Understanding and Concepting

[Diagram showing interrelated fields such as Control Systems, Electronic Systems, Mechanical Systems, etc., related to Mechatronics.]
Human-Centered Design is

The discipline of generating new solutions to problems and opportunities through the process of making “something” where the process is driven by the needs, desires and context of the people being designed for.

“Design is not a one-shot vaccine; it’s an ‘innovation fitness program’ that puts an organization on top of its game. It is not an ‘event’, it is a way of thinking, communicating and doing every day.”
Human-Centered Design is

- Interdisciplinary collaboration
- Engagement with users and stakeholders
- Rapid iteration
HCD Benefits to Your Company

- Get the right product to market faster
- Lower product development costs
- Minimize product support costs
- Build relationship and shared-vision with your customers
- Insure product success
- Strengthen company brand and competitiveness

HCD benefits to your Customer

- Satisfied users – Less frustration and more confidence
- Reduce training time/expenses
- Increased user productivity
Balance
Ease of Use vs. Power

Cost of Technology
At the turn of the century powerful/complex systems were expensive and rare. Today powerful/complex systems are cheap and ubiquitous.

Amount of Information, Complexity and Products
Information doubles every 11 hours. Trillions of connected nodes and devices. Product and Services with richer feature sets (because we can).

Human-Centered Design

Human Evolution
Our ability to deal with the varied complexity inherent in everyday powerful systems.
Understanding & Concepting
“Once a system is in development, correcting a problem costs 10 times as much as fixing the same problem in design (concept). If the system has been released, it costs 100 times as much...”

Bias & Mayhew, 1994

Usability methods raised user satisfaction ratings for a system by 40%; when systems match user needs, satisfaction often improves dramatically.
Why make stakeholder maps?

- Establish shared idea about the users
- Identify and document their needs and goals
- Direct user research
- Document findings from research
- Identify holes and opportunities
- Unify the development team
- Bring new team members up to speed quickly
Observation

“You can observe a lot just by watching”

—Yogi Berra

“In the fields of observation chance favors only the prepared mind.”

—Louis Pasteur
Prep
- Identify People
- Choose Method
- Create Protocol

Execute
- Capture Data

Analyze
- Review Data
- Codify Data
- Share Information
Use your stakeholder map to identify primary and secondary stakeholders.

Choose a method of observing that fits best with your stakeholder context and project constraints.

- Interview
- Lab Inquiry
- Field Study
- Contextual Inquiry
Is it important to observe your stakeholder in their context?

NO  YES

Is it important to observe your stakeholder perform a specific task?

NO  YES

Interview   Lab Inquiry   Field Study   Contextual Inquiry
Is it important to observe your stakeholder in their context?

- NO
- YES

Is it important to observe your stakeholder perform a specific task?

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Understanding & Concepting
Interviews
Tips for conducting a successful interview

- Script it all out! Your introduction as well as the questions.
- If possible, record the interview. Then have a transcript made.
- Start with some casual conversation. It will relax both of you.
- Ask simple questions first.
- Give them time to answer. Get comfortable with pregnant pause.
- Listen more than you speak.
- Don’t ask “yes or no” questions.
- Don’t “lead the witness” with examples of what you are looking for.
- When taking notes, jot down the main ideas; fill in details directly after.
- Direct the conversation, especially if it veers off topic. It’s OK to politely say something like: "Fine, but let me ask you this".
- Draw out specifics by asking them to “expand” or “give you an example”
- If interviewing in a context, absorb their surroundings for insights into their personality, interests and proclivities, such as photos or trophies.
Field Studies

Rules of Thumb for Field Studies

- Be an observer first. Watch and listen.
- Respect the culture, dress appropriately and limit your impact. The *Heisenberg Effect* is “in play”.
- We tend to see what we know or are looking for. Remain objective and keep an open mind.
- Follow your study protocol.
- Count everything as data, not just what is said.
- Ask open ended questions.
- When taking notes, jot down the big ideas. Fill in the details immediately following your time in the field.
- Make a video recording if allowed.
“What people say, what people do, and what they say they do are entirely different things.”

—Margaret Mead
Contextual Inquiry

- Happens in a specific context. Usually the place of work.
- Is an Interview + Field Study.
- Is about establishing a partnership between you and your subject.
- Is about developing a shared understanding.
Walk-A-Mile
I decided to pick up a DVD on my way to check-out. Asked "Can I get a list of DVDs?" got a negative reply. am not sure we need this or not.

Security: saying something to users. Very intimidating.

AUDIENCE C.? + SOUND/SMELL/IMAGERY WHAT IS THE END WHERE?
Personas
A Persona:

- Has specific goals
- Performs specific tasks
- Has a particular mindset that influences his or her decisions.
- Works in a specific context or contexts.
- Has to deal with constraints and barriers.

Personas work better when you give them:

- A name
- An age
- Use a photo or illustration to picture them
- Use details or metrics that explain their goals, tasks and mindset
Workflow Diagrams

Creating workflow diagrams helps to:

- Flesh out how your Personas will interact with your product or service
- Describe how your system works
- Summarize your research findings
- Sell or share an idea

1. Determining who (a Persona)
2. Defining their goals
3. Shaping the tasks necessary to complete goals
4. Diagramming this clearly
Human-Centered Design

Design

UNDERSTANDING
- Concept Mapping
- Stakeholder Mapping
- Interviewing
- Field Studies
- Contextual Inquiry
- Walk-a-Mile
- Personas
- Workflow Diagramming

CONCEPTING
- Sketching
- Ideation
- Participatory Design

FORMING
- Frame-work
- Rapid Prototyping
- Drawing & Modeling

EVALUATING
- Usability Testing
- Questionnaires
- Usability Heuristics
- Priority Matrixes
Sketching
Sketching is thinking and conversing with pictures.
Sketching Tips:

Use bold strokes
Combine basic shapes
Make & reuse icons
Use arrows as verbs
Add text annotations
Invite others to do the same

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Combine basic shapes
Make & reuse icons
Use arrows as verbs
Add text annotations
Invite others to do the same
Use bold strokes
Combine basic shapes
Make & reuse icons
Use arrows as verbs
Add text annotations
Invite others to do the same
Visible
Inviting
Shareable

Gestural
Minimal
Ambiguous

Fast
Spontaneous
Timely

Cheap
Plentiful
Disposable
Ideation

“I think that only daring speculation can lead us further and not accumulation of facts.”

—Albert Einstein

“What if ...”

—Anon
• Come up with as many ideas as possible
• No criticism of any thoughts or ideas
• No idea should be considered too outlandish
• Team members should build upon one another's ideas
We’re brainstorming here, and there are no dumb ideas. But if we weren’t brainstorming, that would have been a really, really dumb idea.
Participatory Design

If I’d asked people what they wanted, they would have said a faster horse.

— Henry Ford

A customer is the most important visitor on our premises. He is not dependent on us. We are dependent on him. He is not an interruption of our work. He is the purpose of it. He is not an outsider to our business. He is part of it.

— Mahatma Gandhi