

Modeling Hierarchy, Coping with the Dynamic Range of Design Details

by *Gerrit Muller* Embedded Systems Institute

e-mail: `gerrit.muller@embeddedsystems.nl`

`www.gaudisite.nl`

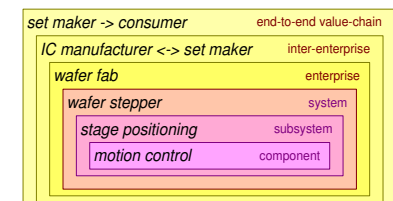
Abstract

A system functions as part of a broader enterprise. For the design of a system understanding is required of its purpose within the enterprise, as well as of its internal functioning. Models are a means to create and capture understanding. Many different models are needed during the design of a system, from broad enterprise models down to detailed implementation models of components or functions. In this article we show the hierarchy of models, their relations and the level of detail in these models.

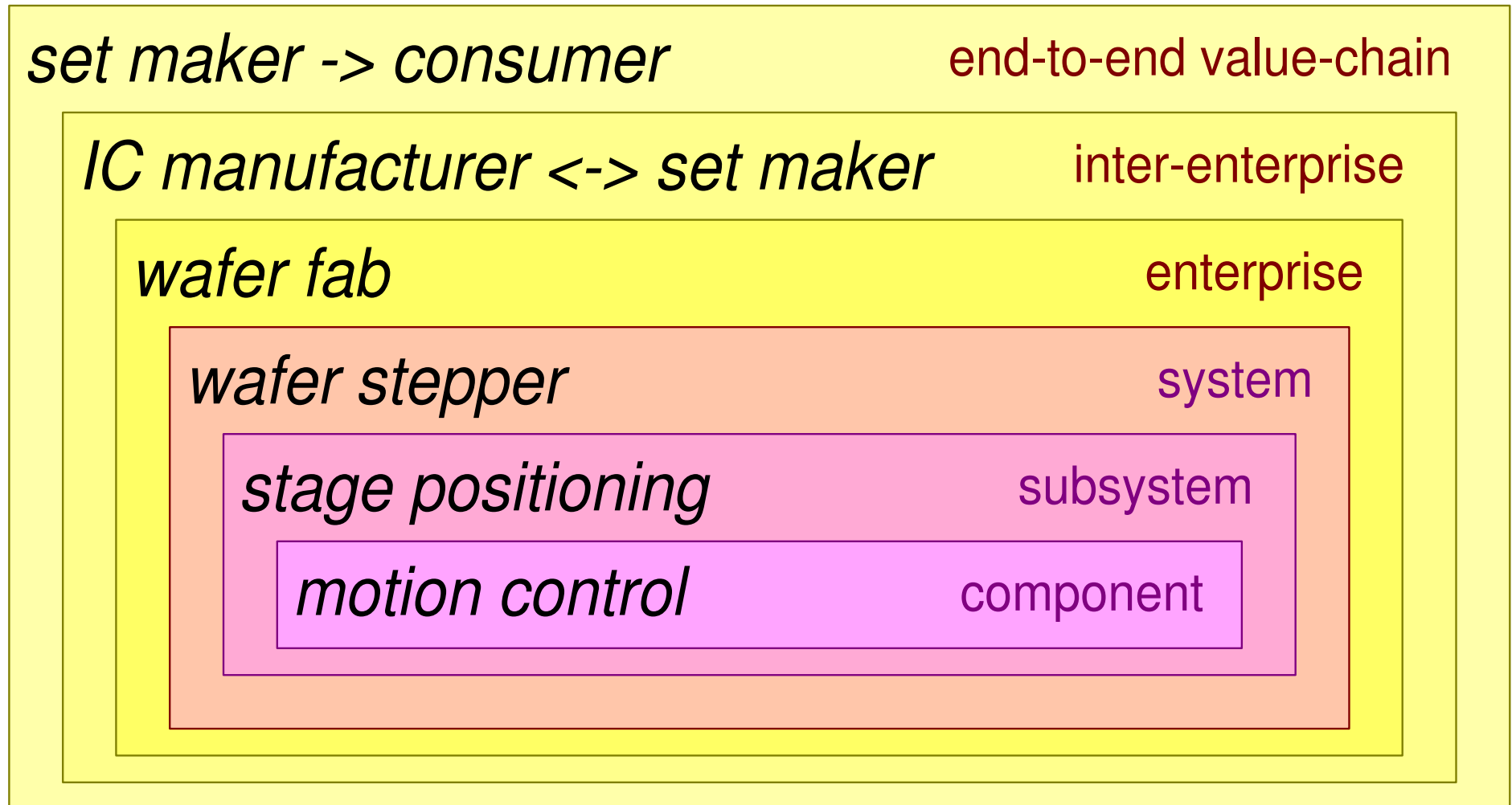
Distribution

This article or presentation is written as part of the Gaudí project. The Gaudí project philosophy is to improve by obtaining frequent feedback. Frequent feedback is pursued by an open creation process. This document is published as intermediate or nearly mature version to get feedback. Further distribution is allowed as long as the document remains complete and unchanged.

