Direct Manipulation:
A Step Beyond Programming Languages
Ben Schneiderman

Presented by Chris Gonzalez
Direct Manipulation

- Word processor as GUI vs. command-based
- Instant feedback
- Rapid incremental and reversible operations
- Labelled buttons as substitute for complex commands, used for infrequently used or complex functions (helps user store less in memory and remain on-task)

- VisiCalc- Excel’s great-great-grandfather
- Allows visual representation of data-set in a form that is familiar to accountants
- Allows immediate computation of items in spreadsheet, column manipulations, etc.
Requirements:

1. Continuous representation of the object of interest

2. Physical actions or labelled buttons replace complex syntax

3. Rapid, incremental, and reversible operations whose impact is immediately visible.

4. Layered/Spiral approach to learning. Permits usage with minimal knowledge and expansion of knowledge as familiarity with system increases.
Syntactic Knowledge

- Fragile, links system-specific syntax to specific actions. Does not translate to other systems.
- Can be arbitrary, depending on system-designer
- Syntactic knowledge is present in most systems (ie Adobe products)

Semantic Knowledge

- Concepts of functionality that can be realized on many systems.
- Top-Level semantic knowledge can often be broken down into smaller lower-level tasks (line replacement as selection, cut, paste for example)
- Novices begin with a close link between the syntactic and semantic (in one system the concept can become linked with syntax until the concept is understood abstractly)