# Architecting for Humans; How to Transfer Experience?

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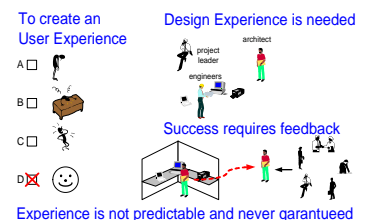www.gaudisite.nl

## Abstract

The ultimate goal of Product Creation is to create products which give the user a great experience.  User experience is very intangible.  Product engineering focuses on tangible requirements.  Successfull product require both sound engineering as well as creative design. The question is how to obtain a workforce, which is capable of both activities?

The education of successfull engineers is limited to engineering methods. Additional skills are acquired by experience.  Unfortunately experience cannot be transfered from one engineer to the next. Such a transfer is approximated by active personal development.

**Distribution**

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A ☐  depressed

B ☐  desparate

C ☐  hysteric

# Product Creation Cycle



Factory

Retailer or Provider

Product

**User**

Architect

Product manager

Project Leader

Engineers

product documentation

design

# 2 Levels of Experience



For Whom

User Experience

What

User

Product

By Whom

Creation Experience

How

Architect

Product manager

Project Leader

Engineers

Product Creation Process

product documentation

design

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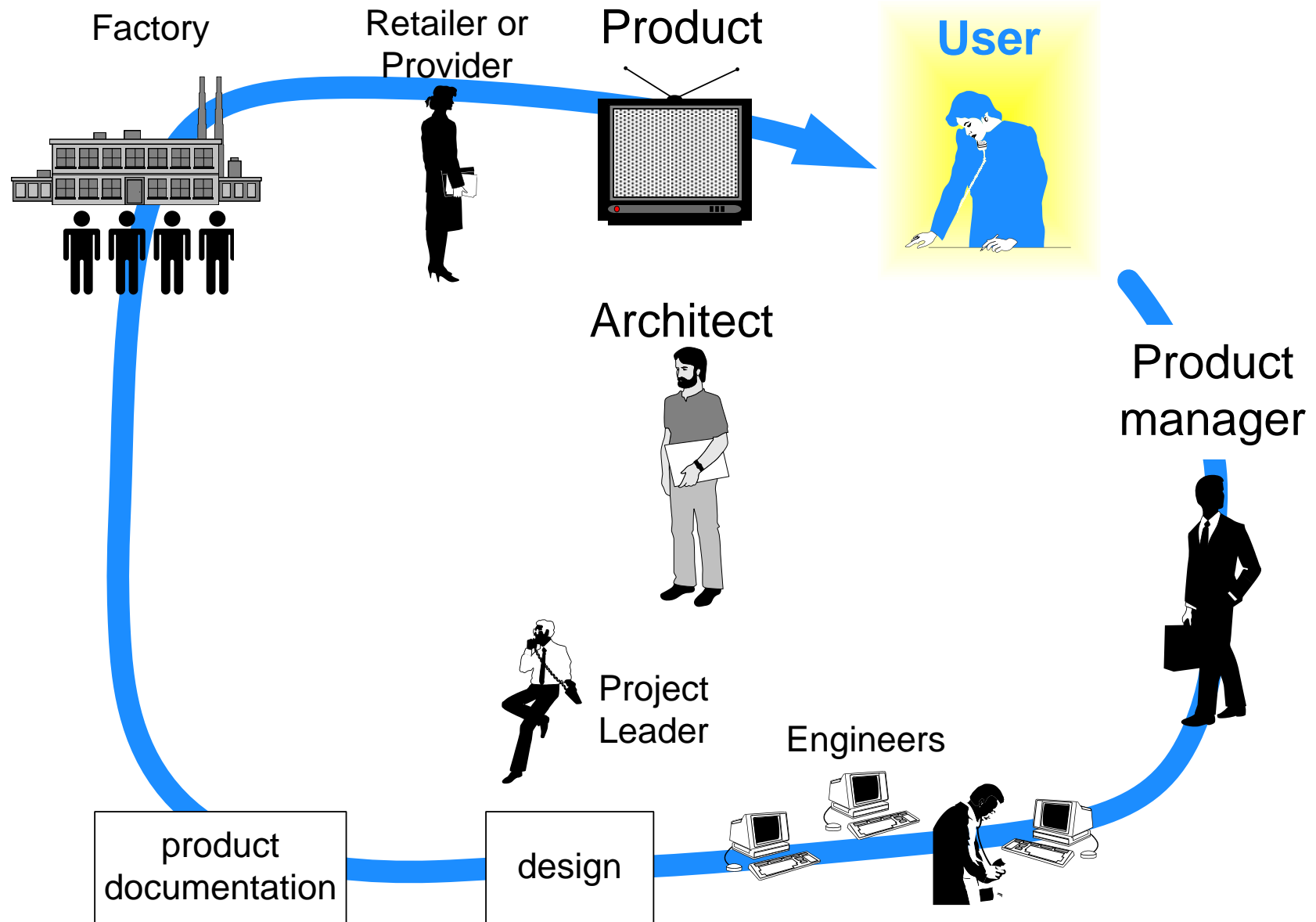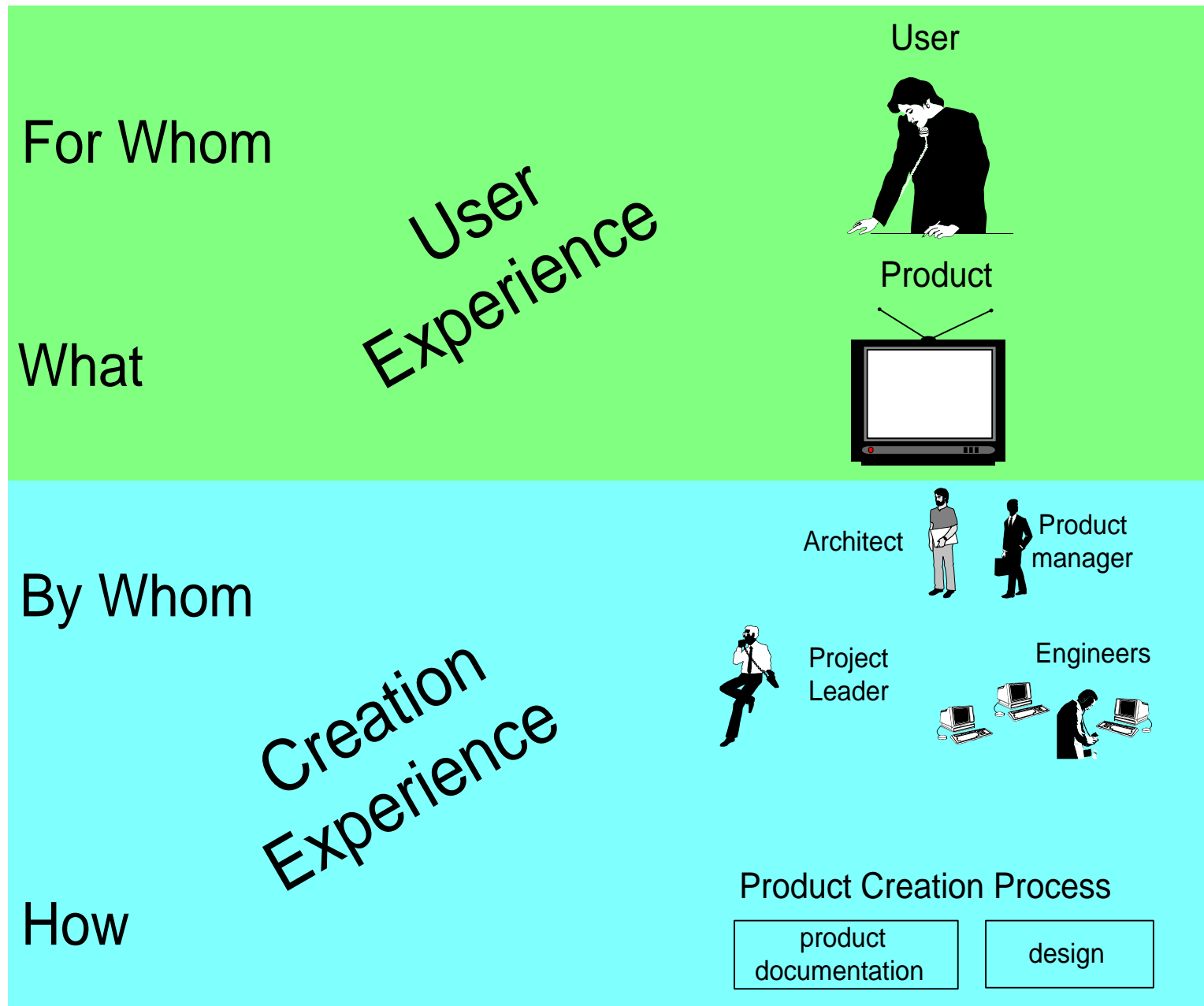
# Bridging the gap between Experience and Engineering



