

Design of Interactive Systems (DIS)



Lecture 3: The Process of human-centred interactive systems design

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Chapter 3

- **Chapter 1:** Designing interactive systems: a fusion of skills
- **Chapter 2:** PACT: a framework for designing interactive systems
- **Chapter 3:** The process of human-centred interactive system design
- Chapter 4: Usability
- **Chapter 5:** Experience Design
- **Chapter 6:** The Home Information Centre (HIC): a case study in designing interactive systems

Process of Human-Centered Interactive System Design

- **Design** is a creative process
- It is about **conscious change and communication** between **designers** and the **people who will use the system**.
- Different design disciplines have **different methods and techniques** for helping with this process
- Different design disciplines have **different constraints: stand alone or fit with legacy system**

Process of Human-Centered Interactive System Design

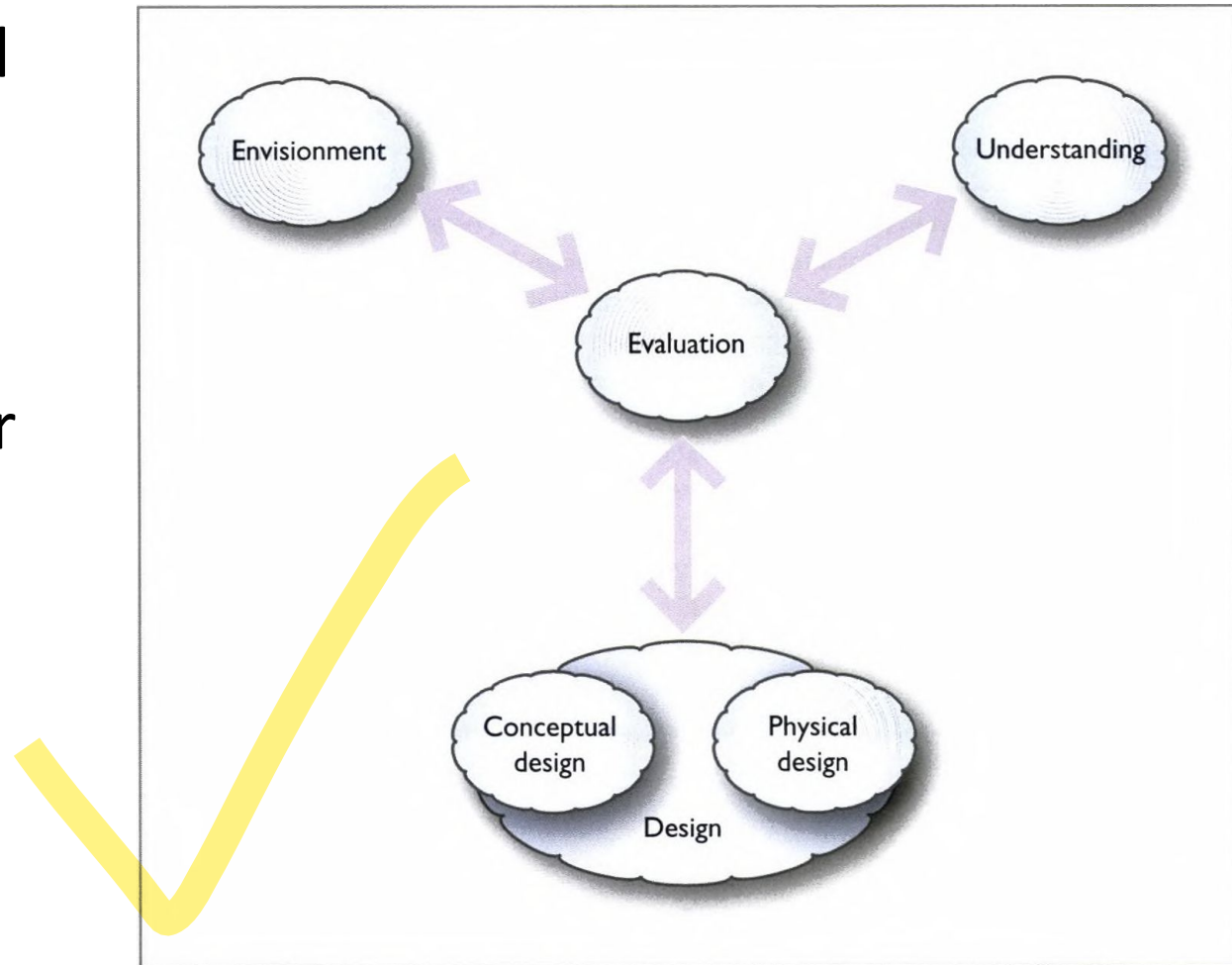
- What is involved in interactive systems design?
- Four processes involved in design:
 - understanding, design, envisionment, evaluation
- Centrality of evaluation in human-centred design
- Scenario-based design approach
- Develop scenarios and personas

