

# Scenario-based design

Chris Fowler

Chimera: Institute of Social and Technical Change

University of Essex



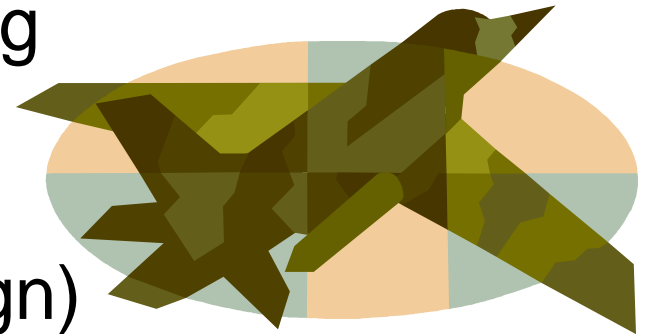
# Contents

- Context
- Defining a scenario
- Scenarios for Need Analysis
- Scenarios for Usability Engineering
- ....and the e-framework?
- Issues & Conclusions



# Context

- Military
- Planning & Decision-making
- User Needs Analysis
- Usability Engineering
- Others (inc. Learning Design)



# Defining a Scenario

- Narrative (a story)
- Bounded (or scoped)
- Descriptive
  - Actors
  - Activities (tasks)
  - Things (objects)
- Within a given time-frame
- For a given purpose
  - Communication (shared)
  - Analysis/design
  - Decision-making



# Defining a Scenario (cont)

- They can describe:
  - ‘current/now’ or ‘as is’
- and/or
  - ‘proposed/future’ or ‘what-if’ situations.
- Current is more about problem analysis
- Proposed is more about building a paper-based ‘prototype’ or representation

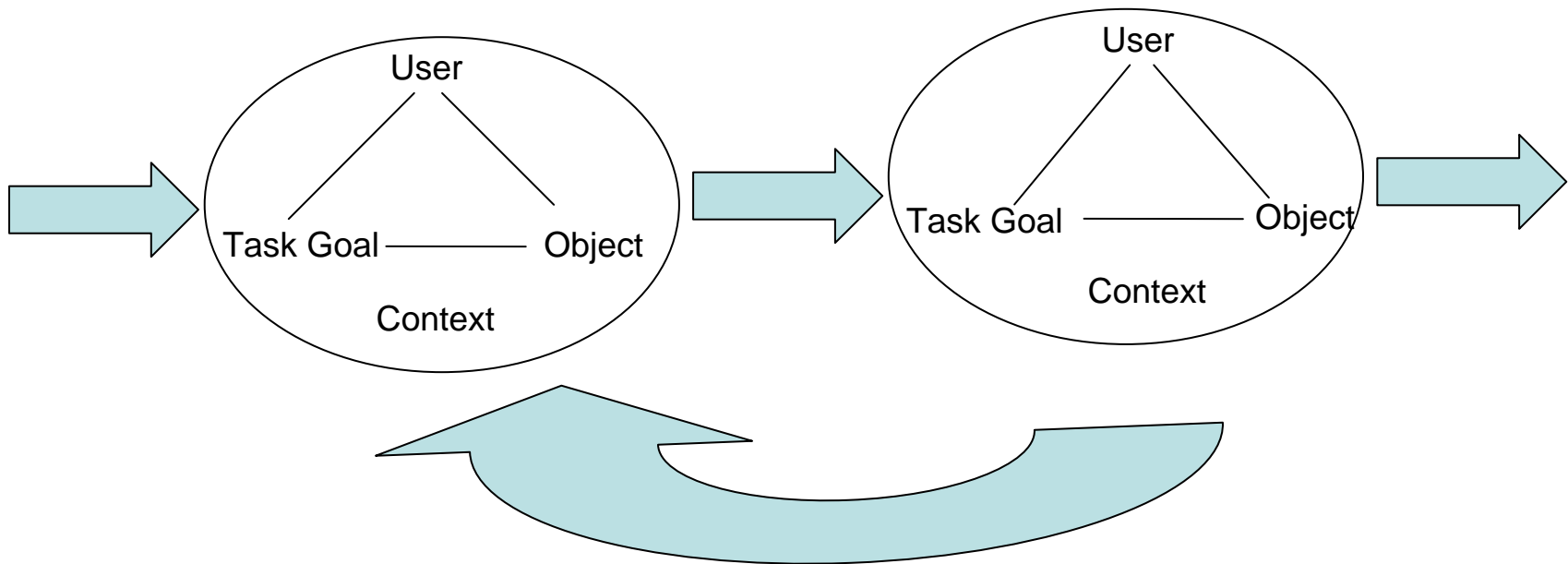
# Focus

- Military
- Planning & Decision-making
- User Needs Analysis
- Usability Engineering
- Others (inc. Learning Design)

