

# Modeling Hierarchy, Coping with the Dynamic Range of Design Details

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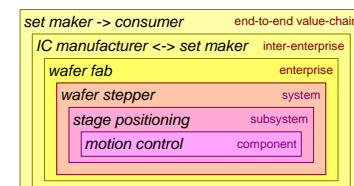
## Abstract

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.

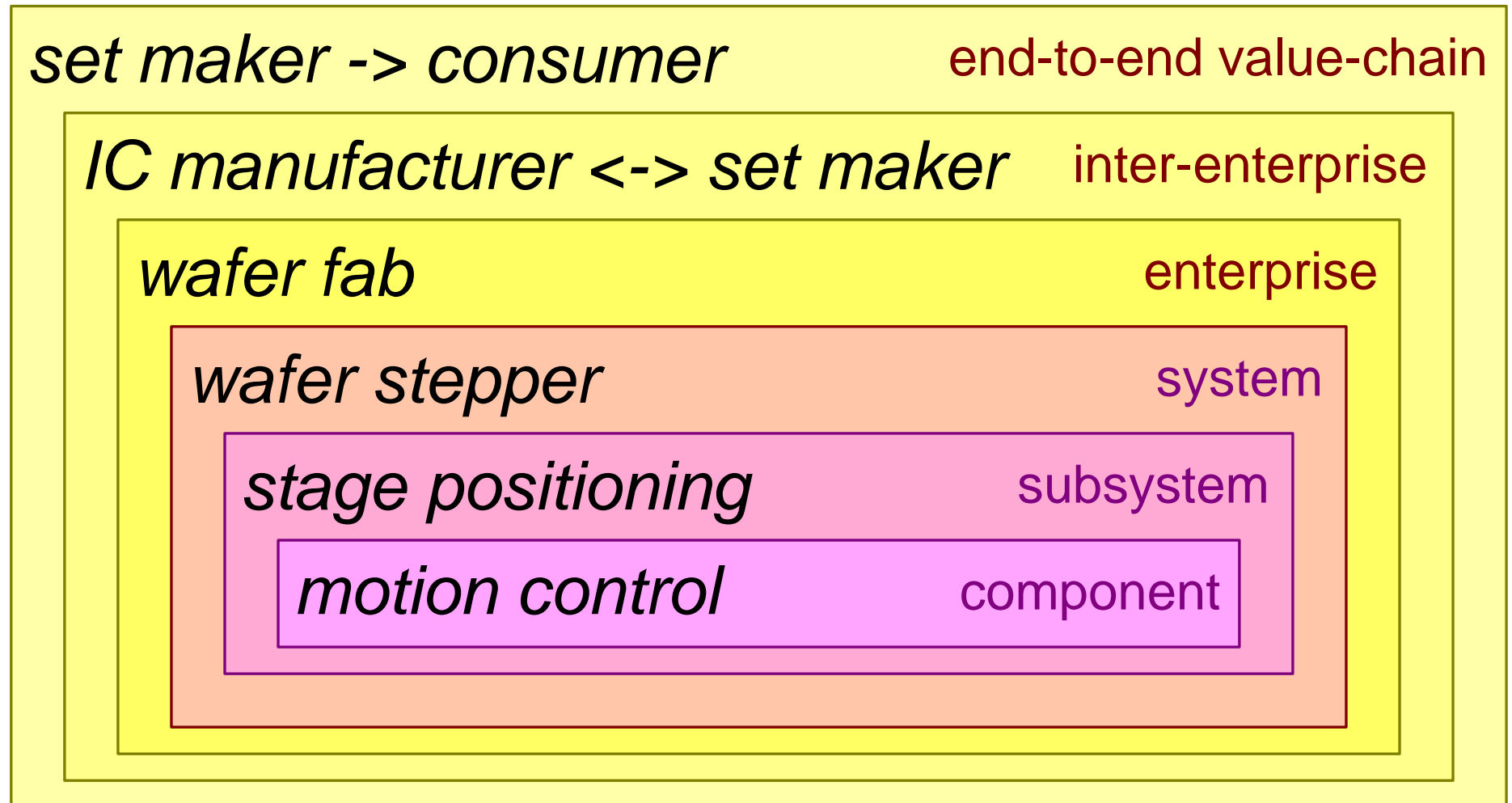
