Human-Computer Interaction

Week 1 Lecture 1D

Requirements in HCI

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Requirements in HCI

Gathering requirements for an interactive computer system is a process that can last for the whole duration of developing that system.

Think of the requirements gathering process as a dialogue between the client and the interaction designer.

The process of gathering requirements in HCI is similar to that in other fields of engineering, but there can be differences in the emphasis, the timing and the way the dialogue between designer and client is conducted.

Why is the HCI design process a dialogue?

The client (and the target users) should be experts in the application that the system will support (desktop software for doctors, software to manage students' marks and grades, …).

The HCI designer should be an expert in how to use a wide range of information technologies. The HCI designer should also be an expert in "design thinking" so that the system that is implemented actually solves the right problem.

Adding your own ideas to the design

There will be a balance between the client's ideas and your ideas, ranging from

- The client has very fixed ideas about what they want and you work to their instructions

to

- The client knows broadly what they want and relies on your design expertise and ideas.

Hypothetical: Building a bridge vs building an interactive system

Bridge:

Requirements: width and height of the river, type of soil on each side, numbers of cars per hour, data on cross-winds, aesthetics.

Dialogue: designer produces a set of 3D models and ideas on aesthetics

Decisions are made and the bridge is built

Hypothetical: Building a bridge vs building an interactive system

Interactive system to manage a child-care facility:

Requirements: enrolment, child check-in/check-out, security, audit, invoicing and payment

Dialogue: what enrolment data, how is it validated, how does it handle split families, what are the privacy issues, staff or self check-in/out, how many levels of security are needed, does the system need to manage communication between the facility and the families?

Example of prototyping to establish requirements: touch-screen content and layout for check-in/check-out.

HCI design: lots of iteration over requirements

Iteration to let the HCI designer reflect back to the client what the designer thought the client was asking for.

Iteration to let the HCI designer explore additional features that he or she thinks should be included (based on his/her previous experience)

Iteration to let the client change their mind or correct features that mis-interpret the design brief.

Compare HCI design and software engineering

Software engineering:

Emphasis on getting the code correct so that bugs don't need to be found and fixed later
[Spiral model of software development (Boehm 1988)]

HCI design:

Emphasis on getting the requirements right then coding them
[Iteration over prototypes to settle on requirements]

Boehm, Barry. 1988. "A Spiral Model of Software Development and Enhancement." *Computer* 21 (5):61-72

Requirements exercise

Give surgeons a way to control the display of their patients' CT and MRI scans during the operation using gestures (so that their hands stay sterile). What will you do to gather requirements?

Design Thinking

"Engineers … are trained to solve problems. Designers are trained to discover the real problems"

"Good designers never start by trying to solve the problems given to them; they start by trying to understand what the real issues are"

