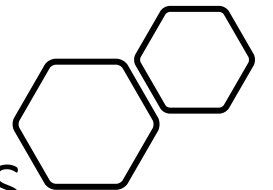


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Paper 87: Maturity of Target Value Design (TVD)
Implementation in Norwegian Public Building Projects



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Introduction: Research Information



The purpose of this study

To discover and bring awareness of the maturity of TVD implementation during the pre-project phase in Norwegian public building projects.

Research question (RQ)

1. How is the TVD maturity in the Norwegian construction industry?

Research design

- Literature study
- 5 cases
- 6 interviews (project managers from the client [OPAK AS] and the contractor)

The study does not reflect the ‘full maturity’ status of the Norwegian construction industry.



CASE DESCRIPTION	
CASE 1	Part of a larger public development plan to encounter growth within the municipality. Demolition and construction of a new high school (550 pupils) and a swimming pool. Partnering contract.
CASE 2	Part of the same larger development plan as case 1. Constructing a new elementary school (700 pupils), a sports center with a tribune (300 people) and two swimming pools. Involves the same contractor as case 1. Partnering contract.
CASE 3	Part of a master plan to upgrade 2,500 of the municipality’s nursing home spots. Construction of 144 spots, a senior and a day care center. First BREEAM Excellent certified nursing home in the country.
CASE 4	Part of the same master plan as case 3. Demolition and construction of a new 6-storey BREEAM Excellent and Zero Emission Building (ZEB) building with 144 new spots. Resulting in the most environmental-friendly nursing home in the country.
CASE 5	Part of the same development plan as case 1 and 2. Constructing a sports center with the stated purpose to achieve the local sports community’s wanted functions. The design competition was cancelled due to not satisfying the users’ needs. Further, the contract was changed from combining partnering and design-build to a full design-build contract.



Background and Theory



Background

TVD projects are more likely to:

- ✓ Completed below anticipated Market Cost (MC)
- ✓ Increased accuracy for conceptual estimates
- ✓ Lower contingency reserve
- ✓ Prevent 'overdesign'.



TVD – Theoretical Introduction

Iterative design process focusing on optimizing and maximizing the client's and user(s)' value within constraints.

- Allowable Cost (AC) = the amount the client is willing and able to pay for a facility with a defined performance.
- Expected Cost (EC) = the amount for a facility with a determined performance provided at current best practice

Dependent on a realistic cost target:

- Benchmarking
- Knowledge of cost and value drivers



Background and Theory

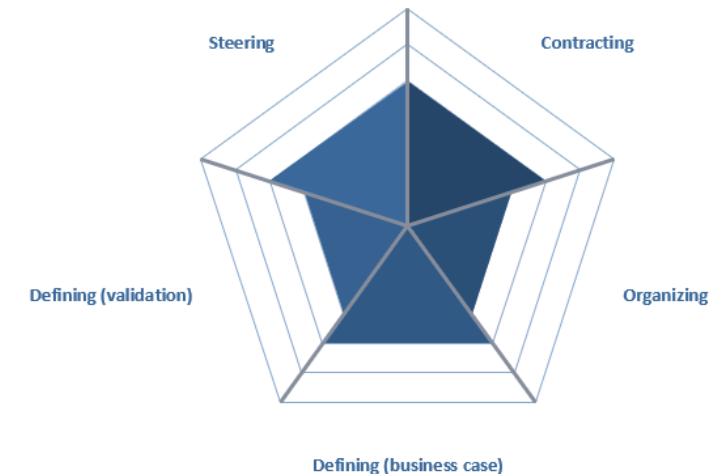


Scorecard

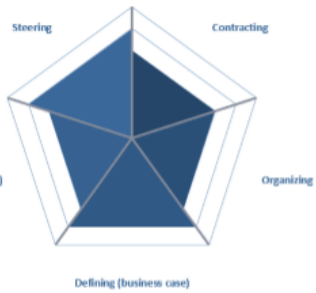
- Based on identified TVD characteristics in well-known articles investigating TVD (Ballard 2008, Pennanen & Ballard 2008, Ballard & Morris 2010, Lee et al. 2012, Zimina et al. 2012).
- TVD characteristics = An element or an activity that has been identified in the literature to be part of the TVD process.

