



# Software Estimation Process

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graph LR
    Input[Input: new code, reused code, re-engineered code, GUI, 4GL, Prototype, Simulator, SQL/DB] --> C1[Classify & size code]
    C1 --> C2[Analyze with cost models & hist data]
    C2 --> C3[Generate detailed cost and schedule]
    C3 --> C4[Senior management review]
    C4 --> C5[Proposal manager review]
    C5 --> C6[Configuration Management process data]
    C6 --> Output[Final "award winning" Product]
    
    C2 --> C3
    C3 --> BOE[Generate Basis of Estimates BOEs]
    BOE --> C4
    
    C3 --> C4
    C4 --> C3
  
```

**Classify & size code**

- new code
- reused code
- re-engineered code
- Graphical User Interfaces (GUI) and Interfaces (GII)
- Fourth Generation Languages (4GL)
- Prototype code
- Simulator code
- Structured Query Language (SQL) / Database (DB)

**Assess cost factors**

- Schedule constraints
- Development environment
- Product attributes
- Personnel attributes

**Analyze with cost models & hist data**

- Lines of Code (LOCs)
- Function points
- Feature points
- Historical data
- Parametric cost models such as COCOMO, SEER, SLIM
- Analyze Graphical User Interface (GUI) productivity rate
- Hours/Lines of Code (LOC)

**Analyze historical data**

- Comparable program productivity rates
- Cost factor impact

**Analyze site and labor mix**

$\$/\text{Hour}$

**Generate detailed cost and schedule**

**Generate Basis of Estimates (BOEs)**

Review top level architecture; major functions; software size, cost, and schedule; risks and opportunities

**Senior management review**

Iterate as required

**Proposal manager review**

**Configuration Management process data**

**Final "award winning" Product**

**Add & delete tasks**

**Generate staff profiles**

**Estimate Other Direct Costs (ODC) & capital**

**Allocate to Work Breakdown Structure (WBS)**

# Software Cost Estimate

- Support to Systems Engineering Requirements Analysis and Design
- Planning and preparation to setup Software Development Environment
- **Software Requirements Analysis**
- **Software Design, Code, and Unit testing**
- **Software Integration and Test (SWIT)**
- Support to the Independent Test Teams
- Software Configuration Management
- Management, clerical, and software processes including metrics and the Software Engineering Process Group (SEPG)
- Operating System, Tools, and Commercial off the Shelf (COTS) software for the Development System, Administration, and Maintenance
- Software Licenses and COTS software for the Target System

Note: Bolded items are typically what the software manager includes and often he/she forgets to cost these other items