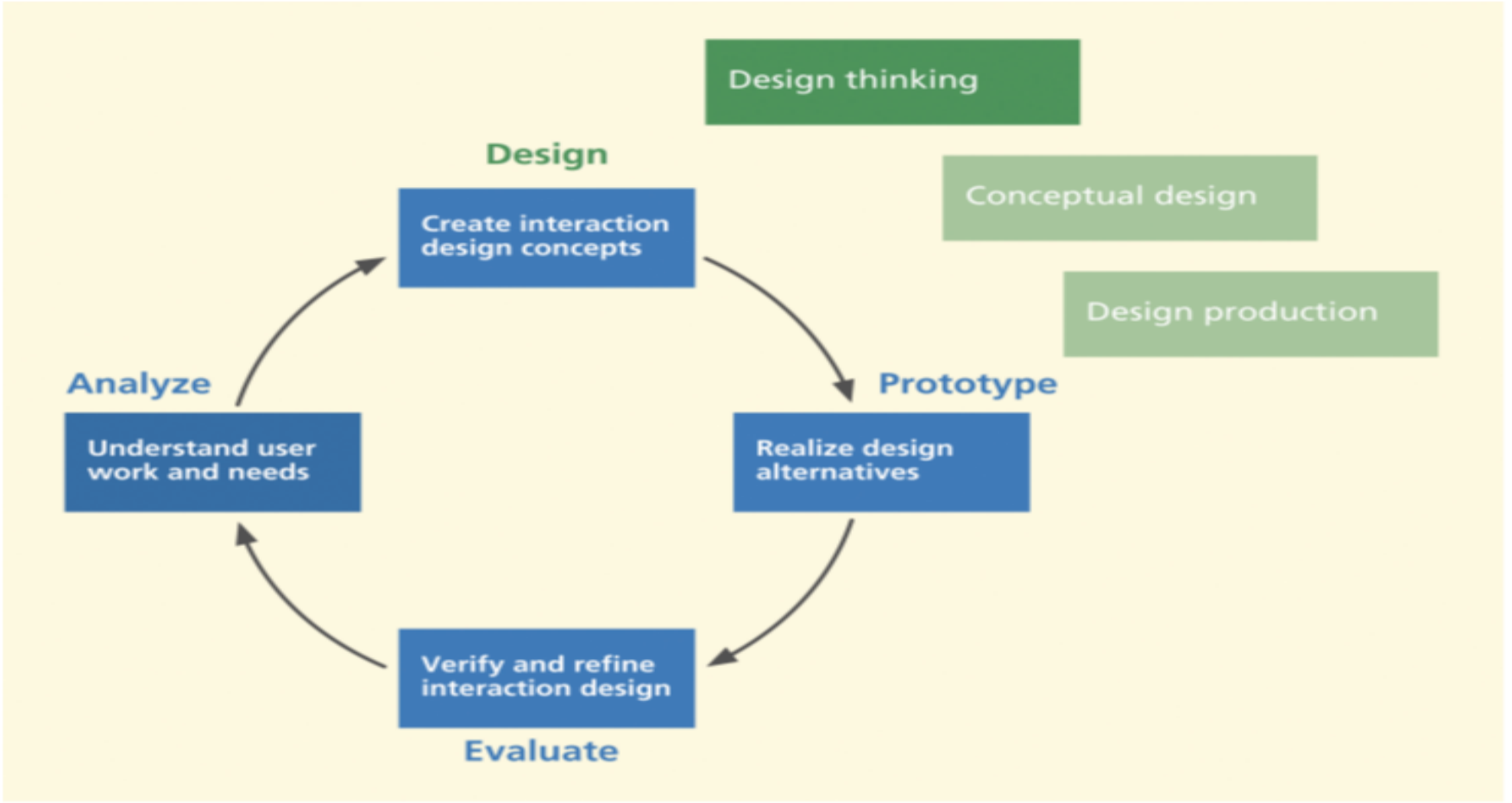
Design Thinking

Synthesize and combine new ideas to create the design

SWEN-444

Selected material from *The UX Book*, Hartson & Pyla


Design thinking
Conceptual design
Design production
Design
Create interaction design concepts
Prototype
Realize design alternatives
Evaluate
Verify and refine interaction design
Analyze
Understand user work and needs

