

SHIFTING THE FOCUS OF DISCUSSION: FROM COST (UNDER)ESTIMATION TO COST REDUCTION

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WHY ARE THERE COST OVERRUNS IN INFRASTRUCTURE PROJECTS?

FLYVBJERG (2002)

Causes

- Deception: Strategic misrepresentation
- Delusion: Optimism bias

Countermeasure

- Reference class forecasting of costs

LOVE (2018)

Causes

- Changing conditions, requirements, and scope

Countermeasure

- Better cost estimating
 - BIM as a promising tool for that

EVALUATION OF THE DEBATE

- In the discussion between Love and Flyvbjerg, there is a fundamental misconception around cost management: it is considered to be akin to natural science

NATURAL SCIENCE APPROACH TO COST MANAGEMENT

- Assumes that the observer is outside the process where costs accrue, and cannot influence it
- Example: Building of an anthill
- However, costs of a construction project can be influenced in many ways by participants internal to the process: client decisions, good management, etc. – another approach is needed!



Costs do not exist to be calculated.
Costs exist to be reduced.

Ohno, T. (2012). *Taiichi Ohno's Workplace Management: Special 100th Birthday Edition*, McGraw Hill.

TECHNICAL (ENGINEERING) APPROACH TO COST MANAGEMENT

Theory

- Costs are both starting points and outcomes from our designing and planning and controlling.
- We can influence them.

Methods

- Cost prediction
- Steering
- Better decision-making
- Creativity
- Waste elimination

COST MANAGEMENT IS REASONING, DONE THROUGH INFERENCE

- Deduction: Reasoning forward
- Regression: Reasoning backward
- Induction: Drawing conclusions on a population from a sample
- Abduction: Creative leap to a solution

Inferential questions in cost management

- For a client, there are three questions of immediate interest in relation to cost – each triggers a particular inference:
 1. Given a scope or design, how much will it cost?
 - Deduction
 2. Given a cost (or price), what will I get?
 - Regression
 3. Given a difference between the estimated cost and the cost that can be afforded, how can the project be realized?
 - Abduction
- Note that there is an additional, fourth question in the background
 4. Given recent realized costs, which cost data should I use for my project?
 - Induction

TABLE

| <i>Method in the technical approach to cost management</i> | <i>Primary inference types</i> | <i>Secondary inference types</i> |
|--|---|------------------------------------|
| Cost prediction | Deductive and inductive inferences | - |
| Steering | Regressive inferences | Deductive and inductive inferences |
| Better decision-making | Regressive and deductive inferences | Inductive inferences |
| Creativity | Abductive inferences | Deductive and inductive inferences |
| Waste elimination | Regressive inferences (for finding the root causes for waste) | Deductive and inductive inferences |

Table 1. Methods and their inference types in the technical approach to cost management

HOW TO GET THE TECHNICAL APPROACH TO COST MANAGEMENT REALIZED?

- Regressive inferences
 - Especially in the conceptual phase
 - Cost per functional unit/the unit method
 - Need for abduction when conflicts between design criteria must be resolved
- Abductive inferences
 - Cannot be conducted in a deliberate manner
 - However, research has pinpointed factors which are encouraging or discouraging creativity

| <i>Factor influencing creativity</i> | <i>Corresponding feature in the TVD practice</i> |
|--------------------------------------|--|
| Progress principle | The progress towards the target cost is prominently visible. |
| Intrinsic and extrinsic motivators | Intrinsic motivation is provided through progress, and such extrinsic motivators as the gain/pain sharing mechanism and the clear targets may act in a synergistic manner |
| Work environment | Many of the stated work environment factors may exist in an TVD environment. Especially, cost reductions are expected to occur over the project duration, and thus there is sufficient time. |
| Collaboration and discussion | Both wide collaboration and one-to-one discussions are encouraged. |
| Affect | Applied methods, like Last Planner, lead to positive mood. |

Table 2. Factors influencing creativity and corresponding features in TVD

CONCLUSIONS

- Cost management is not (only) about predicting costs – it is about reasoning relevant to costs
- Reasoning is carried out through different types of inference: deduction, induction, regression, abduction
- The common natural science approach to cost management, subscribed by Flyvbjerg and Love, leads to the dominance of deduction and induction in handling with costs
- We recommend using regressive and abductive reasoning actively and systematically for controlling and reducing costs (technical approach to cost management)

THANK YOU!

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