**Humans** — Sense, smell, feel — **have** — Emotions, Opinions — **Experience**

Humans — **use** — Devices / Appliances — Technology

From Fuzzy to SMART — **Architecting**

**Technology** — Analysis, Definition — **requires** — Verification — **Engineering**

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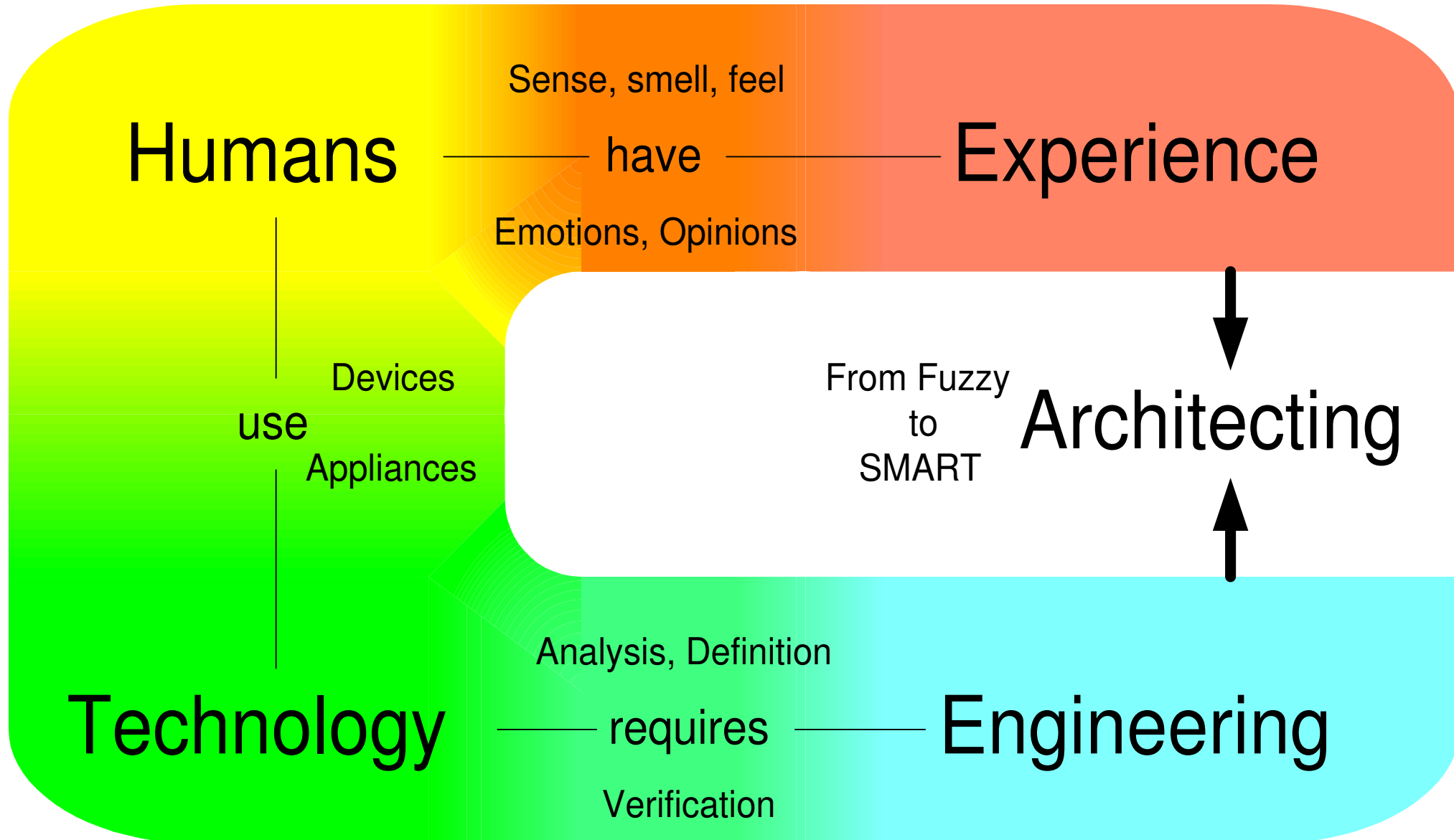
# Example Time Shift recording