Use of term “design”

- We mainly use “design” narrowly to refer to creative human activity
- How new ideas are synthesized and put together

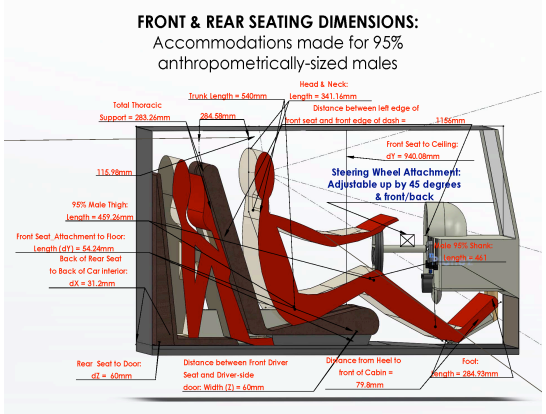
  – Usually meaning will be obvious from context

  – And, of course, it is about *interaction design*

Three design paradigms (patterns of thinking)

- Engineering – focus on user productivity, avoiding errors, achieved through evaluation and iteration
- Human Information Processing (HIP) – cognitive science based, focus on study of how information is sensed, accessed, and transformed in human mind
- Design-Thinking – consider emotional and phenomenological, social and cultural aspects for the UX, focus more on getting right design than on refining design later

Example: Car Design



Engineering view

Seat height, fit of the curve on the seat to fit lower back shape, safety restraints, airbags

HIP view

Meets limits of human signal detection (tactile via steering wheel, audio cue, blinking visual cue e.g. low tire pressure)

Design Thinking view

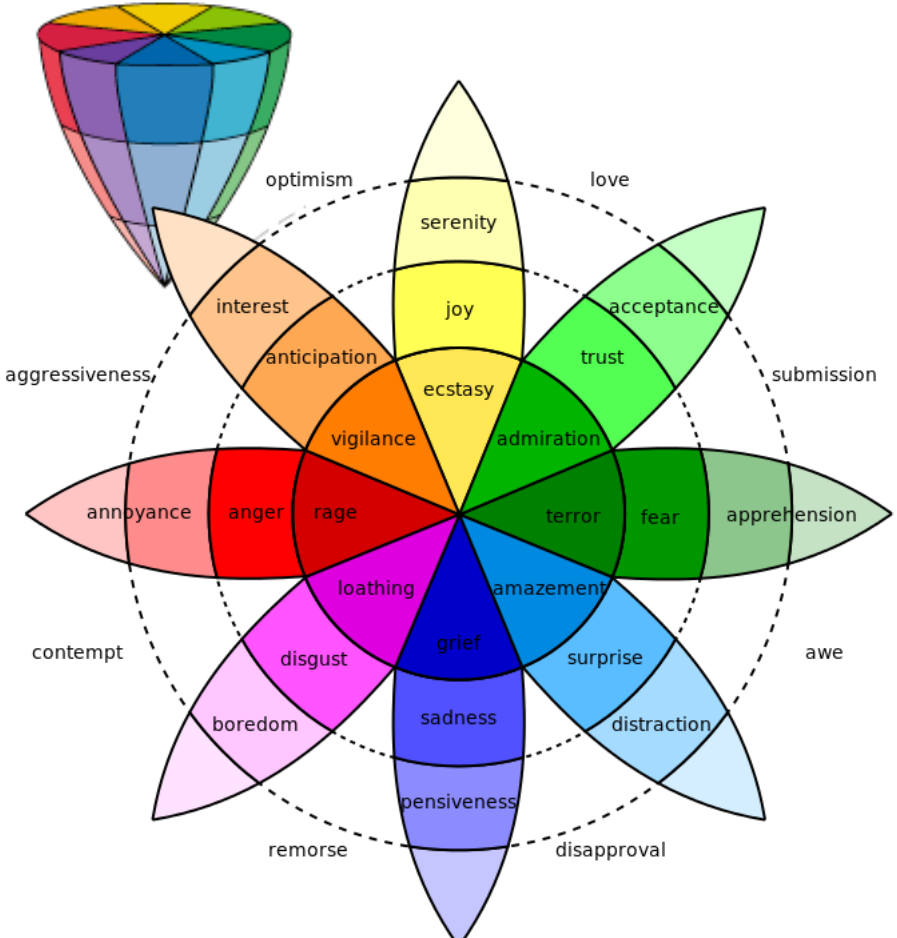
cool factor, joy of driving, life style considerations, pride of ownership, thrill of speed