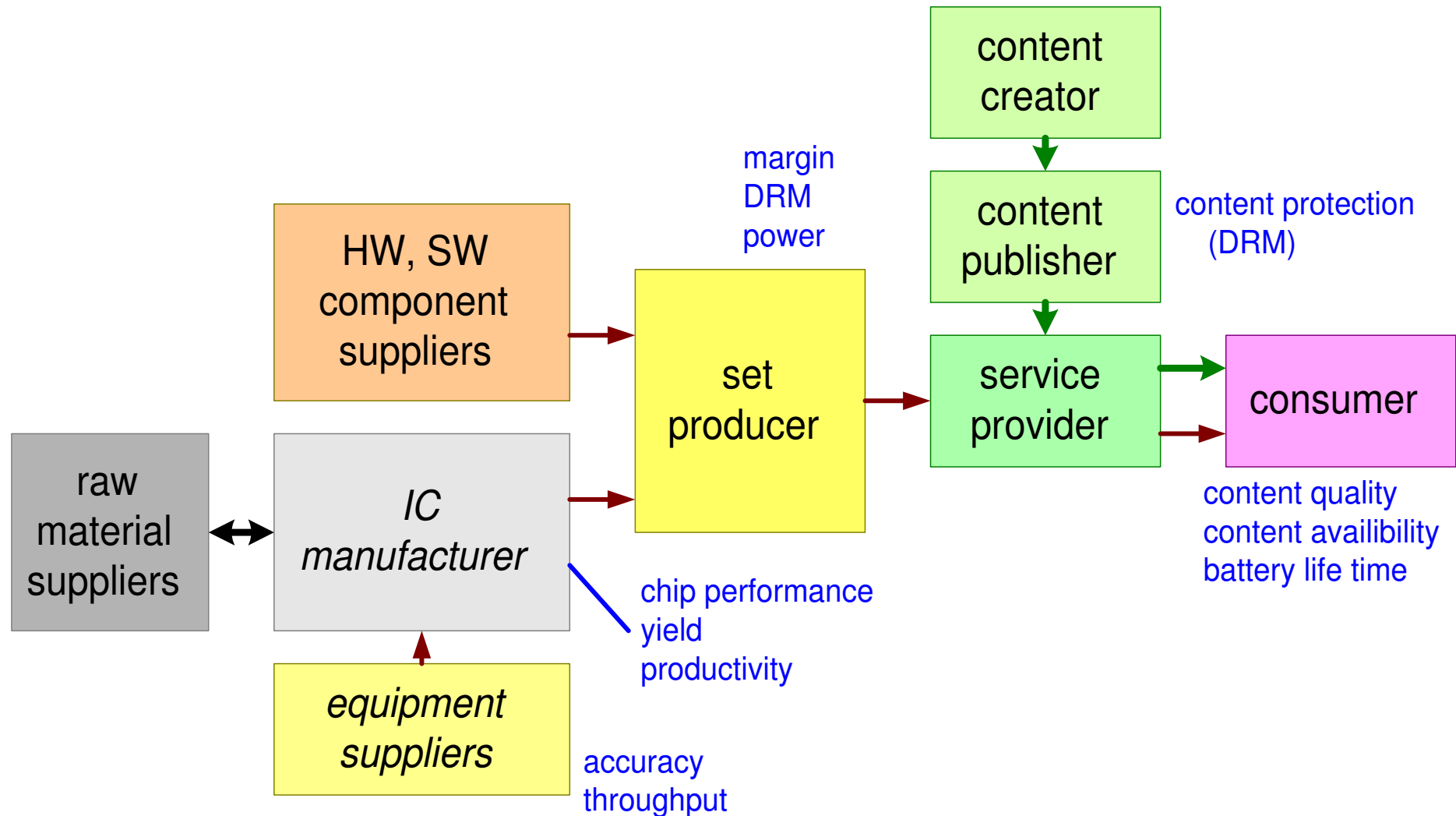
February 10, 2011
status: preliminary
draft
version: 0.1



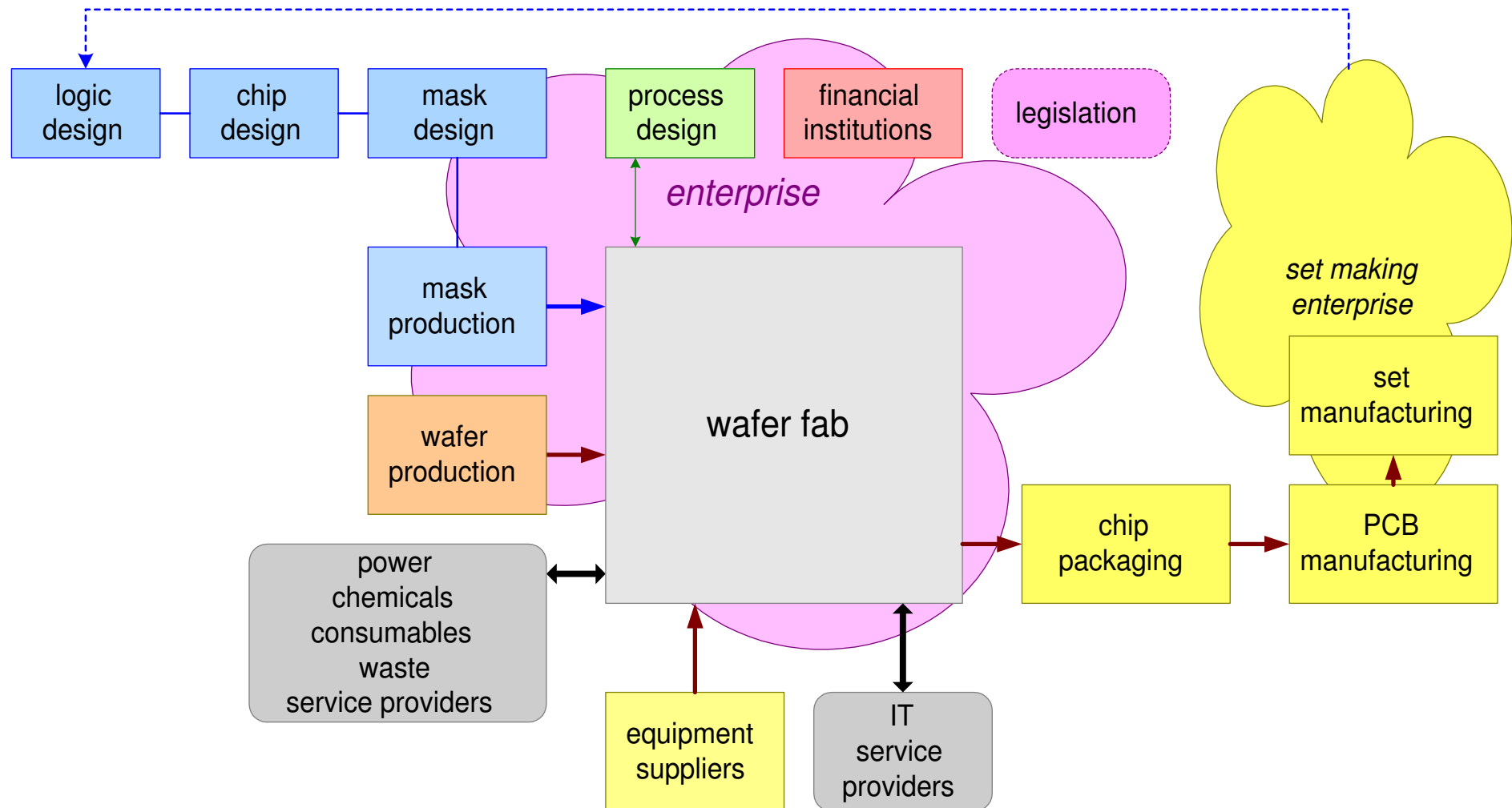
Hierarchical Levels in Semiconductor Industry



