Chapter 8. Project Evaluation and Selection

Case Study: “The Dell Way”

8.1 Making the Right Decisions Up Front

- Net Present value (NPV) Comparison
- Return on Investment (ROI) Comparison
- Cost-Benefits (CB) – the NPV of the total ROS over the project life cycle
- Payback Period (PBP) Comparison
- Pacificio and Sobelman Project Rating

8.2 Quantitative Approaches to Project Evaluation and Selection

8.3 Qualitative Approaches to Project Evaluation and Selection

8.4 Recommendations for Effective Project Evaluations and Selections

- Dell
  - Commodity-Producer Business Model
    - Low-cost commodity production philosophy – that served the company so well for two decades
    - Makes cost-effective computer hardware
  - No. 1 in desktop PCs
  - No. 1 in the U.S. in low-end servers
  - No. 1 in the U.S. in Internet retailing
  - Operating cost soaks up 10 percent of Dell’s $35 billion in revenue
  - Compared with
    - 21 percent at HP
    - 25 percent at Gateway
    - 46 percent at Cisco
  - Dell’s revenue have grown 14 percent, and the company is on track to earn $2 billion in 2004, while the competition is running hundreds of millions in the red
  - Shareholders are willing to pay 36 times price to earnings for the privilege to share in the expectations of gangbuster growth in the years to come.

- Dell’s Challenges
  - Michael Dell & Kevin Rollins, President and CEO:
    - These expectations can’t be met with revenue from PCs alone
    - Dell has had to expand into new products and businesses
    - 2002 -2004 (18 months)
      - Dell announced its entry into a host of new fields of products and services
        - PDAs
        - Printers
        - Hardware for corporate computing networks
  - New vision/strategy
    - The best way to describe us now is as a broad computer systems and service company
  - Dell wants
    - A much larger share of industrial-strength hardware market, at the heart of corporate systems where the stakes and profit margins are higher.
    - Engines that either drive or crash entire businesses
  - New set of enemies and challenges
    - Competing against floundering PC industry
    - Tim Dougherty, Director of Business Strategy of IBM’s server group: “Look at where they came from and where they want to go"
• Mike Winkler, HP Chief Marketing Officer: “Expertise in enterprise computing is not in Dell’s skill set.” “Dell’s archival has finally overextended. “The closest analogy,” he says, “is Napoleon’s invasion of Russia.”
• Predictions: “Could never move into the complex world of corporate computing”

Dell’s Strengths/Advantages – Weaknesses/Disadvantages
• Randy Groves, Vice Presidents and General Manager of Dell’s Enterprise Systems Group: “When it comes to assembling servers, we enjoy all the same advantages from our procurement, logistics and manufacturing capabilities as we do from PC making.”

Advantages/Strengths
• Lower product & service costs: Procurement, Logistics, and Manufacturing capabilities

Disadvantages
• Many of the servers that Dell tries to replace run on Proprietary Technology, such as IBM’s Power4 microprocessors; or various flavors of UNIX operating systems.
• Selling into these established markets is a problem for Dell, which opted for de facto industry standards, such as Intel microprocessors and Windows or Linux operating system.

• Dell Bet on the notion that in a world dominated by standard platforms, hardware running the platform eventually becomes a commodity, and the most important criterion for choosing a vendor is PRICE. And when comes to price Dell can compete with anyone.

Dell has been right, with success in many of its new Business Ventures
• Servers
  • Passing HP as the top provider of Intel-based servers, with one-third market share

Dell’s Failures and Corrected Actions
• Storage Systems – that house enterprise’s most crucial data
  • No standard storage technologies
  • Dell tried first unsuccessfully to develop a system in-house, and quickly realized that it didn’t have the EXPERTISE
  • Purchased network storage specialist ConvergeNet Technologies for $332 million a few years ago, and found the complex storage technology made a poor fit with Dell’s Commodity-Producer Business Model.
• Investment – written off as a loss
• Accepted the closest thing to an industry standard, the storage systems built by industry leader EMC.
• Eventually agreed to co-market its midrange Clarion storage system as a joint-venture until 2006

Lesson Learned
• Jumping into a new product sector, unprepared for some surprise and market realities
• The ECM-Dell joint-venture seems to be working
• The deal brought a new partner
• Yet, technology is not standing still. New and cheaper networked storage technologies become standard, Dell will be the logical winner.