Design Thinking

- **Creative** and **innovative** UX **design concept first**
  - Combination of art, craft, science, invention
- **Followed** by **functional and interactive design**
- Long term **emotional impact**
- **Aesthetics**
- **Social** and **value** oriented interaction
- How **technology** takes on "presence" in user's life
- May be **market driven** (think Apple)

- Tools:
  - Understanding emotions
  - Persona
  - Ideation
  - Sketching

Plutchik's Wheel of Emotions



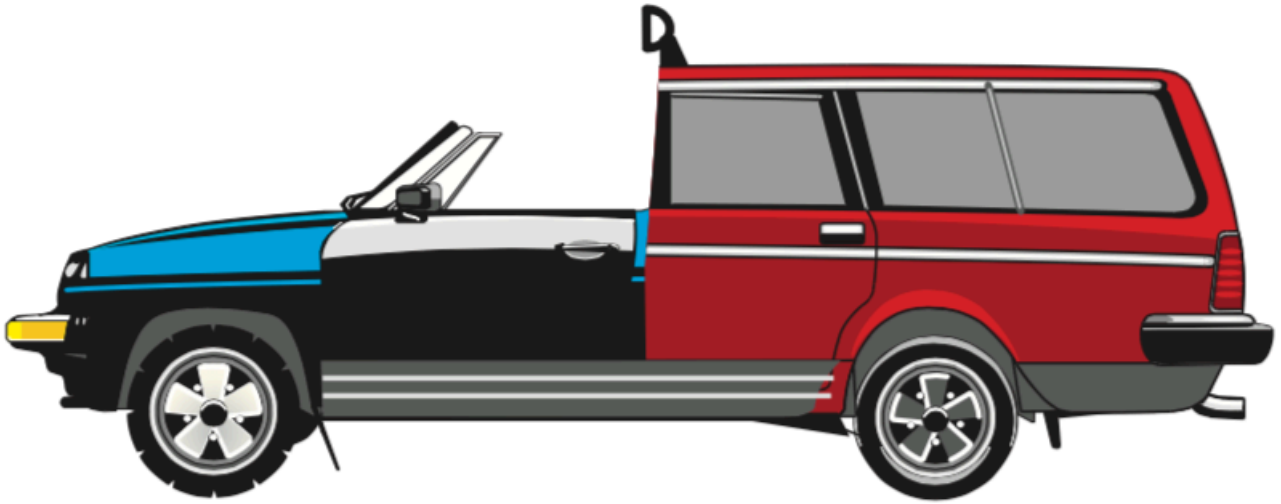
Personas – a Pretend User

- A specific (but imaginary) person in a specific work role;
  - Represent a class of users
  - Composite user archetypes based on behavioral data gathered from many actual users
- Make design thinking more concrete
  - User roles are too broad – can't satisfy everyone
  - Focus and satisfy one "person"
- Minimize designer bias to design for their own needs; engage designer empathy
  - Select a small number of personas from the user class
  - Pick one as primary and design for that one
  - Adjust as necessary to accommodate the others

