Digital transformation

Healthcare Digitization of Bhutan

App Vendor Informative Session

7th November 2023
Thimphu, Bhutan

Agenda

Today’s agenda is to provide information on Bhutan DX project requirement for App Development

- ❑ **Introduction and Overview**
- ❑ **To be Journey**

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Introduction

Below image shows various topics under scope for Bhutan Digitization project. Point no. 2 , Application Service PoC will be highlight for today the App Development

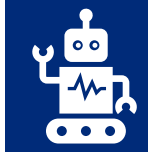
#2 App Development Scope

Responsible for system development in the 2nd phase

#	Area	In charge of system construction
1	Device	• Device vendor
2	Service・Application	• Application vendor
3	DHP Execution Arch. Health Bank	• Bhutanese vendor (API/DB development)
4	DHP Operations Arch. DHP Infrastructure	• Accenture (Infrastructure/Security development)
5	Existing system	• Government of Bhutan
6	Bio Bank	• - ※In the 2nd phase, we will formulate concepts and implement POC, and do not build systems.

Introduction

Objective is to discuss the requirement overview for Local Bhutan IT vendors and understand the interest and expertise in Application development



What is the purpose of App development

- Bhutan is working towards digitization of healthcare system. This includes integration and centralization of health data. **The health service app is required to be developed to integrate patient health data from health devices** so that the government can perform disease specific analysis and policies

What are the requirements

- We are looking for IT vendors in Bhutan **who have app development experience in addition to experience of working with Royal Government of Bhutan**

How will it be done

- A TOR and specification document would be shared next year, **and a business contest will be conducted in July 2024 which would be open to both international and Bhutan Local vendors**. The use-cases identified for Bhutan would be required as a presentation in the contest

Introduction

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App vendors would be required to showcase expertise in one or all 4 (but not limited to) the below identified use-cases for Bhutan

Below are four specific use cases for “Nation-led Healthcare DX Approach” in Bhutan.

Community Health Guidance

A With the advancement of health guidance from local health workers, it is easier to obtain PHR on a regular basis in rural areas to improve health awareness.

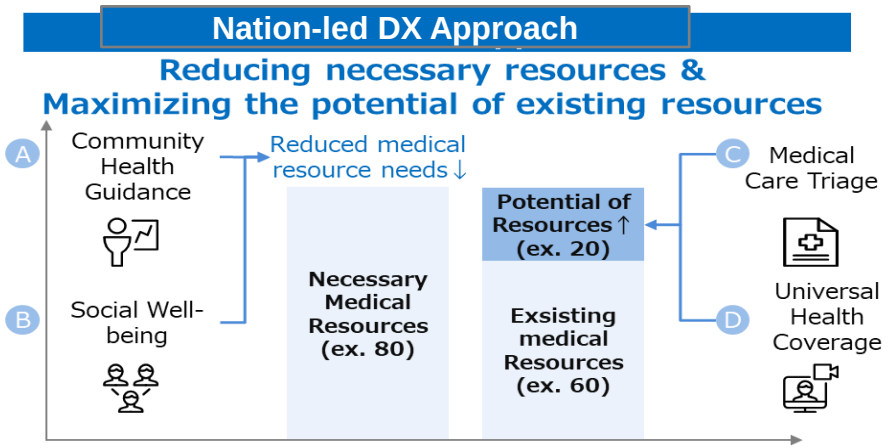
Fig 2: Various services currently being offered by Health Navigators

Service-example: Maya Health (India)

Social Well-being

B Forming online communities between individuals affected by Health Issues, supporting the advancements of health in the social communities.

Service Example: Minchare (Japan)



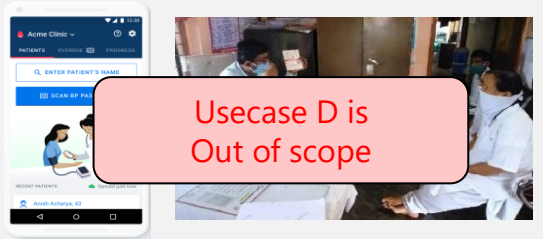
Medical Care Triage

C Data Integration Platform for personal and professional healthcare that improve gaps and triage, eliminating of unnecessary medical care.

Service Example: Healthcare Passport (Japan)

UHC (Universal Health Coverage)

D Provide online remote medical services in areas that were used to be constrained geographically to access medical services.



Service-example: Simple (India)

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- ❑ **To be Journey**

As-is Vs To-be:

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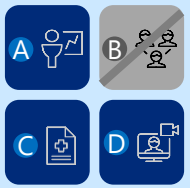
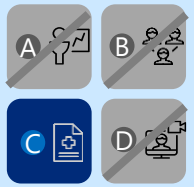
As-is vs To-be in the aspects of "Nation-led Healthcare DX Approach":

	AS-IS (PAINPOINTS)		TO-BE (USE CASE SOLUTION)	
	Cause	Effect	Solution	Results
Citizen	*Lack of health awareness and limited access to preventative care*	More risk exposure to NCDs Increased medical care on already limited resource		• Faster identification and reduction of NCD risk through preventative care (lifestyle changes) and consistent treatment
Healthcare Worker	*Limited Resource*	Inconsistent health data records & reports Difficulties to reach remote patients Limited screenings to cover all patients		• Improved workflow efficiency, minimizing duplicate screenings and reporting • Easier and faster access to patient and its data, making screening more productive
Government	*Fragmented Data*	Lack of EBPM for NCDs intervention, efficient resource allocation, evaluation of health programs and outcomes		• Facilitating evidence-based policy making, leading to reduction of cost, efficient resource allocation, etc. • Effortlessly monitor health data, allowing for timely interventions
Private Sector	*Lack of Incentives & information*	Not able to evaluate future investments in Bhutanese market for innovations		• Comprehensive understanding of healthcare landscape to identify potential investment opportunities in healthcare

To-be Journey (1/3)

"Nation-led Healthcare DX Approach" can enhance health awareness on personal and community level, prioritize the accessibility of medical care, and evaluate the individual health situation on personal and holistic view.

Legend:

- A Community Health Guidance
- B Social Well-being
- C Medical Care Triage
- D UHC

Input for risk group

Health Bank | Household Bank

Use data to identify targeted users who will be prioritized for health apps through
(1) Identification of Risk Groups
(2) Initial Screenings from MoH
- *Health Bank: Vitals to find risks*
- *Household Bank: Family history, distance to medical facilities, Housing as targeted priority (its updated in the National annual survey done by government)*

1 Community Health Guidance (First Touchpoint) A

Ministry of Health (MoH) **conducts annual health screening** and identifies individuals who are at risk. Village Health Workers (VHWs) **promote health mobile app benefits to villagers,** to bridge the gap with the health system

Tshering who lives in a rural village in, Thimphu, was diagnosed with a risk for CVD during NCD screening by MoH. He learned about the health app from his Village Health Worker and wants help registering. As his village is far from the nearest Sub-Post, he wants to save time by connecting to health facilities online

2 Community Health Guidance (APP Registration) A

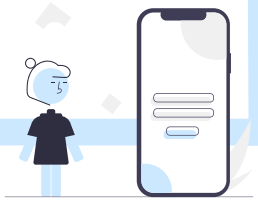
With guidance of VHWs, citizens register the app using their National Digital ID. **Citizens fill in the basic health in the app** integrated to Health Bank. The app also acts as a **digital health book**. For citizens without smartphones, VHWs can also register on behalf of the citizens and puts bar code(same as ePIS) or QR code on the back of their manual health book. **This is to improve health awareness, aiming to reduce medical needs and minimize data loss.**

With the help of the VHW, Tshering registers himself using the National Digital ID. He fills in the basic information and leaves out information that he does not know, which can be monitored later when he visits the monthly ORC

Output for Registration

Health Bank

Collecting data from citizens via registration of mobile app
- *Health Bank: Basic Health Info*



Input for Initial Screening

Health Bank | Medical Bank (ePIS) | Household Bank

Viewing & Managing patients' health data for initial screening purposes
- *Health Bank: Patient's Vitals, Lifestyle, etc.*
- *Medical Bank: Clinical Records, Medical Results, Treatment History, etc.*
- *Household Bank: : Family history, distance to medical facilities*

3 Medical Care Triage (Initial Screening) C

During monthly outreach services, data could be shown of update of health app to monitor the risk group. Health Staff follow protocol, do screenings, to **improve gaps and triage, eliminating of unnecessary medical care. This can save time and support capacity of existing medical resources**

During monthly outreach services citizens can use health app as their health book. Health Assistants, on top of the MoH's annual health screening, follow up by WHO Pen protocols, do NCD screenings and assess vital signs.

