

# 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

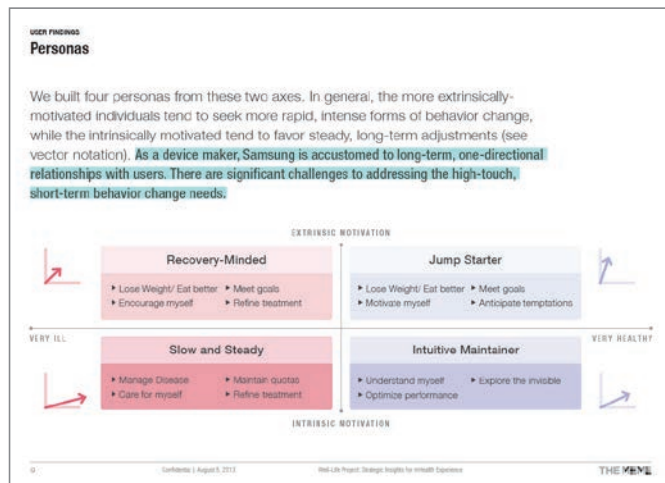
# CONNECTED HEALTH (IoT)



# 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.

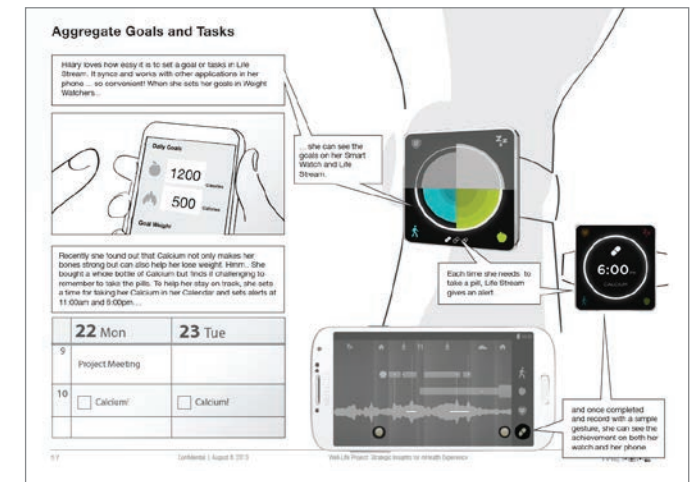
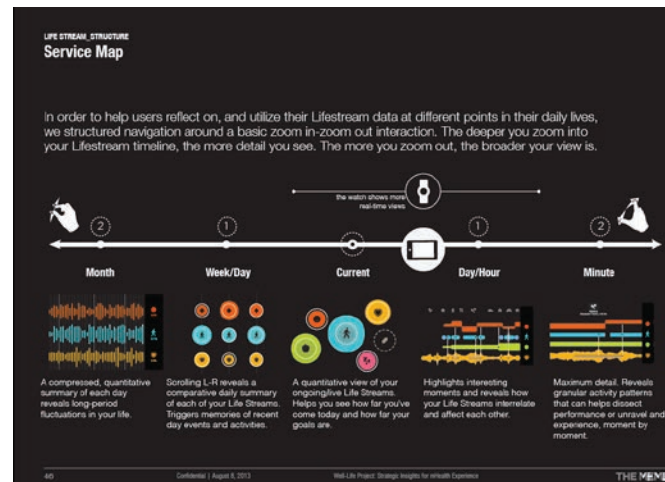
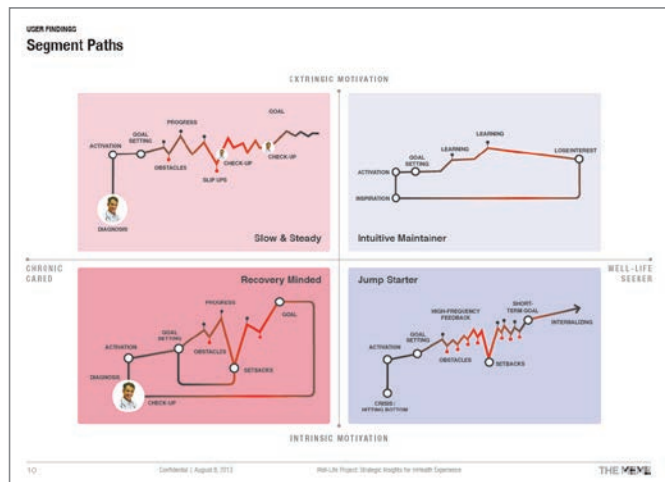
## User Research / Insights



## UX Design Strategy



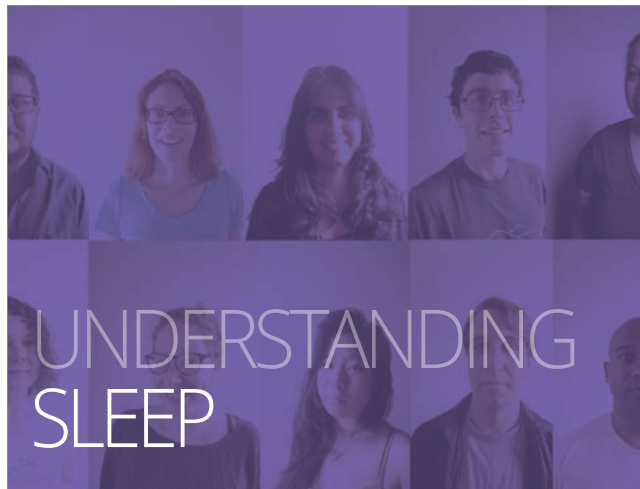
## UX Scenario / UI Design Schematics



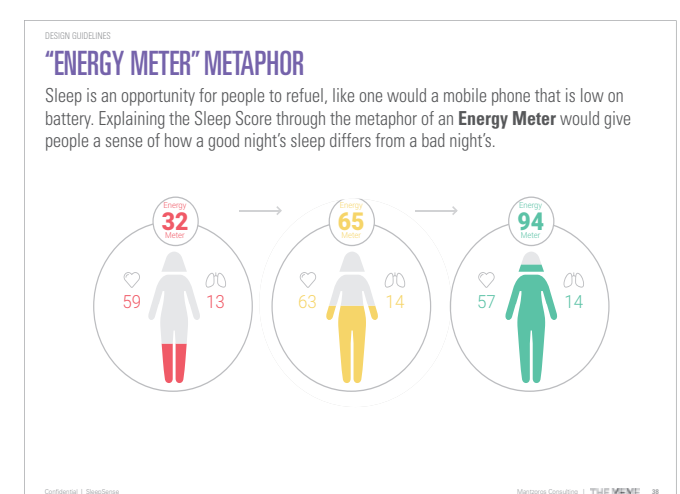
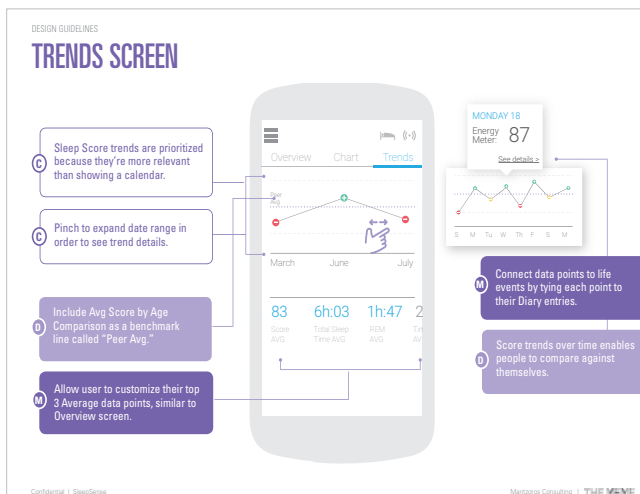
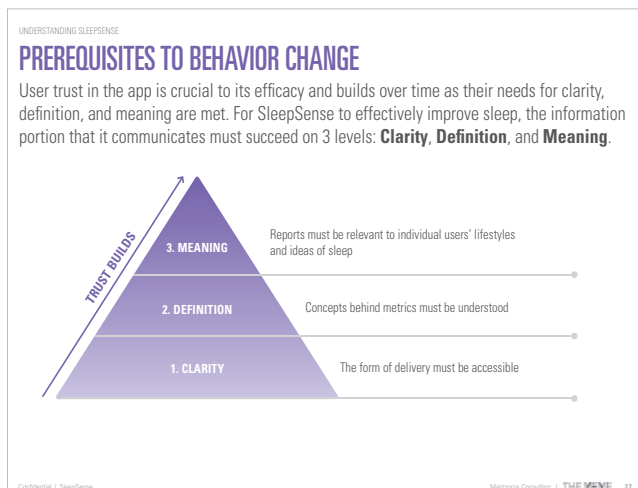
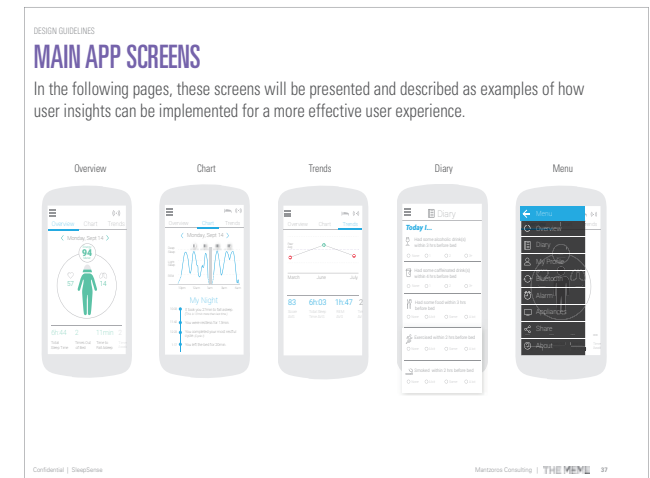
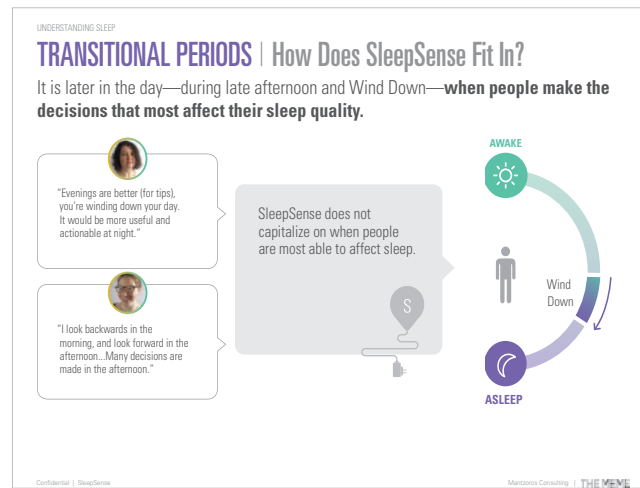
# Sleep Tracking Platform: UX Design for Behavior Change

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.

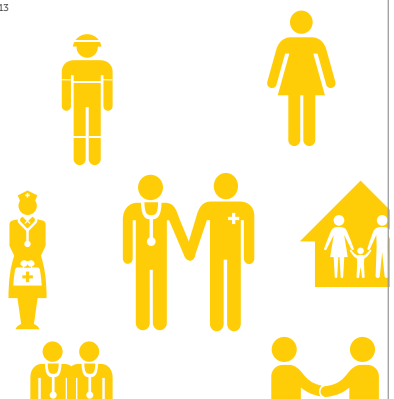
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## EHRs and the Doctor-Patient Relationship

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 way of 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.

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## 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.

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1) EHR as Translator: Build a Common Language



Both Educator and Mentor rely on communicating collaboratively with patients. Visual formats and ex resources can provide an interactive means to check mutual understanding.

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

CARLOS CARDENAS | Portfolio

# 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.

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## EHRs and Contexts of Use

A Providers' Perspective on EHR User Experience

Presented by **THE MEME**

March 2013

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## 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.

Demand 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?**

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## 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

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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.

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# 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

CHAPTER 1 INTRODUCTION


### 2.4 Key Features: Built-In Accessibility Features

To isolate the most relevant built-in tablet features, we consulted accessibility surveys like WebAIM and Paciello Group, non-profit organizations like AccessWireless.org and Fundación ONCE, and considered the views of experts and target consumers from each area of disability.




**BLIND  
LOW VISION**

1. Screenreader
2. Screen Magnifier
3. Adjustable Fonts
4. Contrast
5. Voice Input / Output
6. Audio Alerts




**DEAF  
LOW HEARING**

1. Visual Notifications and Vibrational Alerts
2. Closed Captioning for Video
3. Text Communications
4. Video Conferencing
5. Voice Input / Output
6. Adjustable volume control



**MOBILITY (UPPER LIMB)**

1. Hands-Free or One-Touch / Gesture Control
2. Keyboard Features
3. Voice Input / Output
4. Automatic Responses
5. Customizable Displays
6. Audio, Visual and Vibrating Features



**COGNITIVE (AUTISM)**

1. Keyboard Features
2. Voice Input / Output
3. Alternate Formats of User Guides (understandability)
4. Audio, Visual and Vibrating Features
5. Customizable Displays
6. Captioning Services


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## UX Design Strategy / UI Concepts


CHAPTER 4 SEED UX CONCEPTS

### 4.3 Hotspot: UX Scenario


1 ACTIVATE HOTSPOT



Gesture 1: Tap twice with full hand



Gesture 1: Tap twice with fist



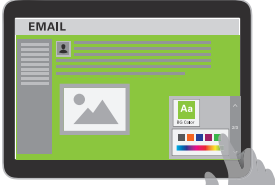
Gesture 1: Swipe vertically with side of hand

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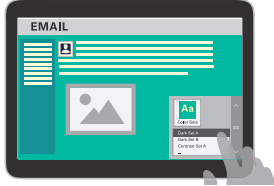
CHAPTER 4 SEED UX CONCEPTS

### 4.4 Smart Styling: UX Scenario

1 STYLE ON-THE-FLY (CONTINUED)



During workflow, the user can style the background any color



During workflow, the user can choose from a FEW standard Color Sets and Themes, with the option to customize further if desired.

