# Digital preventive oral care for pre-school children in China

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## Abstract

This project provides solutions and future research on the oral health problems of Chinese preschool children (0-6). The target users are parents and the scenario is home. Considering parents, external resources, and the development of digital healthcare, I proposed to use a smart toothbrush and an APP to realize the intelligent supervision and management of children's oral cavity. I validated and iterated the proposal through three experiments, and finally tested mid-fid and high-fid with usability testing.

## Introduction & Background

Chinese children are currently suffering from severe dental caries. Chinese government attaches great importance to oral health. In the 2016 “Healthy China 2030” plan outline, the goal of oral health was put forward to reduce the prevalence of children’s teeth. However, due to the lack of parental oral resources and the underutilization of Chinese children's oral resources, **a prevention-oriented oral health policy is advocated**. **mhealthcare** are booming in China. People are inclined to manage and monitor their health with apps or other smart products. In this project, I designed an APP that can be connected to a smart toothbrush. **The purpose of this project is to use digital technology to unite the resources of schools and clinic to help parents to improve preventive oral care for preschool children in China**

## Target Group

**Parents of children aged 0-6 years old in China**

**Needs/Pains**

- **how to access professional information and resources.**
- **Being able to access information about children's oral health as early as possible.**
- **Most educational tools for children's tooth brushing only teach without supervision or review**
- **Children don't brush their teeth carefully.**

