Module Role of Software in Complex Systems

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Abstract

This module addresses the role of software in complex systems

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status: preliminary draft
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The Role of Software in Systems

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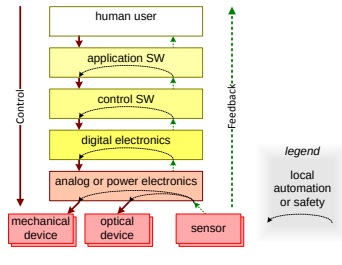
Abstract

Software is a dominating factor in the development of complex systems. It plays a crucial role in the performance of the final product at the one hand, while it contributes significant to the development cost and elapsed time of development. This paper will discuss the role of software in the broader system context. An improved understanding of the role of software enables the system architect, and the other stakeholders of the product creation process, to integrate the software development better. In this way hardware-software tradeoffs can be made, balancing performance, costs and risks.



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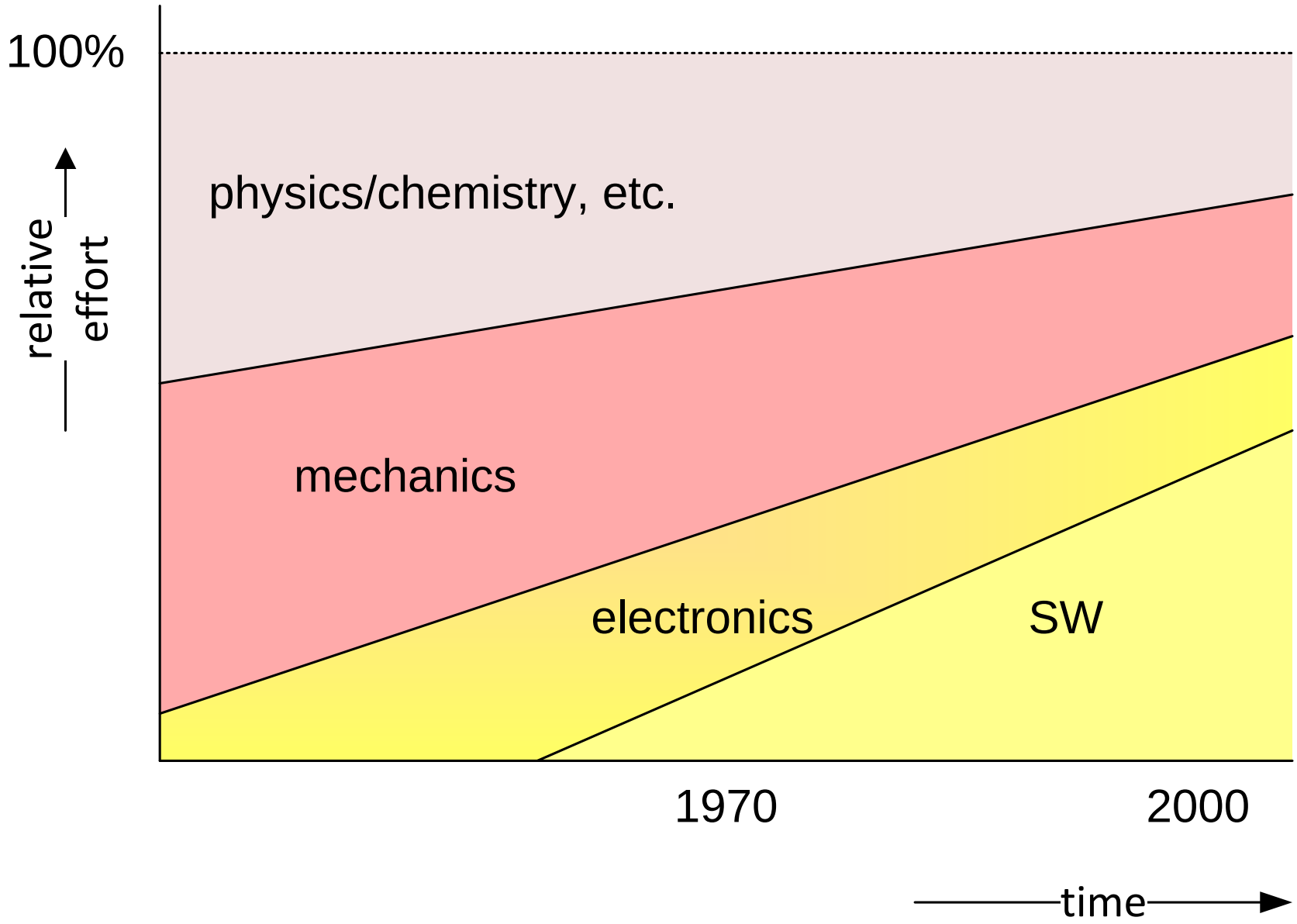
version: 1.3

Relative Contribution of SW



Mismatch between Role and Discipline

role of software

integration technology

captures *application* functionality

defines lot of *system* behavior

determines how much of potential *system* performance is achieved

acts as director

mismatch!

