

Overview of TRUMP Methods

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The trouble with computers ...

- ◆ 3 out of 4 people cannot get their PCs to do what they want
- ◆ Business users are only 30-40% productive
 - ◆ They take 3 times as long as an expert
- ◆ 80% of software defects are due to poor requirements
 - ◆ 60% due to usability errors
- ◆ New UK passport application software has tripled the number of keystrokes required to issue a passport
 - ◆ Now several months backlog of applications



Potential benefits of usability

- ◆ Focus on user and organisational needs
 - ◆ reduce development times
 - ◆ less training and support and documentation is required
- ◆ Improve productivity
 - ◆ simpler interface, fewer user errors
- ◆ Improve the competitive edge
 - ◆ increasing expectations for ease of use
 - ◆ increasing usability of competitive products
 - ◆ high profile of usability in advertising
- ◆ Improve the quality of life
 - ◆ less stress, users are more satisfied
 - ◆ lower staff turnover
- ◆ Health and safety legislation
 - ◆ European Directive on Display Screen Equipment



Why TRUMP?

Promote user centred design through:

- ◆ Trial of INUSE and RESPECT methods
- ◆ Case studies of the benefits



TRUMP project

July 1998 - June 2000

Serco Usability Services	267 days
Inland Revenue UK	227 days
IAI LAHAV	138 days

500,000 ECU (250,000 ECU EU funding)



TRUMP Objectives

1. Improve the quality of user partners' products and processes
2. Validate methods developed by INUSE and RESPECT
3. Develop and publish guidance and case studies



TRUMP: Trial Usability Maturity Process

- ◆ EU-funded trial application of user-centred design methods developed in previous research projects (INUSE and RESPECT)
- ◆ Serco: apply the methods
 - ◆ Lloyds Register: Usability Maturity Assessment
- ◆ Inland Revenue/EDS - IT for 60,000 staff
 - ◆ RAD methodology
- ◆ Israel Aircraft Industries - aerospace systems
 - ◆ traditional methodology

