Cost Model Demo

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For developing an overall system cost model, we have partitioned the cost model into two different sub-models for software (SW) and hardware (HW). We used cost estimation technique of COCOMO for estimating time and cost involved in developing SW for the conventional methodology (referred to here as Non-OPP methodology). We assumed the cost of an engineer is about $150K per year (including all the fringe benefits; there are about 230 working days in a year (365-52-52-31); and thus, the cost of an engineer per day is about $652. Some of the common factors affecting the SW and HW cost and time-to-market were due to reuse, methodology learning, library maintenance and concurrent engineering. We used a component based design methodology. Thus, we assumed the development of a library of reusable components. Further, in the 1st year of the project, we proposed to evolve these components. Thus the reuse factor for the 1st year was zero. It can be seen that this reuse factor increases over a period of five years as we develop more OPP components. As OPP gets more mature, we expected to get increasing amount of expertise and thus shortened time-to-market, thereby, reducing the cost of the product design. As the number of components in a system increase with increase in complexity, maintaining previously designed components will require an increasing amount of effort as well. At the same time, we proposed that different component may be designed independent of each other by a concurrent engineering process. Lastly, we assumed that the complexity of each SW or HW component is equal to that of a digital camera in an embedded system. We assumed that embedded system's complexity will double in three years time, as per Moore's law.

Based on above assumptions we have developed a HW and SW component and sub-system cost models. The final system cost model consists of sub-system cost model. In future we propose to incorporate cost of RF components and SW interfaces to evolve the final cost model. We also propose to develop a GUI for the cost model; this will allow us to alter the characteristics of the OPP flow quickly and see their impact on design productivity. This cost model may also help one identify potential bottlenecks and areas for further automations.