Score	Grading	Description
0	Not implemented	Not mentioned in internal documents and by the interviewee(s)
1	Barely implemented	Mentioned in internal documents but not by the interviewee(s)
2	Sufficiently implemented	Mentioned in internal documents and by the interviewee(s)
3	Fully implemented	Well documented in internal documents and by the interviewee(s)

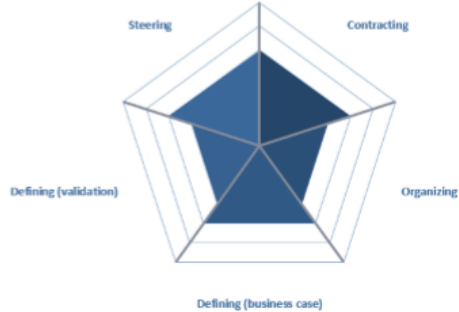
Average TVD maturity



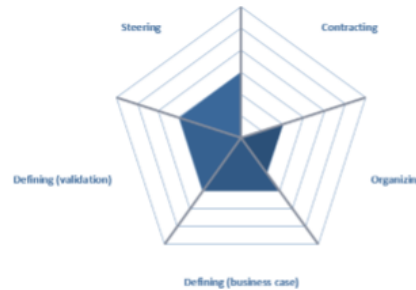
The Implementation of TVD Characteristics (1/4)



