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Faculty Summit

10
YEAR ANNIVERSARY

Use Smart Phones to Promote Diabetes Self-management for Robust Elderly in China

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Agenda

- Overview
- Users
- Context
- Multi-level Architectural Vision
- CADA Prototype
- Next Step
- Future Aspirations
- Q & As

Overview

Introduction

- Goal and importance
- Multidisciplinary Research Team



- Primary collaborators

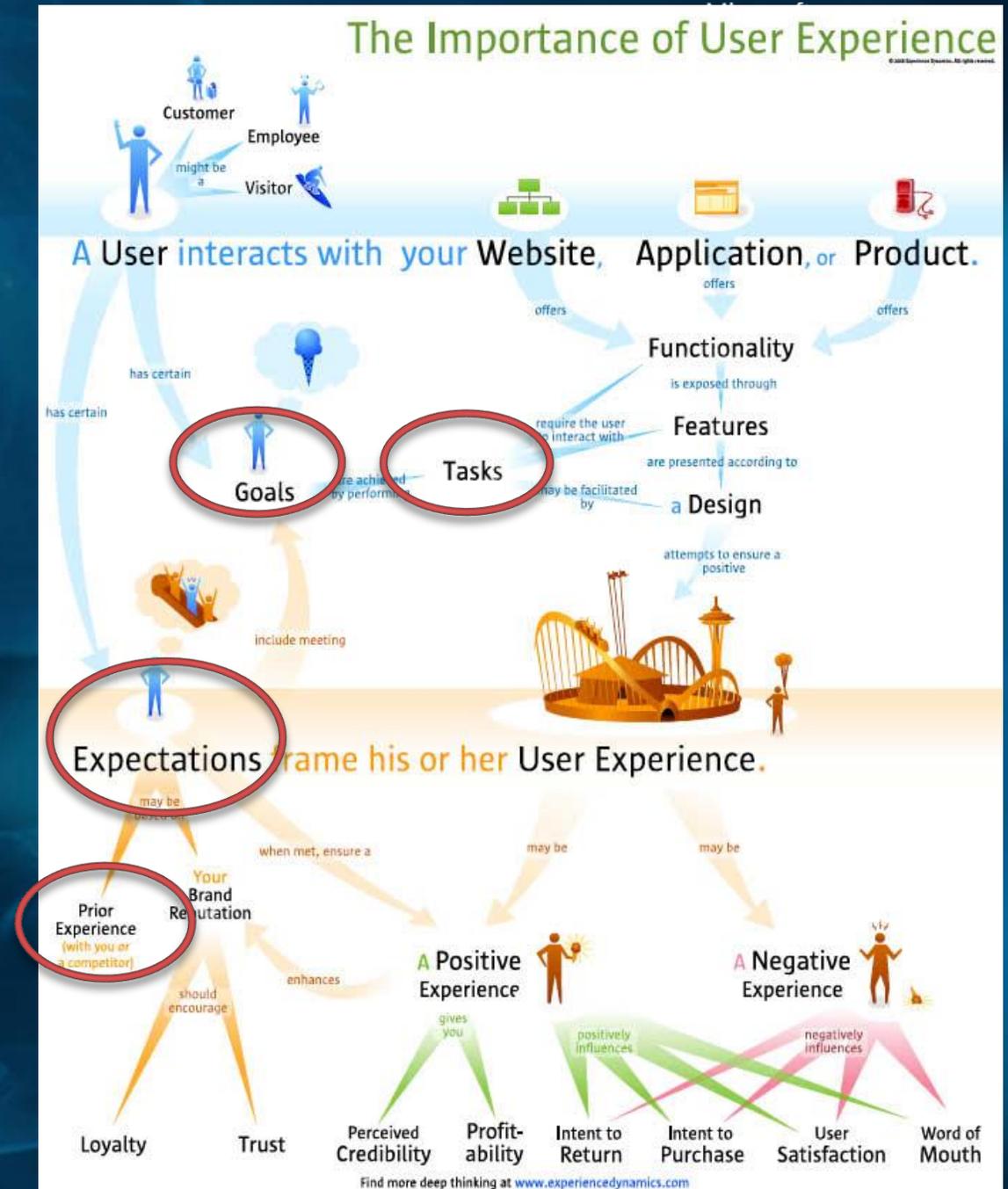
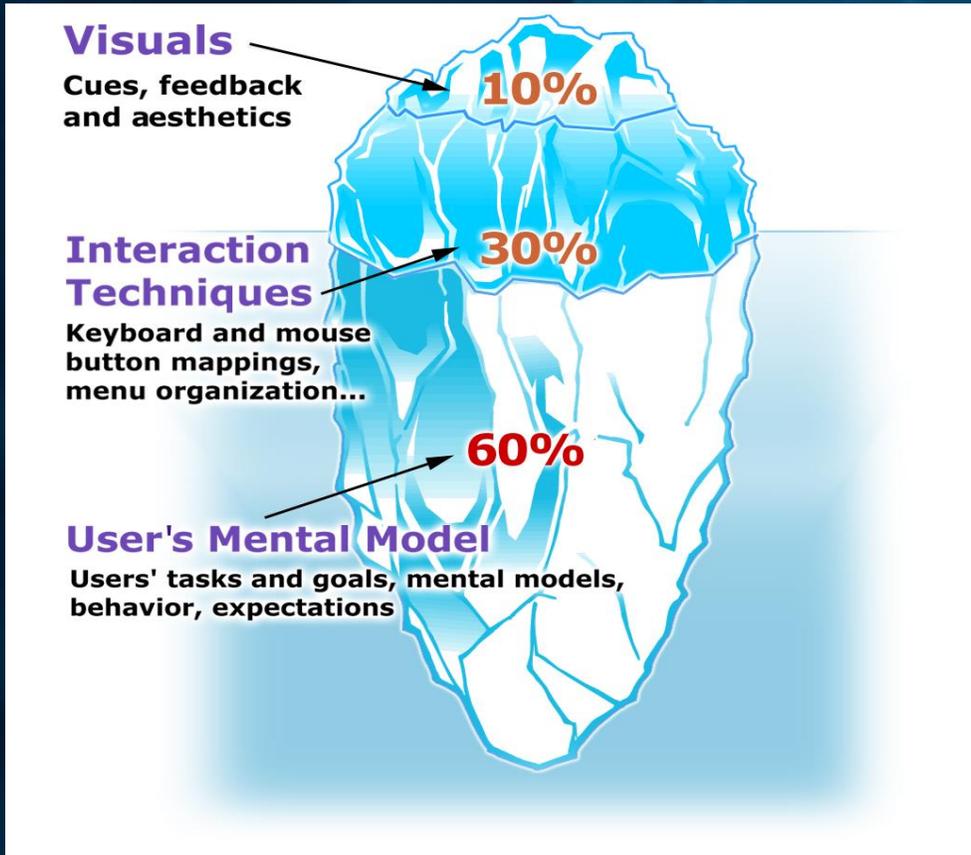


