STRATEGIC DESIGN

Carlos Cárdenas - Portfolio

Vision

I am passionate about the intersection of design, technology and business innovation, and its power to transform the way we live. I have extensive experience as innovation strategist, designer and researcher, honing a diverse skillset that bridges across multiple industries.

I've led strategic projects for global companies developing new products and services, including Digital Design (UI/UX, Mobile/Web), Consumer Electronics, IoT, Healthcare/Wellness, Banking and Automotive categories. Clients include Samsung Electronics, LG, Microsoft, iRobot, Dana-Farber Cancer Institute, and Global Oncology among others.

I bring a human-centered approach to business transformation through well-designed user experiences that create meaningful business and customer value. I enjoy simplifying complex design and business challenges using creative thinking, robust research methods and analytical skills.

Areas of Interest:
- Human Centered Innovation
- Design Research and Strategy
- New Product, Digital and Service Offerings
- Entrepreneurship
- Business Growth
- Project Management
- Competitive Positioning
- Market / Industry / Technology Trends

WORK EXAMPLES

Connected Health (IoT)

- Wearable Healthcare Platform
- Sleep Tracking Platform: UX Design for Behavior Change
- EHRs and the Doctor-Patient Relationship
- EHRs and Contexts of Use

Accessible UX / Inclusive Design

- Inclusive Design Strategy for Tablet Devices
- Augmented Alternative Communication App Design
- Inclusive UX Design for Screen-Based Devices
- Patient Education Materials for Low Literacy

Healthcare Business Strategy

- Medicine Adherence Service Strategy
- Future Market Trends : Tele-Health

Mobile Experience

- Next UX For Mobile—Phablets
- Envisioning New Imaging User Experience
- CampusTap : Mentorship Building (Mobile App)
- City Parking Made Simple (Mobile App)
- Crowdsourcing Decision-Making (Mobile App)

Digital Appliances

- Envisioning a New Type of Cooking Appliance
- Interaction Design for Washing Machine Control Panel
- Trends Research - Digital Appliances

Interactive Display

- New Product and Service Concepts (US)
- New Service Experience for TVs in the U.S. Market
- Non-Conventional TV Experience
- Seamless Experience Strategy for TV & Mobile
- Interactive Large Displays for Public Spaces

Automobiles

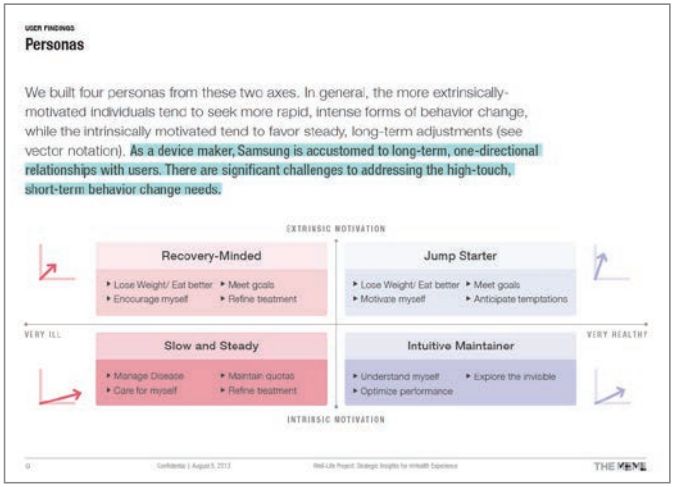
- Connected Car UX: Product and Service Concepts
- Connected Car UX - Systems Design Concepts
- In-Vehicle Infotainment Market Trends / Roadmap

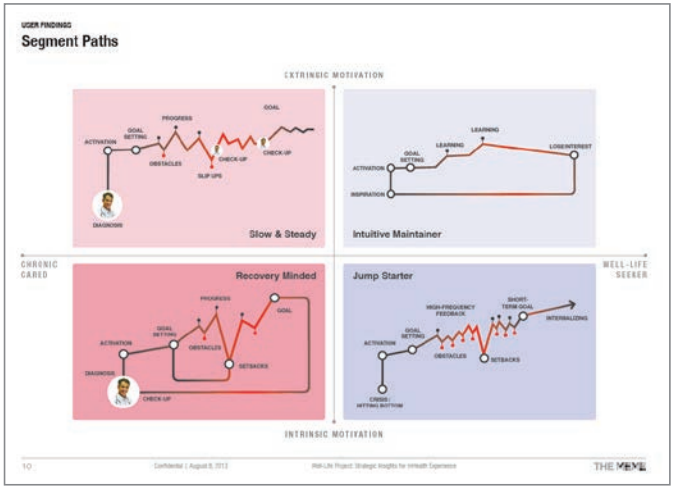
CONNECTED HEALTH (IoT)

Wearable Healthcare Platform

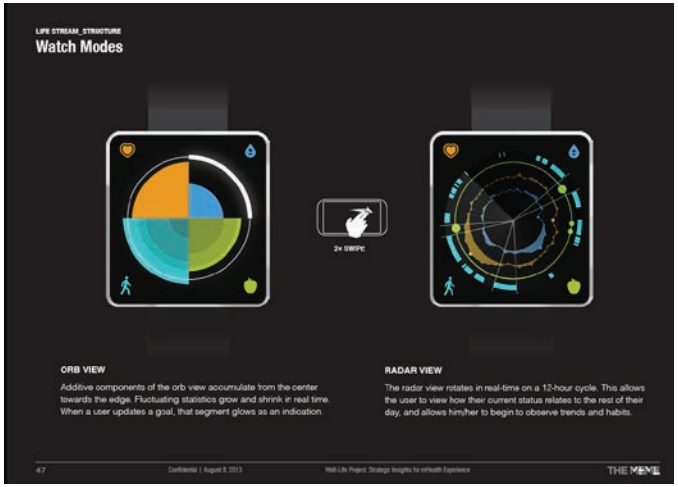
Identified business and design opportunities within the evolving digital health and wellness market in the U.S., with particular focus on the affordances of new wearable devices. Developed product and UX concepts for wellness tracking service platform based on insights from ethnographic research.

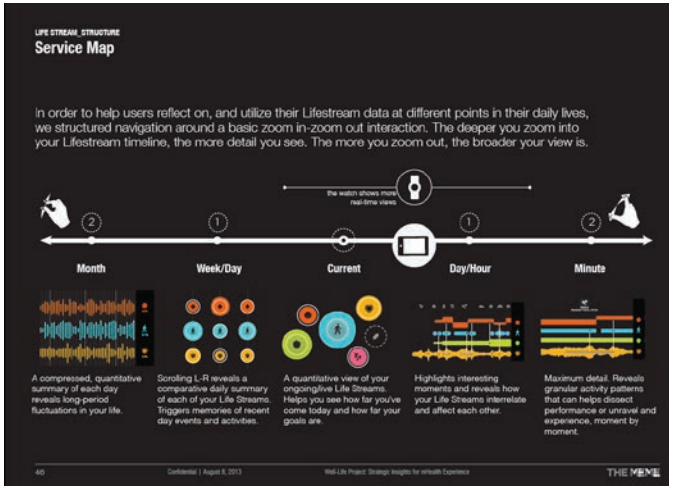
User Research / Insights



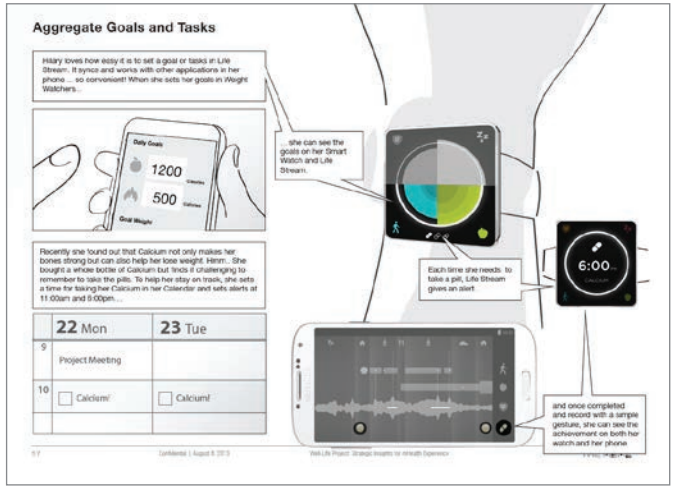


UX Design Strategy





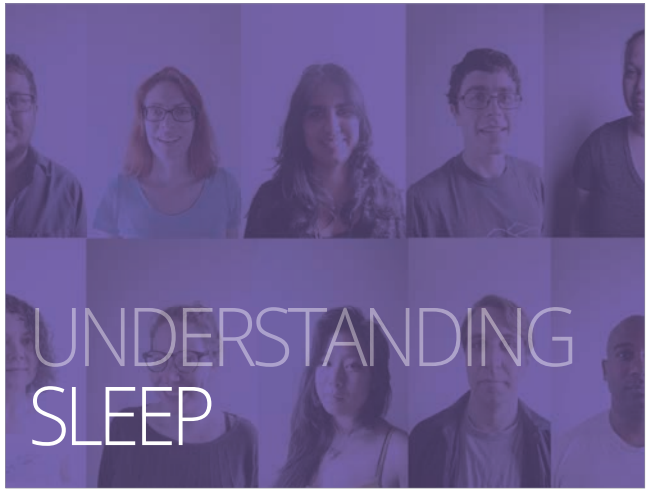
UX Scenario / UI Design Schematics

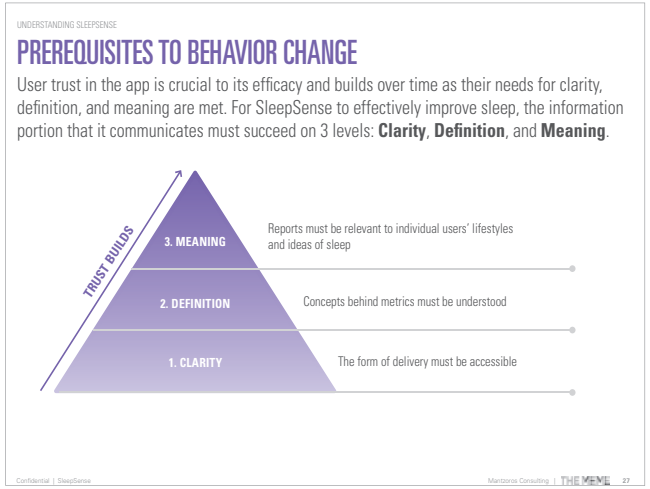


Sleep Tracking Platform: UX Design for Behavior Change

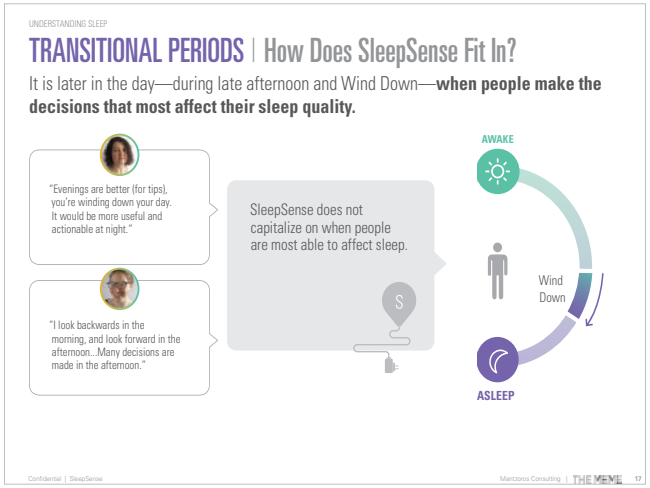
User Research and UX/UI Design for the mobile App of a Sleep Tracking Platform. The project focused on examining the efficacy of the sleep tracker (sensor) and on determining how the experience of using this device impacts user sleep patterns and behavior on a short-term basis.

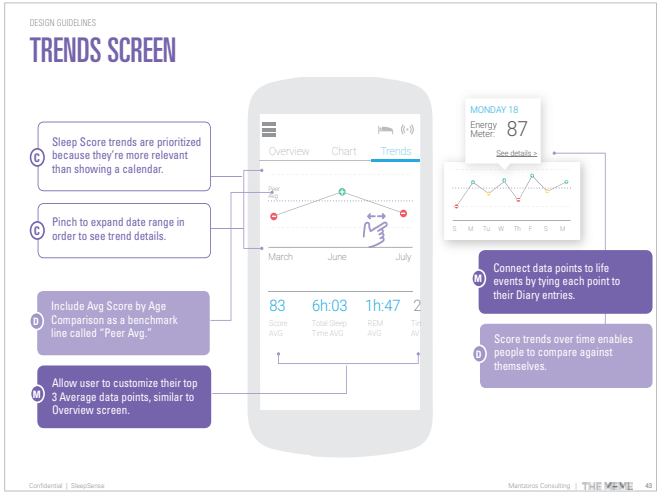
User Research / Insights

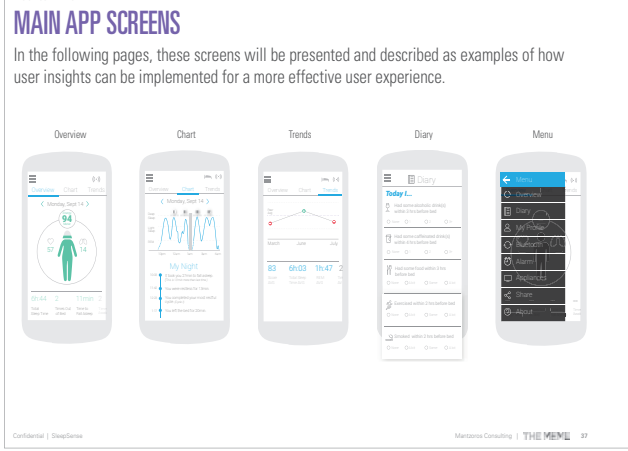


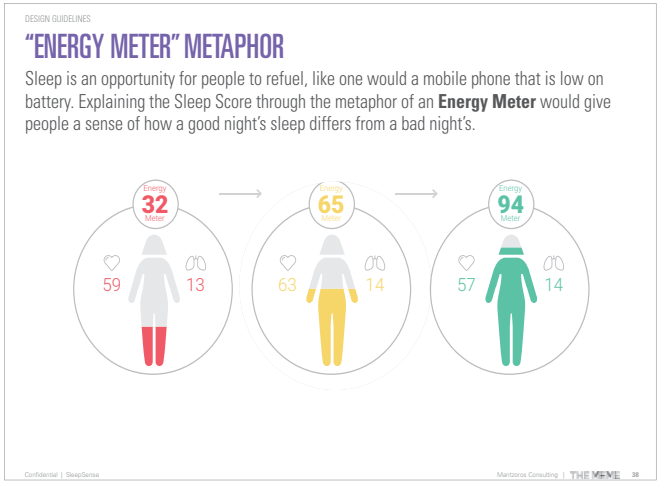


UX Design / Strategy



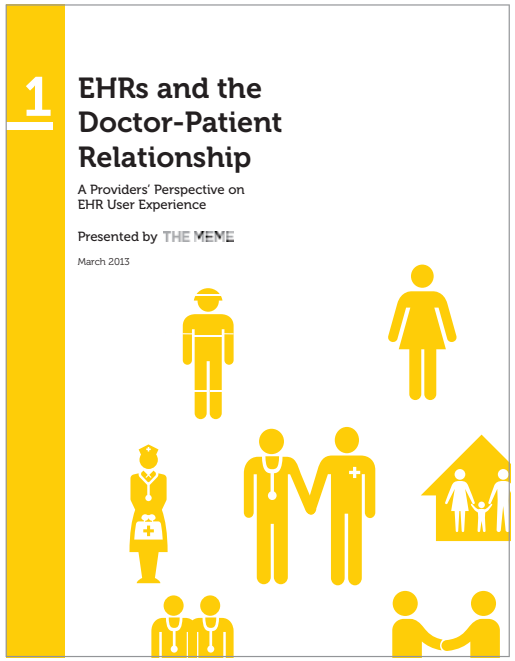






EHRs and the Doctor-Patient Relationship

White paper exploring the way technology is having an impact in medical practice, in particular EHR systems. Research included interviews with health providers in leading hospitals in the Boston area to gather insights on how their evolving relationship with patients is mediated by digital systems.



