

Module Functional View

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Abstract

This module addresses the Functional View.

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.

September 1, 2020

status: draft

version: 0

logo

TBD

The functional view

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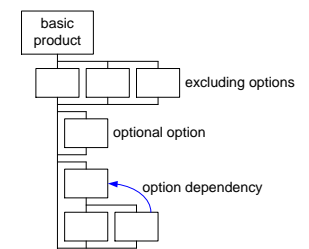
Abstract

The purpose of the functional view is described. A number of methods or models is given to use in this view: (use) case descriptions, commercial decomposition function and feature specifications performance models and specifications, information models. The role of standards is discussed.

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status: preliminary
draft
version: 1.0



Example personal video recorder use case contents

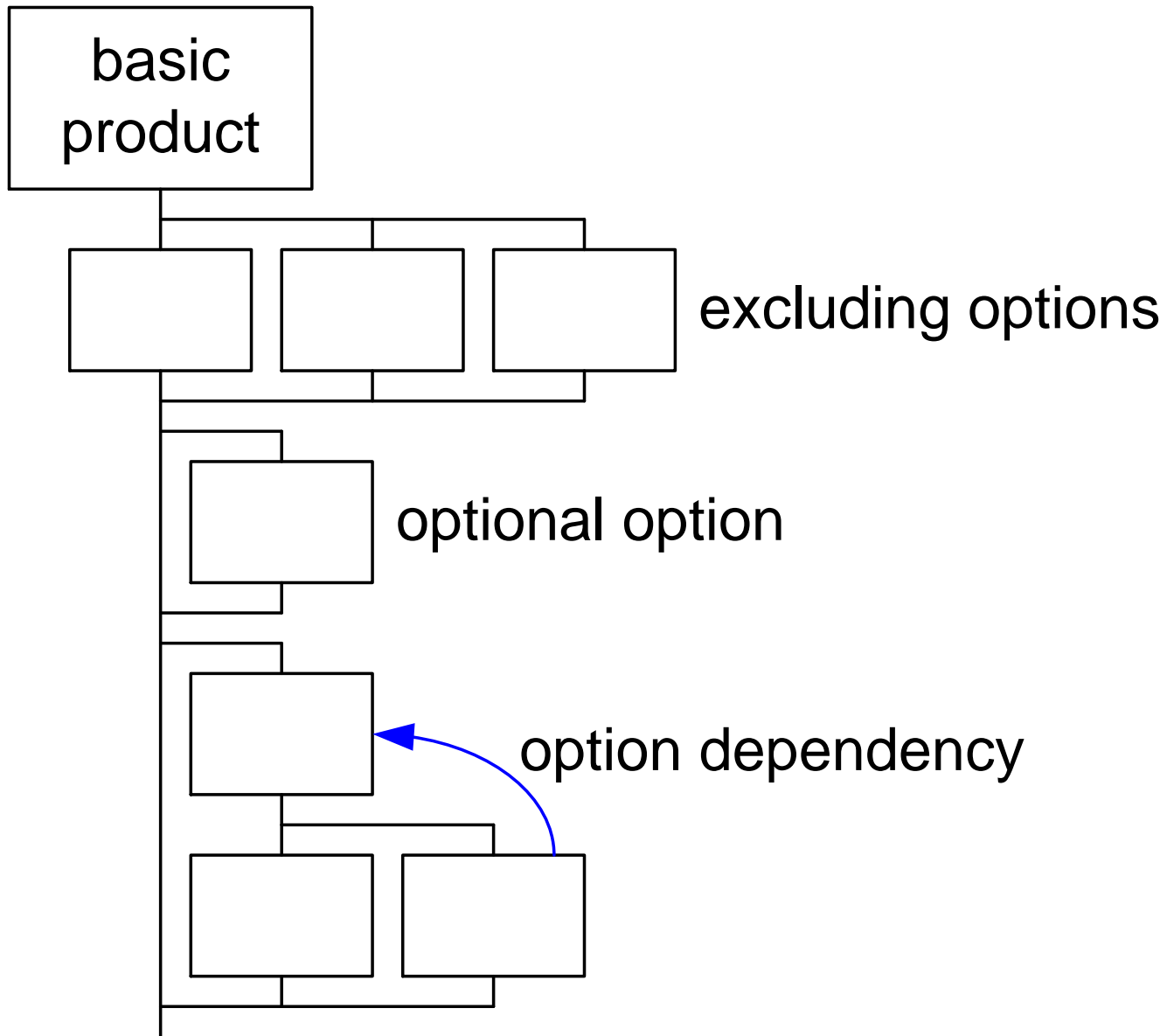
typical use case(s)	worst case, exceptional, or change use case(s)
<p>interaction flow (functional aspects)</p> <ul style="list-style-type: none">select movie via directorystart moviebe able to pause or stopbe able to skip forward or backwardset recording quality	<p>functional</p> <ul style="list-style-type: none">multiple inputs at the same timeextreme long moviedirectory behaviour in case of extreme many short movies
<p>performance and other qualities (non-functional aspects)</p> <ul style="list-style-type: none">response times for start / stopresponse times for directory browsingend-of-movie behaviourrelation recording quality and storage	<p>non-functional</p> <ul style="list-style-type: none">response time with multiple inputsimage quality with multiple inputsinsufficient free spaceresponse time with many directory entriesreplay quality while HQ recording