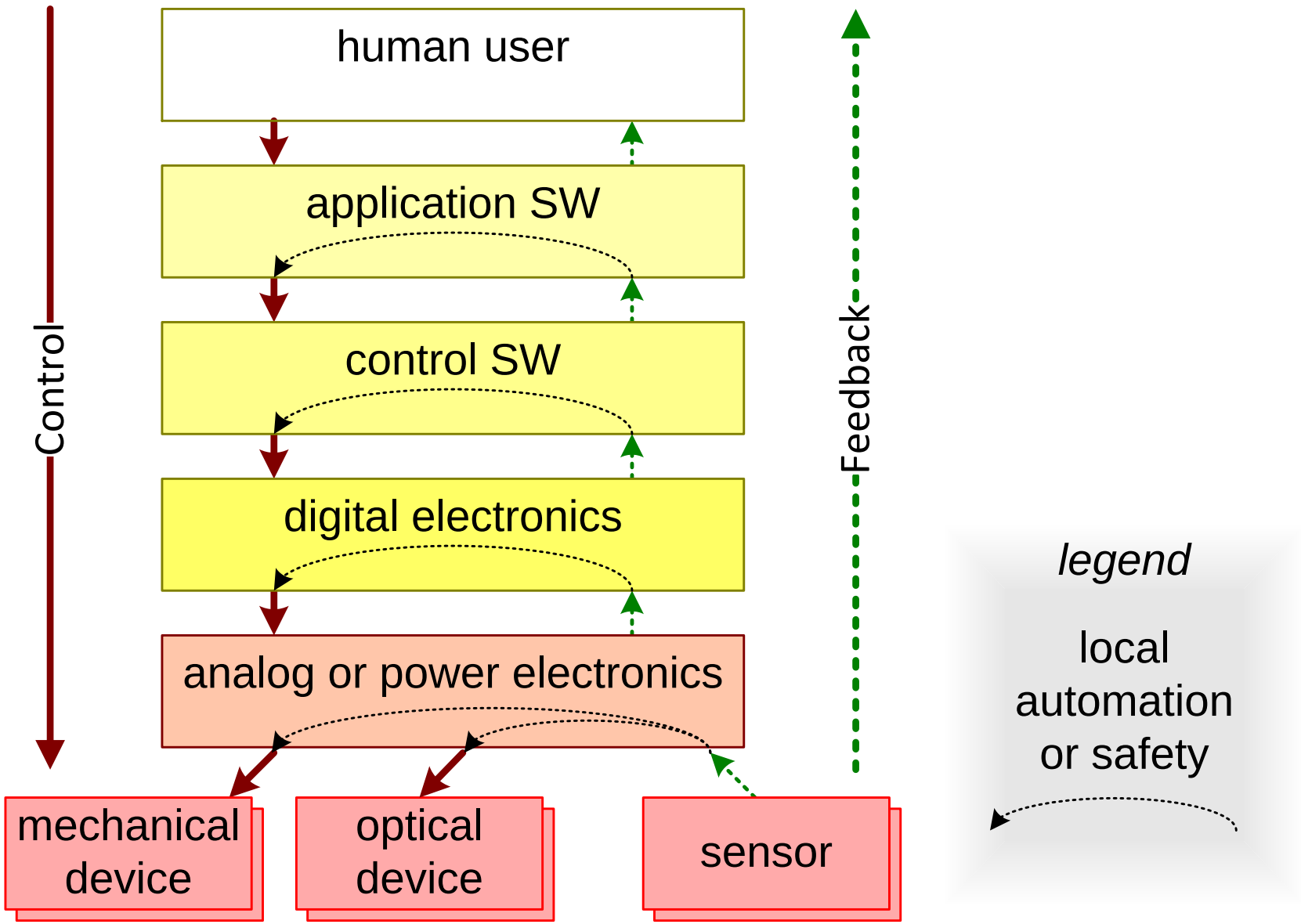
focus of software discipline

software technologies, such as:

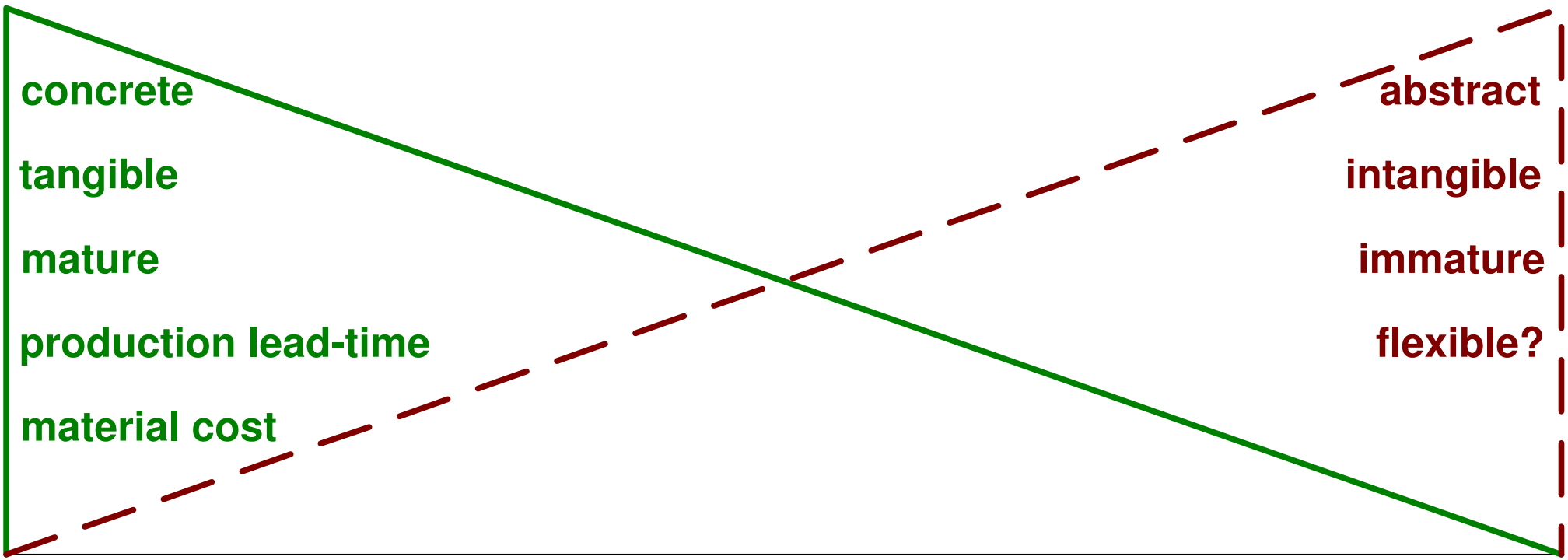
- programming languages
- data bases
- operating systems
- component technologies