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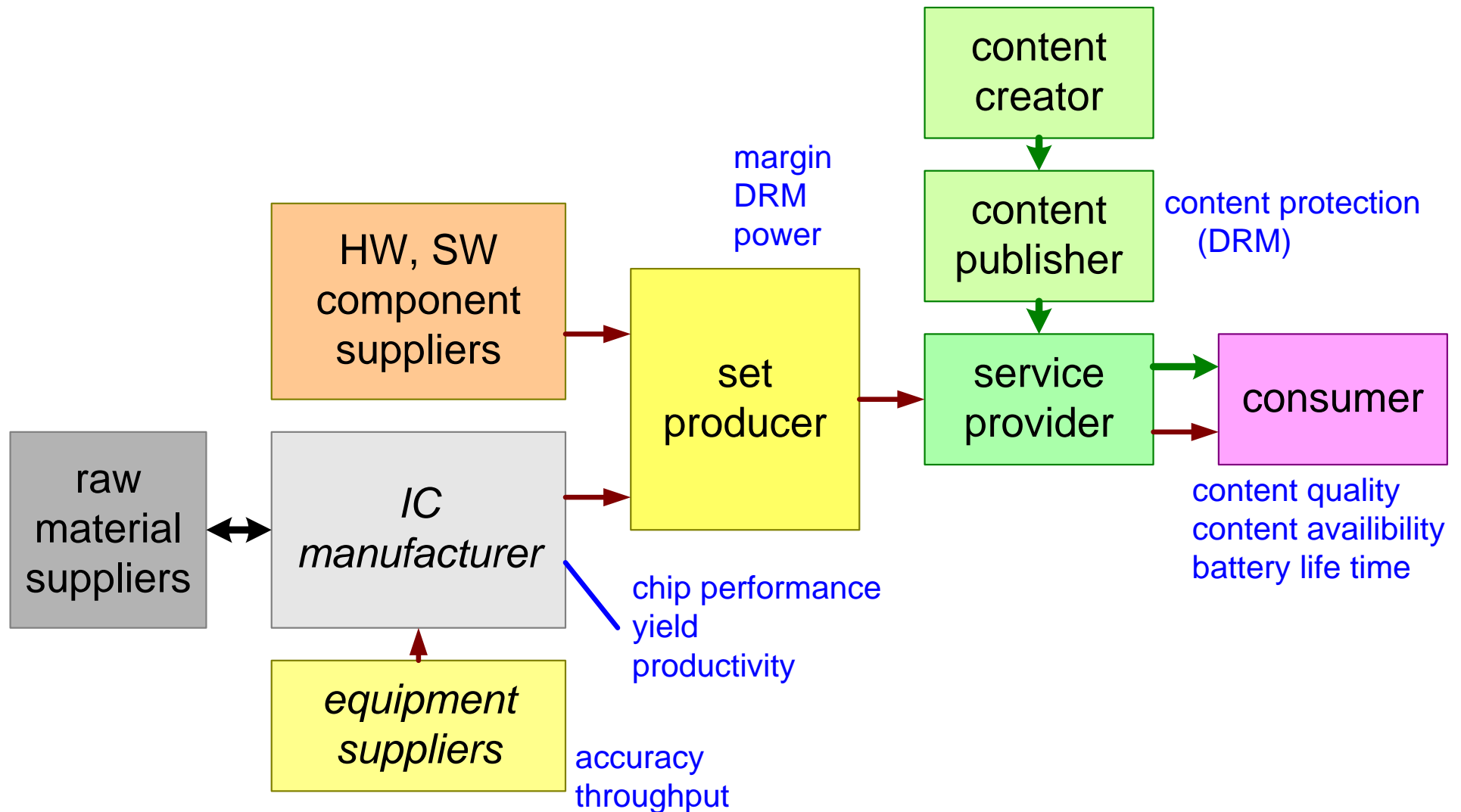
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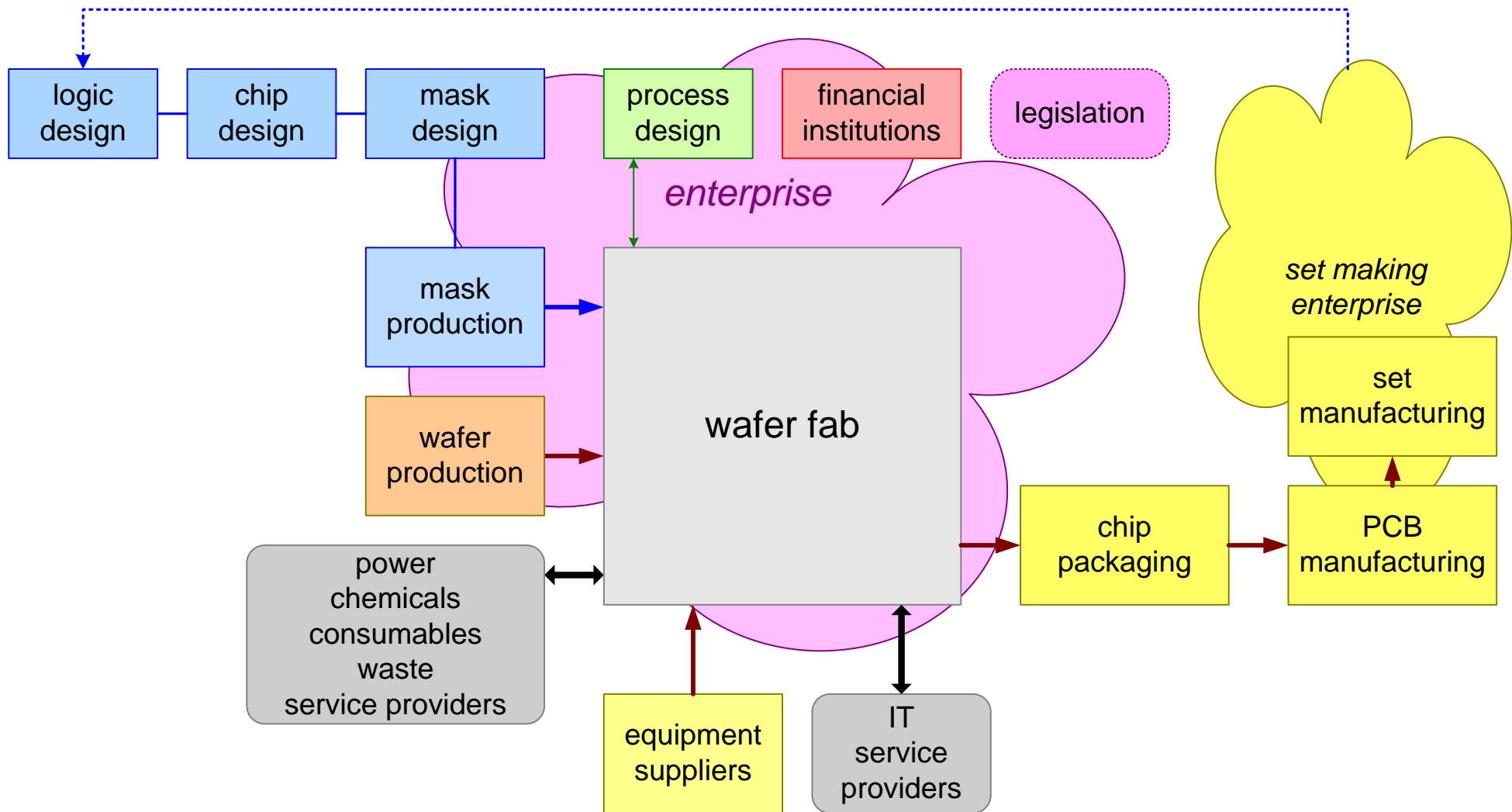
# Hierarchical Levels in Semiconductor Industry



