The Cost Estimator DOCU: An Empirical and Theoretical Study

Juan José Cuadrado Gallego, Antonio de Amescua Seco,
Javier García Guzmán, Emilio Ernica Lafuente,
María Isabel Sánchez Segura, Tomás San Feliu Gilabert*

Departamento de Informática. Universidad Carlos III de Madrid
*Departamento de LSIIS. Universidad Politécnica de Madrid

Documentation Cost Driver in Modern Estimation Models

- NASA
- MKII
- SEER-SEM
- PRICE-S
- SLIM
- COCOMO II
  - New Cost Driver: DOCU
  - DOCU Range: 1.52
Objective 3. To make the selection of an appropriate value for the cost driver DOCU in each software project easier, redefining the questionnaire proposed in COCOMO II.

Documentation Complexity.

Table 5. Complexity

<table>
<thead>
<tr>
<th>DOCU</th>
<th>Very Low</th>
<th>Low</th>
<th>Nominal</th>
<th>High</th>
<th>Very High</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMPLEXITY</td>
<td>The documentation structure is only done by CASE tools, with a type of modification.</td>
<td>The documentation structure is done by CASE tools, with a specific modification during software development.</td>
<td>The structure of the document is only done by CASE tools, with a type of modification.</td>
<td>The structure of the document is done by CASE tools, with a specific modification during software development.</td>
<td>The structure of the document is done by CASE tools, with a specific modification during software development.</td>
</tr>
</tbody>
</table>

Table 1. Complexity factor guide.

Standards Use and Traceability.

Table 6. Standards use and traceability factor guide.

<table>
<thead>
<tr>
<th>DOCU</th>
<th>Very Low</th>
<th>Low</th>
<th>Nominal</th>
<th>High</th>
<th>Very High</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMPLIANCE</td>
<td>No standards are used to govern the documentation.</td>
<td>Only some technical specifications are used to govern the documentation.</td>
<td>All the technical specifications are used to govern the documentation.</td>
<td>All the technical specifications are used to govern the documentation.</td>
<td>All the technical specifications are used to govern the documentation.</td>
</tr>
</tbody>
</table>

Table 2. Standards use and traceability factor guide.
Analysis Experiment Results and Conclusions

- Objective 3. To make the selection of an appropriate value for the cost driver DOCU in each software project easier, redefining the questionnaire proposed in COCOMO II.

- Once the project effort estimation manager has established a value for each one of the previous factors, a definitive value for cost driver DOCU must be assigned. For this purpose, the following equation is proposed:

\[ r = \sum_{i=1}^{3} q_i x_i \]  

(7)

- By applying the value obtained for \( r \) to the following table, the definitive value for the cost driver DOCU is obtained.

<table>
<thead>
<tr>
<th>DOCU</th>
<th>Very Low</th>
<th>Low</th>
<th>Nominal</th>
<th>High</th>
<th>Very High</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-4</td>
<td>0.01</td>
<td>0.91</td>
<td>1.0</td>
<td>1.11</td>
<td>1.23</td>
</tr>
</tbody>
</table>

Table 7. Modified guide for COCOMO II 1998 cost driver DOCU