Design Process for DIS

- Activities involved in the design process
- “Design has three activities: understand, observe and visualize.”
David Kelley
- Understand: design is messy; understand this
- Observe: observe how your products will be used; design is about users and use
- Visualize: visualize which is the act of deciding what it is

Four Activities in Design Process

- Evaluation is central
- The process can start at any point
- The activities can happen in any order



Overall design process

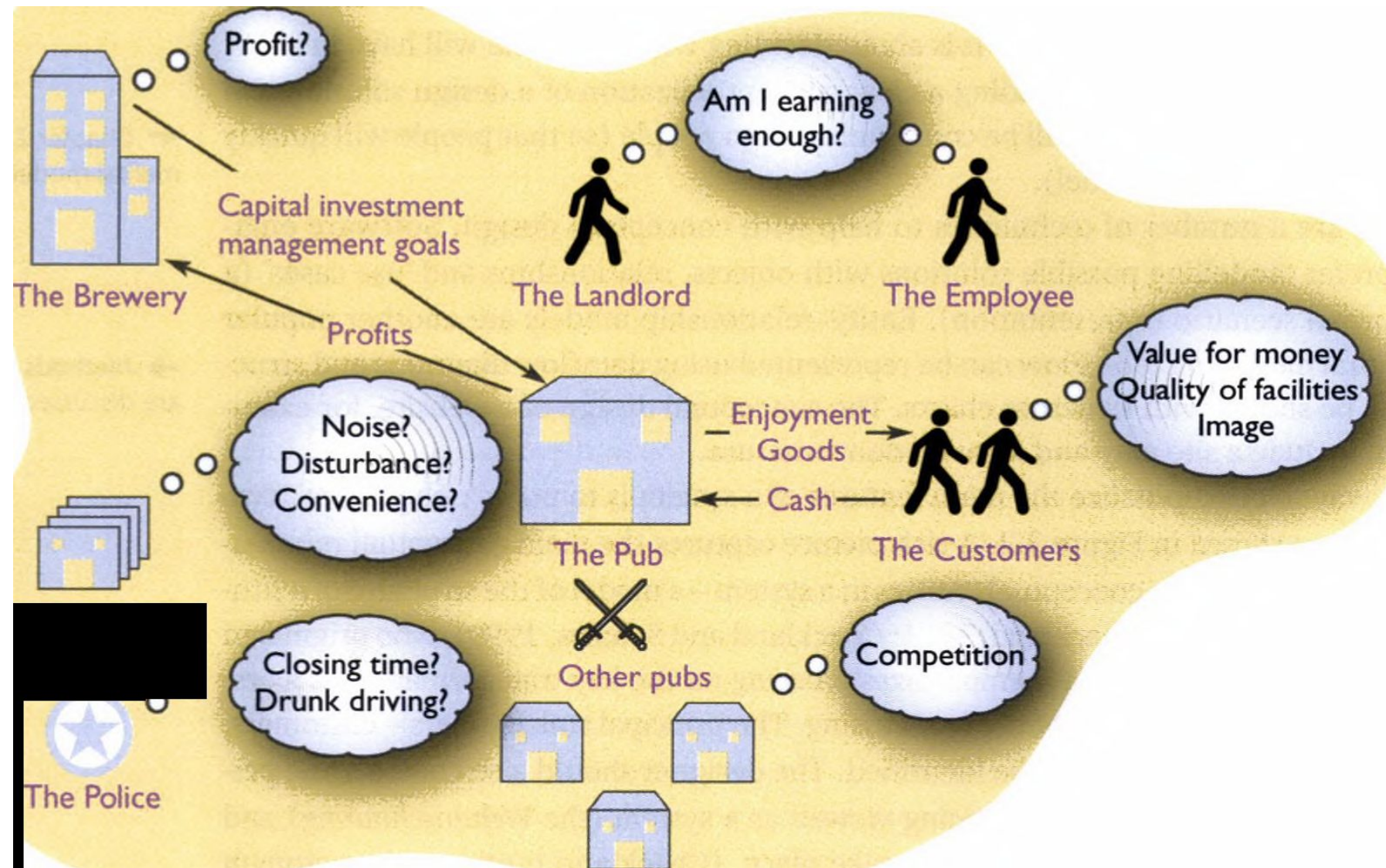
Understanding

- Understanding is concerned with
 - what the system has to do
 - what it has to be like
 - how it has to fit in with other things
- Understanding is requirement of system
- Designers need to research range of people, activities, contexts relevant to the domain
- Requirements are both functional and non-functional

Design

- Design activities concern both conceptual design and physical design
- **Conceptual design** is about designing a system in the abstract, **physical design** is concerned with making things concrete
- Conceptual design: 'Use Cases' and Entry-Relationship models