Recommendations for working with use cases

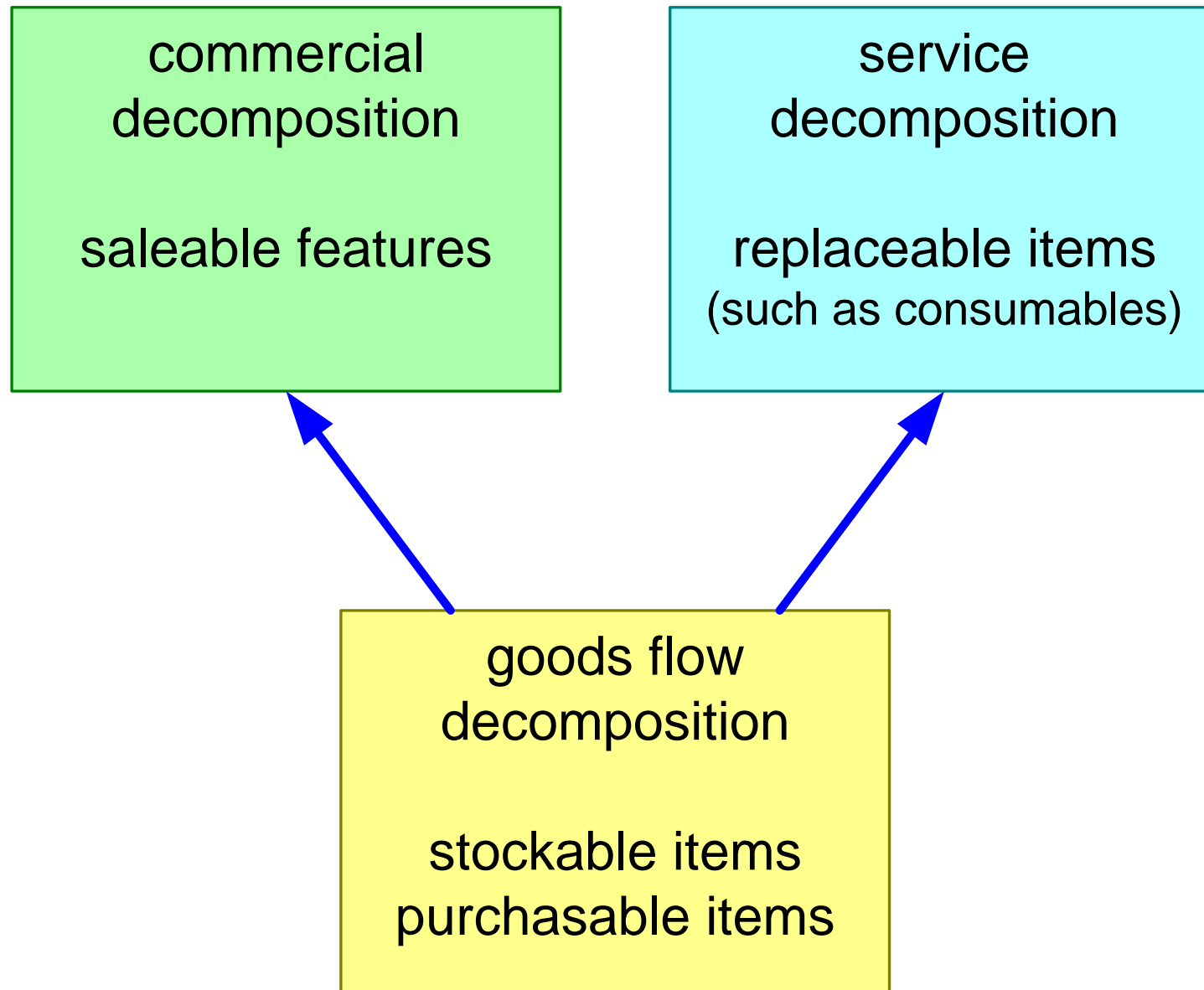
- + combine related functions in one use case
- do not make a separate use case for every function
- + include non-functional requirements in the use cases