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User-Centered Design

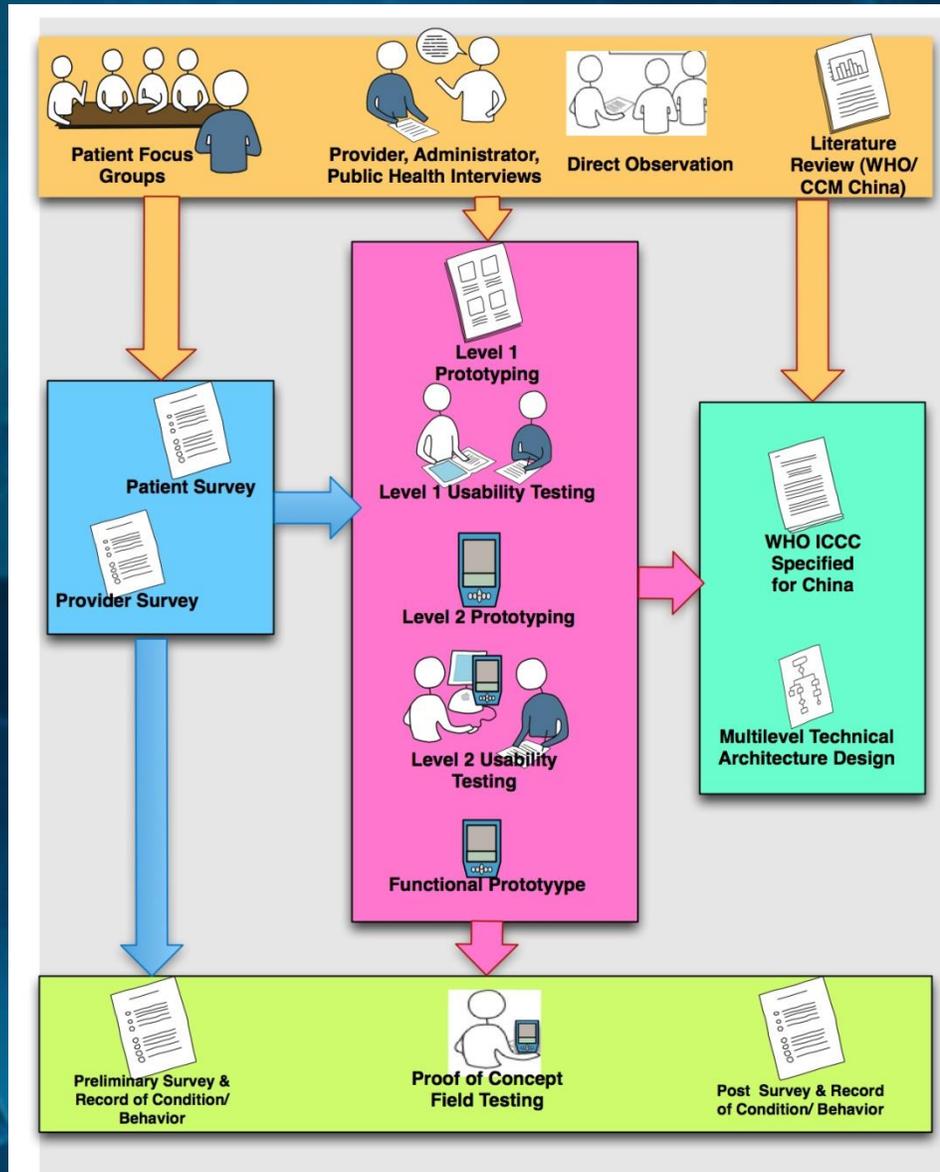


Approach for Design and Prototyping

Phase I –
User Requirements
Gathering

Phase II – Design,
Prototyping & Testing

Phase III –
Proof of Concept Field
Evaluation



Persuasive Design

Primary Principles	Definition
Reduction	Making complex tasks simpler
Tailoring	Tailoring information based on personal needs
Kairos	Technology intervention at the “right” opportune time
Self-Monitoring	Eliminate tedium of tracking
Conditioning	Operant conditioning that uses positive reinforcements to shape complex behavior
Liking/Attractiveness	Persuasion by liking is creating an environment that a user likes to use
Praise	Offering praise to make people feel good
Convenience	Easy accessibility

Users



Target User Populations

- Primary: Urban vs. County vs. Rural Patients
- Secondary: Providers
- Secondary: Caregivers