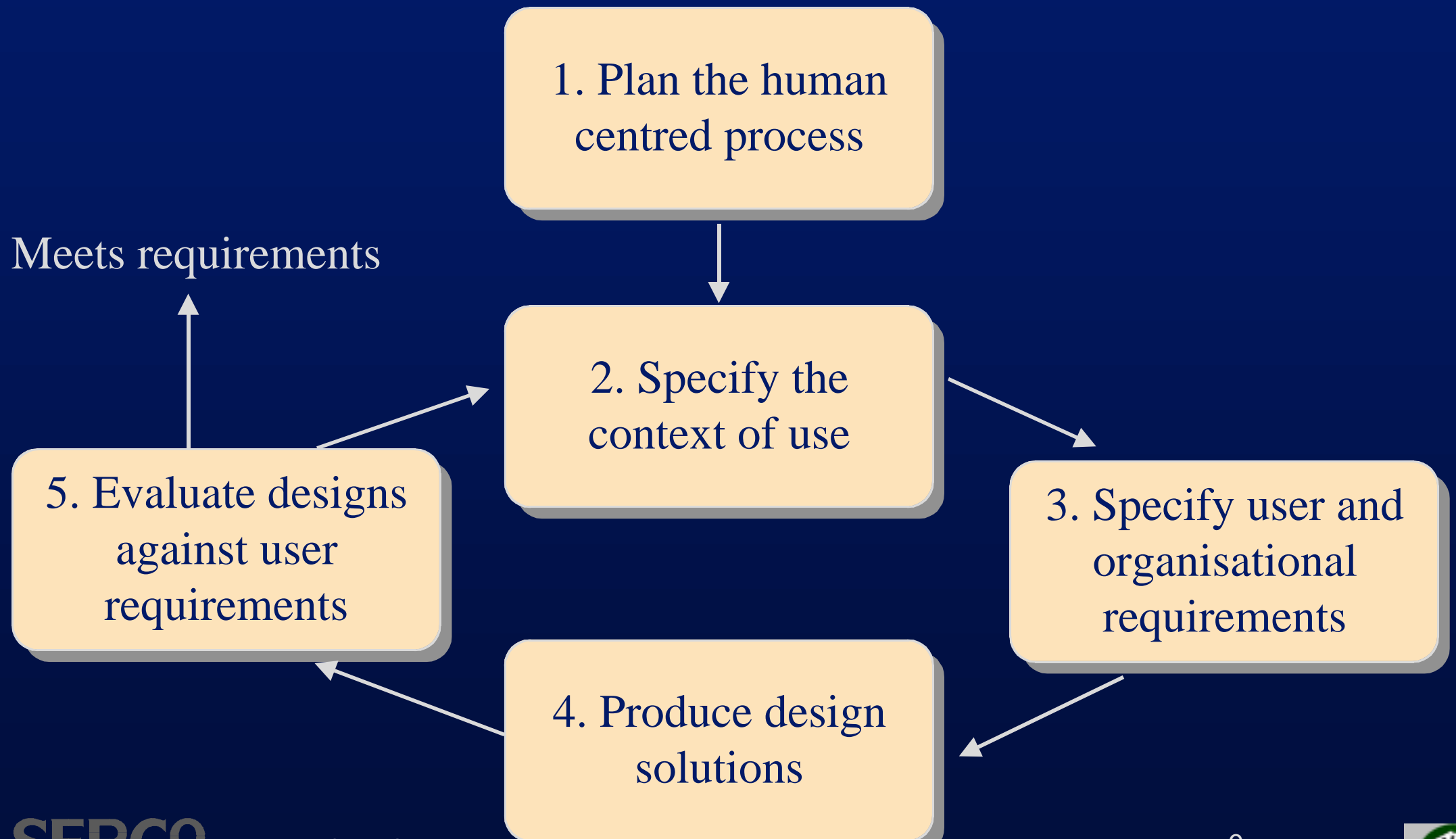


Israel Aircraft Industry

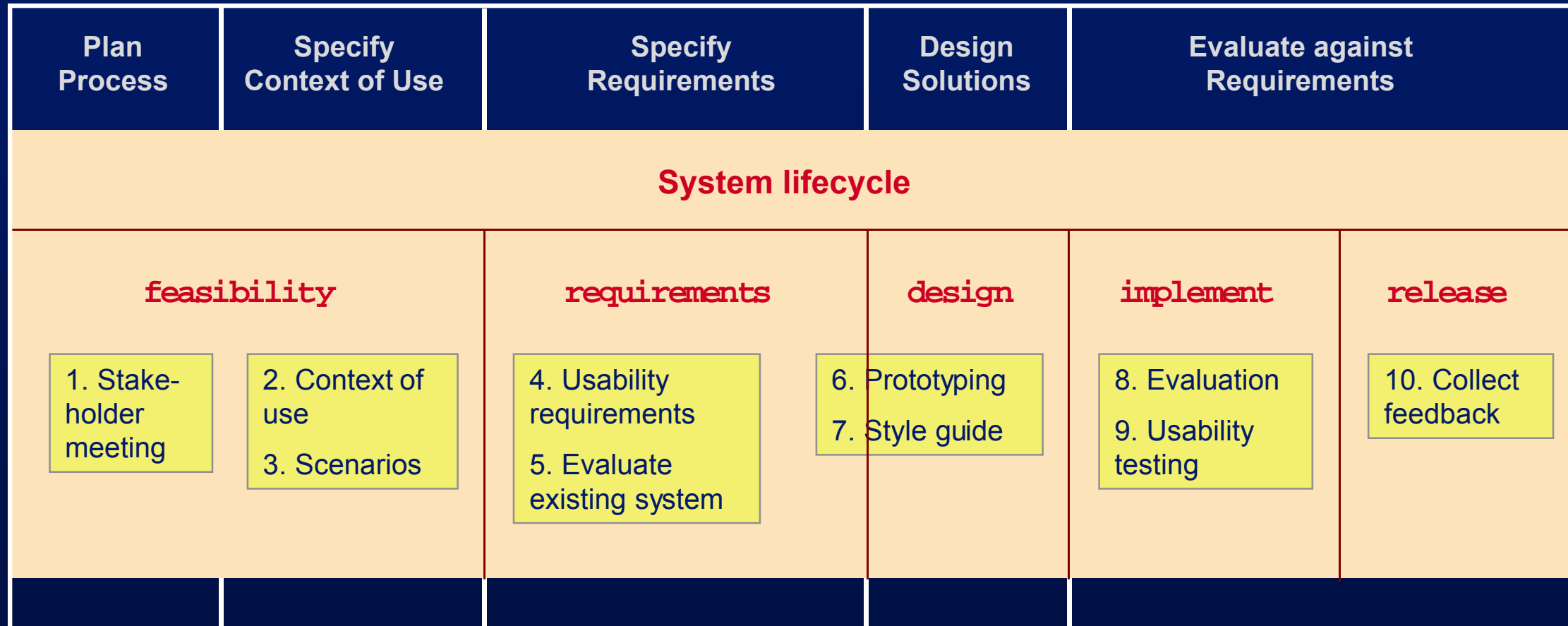
- ◆ **Selected a windows-based application for the trial**
 - ◆ Ground-based mission planning system
 - ◆ Allows the pilot or ground staff to plan the route to be taken
- ◆ **Current development process**
 - ◆ Requirements and design by pilots
 - ◆ No documented process
 - ◆ Implementation by programmers
 - ◆ Software engineering methodology



