Modeling and Analysis: Analysis

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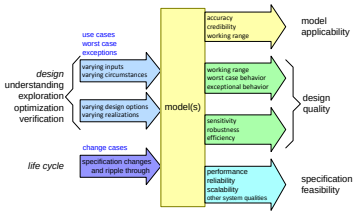

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Abstract

Models only get value when they are actively used. We will focus in this presentation on analysis aspects: accuracy, credibility, sensitivity, efficiency, robustness, reliability and scalability.

version: 0.2 status: planned February 18, 2021

1 Introduction

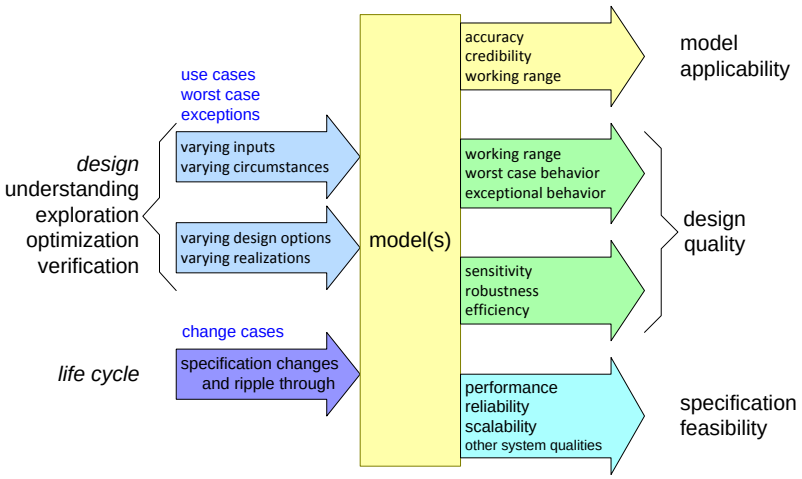


Figure 1: What Comes out of a Model

2 Model Applicability

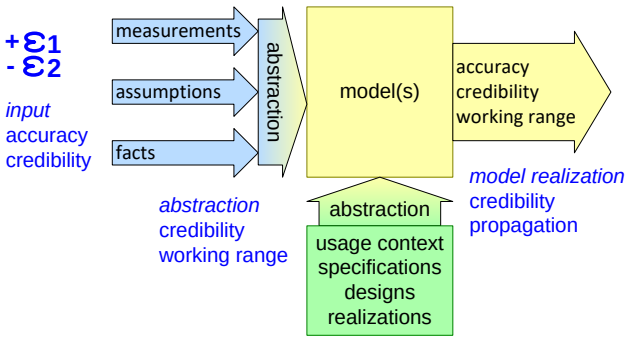


Figure 2: Applicability of the Model

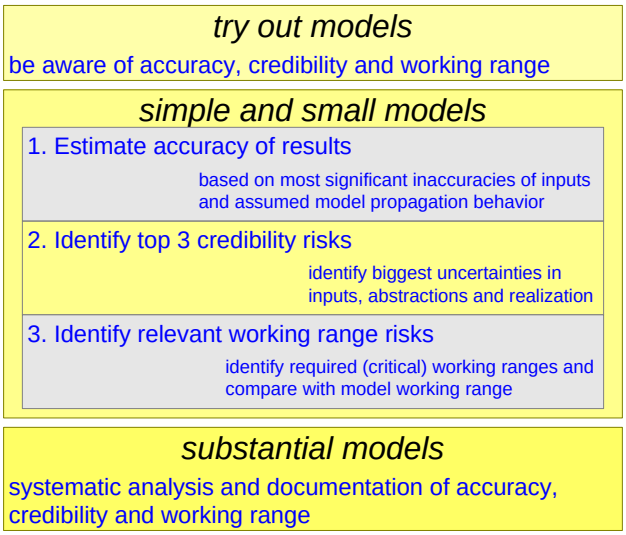
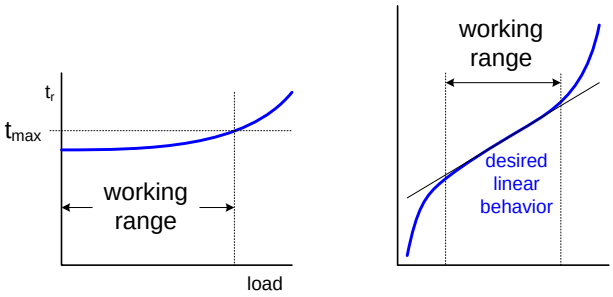


Figure 3: How to Determine Applicability



A system design assumption is often:
the performance of this function
{ is constant | is linear | doesn't exceed x | ...}