They diagnose citizens and record their health data in the app, saving time and resources for future visits

To-be Journey (2/3)

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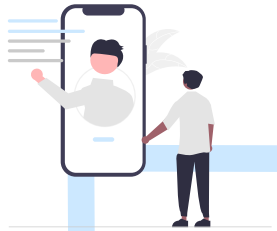

Input Update the health condition

Health Bank

Health Bank: Collecting daily data from Wearables such as heart rate, sleep, step count, physical activity

4 Medical Care Triage (Wearable IoT Health Device) C

The government lends **wearable IoT devices to patients at risk**, which track daily vital signs like heart rate, activity levels, and sleep patterns. The device data is stored in the mobile app, allowing **patients to monitor their health status**

After being diagnosed, Tshering was given a health wearable device to monitor his vitals. The device connects to his mobile phone via Bluetooth and tracks daily metrics like heart rate, step count, and sleep count. The data is stored in the app, allowing Tshering to make lifestyle changes to reduce his risk of CVD

Legend:

- A Community Health Guidance
- B Social Well-being
- C Medical Care Triage
- D UHC

5 Social Well-being (Support from Online Communities) B

The health app **allows citizens to join online social communities to support each other in making healthy lifestyle changes.** Members can share progress and encouragement, potentially reducing the workload for health staff in spreading awareness and **improve their health themselves to reduce medical needs**

Tshering joined an online health community within the mobile app, connecting with other villagers with similar health concerns. He utilized his health wearable device to track his progress and share it with the community for motivation and encouragement towards healthier lifestyle habits

Output for Health Data Sharing

Health Bank

Citizens sharing of data to online communities (optional) such as step count, physical activity for health goals

6 Medical Care Triage & UHC (Convenience of Hospital Visits) C D

Patients who have seen no health improvements can be referred to hospitals. It can be **either Telemedicine or Hospital visits.** Patients with high risk and complex medical needs can visit the hospital for more attentive care, while those with mild risk can receive medication from their local PHC by obtaining a prescription via **Telemedicine**. This efficient data management can **reduce the time and resources needed for health screenings & medical triage** for secondary care

Tshering's high blood pressure persisted, so he decided to visit a secondary care. The doctor access his medical records easily since it was integrated, making the health check process more convenient. This also saves time and resources for additional screenings. With the consistent health records, the doctor made an accurate diagnosis.

Output for Health Data Retrieving

Health Bank | Medical Bank (ePIS)

Viewing, Managing, and Retrieving data for convenient patient care

- *Health Bank: Vitals, Lifestyle, Nutrition, etc.*
- *Medical Bank: Clinical Records, Medication, etc.*

To-be Journey (3/3)

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Legend:

- A Community Health Guidance
- B Social Well-being
- C Medical Care Triage
- D UHC

7 Medical Care Triage (DNA to BioBank) C

For difficult or genetic-related cases, doctors register in the Bio Bank to analyze and recognize new treatment plans to patients. Through a very **personalized patient care, doctors can find specific genetic determinations** with patients' drug response to find the best medication possible

The doctor sent Tshering's DNA samples to BioBank to analyze his genetic associations with drug response, which would allow for a more personalized and effective treatment plan. This decision was made after current blood pressure medications and lifestyle modifications failed to improve Tshering's condition

Output for New Treatment Plans

Medical Bank (ePIS) | Health Bank | Bio Bank | Household Bank

Understanding overall situation for holistic treatment:

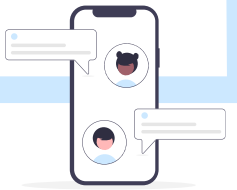
- *Medical Bank: Current treatments & medications & family history*
- *Health Bank: Overall vitals*
- *Bio Bank: Specific DNA and response to drugs*
- *Household Bank: Current living conditions*

The use case on UHC is out of scope the app development Scope

8 UHC (Telemedicine Follow-ups) D

Telemedicine allows patients and doctors to have remote consultations within the app, saving time and money to travel. Health workers can also of exposure streamline workflow and attend to more patients by reducing in-person visits to **increase capacity of existing resources**

Tshering in a rural village uses a mobile app for telemedicine services to receive updated medication and follow up with the hospital, saving him the inconvenience of travel. The doctor monitors Tshering's progress through the app, ensuring appropriate care despite the distance



Output for Health Data Retrieving

Health Bank | Medical Bank (ePIS)

Viewing, Managing, and Retrieving data for remote patient care

- *Health Bank: Vitals, Lifestyle, Nutrition, etc.*
- *Medical Bank: Clinical Records, Medication, etc.*

Important for Government data visualizations and analysis

9 Medical Care Triage (Centralized Data for EBPM) C

With **centralized data to the national data hub**, government can analyze public health trends and allocate appropriate budgets for various diseases, **enabling EBPM.** Data such as BioBanks along with other health data plays a crucial role in development of targeted medicines. This also create new **policies to improve healthcare delivery and drive innovation** in digital health products and services

Government can use the data (including Tshering's de-identified data) to create evidence-based policies on hypertension. For instance: rational consumption model for income-based options of treatment options, development of targeted medicine and evaluating its effectiveness, determining the impact of self-monitoring and lifestyle modifications, identifying root causes of hypertension within each communities, and generating heat maps for targeted interventions

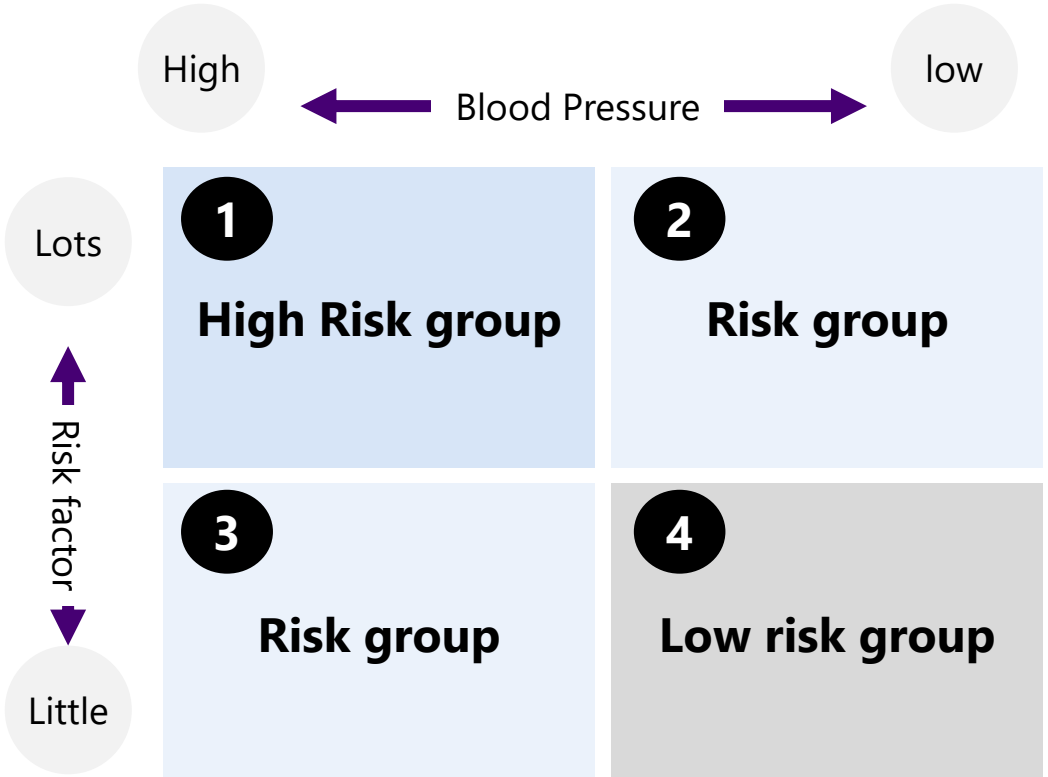
Output for Overall Data Analysis

Medical Bank (ePIS) | Health Bank | Bio Bank | Household Bank

Analyzing overall data from the National Data Hub to create EBPM and drive digital health innovations

Digital Health Use Cases

The Digital Health will provide and monitor services to the vast range of groups. However, for the use-case, there are priority “High Risk Groups” within Hypertension and identifying them is important. As well as, we will have



※Risk Factors includes：overweigh, bad diet, lack of exercise, alcohol, stress, drugs, chronic conditions, over 40 years old, genetic

High Risk Groups

There are prioritized “High Risk group” of hypertension. However, we will monitor vast range of groups

Blood pressure	• Blood pressure Mid o High is Hypertension and those are high risk
Risk Factors	• Has more than 2 risk factors such as, over 40 years old, overweigh, bad diet, lack of exercise, alcohol, stress, drugs, chronic conditions, genetic