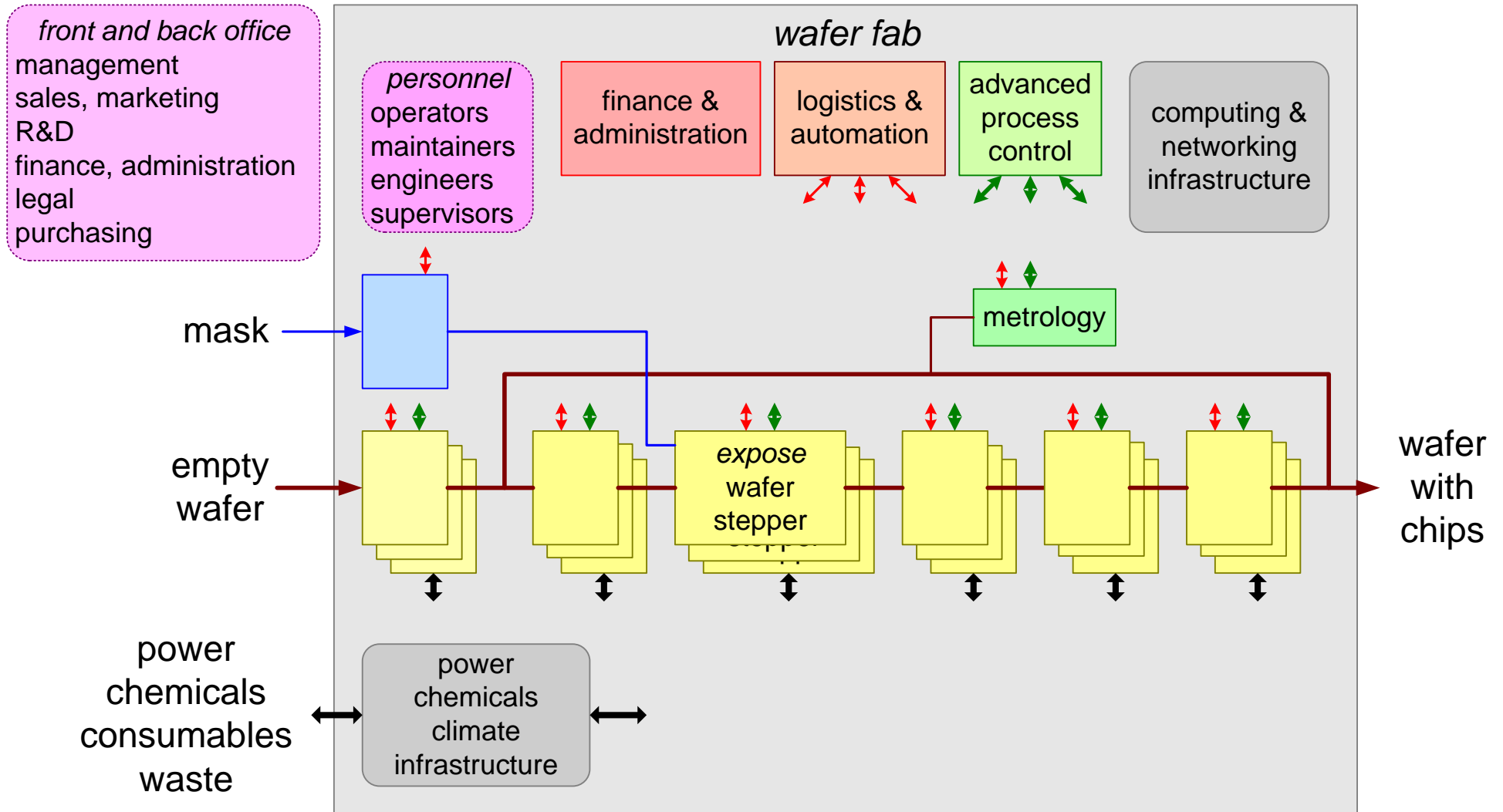
# End-to-End Value-Chain



# Inter-Enterprise

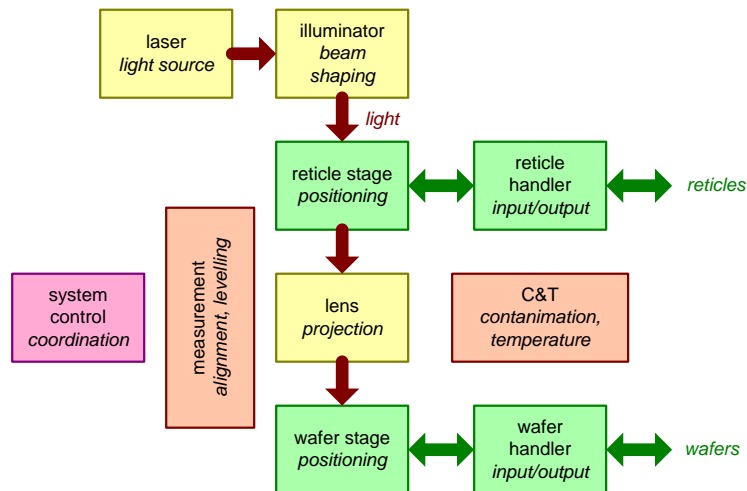