Characteristic	"Urban"	"County"	"Rural"
Demographics			
Educational Level, Intellectual Abilities, Skills of the User	All over the board from some high school to high school and college graduates.	All over the board from some functionally illiterate to high school and college graduates.	All over the board from some functionally illiterate to high school and college graduates.
Learning Style	Mentioned games. Prefers icons and Chinese symbolic characters to text.	Mentioned games. Prefer audio outputs to reading. Do not want the language to be "doctor" language.	Mentioned games. Do not want the language to be "doctor" language.
Diabetic physical capabilities*	Consistently robust elderly population.	Consistently robust elderly population.	Consistently robust elderly population.
Health Value Schema (PATH)			
Health Beliefs (determined by using profile cluster analysis of survey data related to health beliefs)	The most predominant group of urban patients can be described as avid information seeker for information on health treatment, price, nutrition, and healthy diet. They are price sensitive regarding health care, but not price prohibitive. They tend to be decision makers for the family (self and spouse) regarding health care. The urban patients are usually proactive and pay attention to preventive care.	The most predominant group of county patients can be described as information seeker for information on health treatment, price, nutrition, and healthy diet. They are price sensitive regarding health care. They tend to be decision makers for the family (self and spouse) regarding health care. In comparison to the urban patient, the county patients tend to be more reactive and pay less attention to preventive care.	The most predominant group of rural patients depends for health care primarily on themselves and family. They are more reactive to doctors' recommendations and complications.
Technology Intent/Adoption			
Existing Computer/Internet Skills	All over the board from low to high.	All over the board from non-existence to moderate.	Non-existent.

Urban Patient personal profile

Mrs. Shuxin Gao, a 63-yr retired account, lives with her husband in a comfortable 3-bedroom apartment in Beijing. With a family history of diabetes, Mrs. Gao was first diagnosed with gestational diabetes in 1974. Starting her mid 50's, Mrs. Gao tried to control her blood glucose through diet, but this did not work and she switched to oral medications. In 1998, Mrs. Gao's retina suddenly started bleeding, eventually she lost her left eye because diabetes induced glaucoma. She is now on insulin.

A few years back, many primary hospitals in Beijing started offering health seminars. Mrs. Gao likes attending the diabetes seminars. Although the seminars often present too much information each time for her to digest and remember, she enjoys making friends with other diabetes patients. Unfortunately, Mrs. Gao is not able to attend those seminars as often as she would like because commuting to the seminars takes a lot of time. Through the seminars, she has mastered the basic knowledge of diabetes and her blood glucose level are pretty much under control.

Mrs. Gao tests her blood glucose level often, at least once every three days. She learned from the seminars that she should record her glucose test results to see how she is doing over a period of time. Mrs. Gao only occasionally uses the log booklet that the glucose meter company provided, as it is such a hassle writing things down each time. Mrs. Gao knows that diet is important, but struggles with managing her diet during frequent family meals with her children and grandchildren and especially when they go out to eat. Mrs. Gao often forgets what or how much she ate hours later when she tries to write down what she ate in her log. Mrs. Gao enjoys group ribbon dancing in a nearby park every morning.

Ms. Gao carries her cell phone around so her husband who suffers hypertension can reach her easily. She likes to exchange short messages with her son who lives in Shanghai and only comes home for major holidays.

Shuxi Gao 高树新 "I want to help other diabetics."



background

- Lives with her husband of 38 years, both have stable pension
- High school graduate with an accounting certificate
- Enjoys cooking, knitting, and learning how to play poker games on computer with her husband