Norman, D (2013) The Design of Everyday Things, p218

Requirements in HCI

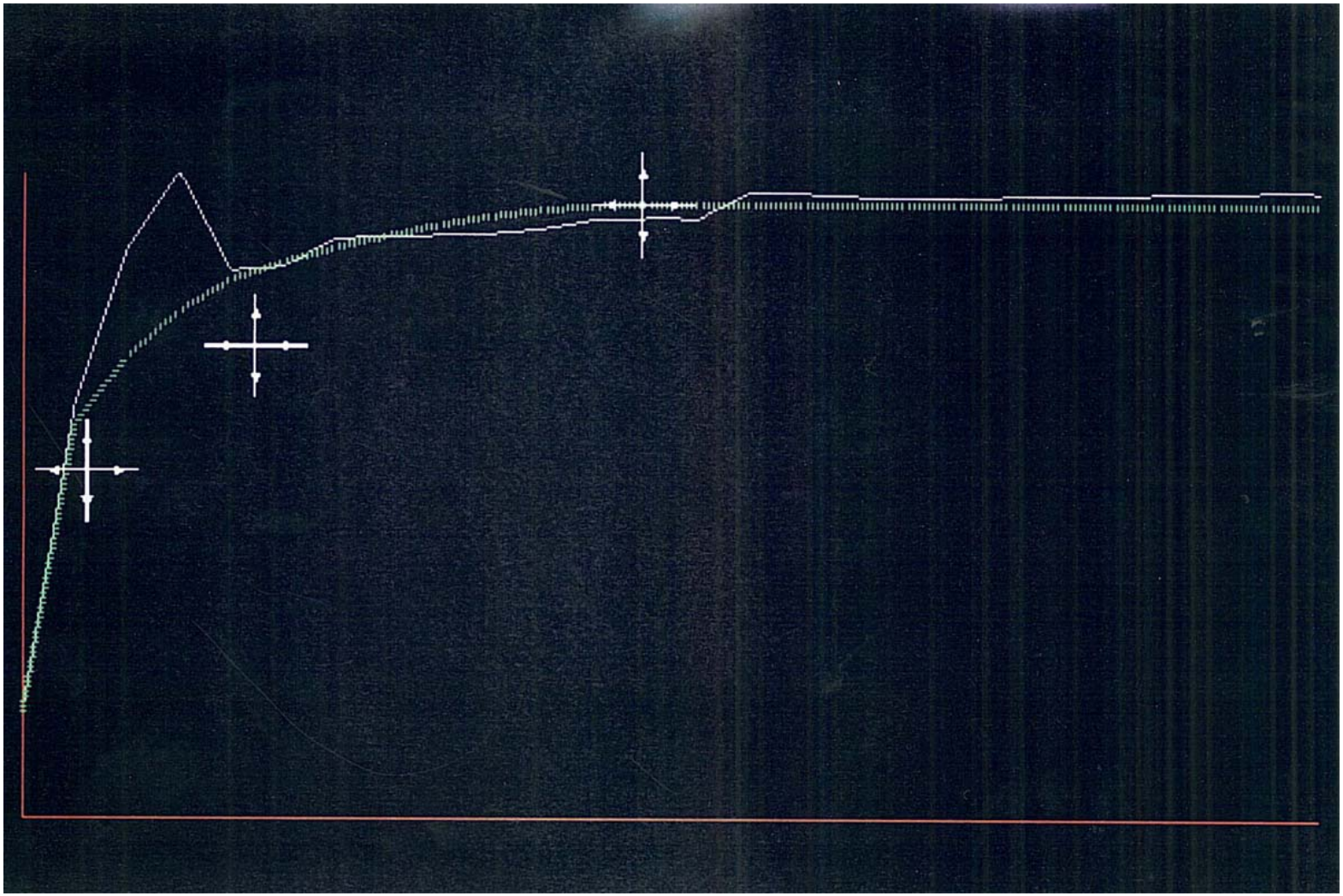
- Requirements emerge or change during the design and early implementation
- The scope and scale of a new system can change rapidly as the system is developed
- Knowledge about the application tasks is not always explicit
- Interactive systems often need to support different types of users (occasional vs frequent; novice vs expert; operational use, management use, auditing use)

