INTERACCION HUMANO-MAQUINA

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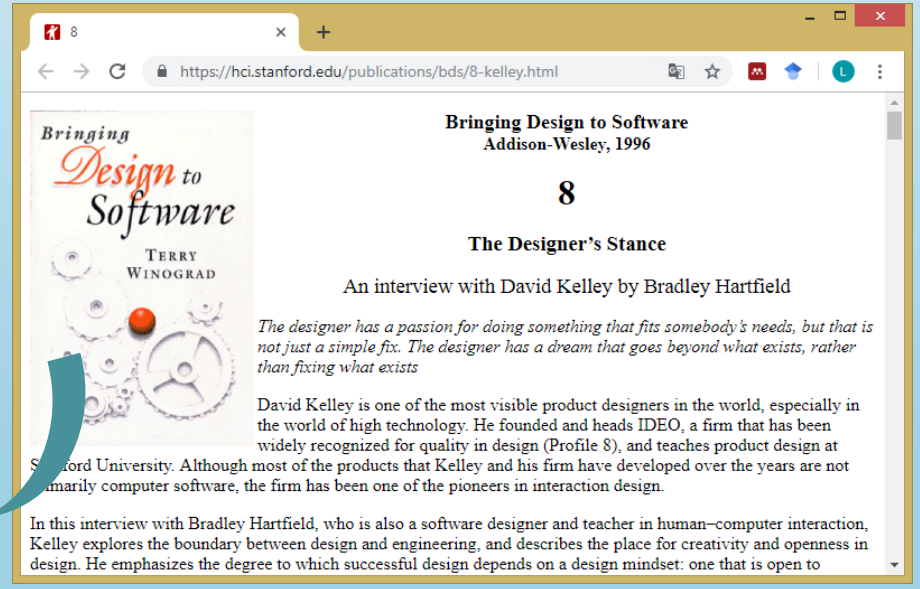
CAPITULO 4

PROCESO DE DISEÑO DE SISTEMAS INTERACTIVOS CENTRADOS EN EL HUMANO

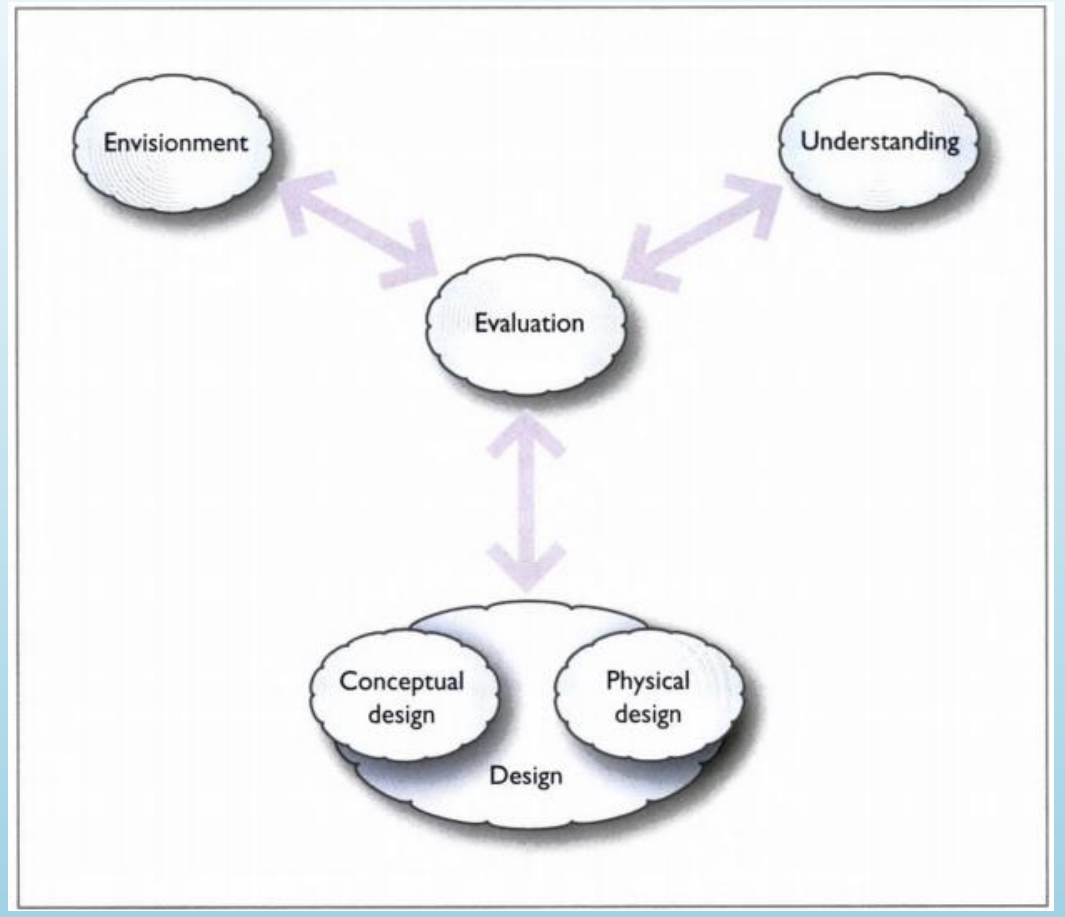
- Design is a creative process concerned with bringing about something new. It is a social activity with social consequences. It is about conscious change and communication between designers and the people who will use the system.
- Different design disciplines have different methods and techniques for helping with this process.