Case 4



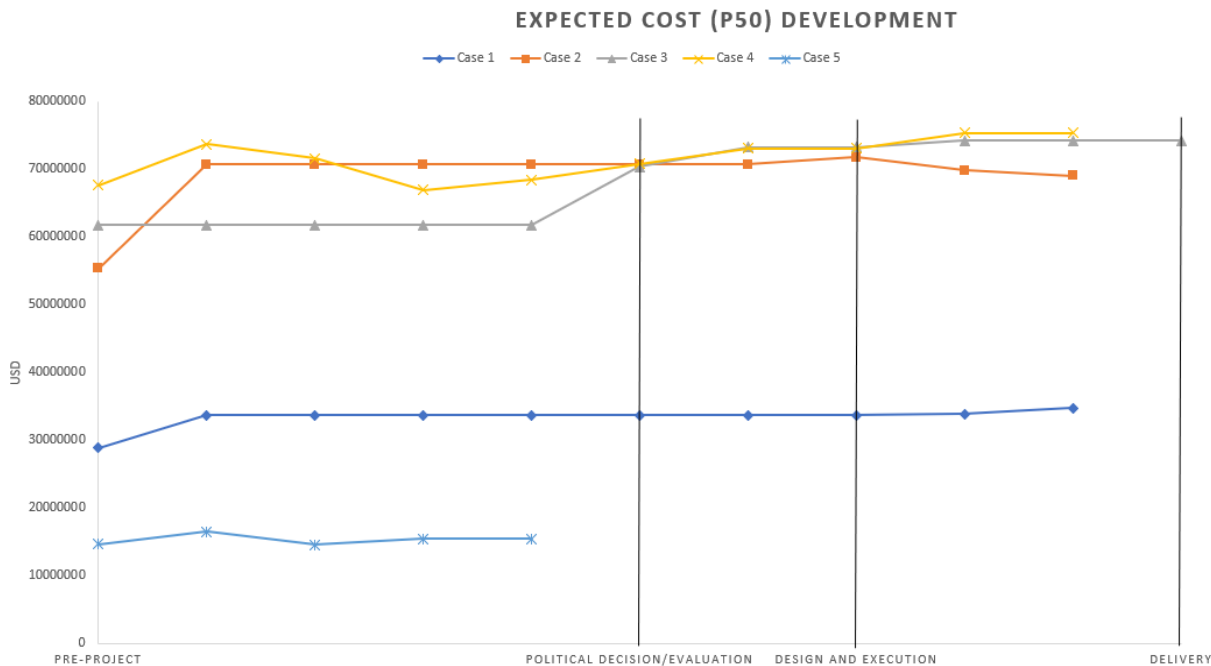
Average TVD Maturity



Case 5

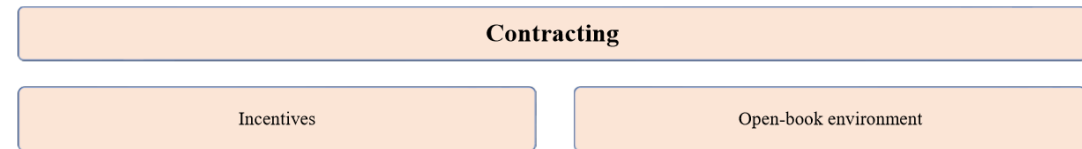
PROJECT	TVD CHARACTERISTICS	DESCRIPTION	AS
CASE 1	Contracting	Partnering, 50/50 split.	3
	Organizing	Limited collaboration and co-location, no target budgets among project objects.	1.5
	Defining (business case)	Validation not based on AC, no priority of outputs, specifying demands, constraints, and limitations.	2
	Defining (validation study)	Shared understanding, align ends, means, and constraints, target scope greater than best practice.	2
	Steering	"Nice to have vs. need to have", targeting cost drivers, rejected optimizations due to cost.	2.5
CASE 2	Contracting	Partnering, 50/50 split.	3
	Organizing	Limited collaboration and co-location, no target budgets among project objects.	1.5
	Defining (business case)	Validation not based on AC, no priority of outputs, debated project location.	1.5
	Defining (validation study)	Shared understanding, align ends, means, and constraints, no benchmarking, target budget lower than best practice.	2
	Steering	Limited SBD, focus on cost reduction.	2
CASE 3	Contracting	Design-build, possibility to cancel the project.	1
	Organizing	Limited collaboration, transparency, workshop model. No target budgets for project objects.	1
	Defining (business case)	Validation not based on AC, part of a master plan, priority of sustainable alternatives.	2.5
	Defining (validation study)	Limited understanding, target scope greater than best practice, not standardized solutions.	1.5
	Steering	Limited SBD, project goals, design-to-value.	2.5
CASE 4	Contracting	Partnering during the pre-project, design-build, possibility to cancel the project.	2
	Organizing	Limited co-location, not fully implemented workshop model, four contractual milestones.	2
	Defining (business case)	Validation not based on AC, part of a master plan, a priority of LCC for alternatives.	2.5
	Defining (validation study)	Target scope greater than best practice, limited benchmarking, and standardized solutions.	2
	Steering	Challenging current best practice, project goals, and focus on operation cost.	2.5
CASE 5	Contracting	Design-build, no incentives.	0
	Organizing	Limited co-location, transparency, a single user with influence.	1
	Defining (business case)	Validation not based on AC, condition of satisfaction not matching the target budget.	1.5
	Defining (validation study)	Limited understanding, mismatching ends and constraints, no benchmarking. Standardized solutions.	1.5
	Steering	No SBD, constructible design, a user's expectations, uncertainty.	1.5

The Implementation of TVD Characteristics (2/4)



Contracting

- The foundation for TVD implementation.
- Incentives:
 - 50/50-split
 - Additional payment for chasing and modifying the environmental targets



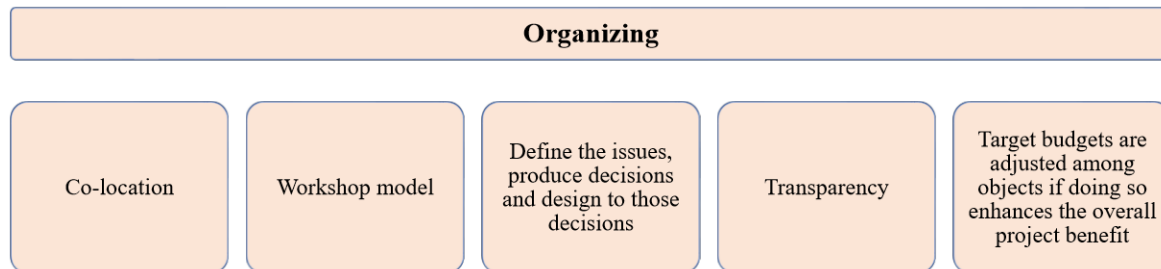
The Implementation of TVD Characteristics (3/4)



Organizing

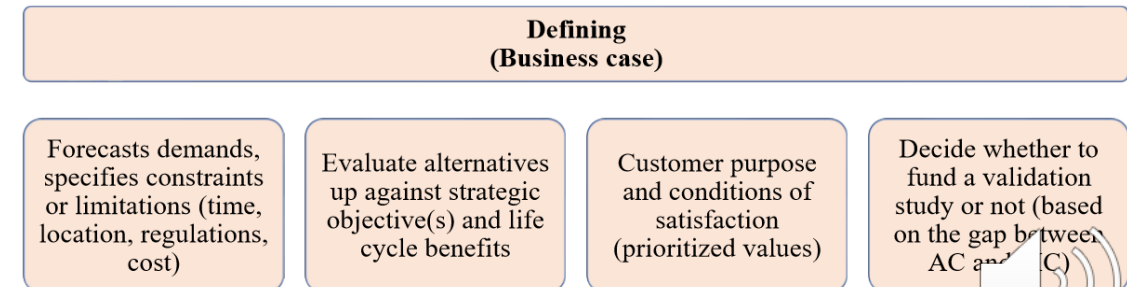
- Collaborative methods (mainly ICE-meetings).
- Decision-making authority and rapid decisions.
- The need for user involvement.

Example: Case 5 shows the consequences for the client if not obtaining the full decision-making authority.



Defining (Business case)

- Closely related to the evaluation of the choice of concept process.
- A stated AC is not implemented.
- Identify project-specific elements of importance.
- Prioritized outcomes and outputs are inconsistent.