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CHAPTER 3 USER INSIGHTS

### 3.5 Dexterity: Ability Level and View of Technology

The wide diversity of causes and symptoms that create dexterity loss makes this spectrum of disability a complex one, almost to consider case by case. A continuous sense of control and the varying range of effects on independence defined the ways they perceive and relate to technology.

**FULL DEXTERITY** D11 D10 D9 D8 D7 D6 D5 D4 D3 D2 D1

**DEXTERITY ABILITY LEVEL\***

**LOW DEXTERITY**

KARIE ROBERT

KARIE ROBERT KARIE CHRISTINE

Karie and Robert's episodic upper limb-motor impairment vary from mild to severe on a weekly basis.

**EPISODIC EXPERIENCE**

Users that experience **episodic changes** in the level of dexterity and discomfort are more aware of the contrast between "good" and "bad" days, feeling that **their sense of independence is severely diminished**. They hope for technologies that help them **maintain continuous activity without sacrificing the level of engagement**, be it through social, productive, leisure or communication features.

**PERMANENT CONDITION**


For users with permanent conditions their **stated sense of independence is high and remains unaltered** as they adjust their lifestyles with varying levels of assistance. They hope for technologies that can **adapt to the changes in their context, control better their environments, and help them communicate** their needs to build robust partnerships with caregivers.

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CHAPTER 4 SEED UX CONCEPTS

### 4.5 Chat Bridge: UX Scenario


2 MULTI-CHANNEL COMMUNICATION




Text to Text (Swipe)



Text to Voice  
(Keyboard is minimized in Quick Response Mode)



Text to Handwriting



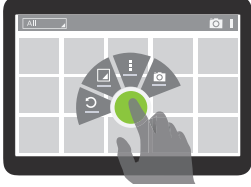
Text to Finger Writing/Drawing

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CHAPTER 4 SEED UX CONCEPTS

### 4.6 Responsive UI: UX Scenario

1 SYSTEM-WIDE



Responsive UI can be used in Gallery (left), Internet (right), Email or other relevant features or applications.



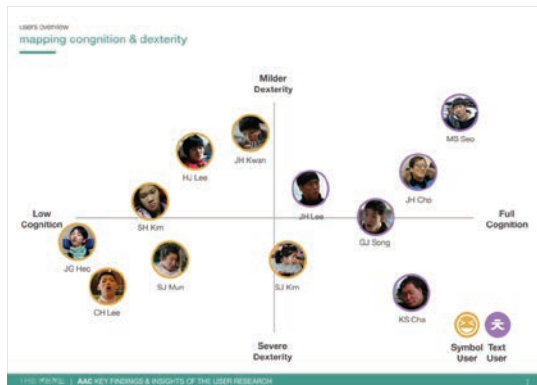
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# Augmented Alternative Communication App Design

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

our concept & areas of opportunity  
opportunity

### Natural Communication

- Enable people to more easily elaborate their feelings. Consider emoticons, emotional expression signs, and other tools.
- Enable seamless participation in conversations. This includes allowing users to provide immediate responses when participating in conversations and reducing delays.
  - (e.g., interjecting, calling and maintaining others' attention, being acknowledged and respected as a conversation participant.)

THE MEMO | AAC KEY FINDINGS & INSIGHTS OF THE USER RESEARCH

our concept & areas of opportunity  
natural communication

### Objective: Live Emotions

KEY FEATURES

- Allow user to upload their face/image to emotion icons, and decorations can be used around the image to portray emotion.
- Animated gifs for common expressions (customizable or generic options)
- Full keyboard integration with emoticons

DESIREABLE FEATURES

- Provide users with a scale for explaining how they feel or how another person seems, with gradations to indicate how (angry / happy / calm / etc.) they feel. (e.g., indicate the level of pain (terrible to great))

Animated effects overlaid on User's picture to convey emotions.

THE MEMO | AAC KEY FINDINGS & INSIGHTS OF THE USER RESEARCH

our concept & areas of opportunity  
maintain user engagement over time

### Objective: Social Integration

Enable sharing messages through text messages or social media.

KEY FEATURES

- Facilitate daily life use, by allowing to push messages to existing social networks or messaging apps (e.g. WeChat, Kakao Talk)
- Embed an internal chat that people can communicate with other users.

DESIREABLE FEATURES

- Encourage a sense of community by allowing users to contribute to building shared stories.

THE MEMO | AAC KEY FINDINGS & INSIGHTS OF THE USER RESEARCH

our concept & areas of opportunity  
natural communication

### Objective: Genuine Voice Tone

Text User: Symbol User

KEY FEATURES

- Change tone/infection for a statement using punctuation (!, ?, .) or emoticons (:-), :-(, :~)
- e.g., "I completely disagree with that statement." + frustrated icon = different tone than "I agree with what you're saying." + excited icon/emoji.
- Must provide different voice options for gender, age and speed. Provide non-robotic natural voice tones

THE MEMO | AAC KEY FINDINGS & INSIGHTS OF THE USER RESEARCH

# 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

USER RESEARCH

Cross Over Insight

Multi-modal Engagement

Users with limitations had unique ways of combining sensory modes when using their devices, giving insight into patterns of interaction.

1 Hybrid Interaction

Use several life channels to maximize efficiencies and cater to a specific range of ability / limitation.

2 Adaptive Use

Users with low levels of limitation often switch between different forms of access to maintain a continuity of use between shifting contexts.

1 Angelika, a User with Limited Vision, relies on vision to grasp the overall structure of what she is looking at and touches details she cannot see to let voice over read those details out loud while navigating on her tablet setting her move more quickly and fluidly.

2 Kalle, a User with Limited Vision, can access visual content on her phone under the controlled light conditions indoors, whereas when she steps outside into bright light she switches to voice over in order to continue accessing that same content.

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## UX Design Strategy / UI Concepts

UX SERVICE CONCEPT - OVERVIEW

User Journey: Opportunity Areas & UX Service Concepts

OUT OF BOX EXPERIENCE	CUSTOMIZATION FOR ACCESSIBILITY	D2D ACCESSIBILITY	EXTENDED ECOSYSTEM
<p>First experience with a new device (initial settings)</p> <ul style="list-style-type: none"><li>Re-thinking OOBE, Device adjustment</li><li>Cloud Configure Profile</li></ul>	<p>Quick and easy access. Adaptable Device Features adjust to users needs.</p> <ul style="list-style-type: none"><li>Star Helper (UX Learning Assistant)</li><li>Filtered Skins, Dynamic Widget</li></ul>	<p>Convergence strategy for accessibility</p> <ul style="list-style-type: none"><li>Multi-screen, Enhanced Media</li><li>D2D Display Magnifier</li></ul>	<p>Accessibility UX beyond smart devices</p> <ul style="list-style-type: none"><li>Haptic Accessories, Object Tagging</li><li>Programmable Ambient Alerts</li><li>Directional Amplifier</li></ul>

ENHANCED ACCESSIBILITY

Interface enhancements to support accessibility with multi-sensory input and output mechanisms.

Combination of sensory channels expand user interaction models and mixed interface possibilities.

Eye-Tracking, Next "Hands Free" UI

Gestural Modulation

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SERVICE CONCEPT

Star Helper

Star Helper is a translucent selector that users can move over any interactive element (link, button, image, controller, player, feature, app, etc.) to get aural (voice output) and text-based descriptions of its main functions.

always-on help function

Help / Tutorial

Clear instructions and descriptions of core features, GUI elements, content and interactive information.

Benefits for the user

- Samsung branded help experience
- In-device help appeals to broad audience

Benefits for Samsung

- Discover Unknown Features
- Get help and explanations on demand
- Learn as you use the device

VISION

HEARING

COGNITIVE

SENIOR

MOTOR

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USER RESEARCH

Functional Insights

VISION

Users with visual limitations primary problem is navigating content inside of the device.

Aspects of Limitation:

- Visual Acuity (near & far sight)
- Contrast Sensitivity
- Color Perception
- Usable Visual Field (central / peripheral)
- Must Resort to Multi-Sensory input
- Extrapolating Information
- Understanding structure w/o visual cues (communication alternatives)

Angelika, a User with Limited Vision, has difficulty viewing content on her device when text is at a high zoom and she knows the overall structure of the page, or on the other hand, when certain elements cannot be quickly pinched and zoomed.

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SERVICE CONCEPT

Filtered Skin

User interface presets provide "bundled" accessibility features. Rather than tweaking each individual setting, filtered skins provide quick and easy access to different device modalities: enhanced vision, optimized display, augmenting sounds, meaningful vibrations, soft simplicity, etc.

Simplified UI language

Resized Buttons and core menu elements

Benefits for the user

- UI adjusts to usability needs
- Ability to switch between use modes easily

Benefits for Samsung

- Unique Samsung branded UI design
- Consolidate access features for greater visibility

VISION

HEARING

COGNITIVE

SENIOR

MOTOR

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USE CASE - FILTERED SKIN

4 Simple mode UI

June previews "simple" mode and loves how clear and direct it looks.

Once a mode has been selected and the phone is running with a different "skin" a simple clockwise gesture will activate a shortcut to bring back the modes menu for adjustment.

1/3

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UX Project: Strategic Insights for Accessibility and Smart Tech

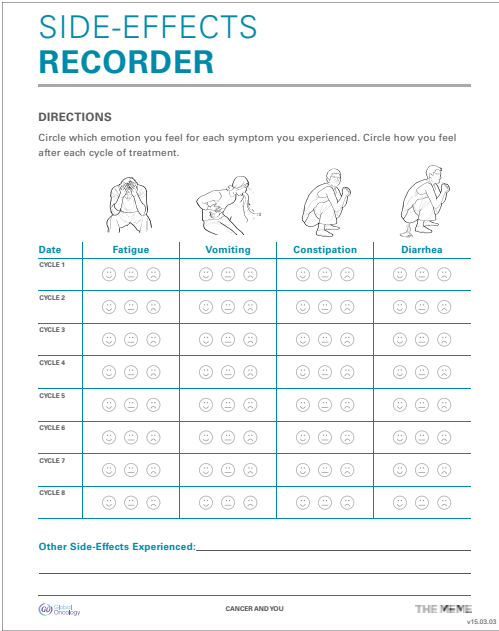
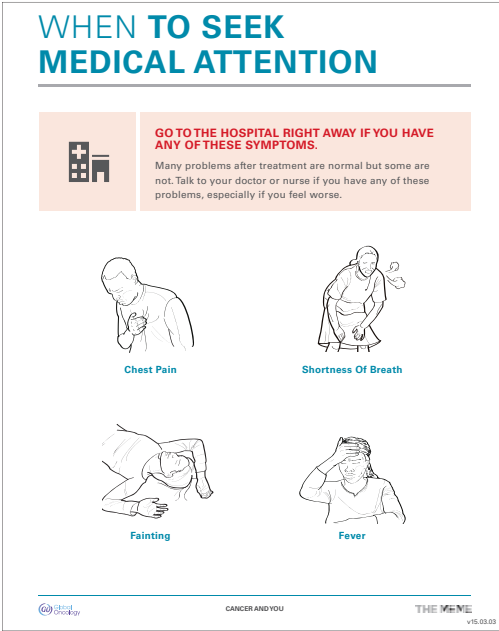
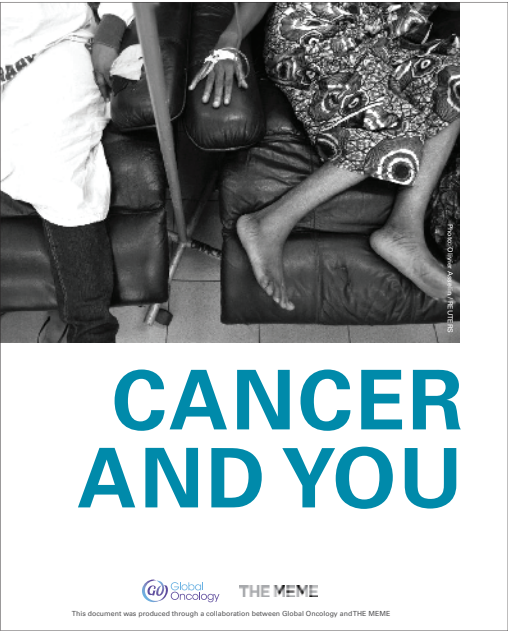
THE MEME



# 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



# 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

SECTION 2 | CHAPTER 1: INTRODUCTION

### 2.1.2 Industry Shifts



The medication non-adherence problem, despite its enormous cost to the US healthcare system, has persisted in many ways because it is so systemic. Lack of cooperation among private-interest stakeholders, lack of government leadership, and lack of accountability, have until recently prevented non-adherence from being addressed in a consequential way.

In recent years, however, a government-led attempt to restructure the healthcare industry's financial model from "fee for service" to "outcome based" compensation (meaning that providers are now culpable for the long-term results of the care they administer or prescribe) has begun to align interests and spawn creative industry partnerships to manage the non-adherence problem and its associated costs.

**INDUSTRY TRENDS:**

- + Stronger Government Role
- + Capitation (per-patient pay)
- + Outcome Based Incentives
- + Payer - Provider Partnerships

\*\* Health Affairs.org Health Policy Briefs: Reducing Waste in Health Care, Dec. 13, 2012

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## Design Strategy

SECTION 2 | CHAPTER 2: IMPROVING ADHERENCE

### 2.2.4 Technology Solution Categories

From a broad set of solution types, we zoomed into those in which technology plays a leading role. The following sections are organized as an investigation of five primary adherence-promotion technology types.

SMART PACKAGING SYSTEMS	ELECTRONIC UNIDOSE CONTAINERS	ELECTRONIC MULTI-DOSE DISPENSERS	MEDICATION ALERT WEARABLE	DIGITAL SERVICES
Medication (re) packaging for adherence promotion and monitoring	Augmenting the single-dose medication container with wireless connectivity to online monitoring software and services	Stores and dispenses manually-loaded pills or pre-calenderized multi-dose sachets, transmitting data to adherence monitoring service	Wearable adherence reminder (and integrated health monitoring) devices	Digital platforms that gather data from user input and 3rd party medication dispensers, push reminders to patient devices, and coordinate patient care with doctors and caregivers.