> Remember, design is messy; designers try to understand this mess. They observe how their products will be used; design is about users and use. They visualize which is the act of deciding what it is.
>
> Kelley and Hartfield (1996), p. 156



Introduction

- The overall design process is represented in terms of four activities illustrated in the figure.
- The key features of this representation are as follows:
  - Evaluation is central to designing interactive systems. Everything gets evaluated at every step of the process.
  - The process can start at any point - sometimes there is a conceptual design in place, sometimes we start with a prototype, sometimes we start with understanding.
  - The activities can happen in any order, for example understanding might be evaluated and a prototype built and evaluated and some aspect of a physical design might then be identified.



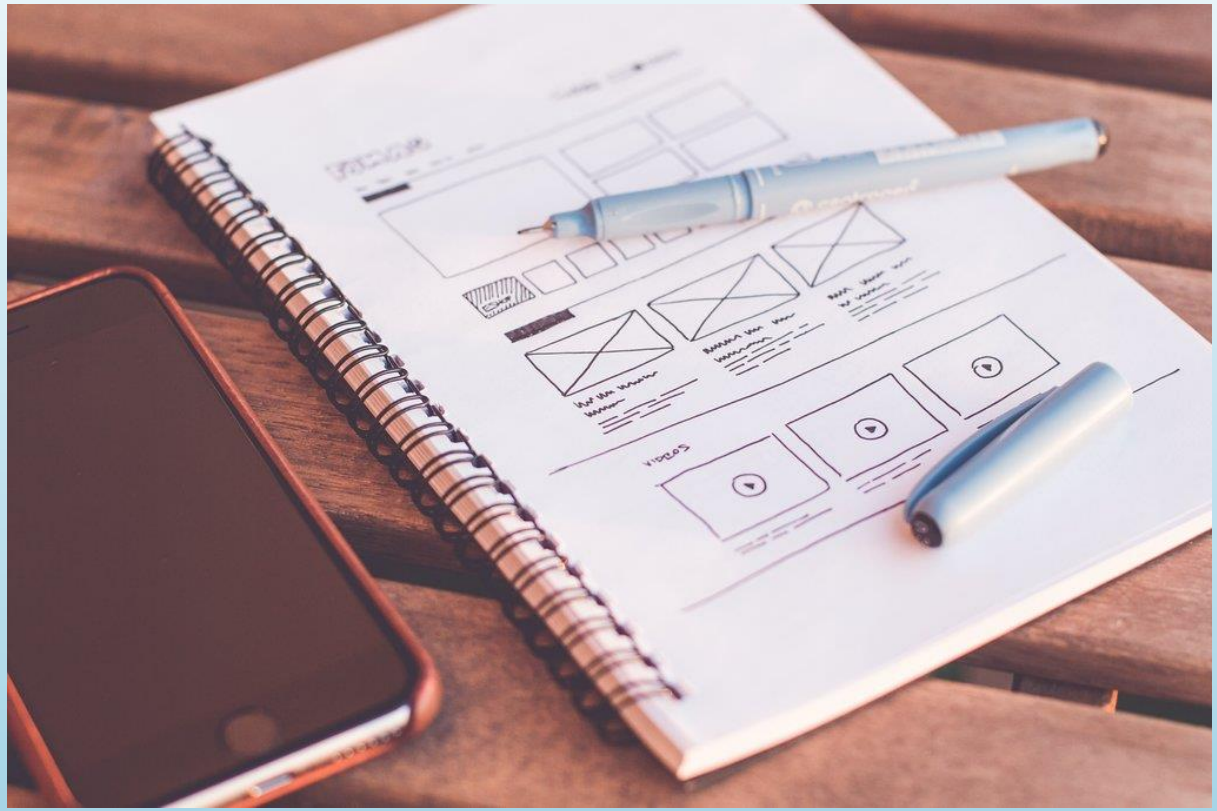
Introduction

UNDERSTANDING

OVERALL DESIGN PROCESS

Understanding

- Understanding is concerned with what the system has to do, what it has to be like and how it has to fit in with other things: with the requirements of the product, system or service.
- Designers need to research the range of people, activities and contexts relevant to the domain they are investigating so that they can understand the requirements of the system they are developing.
- They need to understand the opportunities and constraints provided by technologies.



- There are both functional and non-functional requirements to consider.
- Functional requirements are concerned with what the system should be able to do and with the functional constraints of a system.
- It is important for the designer to think about the whole interaction experience in an abstract way.
- Deciding who does what, when something should be displayed or the sequence in which actions are undertaken should come later in the design process.