Human centred design process for interactive systems ISO 13407



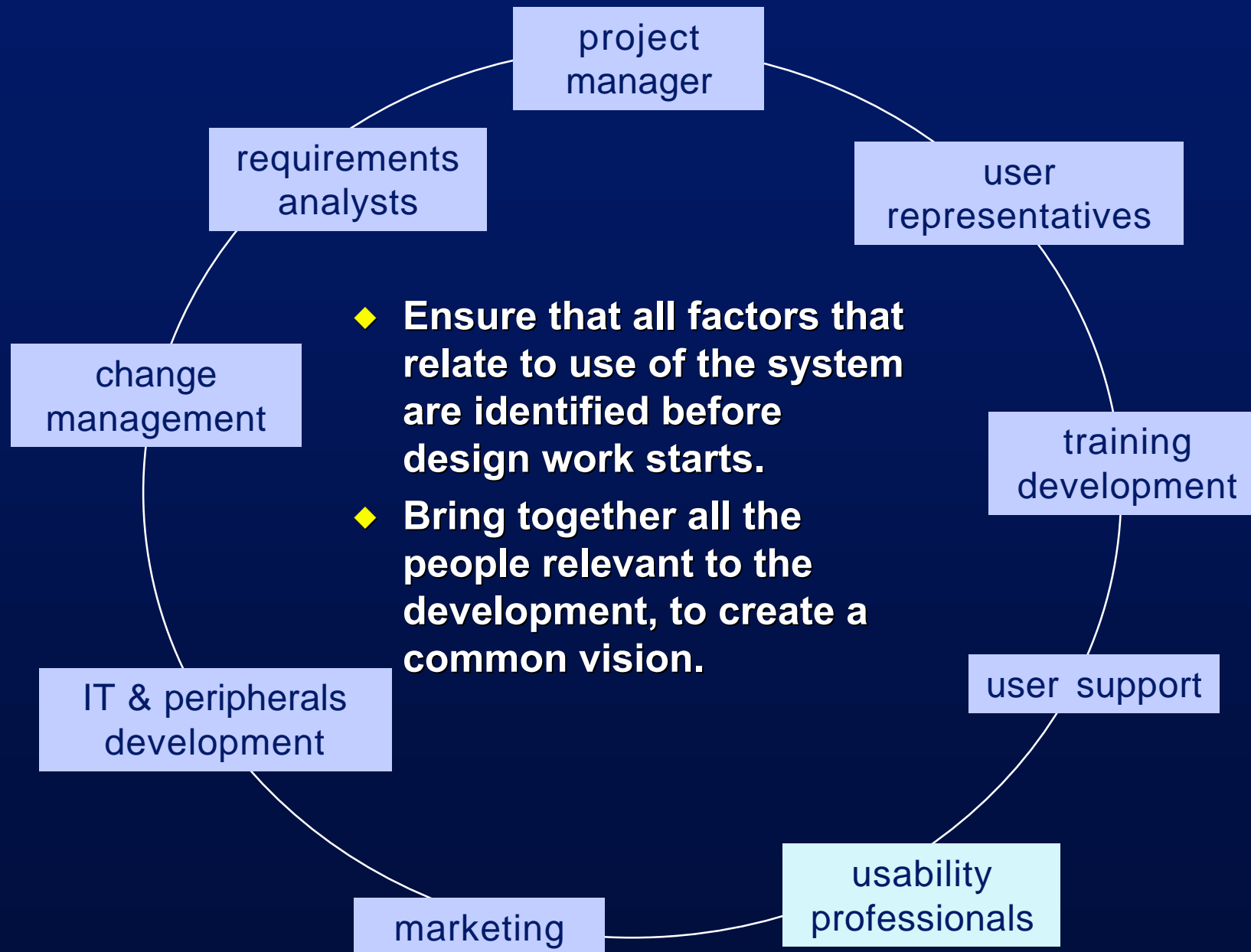
User centred design methods



www.usability.serco.com/trump/ucdmethods

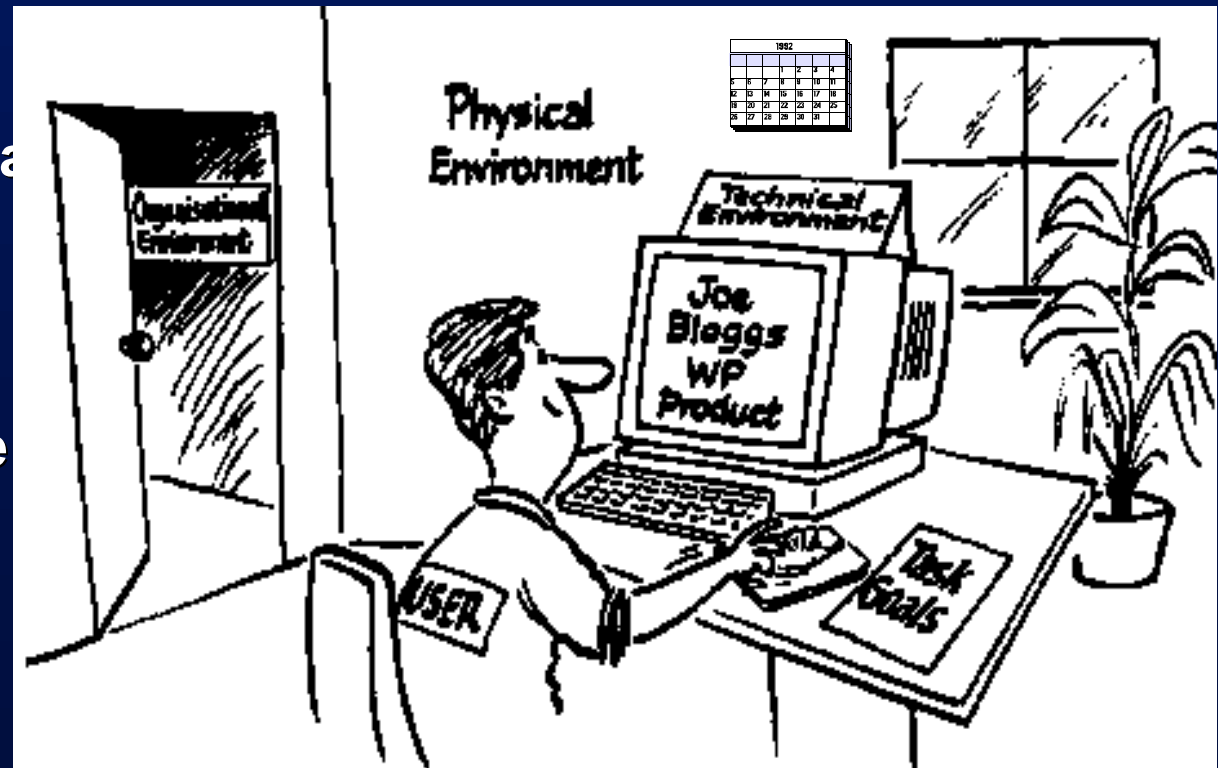


1. Stakeholder meeting



2. Context of Use

- ◆ The usability of a product is affected not only by the features of the product itself but also by its Context of Use
- ◆ Context is the characteristics of:
 - ◆ the users of the product
 - ◆ the tasks they carry out
 - ◆ the technical, organisational and physical environment in which the product is used
 - ◆ the date and time when the product is being used



3. Scenarios

◆ Purpose

- ◆ To provide examples of usage as an input to design, and to provide a basis for subsequent usability testing.
- ◆ Scenarios specify what users do, not how.

Scenario for a mail order enquiry

It is a busy morning with a long queue of telephone calls. John, who only started the job this week, takes a call from Mr Jones. Mr Jones says he still has not received the goods he ordered 3 months ago. Mr Jones does not know his account number, but gives his name and address. John retrieves the account, and checks the status of the order. It shows that the goods were dispatched 7 days ago. He informs Mr Jones that they should arrive shortly. He also notices an error in the post code for the address, which he corrects.



4. Usability Requirements (ISO 9241-11)

◆ Requirements for

- ◆ effectiveness
- ◆ efficiency
- ◆ satisfaction

◆ User performance

- ◆ “all data entry clerks will be able to complete the task with at least 95% accuracy in under 10 minutes”

◆ User satisfaction

- ◆ “the mean score on the SUMI scale will be greater than 50”