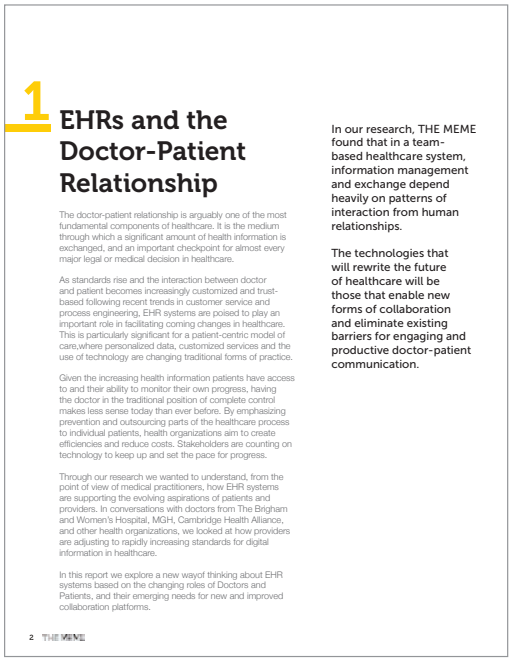
1

EHRs and the Doctor-Patient Relationship

A Providers' Perspective on EHR User Experience

Presented by THE MEME

March 2013



1

EHRs and the Doctor-Patient Relationship

The doctor-patient relationship is arguably one of the most fundamental components of healthcare. It is the medium through which a significant amount of health information is exchanged, and an important checkpoint for almost every major legal or medical decision in healthcare.

As standards rise and the interaction between doctor and patient becomes increasingly customized and trust-based following recent trends in customer service and process engineering, EHR systems are poised to play an important role in facilitating coming changes in healthcare. This is particularly significant for a patient-centric model of care,where personalized data, customized services and the use of technology are changing traditional forms of practice.

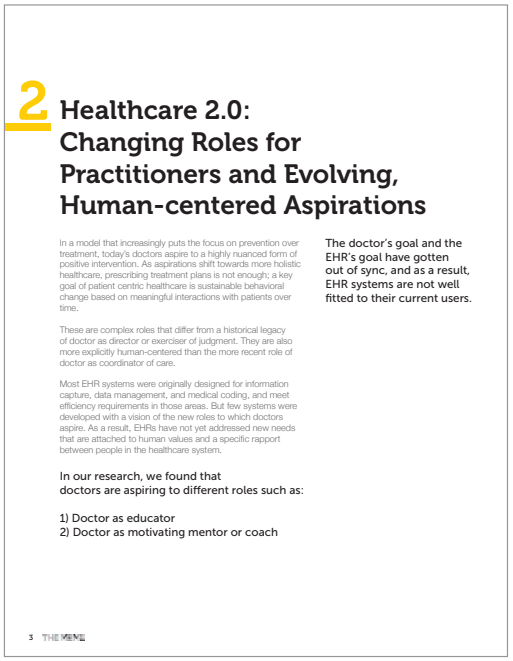
Given the increasing health information patients have access to and their ability to monitor their own progress, having the doctor in the traditional position of complete control makes less sense today than ever before. By emphasizing prevention and outsourcing parts of the healthcare process to individual patients, health organizations aim to create efficiencies and reduce costs. Stakeholders are counting on technology to keep up and set the pace for progress.

Through our research we wanted to understand, from the point of view of medical practitioners, how EHR systems are supporting the evolving aspirations of patients and providers. In conversations with doctors from The Brigham and Women's Hospital, MGH, Cambridge Health Alliance, and other health organizations, we looked at how providers are adjusting to rapidly increasing standards for digital information in healthcare.

In this report we explore a new wayof thinking about EHR systems based on the changing roles of Doctors and Patients, and their emerging needs for new and improved collaboration platforms.

In our research, THE MEME found that in a team-based healthcare system, information management and exchange depend heavily on patterns of interaction from human relationships.

The technologies that will rewrite the future of healthcare will be those that enable new forms of collaboration and eliminate existing barriers for engaging and productive doctor-patient communication.



2

Healthcare 2.0: Changing Roles for Practitioners and Evolving, Human-centered Aspirations

In a model that increasingly puts the focus on prevention over treatment, today's doctors aspire to a highly nuanced form of positive intervention. As aspirations shift towards more holistic healthcare, prescribing treatment plans is not enough; a key goal of patient centric healthcare is sustainable behavioral change based on meaningful interactions with patients over time.

These are complex roles that differ from a historical legacy of doctor as director or exerciser of judgment. They are also more explicitly human-centered than the more recent role of doctor as coordinator of care.

Most EHR systems were originally designed for information capture, data management, and medical coding, and meet efficiency requirements in those areas. But few systems were developed with a vision of the new roles to which doctors aspire. As a result, EHRs have not yet addressed new needs that are attached to human values and a specific rapport between people in the healthcare system.

In our research, we found that doctors are aspiring to different roles such as:

1) Doctor as educator
2) Doctor as motivating mentor or coach

The doctor's goal and the EHR's goal have gotten out of sync, and as a result, EHR systems are not well fitted to their current users.

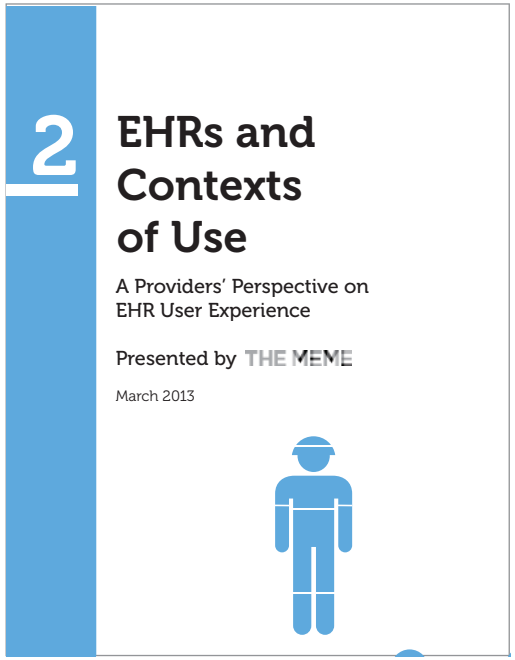
1) EHR as Translator: Build a Common Language

Both Educator and Mentor rely on communicating corroboratively with patients. Visual formats and ed resources can provide an interactive means to chec mutual understanding.

- Translating medical information and trends into int graphics and displays for patients can relieve unn stress that might result from a misunderstanding c medical data.
- Intuitive visual formats can facilitate clear understa normal and abnormal ranges for tests, expected c and next steps for treatment.
- Reduce the complexity of data with look and feel decrease cognitive load and improve clarity.
- Well-summarized, relevant patient information can doctors avoid being distracted or lost in the data their important patient interviews.
- Allowing patients to describe symptoms in advanc own language to help doctors prepare creates the compare terms during the medical interview.
- Provide conversational tools that support doctor-p interactions, both in real-time during consultation remotely.
- Providing simple educational material with clear vi information and using simple language can help p and doctors discuss diagnosis, diseases, medicat results.
- Hosting direct links to trusted and recommended resources for medical information that doctors ca and supervise can encourage patients to learn mo their conditions or lab results on their own, increas transparency and trust.

EHRs and Contexts of Use

White paper exploring the way technology is having an impact in medical practice, in particular EHR systems. We collected insights from health providers in leading hospitals in the Boston area about how digital information can and should be accessed on and off clinical settings, for both in-patient and out-patient scenarios.



2

EHRs and Contexts of Use

A Providers' Perspective on EHR User Experience

Presented by THE MEME

March 2013

1 EHRs and Contexts of Use

It's not a new concept. Most modern EHRs, descending from products designed for a desktop experience, are out of date in terms of mobile access. As phones, tablets, and other devices bring a desktop's display and processing beyond its stationary role, software systems are expected to follow along, providing a continuous experience across a variety of new contexts and platforms of access.

Demands on healthcare providers leave them with a strong need for timely access to relevant medical information, in both inpatient and outpatient settings. Yet particularly with regard to interactions between doctor and patient, there is a delicate balance between technology that supports vs. technology that interferes. This balance becomes difficult to achieve as technology is expected to support increasingly varied and complicated workflows in clinics and hospitals alike.

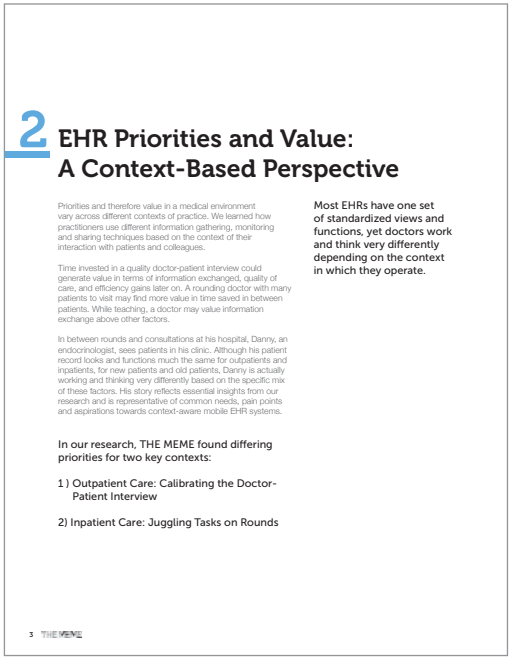
Today's complex inpatient and outpatient EHR systems represent significant differences between both forms of care and the organizations that support them. They have different challenges, processes, certification criteria and measures for clinical quality. Efforts to integrate them in a single platform have focused on facilitating the efficient management of workflows, information exchange, and documentation. But this is not enough. We have to understand the fundamental human experiences and priorities of physicians and their patients in different contexts of care to develop the next generation of innovative EHR solutions.

In conversations with doctors from The Brigham and Women's Hospital, MGH, Cambridge Health Alliance, and other health organizations, we looked at how providers are adjusting to rapidly increasing standards for digital information in healthcare. In this report we explore how EHR systems need to be designed with a better understanding of the different contexts of practice for healthcare professionals and the flexibility required to satisfy their emerging needs.

EHR systems are based on optimizing value, whether in terms of claims accepted, time saved, information exchanged, or overall quality of care.

However, value in a health organization changes based on context, and from stakeholder to stakeholder.

Therefore, when considering the increase in quality expected with more pervasive EHR technology, it's important to define: quality for whom? In what context? How do we define and measure quality in different situations?



2 EHR Priorities and Value: A Context-Based Perspective

Priorities and therefore value in a medical environment vary across different contexts of practice. We learned how practitioners use different information gathering, monitoring and sharing techniques based on the context of their interaction with patients and colleagues.

Time invested in a quality doctor-patient interview could generate value in terms of information exchanged, quality of care, and efficiency gains later on. A rounding doctor with many patients to visit may find more value in time saved in between patients. While teaching, a doctor may value information exchange above other factors.

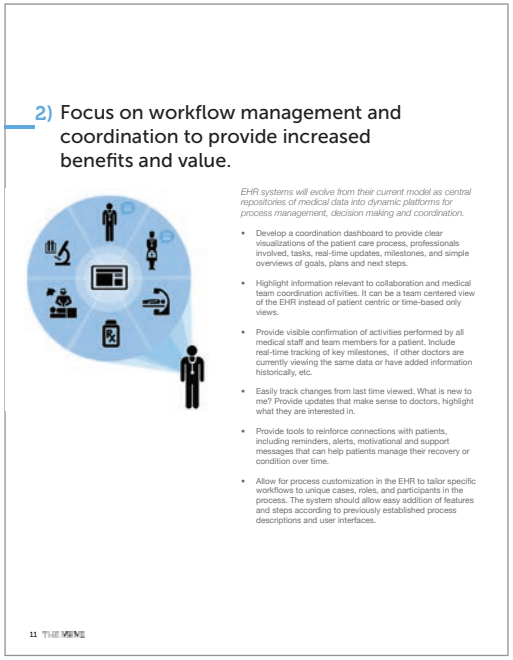
In between rounds and consultations at his hospital, Danny, an endocrinologist, sees patients in his clinic. Although his patient record looks and functions much the same for outpatients and inpatients, for new patients and old patients, Danny is actually working and thinking very differently based on the specific mix of these factors. His story reflects essential insights from our research and is representative of common needs, pain points and aspirations towards context-aware mobile EHR systems.

Most EHRs have one set of standardized views and functions, yet doctors work and think very differently depending on the context in which they operate.

In our research, THE MEME found differing priorities for two key contexts:

1) Outpatient Care: Calibrating the Doctor-Patient Interview

2) Inpatient Care: Juggling Tasks on Rounds



2) Focus on workflow management and coordination to provide increased benefits and value.

EHR systems will evolve from their current model as central repositories of medical data into dynamic platforms for process management, decision making and coordination.

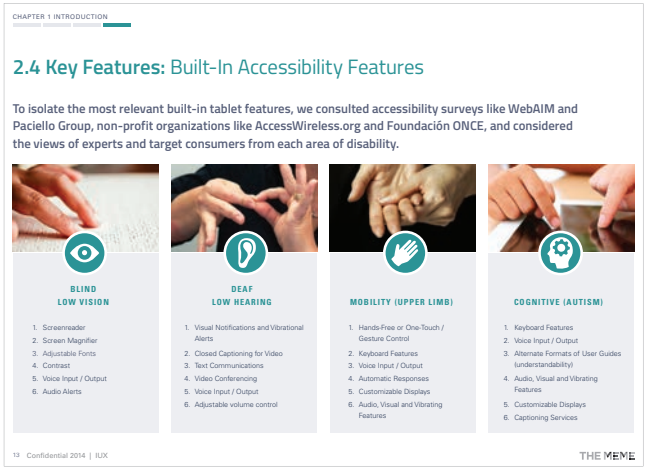
- Develop a coordination dashboard to provide clear visualizations of the patient care process, professionals involved, tasks, real-time updates, milestones, and simple overviews of goals, plans and next steps.
- Highlight information relevant to collaboration and medical team coordination activities. It can be a team centered view of the EHR instead of patient centric or time-based only views.
- Provide visible confirmation of activities performed by all medical staff and team members for a patient. Include real-time tracking of key milestones, if other doctors are currently viewing the same data or have added information historically, etc.
- Easily track changes from last time viewed. What is new to me? Provide updates that make sense to doctors, highlight what they are interested in.
- Provide tools to reinforce connections with patients, including reminders, alerts, motivational and support messages that can help patients manage their recovery or condition over time.
- Allow for process customization in the EHR to tailor specific workflows to unique cases, roles, and participants in the process. The system should allow easy addition of features and steps according to previously established process descriptions and user interfaces.

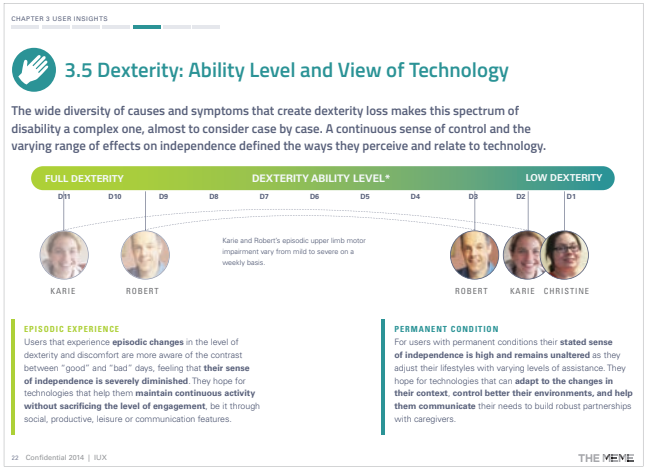
ACCESSIBLE UX - INCLUSIVE DESIGN

Inclusive Design Strategy for Tablet Devices

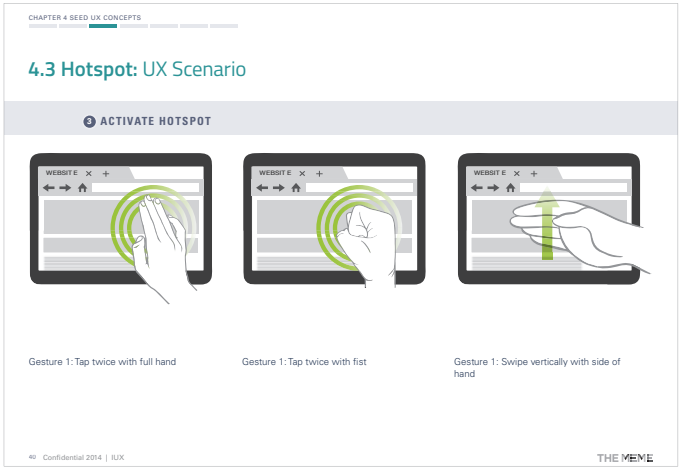
Developed UX strategy and new accessibility features for tablets targeting consumers with vision, hearing, dexterity (hands) and cognitive (autism) functional limitations. Delivered insights on current usage patterns, levels of satisfaction, and unmet accessibility needs, as well as seed UX/UI design concepts.

