

# A Proposed Project Management Cost Modelling Taxonomy

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## Abstract

On inspection of the cost estimation problem it was realised that there are two equally important areas of concern which are; cost explanation, and cost accuracy. A survey of previous cost models applied within the software engineering discipline suggests that there are three distinctive groups which are labelled: The Reductionism Group; The Dynamic Group; The Systemic and Dynamic Group. Key characteristics and archetype models associated with each cost modelling group are briefly outlined. It will be shown that forecasts from the reductionism and dynamic cost modelling groups are inaccurate, and their explanations of project costs are poor. Therefore, alternative mathematical techniques need to be researched. Systems dynamics has been selected, because it focuses on explanation which is seen as a strength. The aim of this research is to develop a negotiation model that explains software project costs.

System dynamics is a subset of the systems movement, consequently, an extensive literature review has been undertaken for it is believed that this discipline might approach the cost estimation issue from a different perspective, and perhaps as a result be more applicable. It is thought that the work of Russell Ackoff, a leading systems thinker, could have a significant contribution to the cost modelling debate, and further underpin the selection of the system dynamics technique. The first of two research papers that he published in 1979, criticised the use of certain traditional operational research techniques. These arguments are outlined because it is thought that they are applicable to the reductionism and dynamic cost modelling groups.

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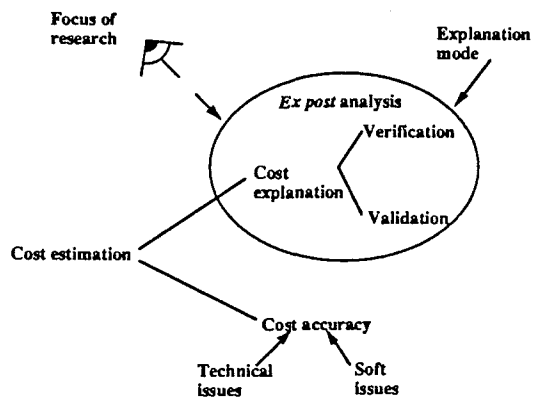
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Slide 0

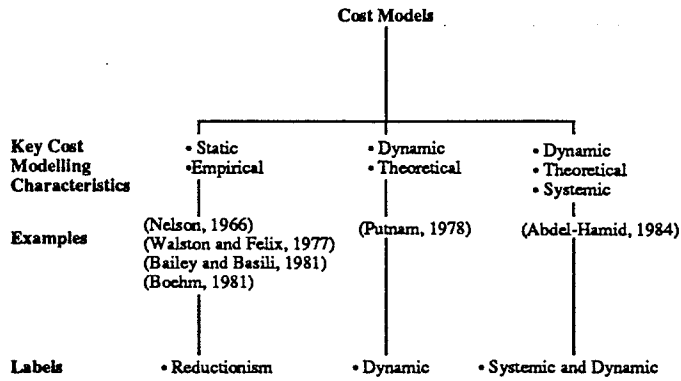
## Research focus - developing a new model using existing data



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Slide 1

### A proposed cost modelling taxonomy



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Slide 2

### A system of systems methodologies (Jackson and Keys, 1984)

	Unitary (U)	Pluralism (P)	Coercive (C)
<b>Simple (S) (Mechanical age)</b>	S-U Operational research (Dynamic group) (Reductionism group)	S-P Strategic Assumption Surfacing and Testing	S-C Critical systems heuristics
<b>Complex (C) (Systems age)</b>	C-U System dynamics Cybernetics (Systemic and dynamic group)	C-P Interactive planning (Ackoff, 1981, 1979a) Soft systems methodology	C-C ?

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Slide 3

### Selective summary of Ackoff's (1979a) conclusions

- There is a greater need for decision-making systems that can learn and adapt effectively.
- Problems are abstracted from systems of problems, messes. Messes require holistic treatment.
- Operational research's analytic problem-solving paradigm, "predict and prepare," involves internal contradictions and should be replaced by a synthesising planning paradigm such as "design a desirable future and invent ways of bringing it about".

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Slide 4

### Future Research

- The use of laboratory experiments to show that the combination of systems thinking and system dynamics improves model confidence.
- Take the software project planning (SSP) model into industry in order to confirm the subsystems and causal structures.

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Slide 5