

Yuhong Wen, He Zhang, Lin Liu, Hongji Yang
School of Software, Tsinghua University, China
Institute of Creative Technologies, De Montfort University, UK

One Bridge, Two gaps

**Beyond An Engineering Approach:
Creativity in Requirements Elicitation**



Media and Enjoyable RE (MERE) & RE Visualization (REV)

User – Designer

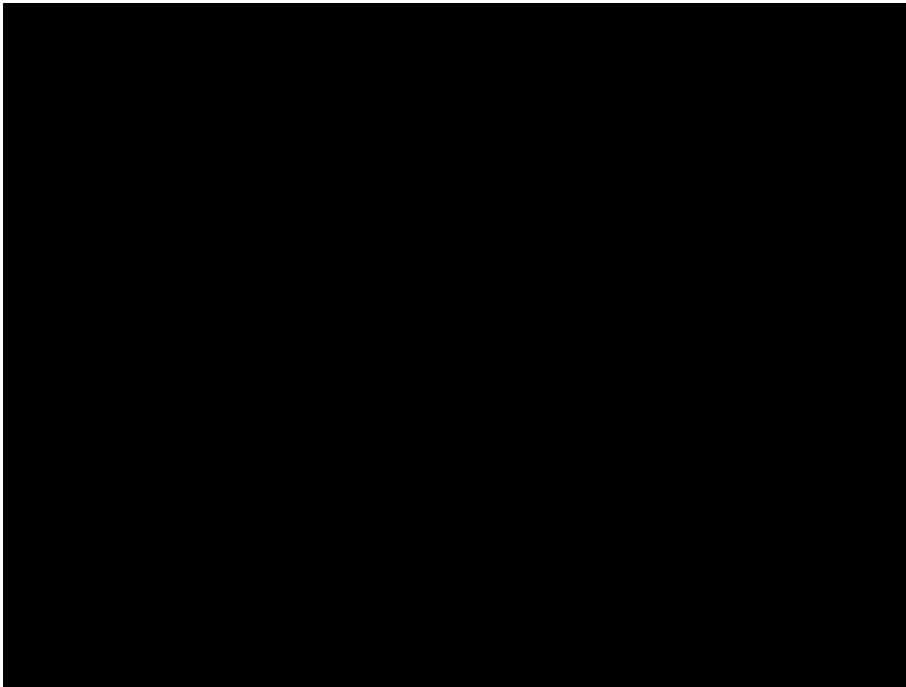
Textual description – Implemented Product

Implemented Product – Customer Experience

Engineering vs. Science

(Sciences of Artificial, Herbert Simon, 1969, p3)

In contrast to a science, engineering is about how to **build** artificial things, so that expected goals, functions, adaptations to environments can be fulfilled.



Automatic Generation of
Computer Animation: Using
AI for Movie Animation,
R. Lu and S. Zhang,
LNAI 2160, 2002, Springer.

Science vs. Art

- "**Science** n,...contra-distincted from **art**. The distinction as commonly apprehended is that a science is concerned with theoretic truth and an art with methods for achieving certain results."

Oxford English Dictionary

- • Learning vs. Making
- Thus, we do find synergies between art and engineering, regardless of many a differences.

Experience Agenda

- Session 1: Team working session (30 minutes)
 - ①: Scripting
 - ②: Action design
 - ③: Background / stage design
 - ④: Music composition
 -
- Session 2: 5 minutes per team
 - ⑤: Execute the integrated designed activities
 -
- Session 3: 20 minutes
 - Summary and discussions

Guidelines for preparation

- 1. assign roles for group members;
- 2. prepare background design;
- 4. think of plots, scenes, dialogues...
- 3. compose / select music for your ;
- 5. you will still have 20-30 minutes in the afternoon session to finalize your team work.

(1)Scripting

write down textual descriptions of the character dialogues, the series of shots with

- (1) introduced movie paradigm and director styles,
- (2) keynote determination,
- (3) further refinement of plots,
- (4) missing plots inserted, and
- (5) whole story segmented into a series of shots.

