

Initial CAFCR scan; top-down

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Abstract

This presentation guides a team through a quick CAFCR scan. Such quick scan with typically 15 minutes per view helps to build an initial overview of the problem and solution space. This version uses a top-down scan, which is typically useful in greenfield approaches.

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.

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Present the results top-down
Use two to three flip charts of the six that have been created.
Explain in five minutes the needs of the customer, the system, and the major design choices.

Exercise Top-down Scan CAFCR

make a top-down analysis of your product:

1. customer objectives
2. application
3. functional
4. conceptual
5. realization
6. qualities

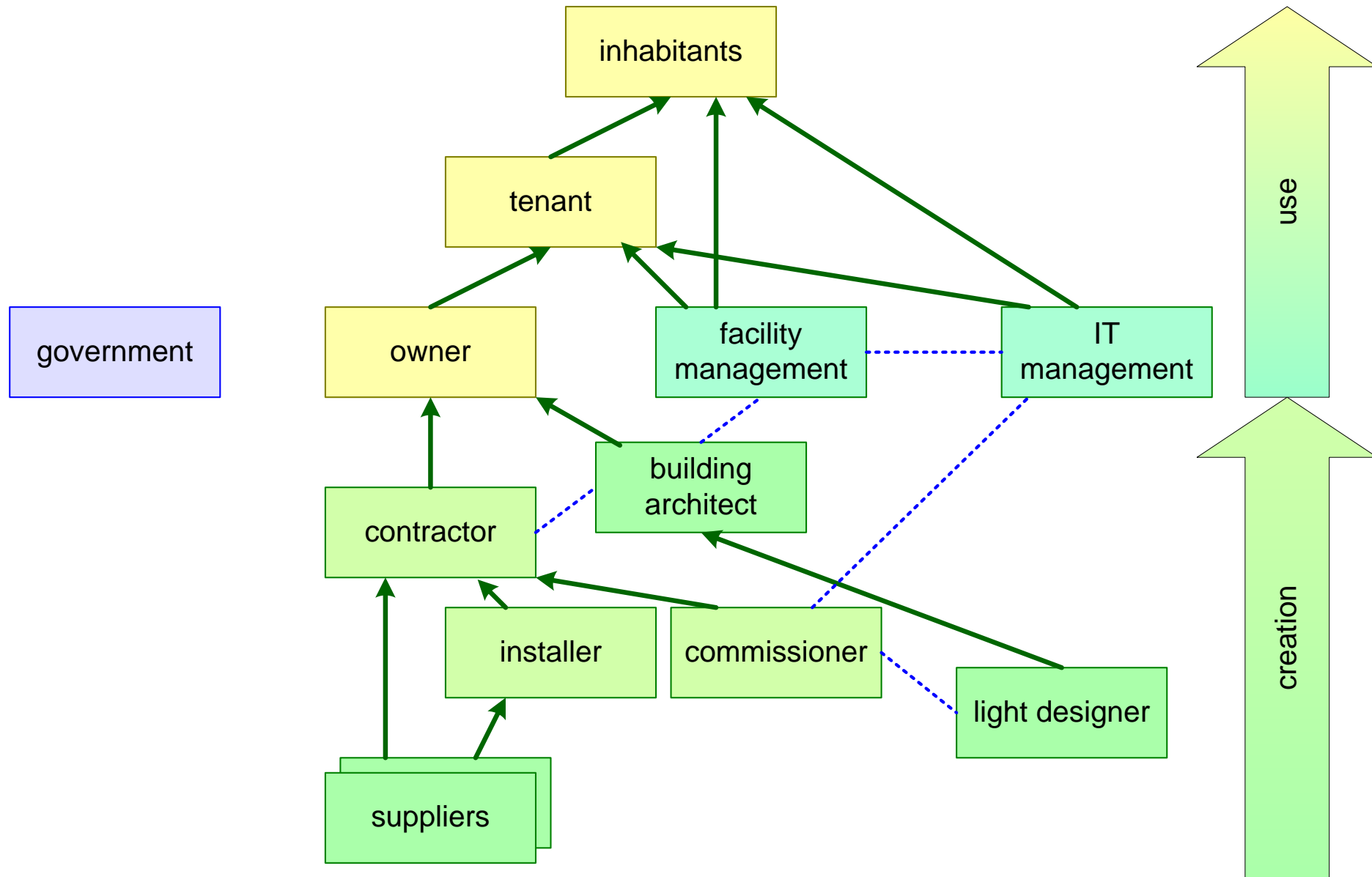
use time boxes of 15 minutes per view

show the most dominant decomposition of that view, as diagram or as a list; some more guidance will be given per step.