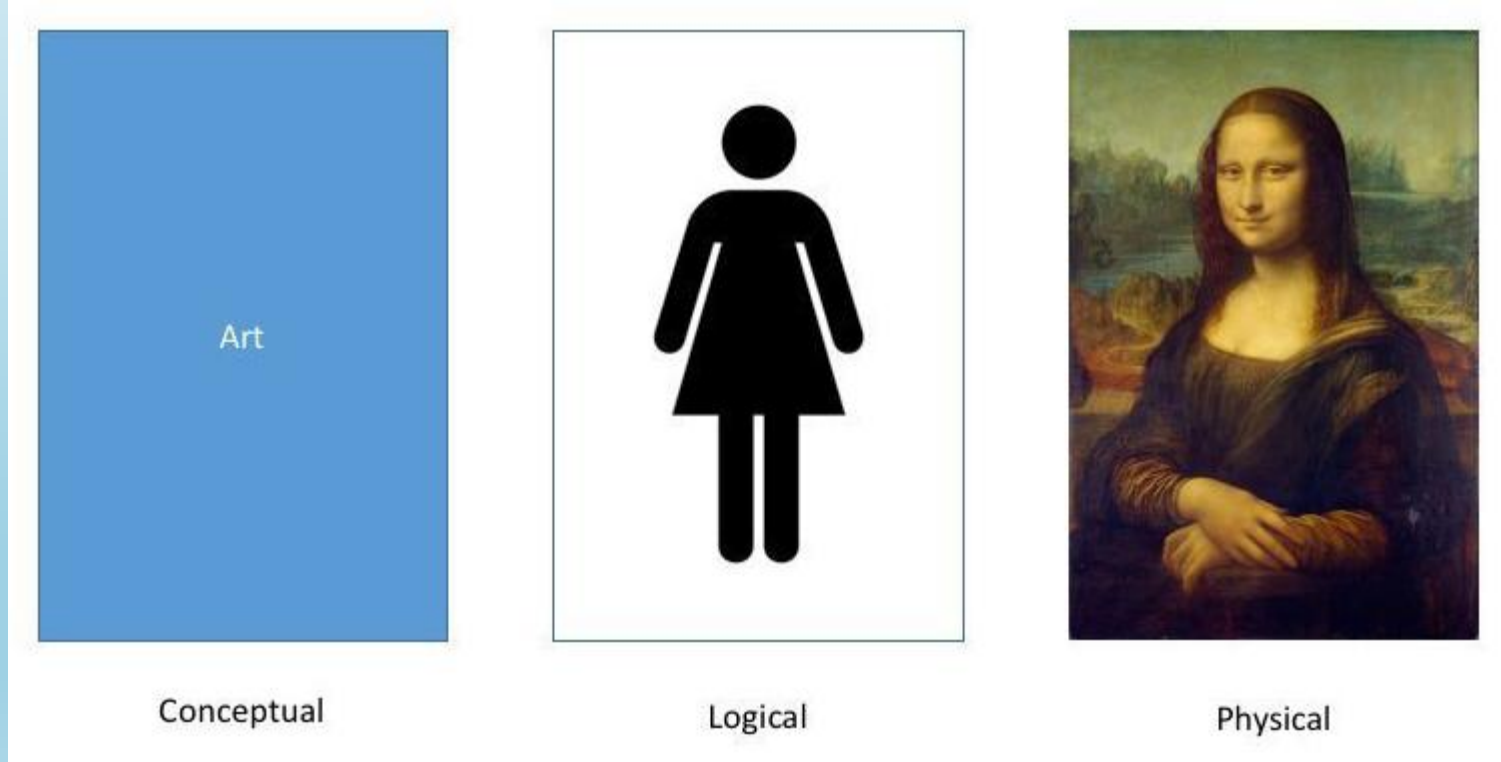
Understanding

- Requirements are generated through discussions and interactions with people who will use or be affected by the proposed system - the stakeholders.
- Requirements are also generated through observations of existing systems, research into similar systems, what people do now and what they would like to do.
- Requirements can be generated through working with people in focus groups, design workshops and so on, where different scenarios can be considered.
- The aim is to collect and analyze the stories people have to tell. Requirements are essentially about understanding.

UNDERSTANDING

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.