- The key feature of conceptual design is to keep things abstract - focus on the 'what' rather than the 'how'


Conceptual Design: Rich Pictures



Physical Design

- Physical design is concerned with **how things are going to work** and with **detailing the look and feel of the product.**
- Physical design is about structuring **interactions into logical sequences** and about clarifying and presenting the **allocation of functions** and knowledge between people and devices.
- Physical design is concerned with taking this abstract representation and translating it into **concrete designs.**

Physical Design: Components

- Three components:
 - **operational design:** specifying how everything works and how content is structured and stored
 - **representational design:** fixing on colours, shapes, sizes and information layout.
 - **design of interactions:** allocation of functions to human agency or to technology and with the structuring and sequencing of the interactions.
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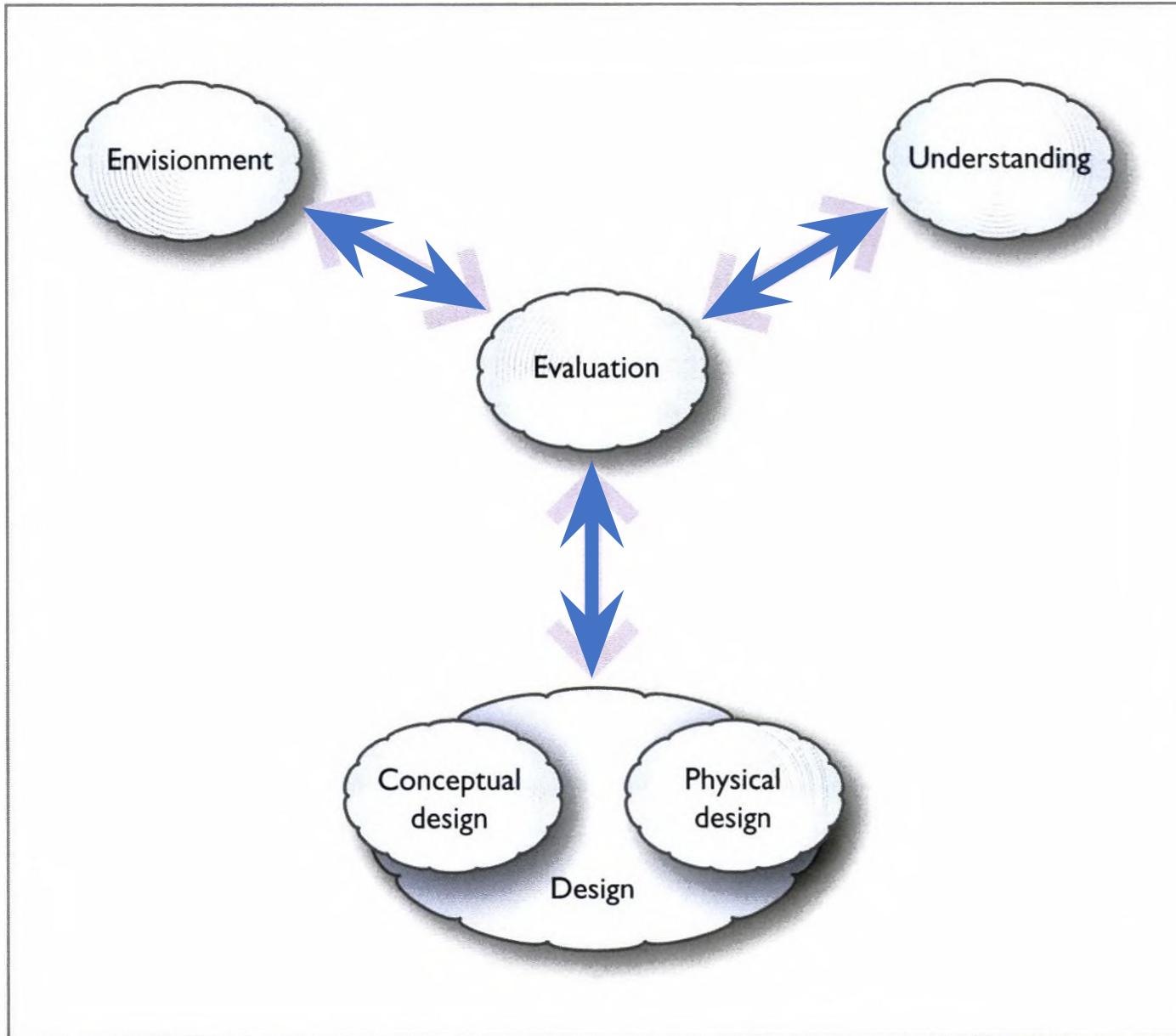
Envisionment