The working range is the interval where this assumption holds

Figure 4: Working Range examples

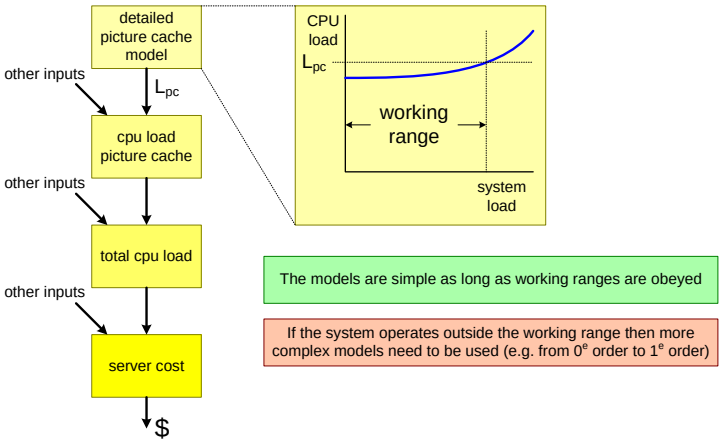


Figure 5: Example of Picture Cache Working Range

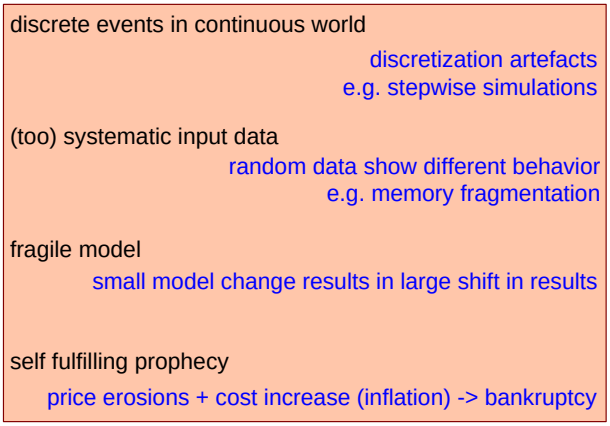


Figure 6: Common Pitfalls

3 Design quality

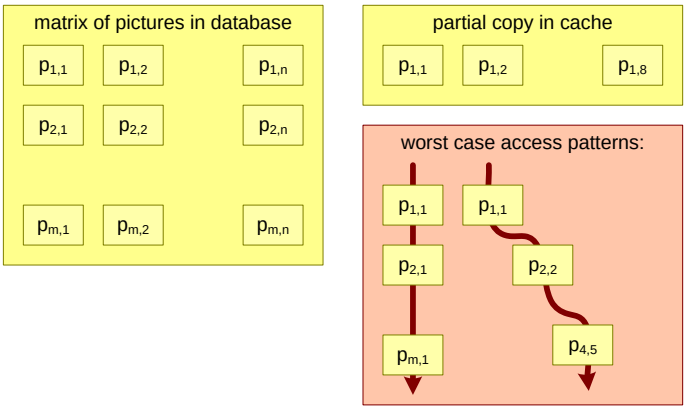


Figure 7: Example of Worst Case Picture Cache

Which design assumptions have a big impact on system performance?

What are the worst cases for these assumptions?

How does the system behave in the worst case?