20:00      21:00      22:00      23:00

start
movie

broadcast

end
movie

record

view

play

talk

view

phone rings
pause viewing

finish conversation
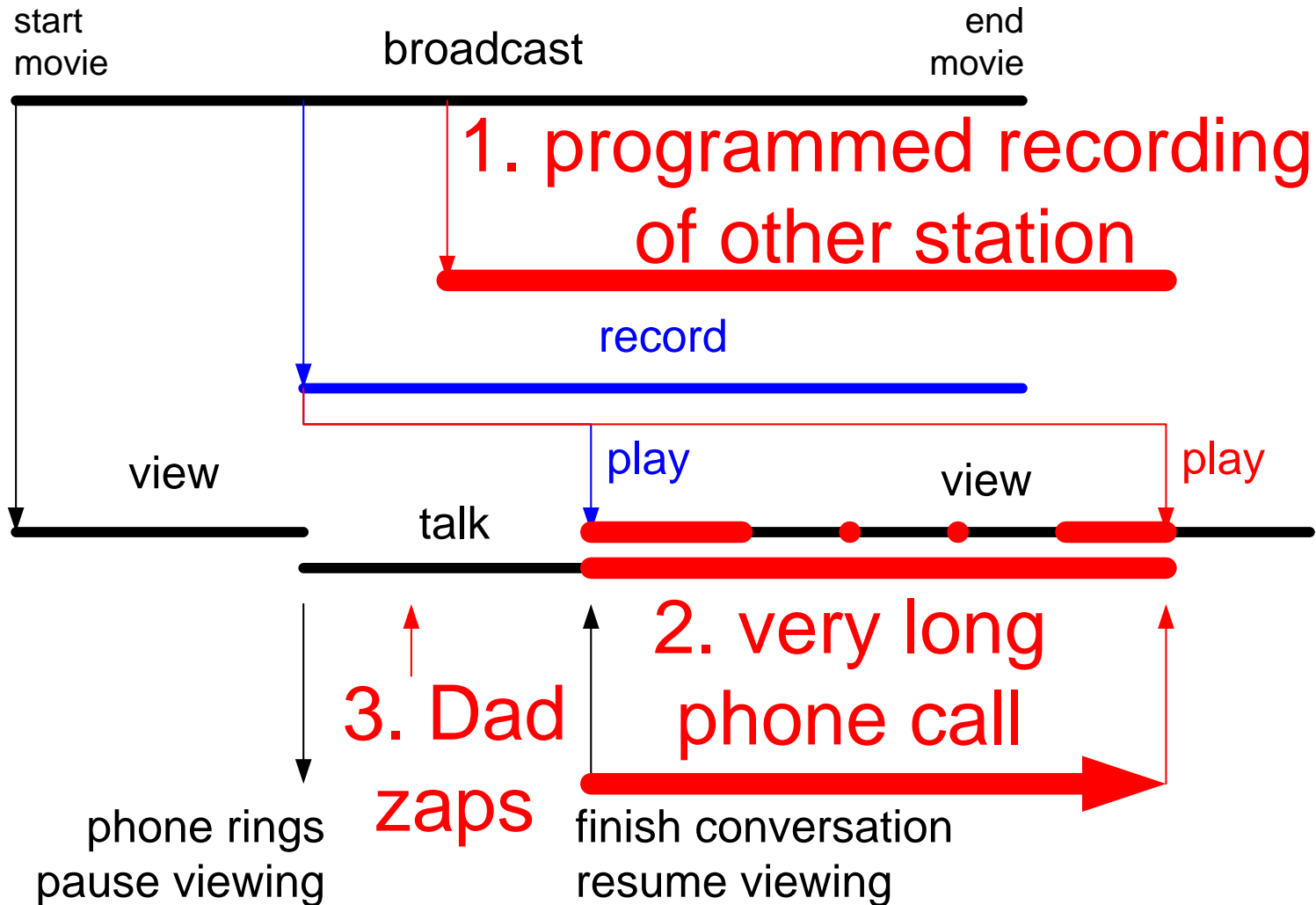resume viewing

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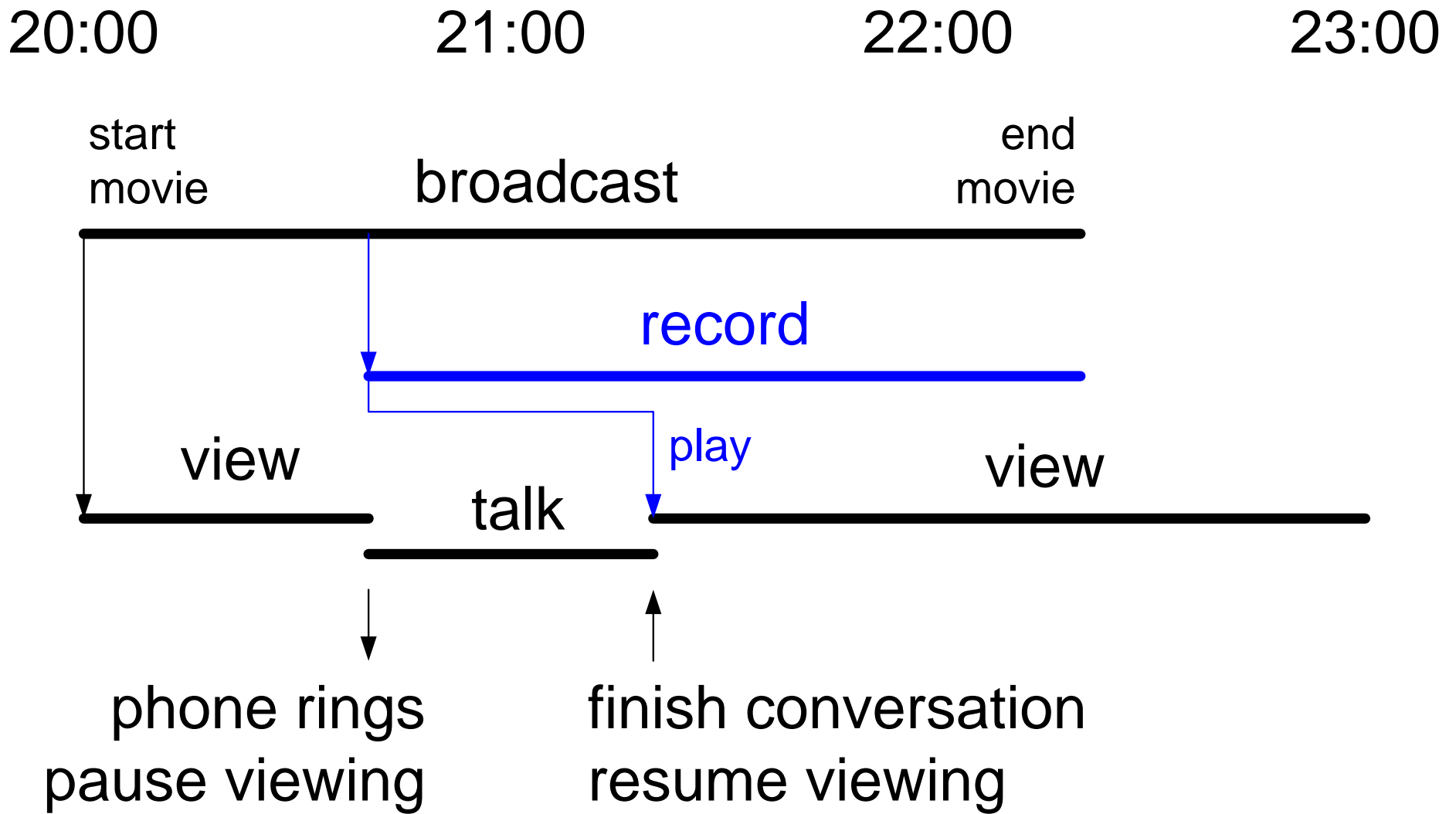
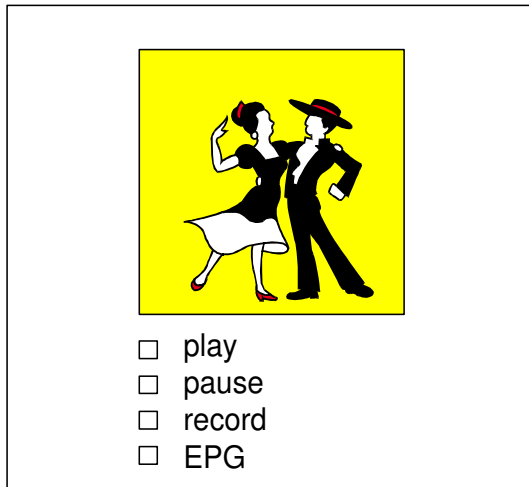# Construction limits intrude in Experience

- number of tuners

- number of simultaneous streams (recording and playing)

- amount of available storage

- management strategy of storage space

# What if?

20:00        21:00        22:00        23:00

start
movie        broadcast

end
movie

## 1. programmed recording of other station

record

view        play        view        play

talk

## 3. Dad zaps

## 2. very long phone call

phone rings
pause viewing

finish conversation
resume viewing

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## Visual Basic Prototype:

## enables "experiencing"

## Requirements specification
### Many tables, mostly addressing details

## 2.1.1 Real-time data requirements

## 2.1.2 Implementation detail

## 2.1.3 Non-real time data requirements

**1.1    Software Requirements**

| 1.1.1 | Real-time data requirements | 1.1.1.1  Access to the non-real-time data must be done in such a way that it does not interfere with the real-time data | |
| | | 1.1.1.2  There must be no disruptions in output of video signal during the operation of VCR | |
| | | 1.1.1.3  Responsiveness for non real-time data is less then 150ms (the time for writing a block on HDD) for 2KB of non-video data | |
| 1.1.2 | Implementation detail | 1.1.2.1  Management of HDD content must only be possible through the TOC in order to prevent unauthorized access to content of HDD | |
| | | 1.1.2.2  Visual feedback is provided to the user via On-Screen Display | |
| | | 1.1.2.3  User input is provided via the RC | |
| 1.1.3 | Non-real time data requirements | 1.1.3.1  User must be able to pause and unpause a title, played from HDD, while (s)he is watching it | |
| | | 1.1.3.2  User can jump forward and backward in a title, from HDD, during watching of this title | |
| | | 1.1.3.3  Names of titles should be derived from the information from the EPG (name of the program to be recorded, time and date of registration) | |

☐ play
☐ pause
☐ record
☐ EPG

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# Factors influencing the User Experience



*environmental factors*
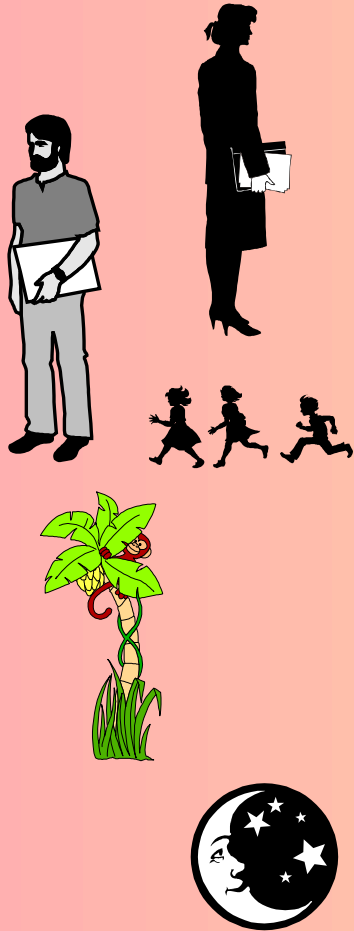
*personal factors*

social status

relation
family

group influence

fashion

culture

taboo
cultural

location

time

education

mental status

trauma
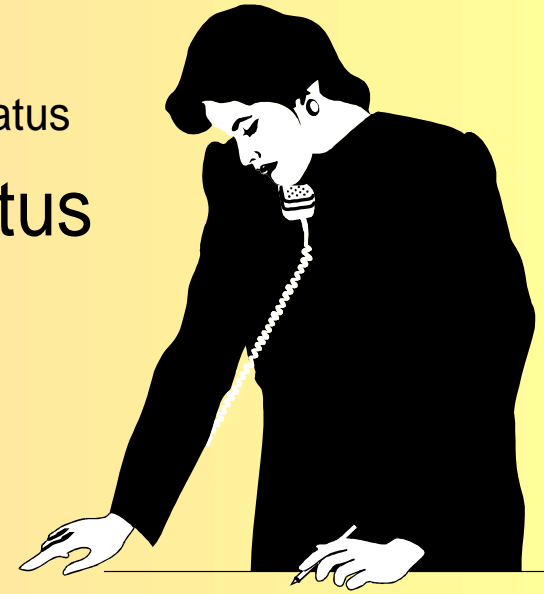emotional status

physical status

allergy
handicap

religion

taboo

preferences

taste

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# How to "SMART"en Experience?

- define

- measure

- predict

- verify

# Infinite Experience Space

| | | |
|---|---|---|
| People | Number of People on earth | $O(10^9)$ |
| | | * |
| Time | Human lifespan in seconds | $O(10^9)$ |
| | | * |
| Location | Square meters of planet earth | $O(10^{14})$ |
| | | * |
| ... | ... | ... |

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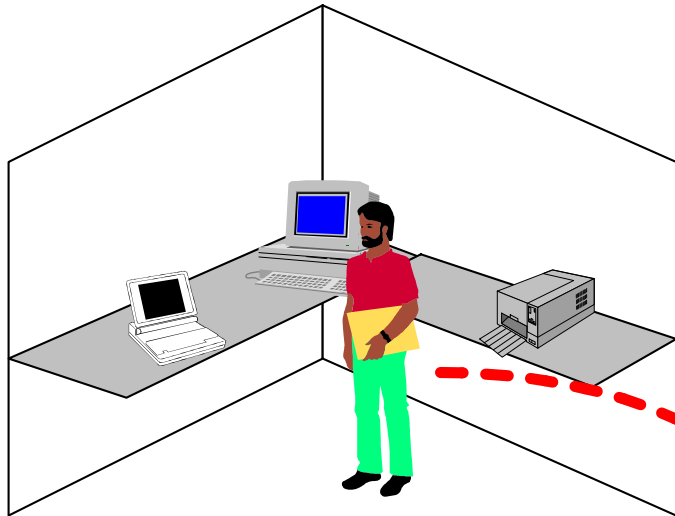| | |
|---|---|
| Size of experience space | $\infty$ |

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# It is not that bad :-)