- Designs need to be **visualized** both to help designers clarify their own ideas and to enable people to evaluate them.
- Envisionment is concerned with finding appropriate media in which to render design ideas
- The medium needs to be appropriate for the stage of the process, the audience, the resources available and the questions that the designer is trying to answer.
- i.e. sketches, fully functional prototypes, cardboard mock-ups.

Evaluation

- Evaluation is tightly coupled with envisionment because the nature of the representation used will affect what can be evaluated.
- Evaluation criteria will also depend on who is able to use the representation.
- Sometimes this is simply the designer checking through to make sure something is complete and correct.
- It could be a list of requirements that is sent to a client
- An abstract conceptual model that is discussed with a colleague, or a formal evaluation of a functional prototype by the future system users.

Implementation



Implementation

- Although Figure 3.1 does not include the implementation or production of the design, ultimately things have to be **engineered** and software has to be **written** and **tested**
- The whole system needs to be checked to ensure that **it meets the requirements** until finally the system can be formally 'launched' and signed off as finished
- **Clients may demand extra features** during completion
- Developer needs to ensure the system meets the **specification without any bugs**.

Developing personas and scenarios

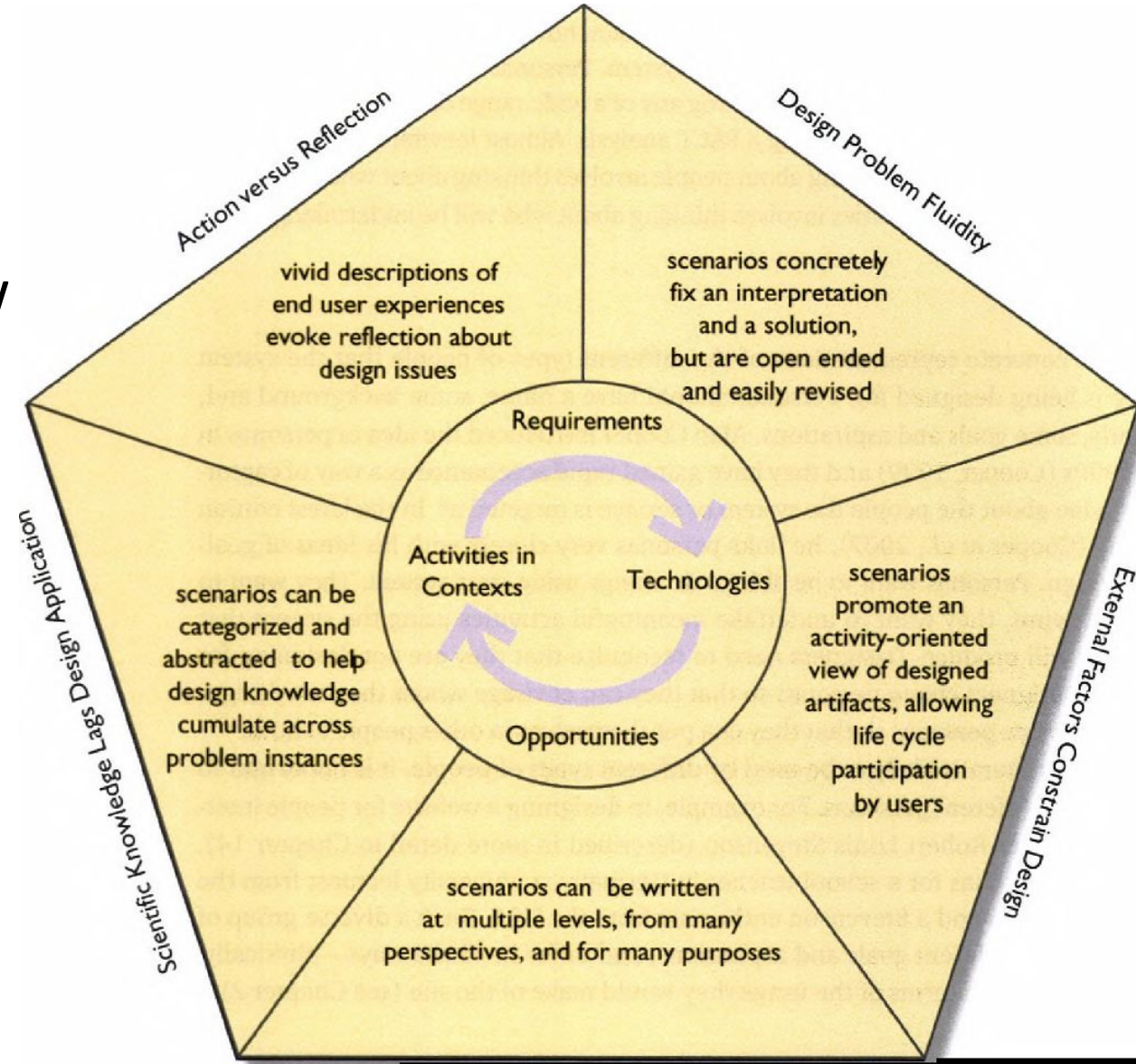
- The people who will use the system are represented by personas:
 1. profiles of the different types, or archetypes,
 2. of people the designer is designing for