(2) Acting design

- You will plan for
- what actions the roles should act on in order to reflect the theme of the story,
- the principal roles,
- the minor principal roles,
- the main development threads,
- the sentiment and behaviour of roles,
- abstract actions unfolded into concrete ones, the environmental constraints, etc.
- or even dance 😊

(3)Background design

- You may list the design plans,
- As well as the guidelines in mind while doing the design.
- Guidelines for camera, colour and light.
- Portray the figures and atmosphere.
- You can prepare simple background slides .

(4) Music composition

- not necessarily musicians who have profound knowledge in composing,
- may simply write down the requirements for the music,
- or use Baidu or Google to pick musics that fits the scenes best.

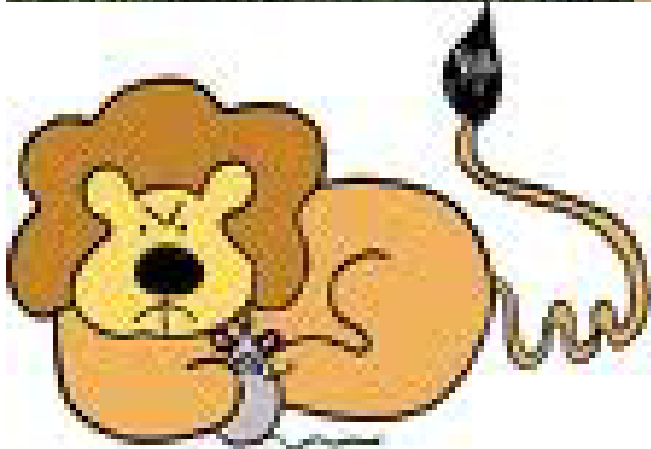
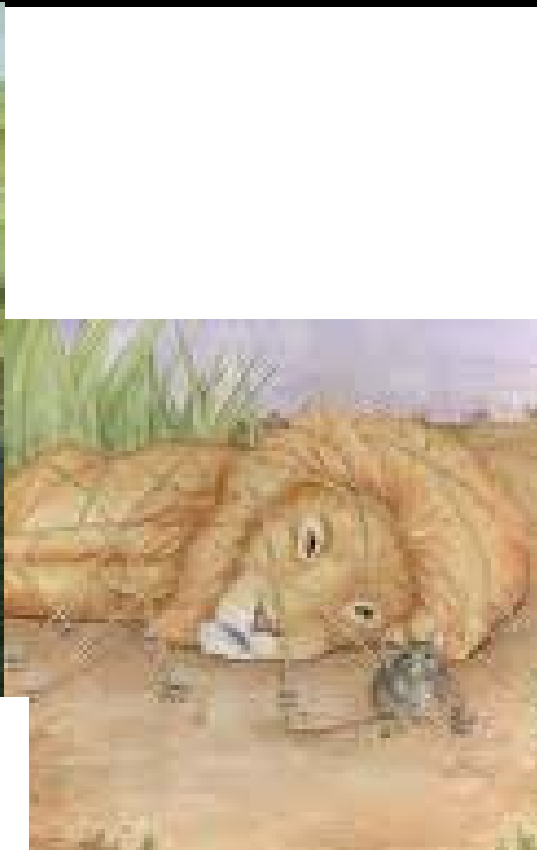
Scenario 1.

Aesop's fable - The Lion and the Mouse

- **The story:**
- Once when a Lion was asleep a little Mouse began running up and down upon him; this soon awakened the Lion, who placed his huge paw upon him, and opened his big jaws to swallow him.
- "Pardon, O King," cried the little Mouse: "forgive me this time, I shall never forget it: who knows but what I may be able to do you a turn some of these days?"
- The Lion was so tickled at the idea of the Mouse being able to help him that he lifted up his paw and let him go.
- Some time after the Lion was caught in a trap, and the hunters who desired to carry him alive to the King, tied him to a tree while they went in search of a wagon to carry him on.
- Just then the little Mouse happened to pass by, and seeing the sad plight, in which the Lion was, went up to him and soon gnawed away the ropes that bound the King of the Beasts.
- "Was I not right?" said the little Mouse.
- **Conductor's instruction:** the film should demonstrate "**little friends may prove great friends**".