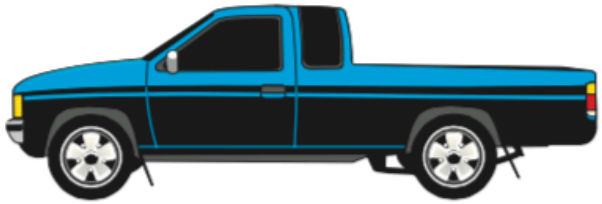
Constructing Personas

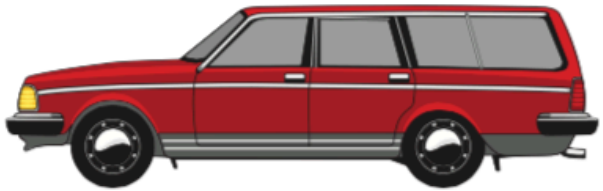
- Establish a persona hypothesis
- Segment use across a set of observed behavioral variables (also called axes or ranges)
  - E.g., computer literacy, annual income
- Identify significant behavior patterns
  - Clusters of users with shared behavior across multiple behavioral variables (6-8)
  - Valid patterns demonstrate logical or causative relationships between clustered behaviors
- Combine one of more patterns into a persona role
- Synthesize persona characteristics and relevant goals
- Review for completeness and distinctiveness

Do not design for the “average” user.



A cast of personas represent different clusters of behaviors.





Synthesize Characteristics

- Give each major pattern a brief description, such as "the bargain-hunter" or "the impulse-buyer"
- Synthesize details from the data
  - Describe use environment, typical workday (or other relevant time period), current solutions and frustrations, relevant relationships, etc.
  - Stick to observed behaviors
  - Avoid too much fictional, idiosyncratic biography
  - A persona is a design tool, not a character sketch for a novel
- Carefully select a first [and last] name for the persona
  - Evocative of the type of person the persona is
- Add some demographic information: age, geographic location, relative income (if appropriate), job title

Example Persona

example persona: Giles

"I do everything with my laptop"

Background
Age: 25
Occupation: Graduate student
School: Faculty of Information
Technology level: Programmer, uber power-user of computers, very "Web 2.0"

Attributes

- Tech-savvy, interested in new technologies
- Uses a lot of keyboard shortcuts
- Comfortable in both Mac and PC platforms
- Eager to try out new technologies
- Diligent blogger
- Finds IM too distracting so stays off it

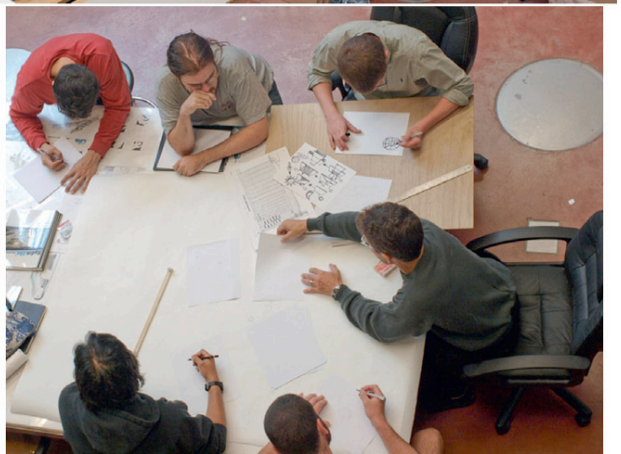
Goals

- Get good grades
- Continue to get funding to complete his masters thesis next year
- Be actively involved in bike clubs and lead an social/outdoorsy life outside school
- Keep fit
- Continue to blog regularly to get recognition from the online community

Ideation

- Collaborative group process for forming conceptual design ideas; i.e., “applied design thinking”
  - Idea creation
  - Idea critiquing – review and judgment
- Brainstorming
  - Team activity
  - Stream-of-consciousness
  - Generate as many ideas as possible
  - Don’t be critical of or constrain creativity
- Brainstorming sessions generate a lot of material that must be filtered and organized
  - Categorize, sort, vote

Ideation: Set up Work Spaces



Dissent

- An alternative to brainstorming
- Participants encouraged to criticize ideas
- Criticism surfaces problems that forces new thinking to respond
- Produces more productive and innovative ideas