- Activities and the contexts in which they will occur are **envisioned** through **scenarios of use**
- Different concrete scenarios can be used to envision how **different technologies could function** to achieve the overall purpose of the system.

Personas

- Personas are concrete representations of the different types of people that the system or service is being designed for
- Personas should have a **name**, some **background** and, importantly, **some goals and aspirations**.
- Personas want to be able to do things using your system
- They want to achieve their aims, they want to undertake meaningful activities using the system
- As any new system is likely to be used by different types of people, it is important to develop several different personas

Scenarios

- Scenarios are **stories about people** undertaking activities in contexts using technologies.
- *Making Use* (2000) illustrates how scenarios are used to deal with the inherent difficulty of doing design.
- He argues that scenarios are effective at dealing with five key problems of design



Using scenarios throughout design

- They are useful in understanding, envisioning, evaluation, and both conceptual and physical design:
- Four different types of scenario are distinguished: **stories, conceptual scenarios, concrete scenarios** and **use cases**.
- Stories are the **real-world experiences** of people.
- Conceptual scenarios are more **abstract descriptions** in which some details are stripped away.
- Concrete scenarios are generated from abstract scenarios by adding **specific design decisions** and **technologies**.
- **After completion of concrete scenarios**, they can be represented as use cases. They describe interaction between people and devices.