## Solutions

**How users can engage with the product early**

**Online** Recommendation section in Mother & Baby APP

**Offline** Brochures in clinics for infant vaccinations

**APP for smartphone or iPad**

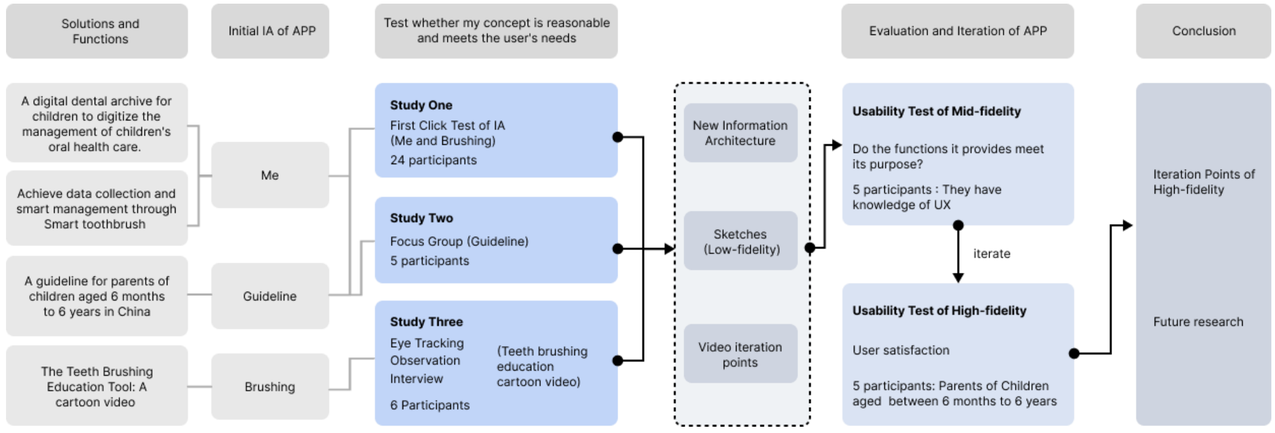
**Smart supervisor**

**+ Bluetooth**

**Collect Oral data**

**Smart toothbrush**

## Functions of APP




## Methodology and Design Strategy




### Study One

‘Brushing Check-in Calendar’ should be put in the Me module of App

### Study Two

**Three Favorite Guidelines Patterns for Parents**

1 Timelines of teething
2 Search bar
3 Chapters

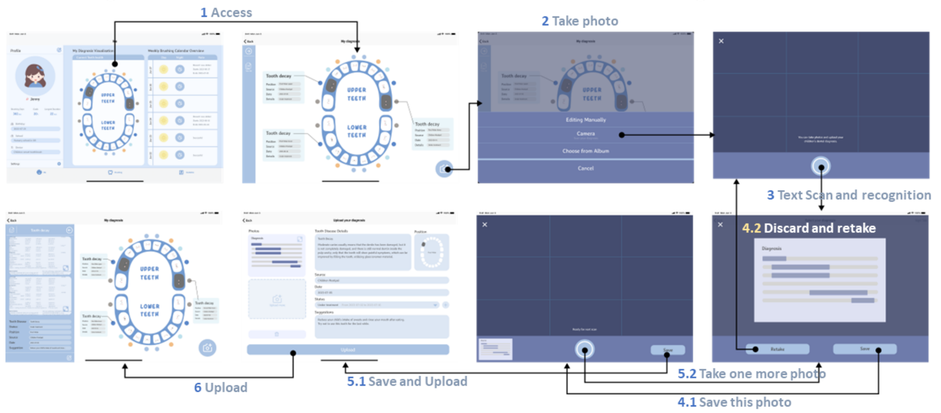
### Study Three

- Using sound effects to prompt or guide the user can avoid distraction when brushing teeth.
- Difficulty with movement and face recognition on the medial side of the tooth requires a side angle, as well as pause time.
- Video Instruction design include Cheatsheet and sound effects overview.

## Design

### Me_Digital Dental Archive

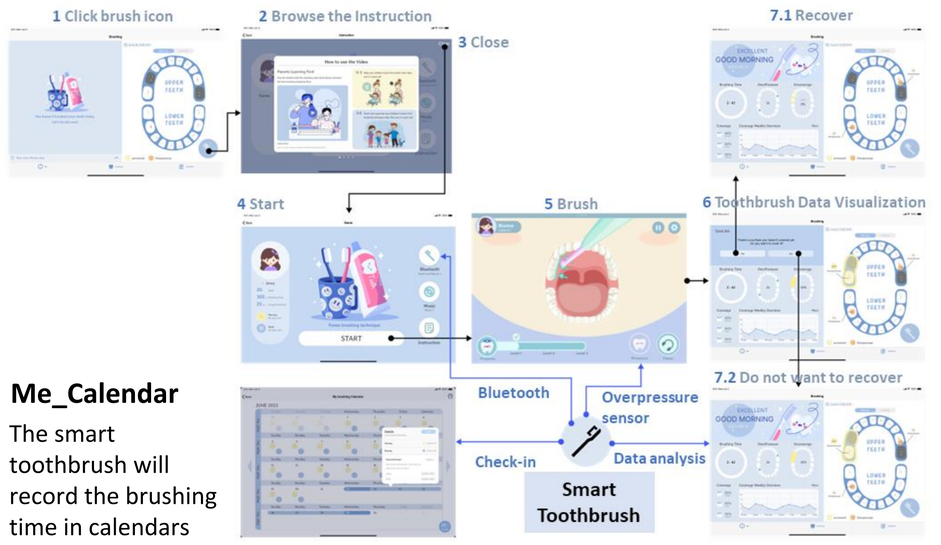
Text recognition and visualization. Upload of children’s dental diagnosis



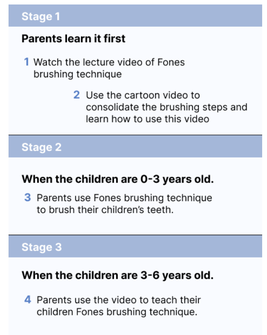

### Guideline for Parents

### Brushing

Bluetooth connects to smart toothbrushes to monitor and record children's brushing.




**A cartoon tooth brushing teaching video based on the Fones brushing techniques. The purpose is to assist parents in teaching their children to brush their teeth.**




### Me_Calendar

The smart toothbrush will record the brushing time in calendars

## Evaluation and iteration of APP

### Usability Test of Mid-fidelity

Poor logic: Digital Archive's photo scanning, Calendar's "Add brushing goal and reward.“
Good and smooth logic: Guideline Module

### Usability Test of High-fidelity

From the conclusion of the high-fidelity usability test, the user utility satisfaction of the Calendar module is low. the rest of the high fidelity work flow is logical and good. Participants thought that Guidelines are the most practical function.

## Conclusion and Future work

Based on the results of the high fidelity usability testing, I think my design solves the problem to some extent. I have answered all the HMW. However, for ethical reasons, I cannot allow my children to participate in the study. This also made my final design less interesting, especially calendar module.

## Future work

1 Explore the Service design of this app
2 Increase the interestingness of the interactive forms in the APP. consider the psychology and characteristics of children aged 3-6