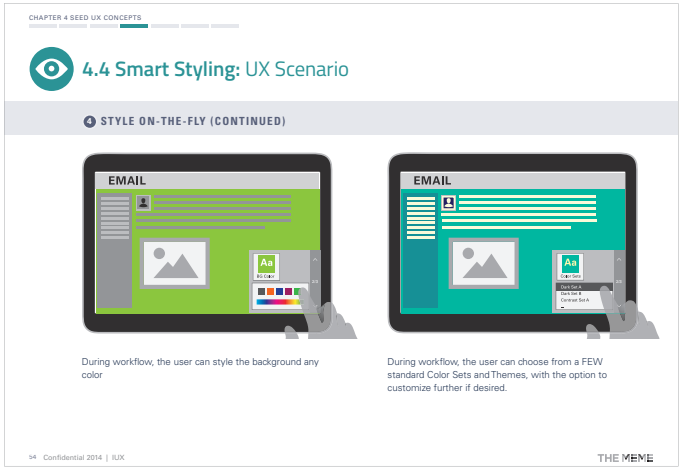
User + Expert Research / Insights

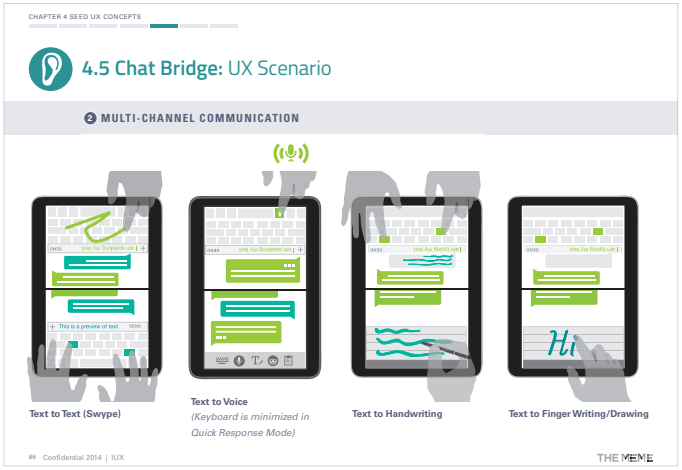


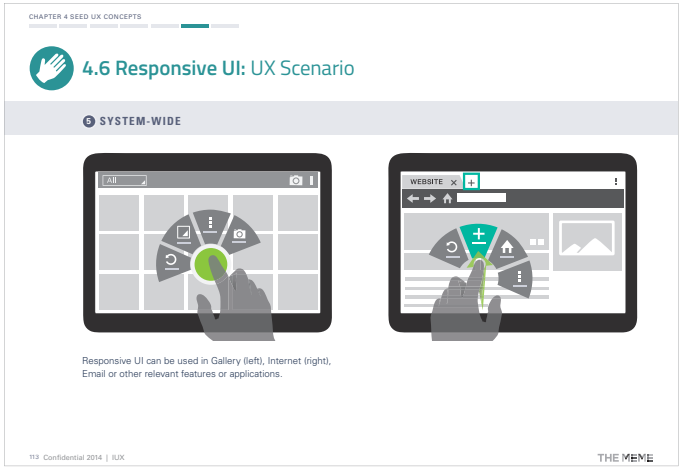


UX Design Strategy / UI Concepts





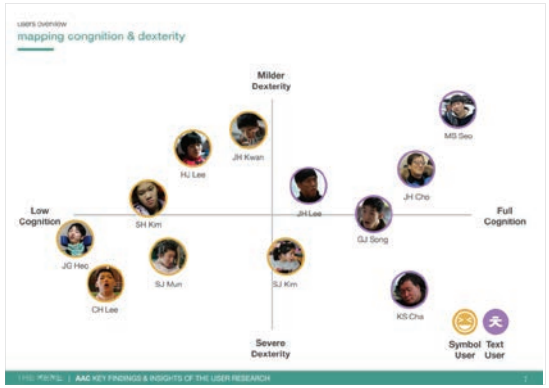


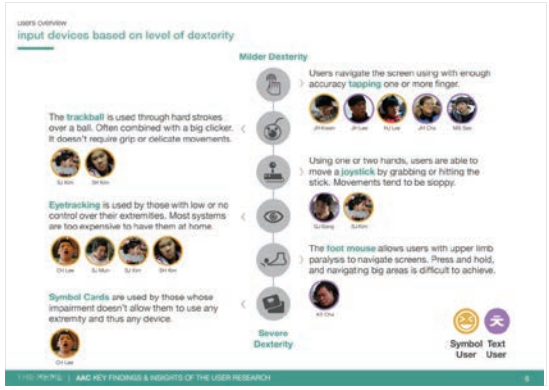


Augmented Alternative Communication App Design

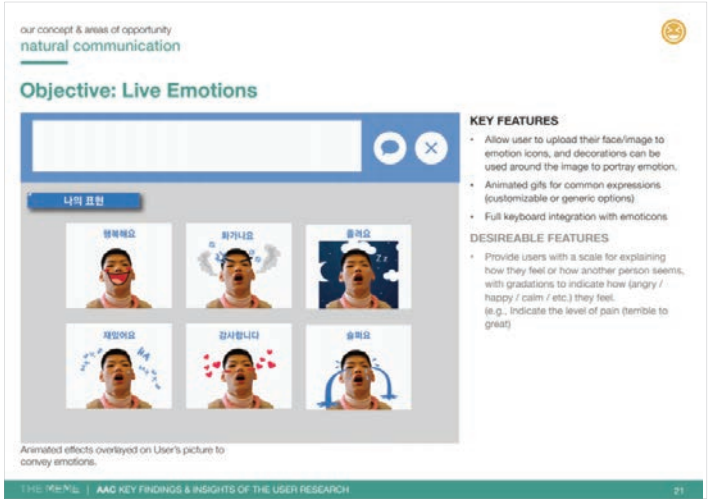
Research and Interaction Design for 3 tablet and mobile AAC apps. The project focuses on providing access to a symbol-based and a text-based communication platform as well as an optimized digital keyboard for users with limited speech capability and across a spectrum of different cognitive limitations.

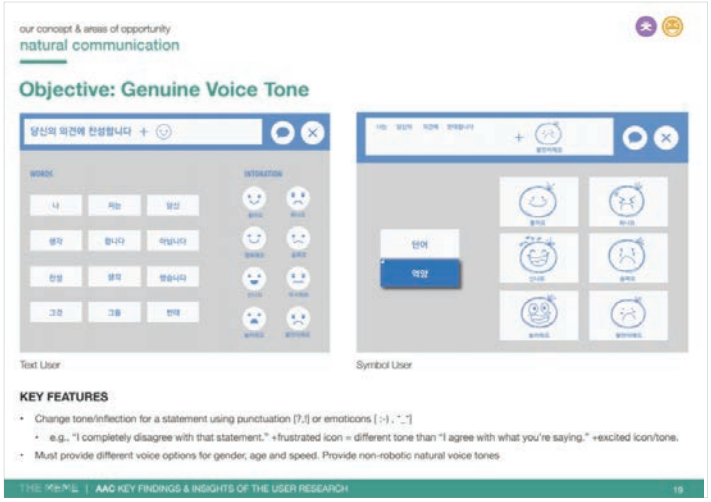
User Research Insights





UX Design Strategy / UI Design

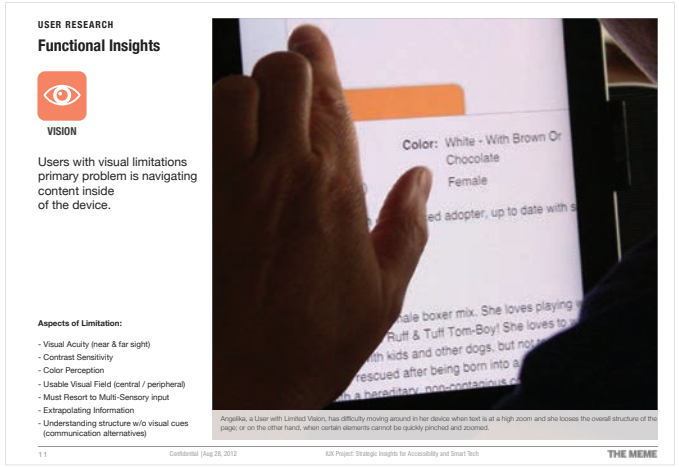




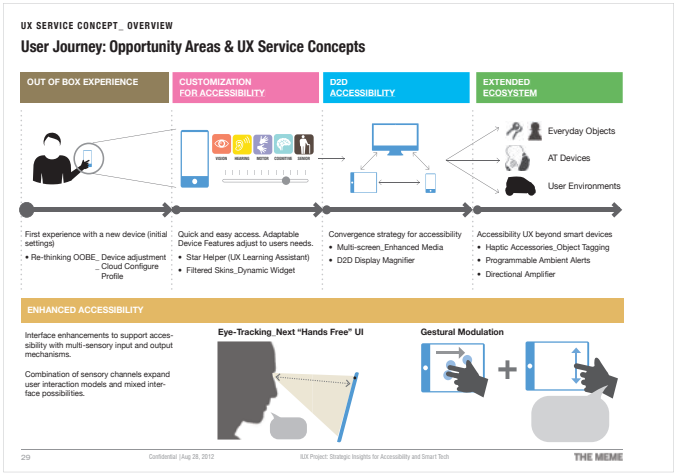
Inclusive UX Design for Screen-Based Devices

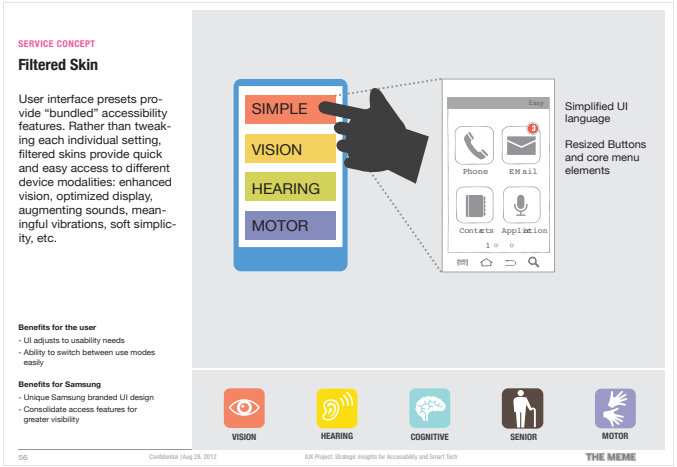
Based on in-depth user research, developed Inclusive UX features for Smart Devices (phone, tablet, and TV), focusing on users with disabilities (vision, hearing, dexterity (upper limb) and cognitive) as well as senior citizens in the US.

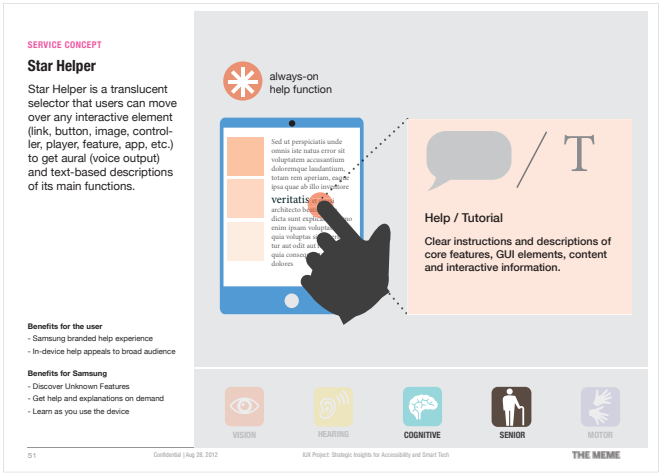
User + Expert Research / Insights

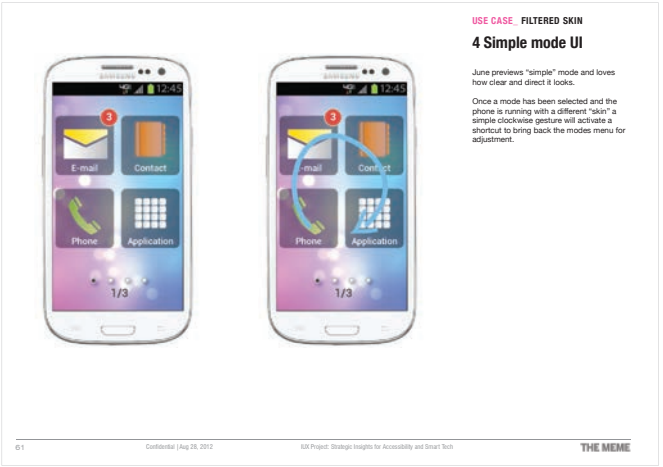


UX Design Strategy / UI Concepts





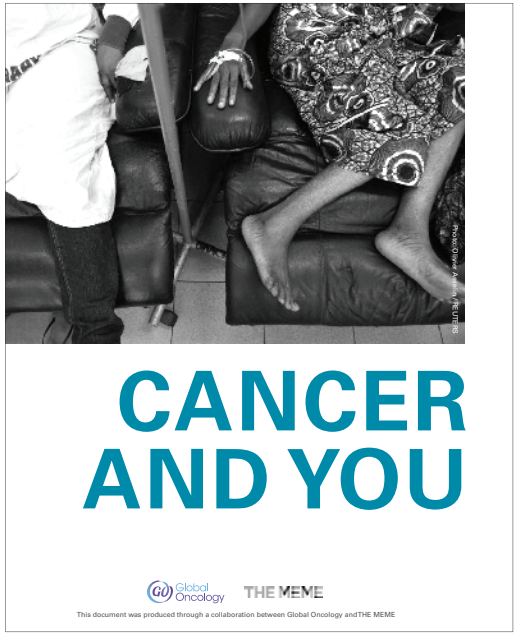




Patient Education Materials for Low Literacy (Oncology)

In collaboration with Global Oncology, developed culturally appropriate patient education materials targeted at low literacy populations in developing countries to improve patient's understanding of their disease symptoms, and chemotherapy treatment adherence. Implemented and tested in Malawi, Rwanda, Botswana and Haiti.

Booklet Design



CANCER AND YOU

Global Oncology THE MEME

This document was produced through a collaboration between Global Oncology and THE MEME

WHEN **TO SEEK MEDICAL ATTENTION**

GO TO THE HOSPITAL RIGHT AWAY IF YOU HAVE ANY OF THESE SYMPTOMS.

Many problems after treatment are normal but some are not. Talk to your doctor or nurse if you have any of these problems, especially if you feel worse.

Chest Pain

Shortness Of Breath

Fainting

Fever

SIDE-EFFECTS **RECORDER**

DIRECTIONS

Circle which emotion you feel for each symptom you experienced. Circle how you feel after each cycle of treatment.

Date	Fatigue	Vomiting	Constipation	Diarrhea
CYCLE 1	☺ 😐 ☹	☺ 😐 ☹	☺ 😐 ☹	☺ 😐 ☹
CYCLE 2	☺ 😐 ☹	☺ 😐 ☹	☺ 😐 ☹	☺ 😐 ☹
CYCLE 3	☺ 😐 ☹	☺ 😐 ☹	☺ 😐 ☹	☺ 😐 ☹
CYCLE 4	☺ 😐 ☹	☺ 😐 ☹	☺ 😐 ☹	☺ 😐 ☹
CYCLE 5	☺ 😐 ☹	☺ 😐 ☹	☺ 😐 ☹	☺ 😐 ☹
CYCLE 6	☺ 😐 ☹	☺ 😐 ☹	☺ 😐 ☹	☺ 😐 ☹
CYCLE 7	☺ 😐 ☹	☺ 😐 ☹	☺ 😐 ☹	☺ 😐 ☹
CYCLE 8	☺ 😐 ☹	☺ 😐 ☹	☺ 😐 ☹	☺ 😐 ☹

Other Side-Effects Experienced:_____

CARING **FOR PEOPLE WITH CANCER**

Rest

You will be tired from chemotherapy. Take time to sleep and rest. Ask family members to help you with your household duties after treatment.

Cover Your Head

If you lose your hair, you should protect your head by covering it with a scarf or hat.

Eat Well

Avoid spicy food and street food. Eat small amounts of bland, foods of different color, cooked well, food throughout the day.

Drink Water

Drink safe water - boil or treat your water before drinking.

Care for Mouth Sores

For mouth sores, mix a pinch of salt with warm, safe water in a small cup or bottle. Rinse your mouth with this saltwater before and after eating, and before sleeping at night.

Wash Hands

Wash your hands with soap and water regularly, especially when you are cooking or around any animals.