Scenario 1.

Aesop's fable - The Lion and the Mouse





Episode 1

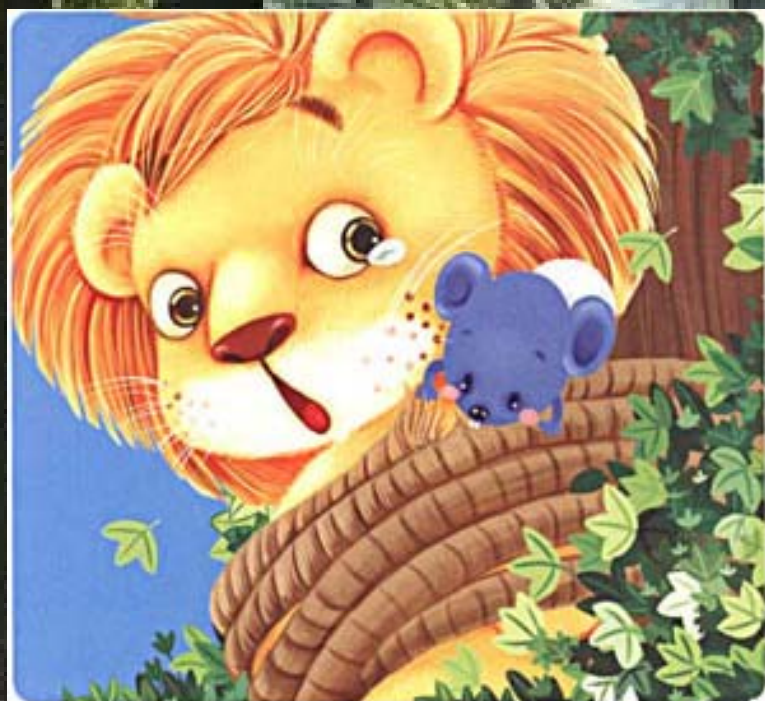




Episode 2







Scenario 2.

A Computer Generated Story

- The **user** asks **E** for an interest free credit.
- Because **E** likes the **protagonist**, s/he proposes to him/her to marry **A** in exchange.
- The user accepts this proposal.
- Because **D** wants to marry **A**, she/he confronts the **protagonist** who decides to confront **D** as well.
- **A** likes **D**. Therefore s/he decides to defend **D** against the **user**.
-
- **Conductor's instruction:** the film should demonstrate "there can be complicated social and emotional interactions between roles".

Scenario 3.

A Poem - **change** is a funny thing

- sometimes things can change
and not always in the best way

I got pissed off and mad and sad
to me this WASN'T ok

this isn't right I don't understand
why they did this to me

- I want revenge I want it bad
i want em' pay their fee...

I know eventually
I'll forget this whole thing

but you gotta admit
I'm one strong little girl
complaining about nothing...

By Brittany Woessner

Scenario 4: Wind in Autumn by Kaii Higashiyama



《Wind in the Autumn》

- Prelude. A mountainous area in autumn, distance shot, russet colour;
- Episode 1. A small house burning charcoals, from distance to close shot, maple leave and white smoke color;
- Episode 2. River and valley in the rain, bamboo, farmer house, persimmon trees, closest scene, green and persimmon red;
- Episode 3. Forest, mule, field and Children, close shot, white and grey.