# Enterprise

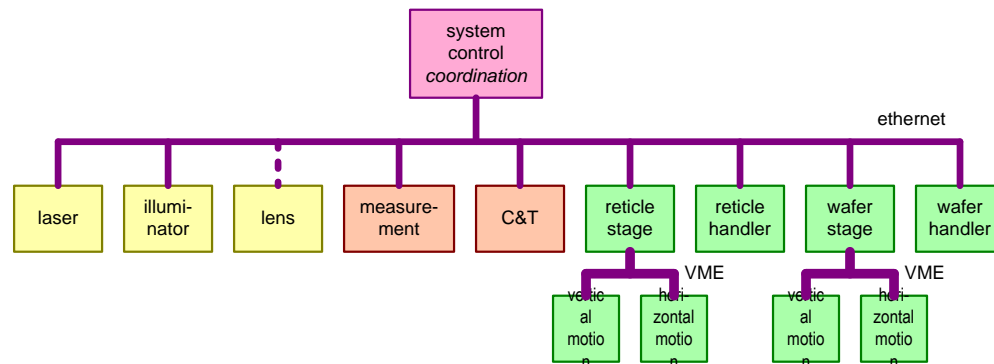


# Wafer Stepper System Views

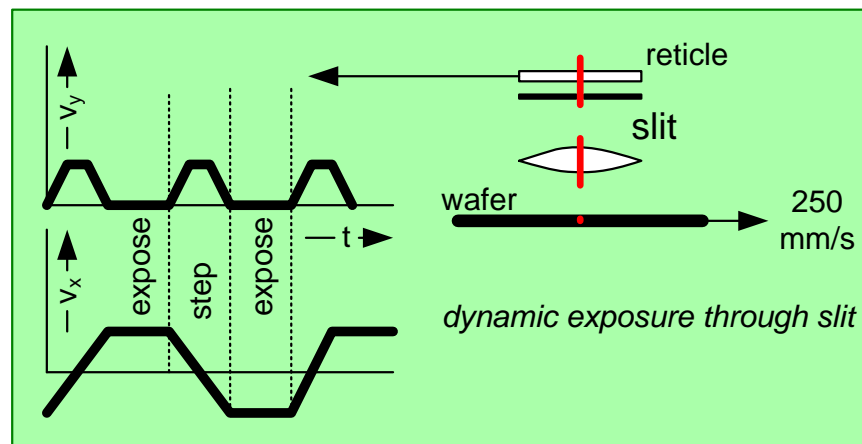
## subsystems



