Recuperação de Informação B

Cap. 10: User Interfaces and Visualization

10.1,10.2,10.3

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Introduction

- Information seek is an imprecise process because users don’t know how achieve your information needs.
- A good user interface should aid the user in this problem.
- The human-computer interface has a big role in the process of information retrieval.
What makes an effective human-computer interface?

Well designed, effective computer systems generate positive feelings of success, competence, mastery, and clarity in the user community. When an interactive system is well-designed, the interface almost disappears, enabling users to concentrate on their work, exploration, or pleasure.

(Ben Shneiderman)
Human-Computer Interaction

- Principles for design of user interfaces:
  - feedback.
  - reversal of actions.
  - Internal locus of control.
  - reduce working memory load.
  - alternative interfaces for novice and expert users.
Design Principles

- Feedback
  - especially important for information access interfaces.
  - introduces important design choices, including which operations should be performed automatically by the system and which should be user initiated and controlled.
Design Principles

- Reduce working on memory load
  - information access is an interactive process, the goals of which shift and change as information is encountered.
  - How reduce?
    - provide mechanisms for keeping track of choices made during the search process.
    - provide browsable information that is relevant to the current stage of the information access process.
Design Principles

- Alternative interfaces for novice and expert users.
  - simplicity versus power.
  - use the scaffolding technique and provide intuitive bridges between the simple and the advanced interfaces.

- Other tradeoffs
  - determining how much information to show the user of the system is a major design choice in information access interfaces.
The Role of Visualization

- The objects interface: windows, menus, icons, dialog boxes,...
- Provide visual depictions of very large information spaces is the deal of information visualization.
- Humans are highly attuned to images and visual information.
- Scientific visualization of information, possible.
- Abstract visualization of information, complex.
- Information visualization techniques are used to represents the information access process.
The Role of Visualization

- Information Visualization Techniques:
  - icons and color highlighting.
  - brushing and linking.
  - panning and zooming.
  - focus-plus-context.
  - magic lenses.
  - animation (trees and hierarchies).
The Role of Visualization

The MedCode - Principal Interface
The Role of Visualization

The MedCode - Secondary Interface
Evaluating Interactive Systems

- Empirical data involving human users is time consuming to gather and difficult to draw conclusions from.

- How evaluate a user interface?
  - Precision/Recall?
  - Other metrics:
    - time required to learn the system.
    - time required to achieve goals on benchmark tasks.
    - error rates.
    - retention of the use of the interface over time.
Models of Interaction

- The standard process:
  - Information need
  - Query
  - Send to System
  - Receive Results
  - Evaluate Results
  - Reformulate

- Are there problems with this simple model?

- Done?
  - Yes
  - Stop
  - No?
Models of Interaction

- This model does not take into account the problem with long disorganized list of retrieval results.

- This model contains the underlying assumption that the user’s information need is static and the information seeking process is one of successively refining a query until it retrieves all and only those documents relevant to the original information need.
Models of Interaction -
(the “berry-picking” model of information seeking)

Main points:
- the user’s information needs continually shift despite the standard model.
- the user’s information needs are found along the way of the search process. The perfect match of the original query is very difficult.
Models of Interaction - (the “berry-picking” model of information seeking)

- Some observations:
  - the seeking process consisted of a series of interconnected but diverse searches on one problem-based theme.
  - goal tended to trigger new goals always preserving the original context.
  - The “during” is more important than “final”.
The interface for this model:
  - allow users reassess their goals and adjust their search strategy accordingly.
  - support search strategies by making it easy to follow trails with unanticipated results.
  - support methods for monitoring the status of the current strategy in relation to the user’s current task and high-level goals.
  - Some techniques: scanning, querying, navigating, browsing...
Non-Search Parts of the Information Access Process

- The information seeking is only one part of the full work process.
- The others works including reading, annotation and analysis.
- The access process is divided in two main componentes that can be done independently:
  - search/retrieval
  - analysys/sinthesis
Earlier Interfaces Studies

- Modern systems versus old systems.
  - Full text versus bibliographic citations.
  - Statistical rankings versus Boolean systems.
  - End users versus professional intermediaries.
  - Online collections versus separated collections.
  - Graphic displays versus text displays.
- Despite these differences, some general information seeking strategies have been identified that seem to transfer across systems.
- Some old problems were resolved but new problems were introduced.