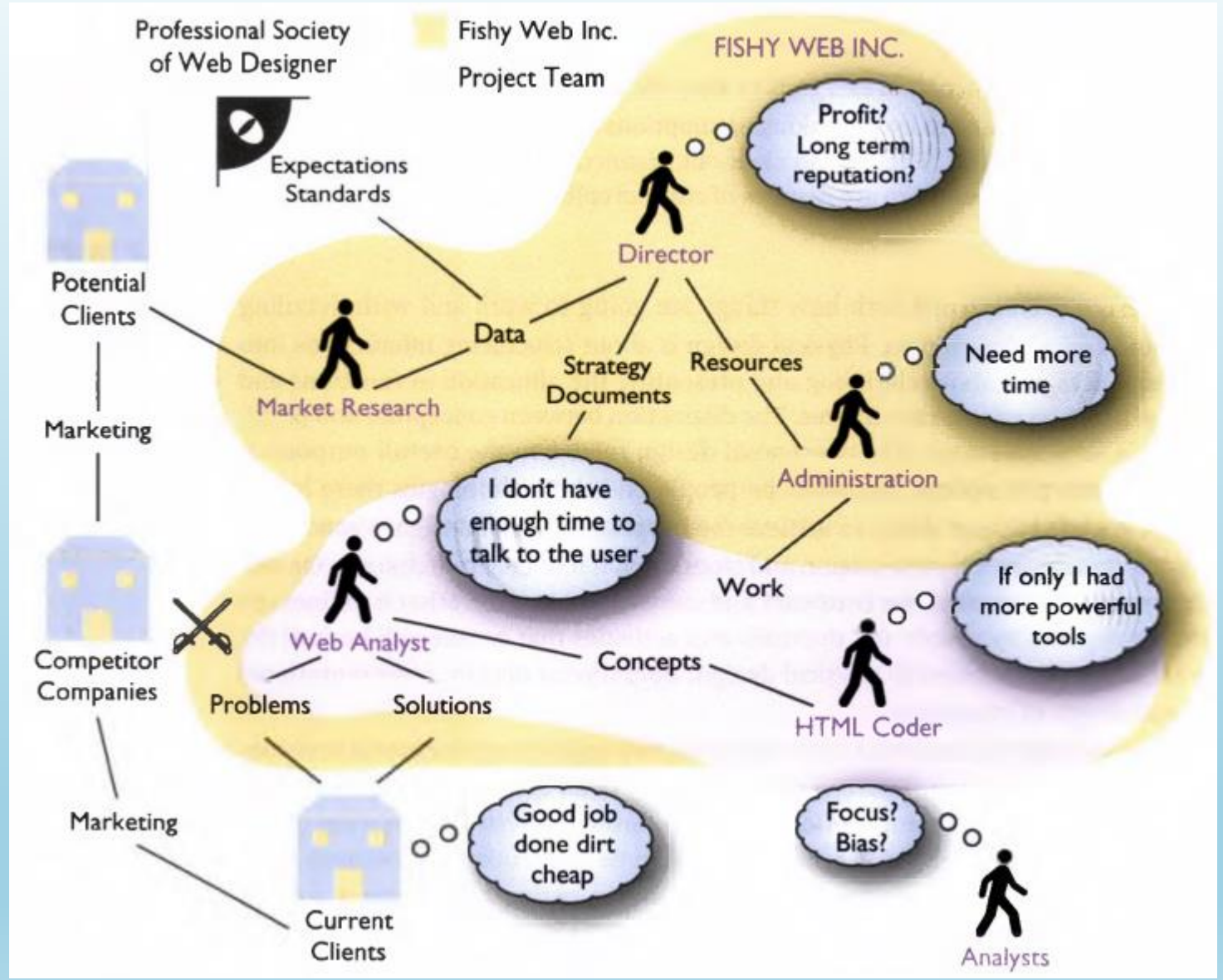


CONCEPTUAL DESIGN

- Conceptual design is about considering what information and functions are needed for the system to achieve its purpose.
  - It is about deciding what someone will have to know to use the system.
  - It is about finding a clear conceptualization of a design solution and how that conceptualization will be communicated to people (so that people will quickly develop a clear mental model).
- There are a number of techniques to help with conceptual design.
  - Software engineers prefer modelling possible solutions with objects, relationships and ‘use cases’
  - Entity-relationship models are another popular conceptual modelling tool.
  - Flow can be represented using dataflow diagrams and structure can be shown with structure charts.
- The conceptual design of a website, for example, will include a site map and a navigation structure

- One way to conceptualize the main features of a system is to use a ‘rich picture’.
- A rich picture captures the main conceptual relationships between the main conceptual entities in a system - a model of the structure of a situation.