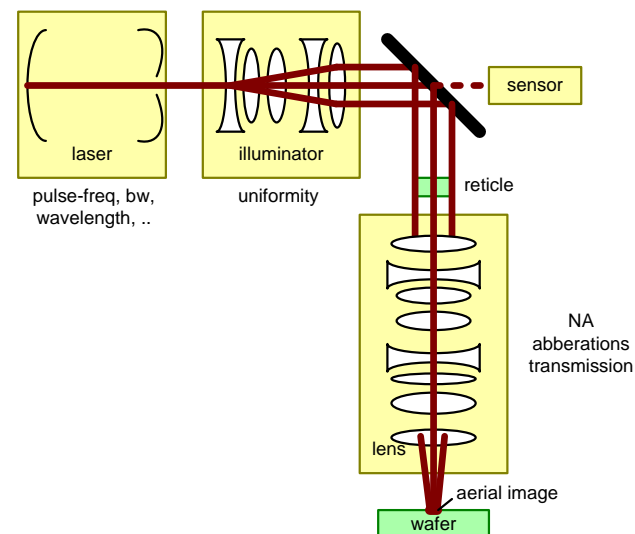
## control hierarchy



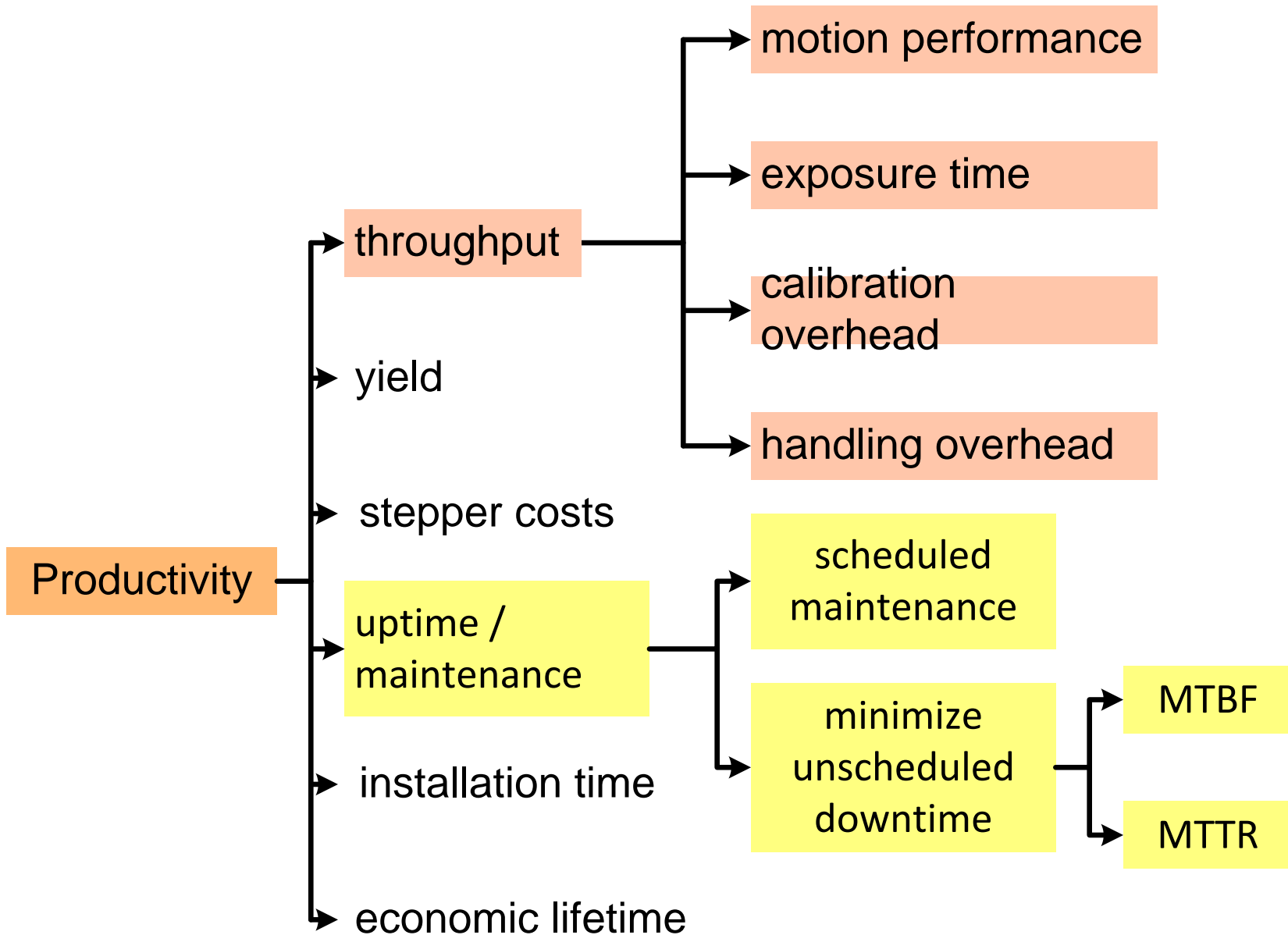
## kinematic



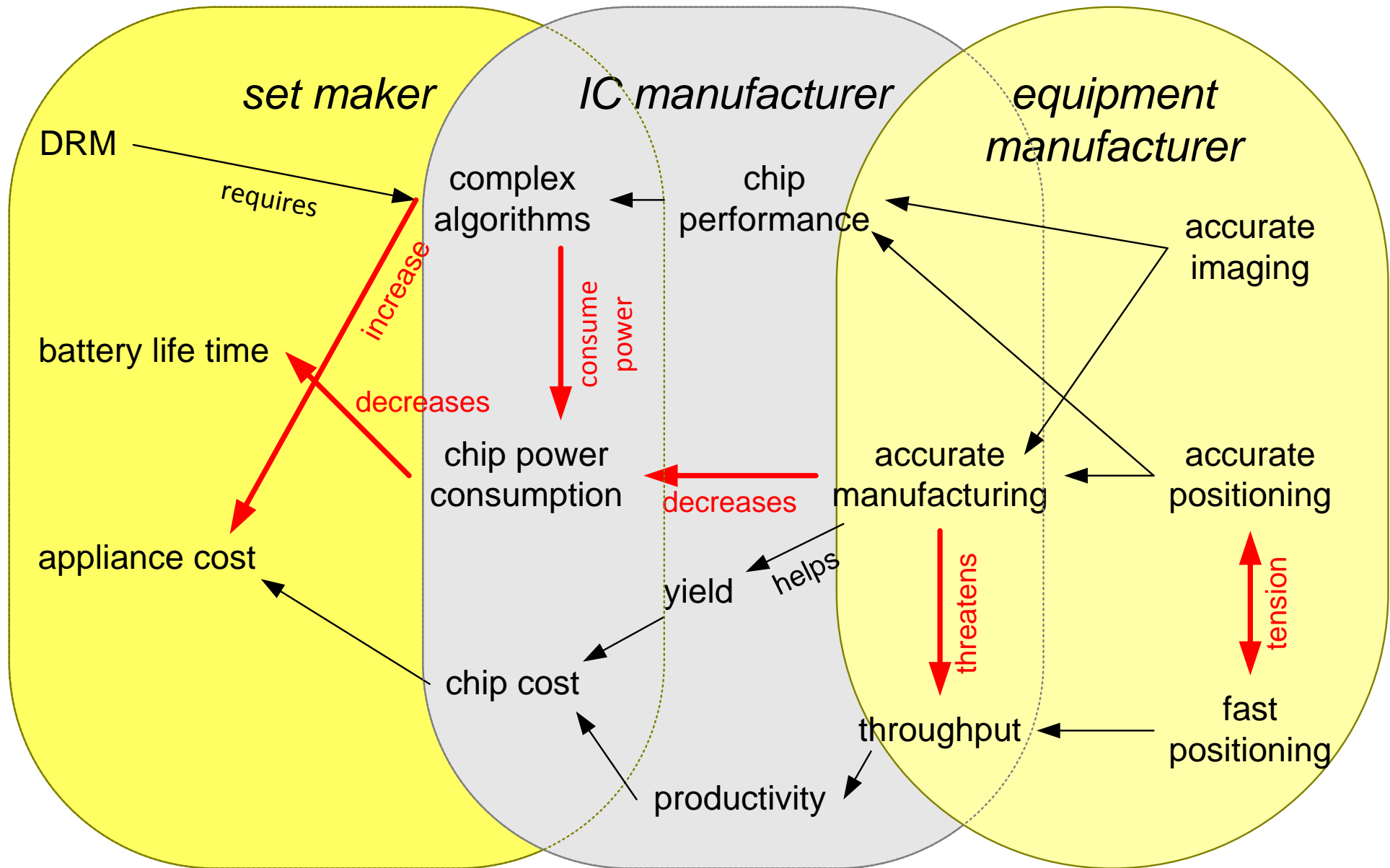