attributes

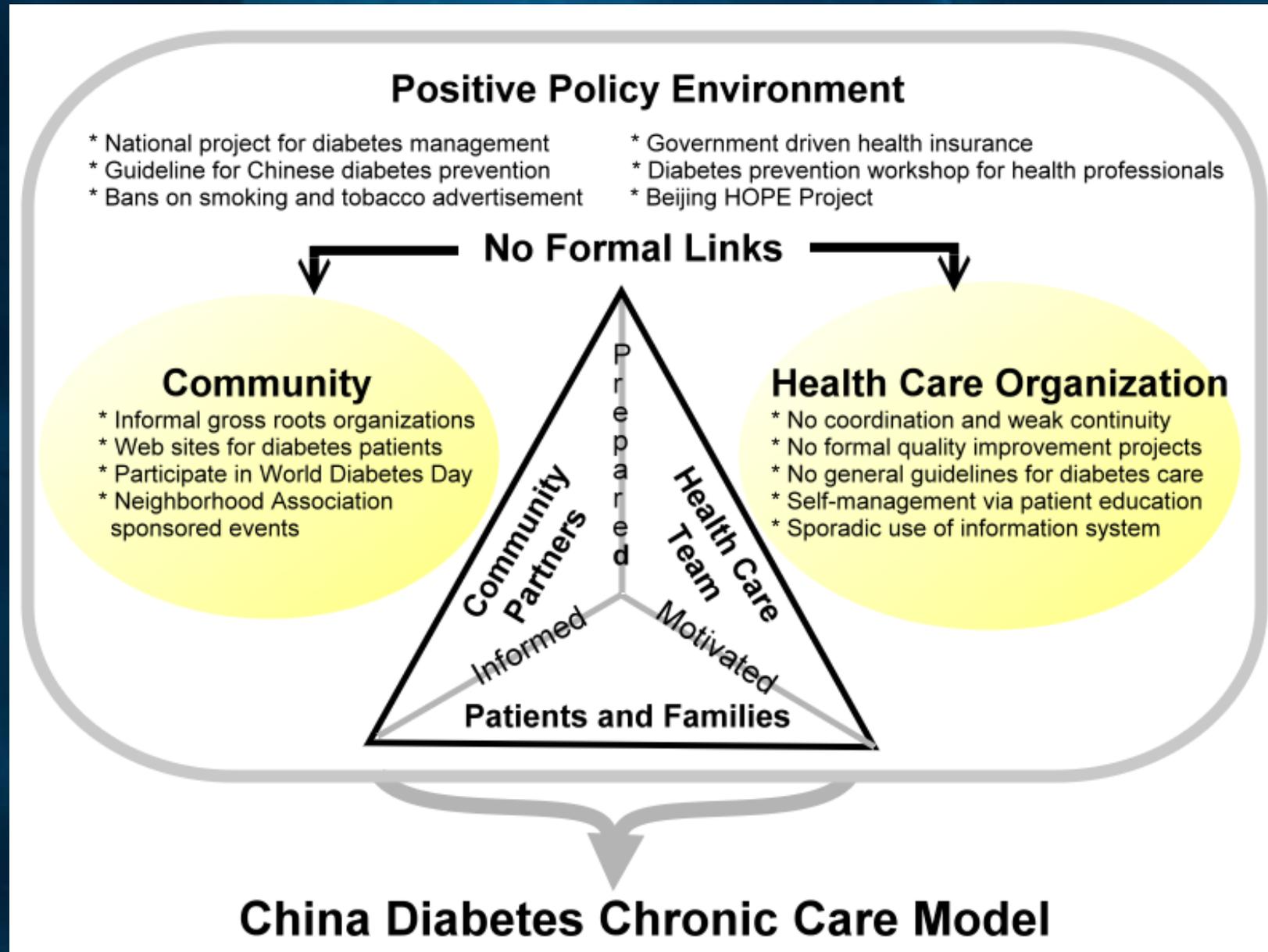
- Outgoing and warm hearted
- Has a clear goal in diabetes management and likes to plan ahead
- Feels empowered by diabetes knowledge she has accumulated over the years and wants to share with others
- Avid information seeker (e.g., nutrition, healthy diet)
- Decision maker for the family regarding health care

user needs

- Easy and portable way to log and track daily diet, glucose levels, and exercise.
- Better access to enjoyable diabetes education approved by her doctors.
- More time and individualized attention from her providers
- Assistance to make diabetes self-management more convenient and fun at an affordable cost