BLACK BOX THINKING: Why Most People Never Learn From Their Mistakes—But Some Do
by Matthew Syed

Example: Ideation for the Ticket System

- Thought questions to get started:
  - What does "an event" mean? How do people treat events in real life?
  - An event is more than something that happens and maybe you attend
  - An event can have emotional meanings, can be thought provoking, can have meaning that causes you to go out and do something
- Things people might want to do with tickets:
  - People might want to email tickets to friends
- Possible features and breadth of coverage:
  - Homecoming events
  - Parents weekend events
  - Visiting speakers on current topics
  - Visitor's guide to what's happening in town and the university
  - Christmas tour of Middleburg

Sketching

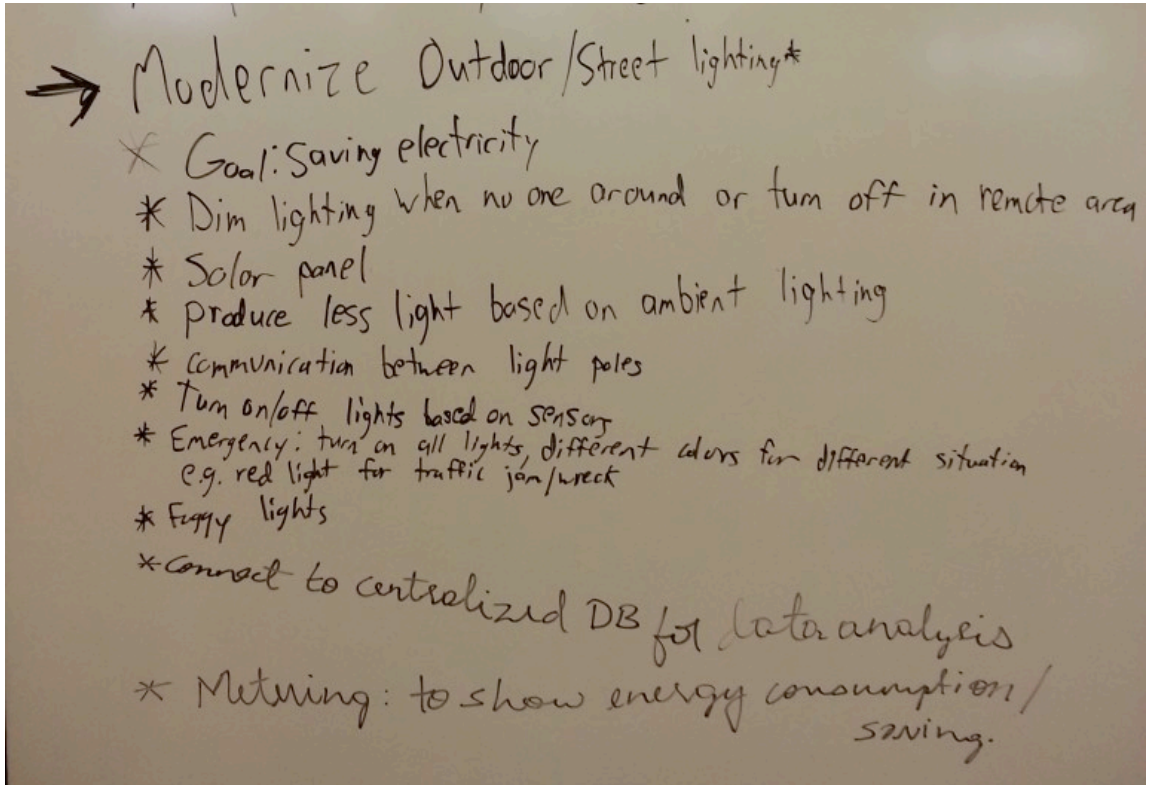
- Rapid creation of freehand drawings
  - Expressing preliminary design ideas
  - Focusing on concepts rather than details
- Reinforces design thinking, augments communication
- Explore and expand design ideas
- Sketches are not prototypes
- They are abstract, incomplete, not artistic, disposable, fast, annotated

Example: Smart Outdoor Lights

- The main purpose of these lights is to save electricity. It runs on solar power and provides intelligent lighting. The way it works is by providing light and hence consuming power only when required.