Do and Don't

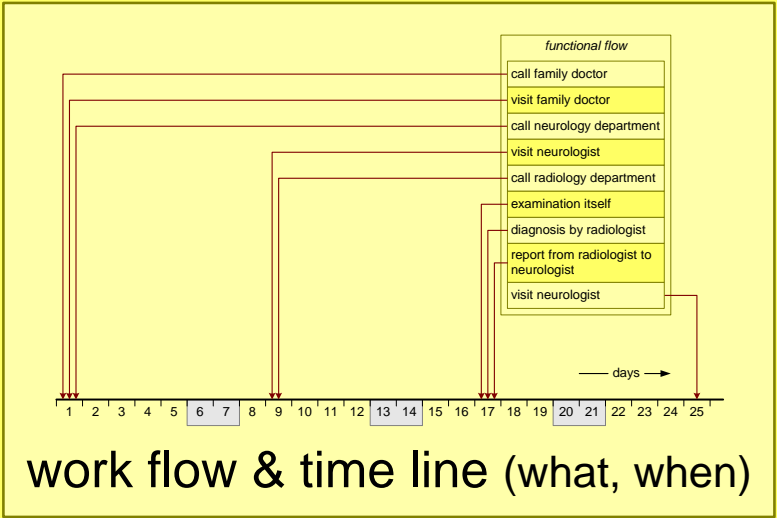
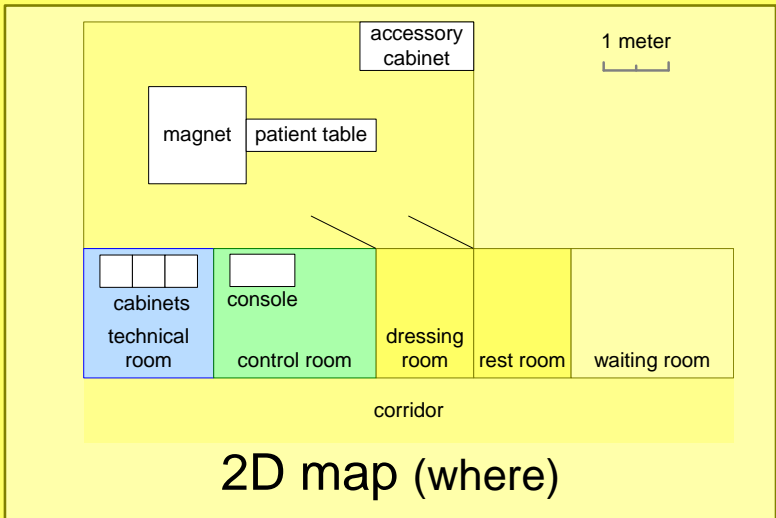
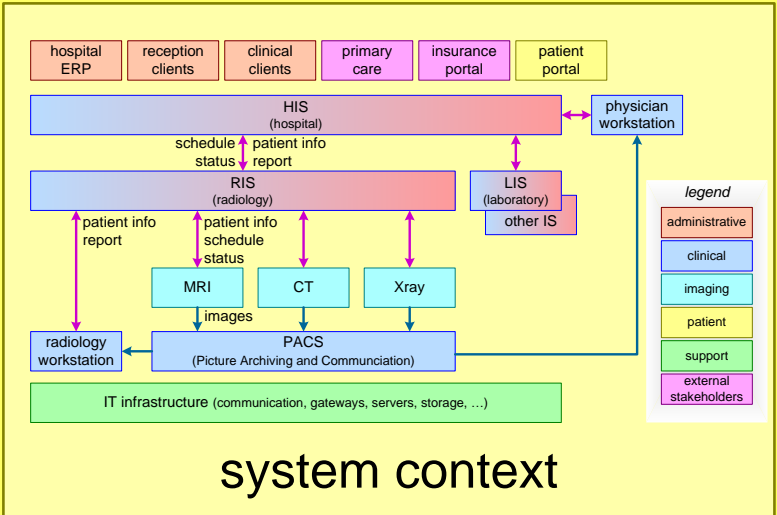
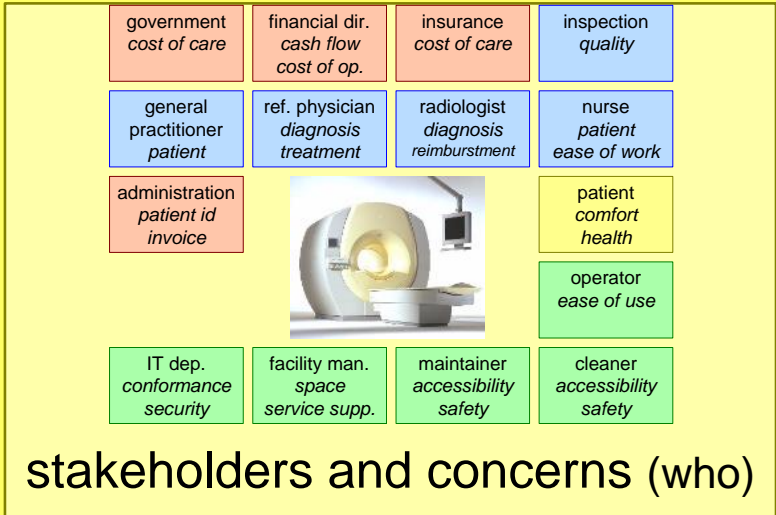
Do	Do not	Because
<ul style="list-style-type: none">• start sketching/drawing as soon as possible• use shared large sheets of paper (e.g. flip-over)• number the flip-overs and add a title• annotate (add notes) during discussions• use yellow note stickers and flip-over markers• be open for ideas and surprises	<ul style="list-style-type: none">• write long texts• immediately capture electronic• have nice but volatile discussions• write with pen or pencil• Do not stick to the first solution	<ul style="list-style-type: none">• sketches stimulate sharing and discussion• sharing and discussion help to explore faster• remembering the order gets challenging• information and insight is quickly lost• stickers are easily (re)moved• you hopefully discover a lot; increased insight will change problem and solution