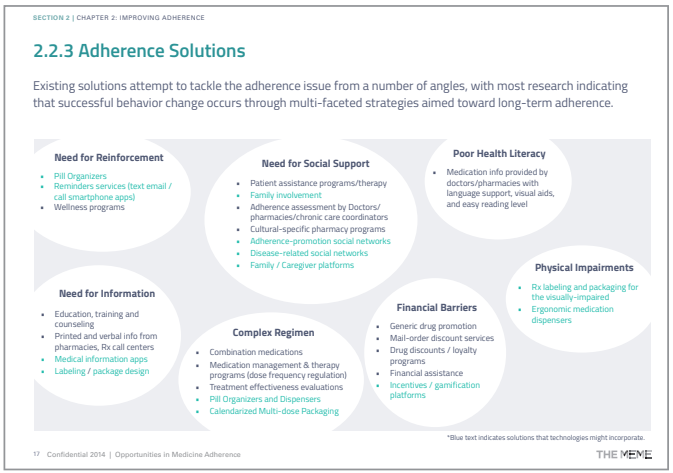
Other Suggestions From Doctor:_____

HEALTHCARE BUSINESS STRATEGY

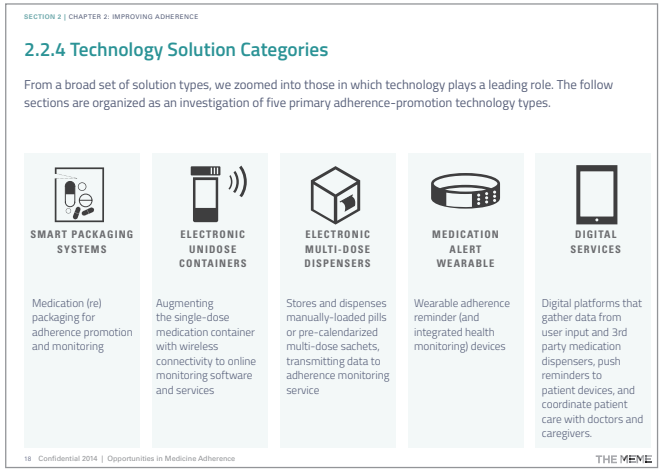
Medicine Adherence Service Strategy

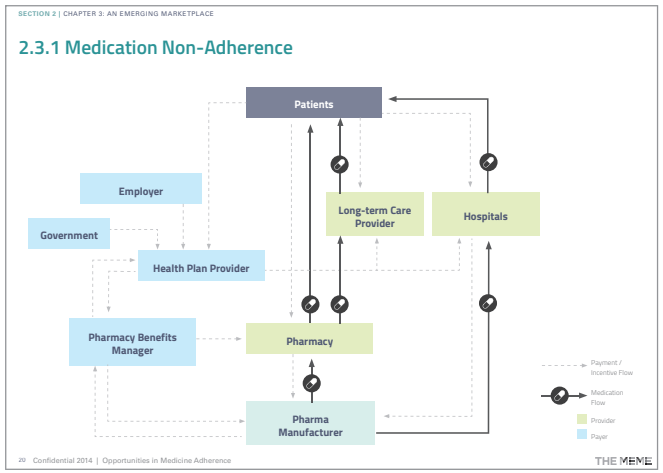
Research on the U.S. healthcare and medication adherence market, addressing policy changes of the Affordable Care Act (AAC/2010). Developed a road map for entering strategic partnerships for future healthcare-related technology projects. Created new product and service design concepts matching potential new business opportunities.

Expert / Industry Research

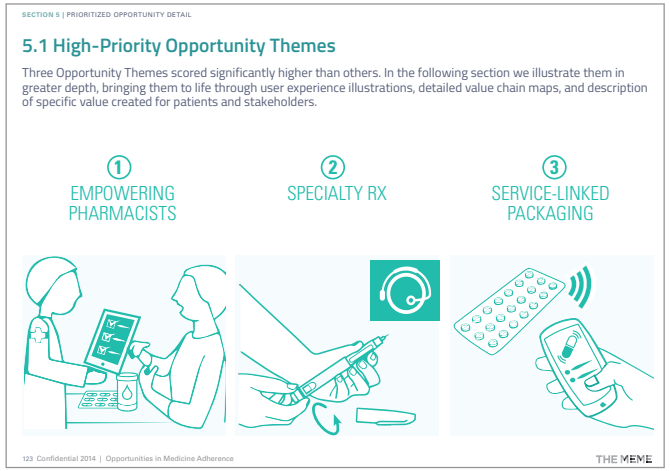


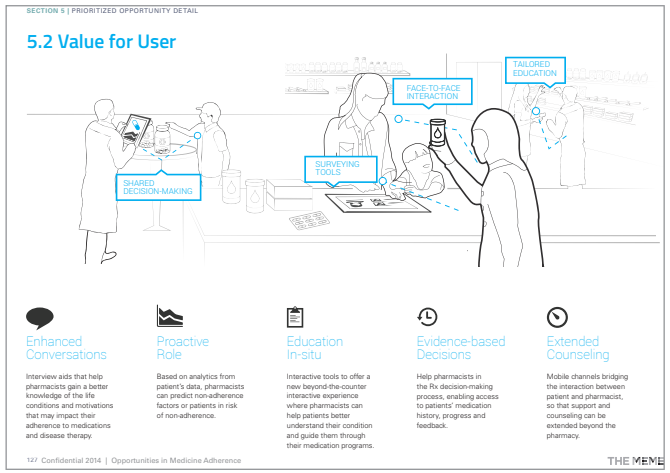
Design Strategy





Product / Service Design Concepts



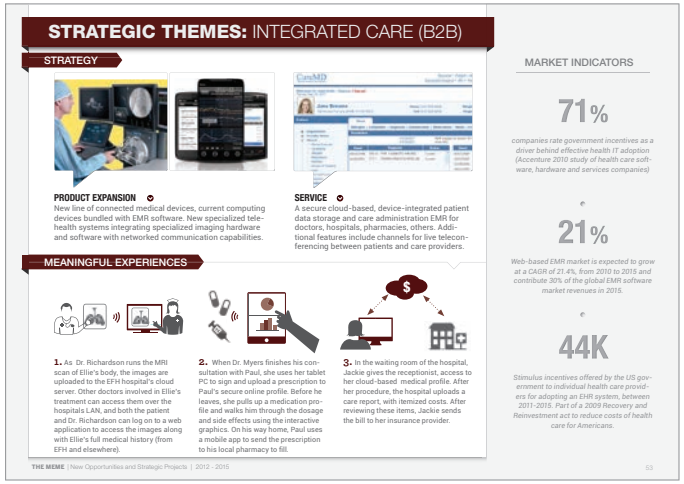


Future Market Trends : Tele-Health

Identified new business opportunities by conducting market and industry trend research. The focus was on understanding the possibilities within the Tele-Health space. Identified relevant technologies, competitors and business models.

Identifying Themes & Trends

Research Insights

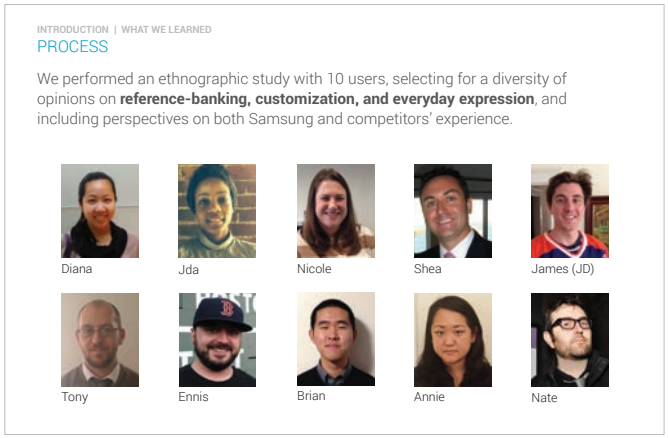


MOBILE EXPERIENCE

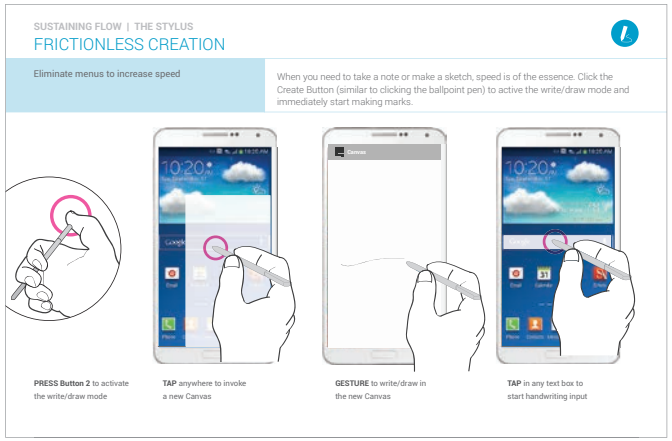
Next UX For Mobile—Phablets

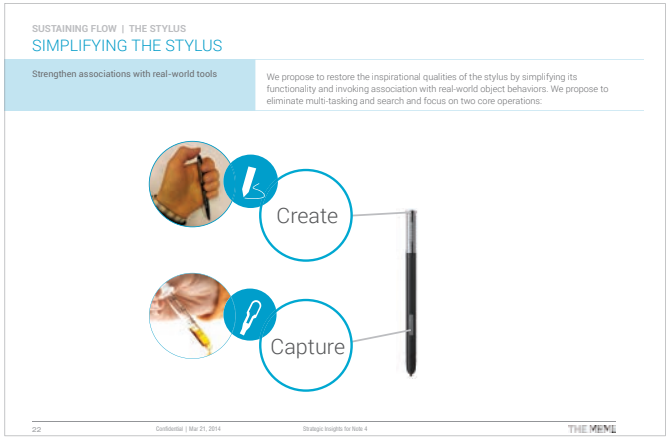
Identified product differentiators and unique selling points for large smartphones (Phablet) and discovered emerging behaviors and usage patterns for new feature development.

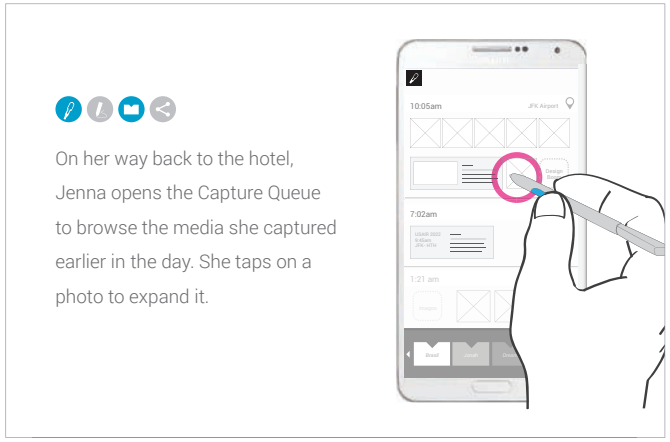
User Research / Insights



UX Scenarios and Design Concepts



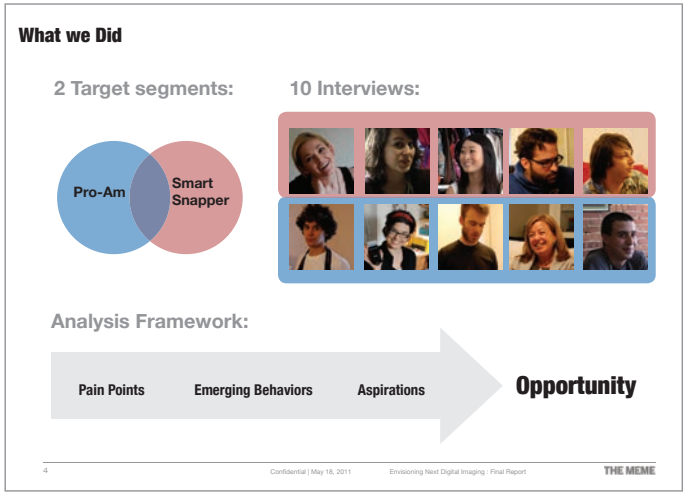


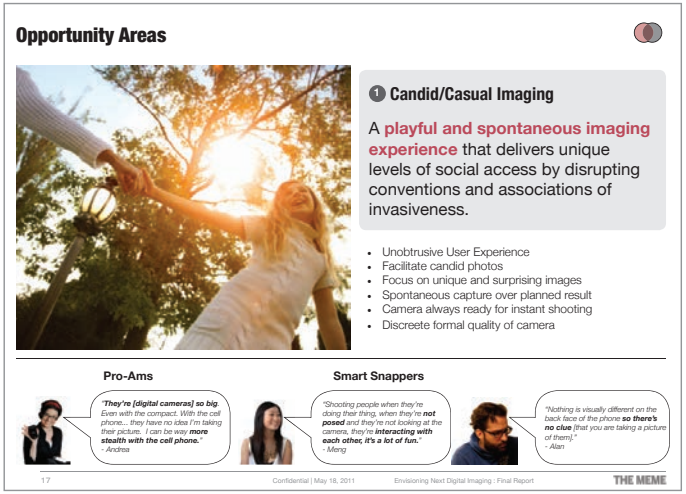


Envisioning New Imaging User Experience

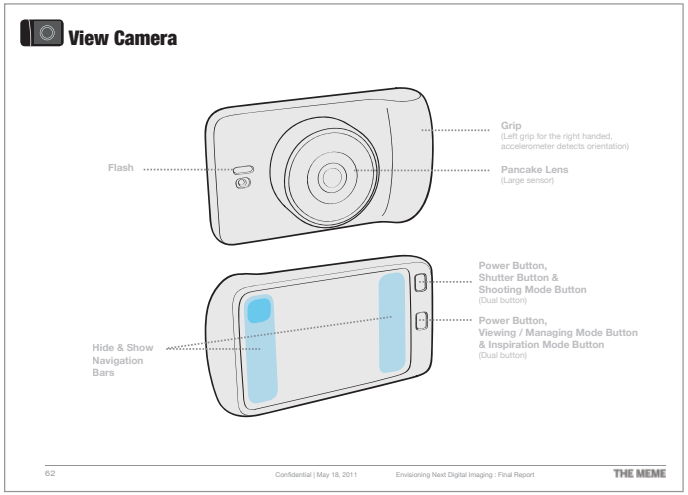
Forecasted evolving dynamics of imaging technologies, markets, and user behaviors. Created concept designs for future product platforms, PUI/GUI interfaces and interaction models, supported by UX scenarios and use cases.