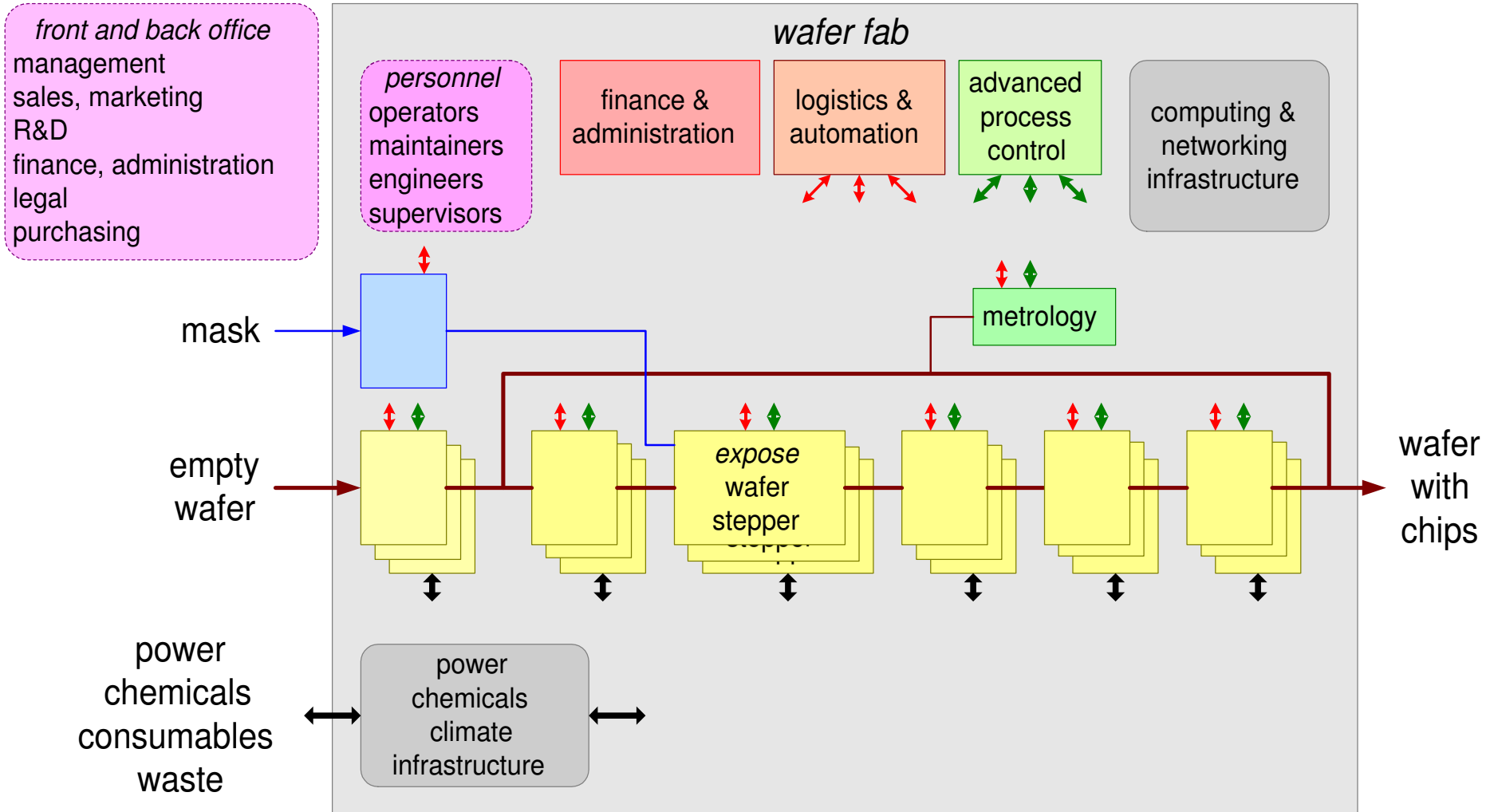
End-to-End Value-Chain



Inter-Enterprise

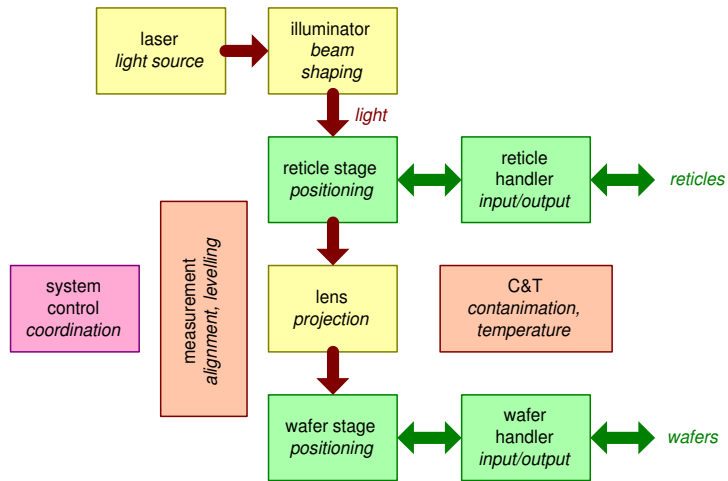


Enterprise