Step 1: Customer Objectives View; Value Network

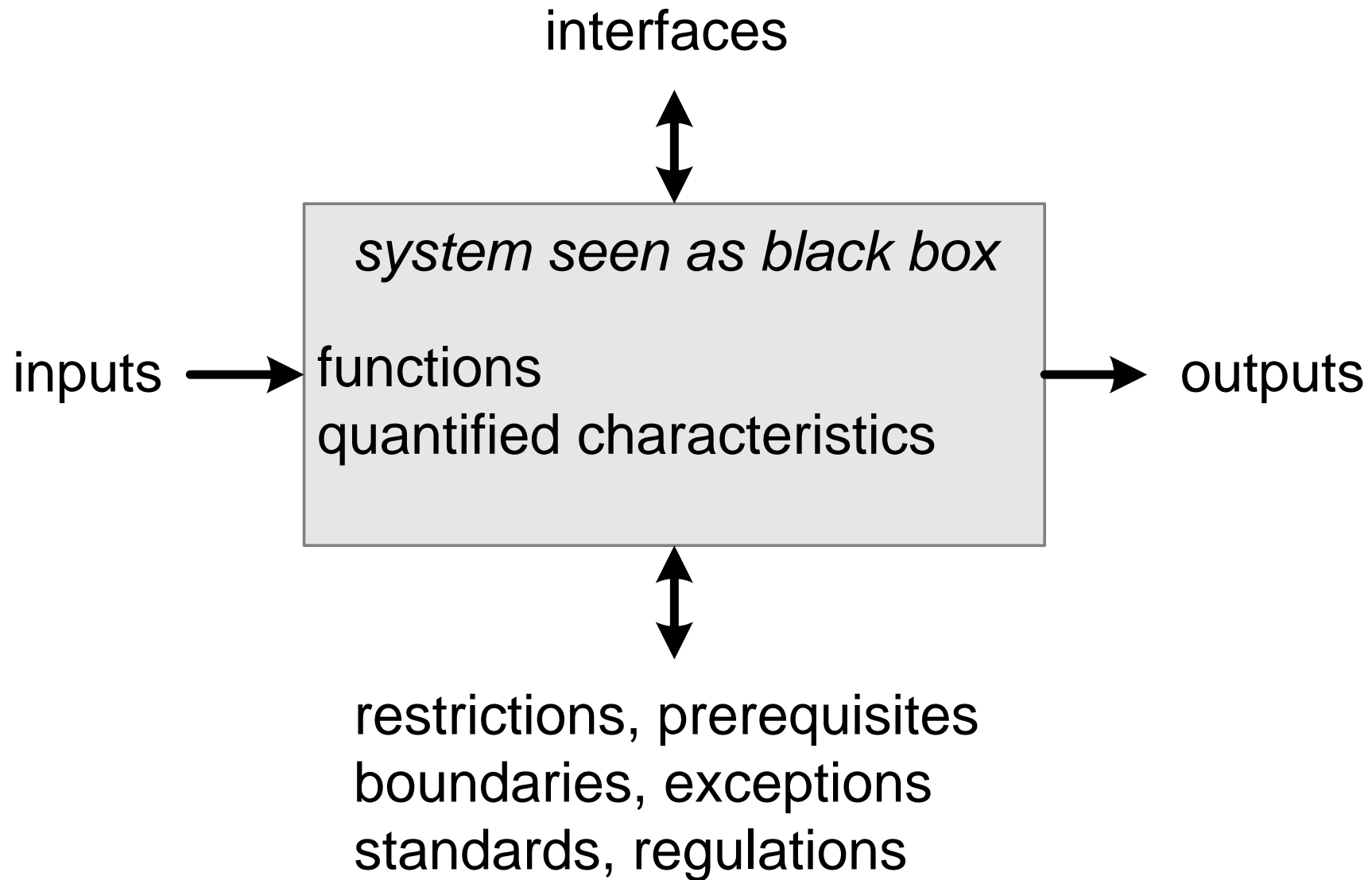


Step 2: Application View

Chose 1 or 2 items from below



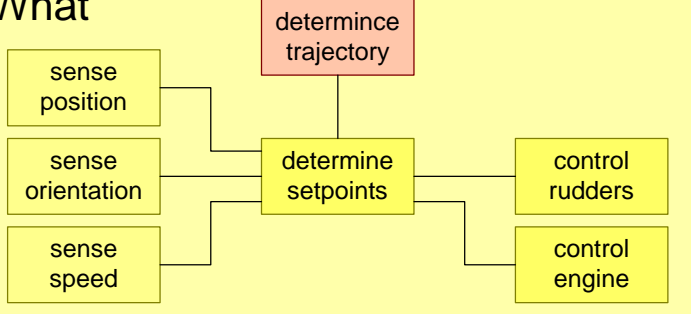
Step 3: Functional View; Top level Spec



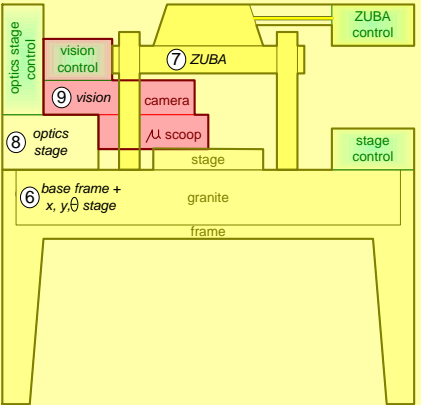
Step 4: Conceptual View

Chose 1 or 2 items from below

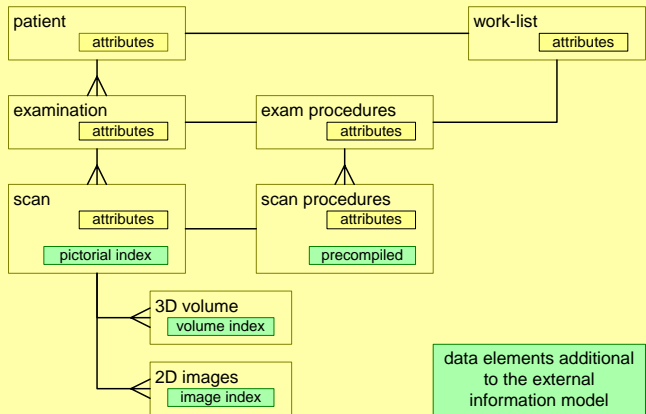
What



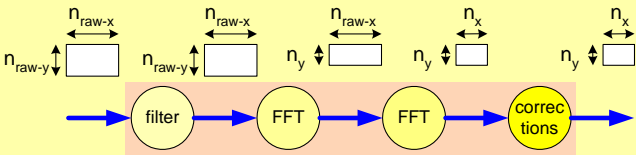
functional model



subsystem decomposition



information model



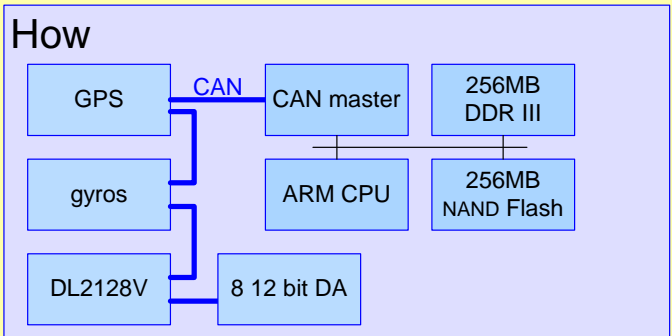
$$\begin{aligned}
 t_{\text{recon}} = & t_{\text{filter}}(n_{\text{raw-x}}, n_{\text{raw-y}}) + \\
 & n_{\text{raw-x}} * (t_{\text{fft}}(n_{\text{raw-y}}) + t_{\text{col-overhead}}) + \\
 & n_y * (t_{\text{fft}}(n_{\text{raw-x}}) + t_{\text{row-overhead}}) + \\
 & t_{\text{corrections}}(n_x, n_y) + \\
 & t_{\text{control-overhead}}
