Evaluation methodology for high-tech and innovative R&D projects proposed by SME, Start-up or Spin-off

Peter Erni
The Aim of this Work

Requestor

Funding

Investor
The Aim of this Work

Requestor | Investor
---|---
Funding Request | yes | yes
Funding | no | no
Evaluation Methodology | yes | no
Pure Program Code?

Pure Brain Work?

Both!
① Data Collection
③ Evaluation
Data Collection

Mapping the Request: Who? What? Why?

Evaluation

Funding Request = Overview From + Project Description
Data Collection

Mapping the Request: **Who? What? Why?**

Evaluation

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Units</th>
<th>Parameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>$a_1$ Size</td>
<td>[FTE]</td>
<td></td>
</tr>
<tr>
<td>$a_2$ Experience</td>
<td>[yr] or {1, ..., 3}</td>
<td></td>
</tr>
</tbody>
</table>

```
Size [FTE]
```

```
Experience in a given domain [yr]
```

- newcomer
- Start-up
- Spin-off
- well-established SME

$a_1$ vs. $a_2$
NOW LET'S NOT JUMP TO CONCLUSIONS!
① Data Collection
② Mapping the Request: Who? What? Why?
③ Evaluation

<table>
<thead>
<tr>
<th>Characteristic Parameter</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>$b_1$ $TRL$</td>
<td>${1,\ldots,9}$</td>
</tr>
<tr>
<td>$b_2$ (\frac{\text{turnover}}{\text{project cost}})</td>
<td>${1,\ldots,3}$</td>
</tr>
</tbody>
</table>

$b_1$ vs. $b_2$

- close to market
- low risk to company
- high risk to company
- low maturity, high risk
- medium risk to company
- very high risk to company

turnover / project cost

TRL
1. Data Collection
3. Evaluation

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market Potential</td>
<td>{1, \ldots, 3}</td>
</tr>
<tr>
<td>Time to Market</td>
<td>{1, \ldots, 3}</td>
</tr>
</tbody>
</table>

$c_1$ vs. $c_2$

Time to Market [month]

low Market Potential high

bad case

"small yet fine"

"cash cow"

good case
① Data Collection
② Mapping the Request: **Who? What? Why?**
③ Evaluation

\[ a_1 \text{ vs. } a_2 \]

\[ b_1 \text{ vs. } b_2 \]

\[ c_1 \text{ vs. } c_2 \]
## Data Collection

### Mapping the Request: Who? What? Why?

#### Evaluation

<table>
<thead>
<tr>
<th></th>
<th>WHO</th>
<th>WHAT</th>
<th>WHY</th>
</tr>
</thead>
<tbody>
<tr>
<td>$a_1$</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>$a_2$</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>$a_3$</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>$a_4$</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>$b_1$</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>$b_2$</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>$b_3$</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>$b_4$</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>$c_1$</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>$c_2$</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>$c_3$</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>$c_4$</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

- **2.5** = perfect
- **2** = excellent
- **1.5** = very good
- **1** = good
- **0.5** = barely acceptable to fair
- **0** = „skip“
- **-0.5** = inappropriate
① Data Collection
② Mapping the Request: Who? What? Why?
③ Evaluation

\[ u_{ij} \cdot w_{ij} = r_{ij} \]
1. Data Collection
3. Evaluation
Outcome

e.g. overall score

\[ r_{overall} = \sum_{i=1}^{15} \sum_{j=1}^{15} \sum_{k=1}^{15} r_{ijk} \]
Presenting the Results