



Alenia Aermacchi

A Finmeccanica Company

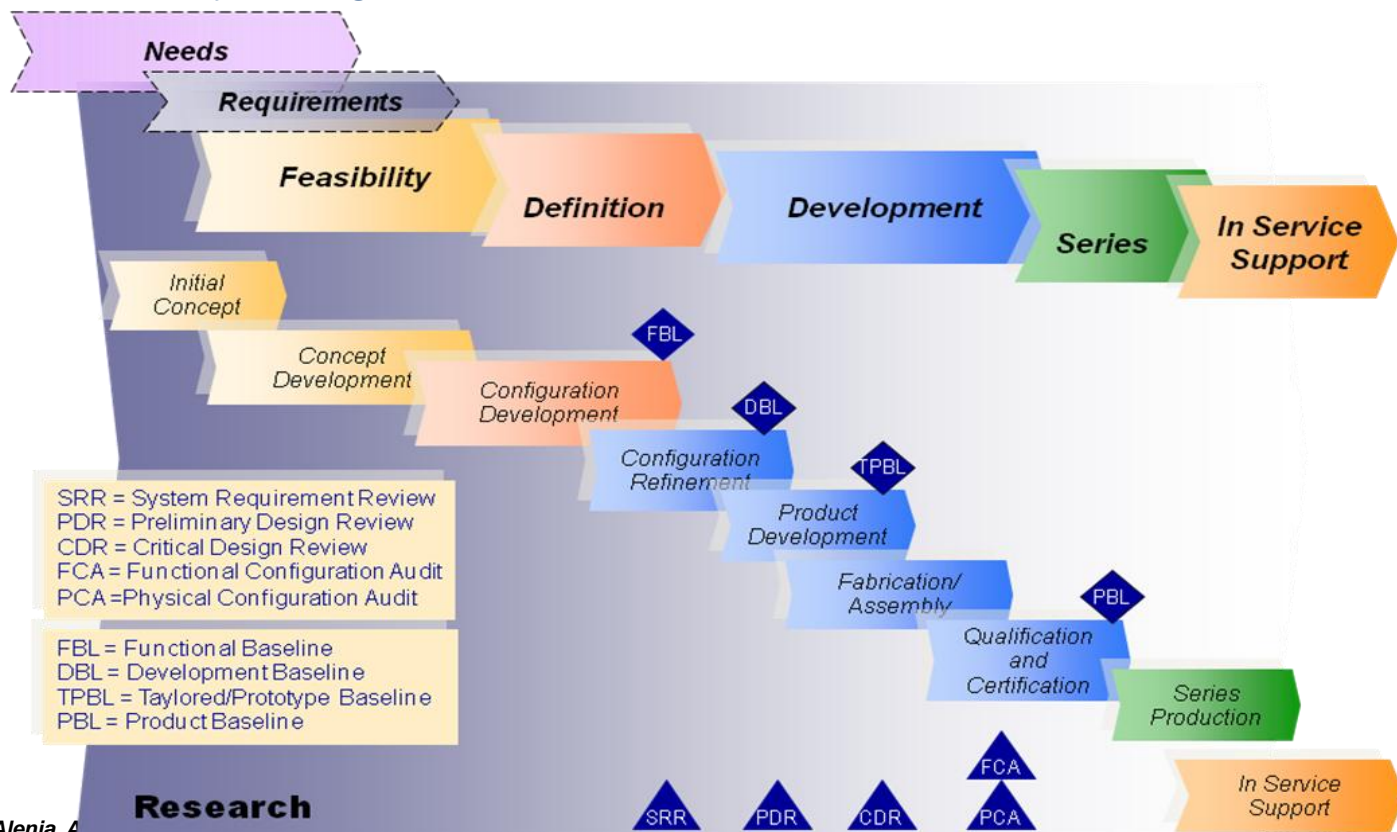
The New Cost Management Framework

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- ✦ The preliminary design activities are identified in the diagram of Aeronautical Product Life Cycle within the Feasibility and Definition phases covering the conceptual and configuration development aspects.
- ✦ Contributions to the Development Phase are provided up to the PDR (Preliminary Design Review).

