Threads of Reasoning

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Abstract

A method of reasoning is described, which addresses cross-cutting issues. The basis is fast iteration in the problem and solution space.

A thread of reasoning is a set of highly relevant related issues, which are addressed by articulating the problem in terms of tension and analyzing it in the CAFCR framework.
Overview of the reasoning approach

1. select starting point:
   - actual dominant need or problem

2. create insight:
   - submethod in one of CAFCR views
   - qualities checklist

3. deepen insight via facts:
   - via tests, measurements, simulations
   - story telling

4. broaden insight via questions:
   - why
   - what
   - how

5. define and extend the thread:
   - what is the most important / valuable
   - what is the most critical / sensitive
   - look for the conflicts and tension

continuously

consolidate in simple models

communicate to stakeholders

refactor documentation
From starting point to insight

**Step 1 Starting Point**

- **C**ustomer objectives
- **A**pplication
- **F**unctional
- **C**onceptual
- **R**ealization

**Slow response**

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Creating Insight

step 2 creating insight

C: Customer objectives  A: Application  F: Functional  C: Conceptual  R: Realization

performance

response time model
Deepening Insight

1. Customer objectives
2. Application
3. Functional
4. Conceptual
5. Realization

- Specific needs
- Step 3 deepening insight
- Simulations, test, measurements
- Specific facts
Broadening Insight

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**TORbroadeningInsight**
Problem identification and articulation

**The Four As of TOR**

- **C**ustomer objectives
- **A**pplication
- **F**unctional
- **C**onceptual
- **R**ealization

**Need and Problem Selection Criterions**

- important
- valuable
- critical
- difficult
- sensitive
- vulnerable

**Definition in terms of tension**

- throughput
- cost
- safety
- high performance sensor
- high speed moves

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TORproblemIdentification
Iteration during the analysis

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Thread of related issues
Documentation and communication structure

Customer objectives

Applications

Functional

Conceptual

Realization

Key drivers

IQ spec

Pipeline design

Processing library

Cost budget

Time budget

Micro benchmarks

Performance

Response time

Target

IQ

CoO

Context

Case

Zap

Store

Functional model

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