Big Idea (Week 12): User Interface

While we can embed automated processing inexpensively into numerous products and enhance their capabilities, the products must be designed to be easily understood and used by the public at large. Features a user can understand and do not cause frustration are much more important than unusable, unfathomable product features. *The engineer developing the inner workings of an application or platform is seldom a good approximation of the public at large.*

We have all had experiences with technology products that were frustrating to use and perhaps made us feel stupid. These unpleasant interactions seldom arise because the consumer really is mentally deficient, but rather are often a failing of the product design to provide a reasonable and intuitive interface. Well designed products will hide the underlying complexities that exists, presenting a simple conceptual model that helps lead the user through the proper use of the product.

Simple and usable interface designs are challenging to achieve. Making complex things simple demands expert design just as making exciting and powerful new capabilities possible through hardware and software engineering requires expert technical design. Failures in either design task can lead to product failure.

Interface design should be largely orthogonal to the underlying implementation. The interface should be driven by what smooths the user experience, not how the technology works under the covers. Connecting the, perhaps disparate, front-end design to the inner working is part of the engineering challenge. As Moore's Law scaling continues to make computers cheaper, we should be increasingly willing to spend computational cycles to support interfaces that are more natural for the human and reduce their effort in the interaction.

The engineer doing the technical design and implementation is seldom the right person to design the user interface or judge its quality.

- Engineers and programmers think differently from the general public; what seems obvious and intuitive to an engineer is often not intuitive to an elementary school teacher, doctor, or politician.
- The engineers developing the inner workings know too much about a device—knowledge that a first-time user doesn't know and should not have to know.
- The engineers developing and implementing the design are wisely motivated to simplify their problem. This causes a conflict of interest between the implementers goals of making the implementation simpler (perhaps achievable by making the interface conform to the underlying technical implementation) and goals of making the user interaction simpler (perhaps requiring a more complex implementation to bridge between the user interface and the technical implementation).

Consequently, it is useful to separate responsibilities for interface design and implementation into separate teams, or at least, individuals. It is also valuable to prototype interface interactions and seek feedback from the intended user base.