Organization Strategy and Project Selection

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This presentation uses information from slides provided with the textbook Project Management: The Managerial Process

By: Clifford F. Gray and Eric W. Larson
The Strategic Management Process: An Overview

• Strategic Management
  – Provides the theme and focus of the future direction for the firm.
    • Responding to changes in the external environment—environmental scanning
    • Allocating scarce resources of the firm to improve its competitive position—internal responses to new action programs
  – Requires strong links among mission, goals, objectives, strategy, and implementation.
Strategic Management Process

• Four of Activities of the Strategic Management Process

  1. Review and define the organizational mission.
  2. Set long-range goals and objectives.
  3. Analyze and formulate strategies to reach objectives.
  4. Implement strategies through projects
Portfolio of Projects by Type

- Compliance (must do) projects
- Strategic projects
- Operational projects
Benefits of Project Portfolio Management

• Builds discipline into project selection process.
• Links project selection to strategic metrics.
• Prioritizes project proposals across a common set of criteria, rather than on politics or emotion.
• Allocates resources to projects that align with strategic direction.
• Balances risk across all projects.
• Justifies killing projects that do not support organization strategy.
• Improves communication and supports agreement on project goals.
A Portfolio Management System

• Selection Criteria
  – **Financial:** payback, net present value (NPV), internal rate of return (IRR)
  – **Non-financial:** projects of strategic importance to the firm.

• Multi-Weighted Scoring Models
  – Use several weighted selection criteria to evaluate project proposals.
Financial Analysis

The table below shows the cash flows associated with 6 mutually exclusive investment opportunities. If the MARR is 10%, identify the feasible alternatives and choose the best one. All alternatives have a useful life of 10 years.

<table>
<thead>
<tr>
<th>Alternative</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capital Investment (P)</td>
<td>-$900</td>
<td>-$1,500</td>
<td>-$2,500</td>
<td>-$4,000</td>
<td>-$5,000</td>
<td>-$7,000</td>
</tr>
<tr>
<td>Annual Revenue (A)</td>
<td>$150</td>
<td>$276</td>
<td>$400</td>
<td>$925</td>
<td>$1,125</td>
<td>$1,425</td>
</tr>
</tbody>
</table>

The key to solving this problem is to realize that each alternative provides us with an opportunity to invest P for an annual return of A. Acceptable alternatives are those that allow us to realize 10% or more on our investment (P). In other words, we are trying to judge whether it is better to invest P at the rate of \( i \times (10\%) \), or invest it for the return of A every period (accept the alternative).
Present Worth (PW) Comparisons

Present worth evaluations assess the value of all cash flows at time 0. In the given problem, we are trying to evaluate whether an annual return (A) realizes a specific return (profit, \(i\)) on an initial investment (P).

The PW of the given cash flows is:

\[
PW = -P + A \left( \frac{P}{A}, i, 10 \right).
\]

A positive PW \([A \left( \frac{P}{A}, i, 10 \right) > P]\) indicates that the investment opportunity provides an annual return that is higher than investing the amount P at the MARR \((i)\). In other words, the given return \((A)\) realizes a higher profit than the targeted \((i)\), and accordingly a favorable investment opportunity for P. Another way to look at a positive PW is that the targeted return rate \((i)\) may be realized with a smaller investment \((P-PW)\).

A PW of 0 indicates that the investment opportunity realizes exactly the targeted return rate \((i)\), and hence, a borderline investment opportunity.

A negative PW \([A \left( \frac{P}{A}, i, 10 \right) < P]\) indicates that the rate of return is less than the targeted \((i)\), and accordingly an unacceptable investment opportunity. In other words, it is better to invest the amount P at the rate \(i\) than to invest it for an annual return of A.

For both cases when PW \(\neq 0\), the IRR method may be used to calculate the exact rate of return.
Future Worth (FW) Comparisons

Future worth evaluations assess the value of all cash flows at time \( n \). In the given problem, we are trying to evaluate whether an annual return (A) realizes a specific return (profit, \( i \)) on an initial investment (P).

The FW of the given cash flows is:

\[
FW = -P(F/P, i, 10) + A(F/A, i, 10).
\]

A positive FW \([A(F/A, i, 10) > P(F/P, i, 10)]\) indicates that the future value of the annuity (A) is higher than that of the initial investment (P), and hence, a favorable investment opportunity. In other words, getting A every period is better than investing P at the MARR (\( i \)). It also means that the given return (A) realizes a higher profit than the targeted (\( i \)).

A FW of 0 indicates that the investment opportunity realizes exactly the targeted return rate (\( i \)), and hence, a borderline investment opportunity.