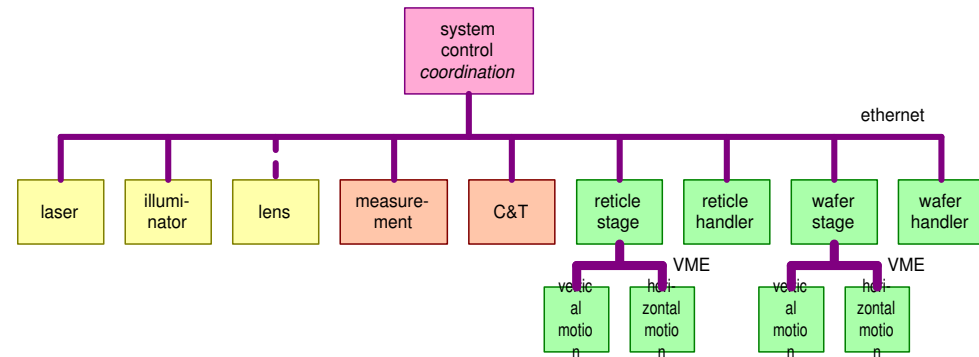


Wafer Stepper System Views

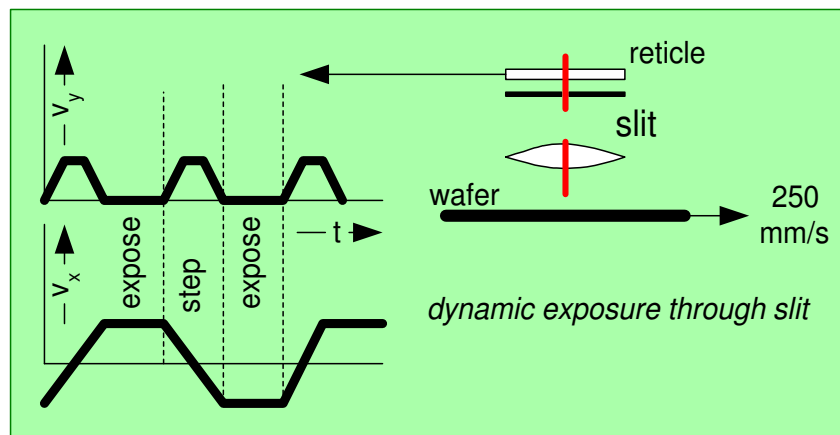
subsystems



