ONE CANNOT NOT INTERACT

Semiotic Approaches to User Interface Design
1. Semiotics — the “mathematics” of CHI

Ferdinand de Saussure (1857–1913)

Sign

Signifier

Signified

synchronic perspective / structure
1. Semiotics — the "mathematics" of CHI

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Charles Sanders Peirce (1839-1914)

Diachronic / dynamic perspective / structure
1. Semiotics — the "mathematics" of CHI

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sign as a construct
2. Ethics of terminology

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Sign:
unity of object represented (O), means of representation (R), and process [infinite] of representation

Sign functions:
representation, communication, knowledge acquisition
2. Ethics of terminology

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Forms of representation: based on resemblance, marks left, conventions OR

Forms of representation
iconic: based on resemblance
indexical: based on marks left
symbolic: based on conventions

R

qualis

sin

legi

O

Rhema
dicent
argument

I
2. Ethics of terminology

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Syntax

Semantic

Pragmatic

formal aspects of representation

meaning of representation

practical use of representation
2. Ethics of terminology

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![Diagram showing iconic, indexic, and symbolic representations]

The nature of specific representation:

- Iconic: person's picture
- Indexic: person's fingerprint
- Symbolic: person's name

Steve Jobs
2. Ethics of terminology

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pictographic representation  iconic sign  symbolic sign
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Semiosis = sign process

a) the functional and relational aspects of the definition of syntax (R), semantics (R,O), pragmatics (R,O,I);

b) demonstrating the pyramidal structure of semiosis, and in particular the active (I,R,S), sensational (O,R,S), practical (I,S,O), theoretic (I,R,O) forms of belief distinguished in Peirce's pragmatic system.
2. Information Theory (1948)

Claude Shannon (1916–2001)

General Communications System
3. Semiotics, information, communication

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Adapting Shannon's model to computation
3. Semiotics, information, communication

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Operating system level

- Computer
  - Process Interface
  - Operational System
  - Computable Function
  - User Interface
  - User

Program and Data
3. Semiotics, information, communication

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Machine language level

Computer \(\xrightarrow{\text{Process Interface}}\) Computable Function \(\xleftarrow{\text{Process Interface}}\) Computer

Input-output level

CPU \(\xrightarrow{\text{Communication Protocol}}\) Computable Function \(\xleftarrow{\text{Output Devices}}\) User

Program and Data

Memory

Communication Protocol

Output Devices

Display Processor
3. Semiotics, information, communication

Ways of describing human-machine interaction
4. Examples

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CHI Types:
Representation/Software/Design
Interaction
Navigation
Retrieval
Transaction
4. Examples

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Representation/Software/Design
4. Examples

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Interaction
Navigation: Knowledge Acquisition Through Associative Processes
(Nadin, Associative Encyclopedia)
4. Examples

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Retrieval