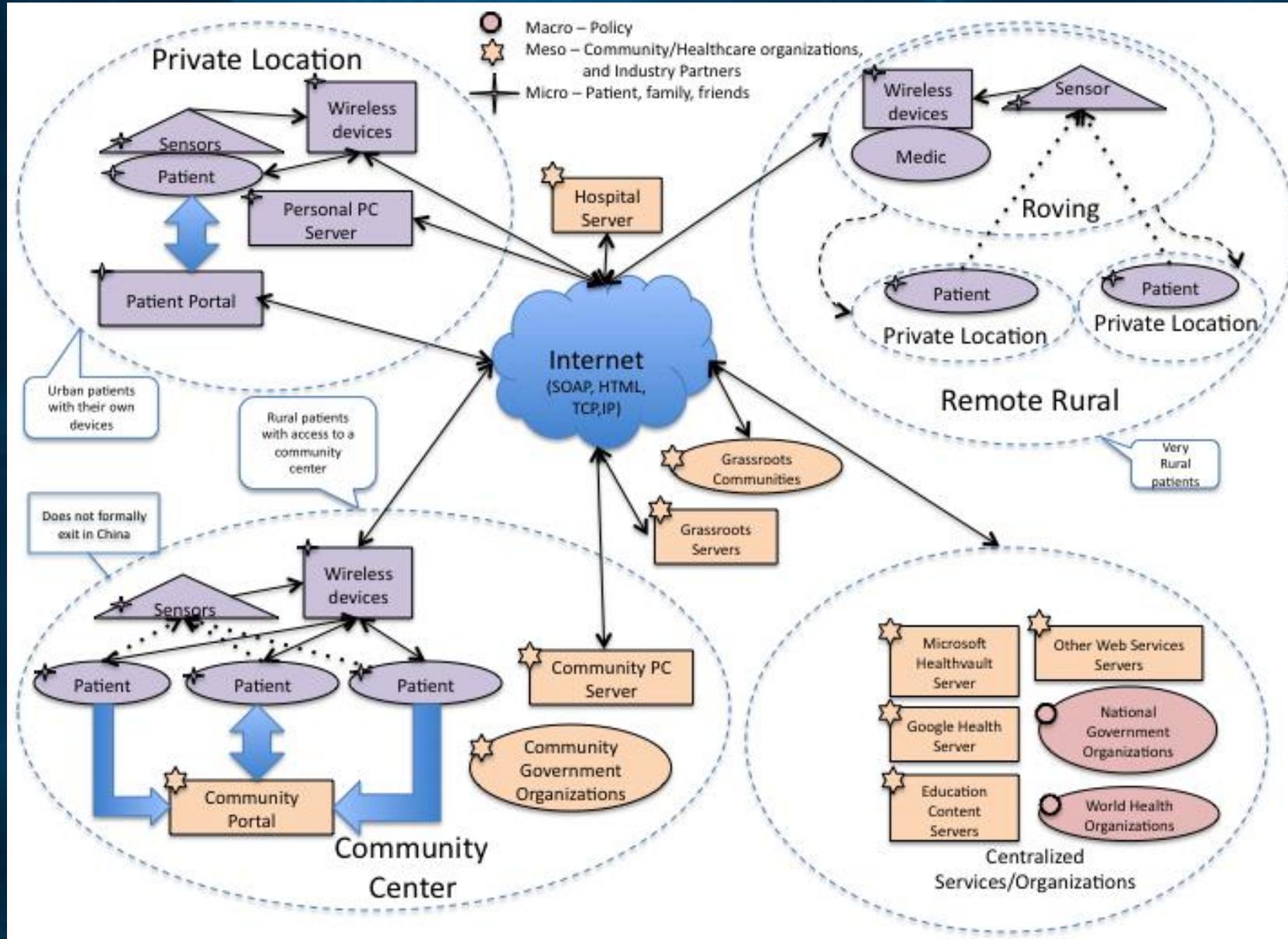
Context

Macro, Meso, Micro

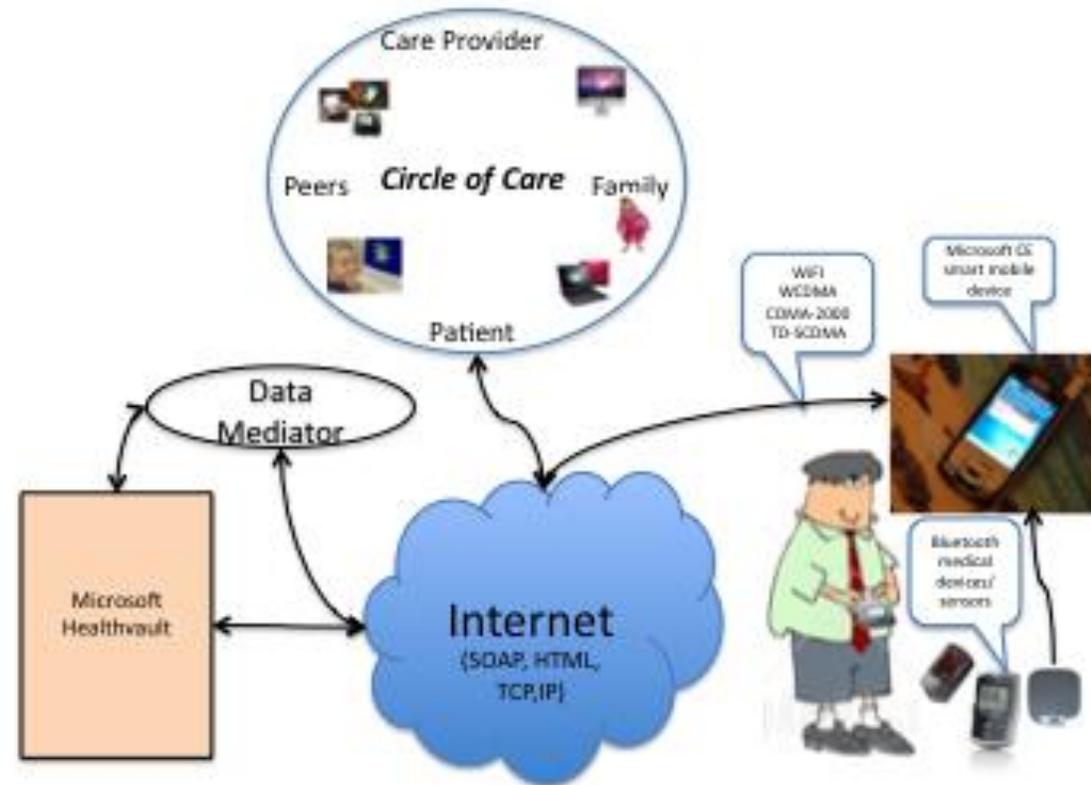


Multi-level Architectural Vision

China Technical Infrastructure

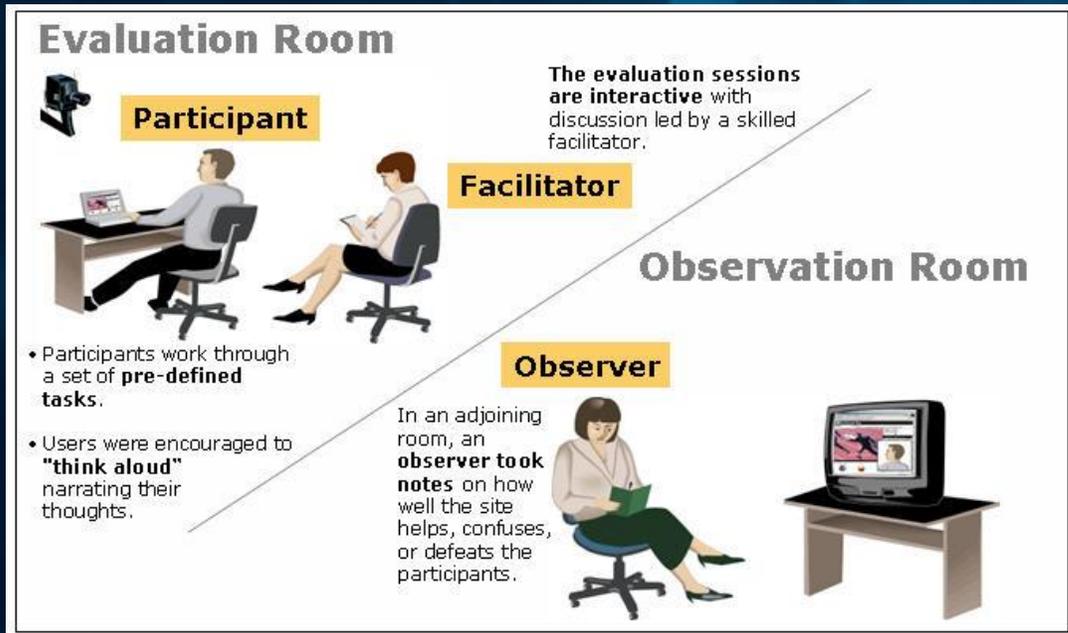


China Diabetes Chronic Care Model



CADA Prototype

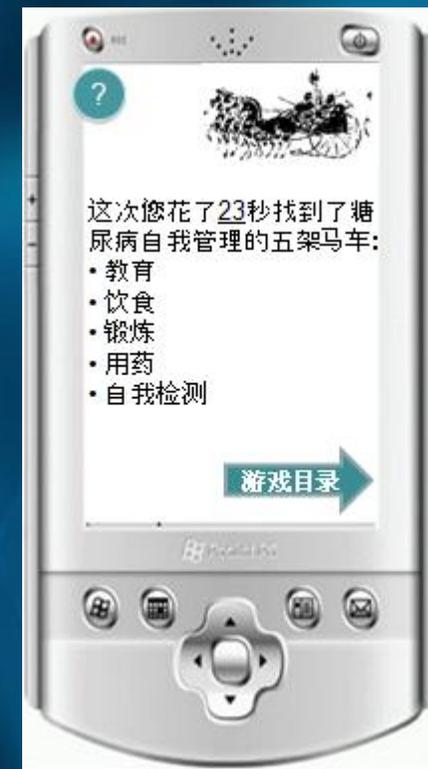
Interactive and Iterative Prototyping



Dancing Mask – Level 1 Only



Tile Game – Level 1 Only



Level 2

Cada - Entrance

? 请点击选择您今天的身状况:



头晕 视线模糊

疲倦 排尿不适

疼痛 无症状

抑郁

继续

Cada - Entrance

糖尿病小助手目录

我的目标 

食物宝塔 

知识小擂台 

Cada - Intro

我今天糖尿病自我管理的目标是:

提高糖尿病知识

合理饮食

合理锻炼

合理用药

自我监测