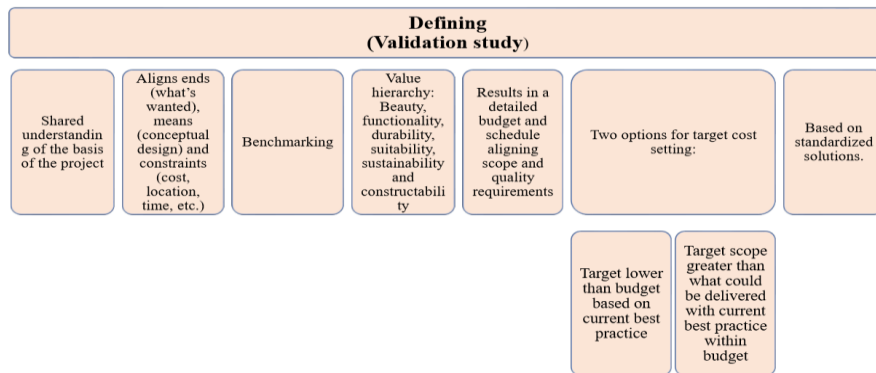


The Implementation of TVD Characteristics (4/4)



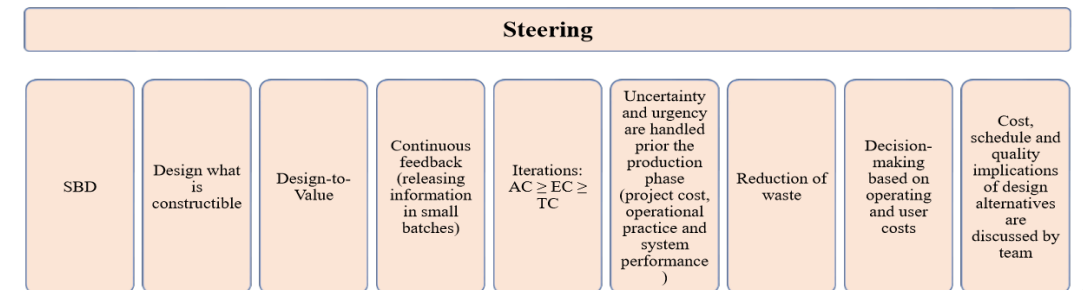
Defining (Validation)

- A common understanding among the involved actors.
- Decisions are often made based on cost.
- A realistic Target Cost (TC):
 1. target a lower cost based on current best practice, or
 2. target scope greater than current best practice.



Steering

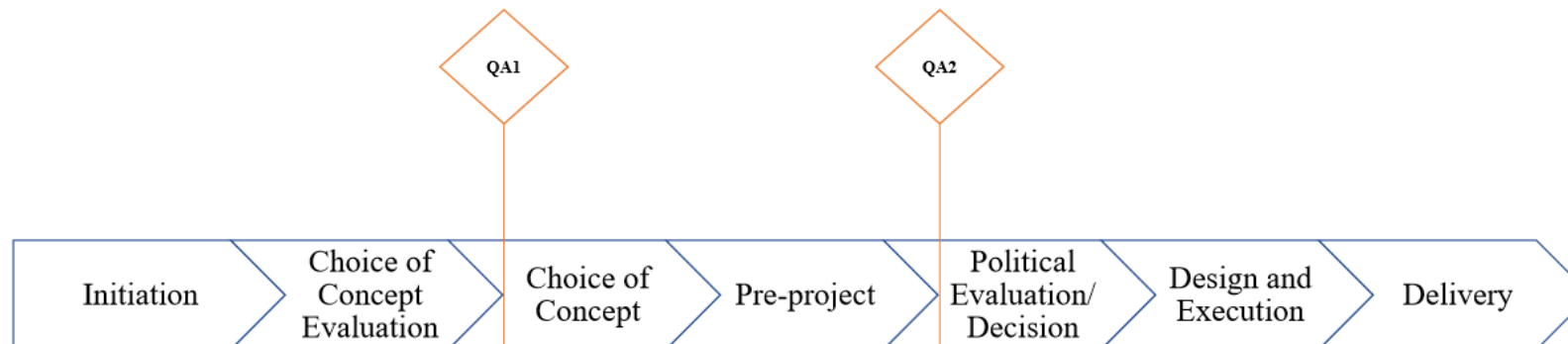
- “Need to have vs. nice to have”
- A specific focus on value drivers.
- Focusing on achieving the outputs of cost and time.



RQ: How is the TVD maturity in the Norwegian Construction Industry?



- The scorecard is sufficient for the identification of the TVD maturity.
- The maturity within the Norwegian construction industry cannot be fully identified.
- Enhancing maximum value is a challenge due to the lack of visualization and the focus on cost reduction.
- Decision-making based on identified cost drivers should embrace project value.



The Need for Further Research



- More focus on the root causes:
 - Cost estimation and benchmarking.
 - Using a maximum AC based on the client's willingness and ability to pay.
 - The ability to create a realistic TC.
- Correlation between cost reduction reduction in project value.
- Validation of the tool – more tests are needed

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