Priority Use-case environment

We would like to prioritized following three aspects for use-case group

Location	• Lives relatively far from hospitals. More than 10 km away from hospitals (Urban and Rural areas)
Frequency	• High frequent visitation group to the hospitals
Tech Saviness	• Use mobile day-to-day but only at basic level

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Stakeholder's To-be Journey

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The To-be journey can cover all types citizen no matter the severity of the condition, as well as public health sector:

	1 First Touchpoint	2 App Registration	3 Initial Screening	4 Wearable Health IoT Device	5 Support from Online Community	6 Convenience of Hospital Visits	7 DNA to Biobank	8 Telemedicine Follow up	9 Centralized Data for EBPM
Journey	Conducting of NCD screening and VHW promotion of mobile app	Registering of mobile app; Citizens without phone receives bar code(ePIS) or QR code to save time	Mobile app act as a health book; Data shown on app helps hass monitor risk group during ORC visits	Wearable health device given to patients with risk groups to track health	Joining of online group based on health goal to make healthy lifestyle change	Treatment when condition persists via telemedicine or hospital visits	Sending of DNA f... p...	Telemedicine	Data utilized to analyze health trends for policies, budget allocation, etc.
Citizens – **High Risk 10%** (High BP, High RF)	Diagnosed with **High Blood Pressure and High Risk Factor**	**Self-Registers & Fills in information** with the help of VHWs	Visits monthly ORC	Receives wearable for being in high risk group	As a person with **high CVD risk**, joins group with same condition	**extensive health check** at hospital as condition persists			Tshering's deidentified data used for EPBM
Citizens – **Risk Group 40%** (High BP, Low RF)	Diagnosed with **High Blood Pressure but Low Risk Factor**	VHWs **registers for Pemba, and gives** code to be attached to health book	Visits monthly ORC	Receives wearable for being in risk group	As a person with **high blood pressure**, joins group with same condition	**Telemedicine to get prescription**; Due to mild risk, not required for hospital visits			Pemba's deidentified data used for EPBM
Citizens – **Low Risk 50%** (Normal BP, Low RF)	Diagnosed with **Normal Blood Pressure and Low Risk Factor**	Self-Registers since Choden has high digital literacy	**Not required to go to ORC visit** since low risk		As a **health-conscious person**, joins group that fits her interest				Choden's deidentified data used for EPBM
Public Sector – **Health Worker**	Promotes the use and benefits of health app	Support citizens in registration of health app	Conduct screenings at ORC monthly visits identifying risk groups	Provide risk groups with health wearables	Spread health awareness and education	Provide diagnosis via in-person visits or telemedicine	Re...		Reporting
Public Sector – **Government**	Set training for VHWs to spread awareness of health app	Collect citizen's PHR data from app registration	Planning & Scheduling to deploy HAs for annual & monthly screenings and ORC visits	Allocate budget for health wearables to citizens	Give health announcements to updates citizens	New healthcare delivery across departments for improved coordination	C... data from Biobank for further secondary use	...ad ...e of telemedicine services to rural areas	Analyze all data gathered within the journey for EBPM

Usecase D is
Out of scope for this PoC

Data To Be Used

Below mentioned data source is the health app which will be used by both citizens and healthcare providers.

Data Collected From	Indicators	Use Case	Impacted Stakeholder	Data Source	Latest Result
Data from Healthcare Facility	Time needed to screen a patient	A ,C	Healthcare	Health App, ePIS	N/A
	No. of patients screened / treatments received for Telemedicine consultation (%)	C, D	Healthcare	Health App	N/A
	Telemedicine access rates for residents in remote areas	D	Citizen, Healthcare	Health App	N/A
	Data utilization for health workers: Report Generating	C	Healthcare	Health App	N/A
Citizens	Primary Data: Hypertension >= 140 / 90 mmHg (%)	A, C	Citizens, Healthcare, Government	Health App, ePIS	35.9%
	Primary Data: Hypertension Under Control (Medication)	A, C	Citizens, Healthcare, Government	Health App, ePIS	3.3%
	Secondary Data: Blood Sugar Fasting >= 126mg/dl (%)	A, C	Citizens, Healthcare, Government	Health App, ePIS	2%
	Secondary Data: Blood Sugar Control Rate (HbA1c)	A, C	Citizens, Healthcare, Government	Health App, ePIS	N/A
	Secondary Data: Cholesterol = 5 mmol/L or >= 190 mg/dl (%)	A, C	Citizens, Healthcare, Government	Health App, ePIS	11%
	Secondary Data: CVD Risk >= 30% (%)	A, C	Citizens, Healthcare, Government	Health App, ePIS	3.7%
	Secondary Data: Overweight and Above BMI >=25	A, C	Citizens, Healthcare, Government	Health App, ePIS	33.5%, 11.4%
	Secondary Data: Tobacco Consumption (lifetime) (%)	A, B, C	Citizens, Healthcare, Government	Health App, ePIS	23.9%
	Secondary Data: Alcohol Consumption (past 30 days) (%)	A, B, C	Citizens, Healthcare, Government	Health App, ePIS	34.5%
	Secondary Data: Salt Intake (average, grams)	A, B, C	Citizens, Healthcare, Government	Health App, ePIS	8.3
	Secondary Data: Vegetable Intake < 5 servings (%)	A, B, C	Citizens, Healthcare, Government	Health App, ePIS	85.9%
	Secondary Data: Betel Use (%)	A, B, C	Citizens, Healthcare, Government	Health App, ePIS	51.8%
	Secondary Data: Physical Inactivity (<150 minutes activity / week) (%)	A, B, C	Citizens, Healthcare, Government	Health App, ePIS	7.3%
	Data Utilization for Citizens: No. of Registrations for the Health App	A, B, C, D	Citizen, Government	Health App	N/A
	Data Utilization for Citizens: No. of Daily Active Users for the Health App	A, B, C, D	Citizen, Government	Health App	N/A
	Data Utilization for Citizens: Activity rate of online community based on healthcare	B	Citizens, Government	Health App	N/A

Data Category	Data Points	Data Source
App Information	App Registration Number	App
App Information	Time needed to screen a patient (based on timestamp)	App
App Information	Telemedicine access rates for residents in remote areas	App

Detailed data indicators in Appendix 1

IDENTIFICATION OF NECESSARY DATA

What data shall be collected within the To-Be Journey:

Medical Bank

EMR / EHR

Medical Records, Diagnosis (Current Disease), Medication / Prescription, Allergy, Vaccination, Lab Tests, Family History

Biobank

DNA / Saliva / Tissue Samples / Cell

Health Bank

PHR

Name / National ID / Sex / Age / Weight (BMI) / Vital Signs (Blood Pressure, Heart Rate, Cholesterol, Blood Sugar) / Lifestyle Assessments (Nutrition, Physical, Risk) / Sleep Count / Step Count

Household Bank

SDH

Address (Permanent & Residential) / Education Level, Housing Conditions, Family Number, Distance to Medical Facilities, Household Income / Occupation History

To Which Extent Who Can Access Data?		
Health Facilities:	**Citizens**	**Government**
Medical Bank: Can access and manage all records only if there is existing treatment relation between patient or referrals **BioBank:** Can access view only upon registered request only in cases where records are needed for medical reasons **Health Bank:** Can access and manage all records only if there is existing treatment relation between patient or referrals **Household Bank:** Can access view only records if there is existing treatment relation between patient or referrals	**Medical Bank:** Can access view only records but cannot obtain access to sensitive information deemed by medical professionals; Cannot access to copies of X-rays / Scans **BioBank:** Do not have access unless requested upon valid reasons **Health Bank:** Can access and manage / input certain records such as Vital Signs, Lifestyle, Nutrition, Medication **Household Bank:** Can access and manage / input certain records such as Housing Conditions, Income, etc.	**Medical Bank:** Can access view only records with redacted identifiable information such as photos, scans, written notes, letters **BioBank:** Can only access data as overall view **Health Bank:** Can access view only records with redacted identifiable information such as name **Household Bank:** Can access view only records with redacted identifiable information such as Address, Pinpoint specific locations