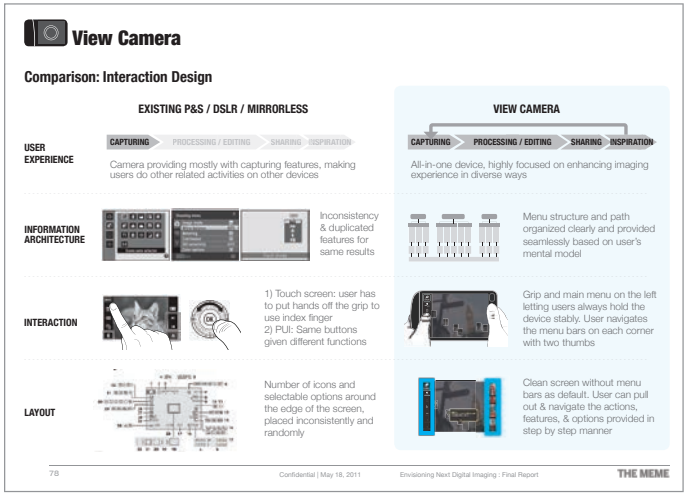
User Research / Insights

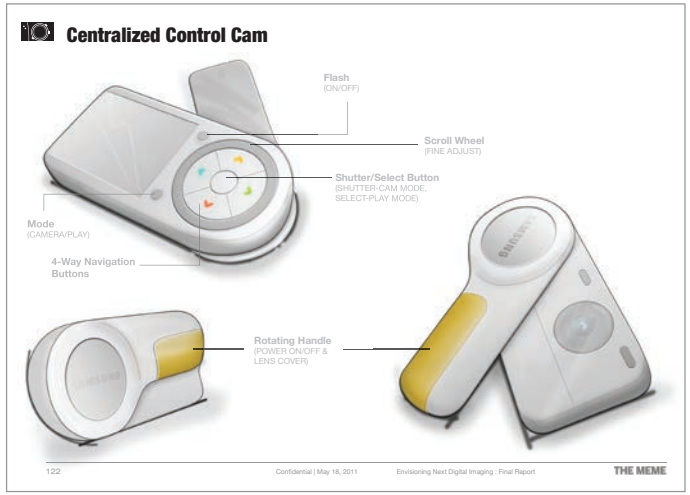


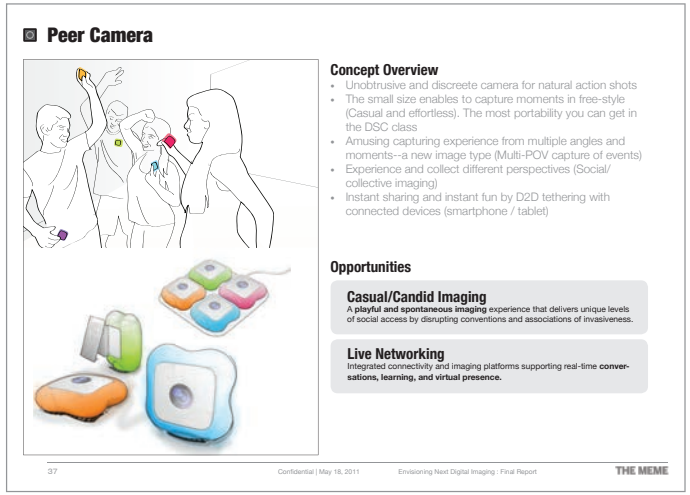


Design Strategy / Product and UX Concepts



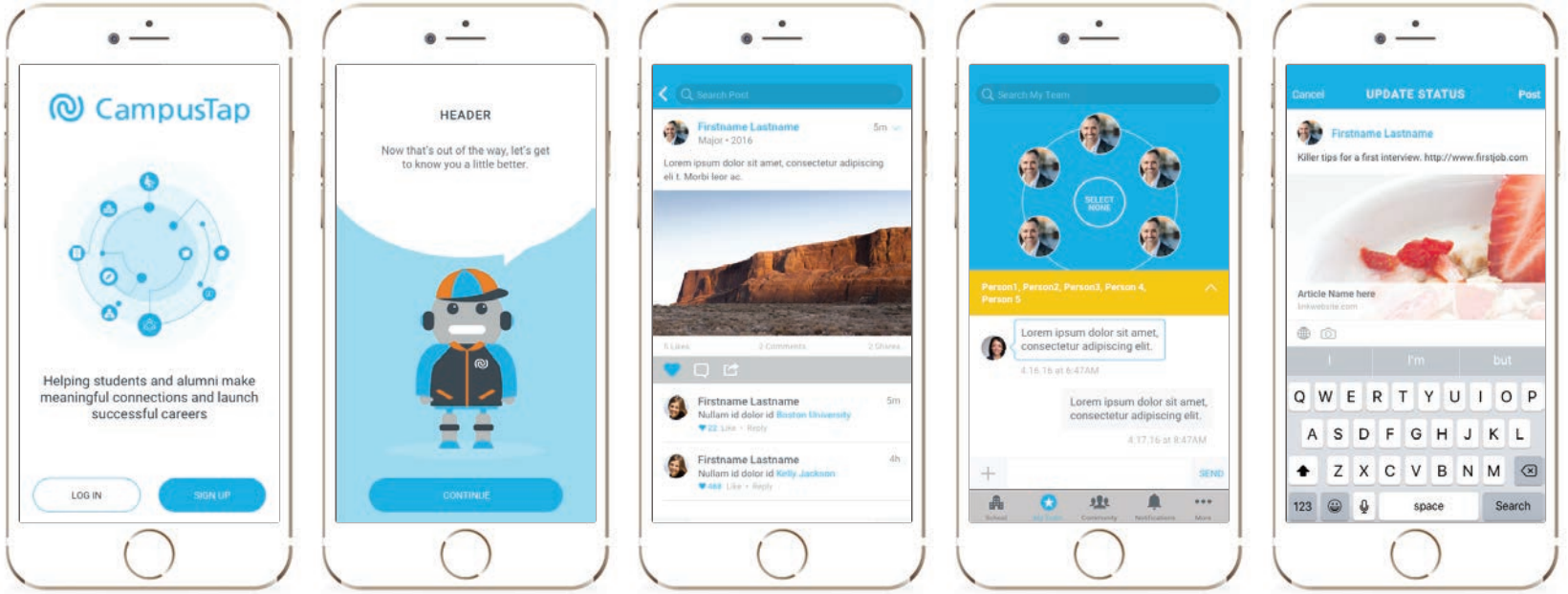




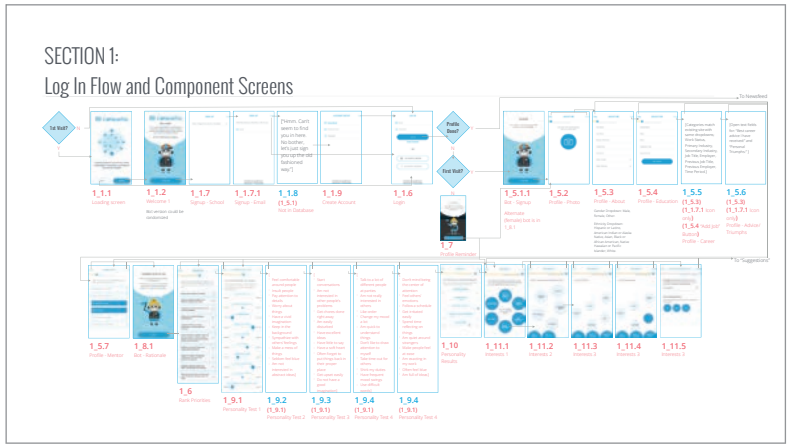


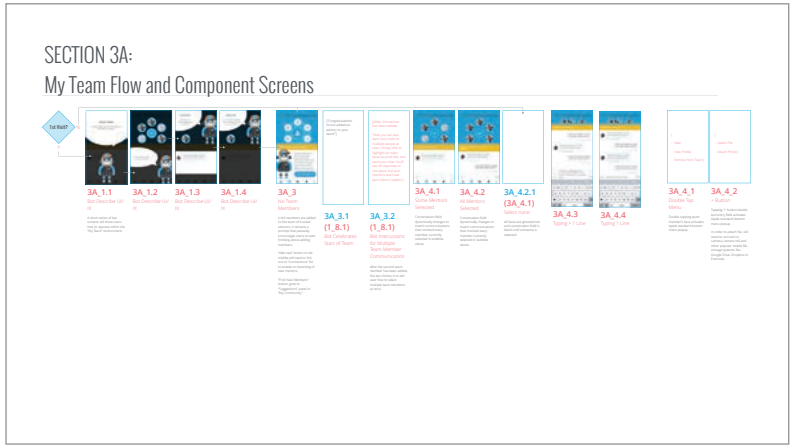
CampusTap : Mentorship Building (Mobile App)

User research, concept validation and UX/UI design of a mobile application for CampusTap, a startup fousing on creating a digital platform and related services to foster mentor relationships in colleges across the US.



UI Design / iOS



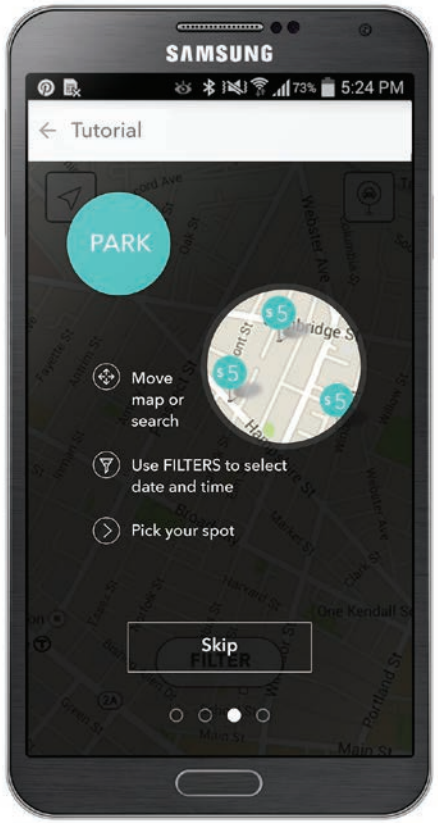


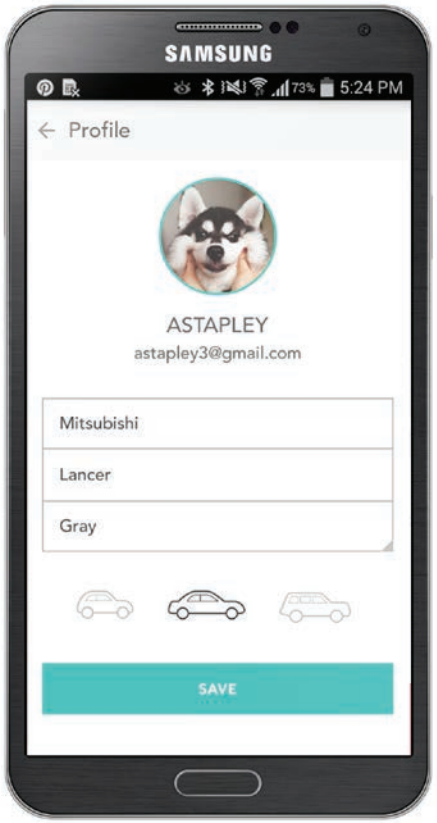
App Architecture / UX

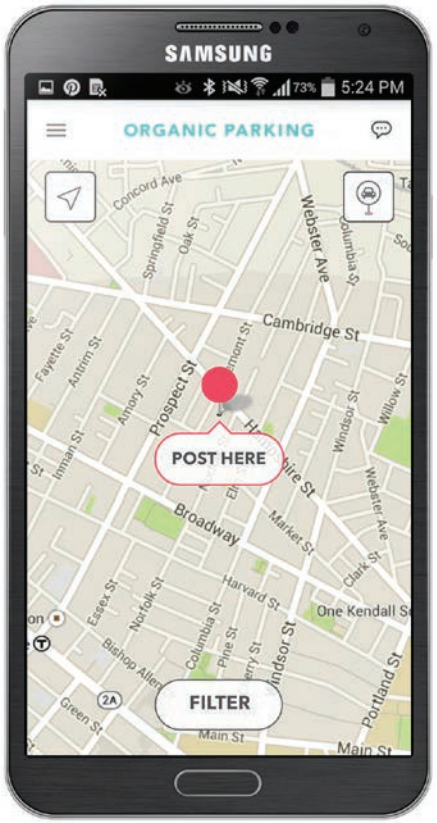
Parking App Redesign / Pivot

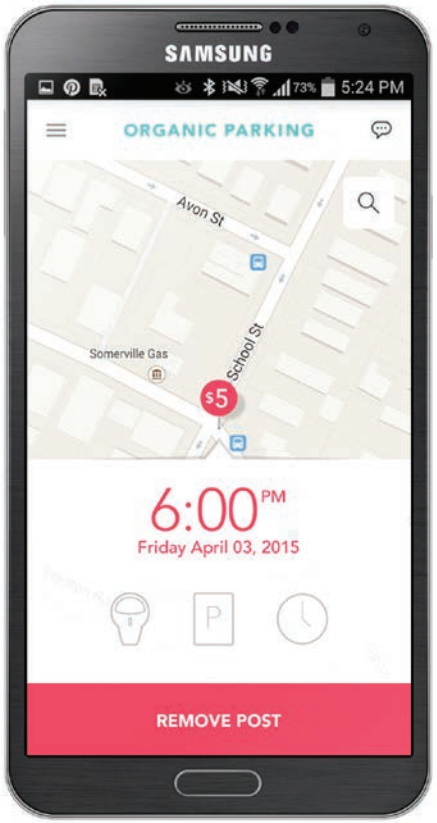
Conducted research to redesign mobile application for shared parking. Developed user studies to verify concept viability and redesign for additional markets in the trucking industry.

Android / iOS App Design





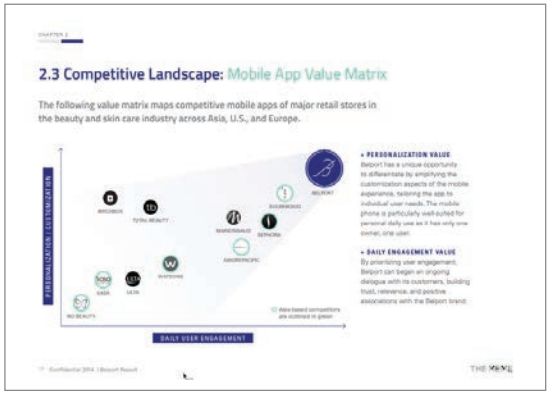




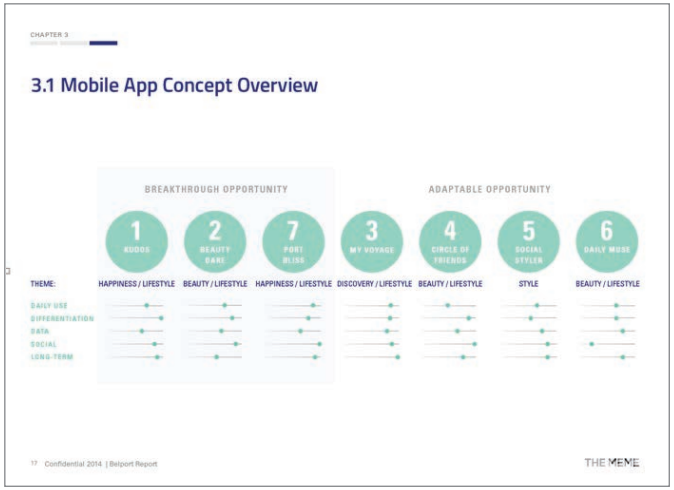
Crowdsourcing Decision-Making

Identified opportunities in the Korean market for a user-centric mobile app with a beauty focus. Created service/ engagement models and developed strategy for gamification. App UX/UI concept development and visual design.

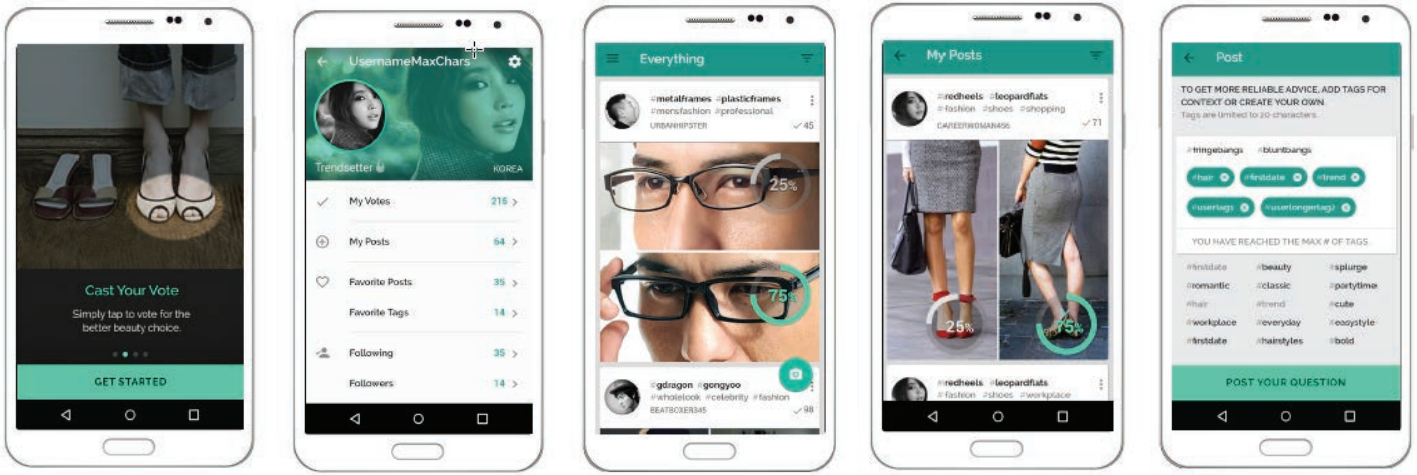
Research Insight



Service Design Strategy



Android App Design

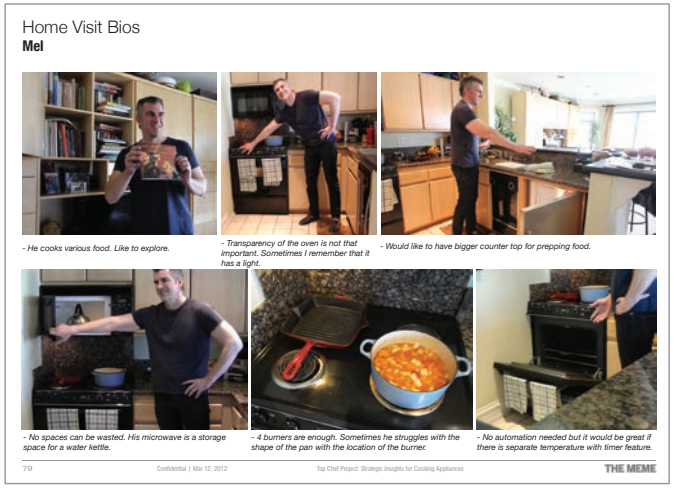


DIGITAL APPLIANCES

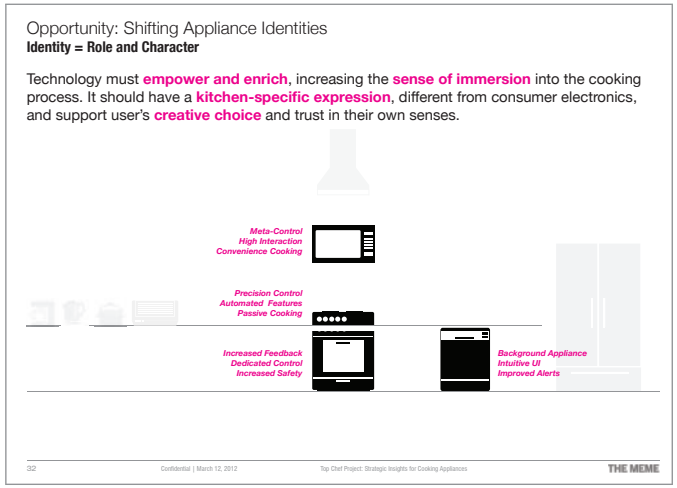
Envisioning New Type of Cooking Appliance

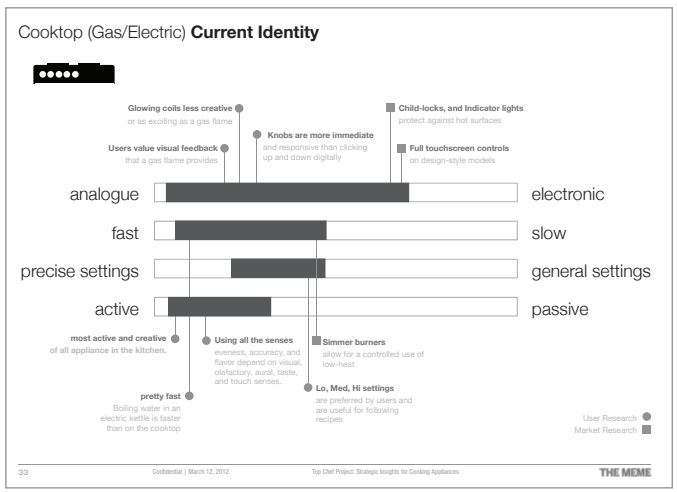
Conducted design research to provide insights on innovative Product Design and UX Concepts for Cooking Appliances in the U.S.