Using scenarios throughout design

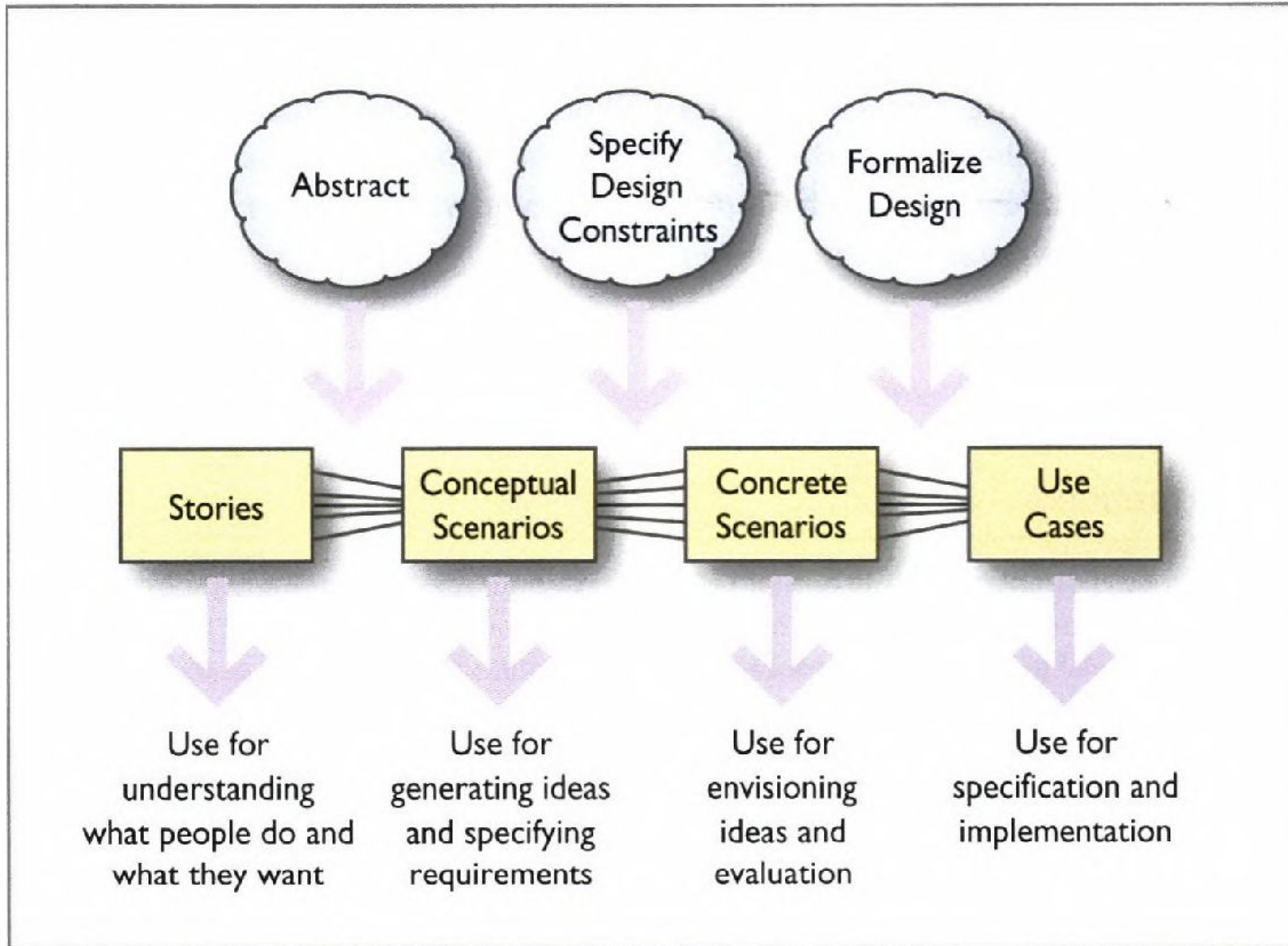


Figure 3.10 Scenarios throughout design

Stories

- Stories are the real-world experiences, ideas and knowledge of people
- These may be captured in any form and comprise small snippets of activities and the contexts
- This could include videos of people engaged in an activity, diary entries, photographs, documents, the results of observations and interviews and so on.