Gathering requirements

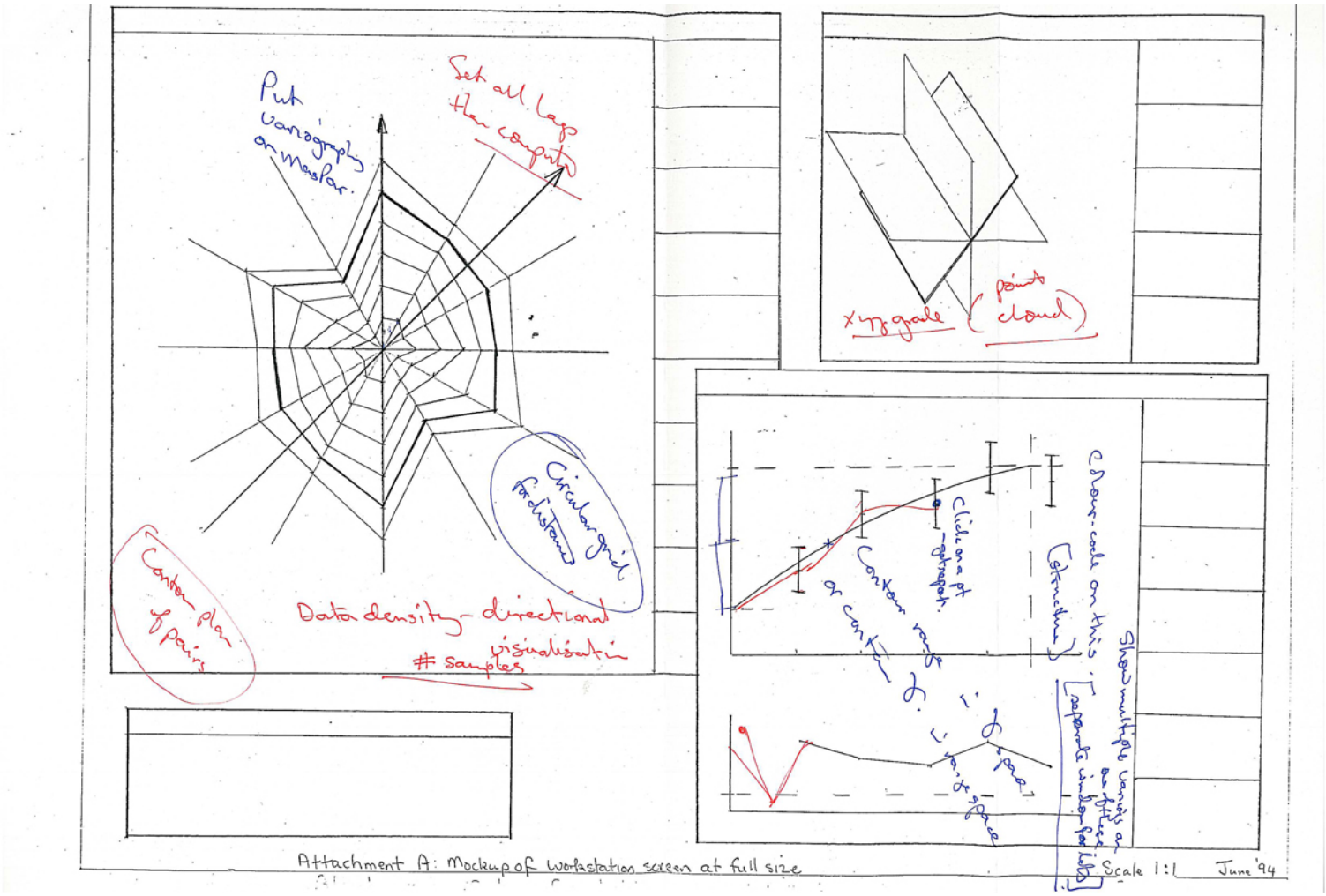
The HCI practitioner needs to be able to gather requirements for a system

- Observing existing work practices
- Interviewing people who will use the system
- Interviewing people who use an older version of the system (or do the task with physical tools)
- Discussing instructions from clients or managers
- Reflecting your understanding of the requirements back to your client/manager/colleagues
- Using simple prototypes as part of your dialogue

Example: interactive prototype



Example: paper prototype



Evidence-based requirements

Each requirement should be supported by evidence:

- Field notes from your observations
- Interview notes/video or audio recordings of interviews
- Qualifications for the people you interview
- Research about systems that solve problems similar to the one you are solving
- Evidence from user evaluations of your early prototypes
- Examples from your own experience (e.g. passwords)
- Application of appropriate generic design principles

Looking for evidence

People should be able to look at requirements that you develop and ask for evidence that those requirements are actually relevant

If you are given a set of requirements you should be able to ask for explanations of the evidence that supports those requirements

You want to minimise the risk that you design sets of features that will not actually be used.

Example: Word and “New Document”