
User-Centered Design in the Product Development World

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My World

- | I'm a Usability Engineer and Interaction Designer, with degrees in Educational and Industrial Technology, Anthropology and Ethnography
- | Socio-Technical Systems; context of use is my focus
- | Now at Navman, Consumer Electronics market. VERY fast-paced, with new products coming out every 6 months.
- | GPS products for the boat and car and handhelds
- | Race to get the customer!

Customer's Choices. His name is Ron.



Which One to Buy?



Ours. Navman's of course 😊

Why?



- | Looks good.
- | Pretty easy to use.
- | Seems like it was designed with Ron's needs in mind.
- | Thinks it'll make his life simpler .. better.
- | Luxury product for the car; the car will LIKE that.
- | Cool, interesting, different.
- | Can't wait to play with it.
- | Can't wait to show his partner and show her how to use it.
- | Can't wait to talk about it with his mates.
- | Price is pretty much okay .. bit expensive, but seems like it's worth it.

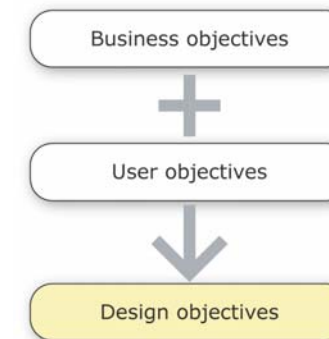
Customers Today

- | Customers today are smarter than they have ever been.
- | Customers are looking for products that:
 - are perfectly adapted to their unique tastes
 - make their life better
 - save them time
 - reinforce their social relationships
- | Then – “I must not be smart enough to use this”
- | Now – “This product is stupid. I expect better.”

Good Dose of Realism

- | I am the customer's advocate. I represent their needs.
 - | I work for the business. I satisfy their business objectives.
- OK?
- | I design a solution that brings those two, sometimes conflicting, worlds together.
 - Business objective “Unload 500,000 copies of Sheena Easton's album.:
 - Customer's objective “Buy the latest White Stripes album.”
 - | What's the offering to the customer that satisfies both objectives?

Objective-Driven Design



User Objectives

- | How do we predict what's going to work best for Ron:
 - 1 year before he's even heard of this product
- | How do we avoid:
 - Poor consumer product reviews
 - Customer complaints and product returns
 - Takeover by the competition
- | Answer: Focus on the Real World Usage, adopting User-Centered Design and Usability approach to design and evaluation

Trends in Product Development

Then ...

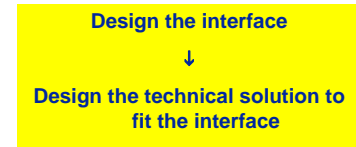
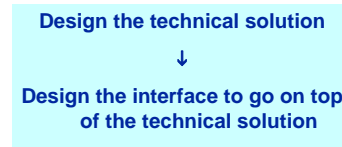
- | Race for impressive functions
- | Function-centric view
- | Technology Push
- | Function bloat

Feature mindset.

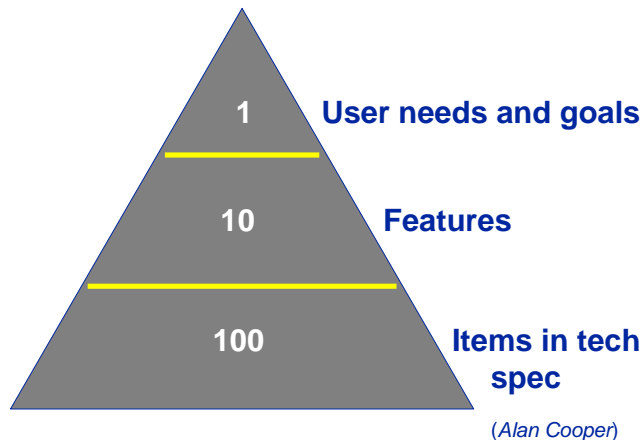
Now.

- | Simple, useful, practical
- | User needs-centric
- | People Pull
- | Clear purpose and value

Customer mindset.



User Needs-Centric



Outside the Company

Ron Sees:

- | Product reviews
- | Retail store
- | Product gift box
- | The product's interface
- | How it looks in his car
- | His buddy's product
- | Product website
- | Technical support

He cares about this.

Inside the Company

Ron Doesn't See:

- | Business Case
- | Market analysis
- | Requirements workshops
- | Use cases
- | Prototypes
- | Entity relationship diagram
- | Code libraries
- | Bill of Materials

He doesn't care about this.

Business is a Jungle

- | **Software Engineers** often want to create something wizzy for the customer, and assume that the customer will be grateful for it.
- | **Product Managers** are worried about keeping ahead of the customer so that there's another product to put out that will rake in the bucks.
- | **Competitors** are watching out for other good designs; struggling to stay ahead.
- | **Product Analysts** (in the product review mags) are helping advocate for the customer, but have their favorite companies to represent.
- | Then there's me. The go-between. I have to crack the whip, keep myself in check, and satisfy the business and the customer.