5. Evaluate existing system

◆ Purpose

- ◆ To identify usability problems
- ◆ To obtain measures of usability for an earlier version or competitor system.

◆ Benefits

- ◆ Identifies problems to be avoided in the design of the new system.
- ◆ Provides measures of effectiveness, efficiency and satisfaction which can be used as a baseline for the new system.



6. Paper prototyping

◆ Purpose

- ◆ To clarify requirements
- ◆ To enable draft interaction designs and screen designs to be very rapidly simulated and tested.

◆ Benefits

- ◆ Potential usability problems can be detected at a very early stage in the design process before any code has been written.
- ◆ Communication between designers and users is promoted.
- ◆ Paper prototypes are quick to build / refine, thus enabling rapid design iterations.
- ◆ Only minimal resources and materials are required.



7. Style guide

◆ Purpose

To make sure that:

- ◆ style guide(s) are identified as part of usability requirements
- ◆ adhered to during development.

◆ Benefits

- ◆ Style guides embody good practice in interface design.
- ◆ Following a style guide will increase the consistency between screens.
- ◆ Using a style guide can reduce the development time.



8. Evaluate working prototype

◆ Purpose

- ◆ To obtain rapid feedback on the usability of prototypes.

◆ Benefits

- ◆ Potential usability problems can be detected at an early stage before development is complete.

◆ Method

- ◆ A simplified version of usability testing is used.
 - ◆ Only 3-5 users are required
 - ◆ Produce a list of usability problems, categorised by importance



9. Test usability (usability lab)

◆ Purpose

- ◆ To identify usability problems and obtain measures of usability.