Current Approaches
• Routers and switches of corporate network – moving more cautiously
• Sole offering PowerConnect switch family, a low-cost version of dominant products by Cisco, 3Com, Enterasys, and Nortel
8.1 Making the Right Decisions Up Front

Company’s Business Model

Many Projects involve

- Standards
- Technologies
- System Acquisitions
- Joint venture

Project Opportunities must be analyzed relative to their

- Potential value
- Strength
- Importance to the enterprise

Consequences of Pursing Wrong Project

- Drain company resources
- Miss alternative opportunities
- Operate less flexibility and responsively in the market place
- Miss opportunities for leveraging core competence

Four Major Dimensions Should be considered

1. The added value of the new project
2. The cost of the project
3. The readiness of the enterprise to execute the project
4. Management desire

Project Decisions can be broken down into four principle categories:

1. Deciding Initial Feasibility
2. Deciding Strategic Value to Enterprise
3. Deciding Detailed Feasibility
4. Deciding Project Go/No-Go

Developing meaningful support data is a complex, expensive, time-consuming process. The decision making requires the following inputs:

- Specific resource requirements [Costs]
- Specific implementation risks [Risks]
- Specific benefits (economics, technology, markets, etc) [Benefits]
• Benchmarking and comparative analysis
• Strategic perspective

Defining a meaningful Aggregate Measure for Rating Project Value and Success

**Table 8.1 Typical Criteria for Project Evaluation and Selection**

- Development cost
- Development time
- Technical complexity
- Risk
- Return on investment
- Cost-benefits
- Product life cycle
- Sales volume
- Market share
- Project business follow-on
- Organizational readiness and strength
- Consistency with business plan
- Resource availability
- Cash flow, revenue, and profit
- Impact on other business activities

**Project Evaluation Methods**

- Primarily quantitative and rational approaches
- Primarily qualitative and intuitive approach
- Mixed approaches, combining both quantitative and qualitative methods
8.2 Quantitative Approaches to Project Evaluation and Selection

- The Quantitative Techniques
  - Generate numeric measures for simple and effective Comparison, Ranking, and Selection
  - Help to establish quantifiable norms and standards, and lead to repeatable processes
  - Based on the assumption that the Decision Parameters can actually be quantified and reliably estimated over the project life cycle. These include:
    - Cash flow
    - Risks
    - Underlying economic, social, political, and market factors
- Favorable to support project evaluation and selections if the decision require economic justification
- Commonly used to support judgment-based project selection
- The Methods
  - Net Present value (NPV) Comparison
  - Return on Investment (ROI) Comparison
  - Cost-Benefits (CB) – the NPV of the total ROI over the project life cycle
  - Payback Period (PBP) Comparison
  - Pacificio and Sobelman Project Rating

Table 8.2 Description of Four Project Proposals

- Project Option P1 – Do not accept any new project proposal. Reasons:
- Project Option P2 – The opportunity requires $1,000 investment at the beginning of the first year and generates a $200 revenue at the end of each of the following 5 years.
- Project Option P3 - The opportunity requires $2,000 investment at the beginning of the first year and generates a variable stream of net revenue at the end of the next 5 years as follows: $1,500, $1,000, $800, $900, $1,200.
- Project Option P4 - The opportunity requires $5,000 investment at the beginning of the first year and generates a variable stream of net revenue at the end of the next 5 years as follows: $1,000, $1,500, $2,000, $3,000, $4,000.