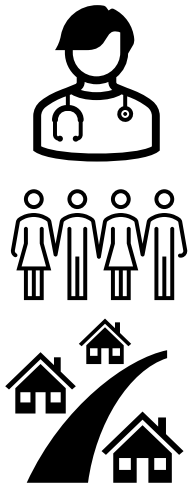
STEP 1: FIRST TOUCHPOINT

USER: HEALTHCARE STAFF DURING NCD ANNUAL SCREENING

Initial Assumption Only

Wireframe

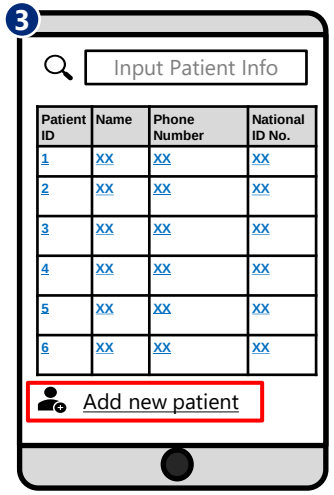
1 Physical Touchpoint



2 Physical Touchpoint

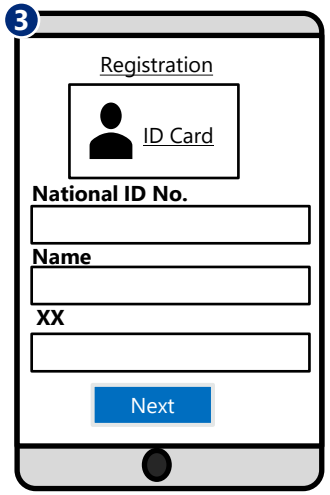
Patient Finder

3



Registration

3



Description

1 NCD Annual screening by MoH is conducted and citizens were notified if they are within the risk groups

2 Citizens received NCD Screening Result

3 After NCD risk groups have been identified, User such as HAs & VHWs can register health application to citizen. VHWs have the option to create user registration for citizens or let them self-register. In the case where citizens do not have access to mobile phones, the user registers for them by adding new patient to the system.

3 User takes photo of citizen's ID Card and enter registration attributes on behalf of the citizen. The OCR Reader prefills information to the registration, and system verifies if the information matches to the National Digital ID Platform.

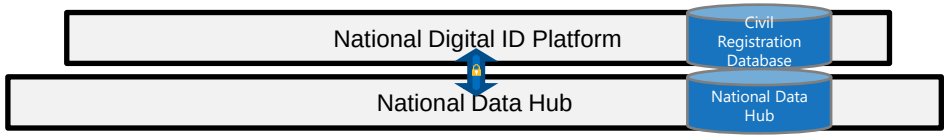
Sample Data

Measures :
- WHO PEN Heart (CVD Risk Assessment)

Output:
- NCD Screening Result

N/A

Input Registration Attributes:
- Name
- Sex
- Date of Birth
- National Digital ID
- Phone Number



STEP 1: DATA POINTS

Data Required:
● Compulsory (Primary)
○ Optional (Secondary)

Data Availability:
✓ Yes
△ Partial
✖ No

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Data needed for Step 1: First Touchpoint (NCD Screening)

Initial Assumption Only

Data Category	Data Points	Availability	Data input	Data output	Data Source	From Who
Personal Information	Full Name	✓	●	-	National Digital ID	Citizen
	Citizen ID No.(for confirmation)	✓	●	-	Citizen ID	Citizen
	Sex/Gender	✓	●	-	National Digital ID	Citizen
	DoB, Age	✓	●	-	National Digital ID	Citizen
	Permanent Address	✓	○	-	Household Bank	Citizen
	Residential Address	✓	○	-	Household Bank	Citizen
Health Information	Consent Management	✓	●	-	DHP	Citizen
	Current Disease (Diagnosis)	△	○	-	Medical Bank	Healthcare Providers
	Medication / Prescription	△	○	-	Medical Bank	Healthcare Providers
	Family History	△	○	-	Medical Bank	Citizen
	Weight (Static)	✓	●	-	Medical Bank	Healthcare Providers
	Weight (Static)	✓	●	-	Household Bank (Annual Health Survey, MoH)	Healthcare Providers
	Weight (Dynamic)		●	-	Health Bank (from Digital Health App)	Citizen/Healthcare Providers
	Height (Static)	✓	●	-	Medical Bank	Healthcare Providers
	Height (Static)	✓	●	-	Household Bank (Annual Health Survey, MoH)	Healthcare Providers
	Height (Dynamic)		●	-	Health Bank (from Digital Health App)	Citizen
	BMI (Static)	✓	●	-	Medical Bank	Healthcare Providers
	BMI (Static)	✓	●	-	Household Bank (Annual Health Survey, MoH)	Healthcare Providers
	BMI (Dynamic)		●	-	Health Bank (from Digital Health App)	App
	Blood Pressure (Systolic(mmHg)) (Static)	✓	●	-	Household Bank (Annual Health Survey, MoH)	Healthcare Providers
	Blood Pressure (Systolic(mmHg)) (Dynamic)		●	-	Health Bank (from BP monitor via Digital Health App)	Healthcare Providers
	Blood Pressure (Systolic(mmHg))(Static)	✓	●	-		
	Blood Pressure (Diastolic(mmHg)) (Dynamic)		●	-		
	Cholesterol = 5 mmol/L or >= 190 mg/dl (%)	△	○	-	Health Bank	Healthcare Providers
	Blood Sugar Fasting & Control Rate	△	○	-	Health Bank	Healthcare Providers
	ECG (Electrocardiogram Heart Rhythm)	△	○	-	Medical Bank	Healthcare Providers

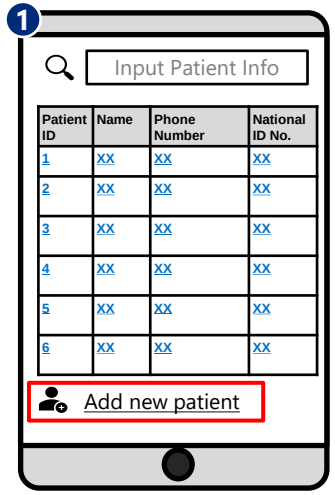
STEP 2: APP REGISTRATION (BY HEALTHCARE STAFF)

USER: HEALTHCARE STAFF

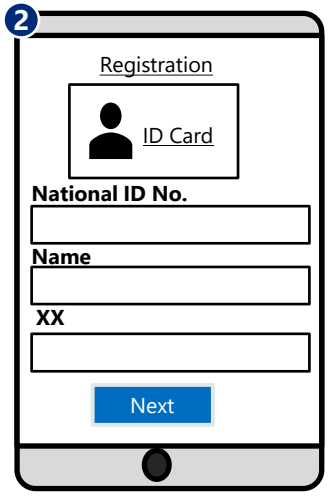
Initial Assumption Only

Wireframe

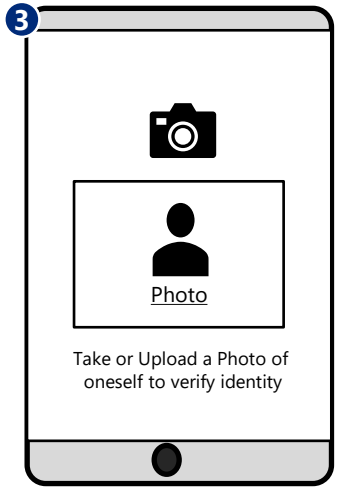
Patient Finder



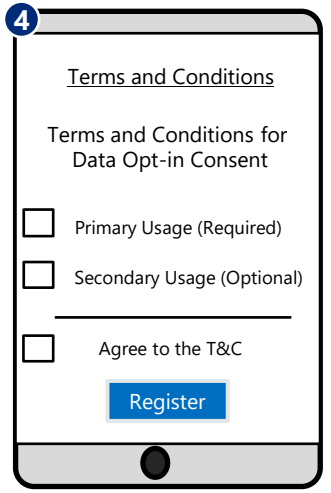
Registration



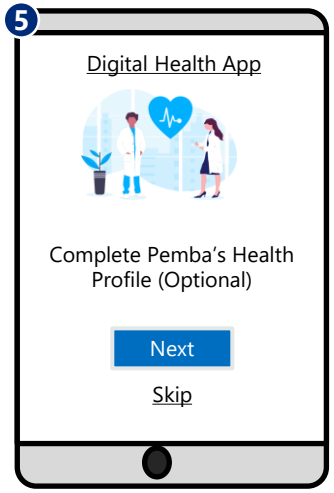
Identity Verification



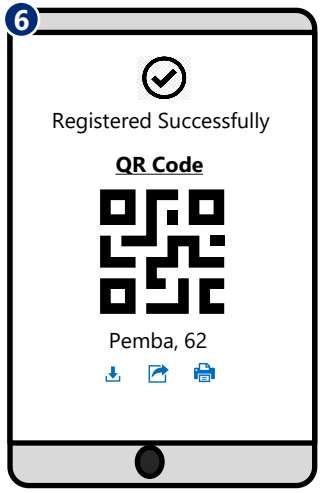
T&C (Opt-in Consent)



Menu



Registration Completion



Description

1. User such as VHWs promote health application to citizen. VHWs have the option to create user registration for citizens or let them self-register. In the case where citizens do not have access to mobile phones, the user registers for them by adding new patient to the system.