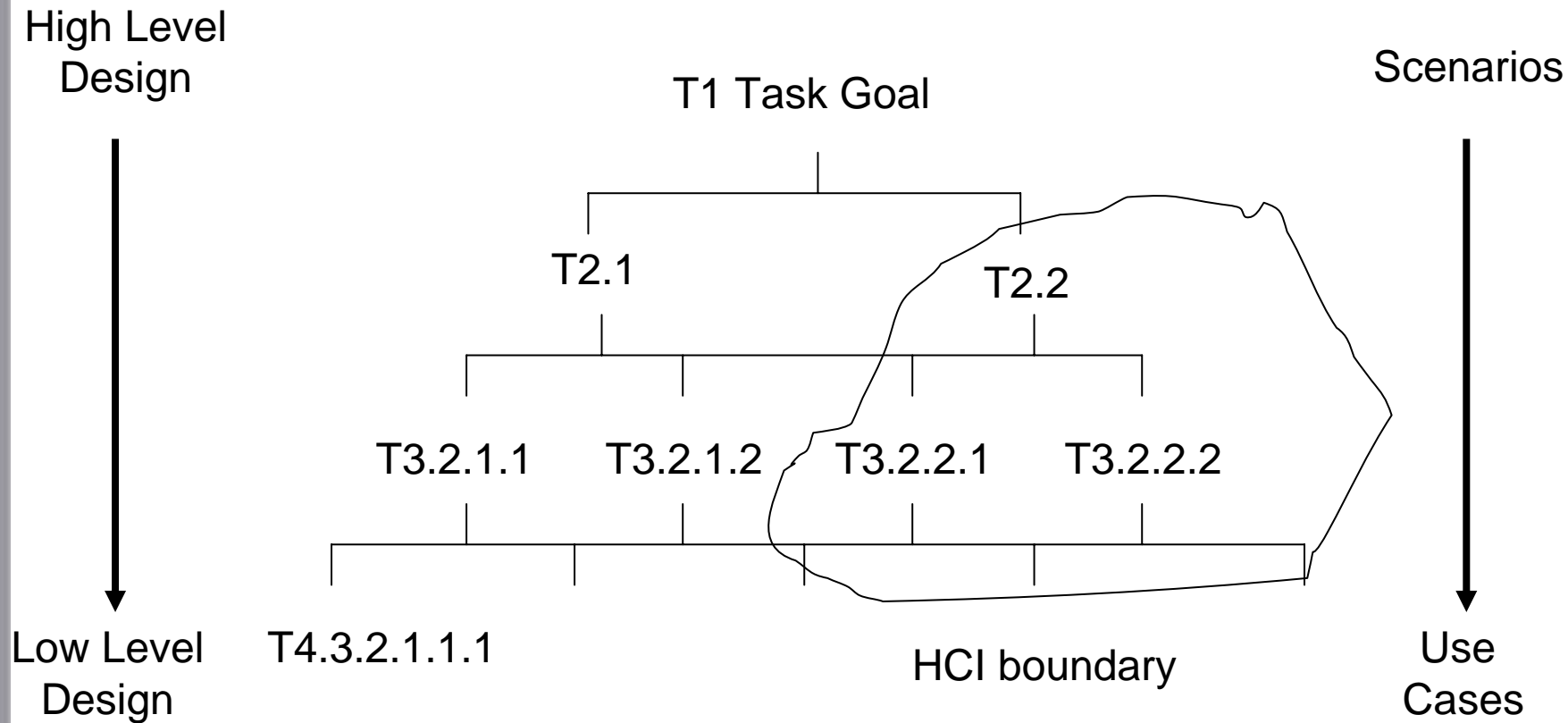


# User Needs Analysis:

The core of any design scenario is a narrative around a user, trying to achieve a task goal involving a 'thing' within a given context or environment (e.g. the workplace).

