Simplistic Financial Computations for System Architects.

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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

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
Profit as function of sales volume

- Income
- Expenses
- Fixed costs
- Variable costs

Break even point
Expected sales volume
Investments, more than R&D

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

business dependent: pharma 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

\[
\begin{align*}
\text{other recurring income} & \quad \sum \text{income}_{\text{service}} \\
\text{services} & \quad \sum \text{sales price}_{\text{option}} \times \text{volume}_{\text{option}} \\
\text{options, accessories} & \quad \text{sales price}_{\text{product}} \times \text{volume}_{\text{product}} \\
\text{products} & \quad \text{license fees} \\
& \quad \text{pay per movie} \\
& \quad \text{content, portal updates} \\
& \quad \text{maintenance} \\
\end{align*}
\]
## The Time Dimension

<table>
<thead>
<tr>
<th></th>
<th>Q1</th>
<th>Q2</th>
<th>Q3</th>
<th>Q4</th>
<th>Q1</th>
<th>Q2</th>
<th>Q3</th>
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</thead>
<tbody>
<tr>
<td>investments</td>
<td>100k$</td>
<td>400k$</td>
<td>500k$</td>
<td>100k$</td>
<td>100k$</td>
<td>60k$</td>
<td>20k$</td>
</tr>
<tr>
<td>sales volume (units)</td>
<td>-</td>
<td>-</td>
<td>2</td>
<td>10</td>
<td>20</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>material &amp; labour costs</td>
<td>-</td>
<td>-</td>
<td>40k$</td>
<td>200k$</td>
<td>400k$</td>
<td>600k$</td>
<td>600k$</td>
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<tr>
<td>income</td>
<td>-</td>
<td>-</td>
<td>100k$</td>
<td>500k$</td>
<td>1000k$</td>
<td>1500k$</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$</td>
<td>880k$</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>
<td>1480k$</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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Gerrit Muller
What if ...?

- early more expensive product + follow-on
- delay of 3 months
- original model
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