2. User takes photo of citizen's ID Card and enter registration attributes on behalf of the citizen. The OCR Reader prefills information to the registration, and system verifies if the information matches to the National Digital ID Platform.

3. For security purposes, user will have to take photo of the citizen to verify the citizen's identity; The AI facial recognition matches the current photo with the photo in the National Digital ID Platform.

4. Upon registration, user reads through Terms & Condition for the citizen, and applies for opt-in consent for different purposes based on citizen's choices.

5. Users can help citizens without an app enter basic profile (weight, height), and do initial surveys to assess behaviors and health risks. This will be later on useful for other medical staff to assess in the initial health screenings.

6. Once everything is completed, a QR or bar code(same as ePIS) will be generated. This will be directly connected to the healthbank ID. User can save, share, or print out QR code to be given to the citizen. Citizen can show this QR code for future screenings, which acts as a digital health book.

Sample Data

N/A

Input Registration Attributes:
- Name
- Sex
- Date of Birth
- National ID No.
- Phone Number

Input Verification:
- ID Card (Front & Back)
- User's Photo

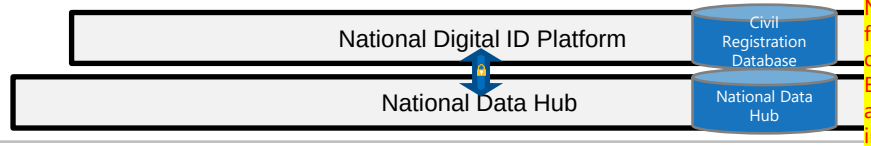
Input Consent:
- Opt-in Consent (Y/N)

Note: In charge of the consent management and forms will be designed and created under DHP by NGN. However, as its important aspect for citizen, as well as to maintain the design of User Interface(UI) and User Experience(UX) of the usability of the application, please provide the design image on the proposal.

Input Health Profile:
- Risk Assessment
- Lifestyle Assessment
- Basic Profile (Weight, Height, BMI)
- Current Medications

Health Bank

N/A

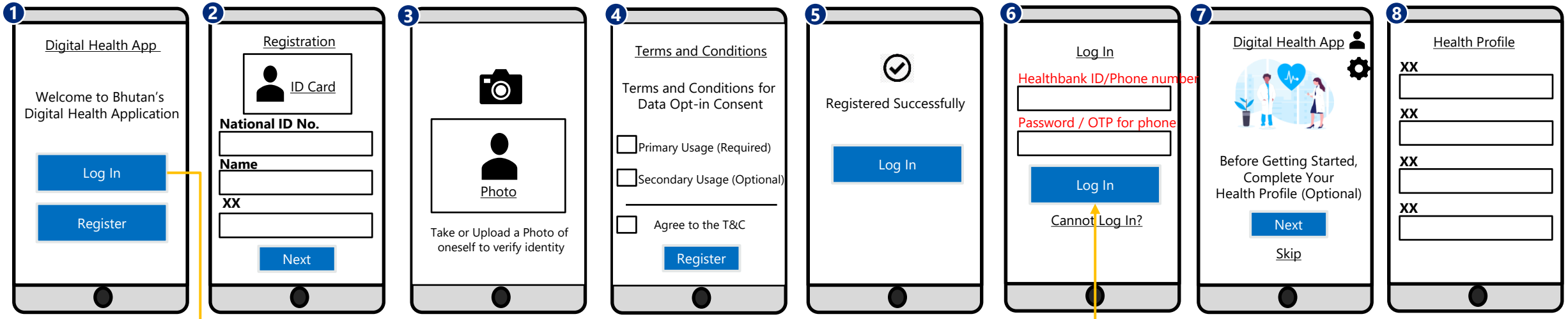


STEP 2: APP REGISTRATION FLOW (SELF-REGISTRATION)

USER: CITIZEN

Initial Assumption Only

Wireframe



Description

1. User can choose to register or log-in to the mobile application.
2. User takes photo of ID Card and enter registration attributes. The OCR Reader prefills information to the registration, and system verifies if the information matches to the National Digital ID Platform. If it is correct, user can go through the next flow.
3. For security purposes, user will have to take photo to verify their identity; The AI facial recognition matches the current photo with the photo in the National Digital ID Platform.
4. Upon registration, user reads through Terms & Condition, and applies for opt-in consent for different purposes. Users will be able to click register once the required fields are checked. Please see details of consent in next three slides
5. After registration process is completed, user will be redirected to first-time log-in screen.
6. For first-time log-in, users will have to enter their new healthbank ID and password (also set their phone number and receives OTP via SMS for verification for security.) The system remembers user log-in and the next time they log-in, only PIN will be required to access the app.
7. First time users will be asked to enter their basic health profile as an initial data.
8. Users can initially enter basic profile (weight, height), and do different surveys to self-assess health risk. This will be later on useful for medical staff to assess in the initial health screenings.

Sample Data

Input Registration Attributes:
- Name
- Sex
- Date of Birth
- National ID No.
- Phone Number
- Password / PIN

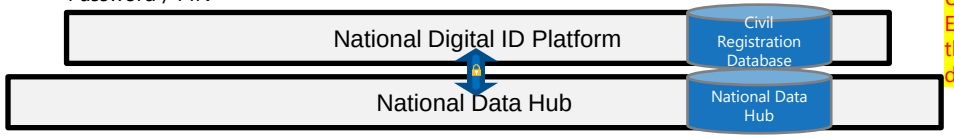
Input Verification:
- ID Card (Front & Back)
- User's Photo

Input Consent:
- Opt-in Consent (Y/N)

Note: In charge of the consent management and forms will be designed and created under DHP by NGN. However, as its important aspect for citizen, as well as to maintain the design of User Interface(UI) and User Experience(UX) of the usability of the application, please provide the design image on the proposal.

Input Login Attributes:
- Healthbank Id
- Phone Number
- OTP via SMS
- Password / PIN

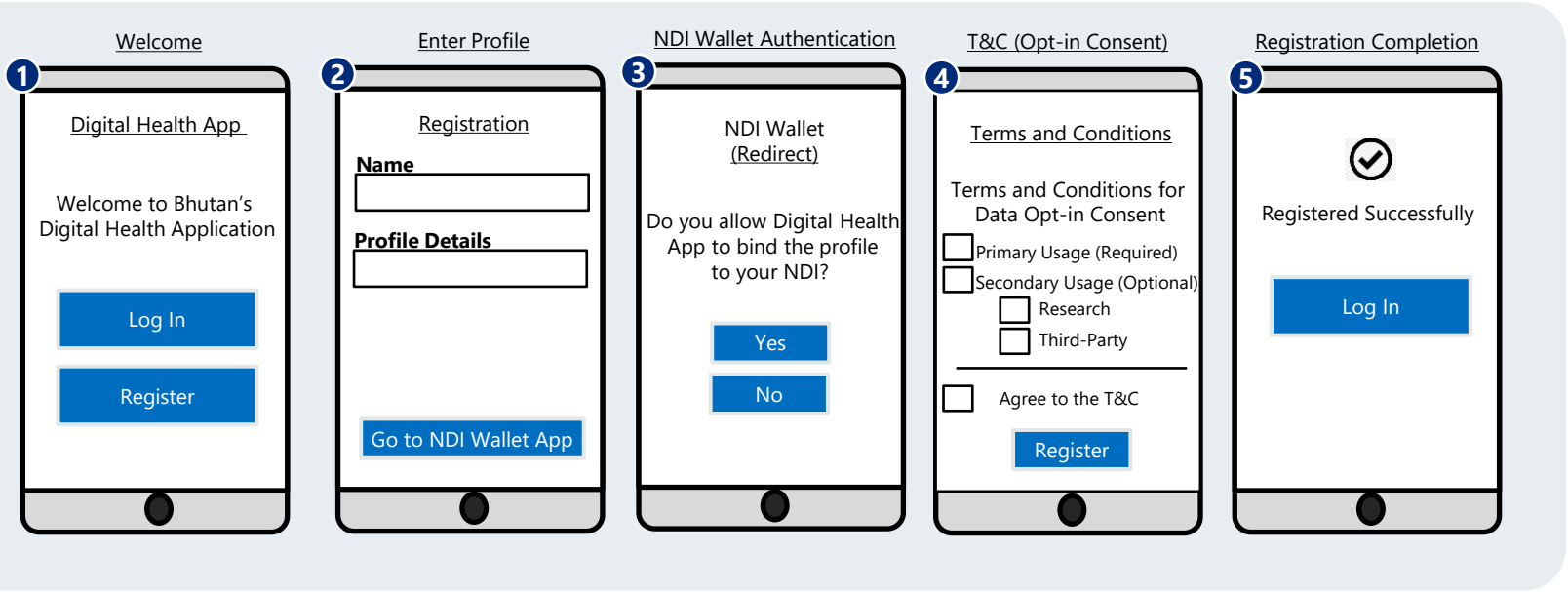
Input Health Profile:
- Risk Assessment
- Lifestyle Assessment
- Basic Profile (Weight, Height, BMI)
- Current Medications



Health Bank

Note: Consent Process of Data for Primary Use

For primary care purposes, consent of primary use is mandatory. If citizen does not allow consent for primary use during registration, they will not be able to create Digital Health App account.