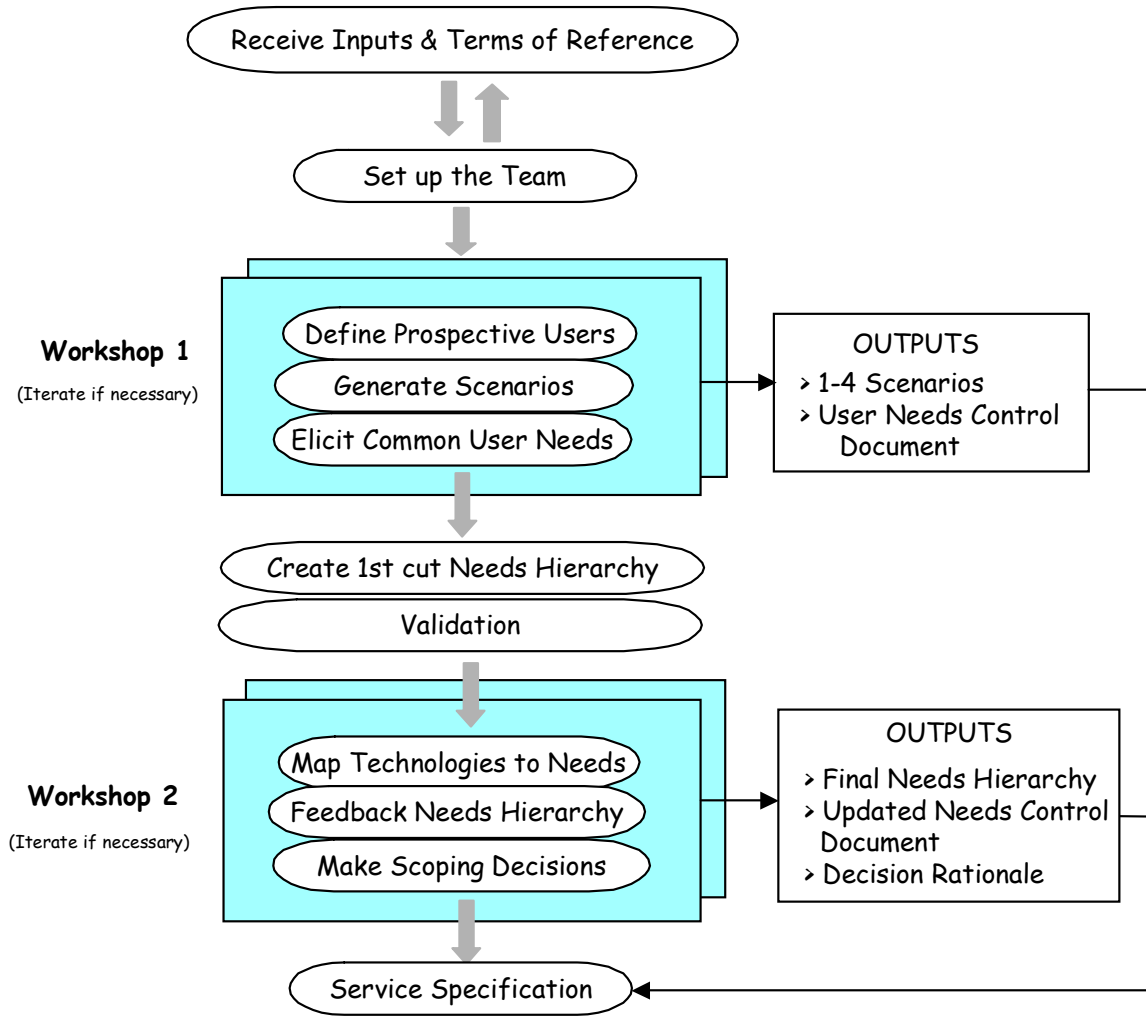


# Scenarios & Design: Hierarchical Task Analysis (HTA)





# SUNA: An Overview



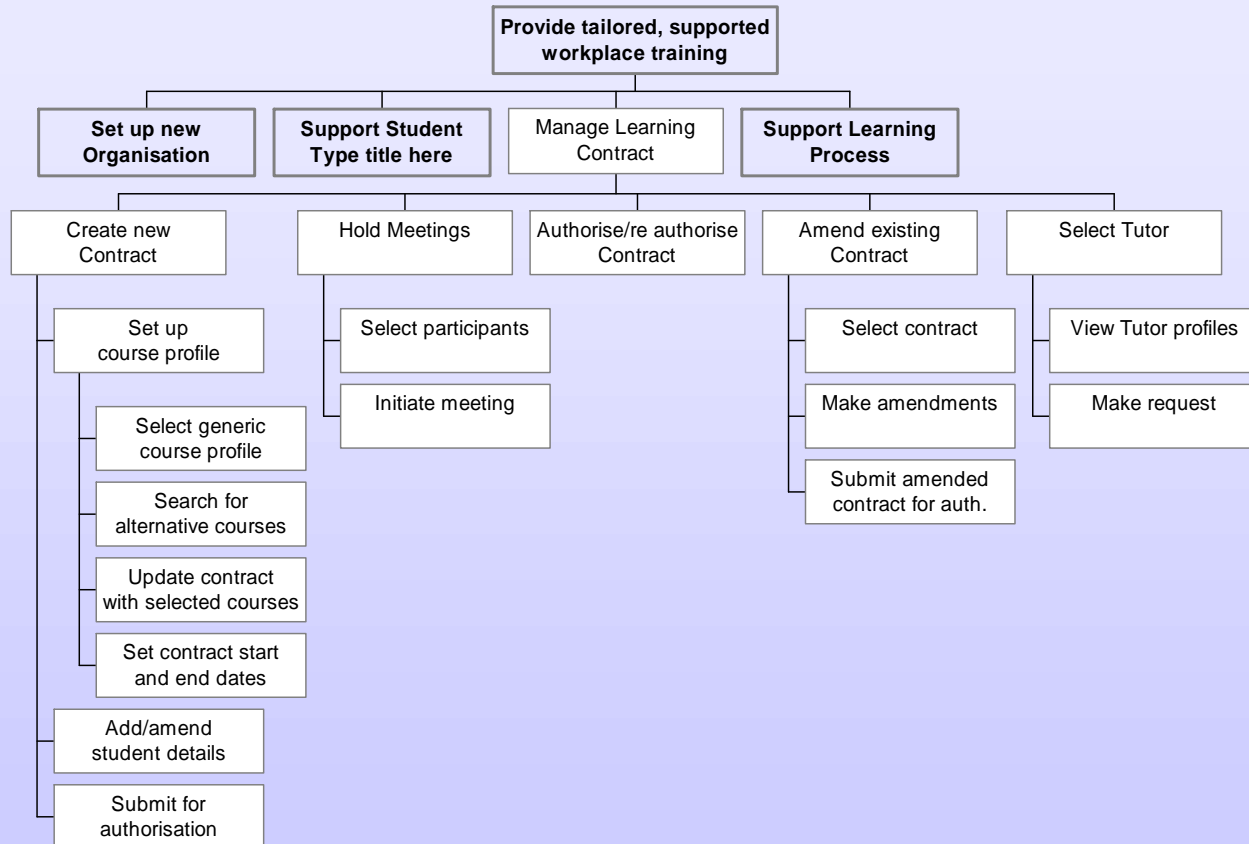
# SUNA Scenario

*Over the next term she uses the case study to inform her own teaching, and from her experience of using it, she annotates it with her own notes **<need to annotate>**, and saves the annotated version and thus 'growing the context'. Indeed, she came to the stage of being so critical of the Case Study that she changed it by adding some of her own material **<need to edit>**. Eventually she decided it would be easier to create a new one **<need to create>** and submit it. Later on, she notices that the University QA officer had deleted the original Case Study **<need to delete>**, and hers was now offered as the best example of effective practice in that area.*

# User Needs Table

No.	User Need
1.	It shall be possible to create new Learning contracts
2.	It shall be possible to base the Learning Contract on a generic course profile
3.	It shall be possible to tailor the course profile to the students requirements
4.	Learning Contracts must be authorised
5.	It shall be possible to amend and re authorise existing Learning Contracts
6.	It shall be possible for students to request the Tutor of their choice
7.	The Learning Account Manager shall conduct on line meetings with the student and the students line manager to agree the Learning Contract.