Conceptual scenarios

- Conceptual scenarios are more abstract than stories
- Much of the context is stripped away during the process of **abstraction** and similar stories are combined.
- Conceptual scenarios are particularly useful for **generating design ideas** and for ***understanding the requirements*** of the system.
- The process of abstraction is one of classification and aggregation: moving from the details of specific people undertaking specific activities in a specific context using a particular piece of technology to a **more general description** that still manages to catch the essence of the activity.
- Aggregation is the process of treating a whole thing as a single entity
- Classification is the process of recognizing that things can be collected together
- The most abstract level is to treat everything simply as a 'thing' and every activity as 'doing something'

Concrete scenarios

- Each conceptual scenario may generate lots of concrete scenarios.
- Concrete scenarios also begin to dictate a particular **interface design** and a particular **allocation of functions** between people and devices
- Concrete scenarios are particularly useful for prototyping and envisioning design ideas and for evaluation
- The more specific the scenario is about some aspects, the more concrete it is.

Use cases

- A use case describes the interaction between people (or other 'actors') and devices
- It is a case of how the system is used and hence needs to describe what people do and what the system does.
- The specification of use cases both informs and is informed by the task/ function allocation process.
- A set of use cases can be produced which specifies the complete functionality of the system and the interactions

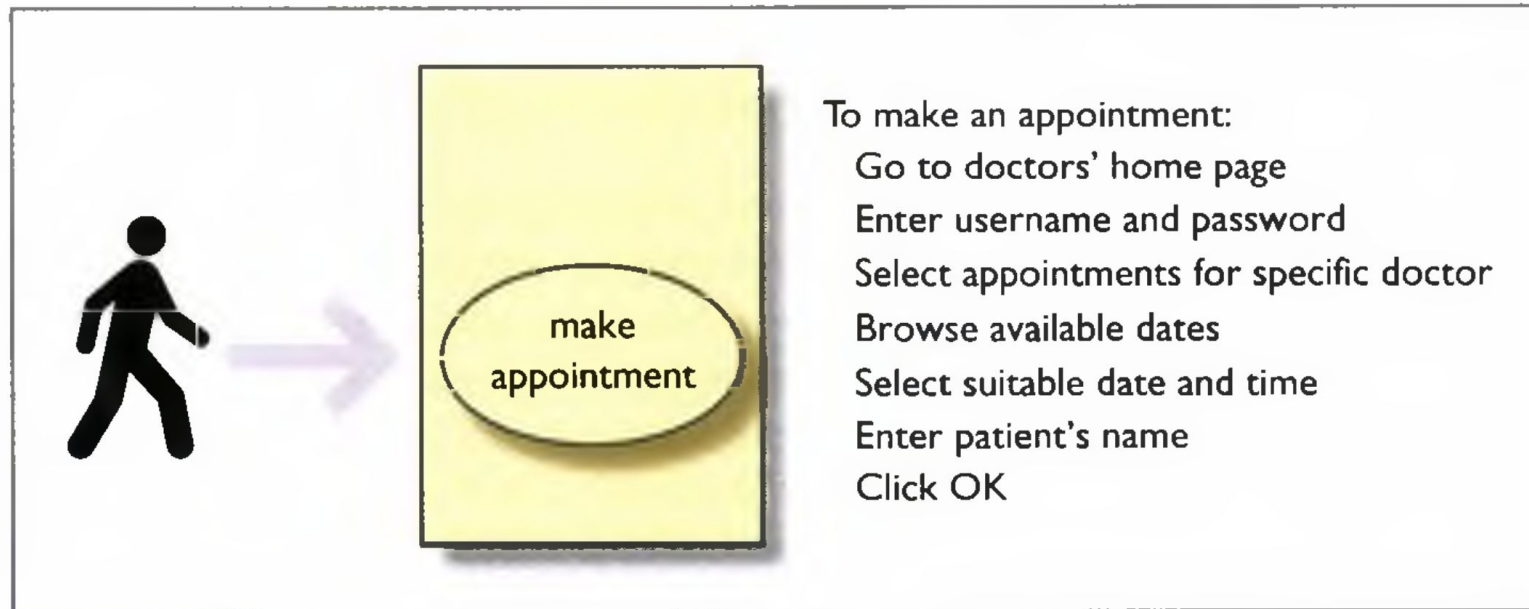


Figure 3.11 Use case for booking an appointment

A scenario-based design method

- The use of the different types of scenario throughout design can be formalized into a scenario-based design method.