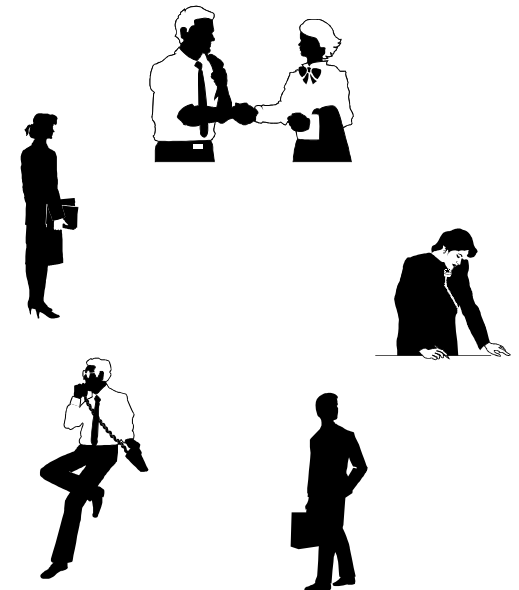Many nice and successfull products exist!

# Key Success Factor: Feedback

Obtain feedback from real users:

- Observe
- (Dare to) Listen

- Experiment
- Use short development cycles

Don't stay in the development lab

# The world of the construction

Product oriented

Means oriented

Application software

Compilers

Methods

Domain specific sw

Operating system

Other SW tools

Domain hardware

Computing hardware

Case Tools

Procedures

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# Engineers are educated in construction disciplines