CONCEPTUAL DESIGN

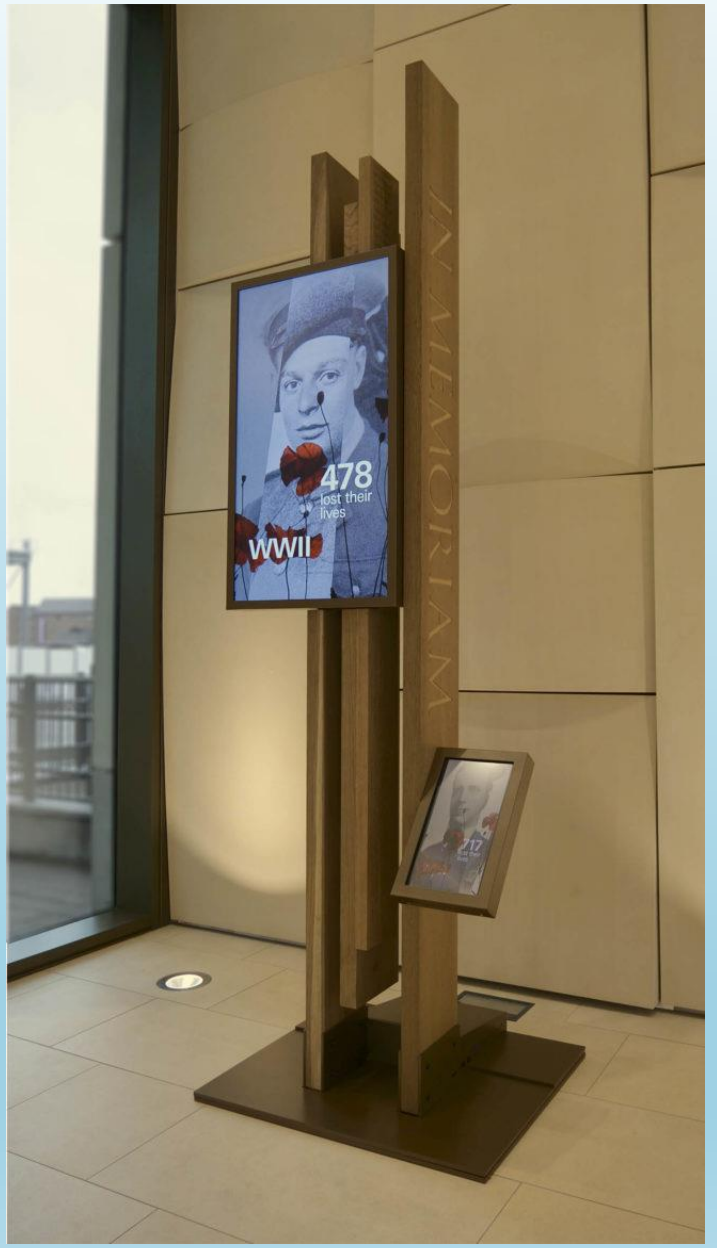


CONCEPTUAL DESIGN

- The key feature of conceptual design is to keep things abstract - focus on the ‘what’ rather than the ‘how’ - and to avoid making assumptions about how functions and information will be distributed.
- There is no clear-cut distinction between conceptual and physical design, but rather there are degrees of conceptuality

PHYSICAL DESIGN

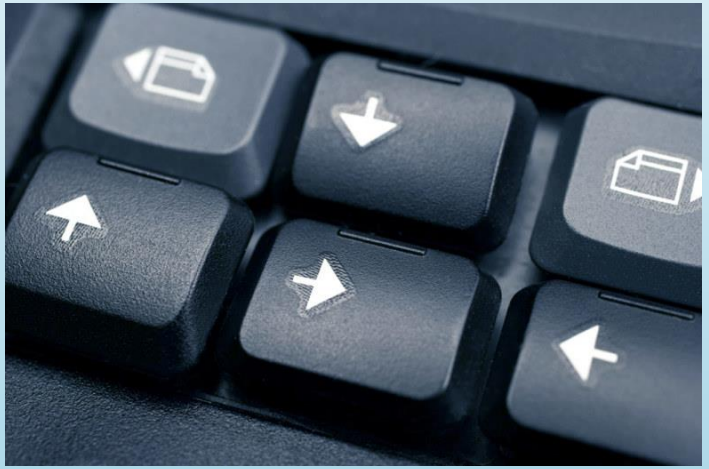
- Physical design is concerned with how things are going to work and with detailing the look and feel of the product.
- Physical design is about structuring interactions into logical sequences and about clarifying and presenting the allocation of functions and knowledge between people and devices.

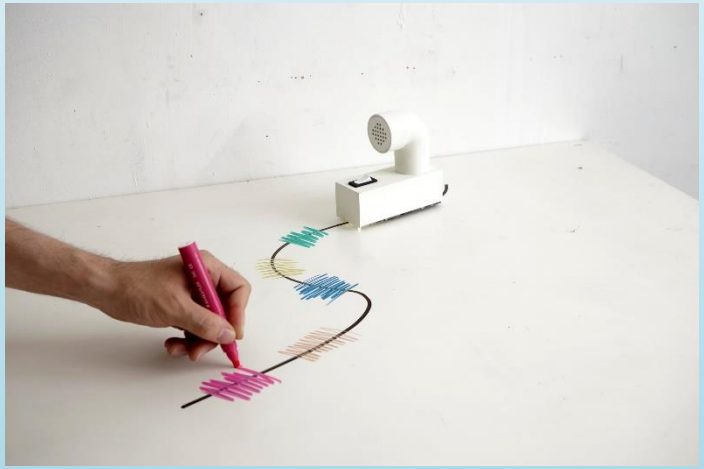


PHYSICAL DESIGN

- The distinction between conceptual and physical design is very important.
  - The conceptual design relates to the overall purpose of the whole interactive system. Between the people and the technologies there has to be enough knowledge and ability to achieve the purpose.
  - Physical design is concerned with taking this abstract representation and translating it into concrete designs. On one side this means requirements for hardware and software and on the other it defines the knowledge required by people and the tasks and activities that people will have to do.

- There are three components to physical design: operational design, representational design and design of interactions.





PHYSICAL DESIGN

OPERATIONAL DESIGN

- Operational design is concerned with specifying how everything works and how content is structured and stored. Taking a functional view of an activity means focusing on processes and on the movement, or flow, of things through a system.
- Events are occurrences that cause, or trigger, some other functions to be undertaken. Sometimes these arise from outside the system under consideration and sometimes they arise as a result of doing something else.