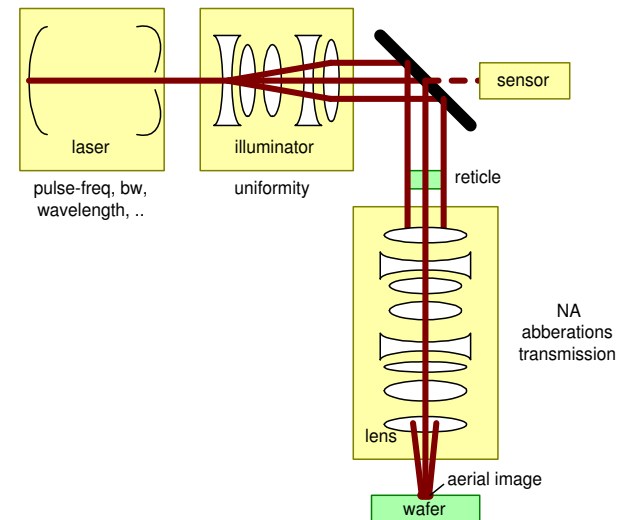
control hierarchy



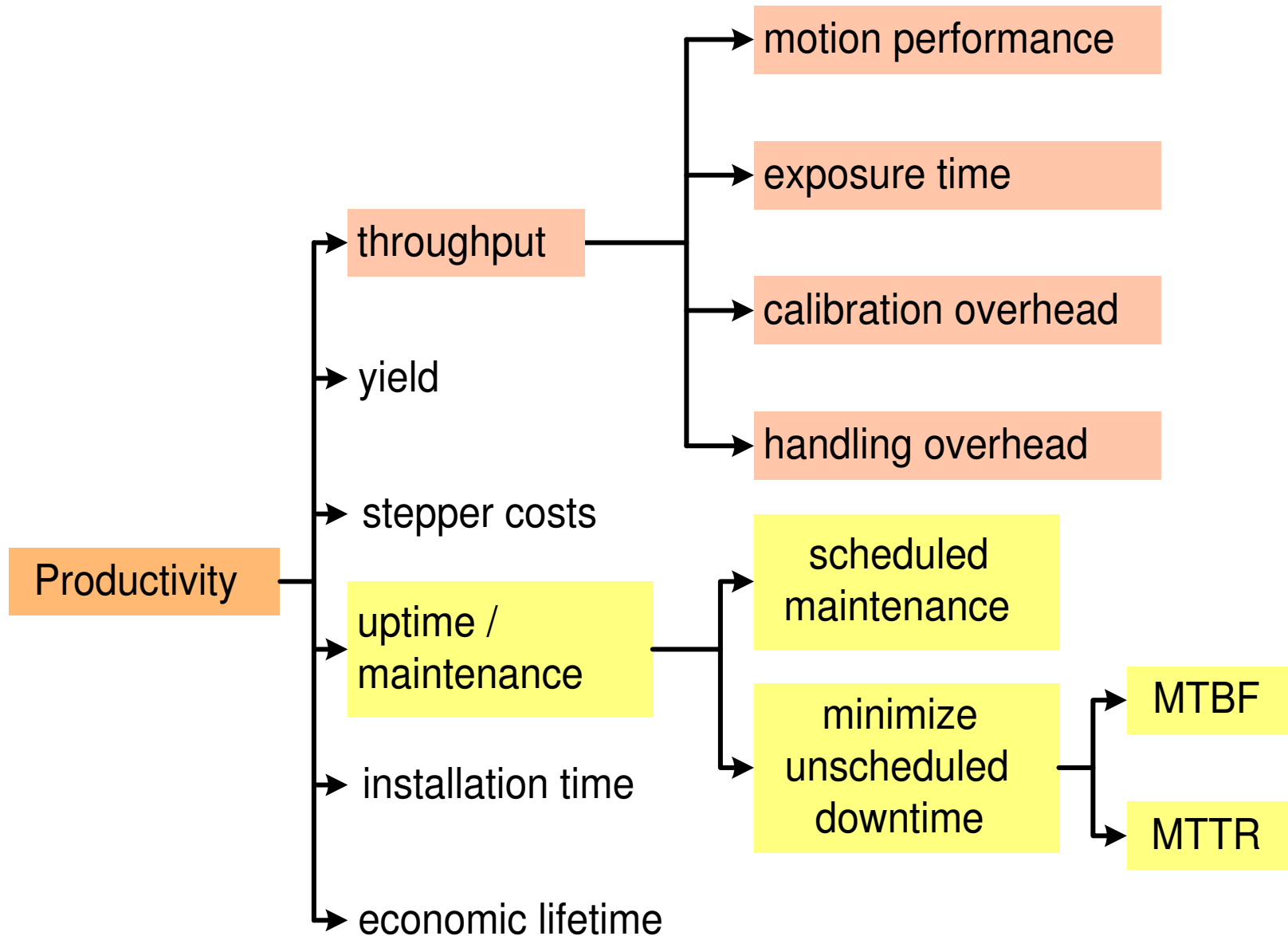
kinematic



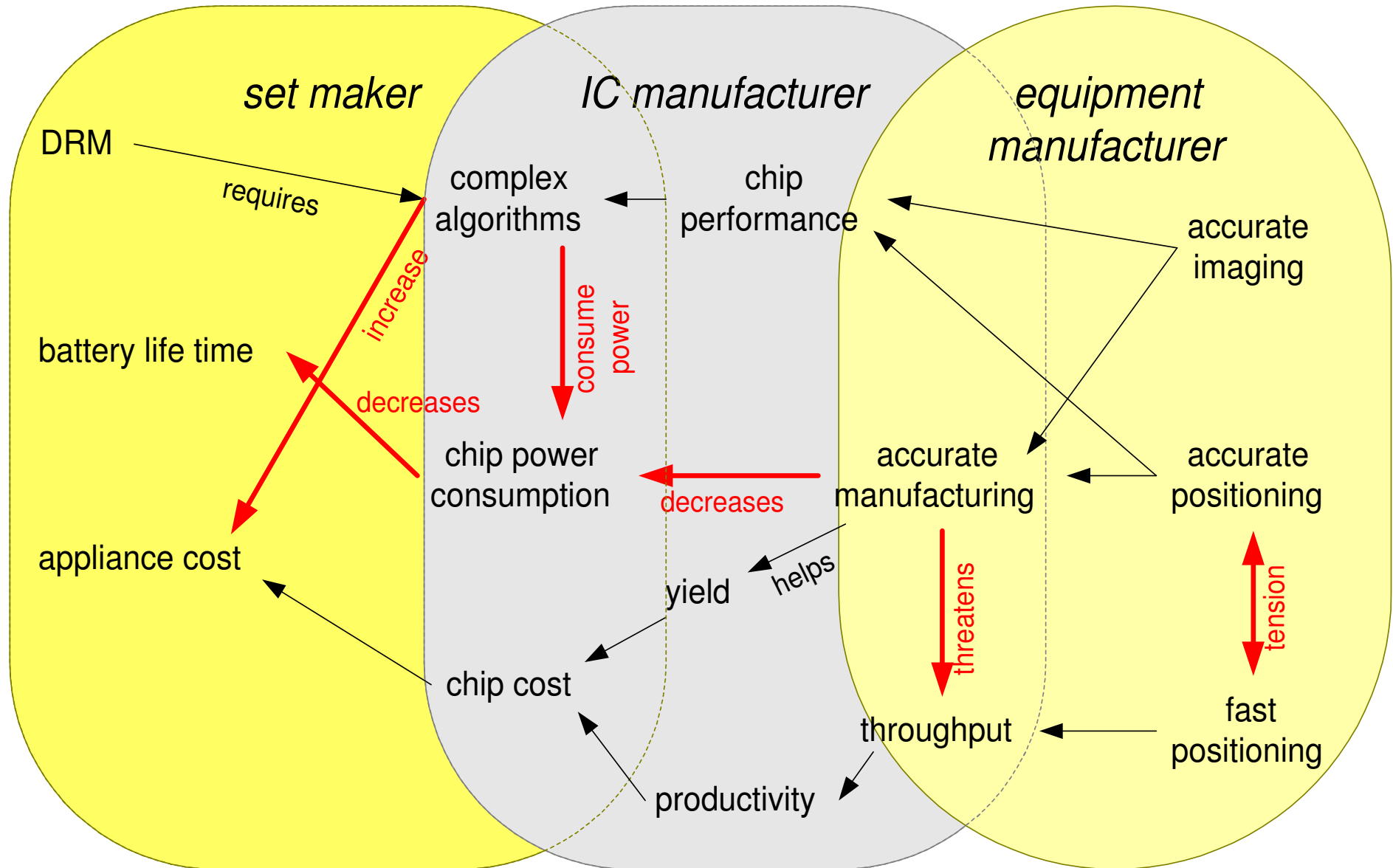