## physics/optics



# Productivity Key Driver Decomposition

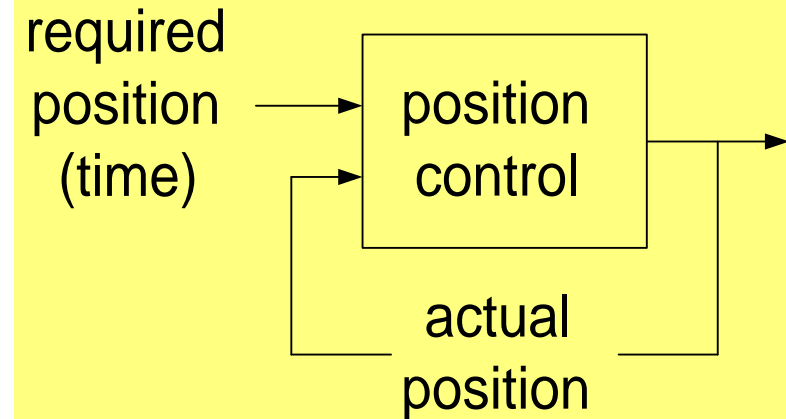
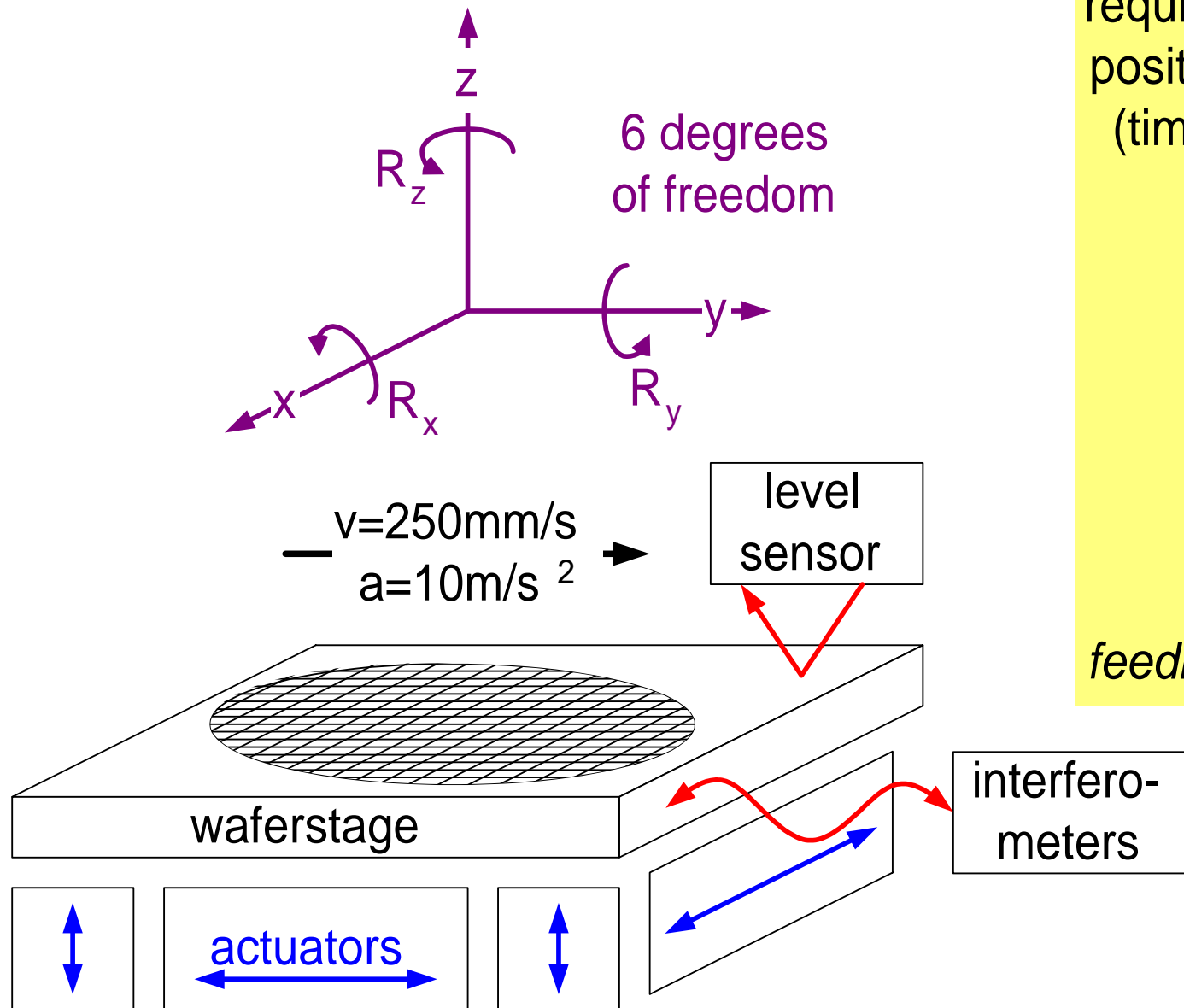