- The new smart outdoor light saves power by making use of sensors which detect activity around them. They can also communicate with one another over the network to smartly and efficiently light up when required.

Example: Smart Outdoor Lights



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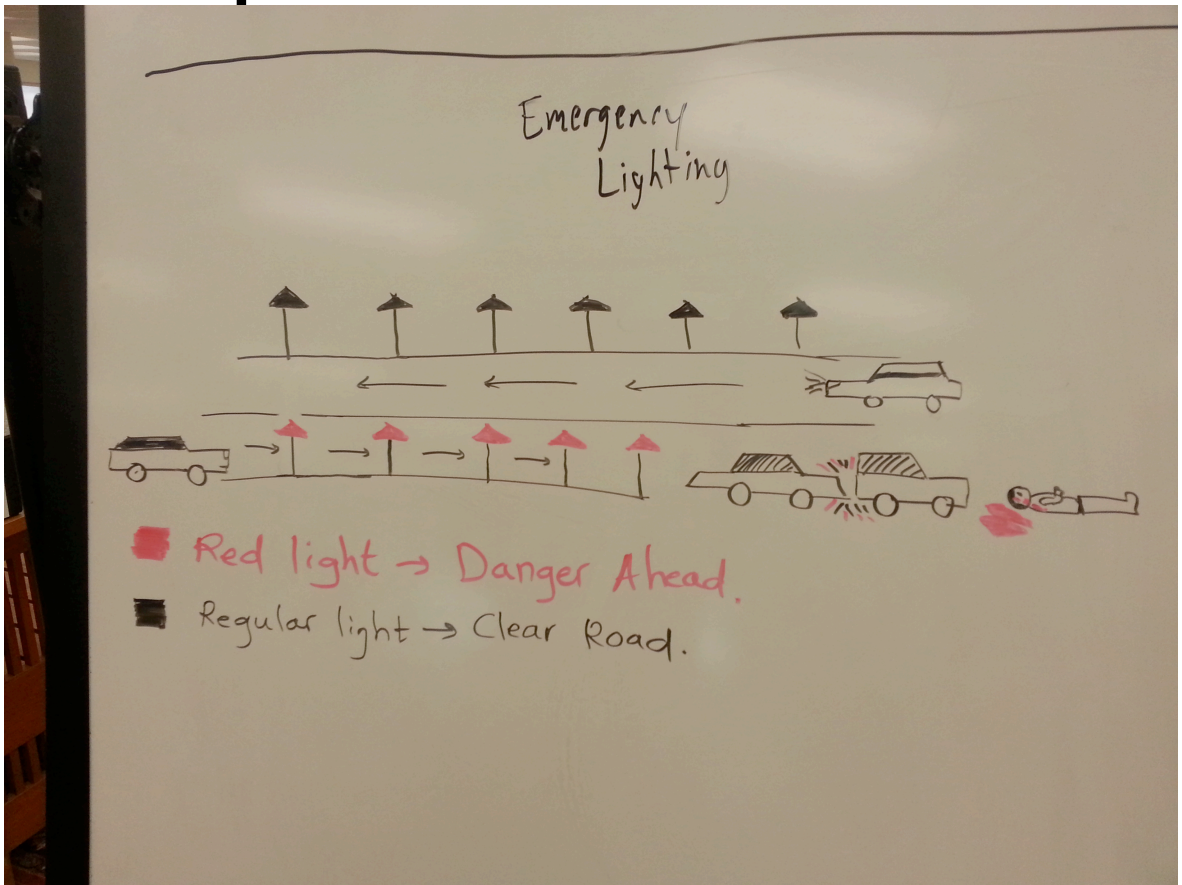