Primary Data Collection is Required (Mandatory Field), while Secondary Data is Optional. If user did not check on the box on primary field, the button will be disabled, and they will not be able to proceed the registration process.

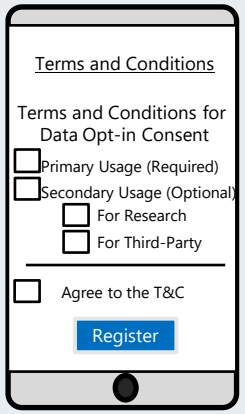
Note: In charge of the consent management and forms will be designed and created under DHP by NGN. However, as its important aspect for citizen, as well as to maintain the design of User Interface(UI) and User Experience(UX) of the usability of the application, please provide the design image on the proposal.

Note: Consent Process of Data for Secondary Use

Citizens will have the flexibility to choose opt-in or opt-out according to their preferences for secondary data utilization

Citizens' Opt-in Consent Procedure

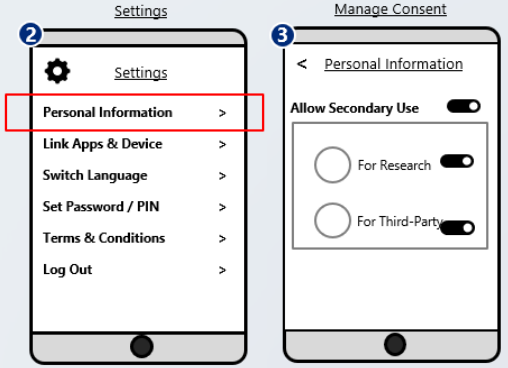
1



Secondary Use Opt-in will be asked during registration

1. User can select which data to be shared to which organizations:
   - Research (Non-Commercial)
   - Third-Party (Commercial)
2. User can select the options on which health data they choose to share*

2



Opt-in/out choice can be changed after registration in Settings under toggle feature

Citizens will have the flexibility to choose whether to do opt-in or opt-out according to their preferences from these two entry points

Company's Procedure of Obtaining Data for Secondary Use

1

Government Authorization: Company asks for permission to Bhutan Ethics Review Board, while specifying the purpose on why and which secondary data will be used to ensure transparency.

2

Reviewing of Permission: The Bhutan Ethics Review Board reviews the company's application form submitted to ensure privacy safeguards, data compliance, ethical considerations, etc. If the company's application is approved, they will be granted authorization to access the platform for secondary data use. However, if the application is not approved, the company will be required to make revisions to align the comments provided by the review board.

3

Secondary Data Use from Consented Citizens: Based on citizens' opt-in procedures, the company can use the consented data within the secondary data platform. The Bhutan Ethics Review Board monitor companies' data usage to maintain ongoing compliance.

Note: In charge of the consent management and forms will be designed and created under DHP by NGN. However, as its important aspect for citizen, as well as to maintain the design of User Interface(UI) and User Experience(UX) of the usability of the application, please provide the design image on the proposal.

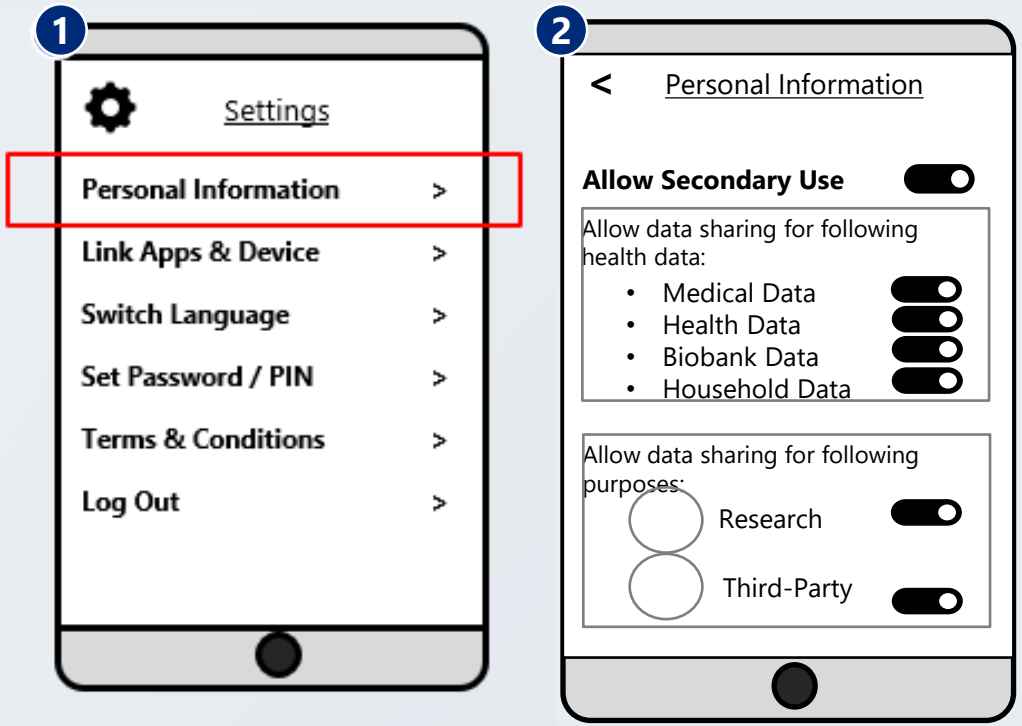
*Due to the interconnection of the health data, careful consideration is required to maintain the integrity and usefulness of interconnected data

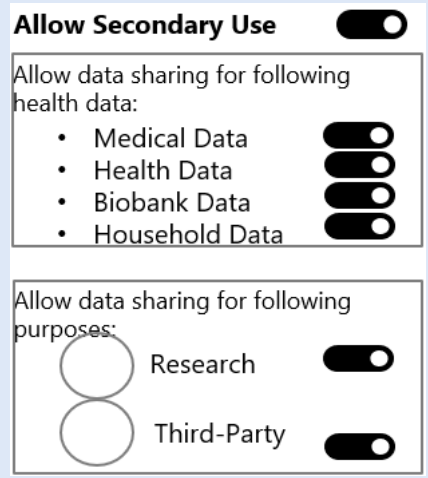
Note: Consent Process of Data for Secondary Use Opt-out

In the personal information citizen can modify which data could be used on secondary use. This will be done under DHP

Data Opt-out in User Settings

2



Discussion Point	Sample Mock-up
Secondary Consent Grouping*: User will be able to choose which data to share and also to whom the data is being shared within the user settings. The grouping of type of data will be based on the four banks, and to whom which data to be shared will be generalized for sustainability and streamlined purpose.	

Note: In charge of the consent management and forms will be designed and created under DHP by NGN. However, as its important aspect for citizen, as well as to maintain the design of User Interface(UI) and User Experience(UX) of the usability of the application, please provide the design image on the proposal.