个人目标

继续

Cada - Pagoda

什么是食物宝塔?



油类

奶/豆制品

肉类禽蛋水

蔬菜水果

谷类

下一页

Cada - Trivia

? 请选一类问题

预防

饮食营养

锻炼

用药

症状并发症

随机混合

继续

Persuasive Design

Persuasion Design Principles	Manifestation in System
Reduction	Making complex meal tracking tasks simpler
Kairos	Smart phone intervention at the “right” opportune time, meal time
Self-Monitoring	Eliminate tedium of tracking meals
Conditioning	Reinforcement to eat well through trending
Liking/Attractiveness	Gaming
Praise	Offering praise with both games
Convenience	Smart phone easy accessibility

Next Step

Field Testing – Proof of Concept

- Experiment vs. Control
- Over an extended period of time
- Assess the following at three time points:
 - (1) knowledge tests about diabetes, particularly hypoglycemia
 - (2) HgbA1C level and patients' weight
 - (3) satisfaction of physician



Future Aspirations

Extension of Research Pursuit

- Technical tools, e.g., Microsoft Health Vault
- Other organizations, e.g., China Red Cross
- US counterpart comparison, e.g., Missouri Health Foundation
- Psychosocial needs -- “emotional” network
- Other high risk populations, e.g., overweight teens

Questions?

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