physics/optics



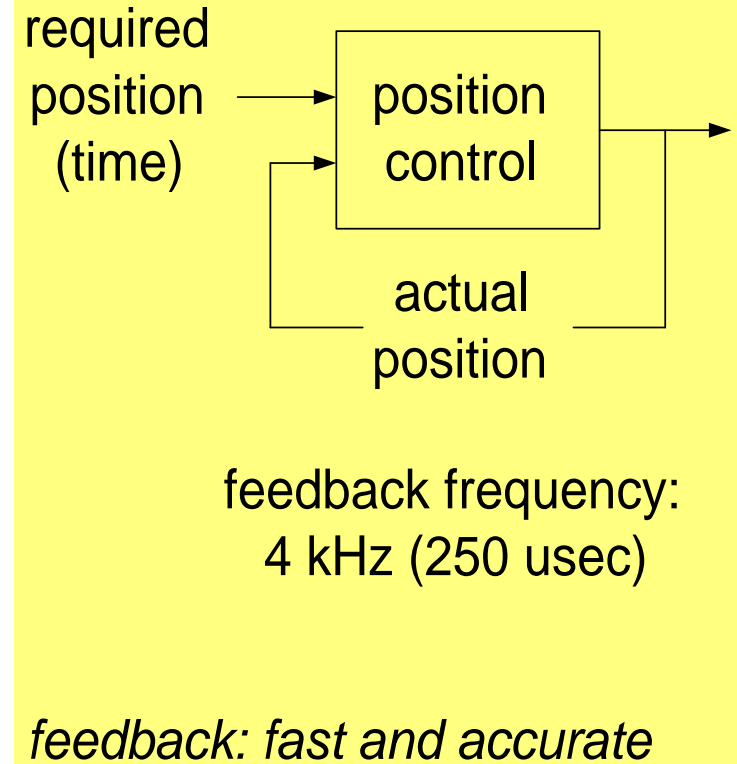
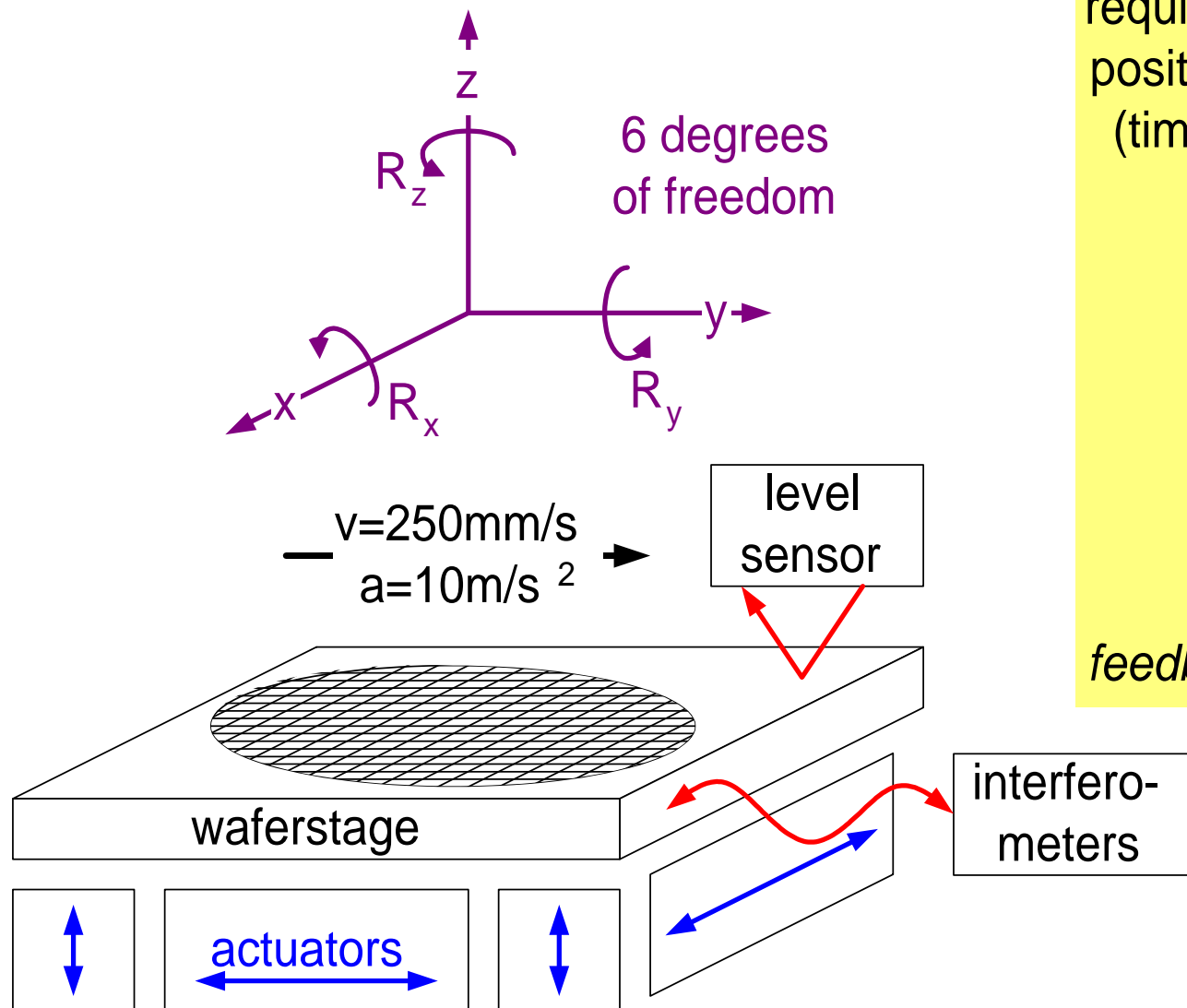
Productivity Key Driver Decomposition