# User Needs Hierarchy



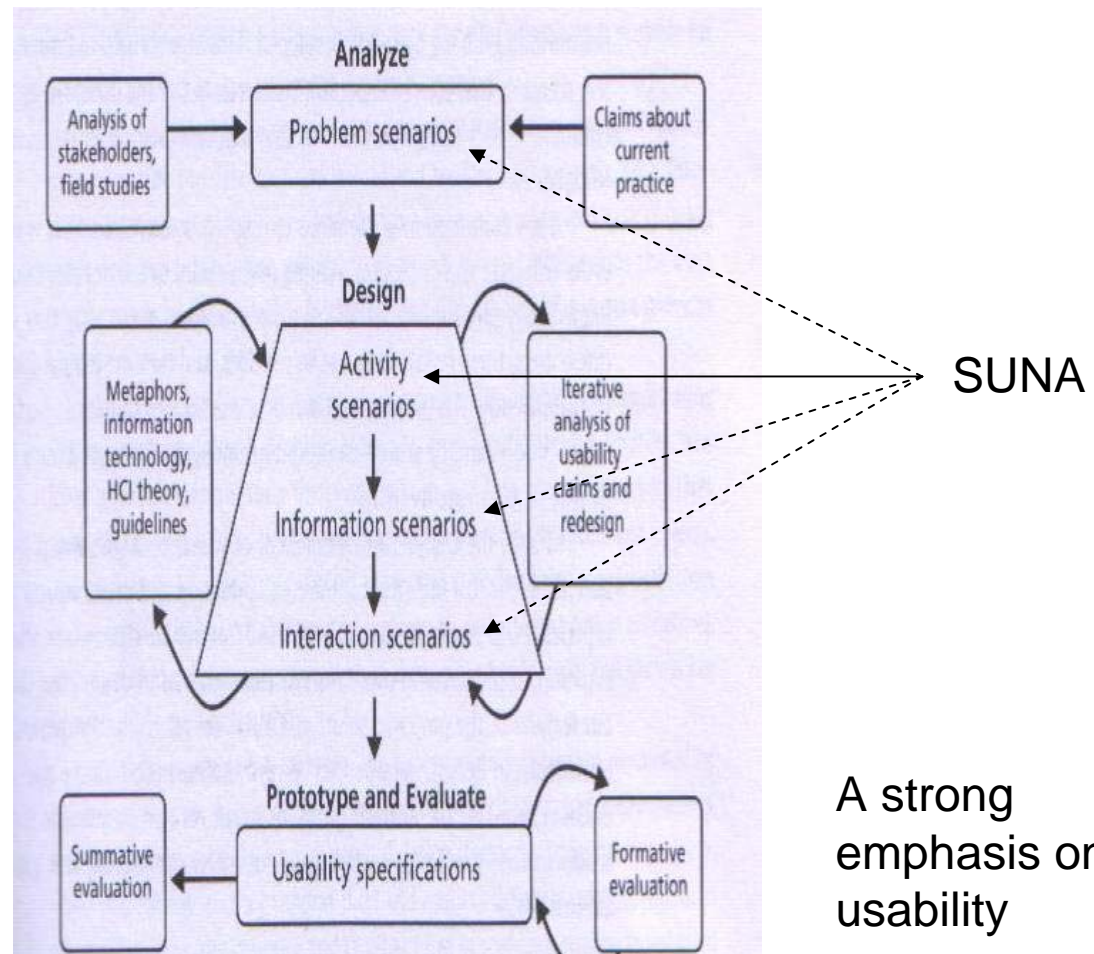
# Mapping Technology onto Needs

	User Need	Technology
1	Ability to submit work to Tutor for assessment (need to distinguish from other types of correspondence from students to tutors)	Learning Management System (LMS)
2	Summary table giving details of the files relating to the conference event: <ul style="list-style-type: none"><li>• File name</li><li>• Where stored</li><li>• Who requires a copy</li></ul>	LMS
3	One click to e-mail conference files (as above) to people who require a copy (recipients must be specified when files are generated or use rules yet to be identified)	E-mail
4	On tool bar - show clocks for countries where students and tutors are based i.e. Malaysia & UK	Portal

# Creating Use Cases

- A Use Case is defined as:  
“a concrete description of activity that the user engages in when performing a specific task, description sufficiently detailed so that design implications can be inferred and reasoned about” (Carroll 1995).
- It starts with a ‘functional need’ (e.g. Withdraw cash from the ATM) but describes the ‘how’ (place card in slot; type in PIN; select service.....)

# Rosson's & Carroll's (2002): Scenario-based Usability Engineering



A strong  
emphasis on  
usability

# Problem Scenarios

- Descriptions of the current situation
- Used to identify 'claims' and 'trade-offs' that may impact usability
- A problem claim is about the positive and negative effects of features on the actor's experience
- E.g. Situation Feature – Students can email their tutors
  - Pos. offers timely and effective support
  - Neg. takes up too much of the teacher's time
  - Trade-off: Teachers will only respond to emails about specific assignments (a need?)



# Activity Scenarios

- Transform current activities to use new design ideas (proposed scenario) or new functionality
- Inputs:
  - Problem claims/trade-offs (keep the best features!)
  - New technologies, metaphors or design ideas (from brainstorming)
  - HCI knowledge
  - Current practice knowledge
- Output:
  - Design Claims (new design features & their implications (SUNA Needs?))

# Information Scenarios

- Making sense of how users perceive, interpret and make sense of information
- Elaborate activities so that they include perceptual & presentation details.

## Activity Design Scenario

“When Delia shows Alicia an email invitation to the VSF, the two of them decide to follow the link right then...”

## Information Design Scenario

“The email includes a string that Delia recognises as a URL in.....”

- Would a template (e.g. object name; representation; required action; flow....) rather than a Scenario be a more effective representation?

# Interaction scenarios

- These are about “physical actions and system responses that enact and respond to the users’ task goals and needs”.
- A use case?