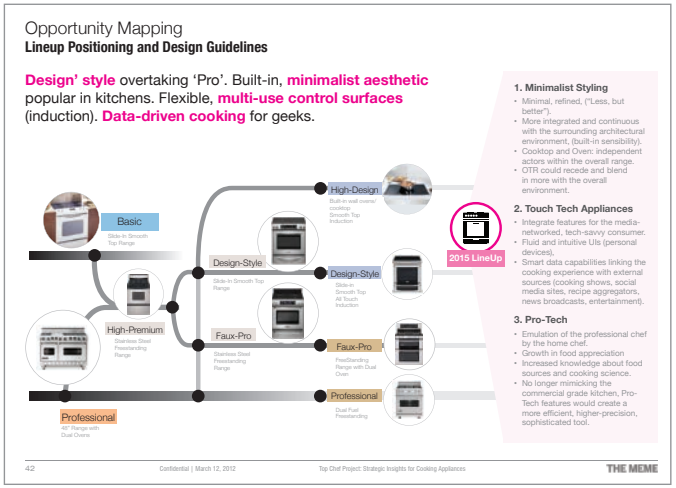
User Research / Insights

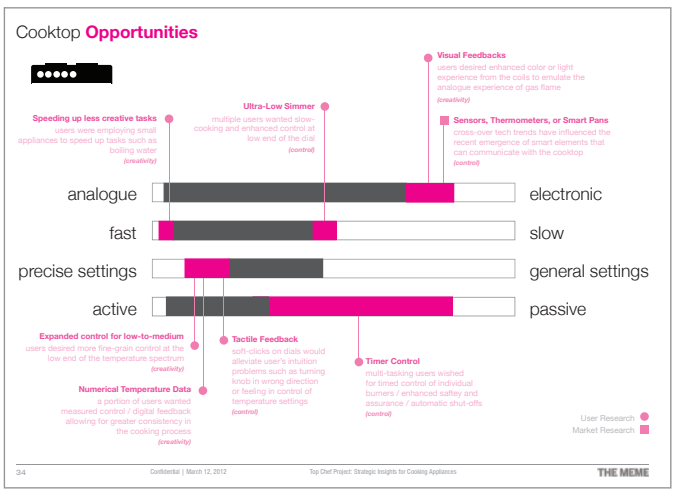


Product Concepts / Roadmap







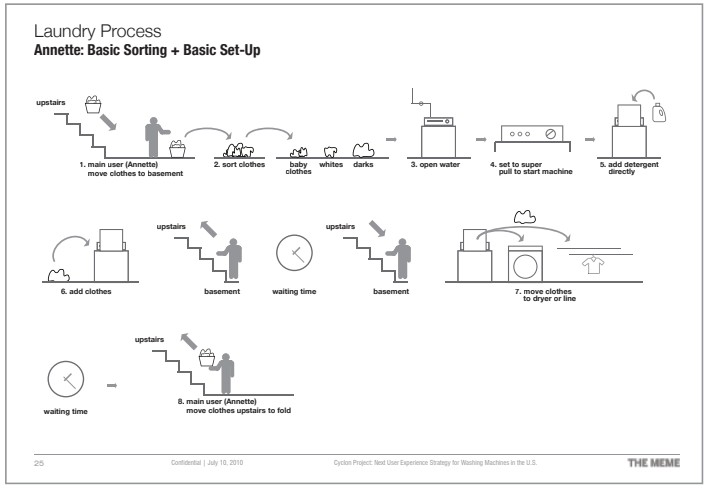


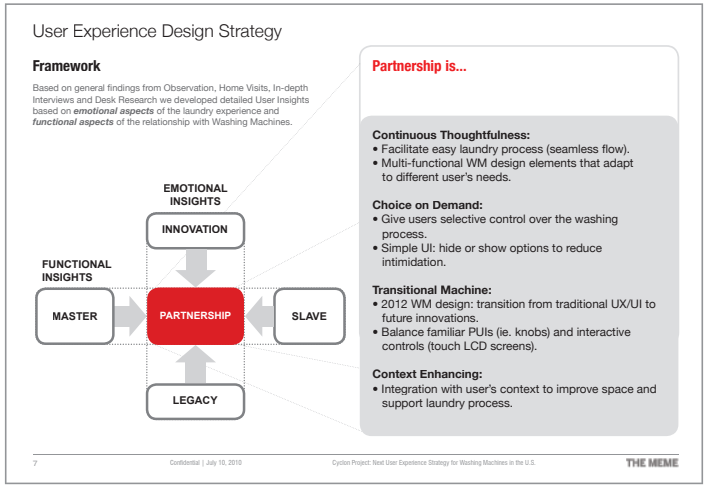
Interaction Design for Washing Machine Control Panel

Analyzed consumer behaviors, habits and preferences in their natural context (home) while operating washing machines. Provided insights on users' mental models for washing and developed innovative concepts for Control Panel Design.

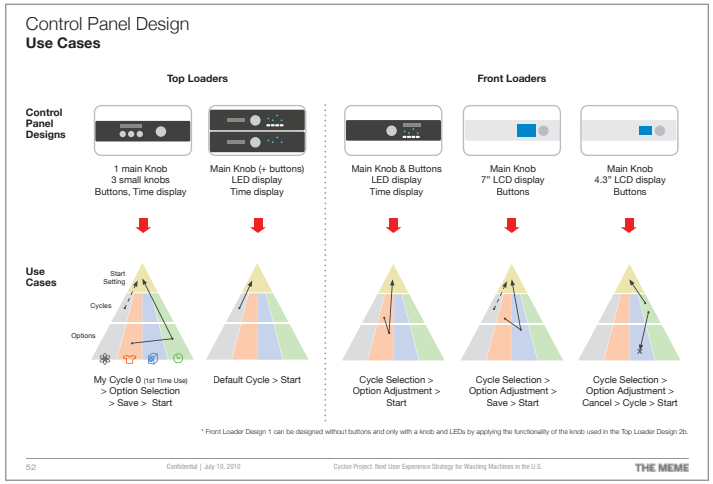
User Research

Research Insights

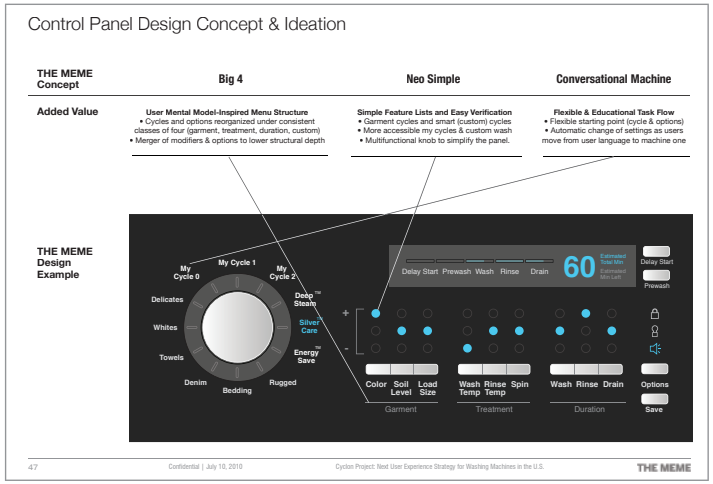




Design Strategy



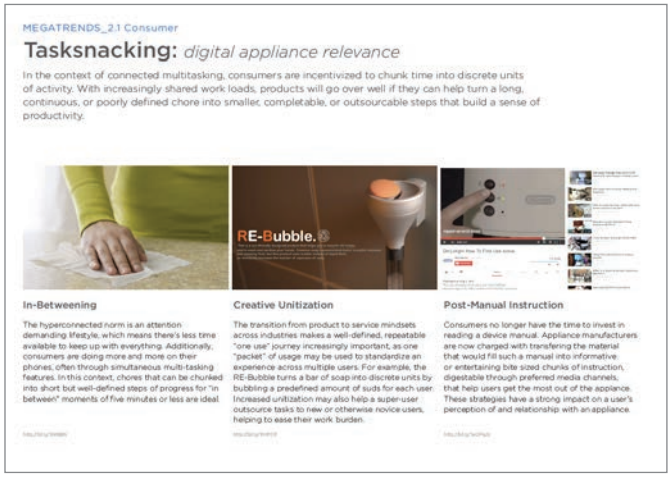
UX Concepts / UI Design



Trend Research - Digital Appliances

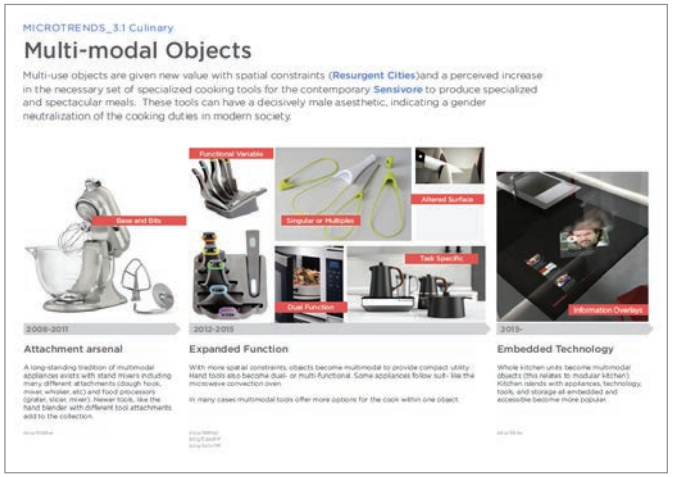
Gained foresight of social, cultural, and technology trends for digital appliances for the next 5 years by researching macro trends (Environment, Consumer, Economy, Technology) and micro trends of each topic.

Trendspotting



Mega Trends / Insights

Micro Trends / Insights

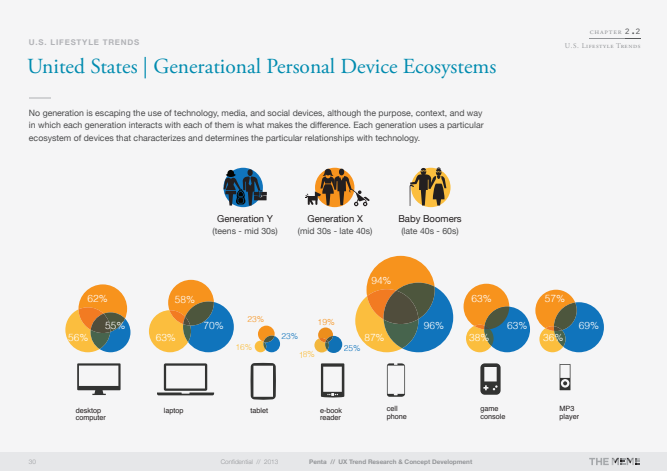


INTERACTIVE DISPLAYS

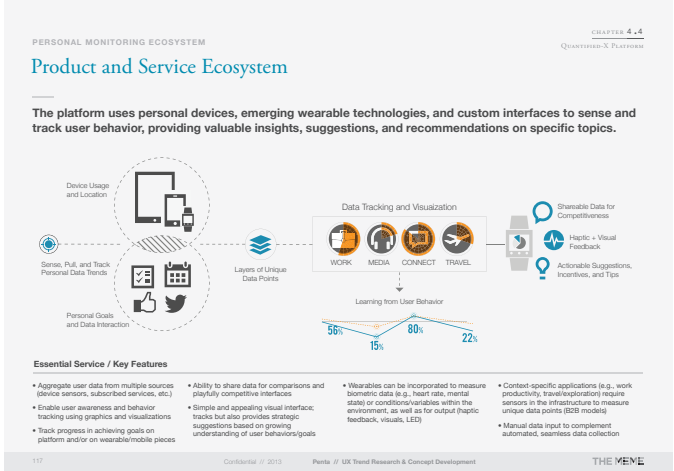
New Product and Service Concepts for the US Market

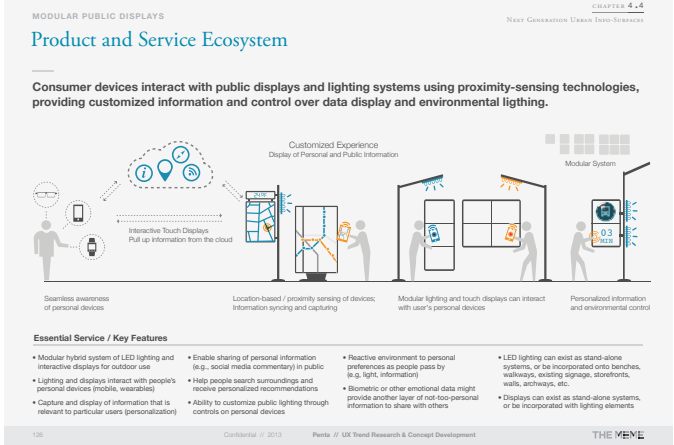
Provided insight into emerging UX and Lifestyle trends in the U.S. market. Identified business and strategic UX design opportunities across different categories to develop seed UX concepts for existing and new products and services.

Research / Insights

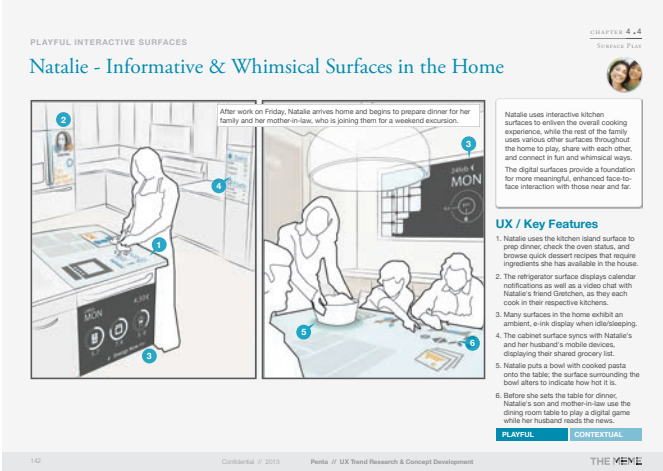


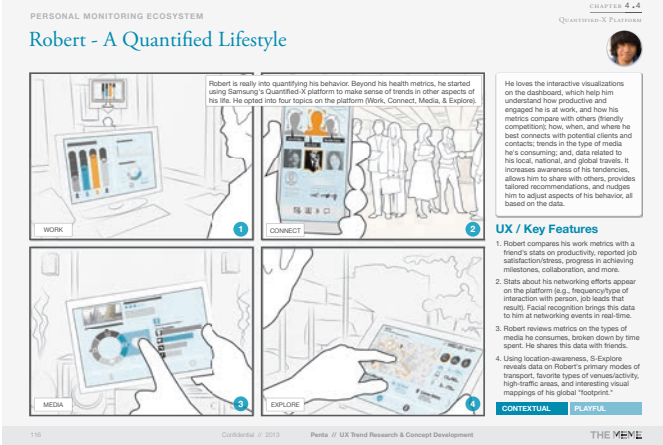
Product / Service Ecosystems





UX / Design Concepts

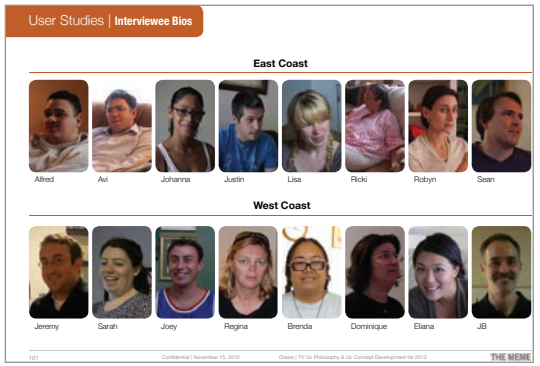


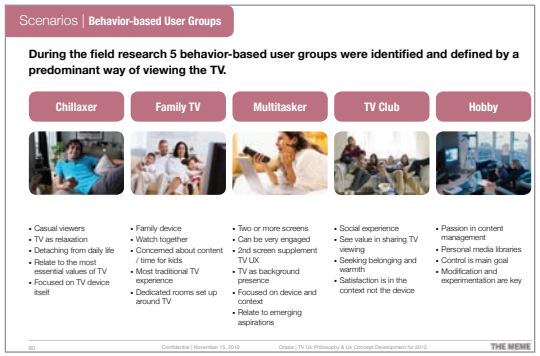


New Service Experience for TVs in the U.S. Market

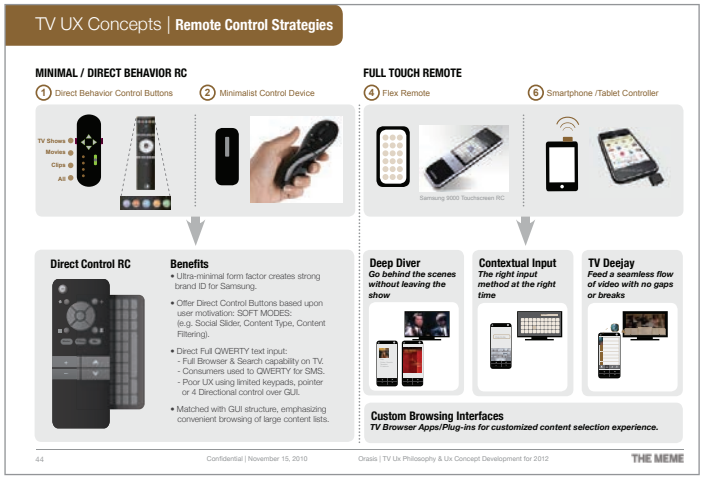
Conducted research to provide insights on new TV Service Concepts and their acceptance in the U.S. market. Analyzed user habits, preferences and behaviors for TV UX and provided opportunities for new usage patterns using mobile devices.

