Abstract

This document explains how simple financial estimates can be made by system architects. These simplistic estimates are useful for an architect to perform sanity checks on proposals and to obtain understanding of the financial impact of proposals. Note that architects will never have full fledged financial controller know how and skills. These estimates are zero order models, but real business decisions will have to be founded on more substantial financial proposals.
Product Margin = Sales Price - Cost

Material
Labour
Miscellaneous
Margin
Retailer margin and costs

Margin per product.
The margin over the sales volume, must cover the fixed costs, and generate profit transportation, insurance, royalties per product, ...

Cost per product, excluding fixed costs
Purchase price of components may cover development cost of supplier

Simplistic Financial Computations for System Architects.
Gerrit Muller
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SFCmargin
Profit as function of sales volume

\[ \text{Income} \] \quad \text{Expenses} \quad \text{Profit} \\
\text{Fixed Costs} \quad \text{Variable Costs} \\
\text{Break Even Point} \\
\text{Expected Sales Volume} \\
\text{Sales Volume in Units}
Investments, more than R&D

- financing
- marketing, sales
- training sales & service
- NRE: outsourcing, royalties
- research and development

**business dependent:**
- pharmaceutics industry
- sales cost >> R&D cost

**strategic choice:**
- NRE or per product

**including:**
- staff, training, tools, housing
- materials, prototypes
- overhead
- certification

often a standard staffing rate is used
that covers most costs above:
R&D investment = Effort * rate
Income, more than product sales only

- **other recurring income**
  - services
  - options, accessories
  - products

\[
\sum_{\text{services}} \text{income}_{\text{service}}
\]

\[
\sum_{\text{options}} \text{sales price}_{\text{option}} \times \text{volume}_{\text{option}}
\]

\[
\text{sales price}_{\text{product}} \times \text{volume}_{\text{product}}
\]

license fees
pay per movie
content, portal updates
maintenance
### The Time Dimension

<table>
<thead>
<tr>
<th>Q1</th>
<th>Q2</th>
<th>Q3</th>
<th>Q4</th>
<th>Q1</th>
<th>Q2</th>
<th>Q3</th>
</tr>
</thead>
<tbody>
<tr>
<td>investments</td>
<td>100k$</td>
<td>400k$</td>
<td>500k$</td>
<td>100k$</td>
<td>100k$</td>
<td>60k$</td>
</tr>
<tr>
<td>sales volume (units)</td>
<td>-</td>
<td>-</td>
<td>2</td>
<td>10</td>
<td>20</td>
<td>30</td>
</tr>
<tr>
<td>material &amp; labour costs</td>
<td>-</td>
<td>-</td>
<td>40k$</td>
<td>200k$</td>
<td>400k$</td>
<td>600k$</td>
</tr>
<tr>
<td>income</td>
<td>-</td>
<td>-</td>
<td>100k$</td>
<td>500k$</td>
<td>1000k$</td>
<td>1500k$</td>
</tr>
<tr>
<td>quarter profit (loss)</td>
<td>(100k$)</td>
<td>(400k$)</td>
<td>(440k$)</td>
<td>200k$</td>
<td>500k$</td>
<td>840k$</td>
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<tr>
<td>cumulative profit</td>
<td>(100k$)</td>
<td>(500k$)</td>
<td>(940k$)</td>
<td>(740k$)</td>
<td>(240k$)</td>
<td>600k$</td>
</tr>
</tbody>
</table>

- **cost price / unit = 20k$**
- **sales price / unit = 50k$**

variable cost = sales volume * cost price / unit  
income = sales volume * sales price / unit  
quarter profit = income - (investments + variable costs)
The “Hockey” Stick

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SFOhockeyStick
What if ...?

- Profit: (1M$)
- Loss: (0.5M$)
- Time: delay of 3 months

Early more expensive product + follow-on

- Delay of 3 months
- Original model

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SFHockeyStickWhatIf
Stacking Multiple Developments

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Fashionable financial yardsticks

Return On Investments (ROI)

Net Present Value

Return On Net Assets (RONA) leasing reduces assets, improves RONA

turnover / fte outsourcing reduces headcount, improves this ratio

market ranking (share, growth) "only numbers 1, 2 and 3 will be profitable"

R&D investment / sales in high tech segments 10% or more

cash-flow fast growing companies combine profits with negative cash-flow, risk of bankruptcy