# SUNA v's Scenario-based Usability Engineering

- SUNA has no 'problem scenarios' such information is owned & shared by experts
- SUNA's Scenarios & SBUE's Activity Scenarios are similar
- Many of SUNA's scenarios also cover 'Information' and 'Interaction' scenarios

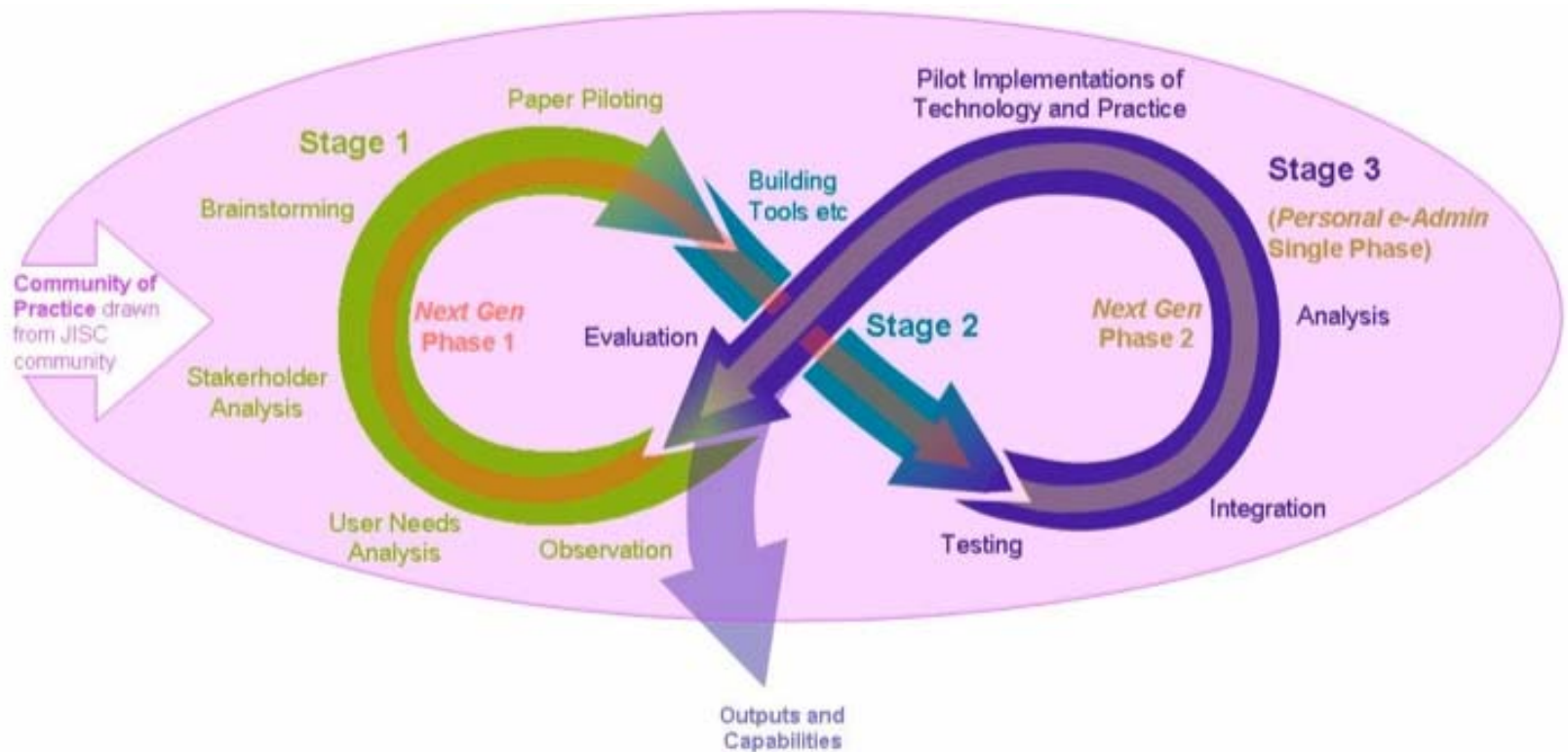
# The e-framework...?

Requires all the pieces to fit together as seamlessly and effortlessly as possible, including, for example:

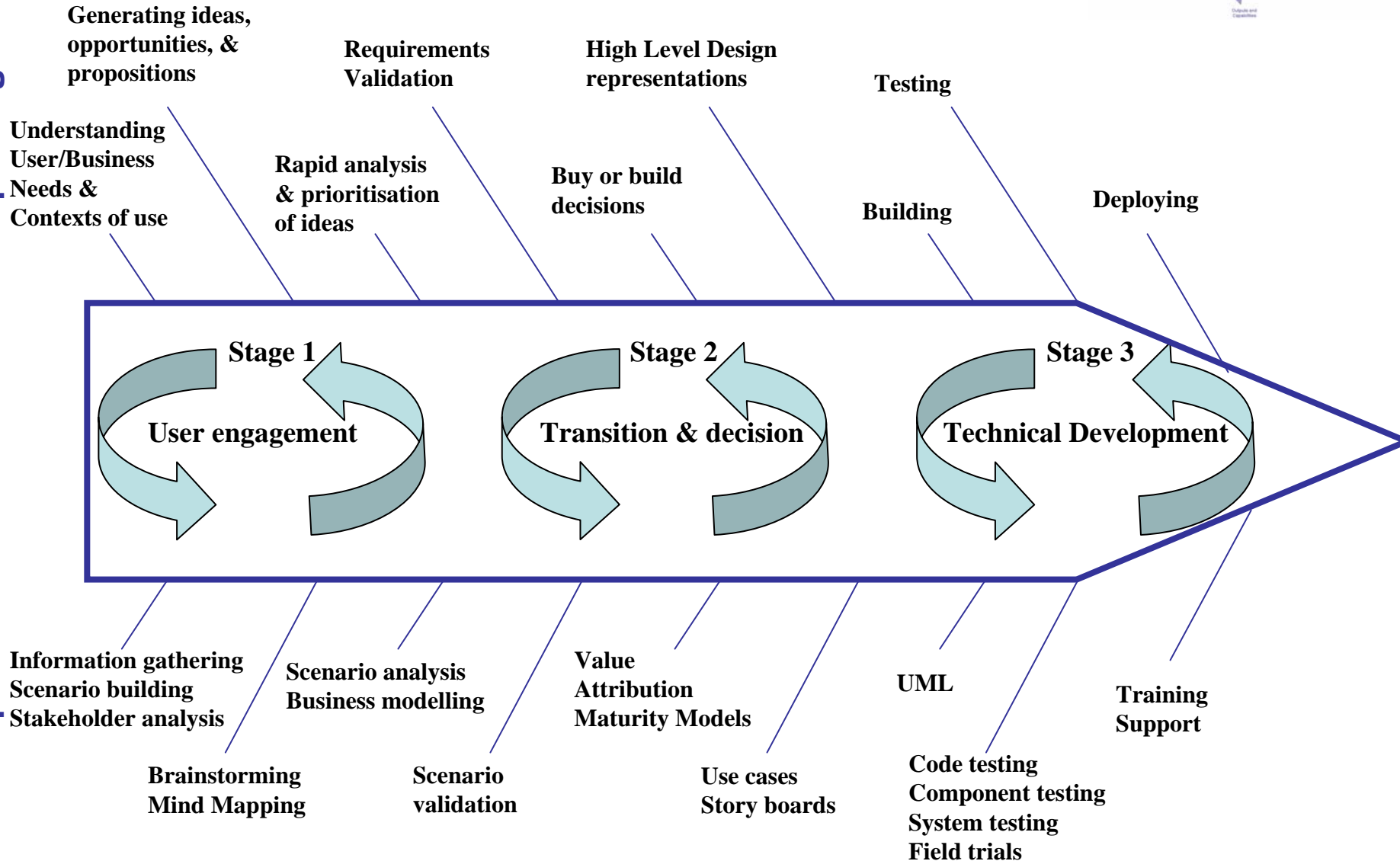
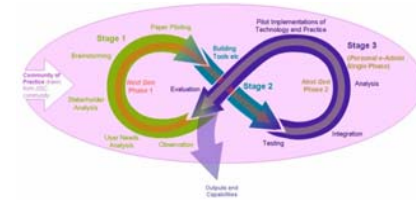
- Open Standards
- Common terms/definitions
- Agreed framework/process
- Open APIs or source code

Or a common design/development/deployment approach – UIDM? Agile? UML? RAD? ANT? MAVEN?

# User Innovation Development Model



# Facilitation of the UIDM



# Issue 1: Where do scenarios come from?

1. Information gathered – templates, marketing docs; previous products...
2. An Individual (beware of design bullies!!!)
3. Expert group (SUNA - proposed only scenario or USTM – now & proposed descriptions
4. Combinations of the above





## Issue 2: One Scenario or Many?

- SUNA can generate a number of scenarios but all at the same level – no concept of a ‘super scenario’.
- SBUE creates many scenarios at many levels – too many? Perhaps only problem and activity scenarios are ‘true’ scenarios.

# Issue 3: Non-functional Needs?

- Needs are what people want the system to do.
- Tasks = functional needs
- Many Non-functional needs e.g.
  - training
  - usability
  - acceptability (organisational/social issues)

Cannot be derived from a HTA nor from SUNA approach;

# Non-functional needs?

- These are about change – so you need a baseline (a current description or scenario).
- So SBUE is better (problem compared to activity scenarios).