engineering practices

Control Hierarchy along Technology axis



Characterization of disciplines



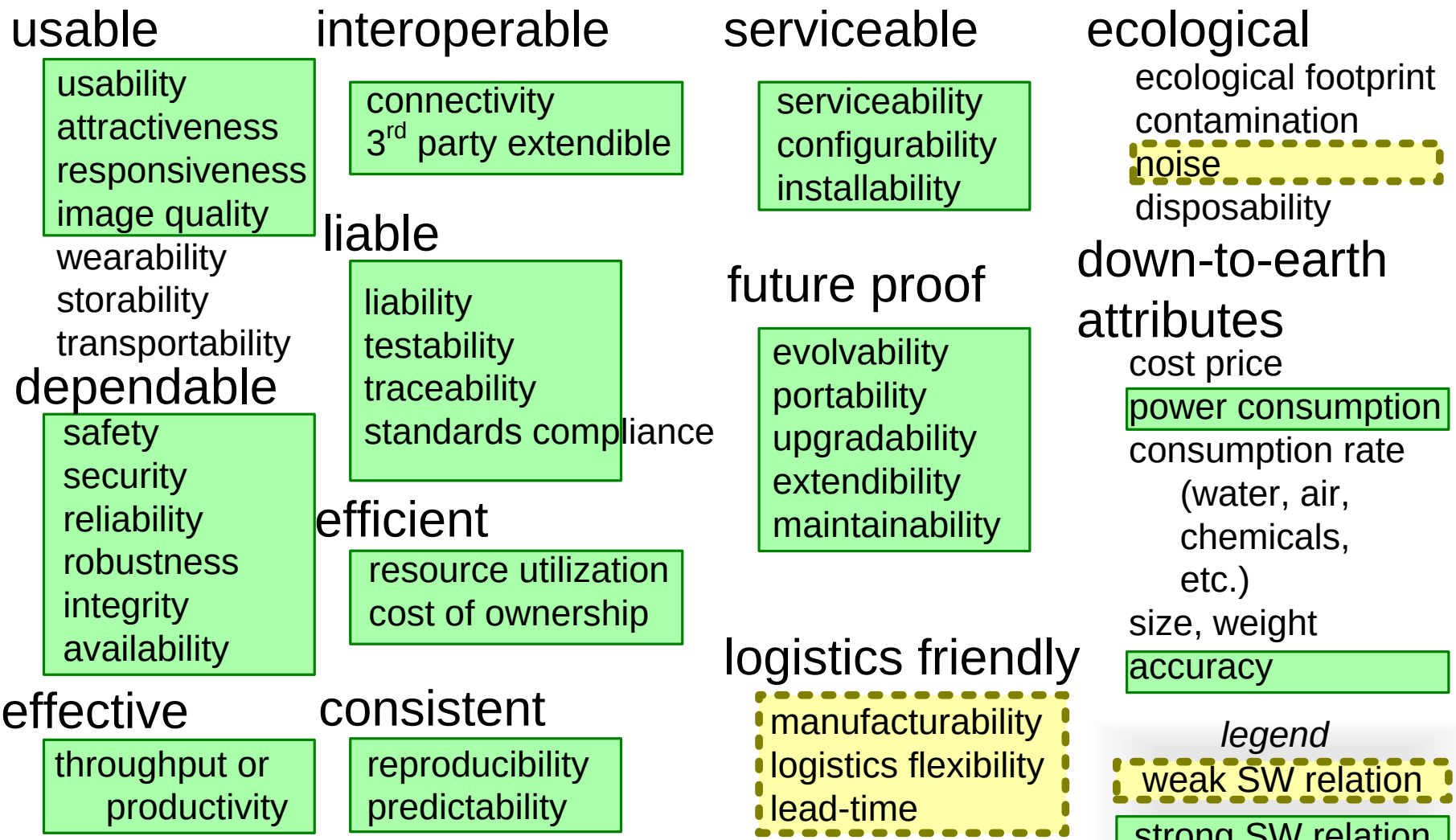
Mechanics

Analogue / power Electronics