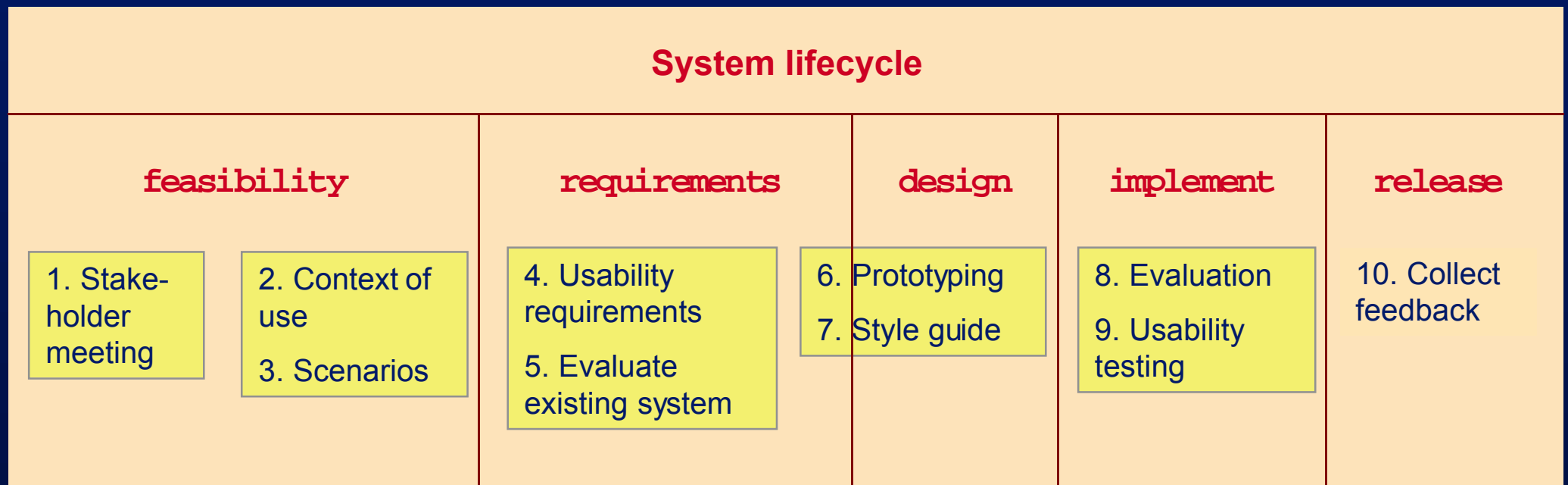
◆ Benefits

- ◆ Major usability problems are identified, including problems related to the specific skills and expectations of the users.
- ◆ User performance
 - ◆ “all data entry clerks will be able to complete the task with at least 95% accuracy in under 10 minutes”
- ◆ User satisfaction
 - ◆ “the mean score on the SUMI scale will be greater than 50”



System lifecycle

System lifecycle



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Trial Application Bottom Line

- ◆ **Positive Feedback from Participants**
- ◆ **A Definite Improvement in the Development Process**
- ◆ **Very Cost Effective and Low Cost**
- ◆ **Mostly Intuitive however tailoring sometimes required**
- ◆ **Expert Guidance needed in few techniques**
- ◆ **LAHAV decided to incorporate TRUMP techniques in it's standard development process**





- **United Kingdom's tax collection department**
- **Employ over 60,000 staff in more than 600 local offices**
- **Partnership with EDS for software development now running for more than 5 years**
- **Challenge is to continue delivering to time, cost and requirement, whilst meeting the needs of increasingly sophisticated customers in our local office network.**



New activities before JADs

- Used context analysis to scope who will use the system, what tasks they will undertake and how the workplace is organised
- Produced task scenarios to cover all the main tasks
- Set a usability requirement for those tasks
- Produced a preparation pack for each function that collated:
 - context analysis, task scenarios, IT requirements and design thoughts
 - so the business share a common view of what they need to deliver from the JAD.



And in JADs

Related design to user and business needs

- Focused on real life task scenarios
- Used different prototyping approaches to design windows
- Captured and managed the issues that were raised
- Made more use of Corporate and Industry usability guidelines
- Tested the paper mock-ups using the task scenarios.



And feedback from the IR and EDS developers was encouraging...

- Task scenarios 2.3
- Test windows by use of prototypes and task scenarios 1.9
- Resolve issues 1.3
- Design windows by use of prototypes 1.2

Scale

+3 better

-3 worse



Usability maturity assessments

- Assessments carried out by Lloyd's Register
- Interviews with IR/EDS staff in January 1999 and February 2000
- Findings from the first assessment gave us a baseline to improve from and met one of our main aims
- Enabled Serco Usability Services to produce suggestions for refined usability techniques to fit within the development lifecycle.