- Programming languages

- Operating systems

- Algorithms

- Data structures

- Formal specification and verification techniques

- Analysis, simulation techniques

# Product Creation is much more than Engineering

**Product Creation** **=** **Engineering** **+** **Creativity**
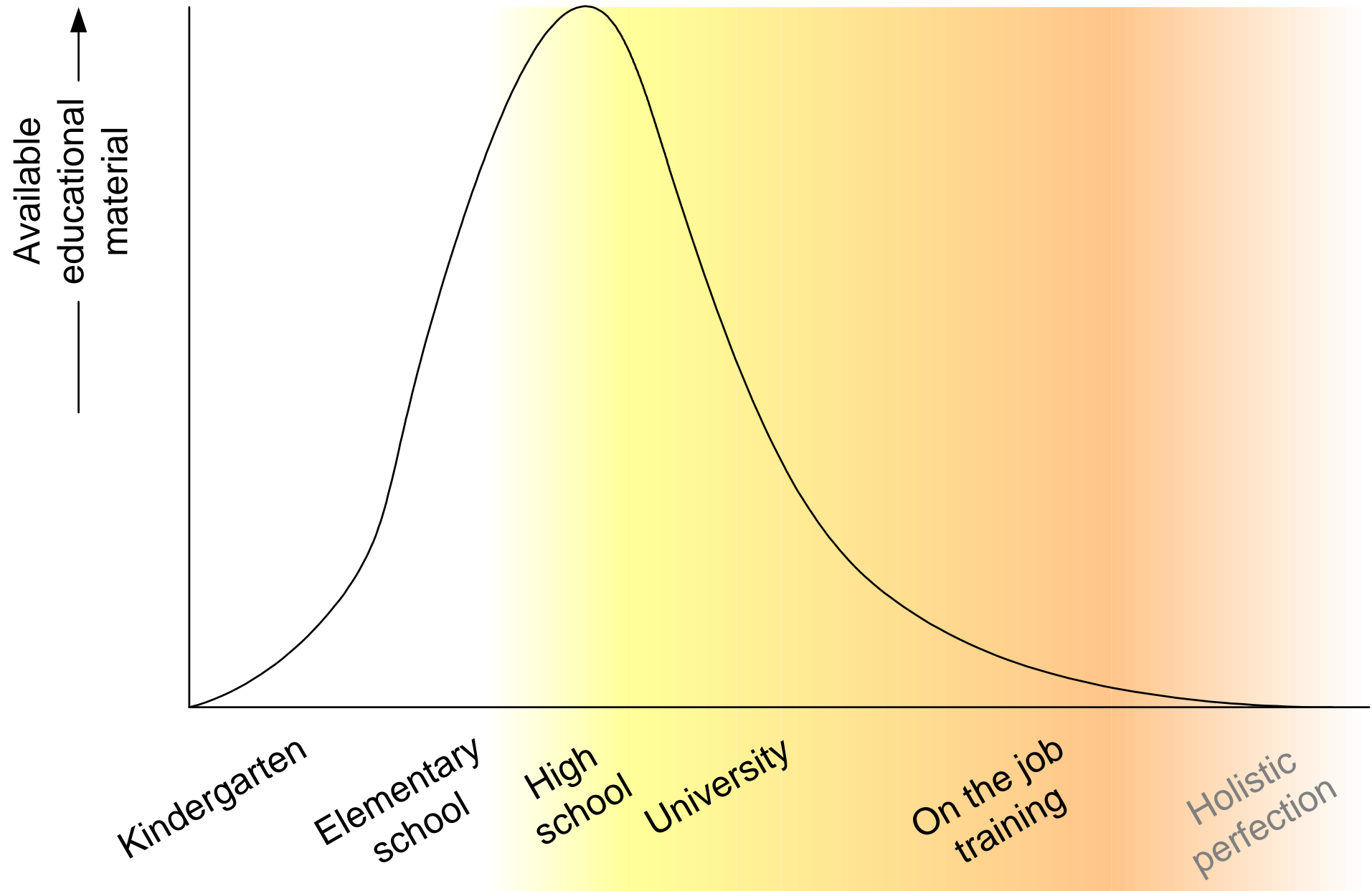
Known:

    Facts

    Notations

    Methods

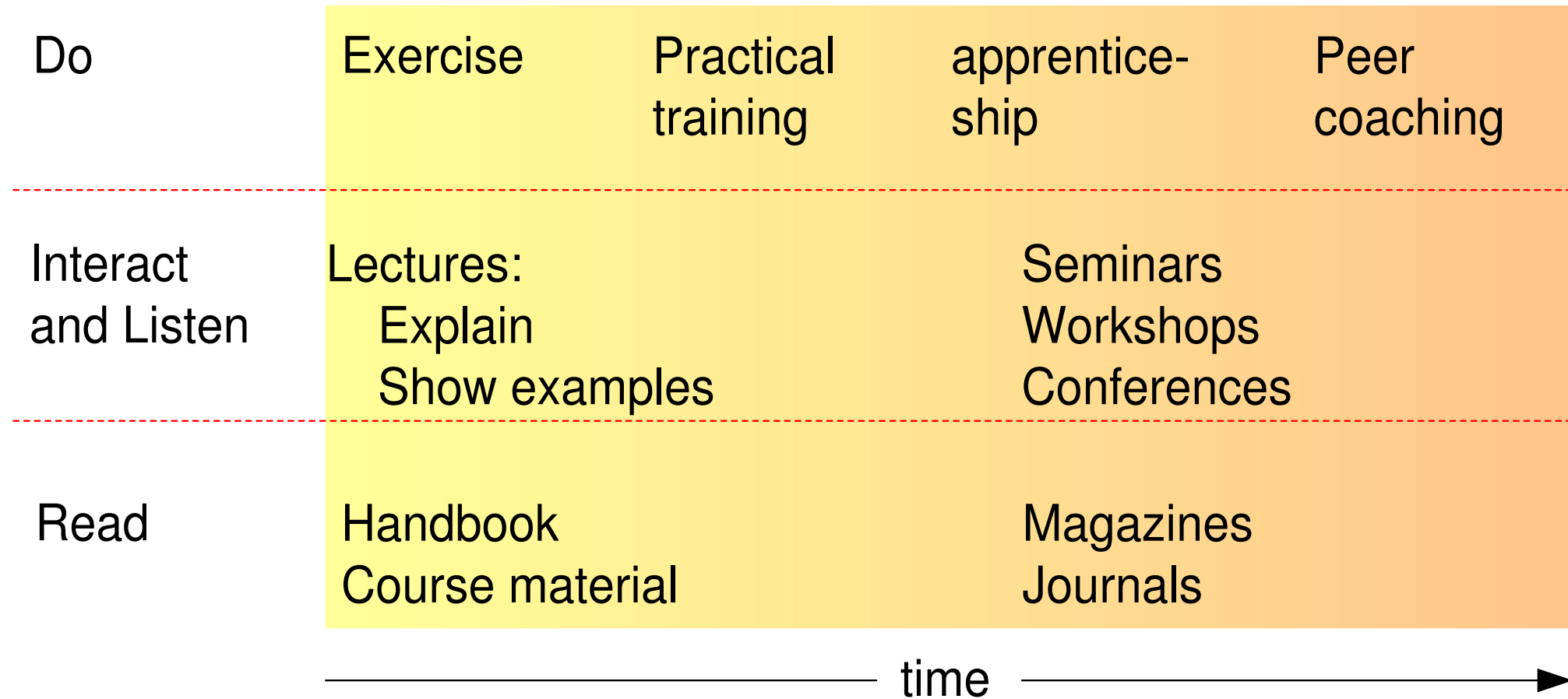    Tools

    Patterns

Intuition

Observation

Trial and error

Lateral thinking

Collection of references

**Education ⟷ Experience**

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# Educational Material per education stage

# Changing Education model in time

| | | | | |
|---|---|---|---|---|
| **Do** | Exercise | Practical training | apprentice-ship | Peer coaching |
| **Interact and Listen** | Lectures:<br>  Explain<br>  Show examples | | Seminars<br>Workshops<br>Conferences | |
| **Read** | Handbook<br>Course material | | Magazines<br>Journals | |

time →

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# Increasing Initiative required

| | | | | |
|---|---|---|---|---|
| **Do** | Exercise | Practical training | apprentice-ship | Peer coaching |
| **Interact and Listen** | Lectures:<br>　Explain<br>　Show examples | | Seminars<br>Workshops<br>Conferences | |
| **Read** | Handbook<br>Course material | | Magazines<br>Journals | |