Scenario 5 Zheng Guo Canal

- 246 years b.c., Qin's **Jing riverside** became China's most spectacular construction site. At that time the construction of over 100 thousand people, which lasted 10 years to complete. Han engineer Zheng Guo is the Chief Engineer.
- Later, the King of Qin found out that Zheng Guo is a spy sent the by King of Han , who **built the canal to weary Qin**. He wanted to kill Zheng Guo.
- Zheng said that the **canal can benefit Qin**, asked to let him finish the project before being killed. King of Qin agreed.
- Zheng Guo Canal goes through today's Jingyang in Shaanxi Province, **124 km long, irrigates 115 million acres** of fertile farmland . Zheng was killed after the project, people named the canal with his name — Zheng Guo.





Scenario 6: New York Fire Department Emergency Call Handling System





- | | |
|-------------------|------------------------|
| (1) 紫荆15号楼 | (8) 大礼堂 |
| (2) C楼 | (9) 南北主干道 |
| (3) 紫荆操场 | (10) 南北副干道 |
| (4) 28号楼 | (11) 第三教室楼
(由南向北三段) |
| (5) 31号楼 | (12) 中央主楼 |
| (6) 蒙民伟
学生活动中心 | (13) 东阶 |
| (7) 西阶 | (14) 东门 |



- | | |
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Scenario 7: University Campus Public Resource Monitoring System



To be or Not to be, It all depends





Sports field



...



Classroom availability



Road Traffic



Restaurants

Scenario 8: Remote Access Platform for Medical Digital Image Slices

Scenario 9: Real-time Public Transit Inquiry System



Real time traffic status report



Bus location report



Passengers number report

Once upon a time there was
a graduate student



He wanted to take the bus line 34
(However, there wasn't a **Real-time
Public Transit Inquiry System**)

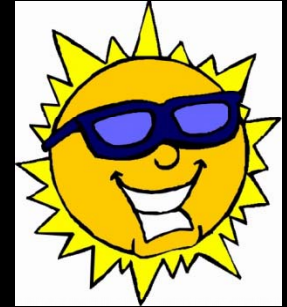


then...



My bus
must arrive
earlier than
yours !

10:00 AM



No
comments...

Passenger B (who also uses the system)



**Use the Real-time
Public Transit Inquiry System
so prevent his tragedy from
happening to you**



Thanks!

Discussions

- A. How to **best use multimedia** techniques to **produce a product** more enjoyable? This can be a joint effort of elaborating on the **enjoyable** elements, to best **mix up** several multimedia elements to achieve a desired level of effect.

Discussions

- B. How to best use multimedia techniques to make the requirements engineering process more enjoyable?
- e.g. what requirements engineers should deliver to the customer in future?
 - A thick stack of textual documents or a video product with vivid exhibition of our understanding to user's needs and system functions?

Discussions

- C. How to reflect creativity for media production in software design?
- How to use creativeness to develop software more efficiently?
- How to maintain the integrity of the specification while allowing creativity and enjoyment?

Discussions

- D. What is the difference between eliciting requirements for a **multimedia intensive** product or a **non-multimedia intensive** product?