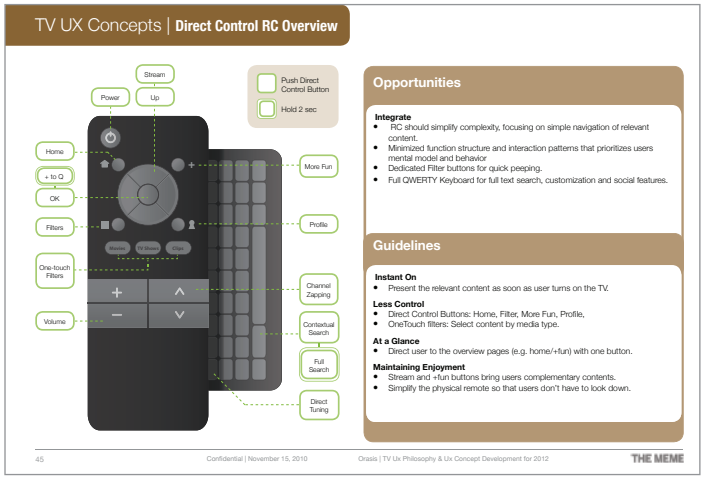
User Research / Insights



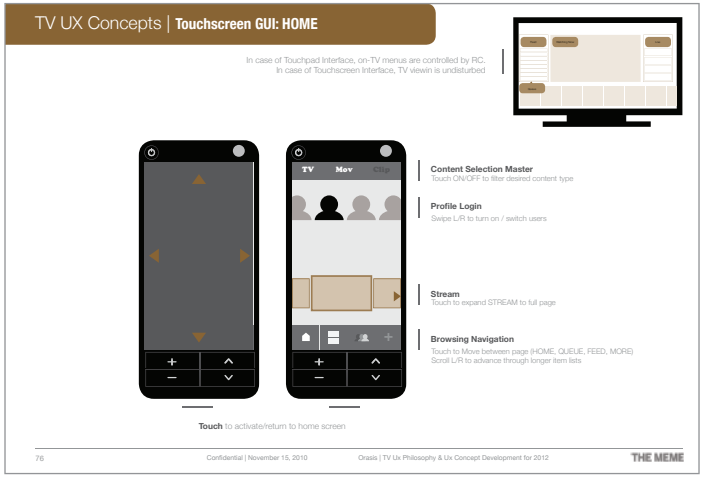


Design Strategy





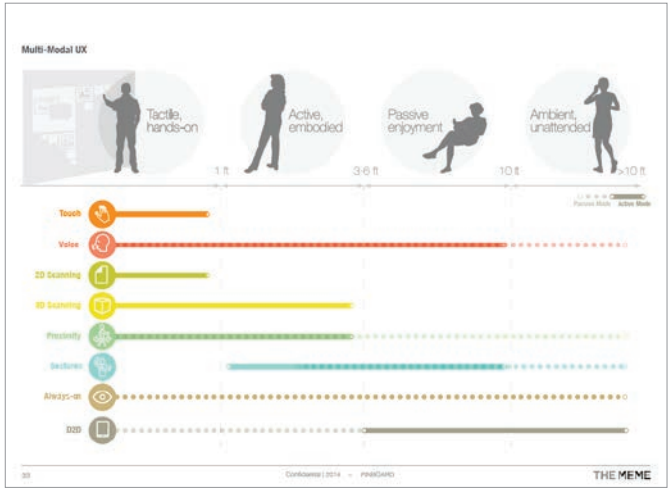
UX Concepts / Design



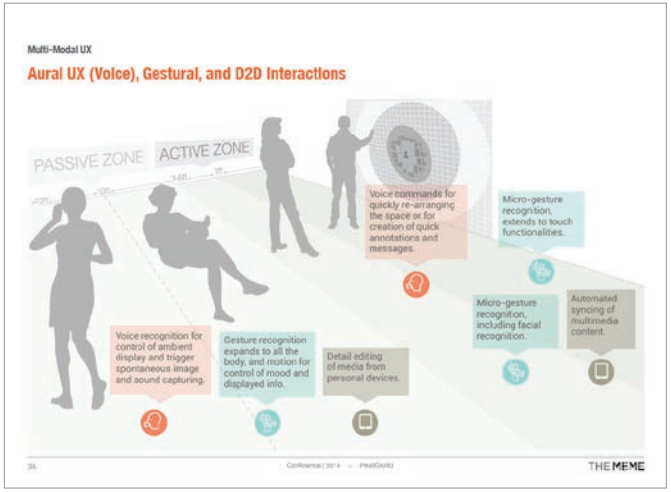
Non-Conventional TV Experience

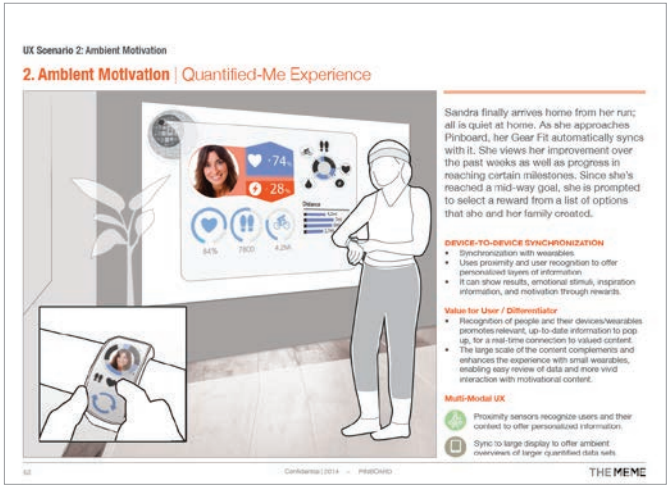
Conducted ethnographic research on families in the US to develop and design a new large format interactive screen device to differentiate from the conventional TV experience in the home environment.

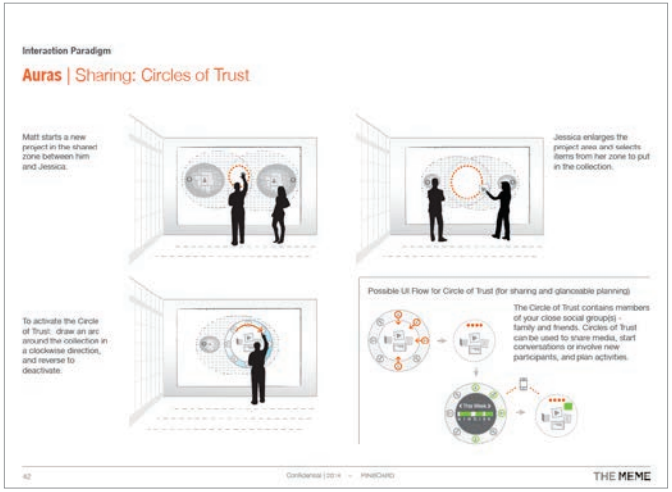
User Research / Insights

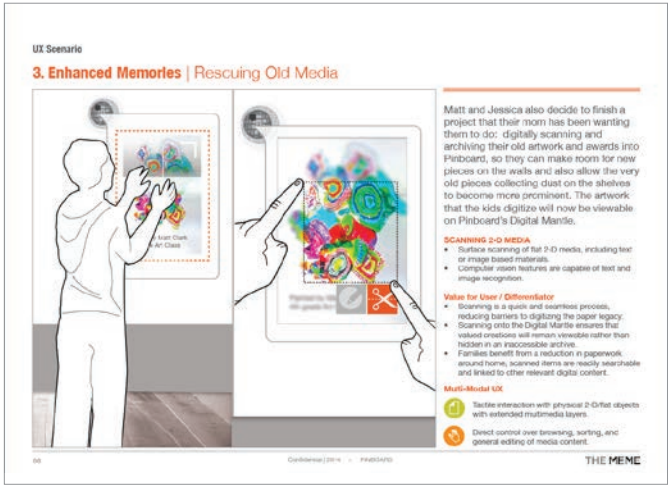


UX Scenarios / Design Strategy







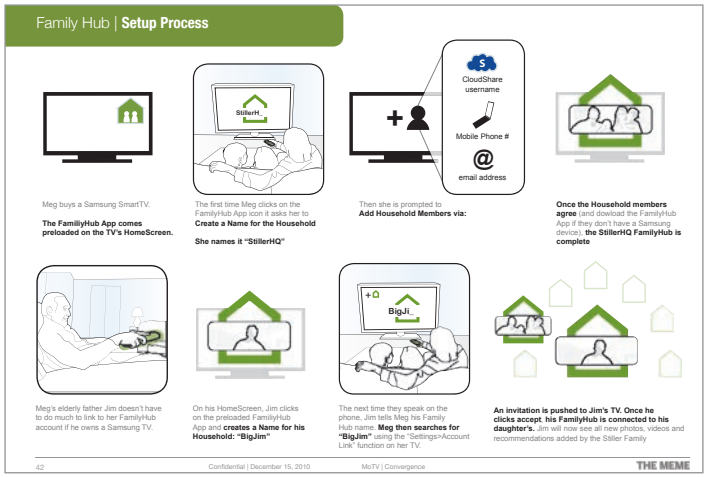


Seamless Experience Strategy for TV & Mobile

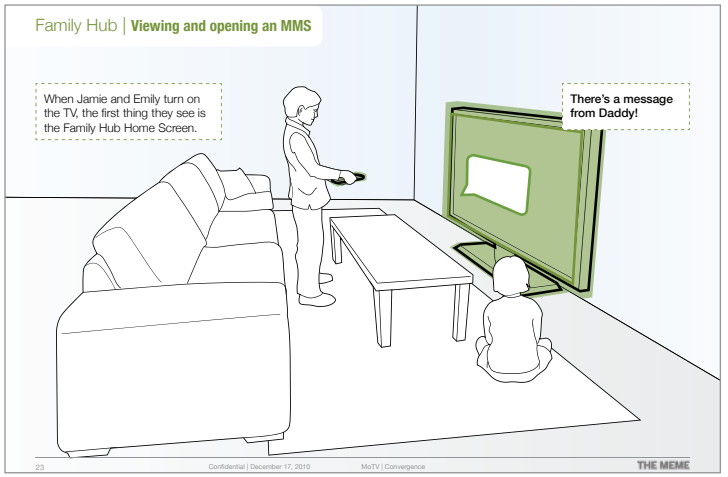
Provided insights and developed a vision for future convergence service offerings for the TV market in the U.S. Identified key user needs and relevance for convergence of Mobile and TV platforms into integrated services.

Market / Industry Research

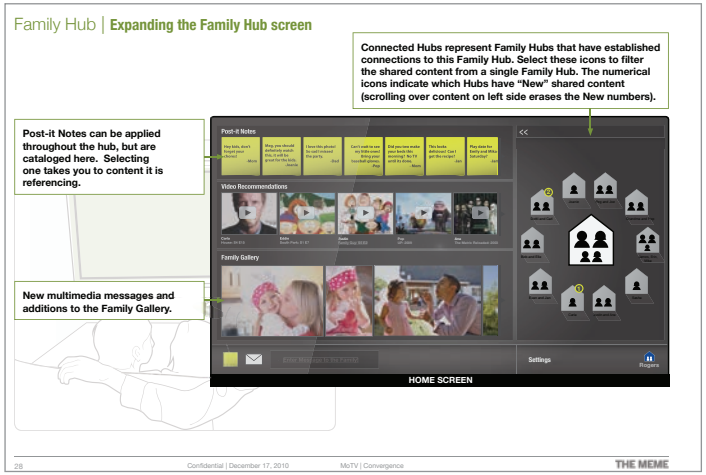
Research Insights



Design Strategy



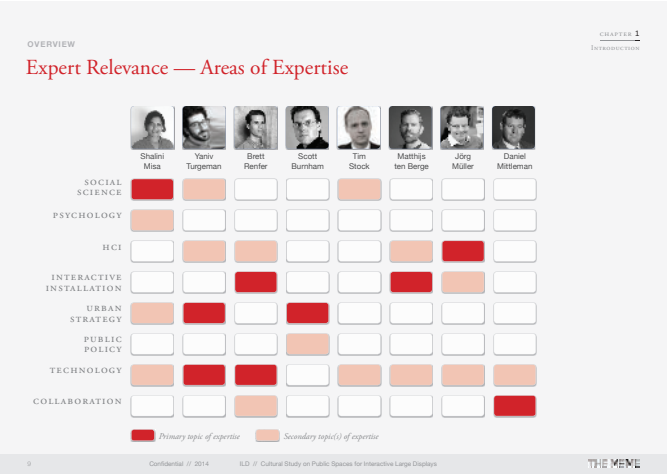
UX Concepts / Design

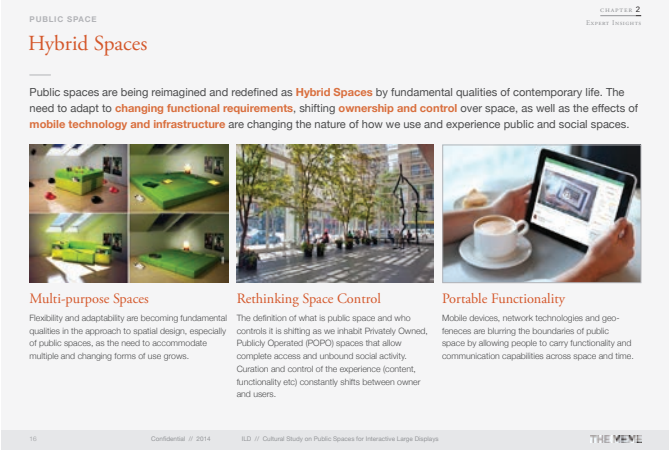


Interactive Large Displays for Public Spaces

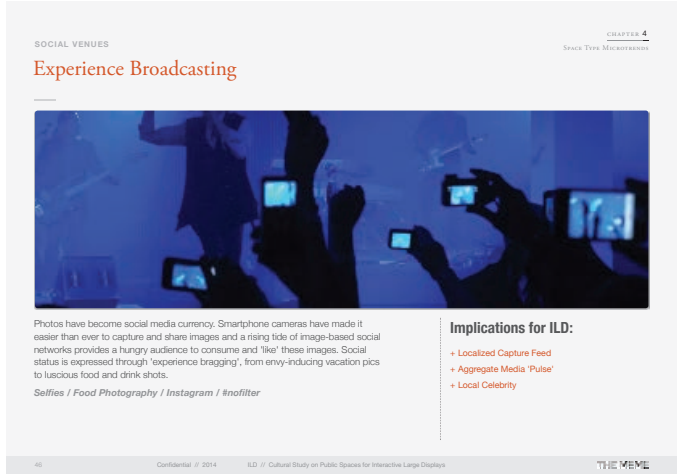
Provided strategic design direction, product and feature concepts for new public Large Interactive Displays. Research focused on identifying opportunities for innovative experiences leveraging users social behaviors in public spaces.