 \end{aligned}$$

$$t_{\text{fft}}(n) = c_{\text{fft}} * n * \log(n)$$

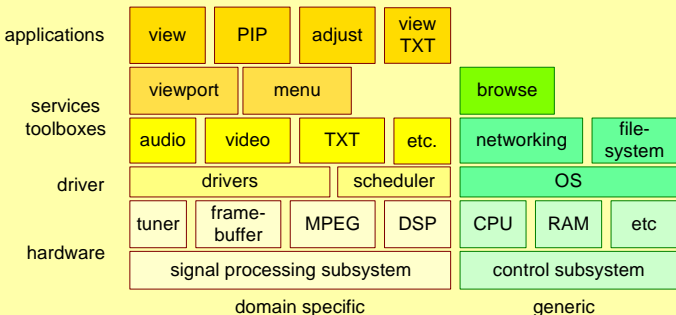
performance model

Step 5: Realization View

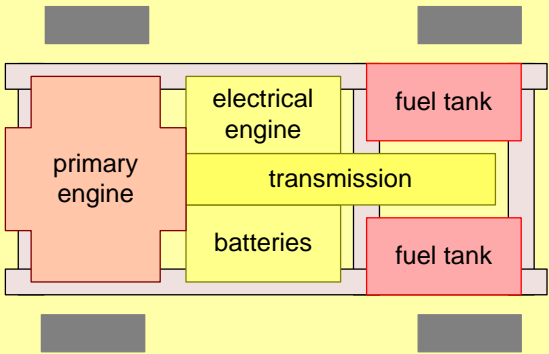
Choose 1 or 2 items from below



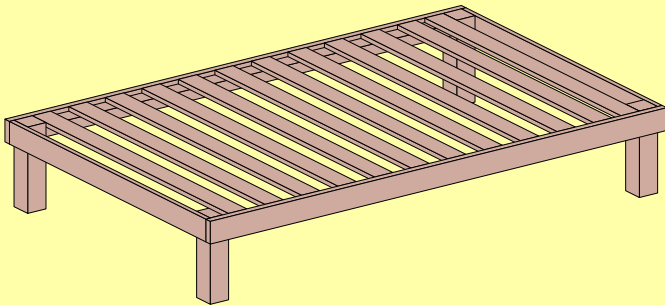
HW block diagram



SW layer diagram



2D layout of system internals



3D sketch of system internals

Annotate/mark most critical technologies or characteristics

Step 6: Qualities

Determine the 5 most relevant qualities from the checklist

- Make the chosen qualities as specific as possible
- Explain for each quality why it is relevant

Step 6: Qualities Checklist

usable

usability
attractiveness
responsiveness
image quality
wearability
storability
transportability

dependable

safety
security
reliability
robustness
integrity
availability

effective

throughput or
productivity

interoperable

connectivity
3rd party extendible

liable

liability
testability
traceability
standards compliance

efficient

resource utilization
cost of ownership

consistent

reproducibility
predictability

serviceable

serviceability
configurability
installability

future proof

evolvability
portability
upgradeability
extendibility
maintainability

logistics friendly

manufacturability
logistics flexibility
lead time

ecological

ecological footprint
contamination
noise
disposability

down to earth attributes

cost price
power consumption
consumption rate
(water, air,
chemicals,
et cetera)
size, weight
accuracy

Presentation

Present the results top-down

Use two to three flip charts of the six that have been created.

Explain in five minutes the needs of the customer, the system, and the major design choices.