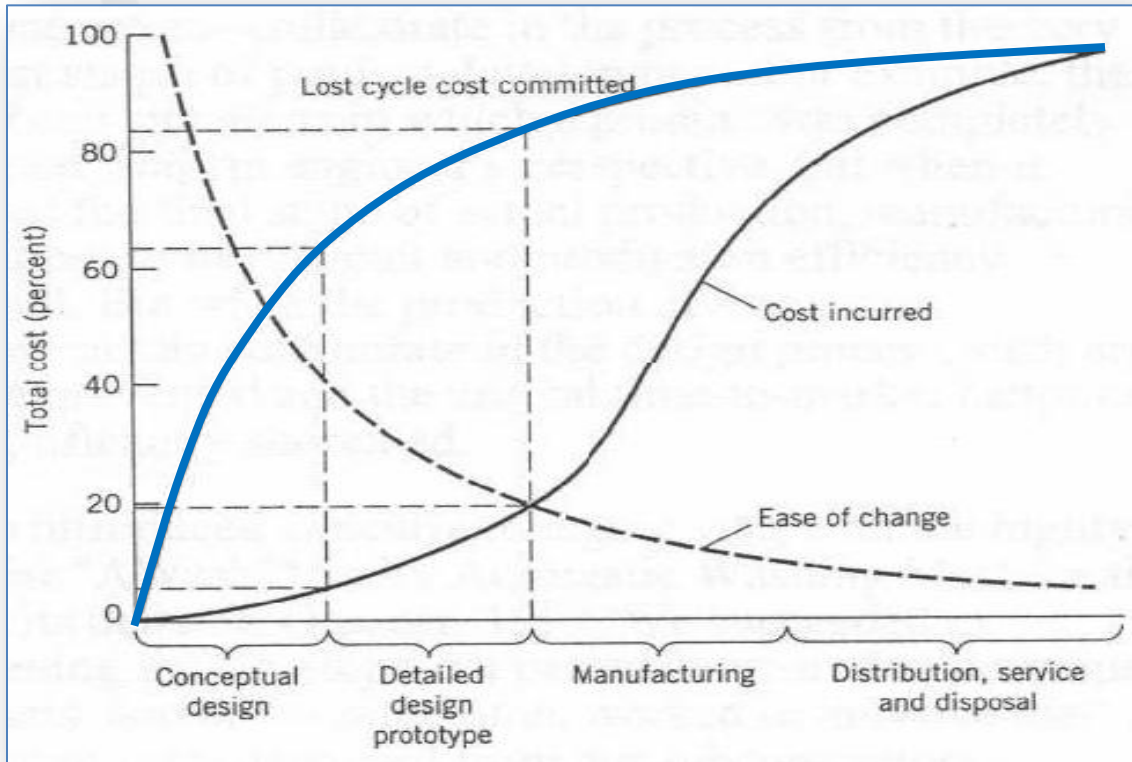


Goals of the Preliminary Analysis of Life Cycle Cost within Engineering Design

- Preliminary estimates of Life Cycle Cost (LCC) and evaluation of economic implications resulting from the various technical solutions/ identified technologies and studies from Preliminary Design;
- Database and tools management for the preliminary analysis of LCC and its use in the trade-off studies;
- Integration with Preliminary Design for the analysis of the technological evolution of product and for the identification of technical/operational requirements and impacts of the new technologies;