Ron's Choices



In the Store

- | The products seem similar to Ron, but using them reveals a world of difference.
- | He wants to set up a route from his house to his most important customer, and then he wants to add a contact from his Palm Pilot into the GPS product.
- | He finds:
 - 2 time-waster products
 - 1 that seems okay
 - 1 that just seems to work better than the rest

Moral: Evaluate before the users do .. they will sooner or later

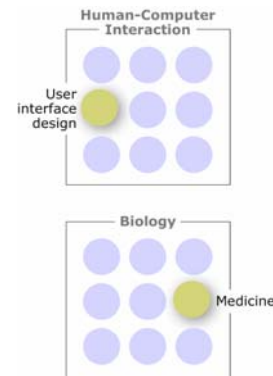
In the Car

- | Situational Awareness
- | Dynamics
- | Human Performance
- | Driver Distraction
- | Cognitive Load
- | Perceptual Abilities
- | Motor Skills



HCI and User Interface Design

- | User Interface Design is an applied science
- | HCI is the science
- | Research findings from HCI GREATLY influence the tools and activities of UI Design



Example: Paul Green, UMTRI

- | University of Michigan Transportation Research Institute, Human Factors Division
- | Driver-Response-Time System
- | Driving Simulators
- | UMTRI Instrumented Car
- | Eye-Fixation Recording System

Example: Sam Charlton, TARS

- | Lecturer in Psychology, University of Waikato
- | Human Factors research
- | Traffic & Road Safety Research Group (TARS)
New Zealand's Premier Road Safety Laboratory
- | Augmented reality lab simulation: worth a field trip
- | Trialing different road signs that are on posts or painted on the road
- | Stop the user's task to measure Cognitive Workload and Situation Awareness

Human Computer Interaction

- | Optimizing the performance of the human and computer, together, as a system
- | The system of relationships for Ron, the driver, and his product:
 - Ron-to-Product
 - Product-to-Ron
 - Ron-to-Car
 - Passenger-to-Ron
 - Passenger-to-Product, etc.
 - Each of these relationships has unique requirements with which the product can assist

Human Computer Conversations

Imagine that your product is a person or group of people.

- | Are they giving you the bare minimum or are they overwhelming you with loads of detail you don't need?
- | What is the right balance for you?
- | If you can do this mental activity, then you're on your way to understanding the conversation between the user and the product.
- | It is this conversation, and the quality of it, that is the focus of design.
- | The mechanics of the conversation is called Interaction.

Human Information Processing

The Brains Subsystems

- | Perceptual System (read, scan)
- | Cognitive System (think)
- | Motor system (respond)

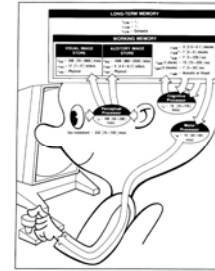


Figure 2.1. The Model Human Processor—memories and processors.

- | External environment
- | Sensory registers
- | Perception
- | Consciousness (can lead to Long term memory)
- | Short term memory (can lead to Long term memory)
- | Cognitive functions
- | Motor responses

Personas

- | Business Traveler
- | Soccer Mum
- | DINKs
- | Adventurer Travelers
- | Retirees Touring in Campervan
- | Service People
- | Commuters

Ultimate Goal

- | To offer the best possible user experience for the greatest number of users of the system.
- | One-size-fits-all
- | Design Compromises
- | Universal Design
- | User Testing

Drive Testing

- | **Aspects to Measure**
 - Time to enter an address
 - Estimation of distances
 - Percentage of turns taken
 - Of the turns taken, how many of them were short-distance vs. long-distance
 - Reaction times
 - Useful, Usable, Desirable
- | **Observe/Record**
 - Emotional experience
 - What's going on on the road

Thanks for the Invite, Beryl & Co.

User-Centered Design in the Product Development World

Books

- | User-Centered Requirements Engineering: Theory and Practice, Alistair Sutcliffe,
- | Writing Effective User Cases, Alistair Cockburn
- | Institutionalization of Usability: A Step-by-Step Guide, Eric Schaffer
- | Usability Inspection Methods, Jakob Nielsen and Robert L. Mack, Editors
- | Designing Web Usability, Jakob Nielsen
- | Flow: The Psychology of Optimal Experience, Mihaly Csikszentmihalyi
- | Studying Those Who Study Us, Diana E. Forsythe
- | The Visual Display of Quantitative Information, Edward R. Tufte
- | The Art of Human-Computer Interface Design, Brenda Laurel, Editor
- | Object Modeling and User Interface Design: Designing Interactive Systems, Mark van Harmelen, Editor
- | Many, many more.