Initial CAFCR scan

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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.

Distribution

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Make a bottom-up analysis of your product:
1. realization
2. conceptual
3. functional
4. application
5. customer objectives
6. qualities

Take three 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.
make a bottom-up analysis of your product:

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2. conceptual
3. functional
4. application
5. customer objectives
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

<table>
<thead>
<tr>
<th>Do</th>
<th>Do not</th>
<th>Because</th>
</tr>
</thead>
<tbody>
<tr>
<td>• start sketching/drawing as soon as possible</td>
<td>• write long texts</td>
<td>• sketches stimulate sharing and discussion</td>
</tr>
<tr>
<td>• use shared large sheets of paper (e.g. flip-over)</td>
<td>• immediately capture electronic</td>
<td>• sharing and discussion help to explore faster</td>
</tr>
<tr>
<td>• number the flip-overs and add a title</td>
<td>• have nice but volatile discussions</td>
<td>• remembering the order gets challenging</td>
</tr>
<tr>
<td>• annotate (add notes) during discussions</td>
<td>• write with pen or pencil</td>
<td>• information and insight is quickly lost</td>
</tr>
<tr>
<td>• use yellow note stickers and flip-over markers</td>
<td>• Do not stick to the first solution</td>
<td>• stickers are easily (re)moved</td>
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<tr>
<td>• be open for ideas and surprises</td>
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<td>• you hopefully discover a lot; increased insight will change problem and solution</td>
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  - you hopefully discover a lot; increased insight will change problem and solution
Step 1: Realization View

Choose 1 or 2 items from below

**HW block diagram**

- GPS
- gyros
- DL2128V
- CAN
- CAN master
- ARM CPU
- 256MB DDR III
- 256MB NAND Flash
- 8 12 bit DA

**SW layer diagram**

- view
- PIP
- adjust
- TXT
- viewport
- menu
- audio
- video
- TXT
- etc.
- drivers
- scheduler
- tuner
- frame-buffer
- MPEG
- DSP
- signal processing subsystem
- control subsystem
- drivers
- scheduler
- OS
- file-system
- CPU
- RAM
- etc.
- domain specific
- generic
- tuning
- frame-buffer
- MPEG
- DSP
- CPU
- RAM
- etc.

**2D layout of system internals**

- primary engine
- transmission
- batteries
- fuel tank

**3D sketch of system internals**

Annotate/mark most critical technologies or characteristics
Step 2: Conceptual View

Choose 1 or 2 items from below:

**What**
- sense
  - position
- sense
  - orientation
- sense
  - speed
- determine
  - trajectory
- determine
  - setpoints
- control
  - rudders
- control
  - engine

**functional model**
- patient
  - attributes
- examination
  - attributes
- scan
  - attributes
  - 3D volume
    - volume index
  - 2D images
    - image index
- work-list
  - attributes
- data elements additional to the external information model

**information model**
- scan procedures
  - attributes
- scan procedures
  - attributes
- precompiled

**subsystem decomposition**
- ZUBA control
- stage control
- electronics
- infrastructure

**performance model**

1. patients
2. examination scan
3. Initial CAFCR scan
4. Gerrit Muller

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SEMABottomUpScanConceptual
Step 3: Functional View; Top level Spec

- system seen as black box
- inputs
- functions
- quantified characteristics
- outputs
- interfaces
- restrictions, prerequisites
- boundaries, exceptions
- standards, regulations
Step 4: Application View

Chose 1 or 2 items from below

- stakeholders and concerns (who)
  - government cost of care
  - financial dir. cash flow cost of op.
  - insurance cost of care
  - inspection quality
  - general practitioner patient
  - ref. physician diagnosis treatment
  - radiologist diagnosis reimbursement
  - nurse patient ease of work
  - administration patient id invoice
  - patient comfort health
  - operator ease of use
  - IT dep. conformance security
  - facility man. space service supp.
  - maintainer accessibility safety
  - cleaner accessibility safety

- system context
  - maintenance contractors
  - fleet management
  - urban traffic control
  - advanced vehicle control
  - environmental monitoring
  - motorway management system
  - taxes
  - car administration government
  - airports
  - railways
  - toll
tunnel
  - car repair
  - gas stations
  - restaurants
  - toll lanes
  - lorry lanes
  - maintenance contractors
  - taxes
  - car administration government
  - airports
  - railways
  - toll
tunnel
  - car repair
  - gas stations
  - restaurants
  - toll lanes
  - lorry lanes

- 2D map (where)
  - magnet
  - patient table
  - cabinets technical room
  - console
  - dressing room
  - rest room
  - waiting room
  - corridor
  - accessory cabinet
  - 1 meter

- work flow & time line (what, when)
  - days
  - functional flow
  - call family doctor
  - visit family doctor
  - call neurology department
  - visit neurologist
  - call radiology department
  - examination itself
  - diagnosis by radiologist
  - report from radiologist to neurologist
  - visit neurologist

Initial CAFCR scan
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SEMAbottomUpScanApplication
Step 5: Customer Objectives View; Value Chain

Consumers
- Boonstra
- Peper
- Kok
- Chirac
- Blair
- Pietersen
- Smith
- Jones
- Jansen
- Muller
- Clinton
- Bush
- Kleisterlee
- v.d. Spijker
- Jansen
- Goedkoop
- Schroder

Providers
- AT&T
- AOL
- Canal+
- UPC
- Sony
- Nokia
- Philips CE-DN
- Philips CE-PCC
- Philips Components
- ST
- LG
- TI
- Samsung
- Philips Semiconductors
- Microsoft
- Intel

Retailers
- Fry's
- It's
- Dixon

System Integrators
- Sony
- Loewe
- Philips CE-TV
- Philips CE-PCC
- Philips Components
- ST
- LG
- TI
- Samsung
- Philips Semiconductors
- Microsoft
- Intel

Component and Platform Suppliers
- Philips Components
- ST
- LG
- TI
- Samsung
- Philips Semiconductors
- Microsoft
- Intel

Providers
- AT&T
- AOL
- Canal+
- UPC

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LWAValueChain

HBV Embedded Systems Innovation
### Step 6: Qualities

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<thead>
<tr>
<th>usable</th>
<th>interoperable</th>
<th>serviceable</th>
<th>ecological</th>
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</thead>
<tbody>
<tr>
<td>usability</td>
<td>connectivity</td>
<td>serviceability</td>
<td>ecological footprint</td>
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<tr>
<td>attractiveness</td>
<td>3rd party extendible</td>
<td>configurability</td>
<td>contamination</td>
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<tr>
<td>responsiveness</td>
<td>liability</td>
<td>installability</td>
<td>noise</td>
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<td>image quality</td>
<td>testability</td>
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<td>standards compliance</td>
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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.