time →

highly organized
well specified
small scope
few (if any) stakeholders

initiative required
uncertainty rules
large scope
many stakeholders

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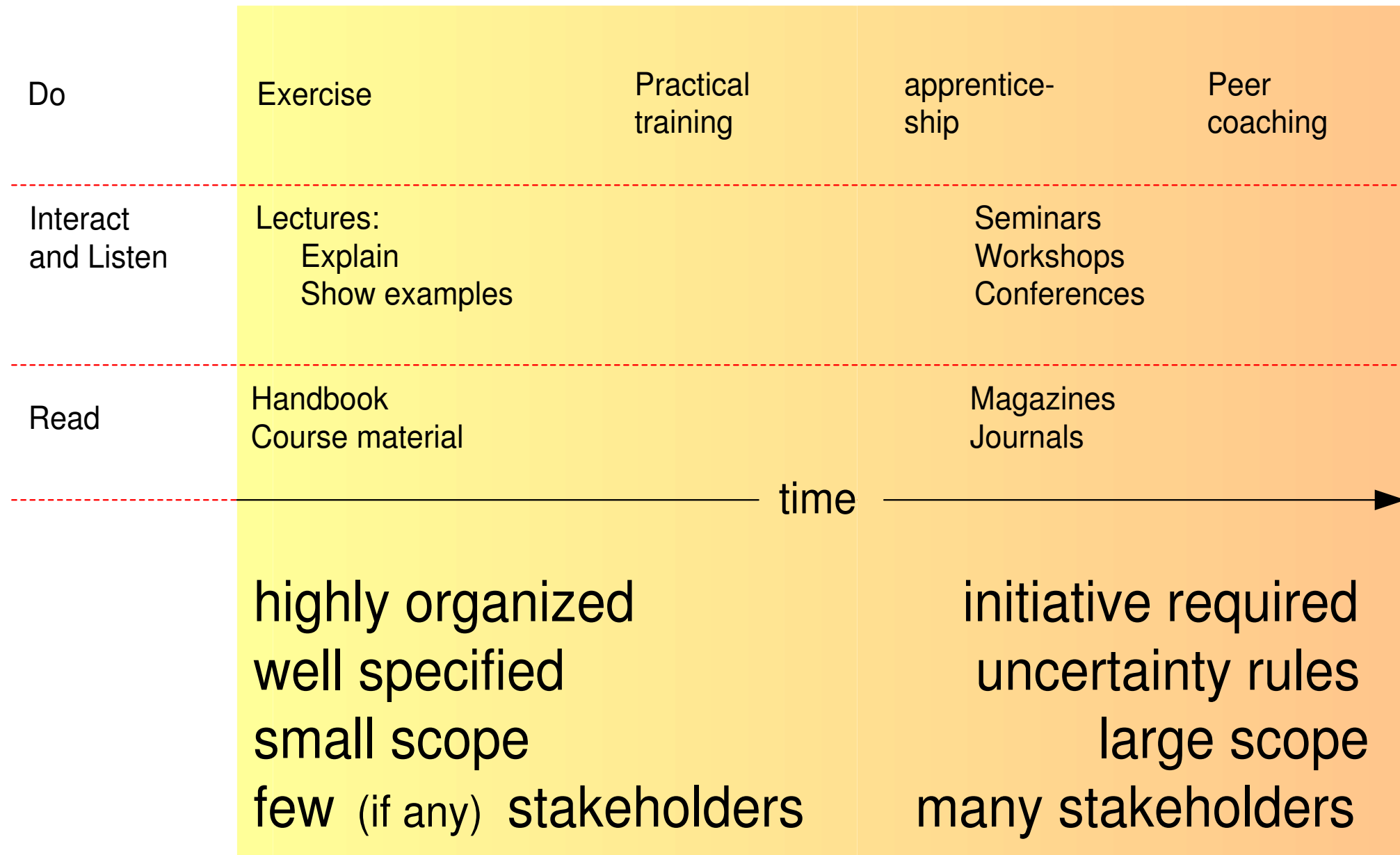
# Prerequisites for continuous successfull product creation

- Awareness of engineers of human aspects

- Active personal development drive of engineers

- Awareness of managers of education models

- Active motivation by managers
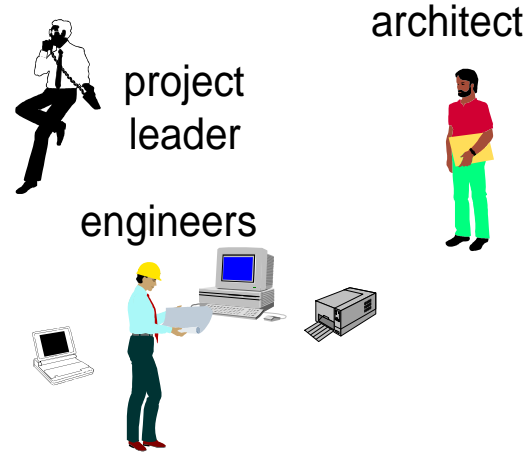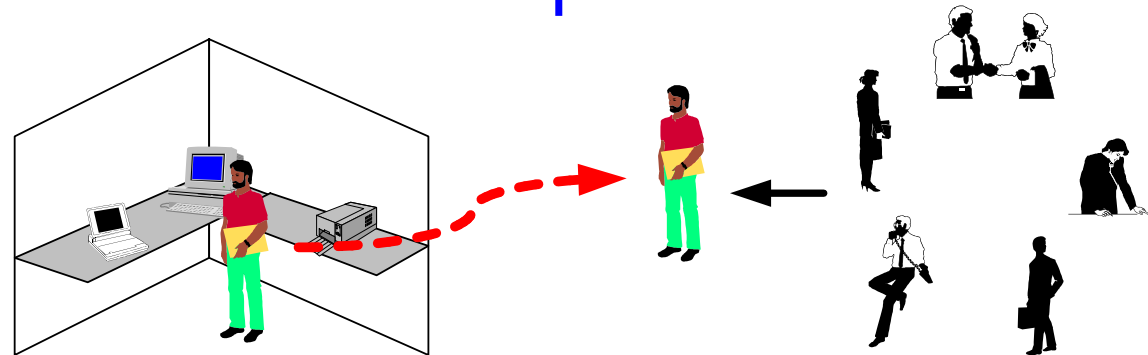
## To create an User Experience

Design Experience is needed

A ☐

B ☐

C ☐

D ☒ ☺

architect

project leader

engineers

Success requires feedback

Experience is not predictable and never garantueed

# Design experience is not transferable
## education is no substitute

Regular education =
### Transfer of Engineering methods
### + Training

# Transfer is approximated by
## personal development

Personal Development =
### On the job training
#### + feedback
#### + continuous personal education