- + minimise the amount of required *worst case* and *exceptional use cases*
- excessive amounts of use cases propagate to excessive implementation efforts
- + reduce the amount of these use cases in steps
- a few well chosen *worst case* use cases simplifies the design

Commercial Decomposition



Logistic decompositions for a product

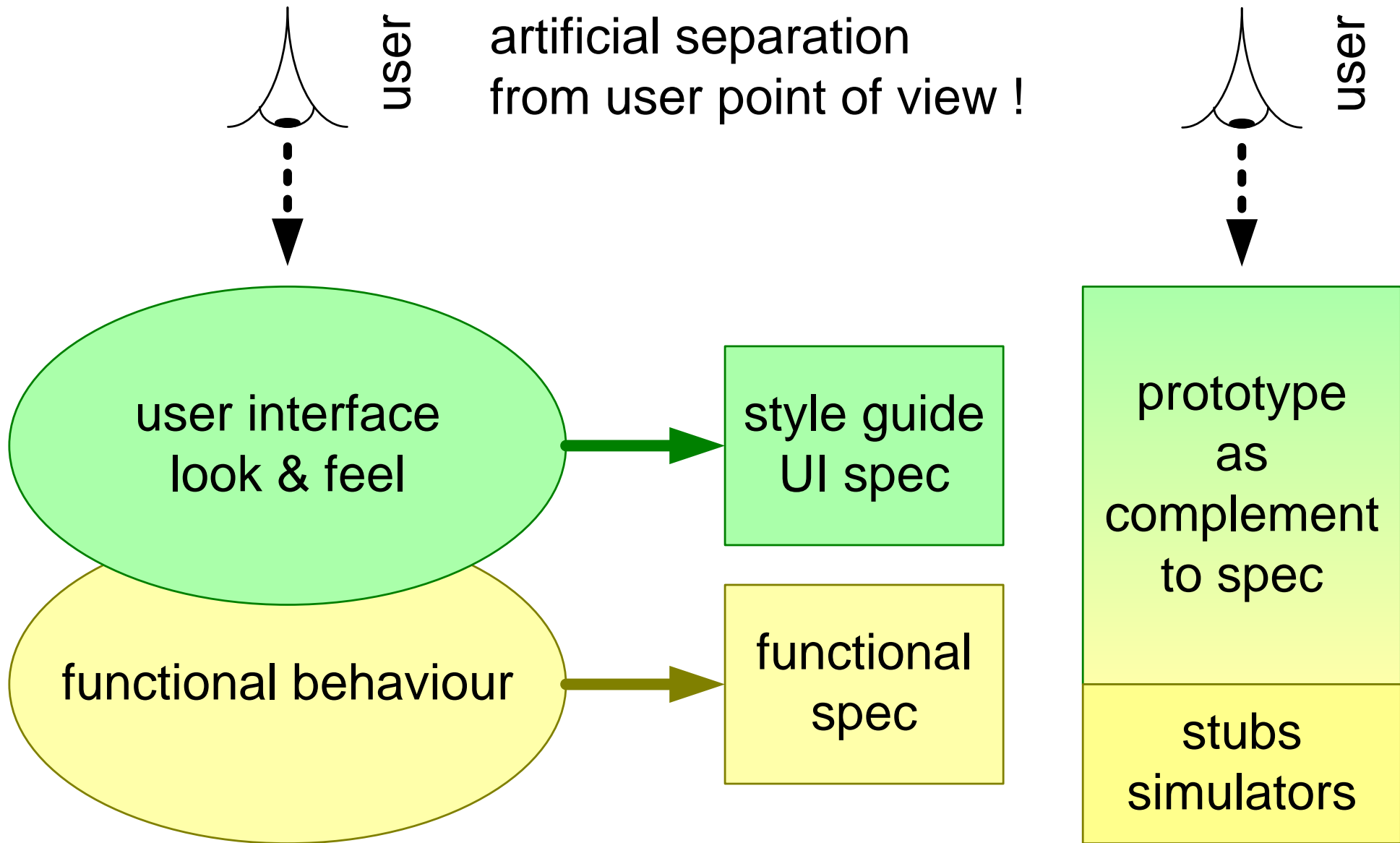


Mapping technical functions on products

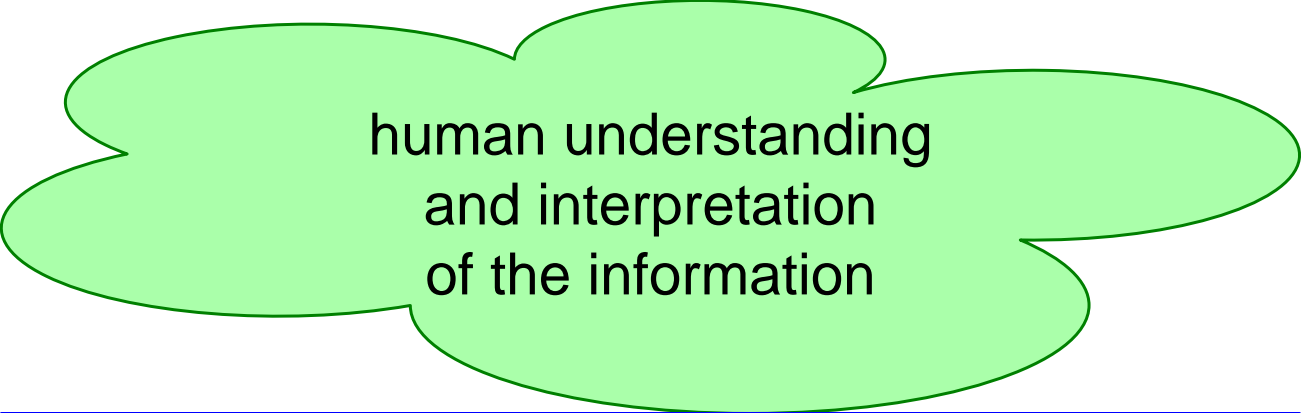
