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# Elements taken from Seminar 1 literature

*I extracted what I believe was the most relevant from the three following papers of the literature for DH2620 – Human-Computer Interaction, Introductory course:*

*Jan Gulliksen , Bengt Göransson , Inger Boivie , Stefan Blomkvist , Jenny Persson & Åsa Cajander (2003)* ***Key principles for user-centred systems design*** *, Behaviour & Information Technology, 22:6, 397-409, DOI: 10.1080/01449290310001624329*

*Ergonomics of human-system interaction -* ***Part 210: Human-centred design for interactive systems*** *(ISO 9241-210:2010)*

*Ergonomical requirements for office work with visual desplay terminals (VDTs) -* ***Part 11: Guidance on usability*** *(ISO 9241-11:1998)*

## 1 - Key principles for user-centered systems design

UCSD: User Centered Systems Design

*Some principles for the organization of a project*

*Continuous iteration*: A cyclic process of design, evaluation and redesign should be repeated as often as necessary. The evaluation process should include empirical measurement in which tests are conducted where users perform real tasks on prototypes. The users' reactions and attitudes should be observed and analyzed.

*Early prototyping*: evaluate and develop design solutions and to gradually build a shared understanding of the needs of the users as well as their future work practices.

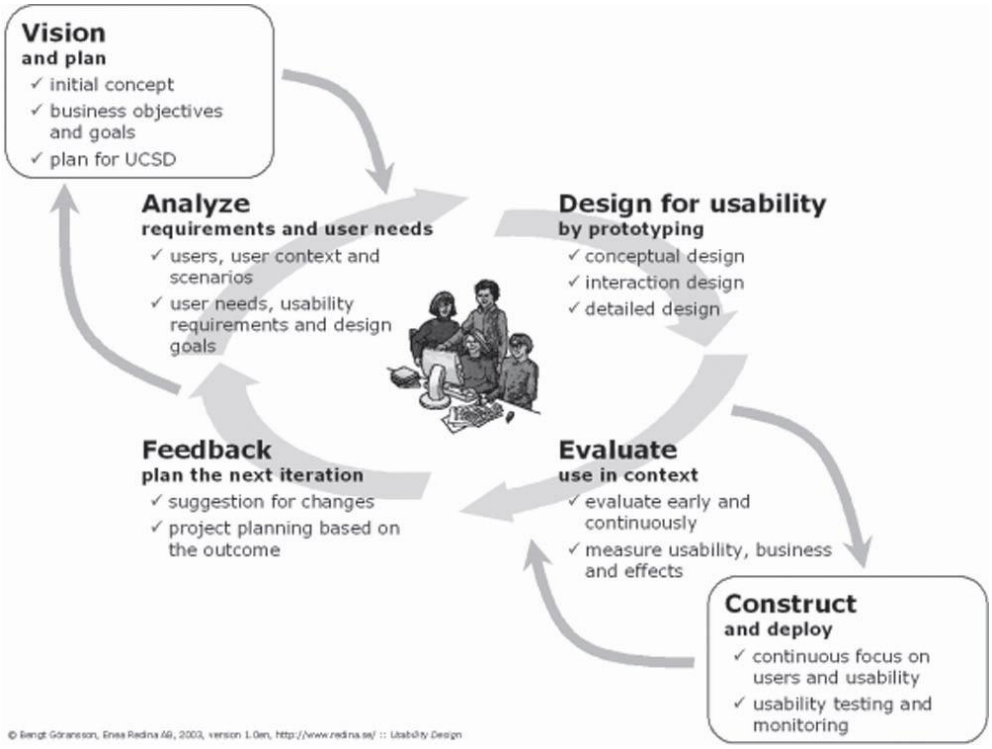
One of the more successful events was a collaborative prototyping activity in which the users could develop their vision of the future system and work situation, integrating a future system and future work practices.

Use case modelling is today one of the most widely used software engineering techniques to specify user requirements. Unified Modelling Language (UML) is one of the most common formal notations to describe use cases Poor understanding of the design documentation.

The design was documented in UML and the users were invited to evaluate it. The users had severe difficulties predicting their future use situation based on the UML notation. One of the users said that after having worked with use case modelling, the collaborative prototyping was like 'coming out of a long dark tunnel'. The design representation principle emphasizes the importance of using representations that are easy to understand for all the stakeholders, in particular as regards the future work/use situation. UML is clearly not suitable in that respect.

Activities, such as identifying user profiles, contextual inquiries and task analysis, must be a natural part of the development process. Make sure that all project members have met real or potential users, for instance, by visiting the workplace.

*Active user involvement*
The users should be directly involved, both in the development project and in related activities, such as, organizational development and designing new work practices (Greenbaum and Kyng 1991). The users must be representative of the intended user groups. Plans for involving users should be specified from the very start of the project.




Hence, UCSD requires an approach which allows continuous iterations with users and incremental deliveries. This, so that design solutions can be evaluated by the users before they are made permanent. An iteration should contain a proper analysis of the users' needs and the context of use, a design phase, a documented evaluation with concrete suggestions for modifications and a redesign in accordance with the results of the evaluation. These activities do not have to be formal. An iteration could be as short as half an hour, as long as it contains all three steps.

If possible produce several prototypes in parallel, since this helps the designers in maintaining an openness and creative attitude to what is being built. Far too often the design space is unnecessarily limited by only sticking with the first set of designs produced

Remember that to the users the user interface is the system.