# USTM Approach to Change

**Product Opportunity:** \_\_\_\_\_

**Generic User: Person Issues** \_\_\_\_\_

**Generic User ID:** \_\_\_\_\_

PROFESSIONAL ENGINEER

Now	Proposed (e.g. 2 years on)
<b>Attitude</b> Professional (traditional & cautious - positive as long as benefits can be seen)	Unchanged
<b>Motivation</b> <ul style="list-style-type: none"> <li>- easier life</li> <li>- to be more effective</li> <li>- to increase quality</li> </ul>	<ul style="list-style-type: none"> <li>- make use of maps etc easier</li> <li>- speed up information flow</li> <li>- increase quality</li> </ul>
<b>Aspiration/Ambition</b> <ul style="list-style-type: none"> <li>- to be a team leader</li> <li>- to be seen as the 'top' engineer.</li> </ul>	to realise aspirations
<b>Expertise</b> High Expertise (v. specialised knowledge base).	<ul style="list-style-type: none"> <li>- exploit expertise more fully by reducing time consuming and/or boring tasks.</li> </ul>
<b>Skill</b> Most technical skills undertaken by technician or tracer - likely to be rather 'rusty'.	<ul style="list-style-type: none"> <li>- new set of IT skills need to be learnt.</li> </ul>
<b>Job</b> Very sociable, varied with high status.	<ul style="list-style-type: none"> <li>- not to be changed.</li> </ul>

**Version:** \_\_\_\_\_ **Produce on:** \_\_\_\_\_ **By:** \_\_\_\_\_

Copyright : (c) International Computers Limited 1986

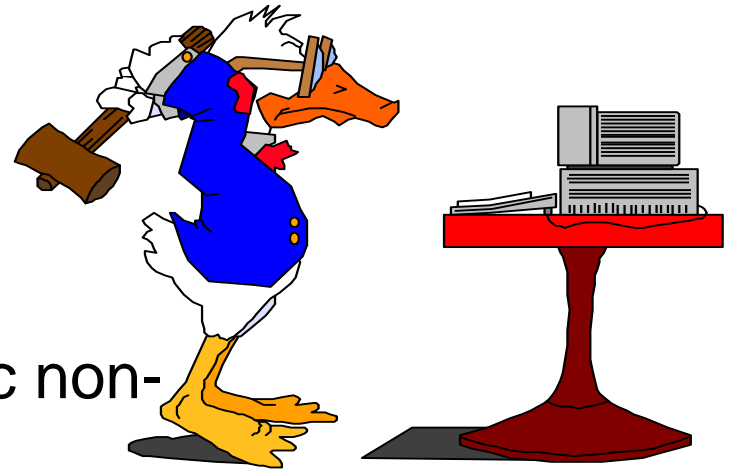
# Issue 4: How valid are Scenarios?

To be valid, they should be:

- Grounded (based on good, valid and trusted back ground information)
- Realistic (evaluate them with users)
- Consistent (same conditions should generate similar scenarios)
- Coherent and complete
- Useful (interface with existing design methods)
- Economical (in time and money)

# Conclusions

- Need for clearer definitions
- Need to know 'how many'
- Need to combine SUNA, SBUE and USTM to create a more complete approach (inc non-functional needs; technical manuals...)
- Must be linked into existing design methods
- Art, Craft or Science?



# Useful readings

- Fowler, C.J.H, van Helvert, J; Gardner, M.G, and Scott, J.R. (in press). The use of scenarios in designing and delivering learning systems. In H. Beetham & R. Sharpe, *Rethinking Pedagogy in a Digital Age: Designing and delivering e-learning*. London: Routledge.
- Van Helvert, J. and Fowler, C. (2004) 'Scenarios for Innovation (SUNA)', in Alexander and N. Maiden (eds.) *Scenarios and Use Cases Stories through the System Life-Cycle*. London: Wiley.
- Rosson, M.B. and Carroll, J.M. (2002) *Usability Engineering: Scenario-based Development of Human-Computer Interaction*. London: Academic Press.
- Carroll, J.M (1995) Introduction: The Scenario Perspective on System Development. In J.M. Carroll (ed.) *Scenario-Based Design: Envisioning work and Technology in System Development* New York: Wiley
- Hutt, A.T.H., Donnelly, N., Macaulay, L.A., Fowler, C.J.H., & Twigger, D. (1988) Describing a product opportunity : A method for understanding the users' environment. In D. Diaper & R. Winder (eds). *People & Computers III*. Cambridge: CUP.

Thank you

[cfowler@essex.ac.uk](mailto:cfowler@essex.ac.uk)

ch*i*mera