REPRESENTATIONAL DESIGN

- Representational design is concerned with fixing on colours, shapes, sizes and information layout. It is concerned with style and aesthetics and is particularly important for issues such as the attitudes and feelings of people, but also for the efficient retrieval of information.
- Style concerns the overall ‘look and feel’ of the system. Does it appear old and ‘clunky’ or is it slick, smooth and modern? What mood and feelings does the design engender?

INTERACTION DESIGN

- Interaction design, in this context, is concerned with the allocation of functions to human agency or to technology and with the structuring and sequencing of the interactions.
- Allocation of functions has a significant impact on how easy and enjoyable a system is to use.
- Designers create tasks for people by the way they allocate functions. For example, consider the activity of making a phone call. Conceptually speaking, certain functions are necessary: indicate a desire to make a phone call, connect to the network, enter the phone number, make connection.

ENVISIONMENT

OVERALL DESIGN PROCESS

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.

ENVISIONMENT

- There are many techniques for envisionment, but they include any way in which abstract ideas can be brought to life.
  - Sketches ‘on the back of an envelope’, fully functioning prototypes and cardboard mock-ups are just some of the methods used.
  - Scenarios, sometimes represented in pictorial form as storyboards, are an essential part of prototyping and envisionment.
- They provide a way of working through a design idea so that the key issues stand out.

EVALUATION

OVERALL DESIGN PROCESS

- Evaluation is tightly coupled with envisionment because the nature of the representation used will affect what can be evaluated. The evaluation criteria will also depend on who is able to use the representation.
- Any of the other design activities will be followed by an evaluation. Sometimes this is simply the designer checking through to make sure something is complete and correct. It could be a list of requirements or a high-level design brief 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.

EVALUATION

- Techniques for evaluation are many and various, depending once again on the circumstances. Expressing the design ideas in terms of a concrete scenario that people have to work their way through can be very effective.
- The important thing to keep in mind is that the technique used must be appropriate for the nature of the representation, the questions being asked and the people involved in the evaluation.

IMPLEMENTATION

OVERALL DESIGN PROCESS

- Ultimately things have to be engineered and software has to be written and tested. Databases have to be designed and populated and programs have to be validated.
- 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 will often want extra features when they see a system nearing completion, but these will have to be costed and paid for. On the other hand, the developers need to ensure that their system really does meet the specification and does not contain any ‘bugs’.

IMPLEMENTATION

- Over the past few years there has been a move away from large software engineering approaches to the development of interactive systems towards 'agile' development methods.
- These are designed to produce effective systems of high quality that are fit for purpose, but without the huge overhead associated with the planning and documentation of a large IT (information technology) project.

IMPLEMENTATION

- There are a number of competing methods, but probably the best known comes from DSDM, a not-for-profit consortium of software development companies. Their system, called Atern, is fully documented, showing how software can be developed in small teams.
- There is still plenty of debate about how well these methods, such as extreme programming, fit in with human-centred approaches, but many of the methods do promote participation between developers and stakeholders. In particular, Obendorf and Finck (2008) describe a method bringing together agile methods and scenario-based design.

IMPLEMENTATION

- The Dynamic Systems Development Method (DSDM) is an agile framework that addresses the entire project lifecycle and its impact on the business.
- Like the broader agile philosophy, DSDM is an iterative approach to software development, and this framework explicitly states “any project must be aligned to clearly defined strategic goals and focus upon early deliver of real benefits to the business.”
- The framework is built on four principles: feasibility and business study, functional model and prototype iteration, design and build iteration, and implementation.

IMPLEMENTATION

- Atern is a vendor-independent approach that recognises that more projects fail because of people problems than technology.
- Atern's focus is on helping people to work effectively together to achieve the business goals.
- Atern is also independent of tools and techniques enabling it to be used in any business and technical environment without tying the business to a particular vendor.

IMPLEMENTATION

- There are eight principles underpinning DSDM Atern. These principles direct the team in the attitude they must take and the mindset they must adopt to deliver consistently.
  - Focus on the business need
  - Deliver on time
  - Collaborate
  - Never compromise quality
  - Build incrementally from firm foundations
  - Develop iteratively
  - Communicate continuously and clearly
  - Demonstrate control

IMPLEMENTATION