# Relating Key-Drivers





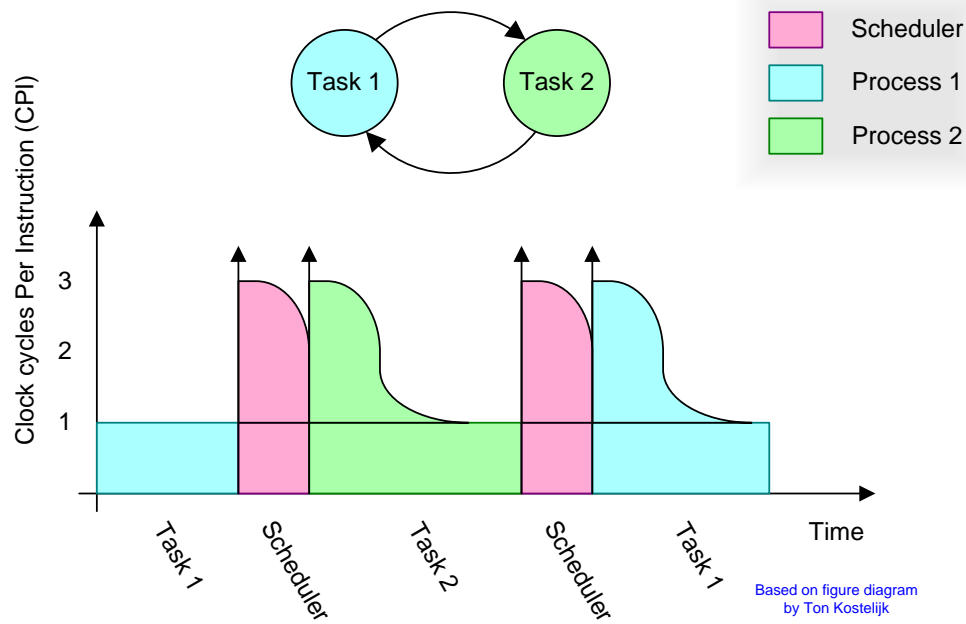
# Stage Positioning



feedback frequency:  
4 kHz (250 usec)