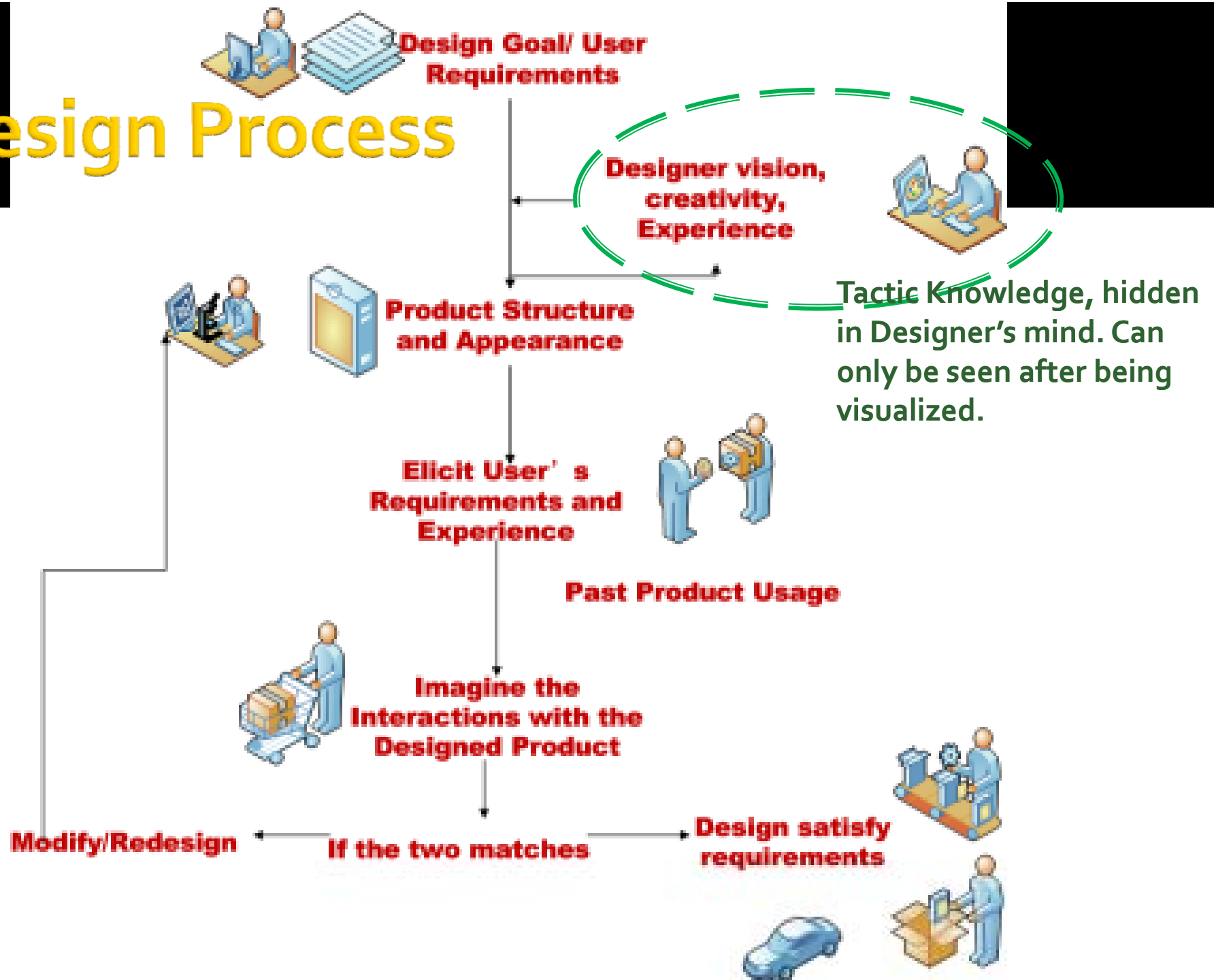
About Design

- The **motive** of Design – **function**
- The **origin** of design – **repeating**
- The **essence** of design – **creation**
- the designer's interest is **Human-Centered**, it is to design **good** and **reliable** products to bring people happiness, these products are practical, functional and attractive, charming, delightful, entertaining.