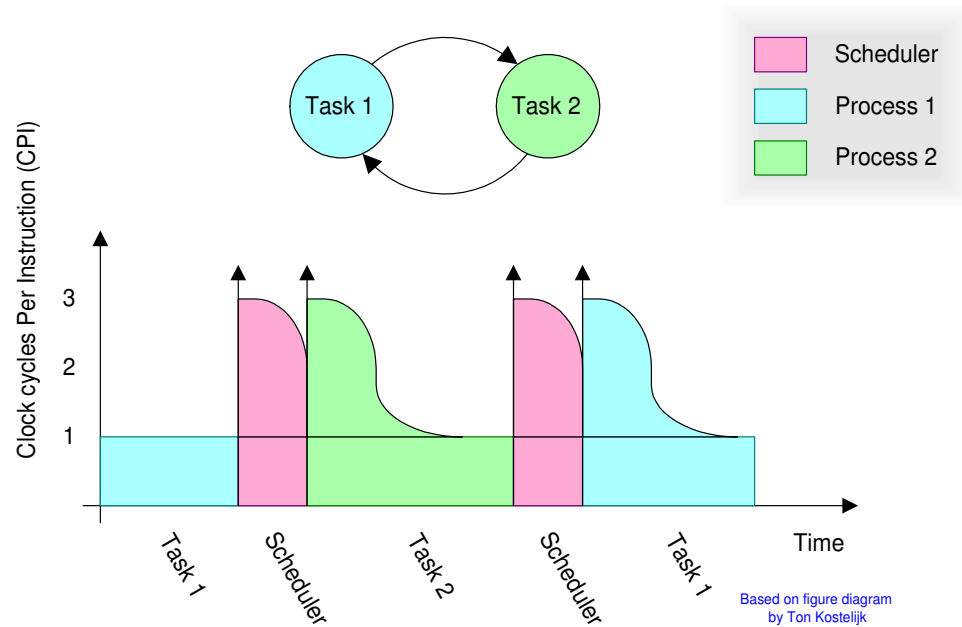
Relating Key-Drivers



Stage Positioning



Characterization of Motion Control Platform



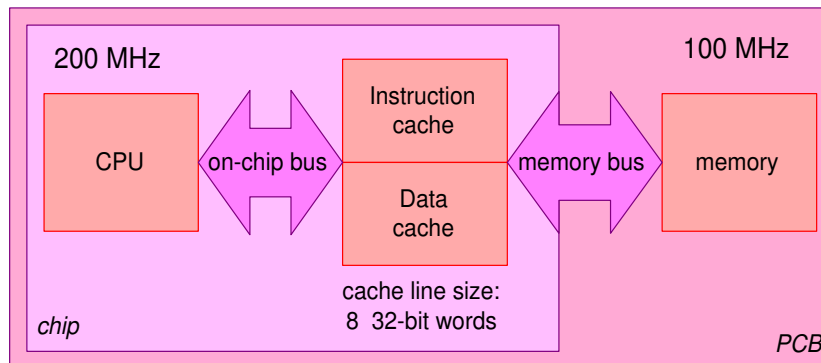
SW
model

+

HW
model



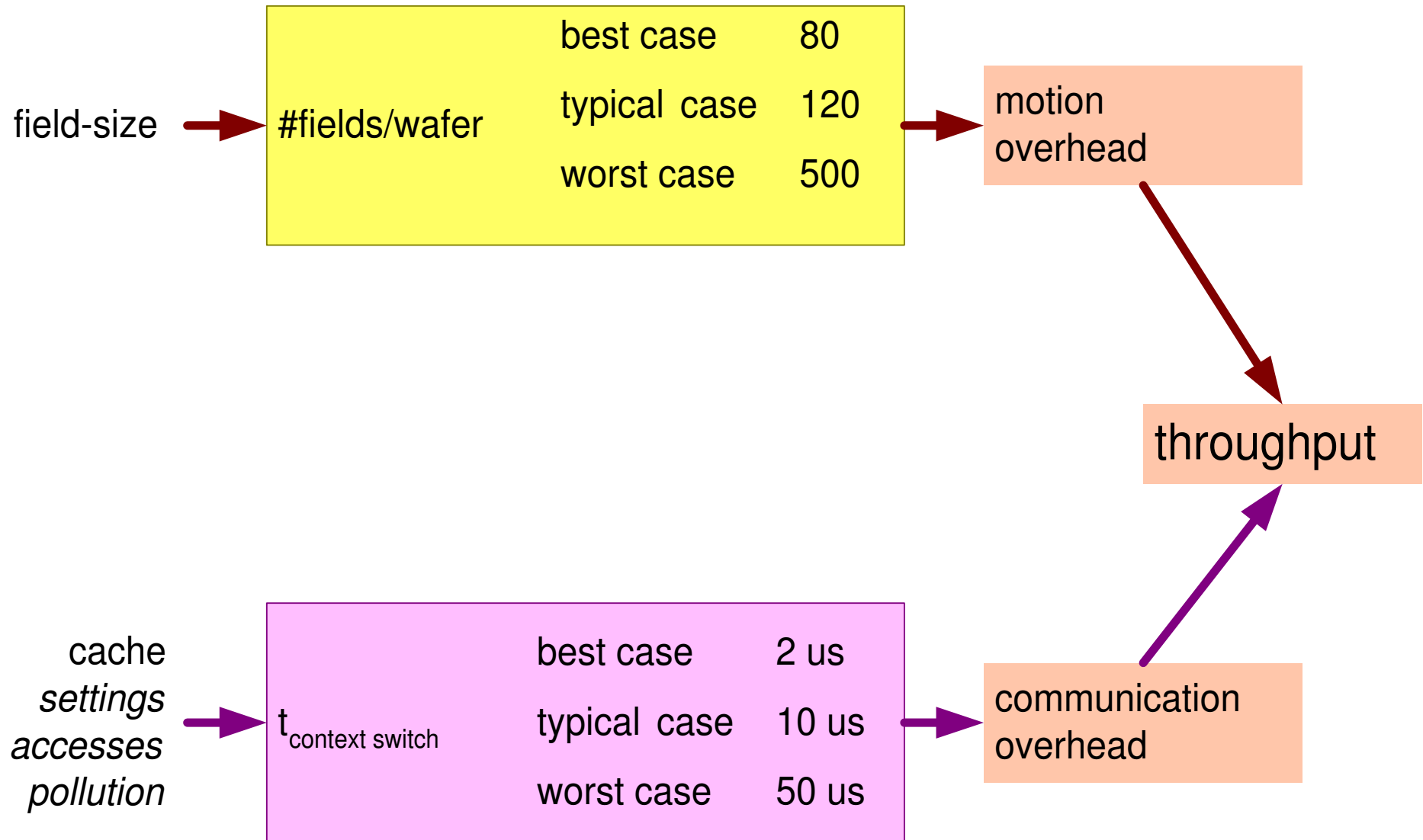
control performance



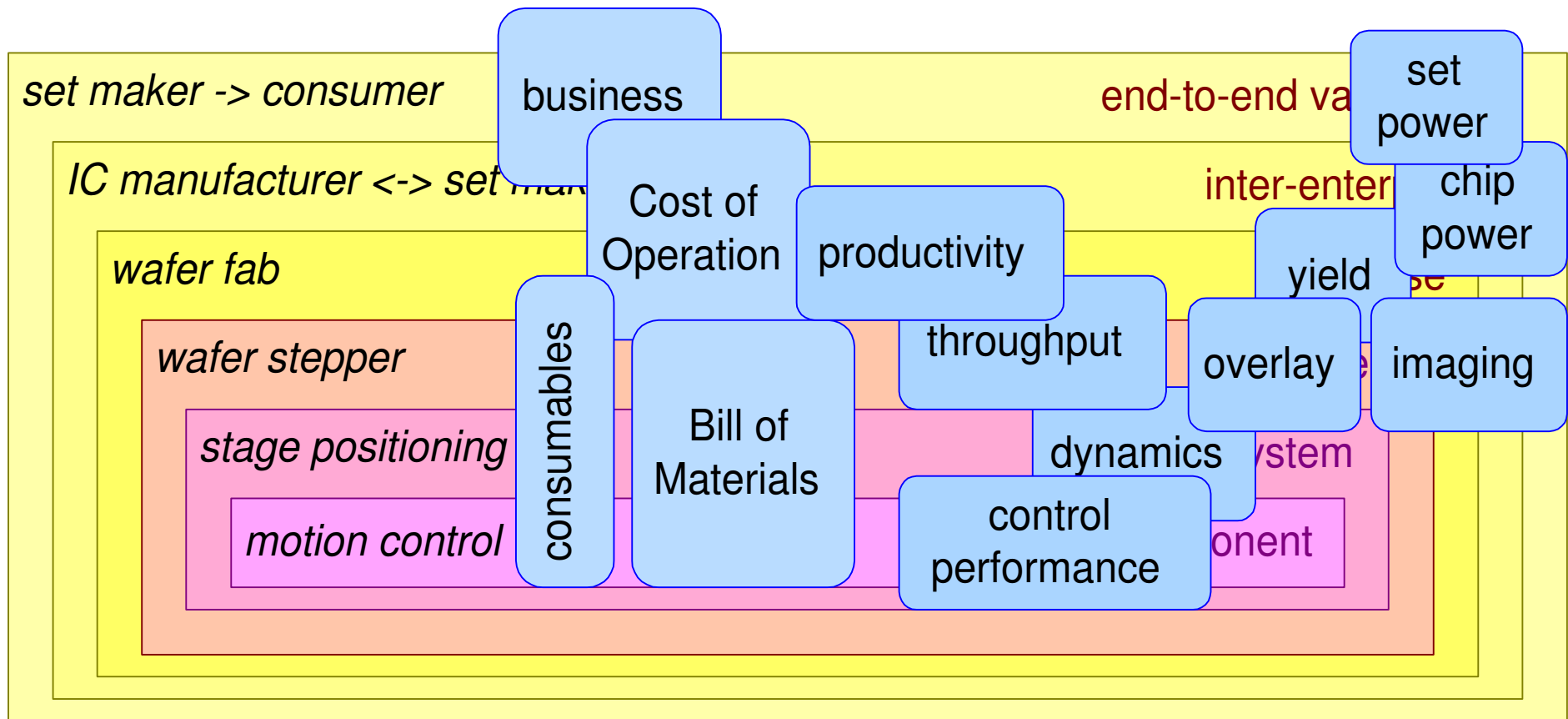
Quantification Issues

requirements analysis	paradigm boundaries application relevance design sensitivity
ranges and relations	typical, best, worst case dependencies
variation analysis	random vs systematic types of systematic variation time-base, rate of change
propagation analysis	amplification or dimming
evolution	application, business evolution technology evolution scaling, scaling boundaries

Typical, Best and Worst Case Example



Related crosscutting models at different levels



Models to be made help to analyse and understand