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## Product / Service Design Concepts

SECTION 5 | PRIORITIZED OPPORTUNITY DETAIL


### 5.1 High-Priority Opportunity Themes

Three Opportunity Themes scored significantly higher than others. In the following section we illustrate them in greater depth, bringing them to life through user experience illustrations, detailed value chain maps, and description of specific value created for patients and stakeholders.


① EMPOWERING PHARMACISTS



② SPECIALTY RX



③ SERVICE-LINKED PACKAGING



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SECTION 2 | CHAPTER 2: IMPROVING ADHERENCE

### 2.2.3 Adherence Solutions

Existing solutions attempt to tackle the adherence issue from a number of angles, with most research indicating that successful behavior change occurs through multi-faceted strategies aimed toward long-term adherence.

**Need for Reinforcement**

- Pill Organizers
- Reminders services (text email / call / smartphone apps)
- Wellness programs

**Need for Social Support**

- Patient assistance programs/therapy
- Family involvement
- Adherence assessment by Doctors/ pharmacists/chronic care coordinators
- Cultural-specific pharmacy programs
- Adherence-promotion social networks
- Disease-related social networks
- Family / Caregiver platforms

**Poor Health Literacy**

- Medication info provided by doctors/pharmacists with language support, visual aids, and easy reading level

**Physical Impairments**

- Rx labeling and packaging for the visually-impaired
- Ergonomic medication dispensers

**Complex Regimen**

- Combination medications
- Medication management & therapy programs (dose frequency regulation)
- Treatment effectiveness evaluations
- Pill Organizers and Dispensers
- Calendarized Multi-dose Packaging

**Financial Barriers**

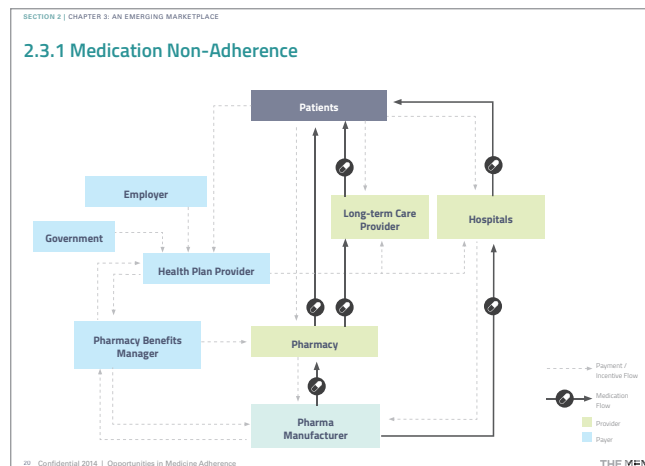
- Generic drug promotion
- Mail-order discount services
- Drug discounts / loyalty programs
- Financial assistance
- Incentives / gamification platforms

**Need for Information**

- Education, training and counseling
- Printed and verbal info from pharmacies, Rx call centers
- Medical information apps
- Labeling / package design

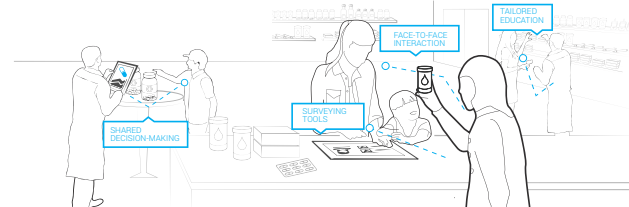
\*Blue text indicates solutions that technologies might incorporate.

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SECTION 5 | PRIORITIZED OPPORTUNITY DETAIL

### 5.2 Value for User



**Enhanced Conversations**

Interview aids that help pharmacists gain a better knowledge of the life conditions and motivations where patients better understand their condition and guide them through their medication programs.

**Proactive Role**

Based on analytics from patient's data, pharmacists can predict non-adherence factors or patients in risk of non-adherence.

**Education in-situ**

Interactive tools to offer a new beyond-the-counter interactive experience where pharmacists can help patients better understand their condition and guide them through their medication programs.

**Evidence-based Decisions**

Help pharmacists in the Rx decision-making process, enabling access to patients' medication history, progress and feedback.

**Extended Counseling**

Mobile channels bridging the interaction between patient and pharmacist, so that support and counseling can be extended beyond the pharmacy.

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# 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

### TELE-HEALTH

Health care industry is **too complex** patients are feeling helpless, distrustful, and beleaguered by costs.

Individuals are becoming more proactive in **managing their own health care experience**.

**Tele-health opportunities:**

- Move tools and resources from the hospital to **patients' homes** (convenience, privacy)
- Leverage **consumer devices** and networked communication platforms
- Improve and **empower patient experience** while **reducing costs**.
- Learn, self-track, monitor, and **diagnose with the help of doctors and care communities**.

Generative Trends  
Market / Industry Insights  
Thematic Examples  
Strategic Roadmap

## Research Insights

### MARKET / INDUSTRY INSIGHTS

#### Strategic Themes to Develop the Tele-Health Opportunity Area

**Integrated Care (B2B)**

Hospital management database solutions, including patient records, administration, and a platform for 3rd party diagnosis applications. Tablet and mobile device package bundles with preloaded software and D2D features.

**Self-Health Platform (B2C)**

Online platform for medical communication, self-diagnosis and social support, specially for growing number of users that require constant monitoring of medical conditions. Portable, wifi-connected hardware systems for self diagnosis, monitoring and treatment.

### STRATEGIC THEMES: INTEGRATED CARE (B2B)

A secure, cloud-based **Electronic Medical Record (EMR) network** forms the backbone of care provider administration, aggregating data from doctor-patient interactions inside and outside the hospital, from consultation and diagnosis histories, to medical imaging, to prescriptions. In the near future, an expanding array of **companion hardware and software** will push and pull data to and from this network, providing care providers ability to monitor and control medical devices in the patient's home.

### MARKET / INDUSTRY INSIGHTS

Due to concerns over security and cost, hospitals, pharmacies, and other care providers have been slow to adopt EMR systems. In order to obtain the critical mass of patient data necessary to attract new EMR Platform subscribers, **big technology players have focused on strategic industry alliances**. Our client should explore **partnerships with large public and private health providers, pharmacies, and insurers**, as well as lobby for open-source EMR standards.

**Winning over the Pharmacies**

With the recent addition of CVS/pharmacy to Google network of pharmacy partners, more than 100 million people can now access their prescription history online and import it into a central, secure place – a Google Health Account.

Medication history provides framework for remembering past medical events, even if detailed medical history is not available.

Google + CVS partnership

**Targeting Big Health Care Orgs**

Targeting services to large health organizations who are making substantial financial investments in technology.

The Meditech EMR controls over 25% of the US market, managing data from over 2,200 health organizations, and providing access to more than 100 million patients.

Meditech EMR (largest in the USA)

**Public Sector Partnerships**

Partnering with governments to develop and manage secure public EMR databases

The American Veterans Health Administration (VA) patient record database is arguably the largest EMR in the world. Accessible through an online portal.

American Veterans EMR

### MARKET / INDUSTRY INSIGHTS

A single digital platform that consolidates a patient's full medical history from multiple disparate sources, is the elusive holy grail of the health care industry. While **technology companies have been investing heavily in three, largely isolated siloes of medical IT**, securing widespread adoption of a proprietary EMR database among large care institutions is essential to control the digital health ecosystem in the long term.

**Consumer Biometrics Devices**

Biometrics and self-care medical accessory devices, paired with mobile or PC software and services often integrate with public-facing EMR databases or social health sites.

**Electronic Medical Record Databases**

Databases and practice management software for secure processing and storage of patient data. Open source and proprietary services cover scales from private practice to national-level health databases. May also include administrative functions (billing, scheduling, etc).

**Tools for Doctors**

Software applications enable patient data access, diagnosis assistance and allow doctors to input, view patient data.

Tele-presence tools for remote diagnosis, treatment, and even surgery

**E-Health examples:**

Whittings wifi scale syncs with a mobile device

ClearHealth EMR

Applications for medical imaging review and diagnosis aids

### STRATEGIC THEMES: INTEGRATED CARE (B2B)

**STRATEGY**

**PRODUCT EXPANSION**

New line of connected medical devices, current computing devices bundled with EMR software. New specialized tele-health systems integrating specialized imaging hardware and software with networked communication capabilities.

**SERVICE**

A secure cloud-based, device-integrated patient data storage and care administration EMR for doctors, hospitals, pharmacies, others. Additional features include channels for live teleconferencing between patients and care providers.

**MARKET INDICATORS**

**71%**

companies rate government incentives as a driver behind effective health IT adoption (Accenture 2010 study of health care software, hardware and services companies)

**21%**

Web-based EMR market is expected to grow at a CAGR of 21.4%, from 2010 to 2015 and contribute 30% of the global EMR software market revenue in 2015.

**44K**

Stimulus incentives offered by the US government to individual health care providers for adopting an EMR system, between 2007-2010. Part of a 2009 Recovery and Reinvestment act to reduce costs of health care for Americans.

**MEANINGFUL EXPERIENCES**

- As Dr. Richardson runs the MRI scan of Ellie's body, the images are uploaded to the EFH hospital's cloud server. Other doctors involved in Ellie's treatment can access them over the hospital's LAN, and both the patient and Dr. Richardson can log on to a web application to access the images along with Ellie's full medical history (from EFH and elsewhere).
- When Dr. Myers finishes his consultation with Paul, she uses her tablet PC to sign and upload a prescription to Paul's secure online profile. Before he leaves, she pulls up a medication profile and walks him through the dosage and side effects using the interactive graphics. On his way home, Paul uses a mobile app to send the prescription to his local pharmacy to fill.
- In the waiting room of the hospital, Jackie gives the receptionist, access to her cloud-based medical profile. After her procedure, the hospital uploads a care report, with itemized costs. After reviewing these items, Jackie sends the bill to her insurance provider.

# 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


INTRODUCTION | WHAT WE LEARNED  
**PROCESS**


We performed an ethnographic study with 10 users, selecting for a diversity of opinions on **reference-banking**, **customization**, and **everyday expression**, and including perspectives on both Samsung and competitors' experience.


  
Diana


  
Jda


  
Nicole


  
Shea


  
James (JD)

  
Tony

  
Ennis

  
Brian

  
Annie

  
Nate

## UX Scenarios and Design Concepts


SUSTAINING FLOW | THE STYLUS  
**THE STYLUS**



SUSTAINING FLOW | THE STYLUS  
**FRICTIONLESS CREATION**

Eliminate menus to increase speed

When you need to take a note or make a sketch, speed is of the essence. Click the Create Button (similar to clicking the ballpoint pen) to activate the write/draw mode and immediately start making marks.

  
**PRESS Button 2** to activate the write/draw mode

  
**TAP** anywhere to invoke a new Canvas


  
**GESTURE** to write/draw in the new Canvas


  
**TAP** in any text box to start handwriting input

SUSTAINING FLOW | THE STYLUS  
**SIMPLIFYING THE STYLUS**

Strengthen associations with real-world tools

We propose to restore the inspirational qualities of the stylus by simplifying its functionality and invoking association with real-world object behaviors. We propose to eliminate multi-tasking and search and focus on two core operations:

  
**Create**

  
**Capture**

22 Confidential | Mar 21, 2014 Strategic Insights for Note 4 THE MEND

AGE 30  
ADVERTISING  
CREATIVE  
NYC

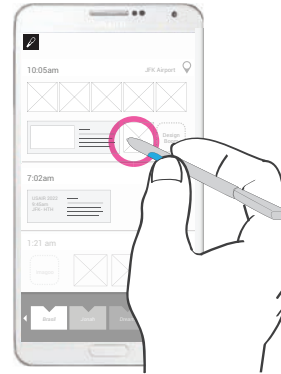
**MEET JENNA**

She is traveling to London to meet with the clients, a big European auto company. They're working on a campaign for a new hybrid car they are due to release later this year, called the Aphid. The goal of the campaign is to express the marriage of ecology and technology with a cool, hip attitude.

In addition to her meetings with the client, Jenna is also on a Coolhunting mission. London is one of the world's best places to experience the themes of sustainability and technology that lie at the heart of the project.

Her Note 4 helps her record and recombine the visual elements that she experiences. It also helps her easily create draft versions of her designs as they evolve on the go.

On her way back to the hotel, Jenna opens the Capture Queue to browse the media she captured earlier in the day. She taps on a photo to expand it.

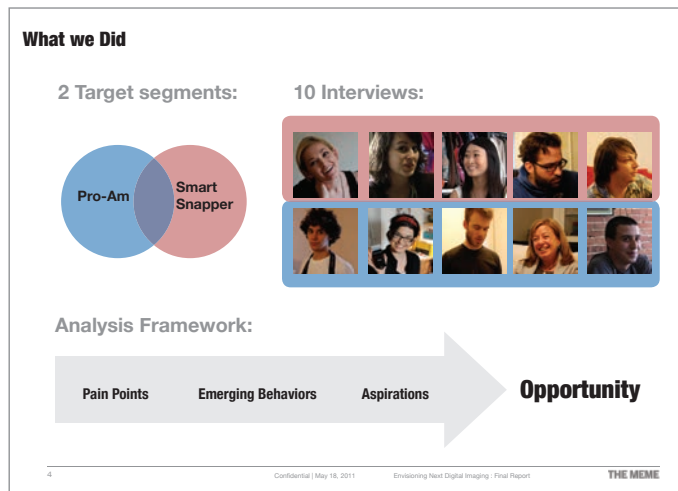




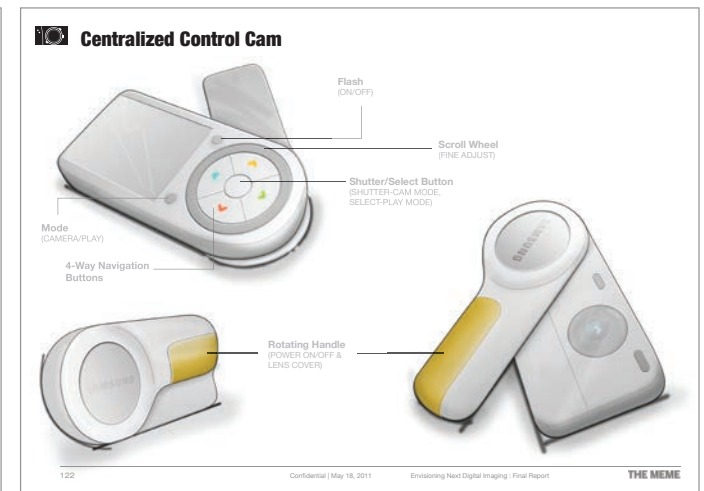
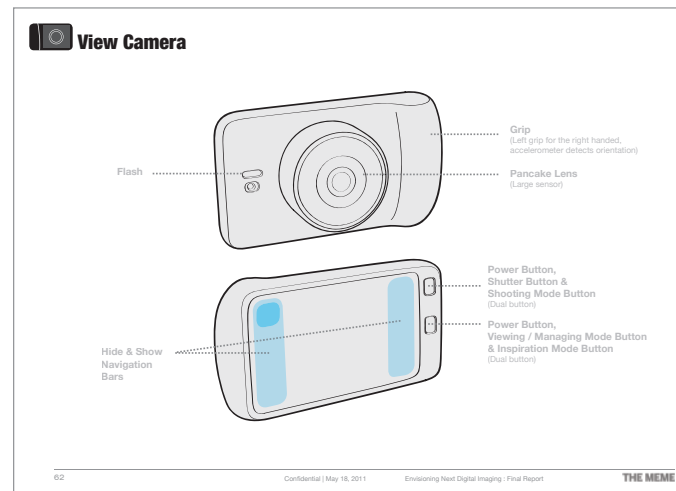
# Envisioning New Imaging User Experience

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



## Opportunity Areas

**1 Candid/Casual Imaging**

**A playful and spontaneous imaging experience** that delivers unique levels of social access by disrupting conventions and associations of invasiveness.