8.2.1 Net Present Value (NPV) Comparison

- Uses discounted cash flow as the basis for comparing the relative merits of alternative project opportunities
- Assumes that all investment costs and revenues are known and that economic analysis is a valid basis for project selection
- Determine
  - The Net Present Value (NPV) of a single revenue, Stream of future revenues, or Costs expected in the future
Terms:

- MARR (Minimum Attractive Rate of Return)
- IRR (Internal Rate of Return)
- A – annuity
- i - Interest
- Net Cash Flow
- NPV|_{N\rightarrow5} - Net Present Value
- NPV|_{N\rightarrow\infty}
- ROI|_{N\rightarrow5}
- CB = ROI_{NPV|N=5} - Cost benefits

Present Worth:

\[ PW(A|i,n) = PW = A \frac{1}{(1+i)^n} \]

Net Present Value:

\[ NPV(A_n|i,N) = \sum_{n=1}^{N} A_n \frac{1}{(1+i)^n} = \sum_{n=1}^{N} PW_n \]

NPV Special Case 1: for a uniform series of revenue or costs over N periods:

\[ NPV(A_n|i,N) = A \frac{(1+i)^{N-1}}{i \cdot (1+i)^N} \]

NPV Special Case 2: for an annuity or interest rate i approaching zero:

\[ NPV = A \cdot N \]

NPV Special Case 3: for the revenue or cost series to continue forever:

\[ NPV = \frac{A}{i} \]

8.2.2 Return on Investment (ROI) Comparison

Return on Investment (ROI)

\[ ROI = \frac{Revenue - Cost}{Investment} \]

The Average ROI Per Year
8.2.3 Cost Benefits

Cost Benefits (CB): the NPV of the total ROI over the project’s life cycle

\[
CB = \frac{\sum_{i=1}^{N} NPV(A_n, I_n | i, N)}{\sum_{i=1}^{N} NPV(I_n | i, N)}
\]

8.2.4 Payback Period (PBP) Comparison

\[
N_{PBP} \gg \text{when } \sum_{i=1}^{N} NPV(A_n | i) \geq \sum_{i=1}^{N} NPV(I_n | i)
\]

8.2.5 Pacifico and Sobelman Project Rating

Project Rating Factor (PR) – by Carl Pacifico for assessing chemical products and predicting commercial success:

\[
PR = \frac{pT \cdot pC \cdot R}{TC}
\]

where

- \( pT \) is the probability of technical success [0.1 < pT < 1.0]
- \( pC \) is the probability of commercial success [0.1 < pC < 1.0]
- \( R \) is the total net revenue over project life cycle
- \( TC \) is the total capital investment for product development, manufacturing setup, marketing, and related overhead

Modified Cost-Benefits measures that takes into account both the development time and commercial life of the product, by Sobelman:

\[
z = (P * T_{LC}) - (C * T_D)
\]

where

- \( P \) is the average profit per year
- \( T_{LC} \) is the estimated product life cycle
- \( C \) is the average development cost per year
- \( T_D \) is the years of development
8.2.6 Going Beyond Simple Formulas

Table 8.4 Comparisons of Quantitative and Qualitative Approaches to Project Evaluation

- Benefits
- Limitations
8.3 Qualitative Approaches to Project Evaluation and Selection

8.3.1 Collective, Multifunctional Evaluations

- Subject experts from various functional areas to collectively define and evaluate broad project success criteria, employing both quantitative and qualitative methods.
- For a typical New Product Development project, it may include evaluators from
  - Marketing
  - Customer Services
  - Product Assurance
  - R&D
  - Engineering
  - Testing
  - Manufacturing
- These evaluator should have the responsibility for ultimate project implementation
- Evaluation Factors
  - Three-types of evaluation factor
    - A 10-point scale, ranging from +5 = most favorable to -5 = most unfavorable
    - A 3-point scale, +1 = favorable, 0 = neutral or can’t judge, -1 = unfavorable
    - A 5-point scale
      - A = highly favorable
      - B = favorable
      - C = marginally favorable
      - D = most likely unfavorable
      - E = definitely unfavorable
- Evaluation Score
  - Given individually scores
  - 1st round collectively discussion
    - Project alternatives
    - The markets
    - Business opportunities
    - Technology involved
    - Recommend
      - Actions needed for better assessment of the project
      - Additional data needed
      - Suggestions that would enhance project success and evaluation score
  - Three to five iteration of meetings before a project selection can be finalized
8.4 Recommendations for Effective Project Evaluations and Selections

References