<i>technical functions</i>	<i>products</i>	home cinema system	flat screen cinema TV	bedroom TV
HD display		+	+	-
SD->HD up conversion		+	+	-
HD->SD down conversion		+	+	0
HD storage		0	-	-
SD storage		0	-	0
HD IQ improvement		+	+	-
SD IQ improvement		+	+	+
HD digital input		+	+	0
SD digital input		+	+	0
SD analog input		0	+	+
6 HQ channel audio		+	0	-
2 channel audio		-	+	+

legend	
+	present
0	optional
-	absent

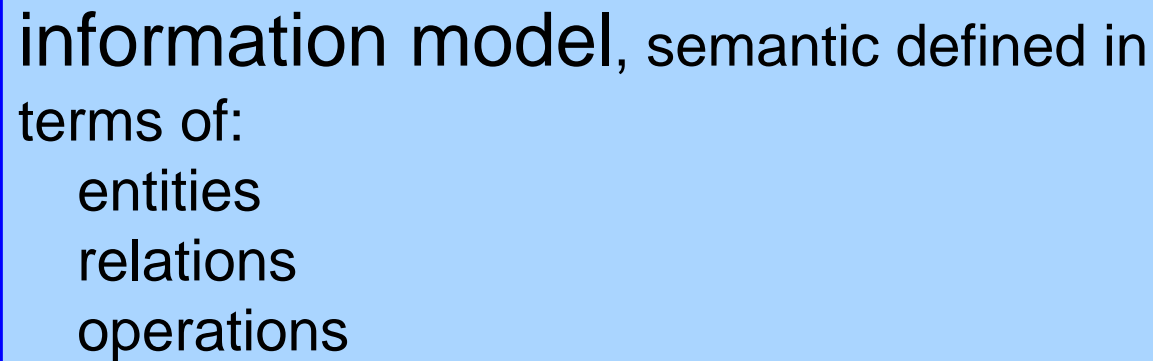
Relation between user interface and functional specification