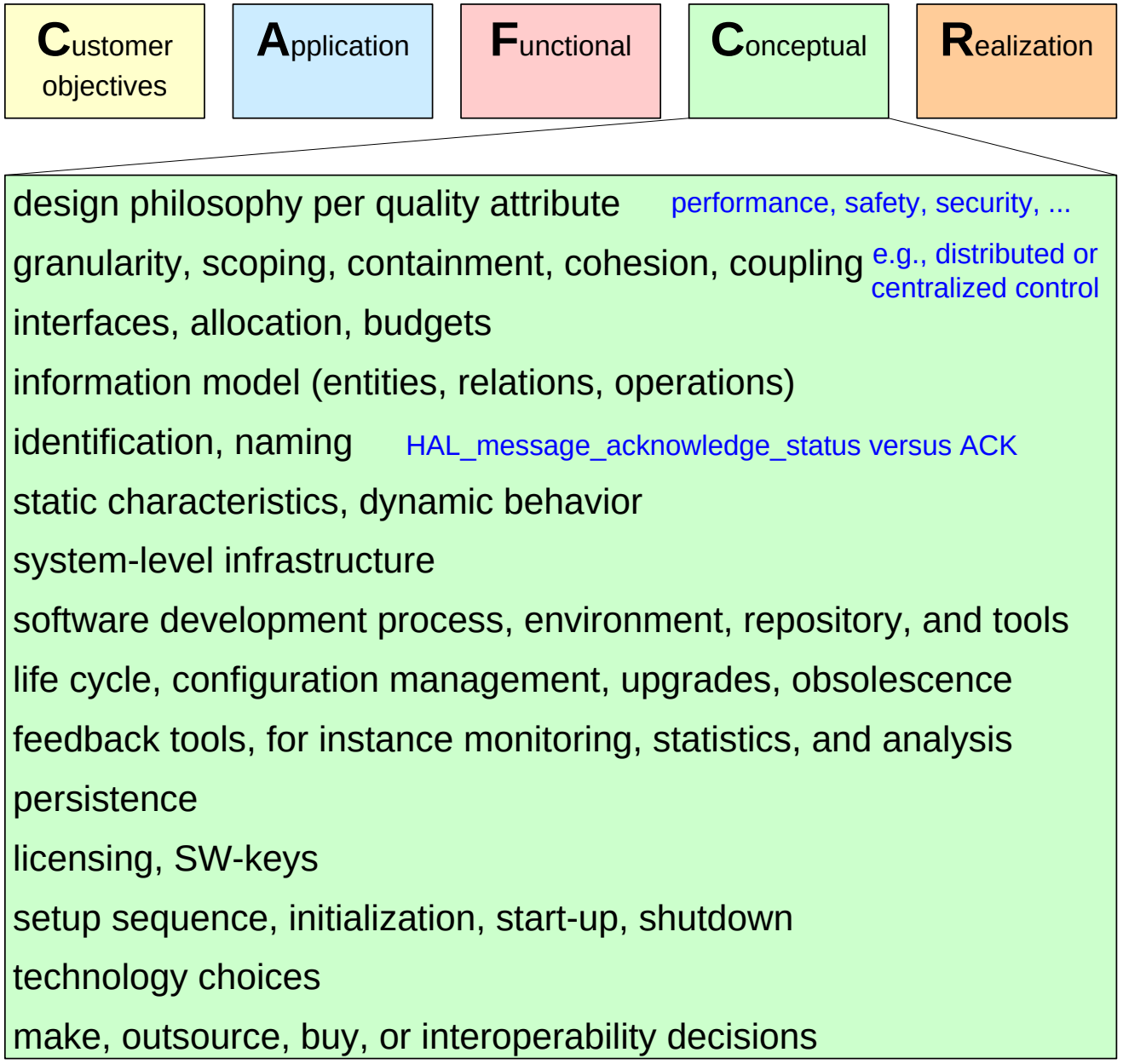
Digital Electronics

Software

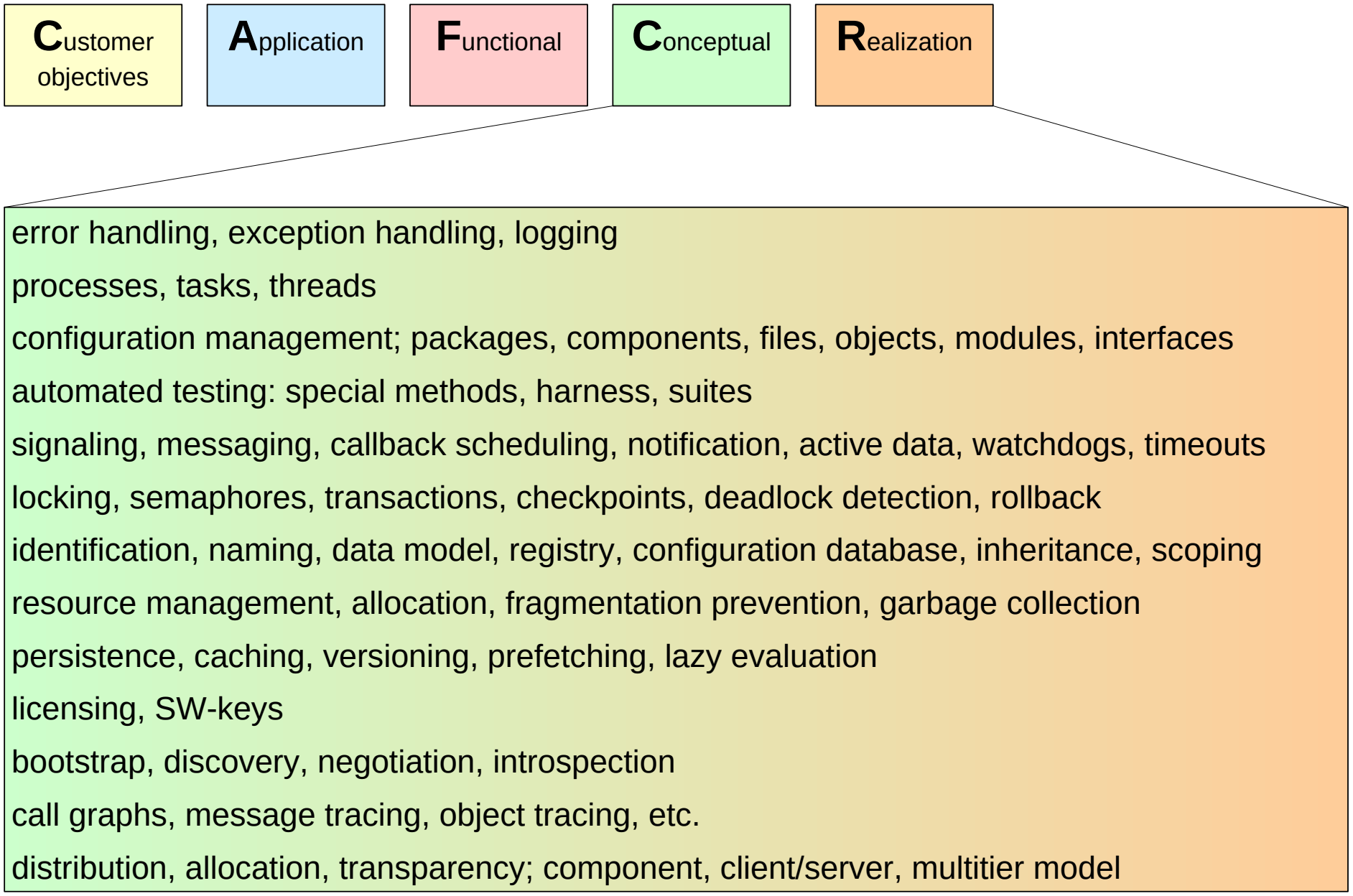
Quality Attributes annotated with SW relation