A negative FW \([A(F/A, i, 10) < P(F/P, i, 10)]\) indicates that the rate of return is less than the targeted (\( i \)), and accordingly an unacceptable investment opportunity. In other words, it is better to invest the amount P at the rate \( i \) than to invest it for an annual return of A.

For both cases when \( FW \neq 0 \), the IRR method may be used to calculate the exact rate of return.
Annual Worth (AW) Comparisons

Annual worth evaluations assess the annual resultant of all cash flows. In the given problem, we are checking that the offered annuity is at least equal to the annuity we could get by investing $P$ at the MARR ($i$). Accordingly, the AW of the given cash flows is defined as:

$$AW = -P(A/P, i, 10) + A.$$

A positive AW [$A > P (A/P, i, 10)$] indicates that the offered annuity is greater than what we could get by investing $P$ at the MARR ($i$), and hence, a favorable investment opportunity. In other words, getting $A$ every period is better than investing $P$ at the MARR ($i$). It also means that the given return ($A$) realizes a higher profit than the targeted ($i$).

An AW of 0 indicates that the investment opportunity realizes exactly the targeted return rate ($i$), and hence, a borderline investment opportunity.

A negative AW [$A < P (A/P, i, 10)$] indicates that the rate of return is less than the targeted ($i$), and accordingly an unacceptable investment opportunity. In other words, it is better to invest the amount $P$ at the rate $i$ than to invest it for an annual return of $A$.

For both cases when $AW \neq 0$, the IRR method may be used to calculate the exact rate of return.
Internal Rate of Return (IRR) Comparisons

IRR evaluations assess the rate of return at which the net cash flow is equal to zero. It is the rate at which the net worth (Present, Future, or Annual) of all cash flows equals 0. A favorable opportunity exists when \( \text{IRR} \geq \text{MARR} \).

In our case, IRR is the actual interest at which a one time deposit \( P \) results in an annual return of \( A \).

Notice that:

- \( \text{PW, FW, AW} > 0 \) correspond to \( \text{IRR} > \text{MARR} \),
- \( \text{PW, FW, AW} < 0 \) correspond to \( \text{IRR} < \text{MARR} \),
- \( \text{PW, FW, AW} = 0 \) correspond to \( \text{IRR} = \text{MARR} \).

In other words, a negative \( \text{PW, FW, or AW} \) does not necessarily mean a loss, but merely a return rate that is smaller than the MARR.
The table below shows the results of the various calculations. Alternative C may be rejected based on its negative net worth. Notice, however, that this doesn’t mean it is unprofitable. It only means that its profit (internal rate of return) is less than the MARR.

<table>
<thead>
<tr>
<th>Alternative</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>PW</td>
<td>21.69</td>
<td>195.90</td>
<td>-42.17</td>
<td>1683.72</td>
<td>1912.64</td>
<td>1756.01</td>
</tr>
<tr>
<td>FW</td>
<td>56.25</td>
<td>508.12</td>
<td>-109.39</td>
<td>4367.15</td>
<td>4960.89</td>
<td>4554.63</td>
</tr>
<tr>
<td>AW</td>
<td>3.53</td>
<td>31.88</td>
<td>-6.86</td>
<td>274.02</td>
<td>311.27</td>
<td>285.78</td>
</tr>
<tr>
<td>IRR</td>
<td>10.558%</td>
<td>12.961%</td>
<td>9.606%</td>
<td>19.097%</td>
<td>18.314%</td>
<td>15.566%</td>
</tr>
</tbody>
</table>

Among all remaining alternatives, E is the best followed by F, D, B, A, respectively. PW, FW, AW results all point to the same ranking. IRR results, however, lead to a different ranking. In the table above, while D has a higher IRR, it is applied to a smaller investment (4,000), while the slightly lower rate of E gives a higher overall return when applied to the higher investment (5,000), and hence, E is better than D. Accordingly, IRR can only be used in relative comparisons (see next slide).
Relative Comparison Results (IRR)

In relative comparisons, alternatives are ranked in an ascending order of their initial investments. The IRR of the difference cash flows between the first two alternatives is evaluated. If the resulting IRR is greater than the MARR, the second alternative is better and is used as a base for further comparisons.

The relative IRR results in the table below agree with those of the net worth methods.

<table>
<thead>
<tr>
<th>Alternative</th>
<th>B-A</th>
<th>D-B</th>
<th>E-D</th>
<th>F-E</th>
<th>F-D</th>
</tr>
</thead>
<tbody>
<tr>
<td>IRR</td>
<td>16.401%</td>
<td>22.567%</td>
<td>15.098%</td>
<td>8.144%</td>
<td>10.558%</td>
</tr>
</tbody>
</table>

Check Excel Sheet for Examples