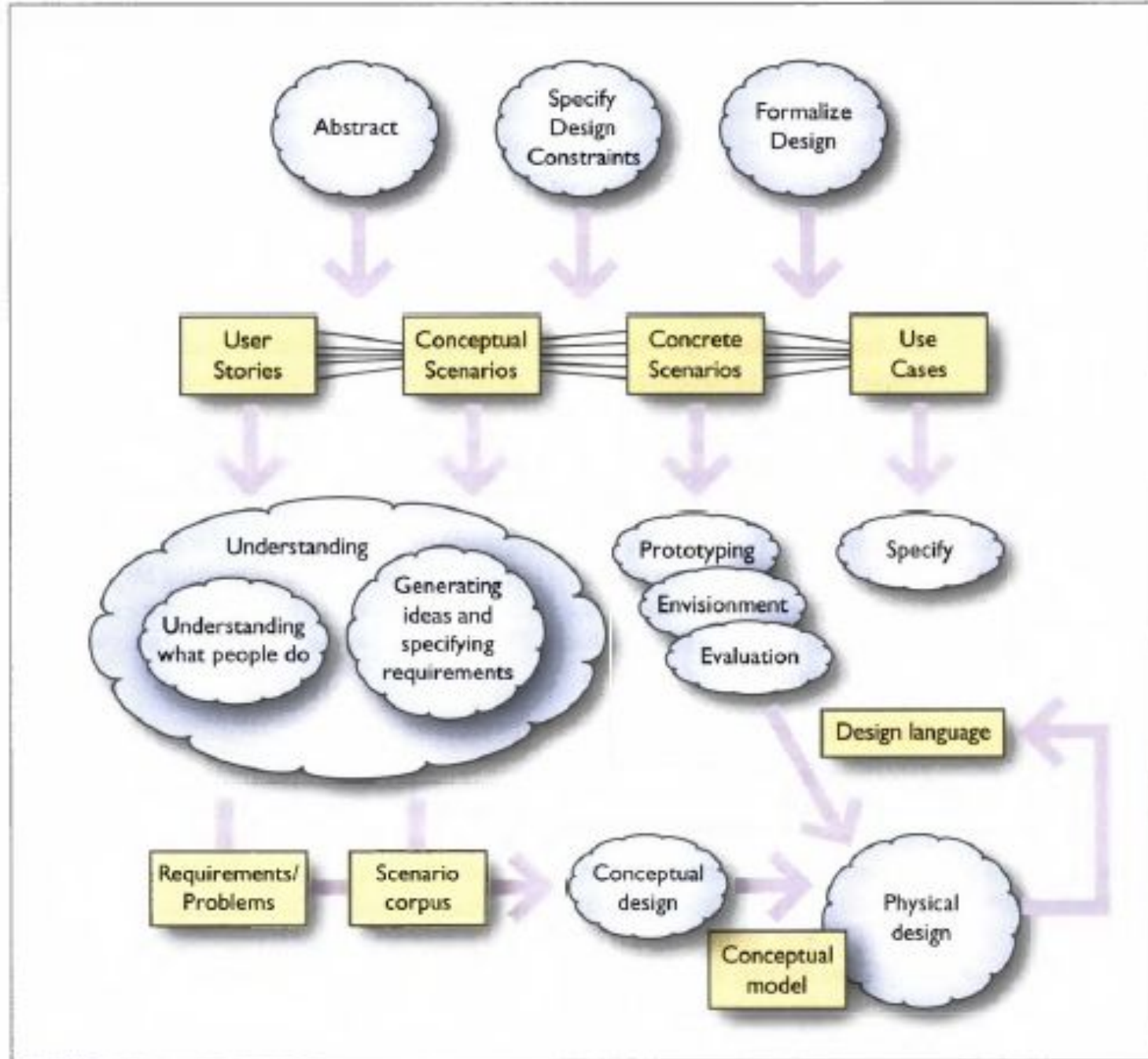


Figure 3.12 Overall scenario-based design method

Class Activity

Consider a vending machine and observe people using it. Write down their stories. Produce a conceptual scenario from the stories.