Design Aspects related to SW



SW Mechanisms



Exercise Role of Software in a complex product

Describe the SW in a complex product, from different viewpoints for instance:

- Give an indication of the size/complexity
- Outline the SW architecture
- Identify the top 3 critical characteristics
- Identify potential improvements
- Process
- Development environment

Software

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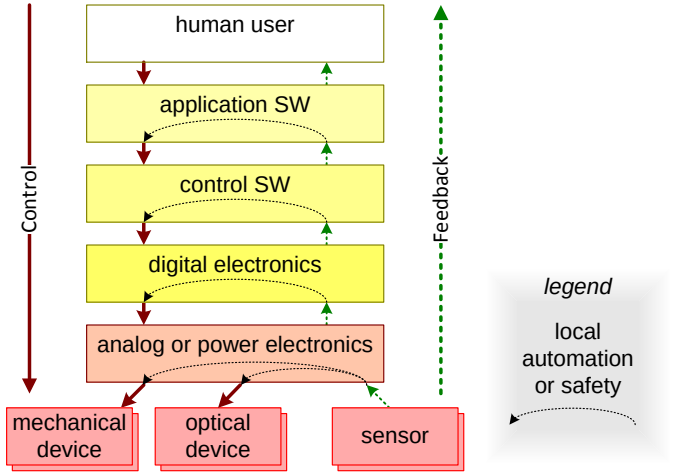
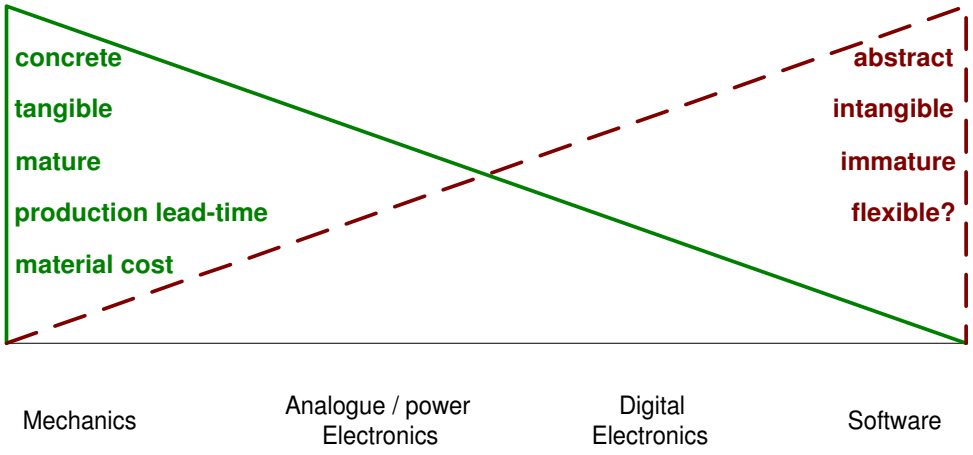


Discipline Characteristics



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