*Due to the interconnection of the health data, careful consideration is required for selective information to maintain the integrity and usefulness of interconnected data

STEP 2: DATA POINTS

Data needed for Step 2: Application Registration

Initial Assumption Only

Data Category	Data Points	Availability	Data input	Data output	Data Source	From Who
Personal Information	Full Name	✓	●	-	National Digital ID	Citizen
	Citizen ID	✓	●	-	National Digital ID	Citizen
	Health Bank ID No,	✓	●	-	Newly created for healthbank	Citizen
	Sex/Gender	✓	●	-	National Digital ID	Citizen
	DoB	✓	●	-	National Digital ID	Citizen
	Permanent Address	✓	●	-	Household Bank	Citizen
	Residential Address	✓	●	-	Household Bank	Citizen
Health Information	Family History	△	○	-	Medical Bank	Citizen
	Weight (BMI)	△	○	-	Health Bank	Citizen
Health Assessment	Physical Activeness Assessment	△	●	-	Health Bank	Citizen
	Alcohol Assessment	△	●	-	Health Bank	Citizen
	Tobacco Assessment	△	●	-	Health Bank	Citizen
	Nutrition Assessment (Salt Intake, Vegetable Intake, Betel Use)	△	●	-	Health Bank	Citizen
	CVD Risk Assessment	△	-	●	Health Bank	Citizen
Household Information	Education level	△	○	-	Household Bank	Citizen
	Housing Conditions (Toilet)	△	○	-	Household Bank	Citizen
	Family Number (in current residential address)	△	○	-	Household Bank	Citizen
	Distance to medical facilities	△	○	-	Household Bank	Citizen
	Household income and expenditures	△	○	-	Household Bank	Citizen
	Occupation & History	△	-	-	Household Bank	Citizen
App Information	App Registration Number	✖	-	●	App	App
Outcome Indicator	NCD Screening result	△	○	-	MoH NCD Screening	Government
	Data utilization for healthcare providers: Report Generating	✖	-	●	App	App

Data Required:
● Compulsory (Primary)
○ Optional (Secondary)

Data Availability:
✓ Yes
△ Partial
✖ No

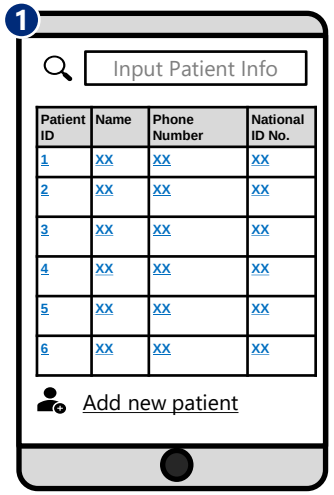
STEP 3: INITIAL SCREENING

USER: HEALTHCARE STAFF (HEALTH ASSISTANTS DURING ORC VISITS)

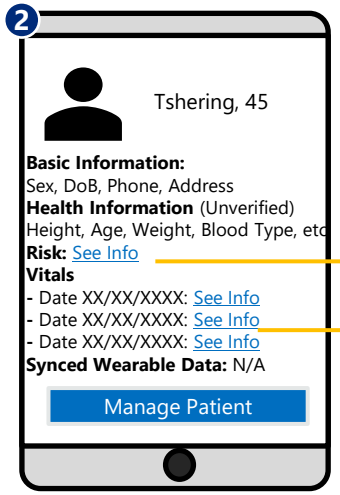
Initial Assumption Only

Wireframe

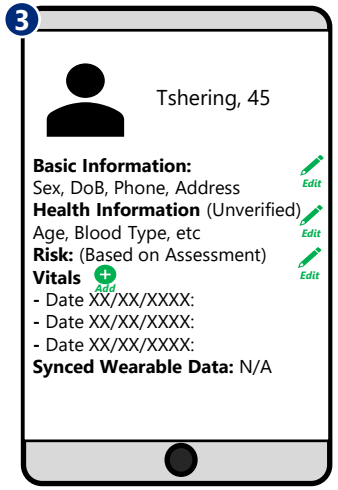
Patient Finder



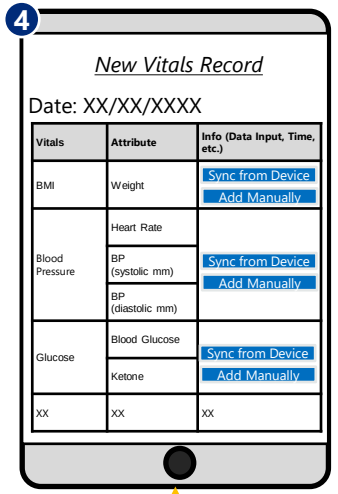
Patient Health Records



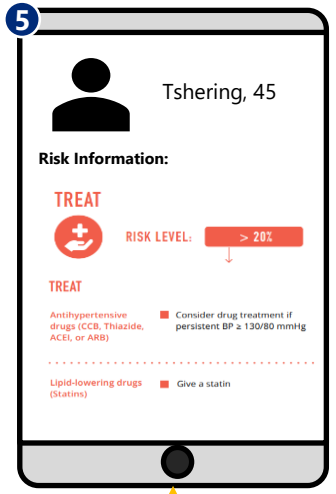
Manage Patient's Info



Sync Vitals Data



Risk Info



Description

1. User enters one of the attributes to find the patient info within the database. If the patient is not registered, user adds new patient. The information which needs to be input will be the same as the **Input Registration Attributes** (except for PIN where citizens will input it themselves in the app).

2. User clicks on the patient info. The patient's health data retrieved from the Health Bank will be shown. Unverified data are self-assessed data that were input by the patient themselves which may need further verification from the user via Manage Info Feature

3. User can add or edit health info and also verify patient's self-assessed info in this feature. User will not be able to edit fixed fields such as National ID, name, age, DoB, Sex. User can also add vitals of the patient through syncing of IoT health device such as BP monitor, HRV sensors, etc.

4. User can input vital records from the medical health device synced via Bluetooth / network or manually add the vital records when there are no available signals.

5. If there is enough information inputs, the system can analyze patient's risk based on system's pre-programmed WHO PEN Protocols. Users (Healthcare Staff) can use this findings to give initial screenings, referral recommendations, and lifestyle changes to the patient.

Sample Data

Input Patient Attributes:
- Patient Name
- National ID No.
- Phone Number
- Address

Data from Application's Database

Output Health Data:
- Patient's Health Data

Health Bank

Input Health Data:
- Patient's Health Data

Health Bank

Input Health Data:
- Patient's Health Data (e.g. Weight, Heart Rate, Blood Pressure, Sugar Levels, Heart Variability Rate, etc.)

Output Risk Info:
- Risk Assessment (Based on different data variables such as patient's lifestyle self-assessments, various vital signs, etc.)

STEP 3: DATA POINTS

Legend:
● Compulsory (Primary)
○ Optional (Secondary)

Data Availability:
✓ Yes
△ Partial
✖ No

JICA Digital transformation

Data needed for Step 3: ORC Visits Monitoring

Initial Assumption Only

Data Category	Data Points	Availability	Data input	Data output	Data Source	From Who
Personal Information	Full Name	✓	●	-	National Digital ID	Citizen
	Citizen ID No.(just for authentication check)	✓	●	-	National Digital ID	Citizen
	Health Bank ID No, (used as main)	✓	●	-	Newly created for healthbank	Citizen
	Sex/Gender	✓	●	-	National Digital ID	Citizen
	DoB	✓	●	-	National Digital ID	Citizen
	Permanent Address	✓	●	-	Household Bank	Citizen
	Residential Address	✓	●	-	Household Bank	Citizen
Health Information	Consent Management	✖	●	-	DHP	Citixen
	Current Disease (Diagnosis)	✓	○	●	Medical Bank	Healthcare Providers
	Medication / Prescription	△	○	-	Medical Bank	Healthcare Providers
	Vaccination	△	○	-	Medical Bank	Healthcare Providers
	Family History	△	●	-	Medical Bank	Citizen
	Heart Rate (Dynamic)		●			
	Family History	✓	●			
	Weight (Static)	✓	●			
	Weight (Static)	✓	●			
	Weight (Dynamic)		●			
	Height (Static)	✓	●			
	Height (Static)	✓	●			
	Height (Dynamic)		●			
	BMI (Static)	✓	●			
	BMI (Static)	✓	●			
	BMI (Dynamic)		●			
	Blood Pressure (Systolic(mmHg)) (Static)	✓	●			
	Blood Pressure (Systolic(mmHg)) (Dynamic)	✓	●			
	Blood Pressure (Diastolic(mmHg)) (Dynamic)	✓	●			
	Cholesterol = 5 mmol/L or >= 190 mg/dl (%)	✓	●			
	Blood Sugar Fasting & Control Rate	✓	●			
	ECG (Electrocardiogram Heart Rhythm)	✓	●			

STEP 3: DATA POINTS

Legend:
● Compulsory (Primary)
○ Optional (Secondary)