- Unobtrusive User Experience
- Facilitate candid photos
- Focus on unique and surprising images
- Spontaneous capture over planned result
- Camera always ready for instant shooting
- Discrete formal quality of camera

**Pro-Ams** "They're [digital cameras] so big. Even with the compact. With the cell phone... they have no idea I'm taking their picture. I can be very more stealth with the cell phone." -Andrew

**Smart Snappers** "Shooting people when they're doing their thing, when they're not posed and they're not looking at the camera, they're interacting with each other, it's a lot of fun." -Megan

"Nothing is visually different on the back face of the phone so there's no clue [that you are taking a picture of them]." -Alan

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**View Camera**

**Comparison: Interaction Design**

EXISTING P&S / DSLR / MIRRORLESS

VIEW CAMERA

**USER EXPERIENCE**

CAPTURING PROCESSING / EDITING SHARING INSPIRATION

Camera providing mostly with capturing features, making users do other related activities on other devices

**INFORMATION ARCHITECTURE**

Inconsistency & duplicated features for same results

Menu structure and path organized clearly and provided seamlessly based on user's mental model

**INTERACTION**

1) Touch screen: user has to put hands off the grip to use index finger  
2) PUI: Same buttons given different functions

Grip and main menu on the left letting users always hold the device stably. User navigates the menu bars on each corner with two thumbs

**LAYOUT**

Number of icons and selectable options around the edge of the screen, placed inconsistently and randomly

Clean screen without menu bars as default. User can pull out & navigate the actions, features, & options provided in step by step manner

78 Confidential | May 18, 2011 Envisioning Next Digital Imaging - Final Report THE MEME

**Peer Camera**

**Concept Overview**

- Unobtrusive and discrete camera for natural action shots
- The small size enables to capture moments in free-style (Casual and effortless). The most portability you can get in the DSC class
- Amusing capturing experience from multiple angles and moments--a new image type (Multi-POV capture of events)
- Experience and collect different perspectives (Social/collective imaging)
- Instant sharing and instant fun by D2D tethering with connected devices (smartphone / tablet)

**Opportunities**

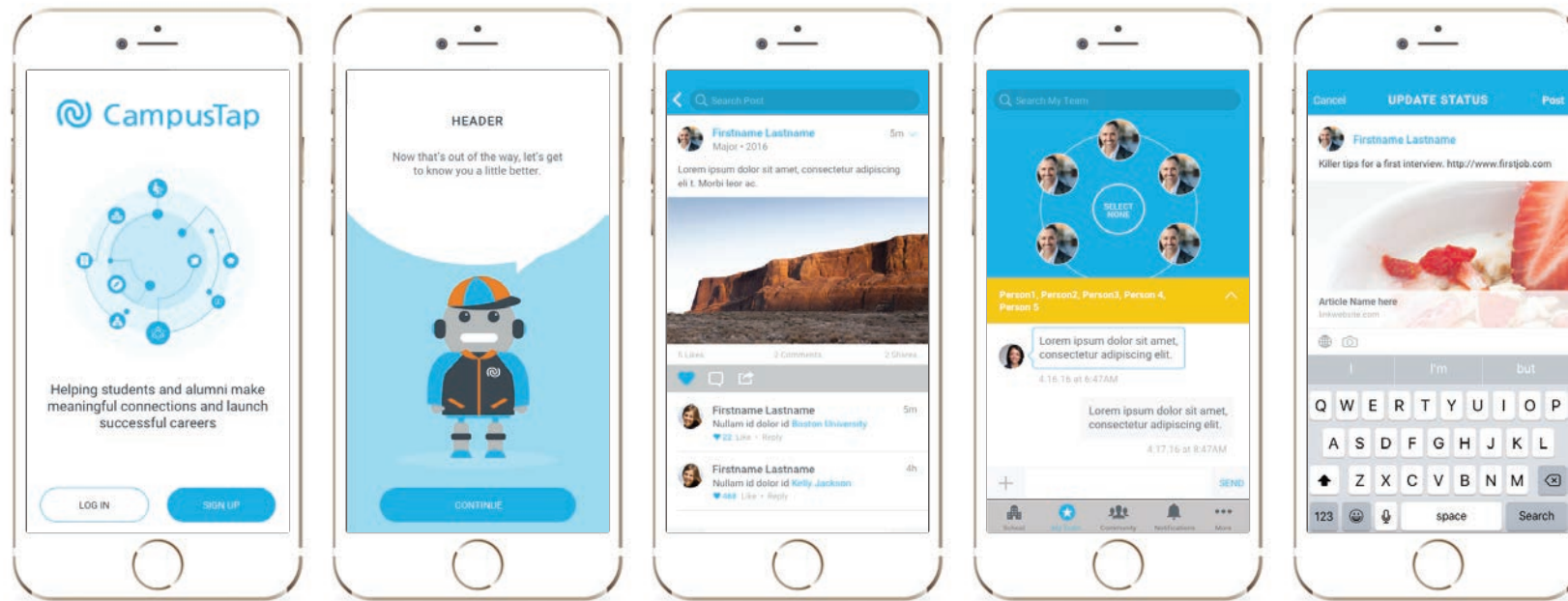
**Casual/Candid Imaging**  
A playful and spontaneous imaging experience that delivers unique levels of social access by disrupting conventions and associations of invasiveness.

**Live Networking**  
Integrated connectivity and imaging platforms supporting real-time conversations, learning, and virtual presence.

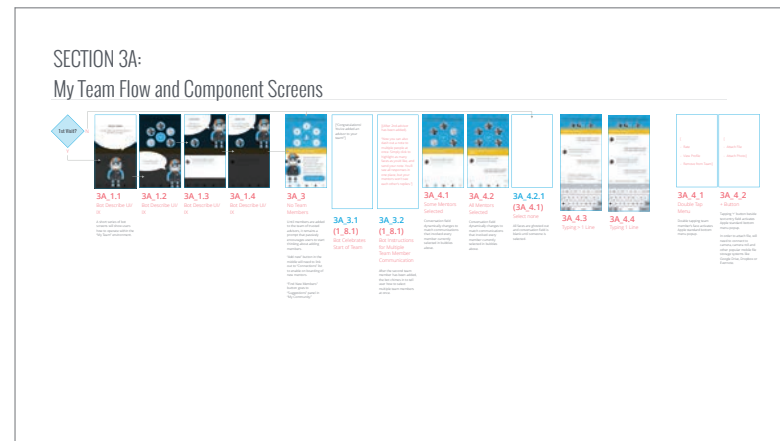
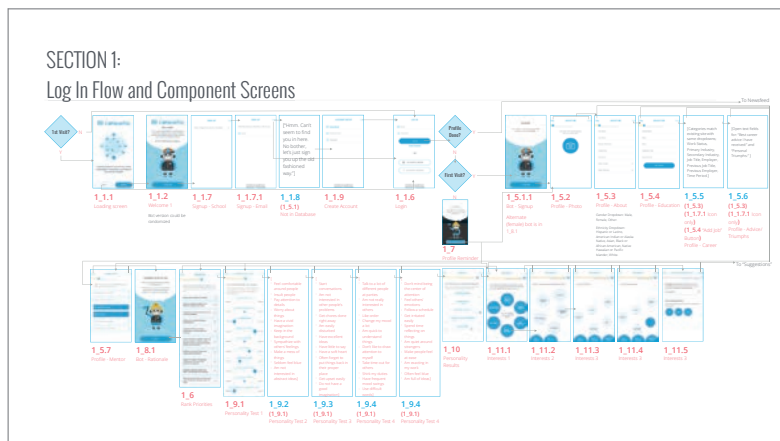
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# CampusTap : Mentorship Building (Mobile App)

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



UI Design / iOS



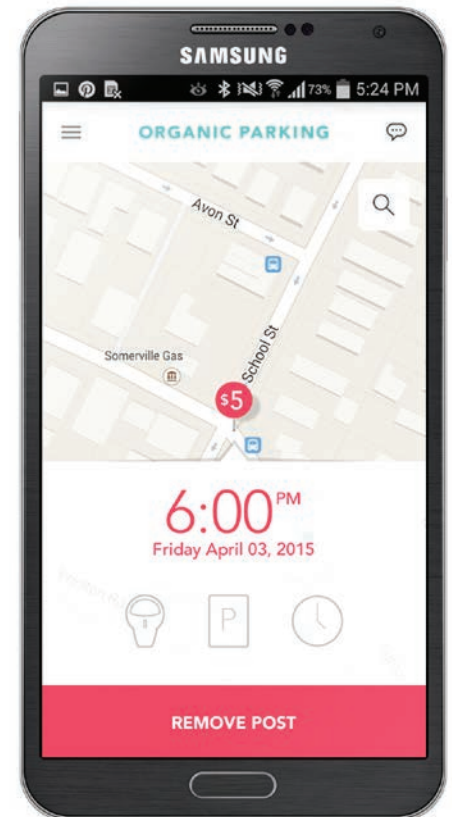
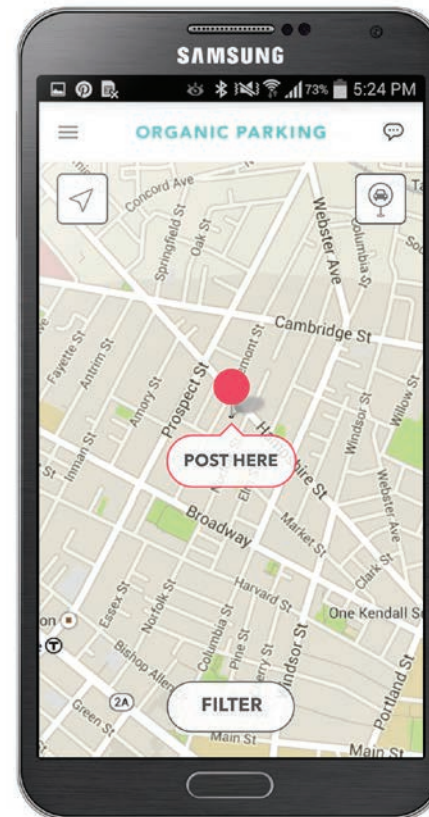
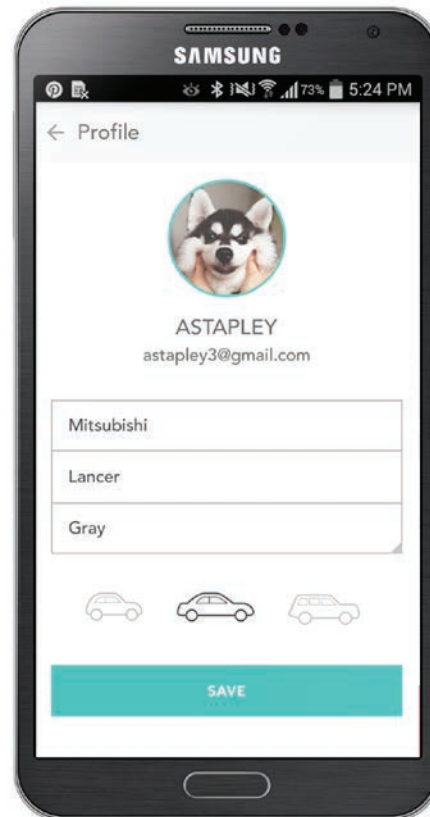
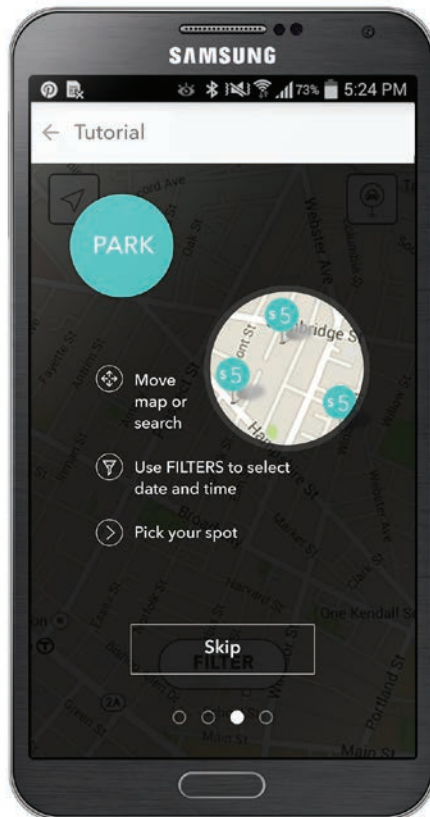
App Architecture / UX



# 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.

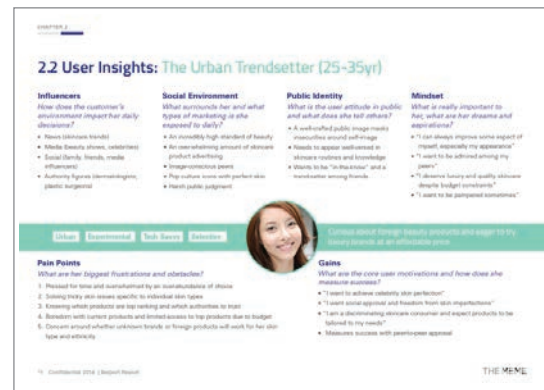
## Android / iOS App Design



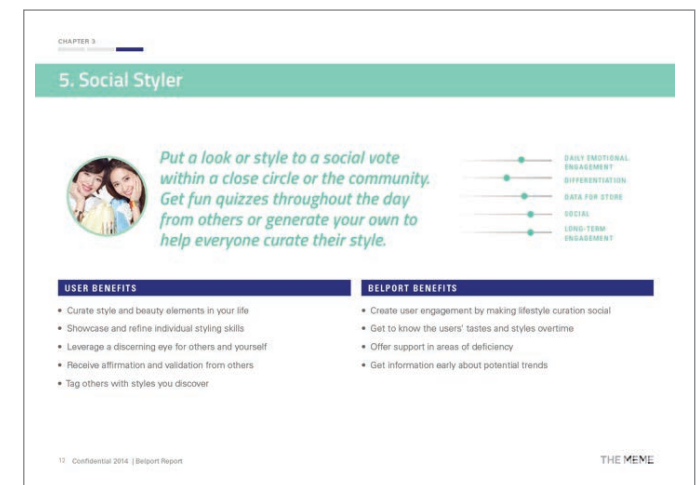
# Crowdsourcing Decision-Making

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.