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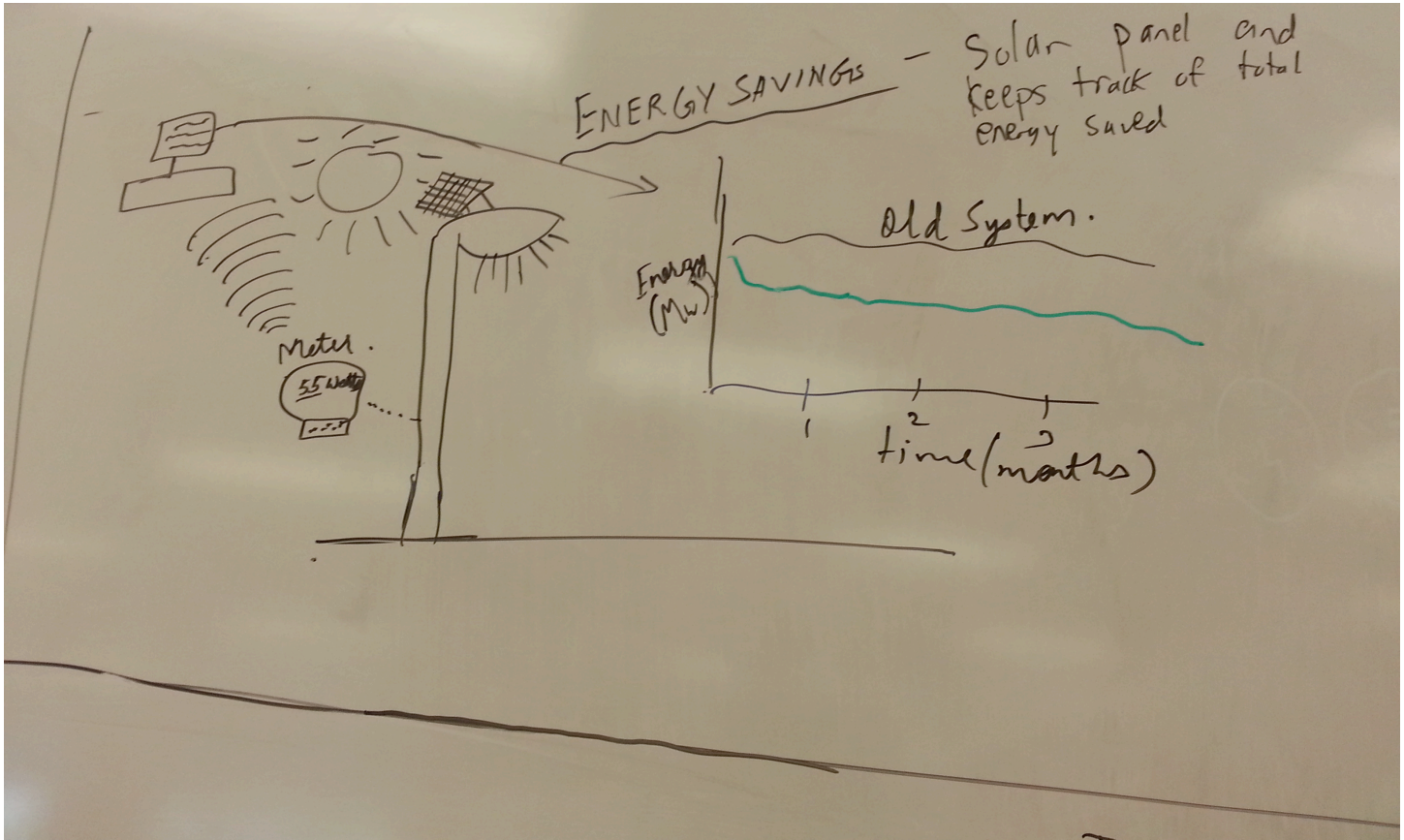