The main focus of agile methods is on delivering working software. This is of course excellent, as usable software also must be delivered and be working. But to get there, the development is focused on making coding effective and there is a risk that usability issues get lost as there is no explicit user-centered focus.

Our pilot study shows that even with an explicit commitment to UCSD and a usability focus, usability may get lost in the software development process. Since few projects have the explicit goal to produce systems with poor usability, we believe that there are obstacles to usability and user involvement in the actual development process.

## 2 – Ergonomics of human-system interaction – Part 210: Human-centered design for interactive systems (ISO 9241-210:2010)

Support and help-desk costs are reduced when users can understand and use products without additional assistance.
Whatever the design process and allocation of responsibilities and roles adopted, a human-centered approach should follow the principles listed below (and described in 4.2 to 4.7):

a) the design is based upon an explicit understanding of users, tasks and environments (see 4.2);
b) users are involved throughout design and development (see 4.3);
c) the design is driven and refined by user-centered evaluation (see 4.4);
d) the process is iterative (see 4.5);
e) the design addresses the whole user experience (see 4.6);
f) the design team includes multidisciplinary skills and perspectives (see 4.7).

Feedback from users is a critical source of information in human-centered design. Evaluating designs with users and improving them based on their feedback provides an effective means of minimizing the risk of a system not meeting user or organizational needs (including those requirements that are hidden or difficult to specify explicitly).

User experience is a consequence of the presentation, functionality, system performance, interactive behaviour, and assistive capabilities of an interactive system, both hardware and software. It is also a consequence of the user's prior experiences, attitudes, skills, habits and personality. There is a common misconception that usability refers solely to making products easy to use. However, the concept of usability used in ISO 9241 is broader and, when interpreted from the perspective of the users' personal goals, can include the kind of perceptual and emotional aspects typically associated with user experience, as well as issues such as job satisfaction and the elimination of monotony.

Project planning shall allocate time and resources to human-centered activities. This shall include time for iteration and the incorporation of user feedback, and for evaluating whether the design solution satisfies the user requirements.

In most design projects, identifying user needs and specifying the functional and other requirements for the product or system is a major activity. For human-centered design, this activity shall be extended to create an explicit statement of user requirements in relation to the intended context of use and the business objectives of the system.

Allow designers to explore several design concepts before they settle on one. Make it possible to incorporate user feedback into the design early in the development process.

When prototypes are being tested, the users should carry out tasks using the prototype rather than just be shown demonstrations or a preview of the design. The information gathered is used to drive the design.

## 3 – Ergonomic Requirements for office work with visual display terminal (VDTs) – Part 11: Guidance on usability (ISO 9241-11:1998)

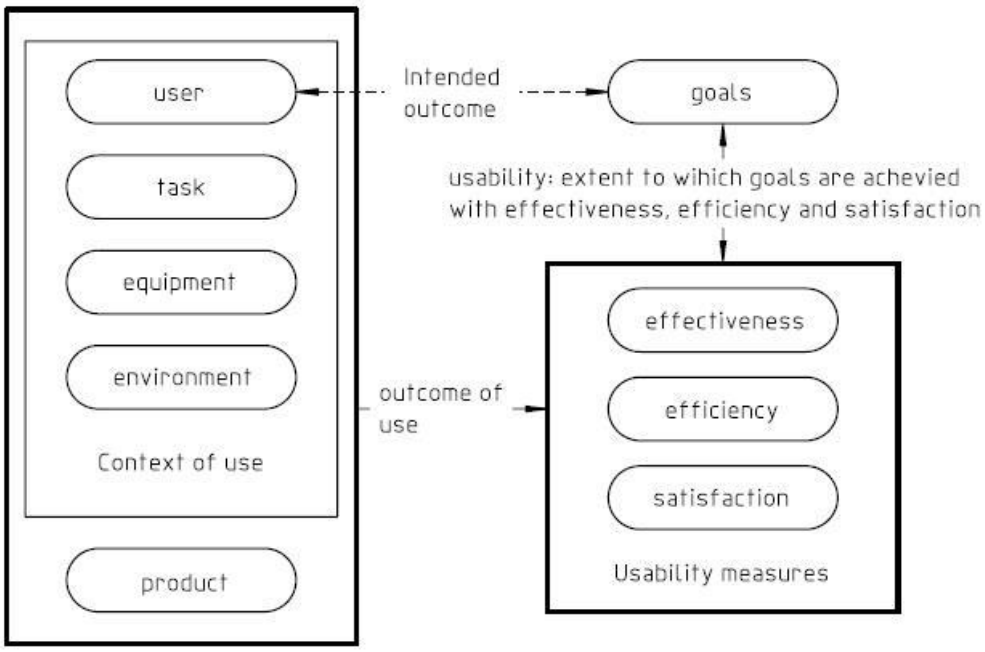



**Figure 1 — Usability framework**

*For the purposes of evaluating usability, a set of key tasks will typically be selected to represent the significant aspects of the overall task.*

*Effectiveness: for example if the desired goal is to accurately reproduce a two-page document in a specified format, then accuracy could be specified or measured by the number of spelling mistakes and the number of deviations from the specified format, and completeness by the number of words of the document transcribed divided by the number of words in the source document.*

*Human efficiency could be measured as effectiveness divided by human effort, temporal efficiency as effectiveness divided by time, or economic efficiency as effectiveness divided by cost.*