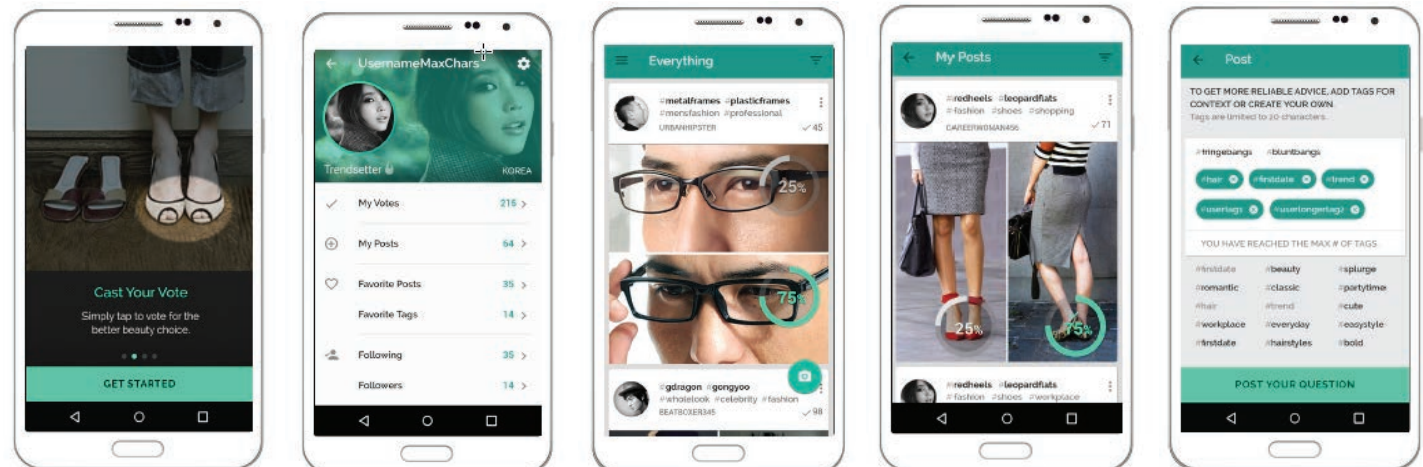
## Research Insight



## 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


Home Visit Bios  
Mel



- He cooks various food. Like to explore.

- Transparency of the oven is not that important. Sometimes I remember that it has a light.

- Would like to have bigger counter top for prepping food.



- No spaces can be wasted. His microwave is a storage space for a water kettle.

- 4 burners are enough. Sometimes he struggles with the shape of the pan with the location of the burner.

- No automation needed but it would be great if there is separate temperature with timer feature.

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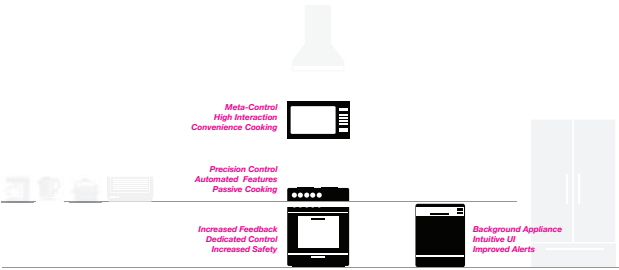
Top Chef Project: Strategic Insights for Cooking Appliances

THE MEME

## Product Concepts / Roadmap

Opportunity: Shifting Appliance Identities  
Identity = Role and Character

Technology must **empower and enrich**, increasing the **sense of immersion** into the cooking process. It should have a **kitchen-specific expression**, different from consumer electronics, and support user's **creative choice** and trust in their own senses.



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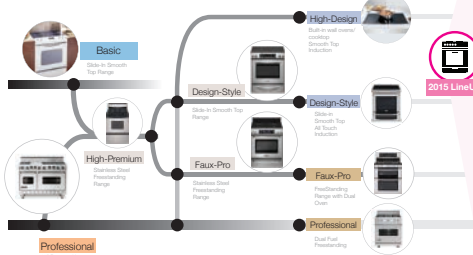
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Top Chef Project: Strategic Insights for Cooking Appliances

THE MEME

Opportunity Mapping  
Lineup Positioning and Design Guidelines

**Design' style** overtaking 'Pro'. Built-in, **minimalist aesthetic** popular in kitchens. Flexible, **multi-use control surfaces** (induction). **Data-driven cooking** for geeks.



**1. Minimalist Styling**

- Minimalist, "Less, but better".
- More integrated and continuous with the surrounding architectural environment, (built-in sensibility).
- Cooktop and Oven: independent actors within the overall range.
- OTI could recede and blend in more with the overall environment.

**2. Touch Tech Appliances**

- Integrate features for the media-networked, tech-savvy consumer.
- Fluid and intuitive UIs (personal devices).
- Smart data capabilities linking the cooking experience with external sources (cooking shows, social media sites, recipe aggregators, news broadcasts, entertainment).

**3. Pro-Tech**

- Emulation of the professional chef by the home chef.
- Growth in food appreciation
- Increased knowledge about food sources and cooking science.
- No longer mimicking the commercial grade kitchen, Pro-Tech features would create a more efficient, higher-precision, sophisticated tool.

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Desk Research Summary  
Understanding Food, Cooking Industry and Culture

**What we learned**

**Influence Cycles: Food Trends and Appliances**

- Baked goods <-> Fast ranges in the 19th century.
- MW <-> Fast food in the 1950s
- Light, healthy foods <-> steam oven in the late 21st century.

**Professional Cooking Culture + Popular Media influence appliance and kitchen trends**

- Birth of practical kitchen at the end of the 18th century.
- Images of the modern housewife in the post-war era.
- Food appreciation with Julia Child.
- Celebrity Chefs and TV shows promote the Pro-Style.

**Application to Today's Cooking Appliances**

**Local and Organic Foods**

- Appliances provide home cooks **access to data** about the cooking process, nutrition and food quality.
- **Share information** about how they achieve the perfect texture, taste, and flavor using farm fresh ingredients.

**Molecular Gastronomy, Scientific Cooking, Modernist Cuisine Aesthetics, and Knowledge of Origin of food source**

- **Sleek, minimal, data-driven cooking.**
- Interest in **transparency and precision** control in the cooking process.
- Demand for **more power, multiple forms of heat** (steam, convection, induction, etc.).
- **Modular, flexible,** or adjustable cooking appliances.

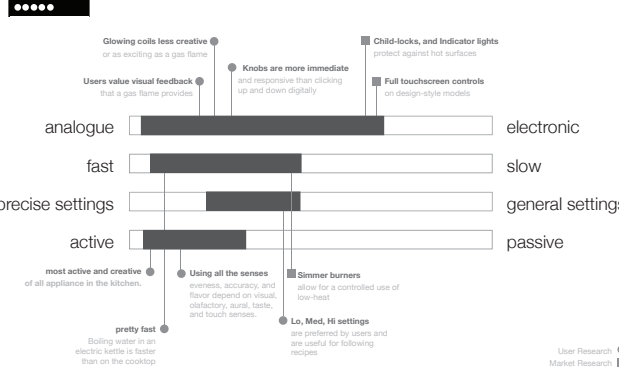
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Cooktop (Gas/Electric) **Current Identity**



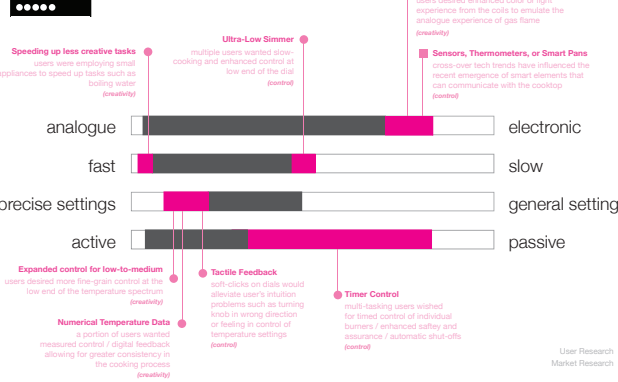
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Cooktop **Opportunities**



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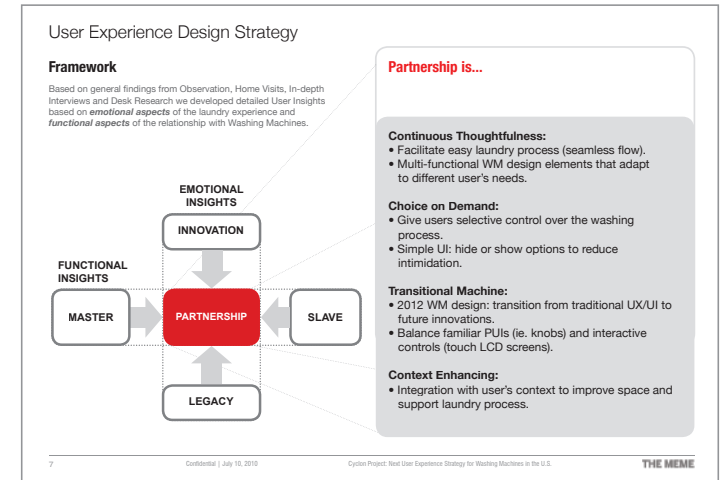
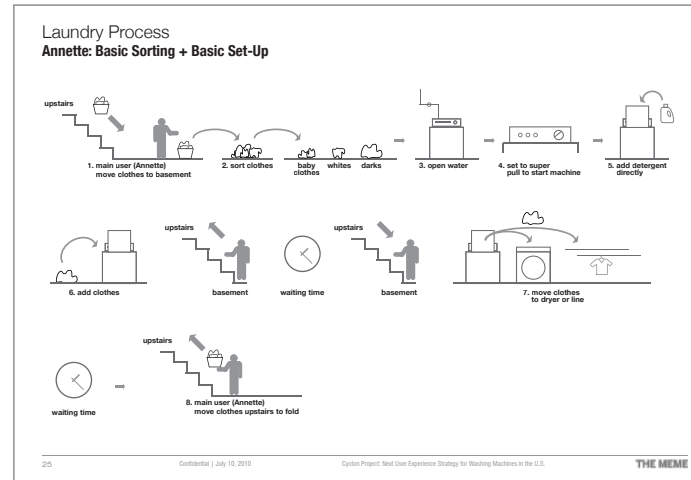
# Interaction Design for Washing Machine Control Panel

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.

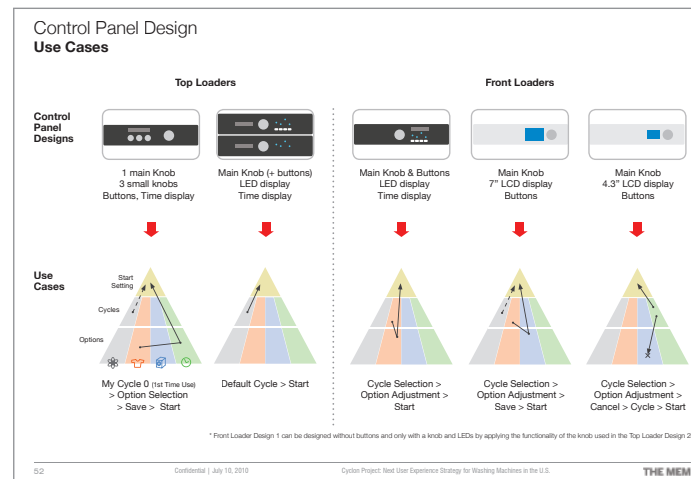
## User Research



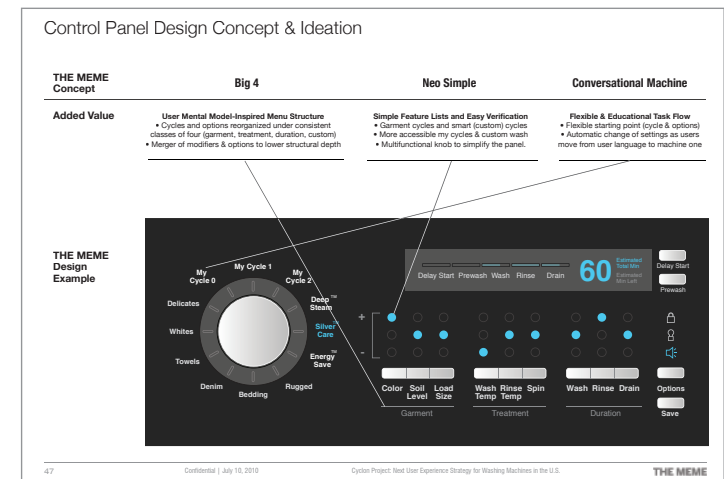
## Research Insights



## 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

**MEGATRENDS\_21 Consumer**

### Tasksnacking: digital appliance relevance

In the context of connected multitasking, consumers are incentivized to chunk time into discrete units of activity. With increasingly shared work loads, products will go over well if they can help turn a long, continuous, or poorly defined chore into smaller, completable, or outsourcable steps that build a sense of productivity.