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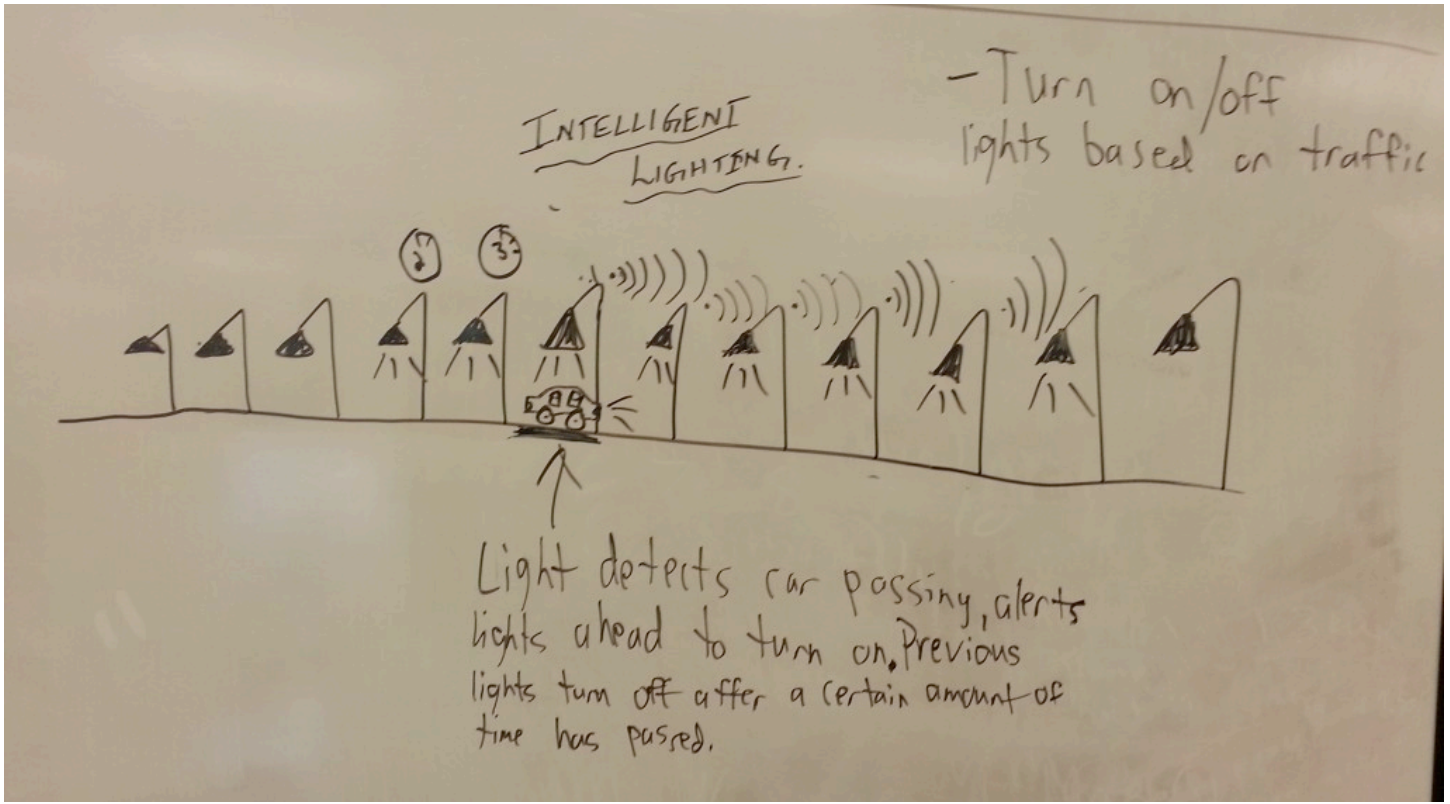

Activity:

1- Construct a detailed description of the persona for your main work roles

2- Create a new design vision. Here you are totally focused on the user experience.

- Engage in ideation, to rapidly create and compare a large number of design alternatives.
- Everyone in turn, start throwing out ideas for discussion.
- Make sketches simultaneously and hang them on the wall. Feel free to use the whiteboard for brainstorming and drawing.

Remember to keep separate idea creation and critiquing. In the idea creation phase, keep the rich ideas flowing. ***No idea is too far out.***
When that well starts running dry, switch to critiquing and evaluate the ideas, winnowing out the most promising ones.