Need to estimate the LCC in the preliminary design phase

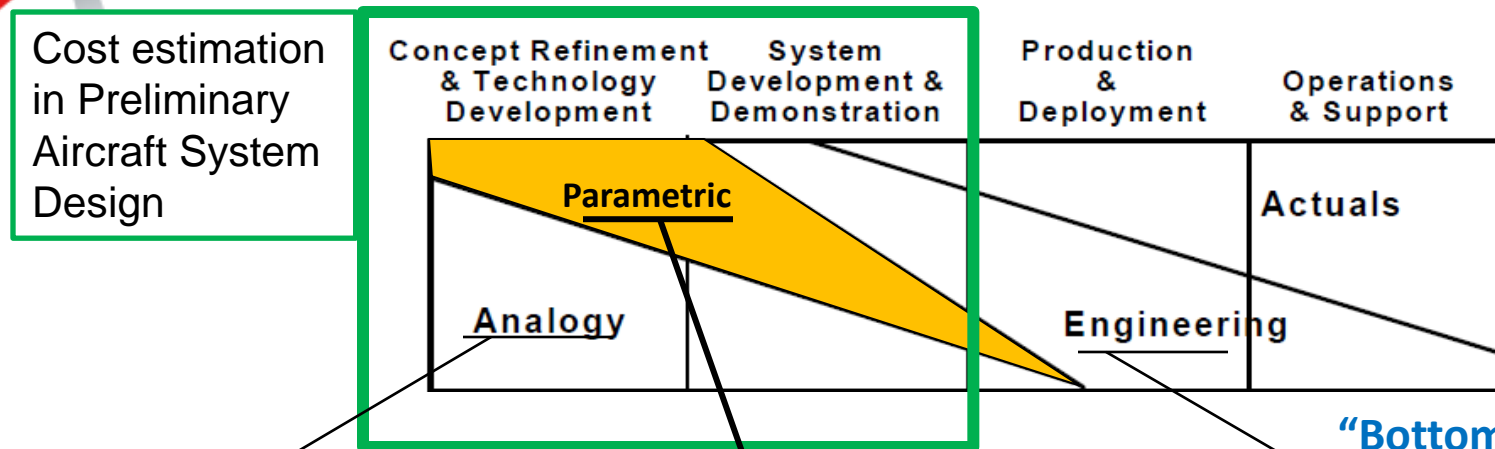
Considerations



- *The cost of modification grows as the definition/project is going on*
- *In the preliminary phases the company is taking commitments for more than half of the total costs*
- *This means that the modification in preliminary design cost less*
- *Philosophy of CAIV :“Cost as an independent variable”
The cost becomes part of requirements and so it have to be fulfilled as the other performance parameters*

Cost estimation techniques

GROSS ESTIMATES → DETAILED ESTIMATES



Analogy

It is based on a single point
It is fast, smooth, but it is also very subjective and so there is a high risk of producing errors

Parametric or statistic

The estimation is based on the information included in a database. The estimation is linked to the database from which are derived the cost parameters. Once the database has been created, the estimation is fast and reliable. It uses the so called Cost Estimation Relationships (CERs)

“Bottom-up” or Engineering estimation

The activities are flowed down to a simple level, easy to estimate

Reliable, but highly labor-intensive, too much detailed for a preliminary estimation

LCC Tools within Preliminary Aircraft System Design

1. PRICE

PASD are using PRICE True Planning SW for development, production and operating cost preliminary analysis.

2. Tools “homemade”

The first tool homemade has been developed within Alenia Aermacchi/Preliminary Aircraft System Design Department with the collaboration of Polytechnic of Turin.

The tool homemade is based on the Roskam and Beltramo methods of cost estimation for non recurring and recurring costs.

For operating costs the estimation is based on Northrop/NASA method.

The tool uses databases and CERs to estimate the costs.

It has been calibrated with a series of different air vehicle characteristics and costs, for military and civil programs.

It is used as a complement to PRICE.

The second tool, developed by Aermacchi, uses DAPCA, an American method of calculating development costs and acquisition studied for RAND Corporation, which uses military databases.

It has been also calibrated for civil aircraft.

It is a simple tool and requires some input values, for example the main characteristics of the aircraft we are talking about, typical indications of an early stage of Design.

It can be used for quick evaluations and indications.

Preliminary Analysis of LCC Current and future activities

Current Activities

- Development and Production Cost Estimate (parametric) of UAS, Trainers, Military Aircraft, Civil aircraft , systems/subsystems
- Support to Logistic Engineering for researches, studies on operating cost evaluation
- Support to Program Management, Business Development, Working Teams
- Participation to European researches , civil (SESAR, Clean Sky) and military (Astyanax)

Preliminary Analysis of LCC Current and future activities

Future Activities

- Link of external database/available tools to PRICE
- Parametric cost evaluation of Operating Costs with PRICE and its calibration
- Integration and optimisation tools in an unique process of Preliminary Design including parametric cost evaluation

Thanks for your attention