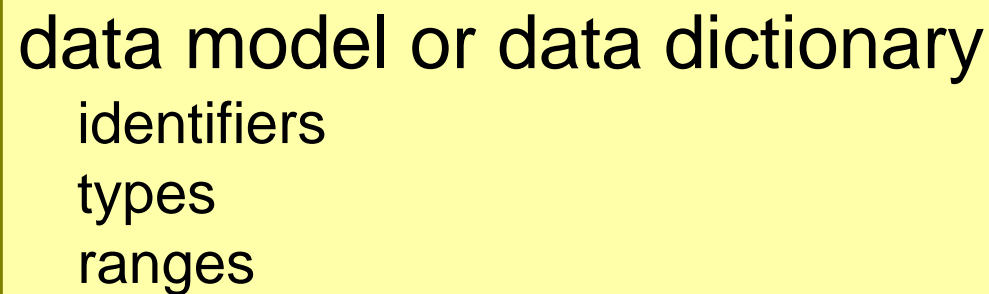
Layering of information definitions



human understanding
and interpretation
of the information

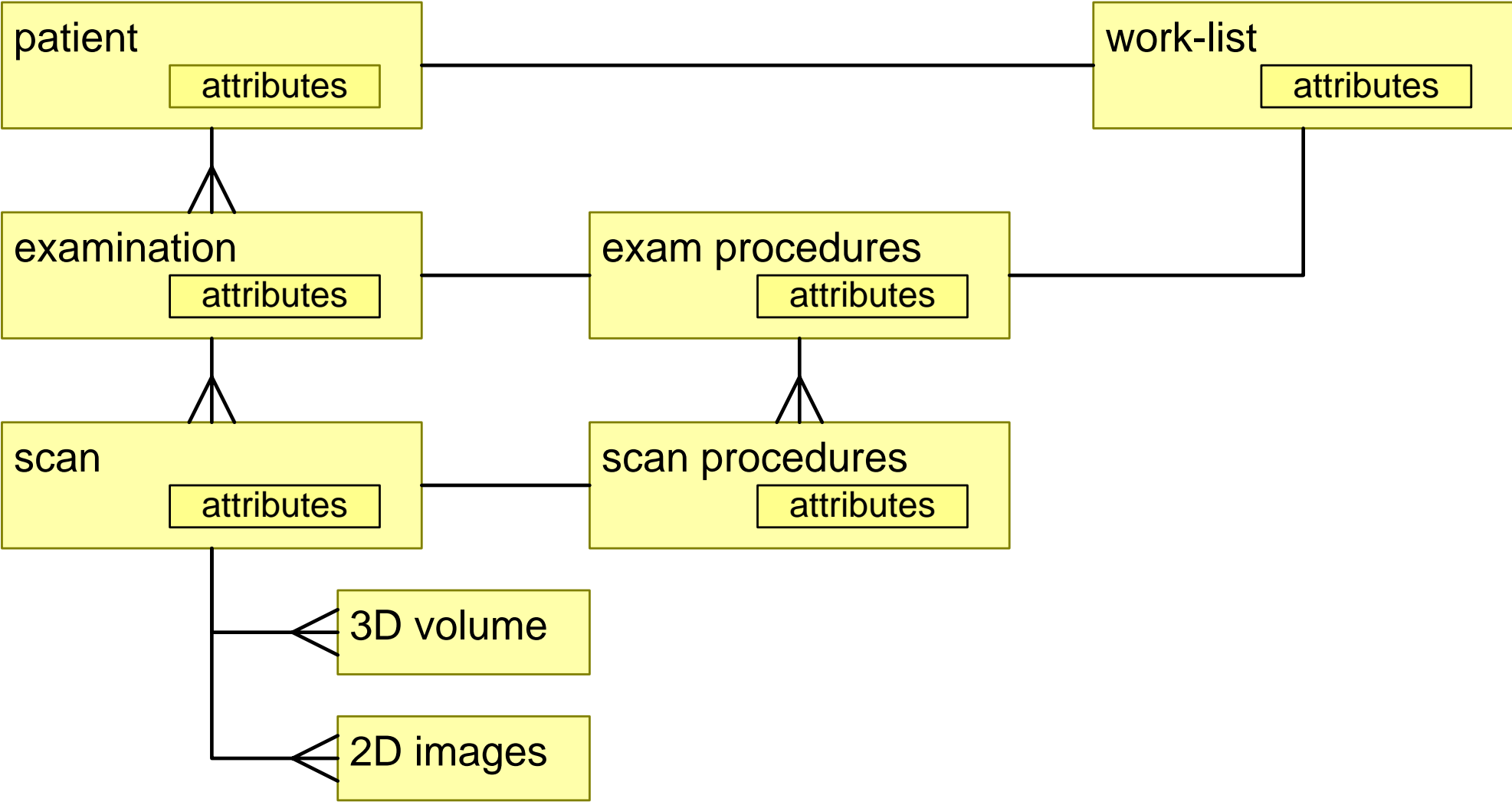


information model, semantic defined in
terms of:
entities
relations
operations