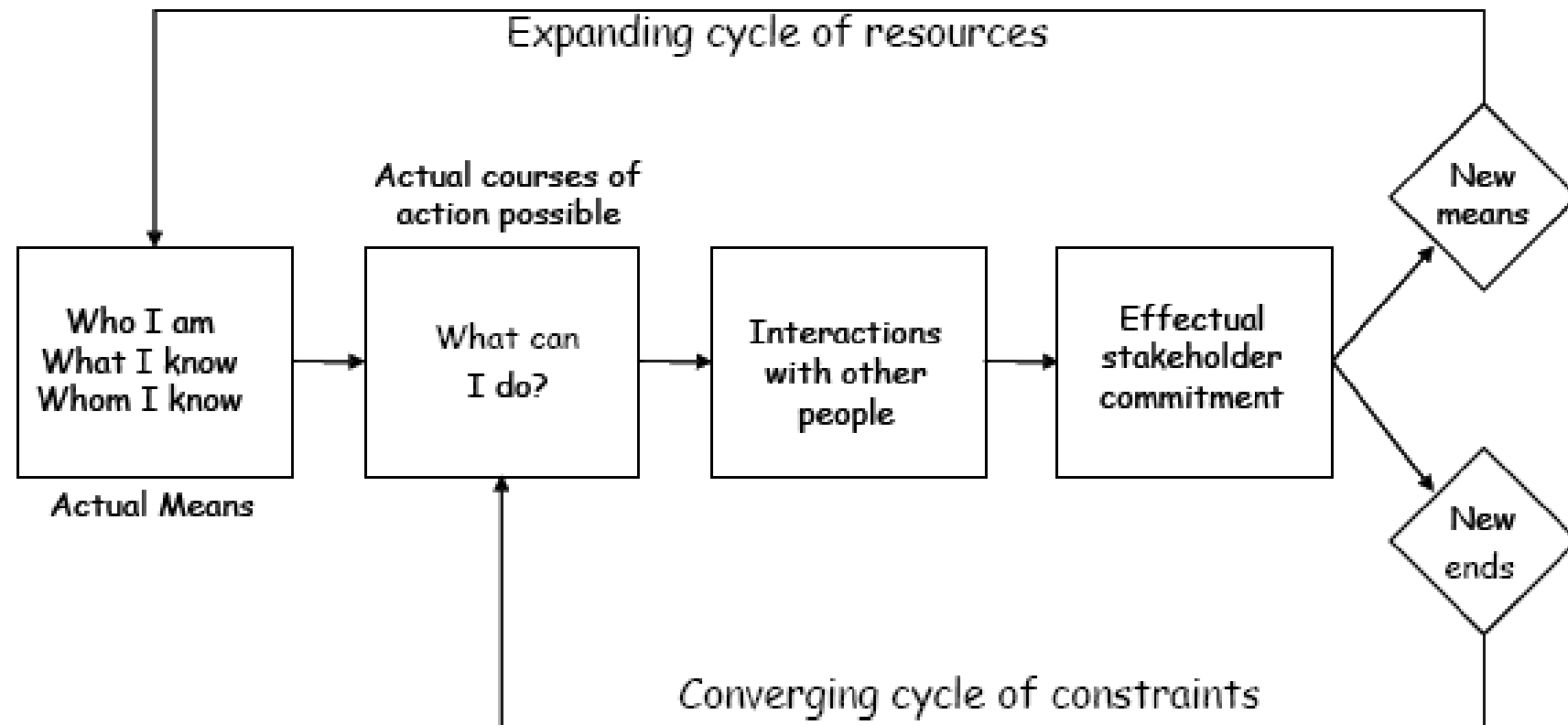
Semantic turn (Krippendorff, 2006)

Technology centered		Human centered	
People	Machines	People	Machines
Vague	Precise	Creative	Unoriginal
Disorganized	Orderly	(accommodating)	Rigid
Distractible	(focussed)	(Context sensitive)	(Context insensitive)
Emotional	(rational)	Resourceful	Un- imaginative
Illogical	Logical	(many intelligence)	(fast but repetitious)

Design Process



The double feedback loop



Artefacts

- Requirements (Design Goals, Intentional Model)
- Concepts/ Ideas
- Graphical Representation
 - Concept diagram
 - Renderings
- Communication media & Tool for selections and evaluations
- Product (symbol, semantics, appearance)

Representation of the Design

- The influence of problem representation on Design.
 - Problem solving as change in Representation
 - Solving a problem simply means representing it so as to make the solution transparent.
 - Spatial Representation
 - E.g. in CAD
 - The Taxonomy of Representation
- Alternative representation for design problems.

A LASTING COMMITMENT to the DEAF...



YOUR LASTING
COMMITMENT ???

Energy Saving, Pollutant
Reduction, ... Efficiency...
Security... Automation...
Optimization... Accuracy...







Enjoy the taste of creativity

...