**In-Betweening**  
The hyperconnected norm is an attention-demanding lifestyle, which means there's less time available to keep up with everything. Additionally, consumers are doing more and more on their phones, often through simultaneous multi-tasking features. In this context, chores that can be chunked into short but well-defined steps of progress for "in-between" moments of five minutes or less are ideal.

**Creative Utilization**  
The transition from product to service mindsets across industries makes a well-defined, repeatable "one user" journey increasingly important, as one "packet" of usage may be used to standardize an experience across multiple users. For example, the RE-Bubble turns a bar of soap into discrete units by bubbling a predefined amount of suds for each user. Increased utilization may also help a super-user outsource tasks to new or otherwise novice users, helping to ease their work burden.

**Post-Manual Instruction**  
Consumers no longer have the time to invest in reading a device manual. Appliance manufacturers are now charged with transferring the material that would fit such a manual into informative or entertaining bite-sized chunks of instruction, digestible through preferred media channels, that help users get the most out of the appliance. These strategies have a strong impact on a user's perception of and relationship with an appliance, helping to ease their work burden.

## Mega Trends / Insights

**MEGATRENDS\_21 Environment**

### Reharvesting Value



**2011-2015**

#### Waste Recapture

Where the 20th-century ethos of recycling preached a consumer mandate to separate streams of waste for more efficient downstream disposal, today we seek of recapturing waste at its source—a process of extracting energy from waste and using it to power a secondary, often related process. That means hybrid cars with regenerative braking and buildings with heat exchangers that recycle energy from exhaust air. Increasingly sophisticated attempts to minimize waste downstream are emerging through increased planning and intervention upstream.

**2015+**

#### New Alchemy


Innovative companies are starting to go beyond "greenwashed" recycling measures to combine materials in unusual combinations and treatments in order to unlock surprising value or functionality. For example, the German company Gerdil has developed a high-end, high-performance silk-like material derived from spoiled milk fibers. This type of "win-win" recycling scenario will need to occur more frequently as appliances, environments, and public services will be expected to function together as a more streamlined energetic whole.

## Micro Trends / Insights

**MICROTRENDS\_31 Culinary**

### Multi-modal Objects

Multi-use objects are given new value with spatial constraints (**Resurgent Cities**) and a perceived increase in the necessary set of specialized cooking tools for the contemporary **Sensivore** to produce specialized and spectacular meals. These tools can have a decisively male aesthetic, indicating a gender neutralization of the cooking duties in modern society.



**2009-2011**

#### Attachment arsenal

A long-standing tradition of multimodal appliances exists with stand mixers including many different attachments (dough hook, mixer whisk, etc.) and food processors (grater, slicer, meat's tenderizer, etc.). In many cases multimodal tools offer more options for the cook within one object.

**2012-2015**

#### Expanded Function

With more spatial constraints, objects become multimodal to provide compact utility. Stand tools also become dual- or multi-functional. Some appliances follow suit—like the microwave convection oven.

**2015+**

#### Embedded Technology

Whole kitchen units become multimodal (objects that relate to modular kitchen) kitchen islands with appliances, technology, tools, and storage all embedded and accessible become more popular.

**MICROTRENDS\_33 Air & Lighting**

### Informative Interfaces

Through **Ecometrics**, air purifiers offer more value through quantified feedback. Incorporating **Disappearing Interface**, hidden display screens show change in air quality to visualize the cleaning process and empowers better decision-making with measured information. **Light as Platform** plays a large role in the evolution of the controls as well.



**2009-2011**

#### Mode-based Illustration

Simple selection buttons with indicate activation with light. Basic features such as circulation and quiet cleaning mode are visually called out with iconography.

**2012-2015**

#### Glanceable Process

Analog aesthetics is replaced with with color-coded quality indicators and touchscreen controls. Users are able to discern information at a glance and obtain a general understanding of atmospheric data. Cleaning is qualitatively visualized with bar graphs and changes in color, and illuminated icons express current activity.

**2015+**

#### Invisible Reveal

Interface interfaces are hidden by default for convenience, with detailed information appearing on demand. Appliances are responsive and collect information on atmospheric quality. Smartphones-connected devices send context-based notifications and drive low-touch interactions.

**MEGATRENDS\_22 Consumer**

### Tasksnacking



**2011-2015**

#### Multitasking Mindset

With the proliferation of digital devices, all competing for a user's attention, multi-platform multitasking is becoming increasingly prevalent. More than any other demographic, this trend is driven by millennials. While smaller than some other segments, tech-savvy millennials are serial early-adopters and are increasingly influential across digital sectors. Their impatience and also their need to keep up with an increasing number of active social feeds both contribute to a perpetual multitasking mindset.

**2015+**


#### Productivity Points

Driven in part by the latest wave of global entrepreneurship and startup-mentality trends, there is an increasing obsession with productivity. In many cases, the mere feeling of being productive and maintaining momentum is valued more than any real impact of an activity. This concept of saving over a minute or two, for example, is going down a counter while waiting for a fax to download (or answering an email while waiting for something to finish microwaving), is highly valued. In the future, products designed for bite-sized moments of use that facilitate feelings of being productive or clever with time will be sought out.

**MICROTRENDS\_32 Cleaning**

### Tools of Engagement

The gender gap in cleaning is very stubborn despite women participating much more in the work force, they still account for the majority of the housework labor. New appliances, tools, and marketing strategies are seeking to expand the image of cleaning to include the whole family. The image of shared labor and engagement with men and children suggests a shift to a more equalized household labor distribution. Tools appeal to the **Tasksnacking** population, and are applicable to the household of the **Flexfamily**.



**2009-2011**

#### Mechanical Aesthetic

Some appliances, such as the vacuum cleaner, show a raw machine aesthetic. Their function is transparent and their power is emphasized. They also come in a wide color variety, including more masculine colors.

**2012-2015**

#### A Family Affair

Children are engaged with cleaning products, beyond just in a pretend play sense as before. Cleaning devices are fun and interesting, and often interactive. They are also anthropomorphic in many cases, adding a playful tone to the drudgery of cleaning. Cleaning products emerge that have a uniquely masculine experience, and are marketed towards men.

**2015+**

#### Universal Appeal

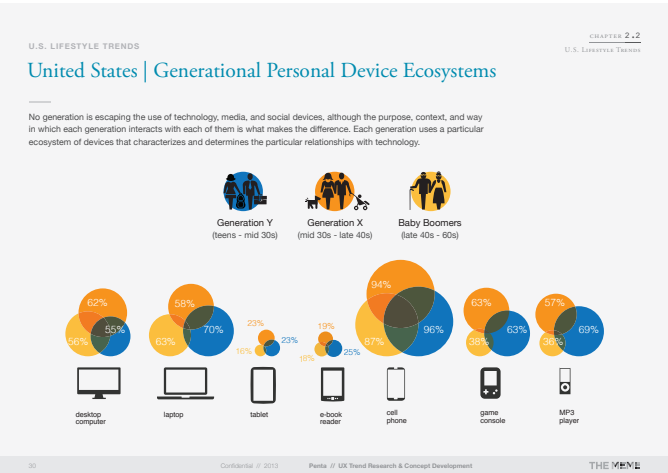
As robots become more essential in the household, cleaning bots will take on personalities and interactive abilities that are user-friendly appearing.

# INTERACTIVE DISPLAYS

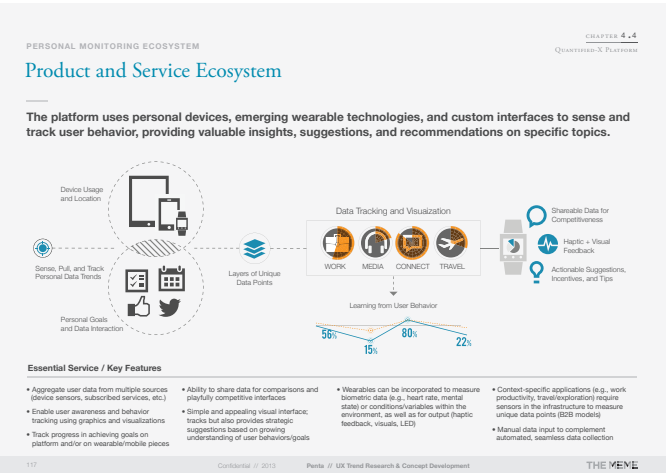
# New Product and Service Concepts for the US Market

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.

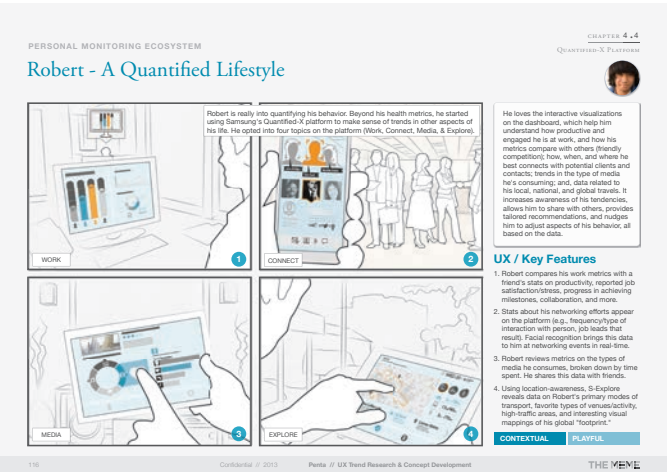
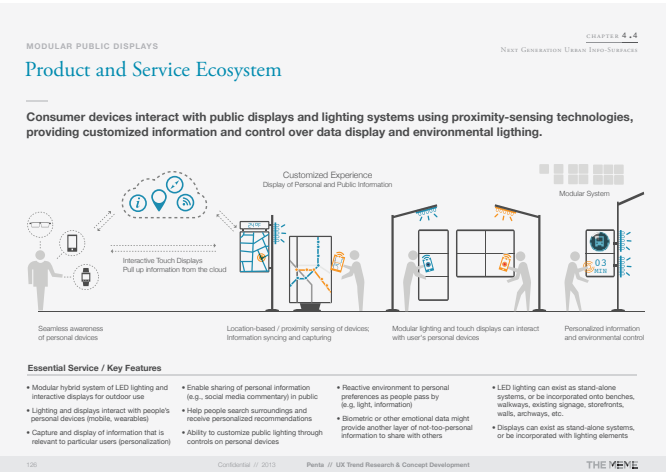
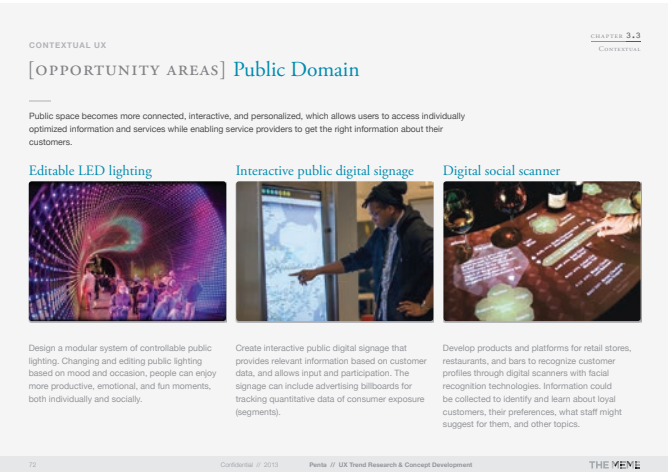
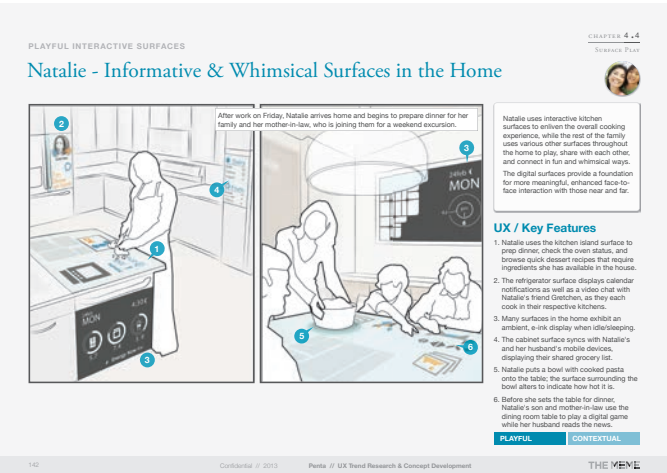
## Research / Insights



## Product / Service Ecosystems



## UX / Design Concepts





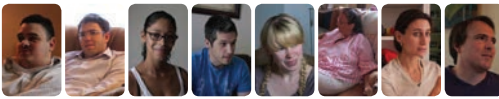
# New Service Experience for TVs in the U.S. Market

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

User Studies | Interviewee Bios

**East Coast**



**West Coast**




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Scenarios | Behavior-based User Groups

During the field research 5 behavior-based user groups were identified and defined by a predominant way of viewing the TV.