*feedback: fast and accurate*

# Characterization of Motion Control Platform



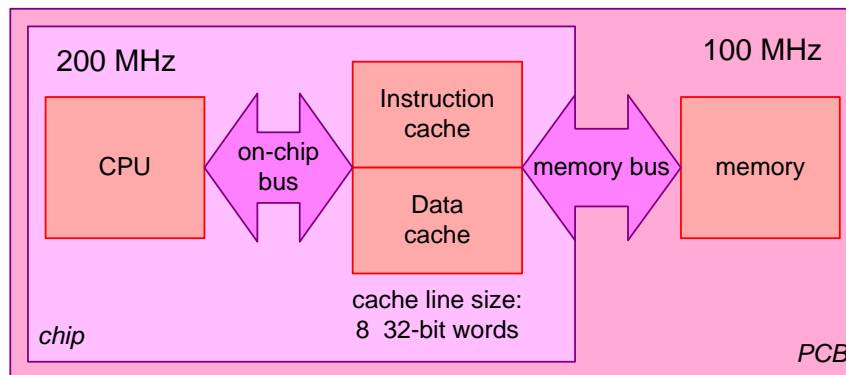
SW  
model

+

HW  
model



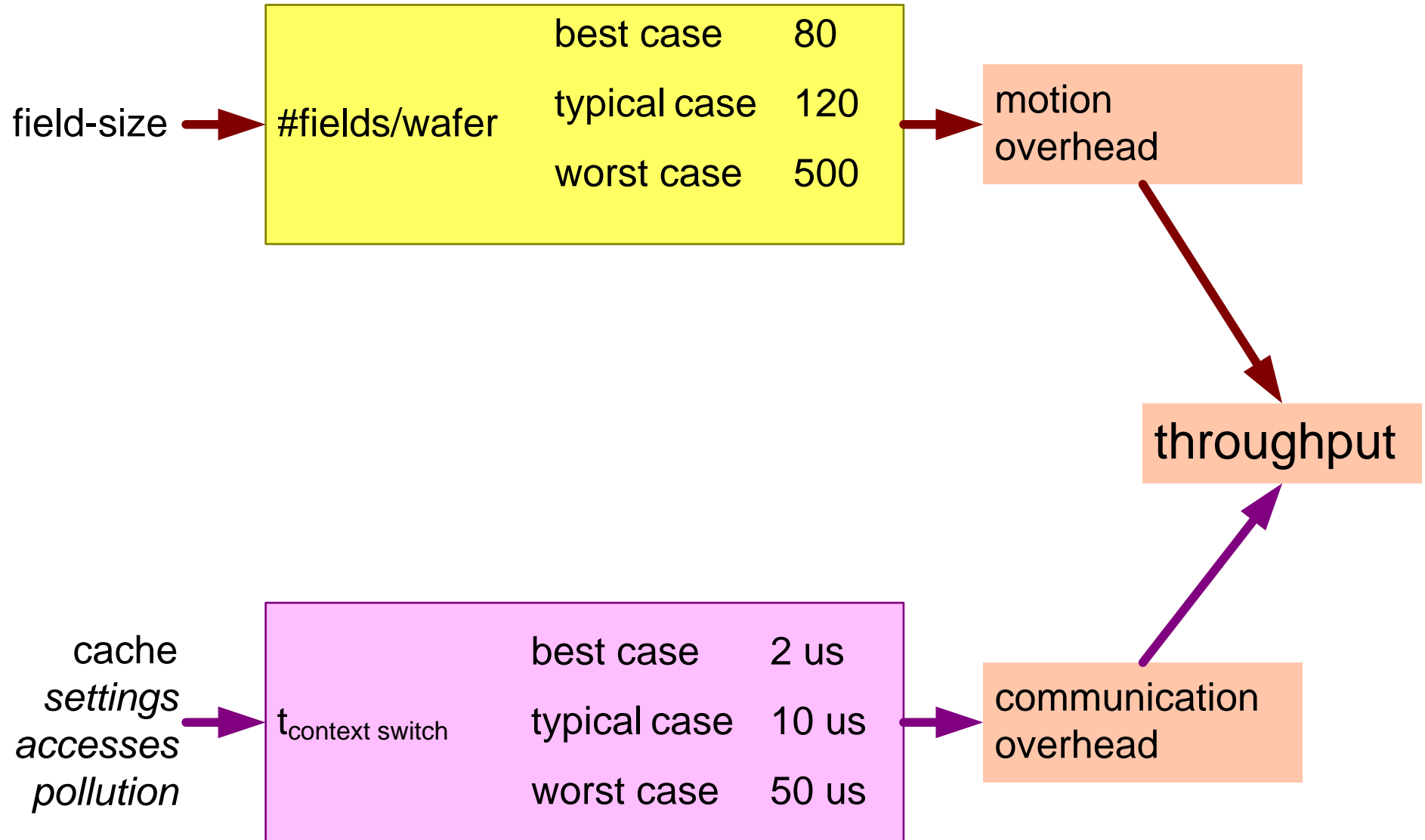
control performance



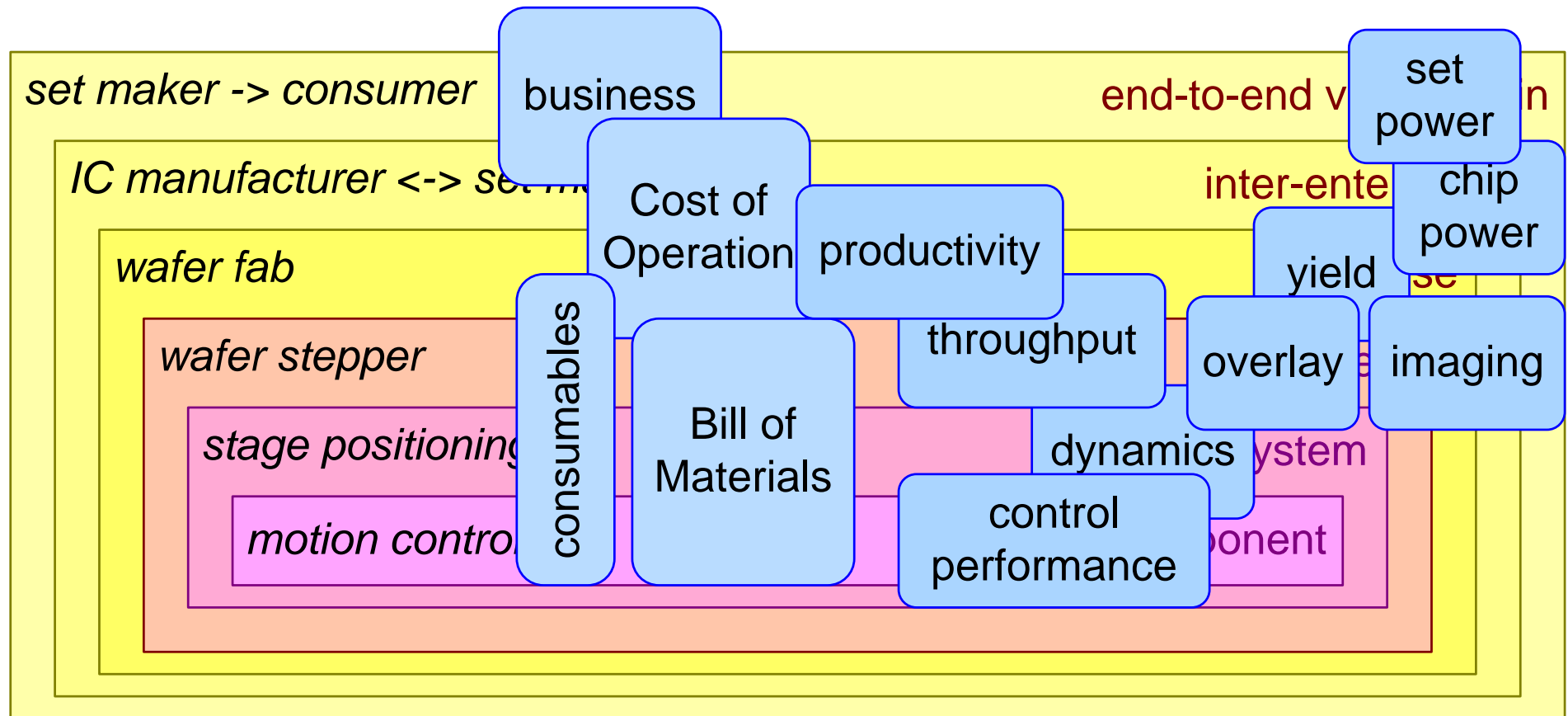
# Quantification Issues

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