Usability Maturity Model (INUSE)

HCD.1 Ensure HCD content in system strategy

HCD.2 Plan and manage the HCD process

HCD.3 Specify the user and organisational requirements

HCD.4 Understand and specify the context of use

HCD.5 Produce design solutions

HCD.6 Evaluate designs against requirements

HCD.7 Introduce and operate the system

ISO TR 18529: Human-centred lifecycle process descriptions



Headline Conclusions

- ✓ Significant improvement in all areas
- ✓ IR/EDS strong in the “core” areas of context, requirements, design and evaluation
- ✓ Evaluation rated as outstanding
- ✓ Higher assessor confidence in results
- ✓ “A step change in the awareness and practice of human centred design within IR/EDS.

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When to use the techniques

[Maturity assessment](#) will identify the additional skills you need to apply the techniques

A [stakeholder meeting](#) should take place as early as possible.

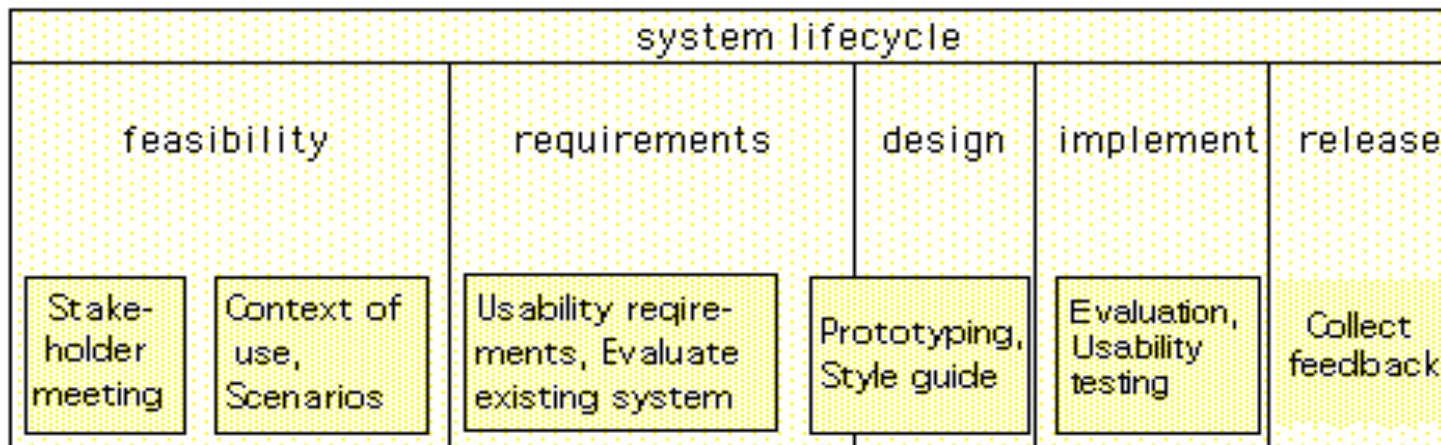
[Context of use](#) and [produce scenarios](#) should take place during feasibility and prior to requirements.

Setting [usability requirements](#) and [evaluating an existing system](#) are part of the requirements process.

[Paper prototyping](#) and a [style guide](#) can be used during requirements and design.

[Evaluation of machine prototypes](#) and final [usability testing](#) takes place during implementation.

It is also important to [collect feedback](#) from users after release to inform any redesign.



TRUMP has improved the quality of products and processes

- ◆ **Successful trials of user centred design methods**
 - ◆ **Methods simple to apply, easily integrated with development process and cost effective**
 - ◆ **Products are more usable**
- ◆ **Incorporating the methods in the development process**
 - ◆ **Many methods will be used by the development teams**
 - ◆ **Need skilled back-up**
- ◆ **Internal culture change has not been a barrier**
 - ◆ **Organisations were convinced by the success of the trials**
 - ◆ **Top-down and bottom-up**