**Chillaxer** **Family TV** **Multitasker** **TV Club** **Hobby**



- Chillaxer**
  - Casual viewers
  - TV as relaxation
  - Detaching from daily life
  - Relate to the most essential values of TV
  - Focused on TV device itself
- Family TV**
  - Family device
  - Watch together
  - Concerned about content / time for kids
  - Most traditional TV experience
  - Dedicated rooms set up around TV
- Multitasker**
  - Two or more screens
  - Can be very engaged
  - 2nd screen supplement TV UX
  - TV as background presence
  - Focused on device and content
  - Relate to emerging aspirations
- TV Club**
  - Social experience
  - See value in sharing TV viewing
  - Seeking belonging and warmth
  - Satisfaction is in the context not the device
- Hobby**
  - Passion in content management
  - Personal media libraries
  - Control is main goal
  - Modification and experimentation are key


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## Design Strategy

TV UX Concepts | Remote Control Strategies


**MINIMAL / DIRECT BEHAVIOR RC**

- 1 Direct Behavior Control Buttons
- 2 Minimalist Control Device



**FULL TOUCH REMOTE**

- 4 Flex Remote
- 6 Smartphone / Tablet Controller



**Direct Control RC**

**Benefits**

- Ultra-minimal form factor creates strong brand ID for Samsung.
- Offer Direct Control Buttons based upon user motivation: **SOFT MODES** (e.g. Social Slider, Content Type, Content Filtering).
- Direct Full QWERTY text input:
  - Full Browser & Search capability on TV.
  - Consumers used to QWERTY for SMS.
  - Four UX using limited keyboards, pointer or 4 Directional control over GUI.
- Matched with GUI structure, emphasizing convenient browsing of large content lists.

**Deep Diver**  
Go behind the scenes without leaving the show


**Contextual Input**  
The right input method at the right time

**TV DeeJay**  
Feed a seamless flow of video with no gaps or breaks

**Custom Browsing Interfaces**  
TV Browser Apps/Plug-ins for customized content selection experience.

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TV UX Concepts | Direct Control RC Overview



**Stream**  
Push Direct Control Button  
Hold 2 sec

**Home**  
OK  
Filters  
One-touch Filters  
Volume

**More Fun**  
Profile  
Channel Zapping  
Contextual Search  
Full Search  
Direct Tuning

**Opportunities**

**Integrate**

- RC should simplify complexity, focusing on simple navigation of relevant content.
- Minimized function structure and interaction patterns that prioritizes users mental model and behavior
- Dedicated Filter buttons for quick peeping.
- Full QWERTY Keyboard for full text search, customization and social features.

**Guidelines**

**Instant On**

- Present the relevant content as soon as user turns on the TV.

**Less Control**

- Direct Control Buttons: Home, Filter, More Fun, Profile.
- OneTouch Filters: Select content by media type.

**At a Glance**

- Direct user to the overview pages (e.g. home+fun) with one button.

**Maintaining Enjoyment**

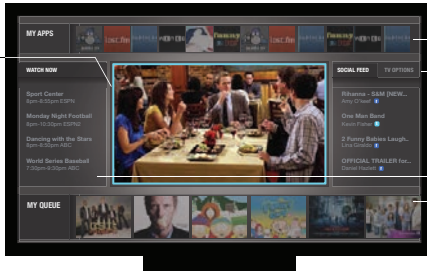
- Stream and +fun buttons bring users complementary contents.
- Simplify the physical remote so that users don't have to look down.

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## UX Concepts / Design

TV UX Concepts | GUI Design: Home Page

**Unique: Personalized TV UX for individuals or family**  
**Continuous Enjoyment | At a Glance Selection | Easy Access Anytime**



**Continuous Enjoyment**

- Current video being watched

**Selection box:**  
Easy navigation with 4-directional buttons

**Easy access any-time**  
Home Button


**At a glance selection of relevant content.**

- Direct Access to full pages per section:
  - My Apps
  - My Queue
  - Watch now (Live TV)
  - Social Feed
  - TV Options (Custom TV Settings)
    - Picture Mode, Backlight / Contrast / Brightness / Sharpness / Color / Tint, Economy
    - 3D TV
    - Sound: Mode (Master), EQ, Caption, Language, Auto Volume
    - Time / Timer
    - Security
- My Queue thumbnail stream fading:
  1. Focus on the limited favorite content
  2. Get the sense that the list is in a loop.

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TV UX Concepts | Touchscreen GUI: HOME

In case of Touchpad Interface, on-TV menus are controlled by RC. In case of Touchscreen Interface, TV screen is undisturbed.



**Content Selection Master**  
Touch ON/OFF to filter desired content type

**Profile Login**  
Swipe L/R to turn on / switch users

**Stream**  
Touch to expand STREAM to full page

**Browsing Navigation**  
Touch to Move between page (HOME, QUEUE, FEED, MORE)  
Scroll L/R to advance through longer item lists

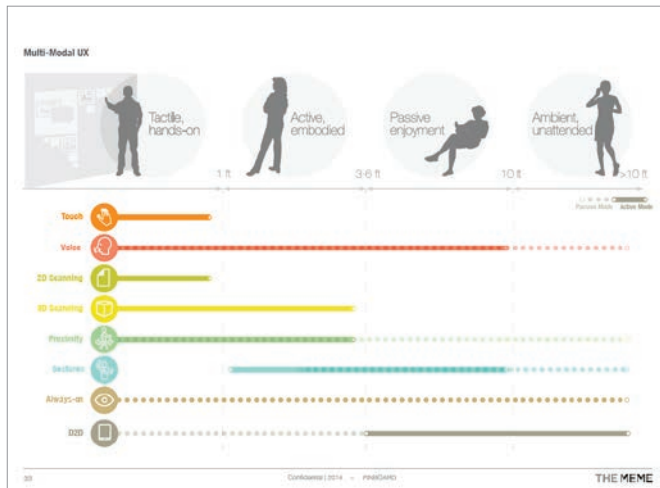
**Touch to activate/return to home screen**

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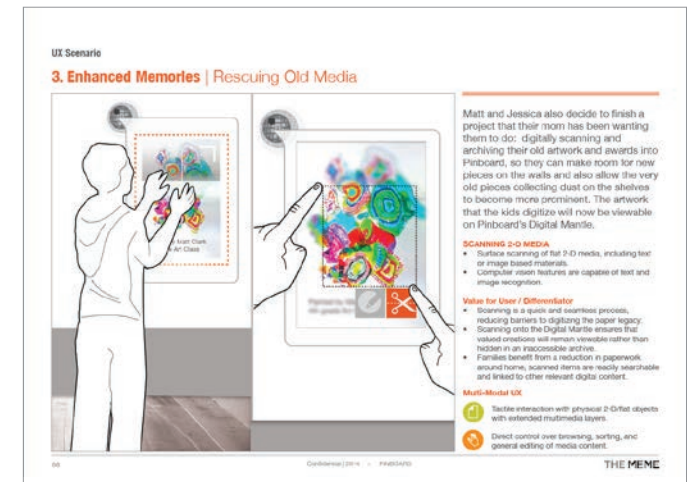
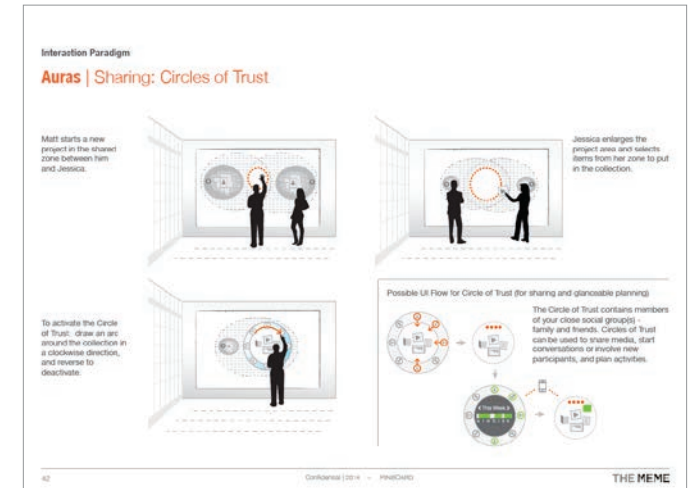
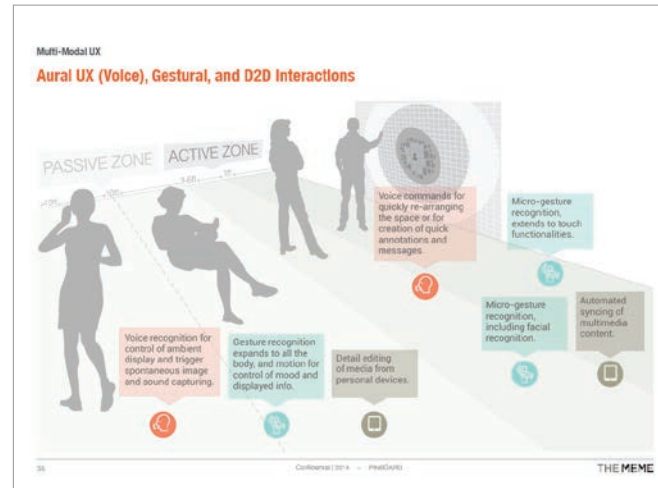
# Non-Conventional TV Experience

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

**SAMSUNG CLOUDSHARE SERVICE PRECEDENT SUMMARY**

Cloud Service: Partnership, Manufacturer, Operates on: Photo/Video Cloud Management and Sharing, Universal File Access

As consumers are increasingly using the H-IP as their primary still video camera, a number of H-IP manufacturers (including Samsung) have marketed the "automatic upload to cloud" functionality as a core service offering, though almost exclusively relying on 3rd-party cloud service providers (Facebook, MS SkyDrive, Flickr for the hosting).

A slight variation on this model is the Toshiba-Pixio partnership, which uses Flickr's storage and sharing infrastructure, yet retains the photo files for display and management within a Toshiba-specific 3-screen media application (Pixio). Toshiba-Pixio UX is also notable for offering (Pig) to-TV feature within the App itself.

The most complete device-server integration can be found in Apple's 3-part Cloud Service Application (MobileMe, MobileMeGallery, and iWork), offering a photo storage/sharing, universal file access, and collaboration solution, for both mobile and web. Because Apple owns the hardware, software, and cloud storage, it can offer users consistent 4-screen UI as well as integration with a wide range of Apple applications.

Specific features unique to MobileMe include 1) adding other approved users' accounts to see updates from their Galleries in real-time, 2) save-to-cloud options incorporated within all Apple software (iPhoto, iMovie, etc.).

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### FamilyHub | Trends

- A small-scale social network of trusted individuals is typically between 5-20 people, including close friends and family.
- A number of U.S. mobile carriers have targeted this scale of interpersonal network with special calling plans.

**5 T-Mobile** (until recently) offers a calling plan that granted a mobile user free calling to his or her five favorite contacts.

**10 Verizon/At&T** identify 10 numbers as a Friends & Family calling group. Minutes used when placing or receiving calls to anyone in the calling group will not count against customers' plan minutes.

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## Research Insights

**Family Hub | Setup Process**

Meg buys a Samsung SmartTV. The FamilyHub App comes preloaded on the TV's HomeScreen.

The first time Meg clicks on the FamilyHub App icon it asks her to Create a Name for the Household. She names it "SillerHQ".

Then she is prompted to Add Household Members via: CloudShare username, Mobile Phone #, email address.

Once the Household members agree (and download the FamilyHub App if they don't have a Samsung device), the SillerHQ FamilyHub is complete.

Meg's elderly father, Jim, doesn't have to do much to link to her FamilyHub account if he owns a Samsung TV.

On his HomeScreen, Jim clicks on the preloaded FamilyHub App and creates a Name for his Household: "BigJim".

The next time they speak on the phone, Jim tells Meg his Family Hub name. Meg then searches for "BigJim" using the "Settings/Account Link" function on her TV.

An invitation is pushed to Jim's TV. Once he clicks accept, his FamilyHub is connected to his daughter's. Jim will now see all new photos, videos and recommendations added by the Siller Family.

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## Design Strategy

**Family Hub | Viewing and opening an MMS**

When Jamie and Emily turn on the TV, the first thing they see is the Family Hub Home Screen.

There's a message from Daddy!

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## UX Concepts / Design

**Family Hub | Expanding the Family Hub screen**

Connected Hubs represent Family Hubs that have established connections to this Family Hub. Select these icons to filter the shared content from a single Family Hub. The numerical icons indicate which Hubs have "New" shared content (scrolling over content on left side erases the New numbers).

Post-it Notes can be applied throughout the hub, but are cataloged here. Selecting one takes you to content it is referencing.

New multimedia messages and additions to the Family Gallery.

HOME SCREEN

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**Family Hub | Flinging an MMS to the TV**

The images are so good she has to share them with her kids. During one of their commercial breaks, she touches device select and chooses TV: Living Room.

The invitation includes a short photo album of highlights from their past 10 years together—how cute! The photo device select and chooses TV: Living Room.