a. poor performance within spec

b. poor performance not within spec

c. failure -> reliability issue

Figure 8: Worst Case Questions

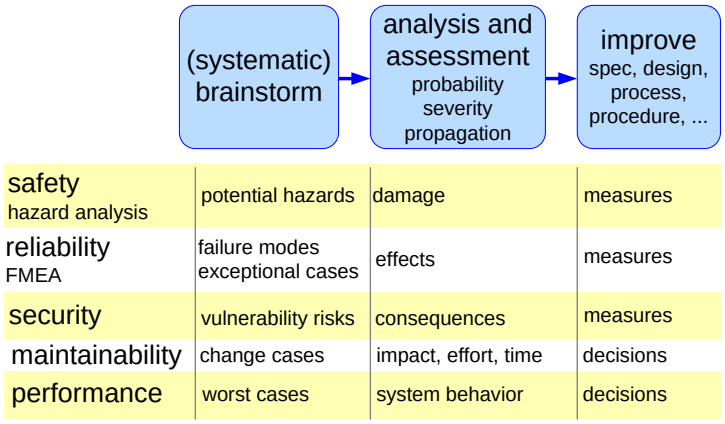


Figure 9: FMEA-like Analysis Techniques

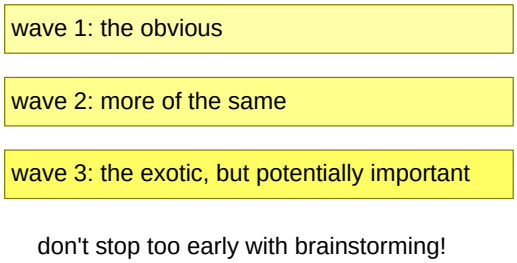


Figure 10: Brainstorming Phases

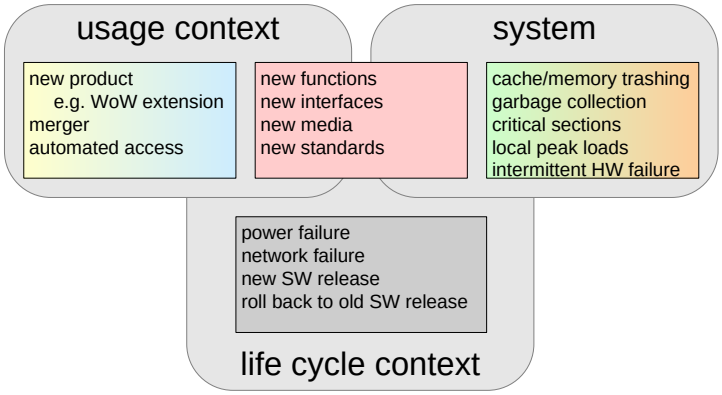


Figure 11: Different Viewpoints for Analysis

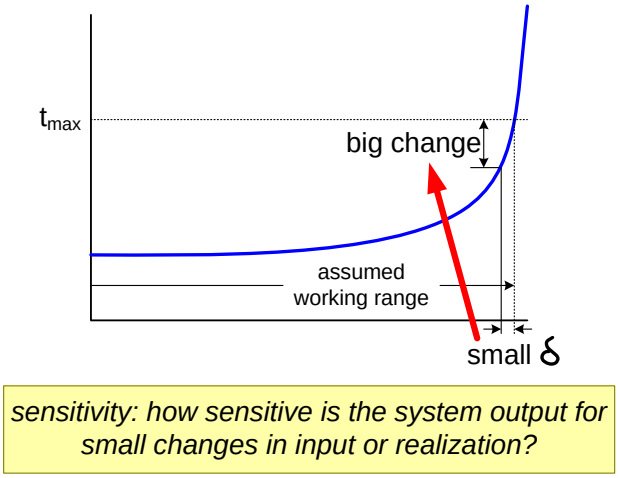


Figure 12: Example Sensitivity

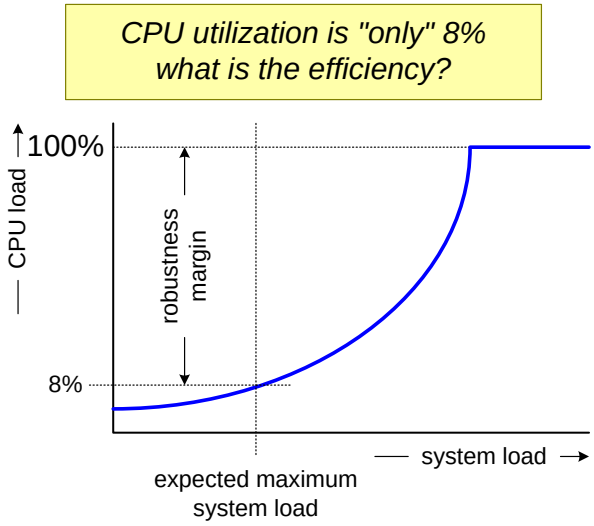


Figure 13: Example of CPU Utilization and Efficiency

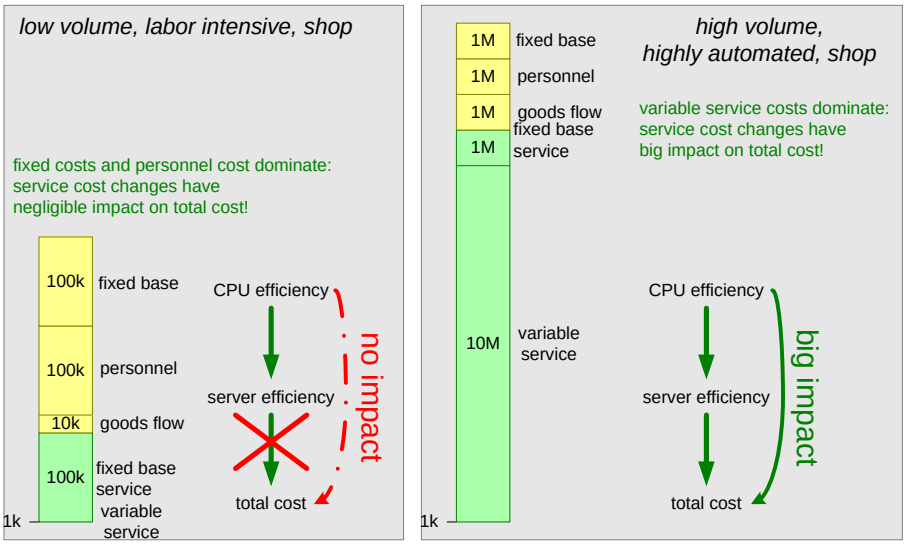


Figure 14: Efficiency is Context Dependent!

4 Specification feasibility

5 Life Cycle Changes

6 Inputs

7 Summary

References

[1] Gerrit Muller. The system architecture homepage. `http://www.gaudisite.nl/index.html`, 1999.

History

Version: 0.2, date: 27 February, 2007 changed by: Gerrit Muller

- article version without text created
- logo defined

Version: 0.1, date: 17 January, 2007 changed by: Gerrit Muller

- added list with pitfalls
- added working range examples
- added worst case example and questions
- added brainstorm recommendation
- added FMEA-like method
- added analysis viewpoints
- added efficiency, sensitivity and robustness slides

Version: 0, date: 16 January, 2007 changed by: Gerrit Muller

- Created, no changelog yet