’s competitive position.
Market Segmentation Profiles

FyreRoc Position Analysis Chart - Commercial Marine Product Application

- The same template can be used to further segment each market sector to determine a sub-segment’s attractiveness and competitiveness.

- For example, The FyreRoc Commercial Marine market can be segmented into Bulkheads, Engine Room Fire Barriers, Piping and Exhaust Stacks applications.
Decision Trees to Value Opportunities

Max $f(\$)$

Recommendation

Explicitly monetize decision elements
Explicitly incorporate risk
Convert $$ returns to “Utils” if required – not easy
Decision Trees and Multi-Objective Modeling to Value Opportunities

Monetize what you can
Incorporate financial metrics into a weighted multi-objective model
Consider non-financial objectives
Evaluate alternatives against the objectives
Recommendation based on total “Value”

Financials
- Min ENPV
- Max Upside Potential
- Min VaR
Observations

- Most important decision problems have objectives that cannot be directly monetized

- All Trade-offs are subjective
  - Management needs a trade-off mechanism

- Multi-objective recommendations are theoretically normative and prescriptive but in reality “approximate” and advisory

- Decision management interventions should be flexible
  - Integrate qualitative/judgmental factors with the analytics

- Partner with the client early in problem definition and solution design
  - The client wants a process that is temporally and intellectually accessible
  - Recommendations are often rejected because something was left out
    - Iterate until clarity is reached

- Active selling/marketing a complement of decision management solutions should be a core competency of both an internal and external consulting practice
Other Applications

- Marketing
  - Value Based Pricing
  - Resource Allocation – Media Selection
  - Regional Analysis

- Procurement
  - Vendor Selection
  - Capital asset selection

- R&D
  - Project Portfolio Analysis
  - Employee Candidate Assessments

- Decision Analysis
  - Subjective Probability Assessments
Backup
Notes on Expert Choice® and the AHP

- Rank reversal is *not* an issue with the EC implementation of AHP analysis
  - Enhanced algorithm introduced 8 years ago to preclude rank reversal
- Expert Choice has a very large user base
- The AHP process is more intuitive for many clients than other methods
- Group enabled EC builds individual traceable models for all participants
- Utility curves can be constructed for assessment
- The pair-wise process isolates specific points of contention
- It is not always necessary to complete an exhaustive pairwise process
- The axioms of AHP (and every compensatory method) are sometimes violated
  - “All models are wrong – some are useful.”