(1) Project Phase 3: cash flow analysis

(2) Financial Strategy: How Financing Works

- capital structure
- a 1-year business cycle
- financial metrics
(1) Project Phase III -

Cash Flow Analysis

Teams need to estimate your expenses (negative cash flow) and your revenues (positive cash flows) for 3-5 years.

Organize expenses by activity

(1) Product Development
   - People (e.g., designers, engineers); how many? (e.g., 5-10) and salaries (e.g., $50,000-
     $100k)
   - Equipment: software, desktops, laptops, servers, 3D printers, etc.
   - Facilities: 100-200 ft² per person @ $25/sq ft per month

(2) Product Manufacturing
   - # of units
   - Manufacturing cost per unit
   - Transportation cost (shipping units)
(3) Marketing & Sales
   - People (salespeople); how many;
   - Salary (depends on product);
   - Advertising campaigns; how many impressions; cost per impression ($2.5 for 1000)

(4) Management & Support
   - People (e.g., CEO, CFO, CTO); how many and salaries
   - Legal
   - HR (hiring, firing, workplace issues)

Estimate Revenue based on Business Goals, Market Strategy, Product Strategy

(1) Estimate the total (cumulative) target market size ($) for 3-5 years

Source: Market Strategy & Revenue Map

n = number of years in the projection (3-5)

total market size = \( \sum_{n=0}^{n} \text{target market size \times (1 + growth rate)}^{n} \)
(2) Forecast revenue for 3-5 years

\[ \text{Revenue} = \text{Total market size} \times \text{Desired market share} \]

(3) Determine the Price per unit

Source: Product Strategy, Market Strategy (4 Ps)

(4) Determine Sales Volume

\[ \text{Sales Volume} = \frac{\text{Revenue}}{\text{Price per unit}} \]

For sales volume, use the product lifecycle analysis:

- **Cumulative sales**
- **Time**
  - Introductory
  - Growth
  - Maturity
  - Decline
Suggestions:

(1) Review the new handout on cash flow analysis

(2) Use Excel to generate your cash flow model

(3) Work "top-down" and "bottom up"

market

\[
\text{Business goals} \\
\text{Revenue} \\
\text{Price per unit} \\
\text{Sales volume}
\]

do 2-3 iterations
(2) Financial strategy: Financing

Capital structure of a company refers to how the company is financed.

Companies are financed from two sources:

The company's owners (shareholders) financially contribute cash, which is called equity capital.

Financial institutions (e.g., banks) lend money to the company (debt holders), contributing cash, which is called debt capital.

The capital structure of a company is the debt-to-equity ratio:

\[
\frac{\text{debt capital}}{\text{equity capital}}
\]
A high debt/equity ratio => more earning potential but more risk
- called "being leveraged"

"Typical" DE ratios depend on markets,
e.g. hardware companies > software companies

why? ... inventory & machinery can be sold to cover debts.
A 1-year business cycle

Turning capital into profits
(call #’s in $1,000s)

Loan interest (25) ←

STEP 1: Raise capital
Equity: 500
Debt: 500
Total: 1,000

STEP 2: Create assets
- Product Development
- Product Manufacturing
- Equipment
- Facilities
  Total: $1,000

STEP 3: Make sales
- Sales of the product
- Licensing technology to others
  Total Revenue: 500

STEP 4: Determine profits: revenue - costs
  costs: 400
  Total profit = 100

Retained earnings (50)

Dividends to shareholders (50)
Financial metrics for assessing a company

(1) Capital structure: \[ \frac{\text{debt}}{\text{equity}} \]

Ex: \[ \frac{5\,000}{5\,000} = 1 \]

(2) Return on assets (ROA) = \[ \frac{\text{Revenue}}{\text{Assets}} \]

Ex: \[ \frac{5\,000}{10\,000} = 0.5 \text{ or } 50\% \]

(3) Profit Margin = \[ \frac{\text{Profit}}{\text{Revenue}} \]

E.g: \[ \frac{1\,000}{5\,000} = 20\% \text{ (Very good)} \]

(4) Retention Rate = \[ \frac{\text{Retained Earnings}}{\text{Profit}} \]

E.g: \[ \frac{5\,000}{10\,000} = 50\% \]
(5) Return on invested capital (ROIC)

\[
\text{ROIC} = \frac{\text{Profit}}{\text{Invested capital}}
\]

\[\text{e.g., } \frac{100k}{1,000k} = 10\% \quad \text{(very good)}\]

(6) Return on Equity (ROE)

\[
\text{ROE} = \frac{\text{Profit}}{\text{Equity capital}}
\]

\[\text{e.g., } \frac{100k}{500k} = 20\% \quad \text{(very good)}\]

(7) Return on Debt

\[
\text{ROD} = \frac{\text{Profit}}{\text{Debt capital}}
\]

\[\text{e.g., } \frac{100k}{500k} \geq 20\%
\]

(8) Equity cost (%)

\[
\text{Equity cost} = \frac{\text{Dividends}}{\text{Equity capital}}
\]

\[\text{e.g., } \frac{50k}{500k} = 10\%
\]

(9) Debt cost (%)

\[
\text{Debt cost} = \frac{\text{Interest payments}}{\text{Debt capital}}
\]

\[\text{e.g., } \frac{2.5k}{500k} = 5\%\]
(10) Weighted average cost of capital

\[ WACC : \left( \left( \frac{\text{equity capital}}{\text{invested capital}} \right) \times \text{equity cost(\%)} \right) + \left( \left( \frac{\text{debt capital}}{\text{invested capital}} \right) \times \text{debt cost(\%)} \right) \]

\[ = \left( \frac{\$500K}{\$1,000K} \times 10\% \right) + \left( \frac{\$500K}{\$1,000K} \times 5\% \right) = 7.5\% \]