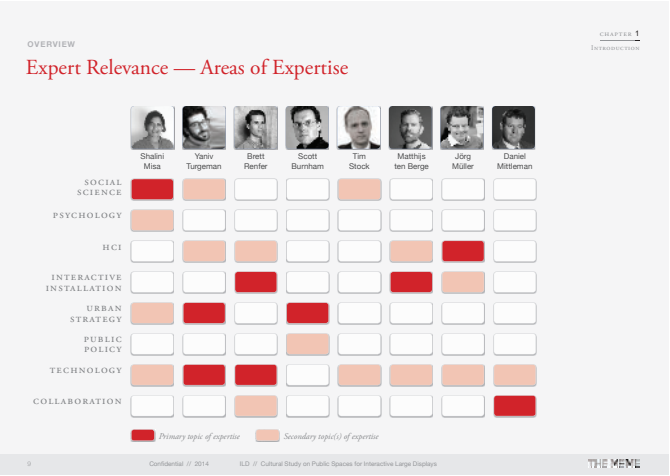
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# Interactive Large Displays for Public Spaces

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



# AUTOMOBILES

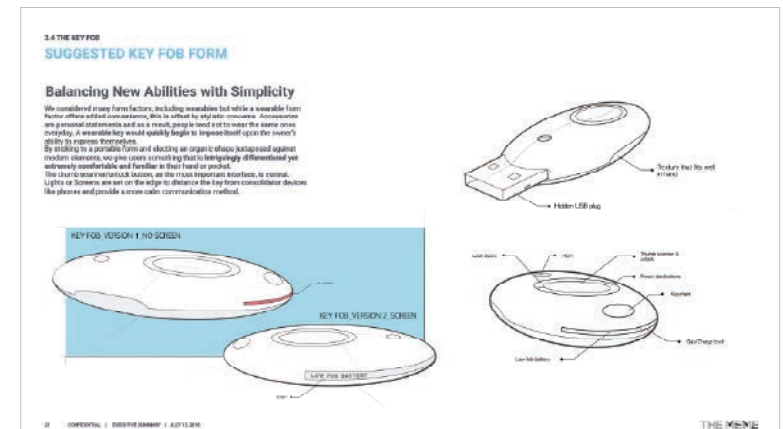
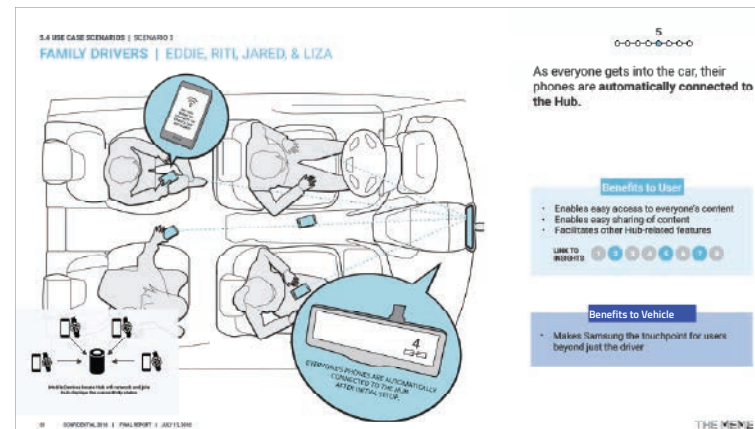
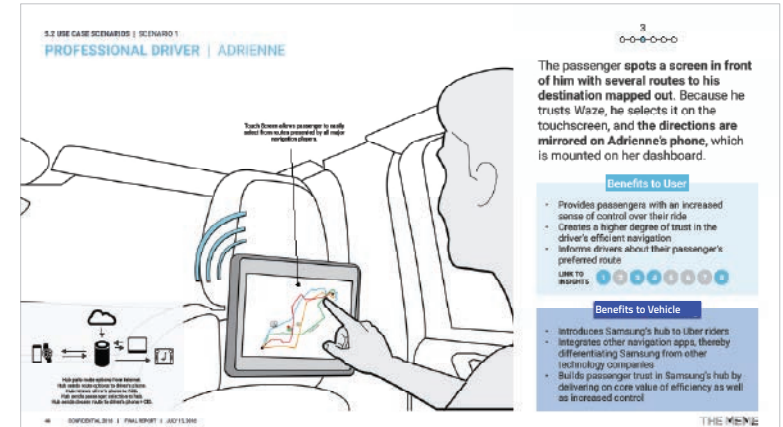
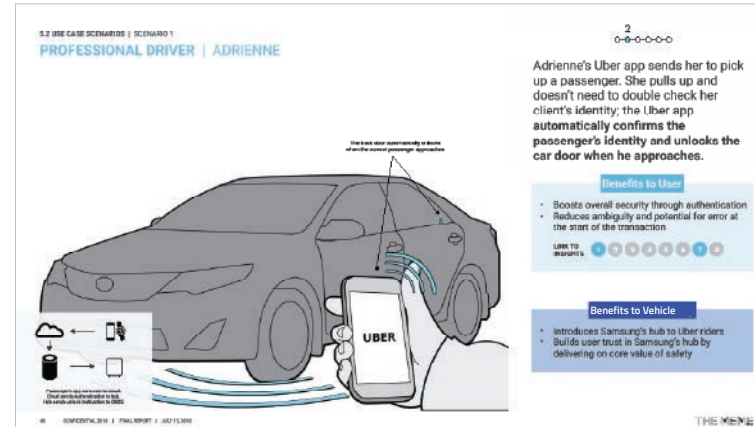
# Connected Car UX: Product and Service Concepts

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

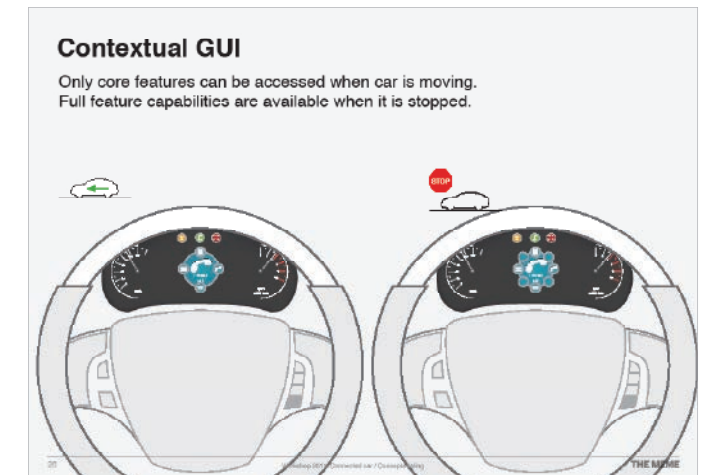
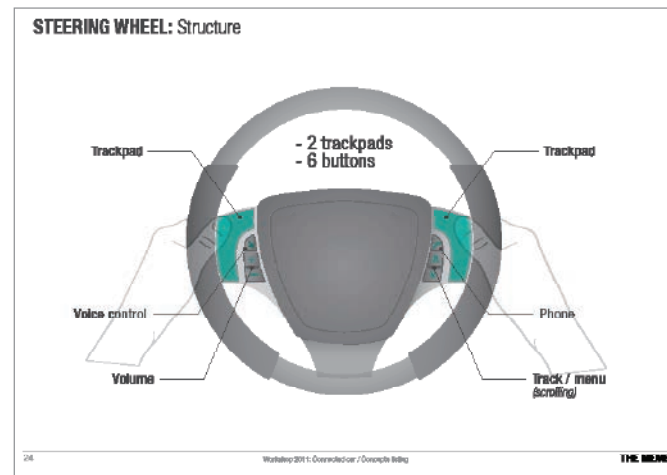
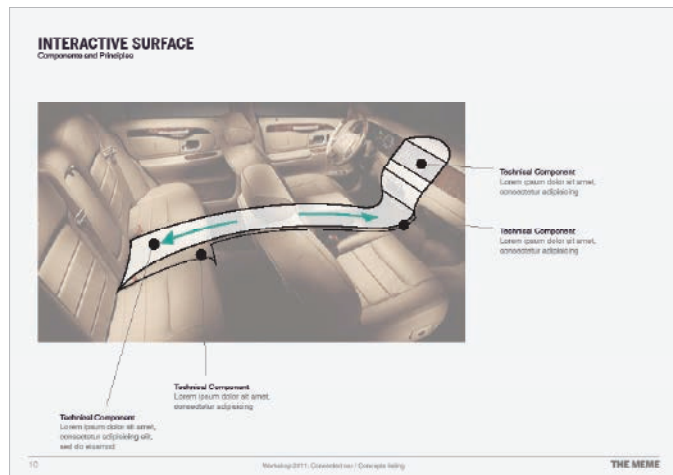
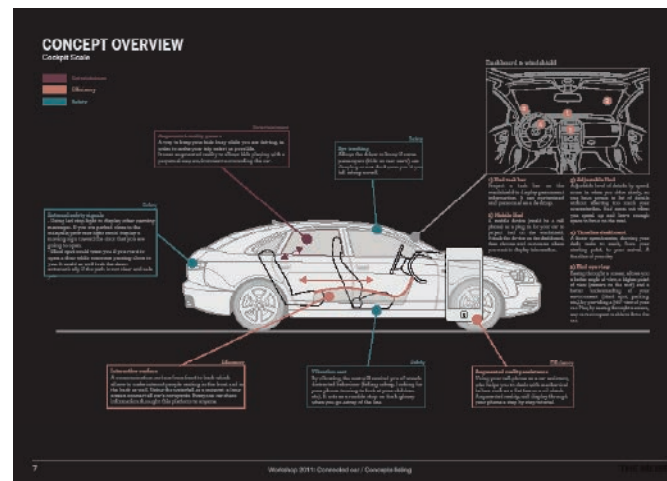


## UX Concepts / Design



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

## 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



# IVI EXPERIENCE

- Generative Trends
- Market / Industry Insights
- Thematic Examples
- Strategic Roadmap

The car must be an *extension of its driver and passengers.*

It is no longer just a machine for transportation, it is a smart mobile device.

IVI Experience opportunities:

- Satisfy information and entertainment demands within the ever-changing car environment.
- Integrate users digital lifestyle with vehicle-specific capabilities and character.
- Leverage smart vehicle and infrastructure technology to create next generation mobile experiences.

11

## Research Insight






## STRATEGIC THEMES: INTERACTIVE DASHBOARD

**T**elematics systems are transforming the automotive industry with innovative products and services that provide new value propositions and business models. There are opportunities in leveraging our client's technology in partnership with vehicle manufacturers to develop interactive dashboard/steering wheel, passenger-seat controls and display technologies, optimized for the unique safety and ergonomic constraints of the driving experience.

THE BOARD | New Opportunities and Strategic Projects | 2012-2015

## MARKET / INDUSTRY INSIGHTS

To keep up with the demands of consumer devices, **car infotainment has shifted from in-vehicle features to off-board services**, creating new business opportunities through personal device synchronization, software and operating system level customizations.

<p><b>Market Growth</b></p> <p>Global sales of telematics smartphone applications to grow from 3.2 million in 2011 to 129 million in 2016. <i>IoT Research</i></p>	<p><b>Today's App Offering</b></p> <p>At least 10,000 car-related applications on Apple's App Store and nearly as many on Android Market. <i>adidas, @Digital Forecast</i></p>	<p><b>Future Source of Your Business</b></p> <p>Backend services will become a service provider enabling device companies and manufacturers to a whole new range of opportunities including car repair, education, and next-gen mobile ads.</p>
<p><b>IVI platform examples:</b></p>  <p>Myford Touch Windows Embedded Automotive OS</p>	 <p>Audi MMI System (Multi-Media Interface) Android OS M System</p>	 <p>Hyundai Blue2 concept car: Tablet Device On Android OS M System</p>

# STRATEGIC THEMES: INTERACTIVE DASHBOARD

## STRATEGY

**FIGURE 1 EXPANSION**

In direct partnership with car manufacturers, Google is launching display systems for its telematics, leveraging our Client's expertise in Digital Displays, Mobile Devices and Consumer Electronics applications in general.

**FIGURE 2**

Integration over Client's Mobile Applications and Media services into co-branded Automotive Telematics systems, offering a unique advantage in integrating consumer general needs and mobile lifestyle with the car experience.

## MEANINGFUL EXPERIENCES

**1.** Fun has two sides, Live and Virtual. They spend a lot of time in the car. The kids are playing games using the rear view of the window while the car is driving. The whole time frame an augmented reality display projecting images that allow them to play with suspended new environment interacting with the car.

**2.** As in their own car, the Wireless fidelity can enjoy a communication surface that allows interaction between all the passengers in the car. The mobile telephony creates a platform for web-browsers to fly, allowing, media and try and played information between the two front and the back seats.

**3.** More wanted to surprise his fiancée Linda with a wedding proposal while they are walking a nice scenery. More presented a message and asked it to be the first and the last of the ride. Linda nodded in agreement by smiling it on the public to Linda. Saw next to them, kept looking to contemplative faces.

## MARKET INDICATORS

**30 %**

By 2015, electronics are likely to form 30 percent of the cost of a new providing opportunities for dashboard integration of hands-free communication, in-car entertainment systems, navigation and vehicle car diagnostics.

**211M**

Smartly fitted 27 million vehicles were in 2010, more than 27% in the US.

2010 Revenue, 2009

**46 %**

Globally, the percentage of new vehicles fitted with telematics is forecast to grow from 6% in 2009 to 46% in 2017.

WEEK 1000 - Value Opportunities and Strategic Projects | 2012 - 2015

10

MARKET / INDUSTRY INSIGHTS

Automobile infotainment has become a strategic part of the Mobile Device Industry's future growth. By working with car manufacturers to integrate product, service and OS platforms, CE companies are positioning themselves to create new business opportunities and business models.

Nokia is developing "Terminal Mode", a technology that connects mobile devices to in-car infotainment systems.

- Mobile Services and content fully integrated with IVI System
- Two-way connective phone can access our data to provide relevant information to the driver).
- Proposed as an industry standard to connect all smartphones (not only Nokia) to support IVI.
- Accessible Apps from OVI Store

RILM owns QNX Software Systems, developing OS platforms including QNX CAR as well as their PlayBook tablet OS, promising integration.

- TOYOTA ENTUNE/TOUCHAGO MULTIMEDIA SYSTEM**  
Uses mobile phone for navigation, entertainment, and information services using voice recognition.
- BMW CONNECTED DRIVE**  
Listen to emails from Bluetooth-connected phones, (SMS) connectivity, calendar entries, call and contact lists, and memos.




THIS REPORT IS OUR Opinion and Strategic Perspective | 2013-2015

## PLANNING: STRATEGIC EXPERIENCE ROADMAP

2010

### WHEELED INFOTAINMENT

#### OPTIMIZED MODELS FOR CAR

- Secondary Devices for Open-Source Car UI
- Mobile Interface (UI) for Car Usage
- Risky Representations (Mobile / PC)
- Independent Mobile Apps for Car

#### VIDEO CAR 3.0

- Interactive Media in Car
- Personalized Content
- Car UI Mobile Modularity
- Mobile Apps for Car

### SEAMLESS MOBILE LIFESTYLE

Continuous enjoyment of mobile experience inside the car with **integrated devices, synchronized media and dedicated apps.**

#### DEVICES IN CAR CONTEXT

- Mobile device adapts for use in car (UI, apps, content, privacy features)
- Secondary devices support driving (HUD, camera, Mi-Fi HotSpot)

#### CAR MEDIA

- Access to user cloud media services, subscriptions, feeds, etc.
- Automatic media sync in the car (V2V), with instant personalized content, suggestions and feedback.

### INTERACTIVE DASHBOARD

NEW BUSINESS OPPORTUNITIES: MARKET EXPANSION

#### CAR INDUSTRY PARTNERSHIPS

- Develop relationship with Car Manufacturing Company / Brand
- Provide new market and leverage specific technology know-how within the Car Industry

Y&M 000000 | New Opportunities and Strategic Challenge | 2010 - 2015



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