data model or data dictionary
identifiers
types
ranges

Example partial internal information model



12 bit Image:

nx: 16 bit unsigned integer

ny: 16 bit unsigned integer

pixels[nx][ny]: 16 bit unsigned integers [0..4095]

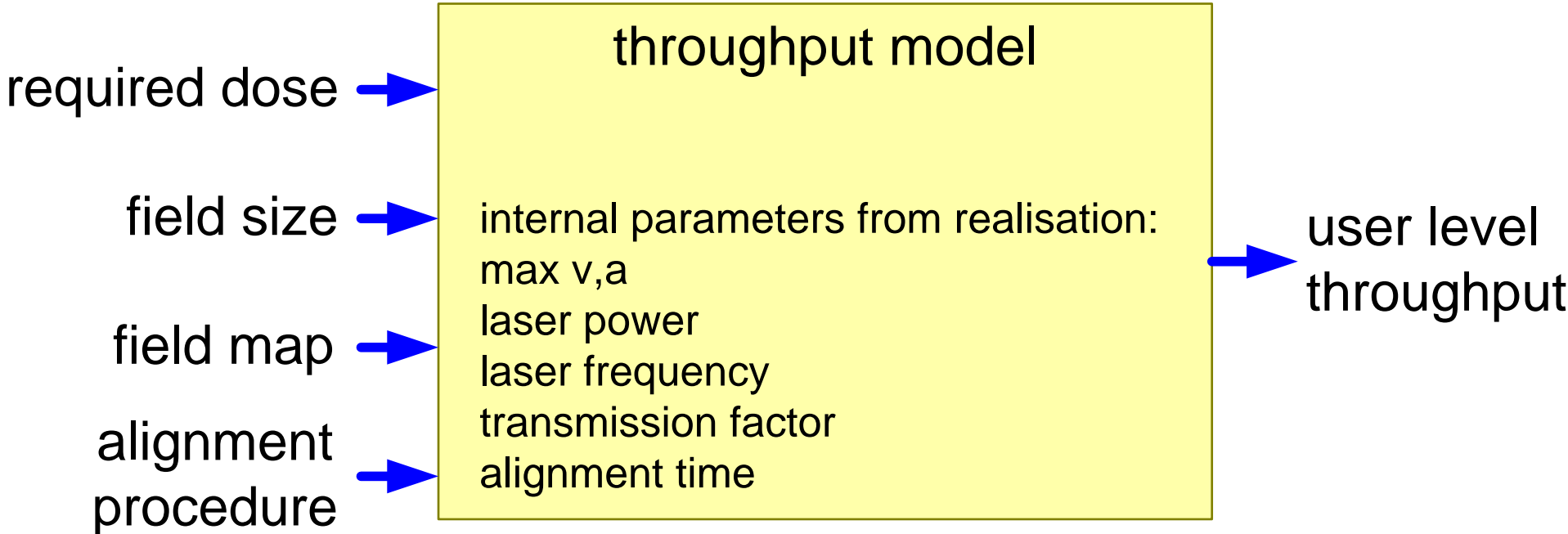
16 bit Image:

nx: 16 bit unsigned integer

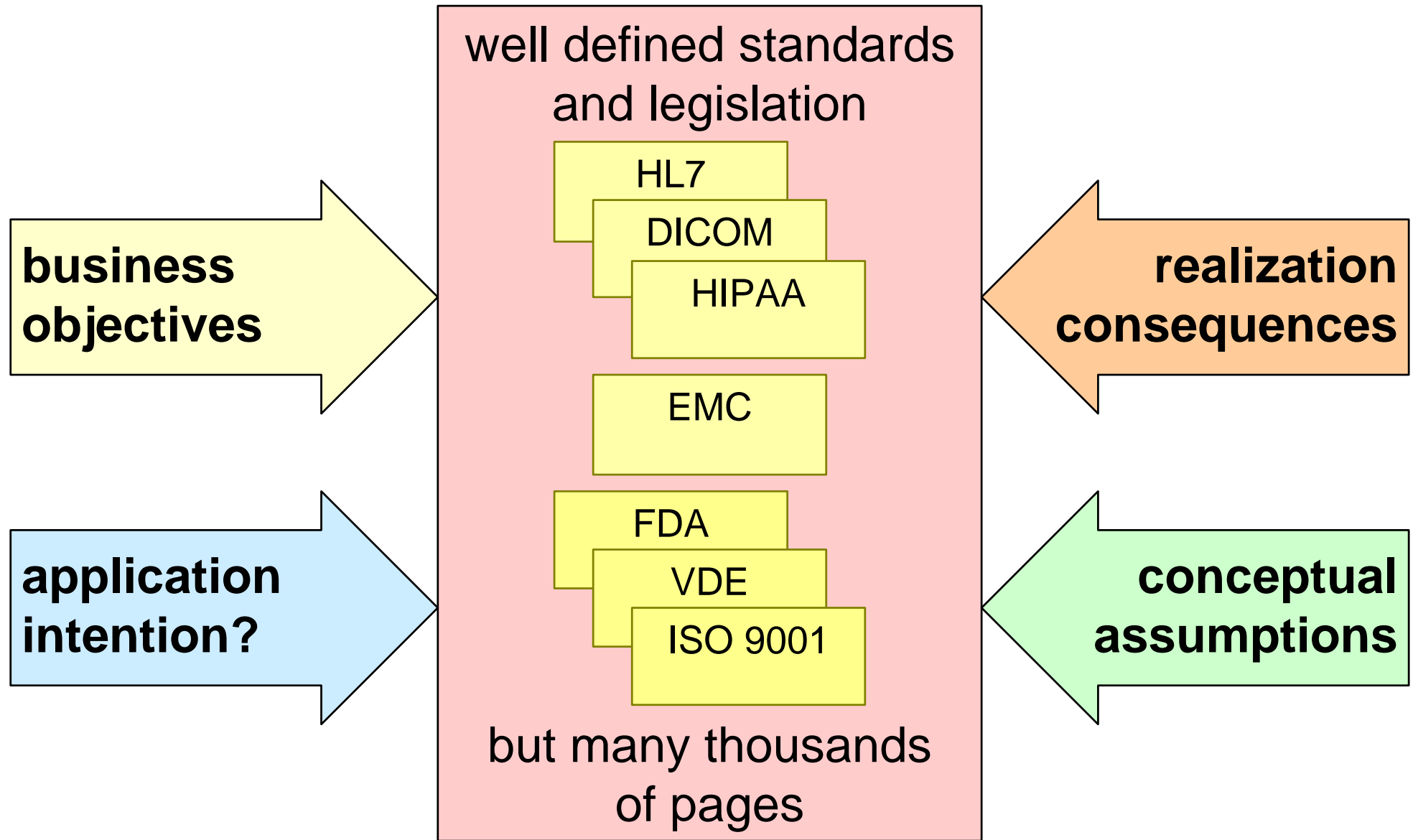
ny: 16 bit unsigned integer

pixels[nx][ny]: 16 bit unsigned integers

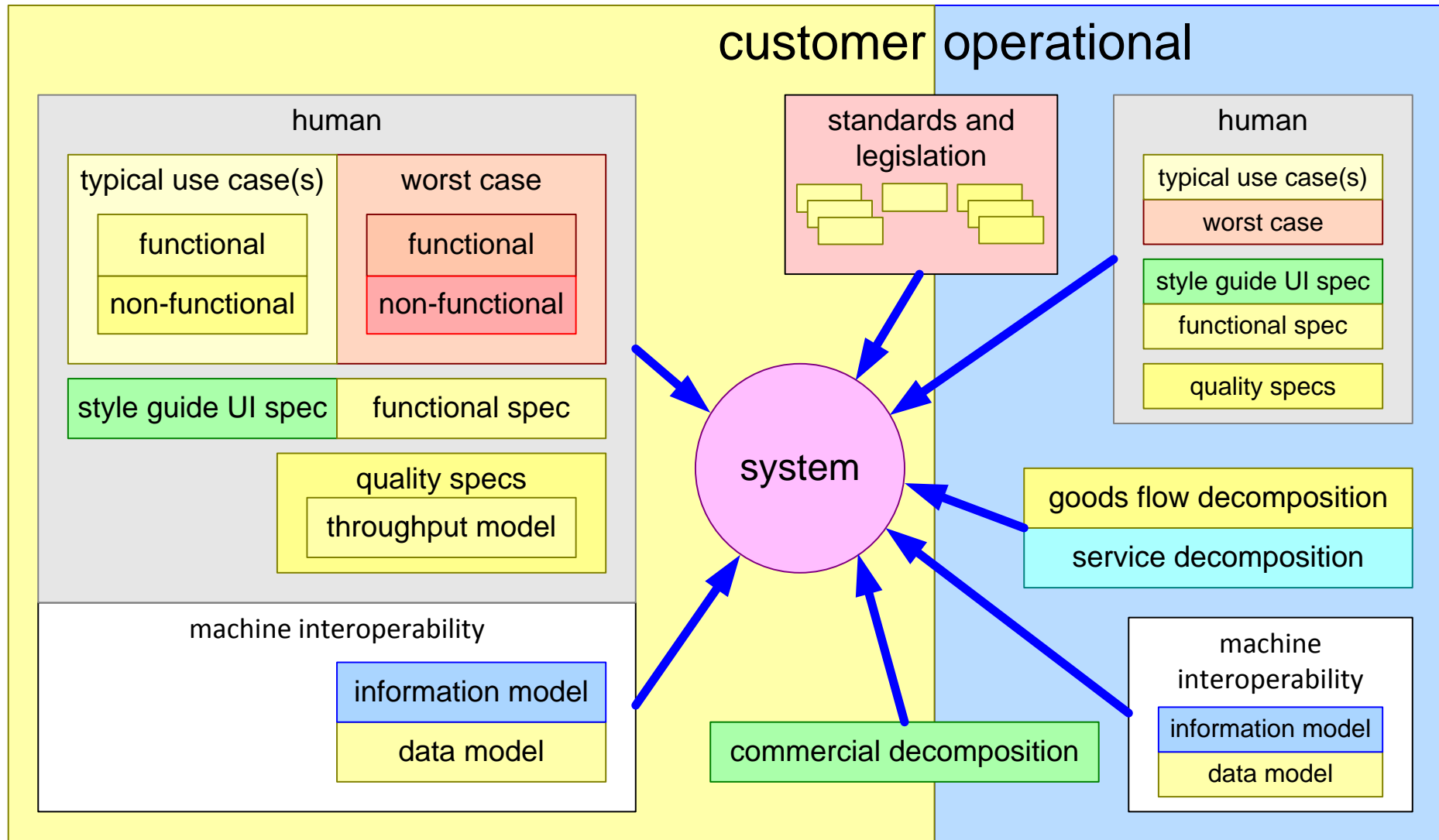
Example of performance modelling



The role of standards



Functional view summary



Functional view = What: externally observable

Exercise Functional View

- Make an overview of functions, performance figures, interfaces and optional features
- identify "most important" (related to CA-views)
- identify "most challenging" (related to CR-views)
- explain why "most important" or "most challenging"
- present in 5 minutes

Goals:

- create awareness of the breadth of the specification
- share the spec with the team
- create a "living" image of the Functional view

Exercise Functional View, second iteration

- Define a typical case, both functions and quantitative
- Create a single page product specification
- Define a worst case, suitable for design exploration and verification