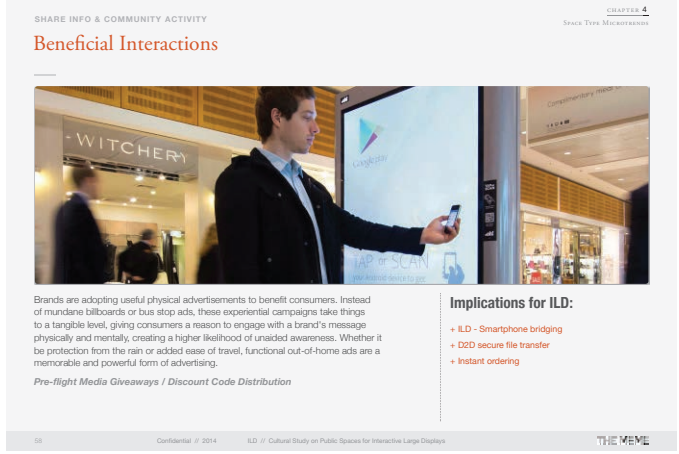
Expert / Industry Research



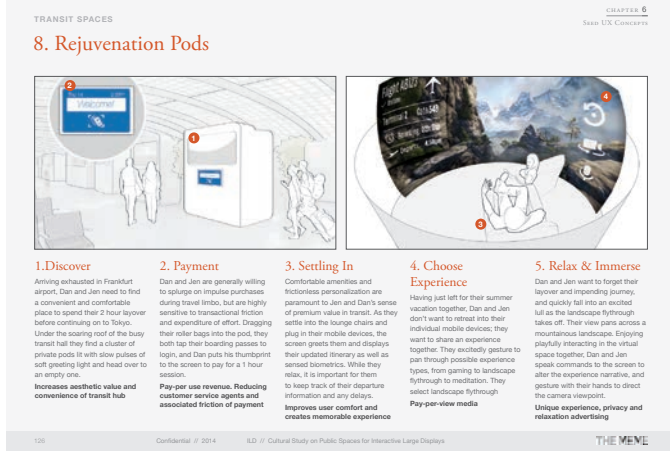


Research Insights





UX Concepts / Design

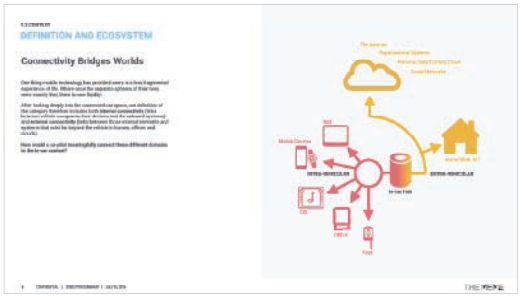


AUTOMOBILES

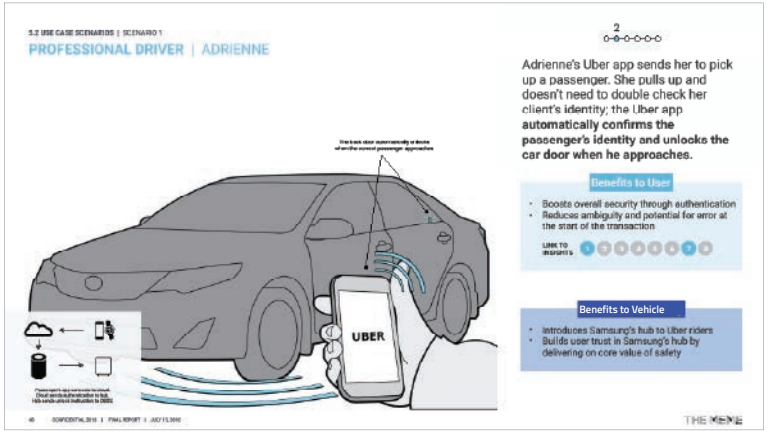
Connected Car UX: Product and Service Concepts

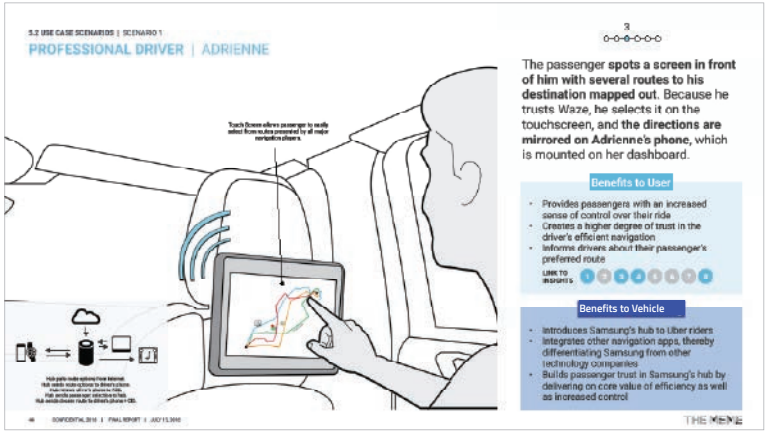
Uncovered latent user needs and unexploited market opportunities on a research phase that included user ride-alongs, expert interviews and market analysis. Developed connected car products (in-car hub and key fob) and services.

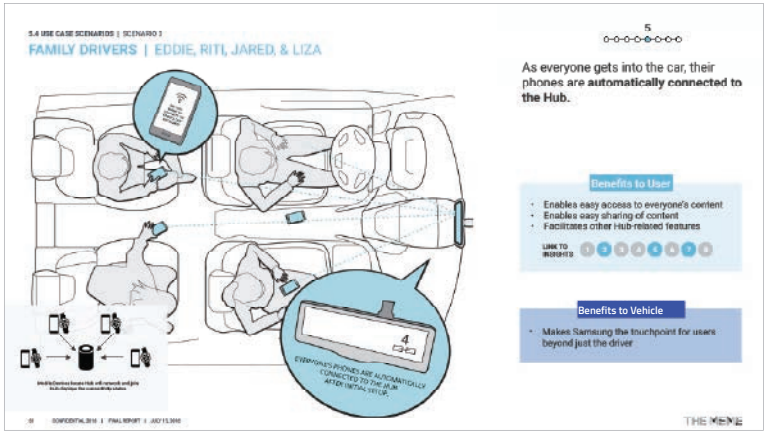
Expert Research

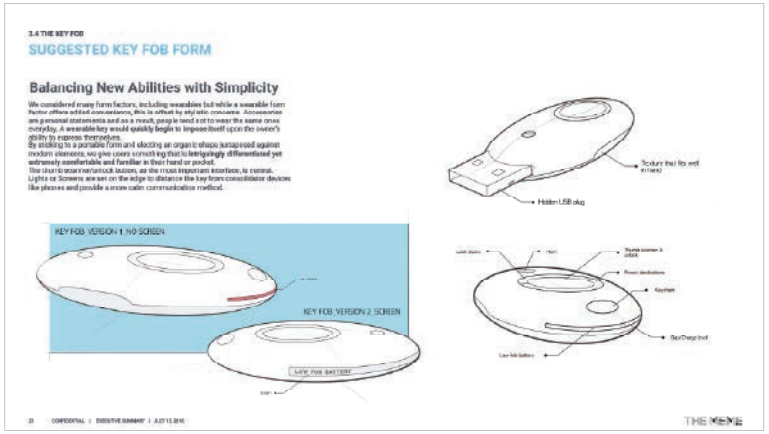


UX Concepts / Design





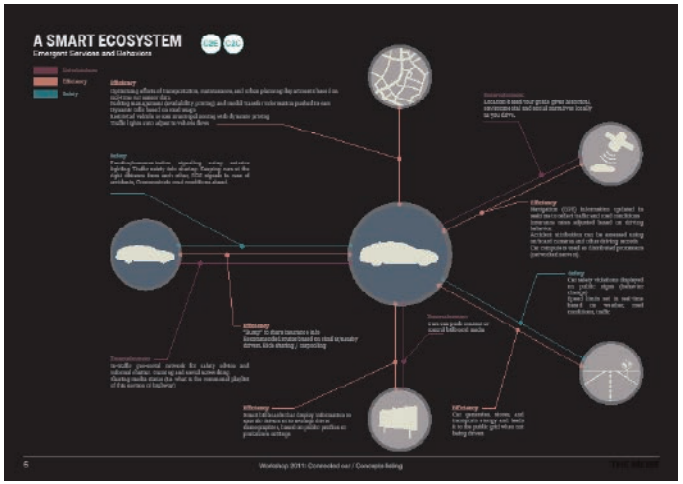




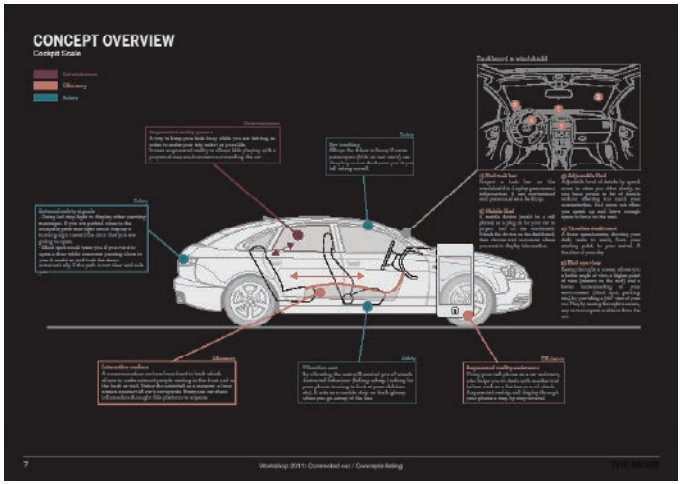
Connected Car UX - Vehicle Interface Systems Design Concepts

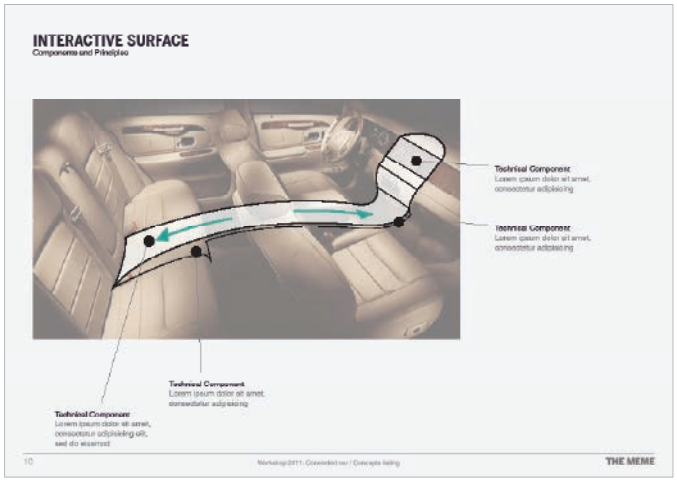
Implemented multi-disciplinary co-creation workshops to generate ideas for new interative control and interface systems for connected cars. Developed most promising ideas into detailed UX design and product concepts.

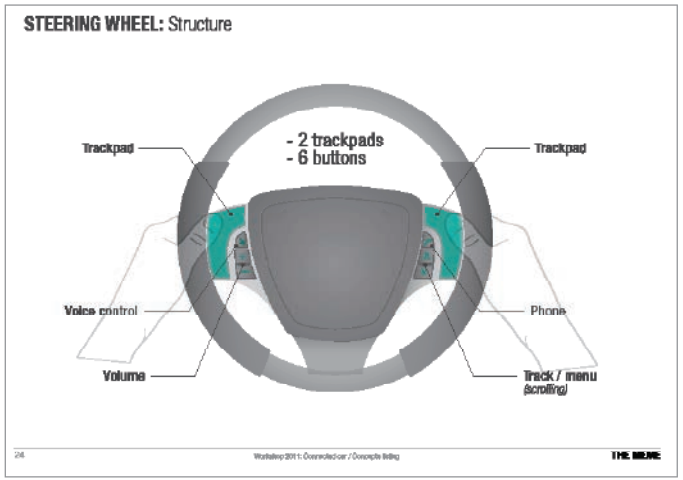
Market / Industry Research

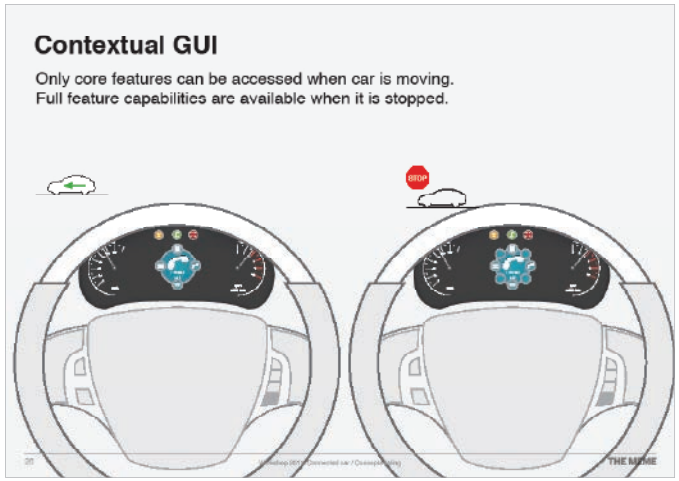


Co-creation / Design Concepts





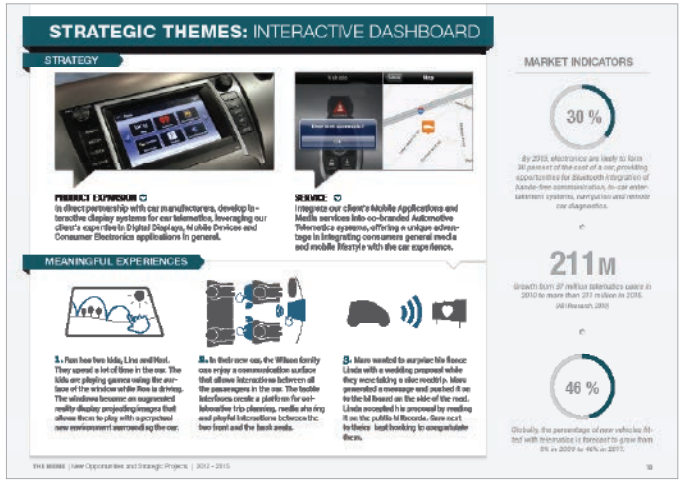




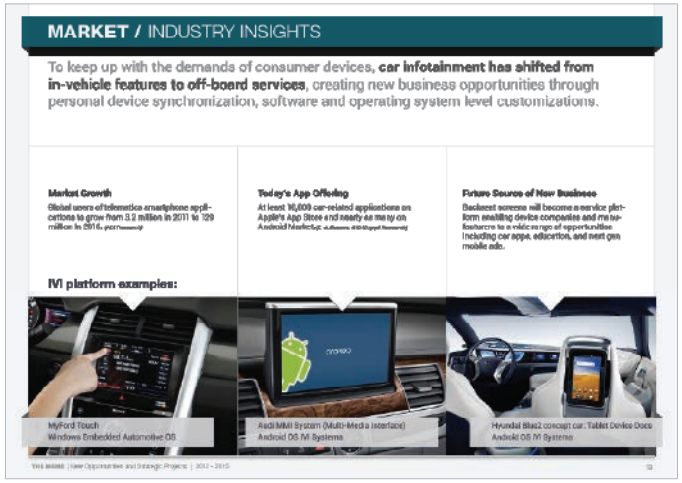
In-Vehicle Infotainment Market Trends / Roadmap

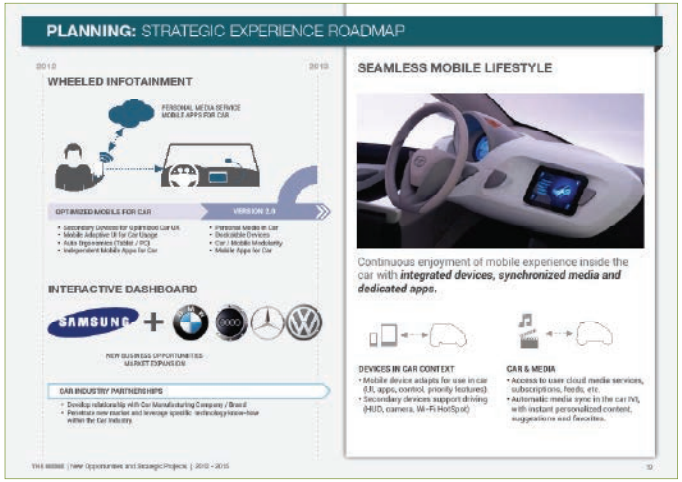
Conducted market research on leading In-vehicle Infotainment technologies. Developed different product roadmaps for device-to-device services (Mobile + IVI) and embedded infrastructure for interactive car dashboard systems.

Expert Research



Research Insight





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