Data Availability:
✓ Yes
△ Partial
✖ No

JICA Digital transformation

Data needed for Step 3: ORC Visits Monitoring

Initial Assumption Only

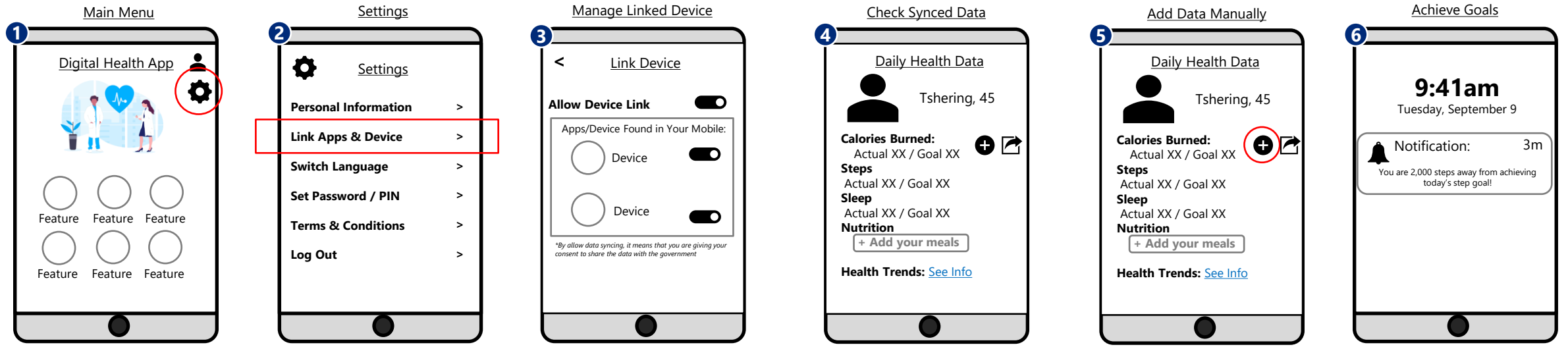
Health Assessment	Physical Activeness Assessment	△	○	-	Health Bank	Citizen
	Alcohol Assessment	△	○	-	Health Bank	Citizen
	Tobacco Assessment	△	○	-	Health Bank	Citizen
	Blood test result (LDL Cholesterol)	✓	○	●		
	Blood test result (Cholesterol = 5 mmol/L or >= 190 mg/dl (%))	✓	○	●		
	Blood test result (hemoglobin A1C -HbA1c)	✓	○	●		
	Blood test result (Blood Sugar Fasting & Control Rate)	✓	○	●		
	Blood test result (Blood Glucose rate)	✓	○	●		
	Blood test result (γ-GTP)	✓	○	●		
	Blood test result (Creatinine)	✓	○	●		
	Nutrition Asessment (Salt Intake, Vegetable Intake, Betel Use)	△	○	-	Health Bank	Citizen
	CVD Risk Assessment (Dynamic)	✓	○	-●	Health Bank	Citizen
Household Information	Education level	△	○	-	Household Bank	Citizen
	Housing Conditions (Toilet)	△	○	-	Household Bank	Citizen
	Family Number (in current residential address)	△	○	-	Household Bank	Citizen
	Distance to medical facilities	△	○	-	Household Bank	Citizen
	Household income and expenditures	△	○	-	Household Bank	Citizen
	Occupation & History	△	-	-	Household Bank	Citizen
App Information	Time needed to screen a patient (based on timestamp)	✖	-	●	App	App
	Telemedicine access rates for residents in remote areas	✖	-	-	App	App
Outcome Indicator	NCD Screeing result	△	○	-	MoH NCD Screening	Government
	Data utilization for healthcare providers: Report Generating	✖	-	●	App	App

STEP 4: WEARABLE IOT HEALTH DEVICE

USER: CITIZEN

Initial Assumption Only

Wireframe



Description

1 User can sync data from IoT Wearables (e.g. Smartwatch) to the application through feature in Settings *(Assumption: IoT Device will be managed by third-party; Health App will only sync the data. User will have to sync wearables and download third-party applications prior to syncing data)*

2 In the settings menu, user can click on sync data from wearable to sync data.

3 User can add applications or device found to sync health data to the mobile application. Once user toggles on the button, the wearable device data will be synced to the app, which will also be synced to Health Bank.

4 User can check synced data within the application. They can also set health goals and add their daily nutrition. User can share the progress with the social community, as well as share it to social channels such as WeChat.

4 For users without IoT Device, they can still participate by logging the health status manually in the app.

5 User will receive notifications that will remind the user based on the health goals set.

Sample Data

N/A

N/A

Input Wearable Data to the App & Health Bank:
- Data within the wearable such as step count, sleep count, activity levels, etc.

Health Bank

Output Wearable Data Shown:
- Data within the wearable such as step count, sleep count, activity levels, etc.

Health Bank

Input Health Data:
- Daily health data such as step count, sleep count, activity levels, nutrition, etc.

Health Bank

Output Wearable Data Shown:
- Data within the wearable such as step count, sleep count, activity levels, etc.

Health Bank

STEP 4: DATA POINTS

Legend:
● Compulsory (Primary)
○ Optional (Secondary)

Data Availability:
✓ Yes
△ Partial
✖ No

Digital transformation

Initial Assumption Only

Data needed for Step 4: Wearable Health Device

Data Category	Data Points	Availability	Data input	Data output	Data Source	From Who
Personal Information	Full Name	✓	●	-	National Digital ID	Citizen
	Sex/Gender	✓	●	-	National Digital ID	Citizen
	Health Bank ID No, (has to be connected)	✓	○	-	Healthbank ID	Citizen
	DoB	✓	●	-	National Digital ID	Citizen
	Permanent Address	✓	○	-	Household Bank	Citizen
	Residential Address	✓	○	-	Household Bank	Citizen
Health Information	Current Disease (Diagnosis)	△	○	-	Medical Bank	Healthcare Providers
	Family History	△	○	-	Medical Bank	Citizen
	Weight (Static)	✓	●	-	Medical Bank	Healthcare Providers
	Weight (Static)		●	-	Household Bank (Annual Health Survey, MoH)	Healthcare Providers
	Weight (Dynamic)	✓	●	-	Health Bank (from Digital Health App)	Citizen/Healthcare Providers
	Height (Static)	✓	●	-	Medical Bank	Healthcare Providers
	Height (Static)		●	-	Household Bank (Annual Health Survey, MoH)	Healthcare Providers
	Height (Dynamic)		●	-	Health Bank (from Digital Health App)	Citizen
	BMI (Static)	✓	●	-	Medical Bank	Healthcare Providers
	BMI (Static)	✓	●	-	Household Bank (Annual Health Survey, MoH)	Healthcare Providers
	BMI (Dynamic)		●	-	Health Bank (from Digital Health App)	App
	Heart Rate (Dynamic)	△	-	●	Household Bank (Annual Health Survey, MoH)	Healthcare Providers
	ECG (Electrocardiogram Heart Rhythm)	△	-	○	Medical Bank	Healthcare Providers
Health Assessment	Physical Activeness Assessment	△	○	-	Health Bank	Citizen
	Nutrition Asessment (Salt Intake, Vegetable Intake, Betel Use)	△	○	-	Health Bank	Citizen
	CVD Risk Assessment	△	○	-	Health Bank	Citizen
Wearable Information	Physical Activity (Calorie)	✖	-	●	Health Bank	Citizen
	Sleep Hours (Optional)	✖	-	●	Health Bank	Citizen
Outcome Indicator	NCD Screeing result	△	○	-	MoH NCD Screening	Government

Devices (Blood Pressure)

The following are possible device for Blood Pressure that maybe asked to be connected. The product will be bought by Accenture for the PoC. Please suggest if any one is feasible on your proposal.

Model (Clinically Validated)	OMRON Automatic Blood Pressure Monitor HEM-7120 (link)	A&D Medical electronic blood pressure monitor UM-212BLE (link)	Welch Allyn ProBP ™ 2000 Digital Blood Pressure Monitor (link)
Image			
Quality	• **Portable devices** • **Cuff pressure** • Oscillometric/auscultation • Measurement parameter: Systolic or diastolic pressure, Heartbeat • Battery life: 300 measurement conditions • Memory 2 people x 100 times	• **Portable devices** • **Cuff pressure** • Osillometric • Measurement parameter: Systolic or diastolic pressure, Heartbeat • Battery life: 300 measurements • Memory: 99 data	• **Portable devices** • **Cuff pressure** • Osillometric • Measurement parameter: Systolic or diastolic pressure, Heartbeat
Price	**$109.00** Additional Cuffs size: ¥3300	**$185** Additional Cuffs size: ¥2200-5000	**$153** Additional Cuffs size: ¥3000-5000
Data Management	• OMRON connect app and OMRON connect compatible devices (https://datahealthcare.omron.co.jp/hms_b)	• Bluetooth Low Energy Ver.4.1 • SDK is available for system integrator (link)	• Data transfer to PC/smartphone/tablet with USB cable or Bluetooth 4.2

Devices (Wearable Device)

The following are possible wearable device to collect the Steps count, sleep hours, and physical activity calories. That maybe asked to be connected. The product will be bought by Accenture for the PoC. Please suggest if any one is feasible on your proposal.

Model	Samsung Galaxys4 Classic (link)	Fitbit Charge 6 (link)	Amazfit Active (link)	J-Style JC 2301B Smart Health Ring (link)	Smartwatch developed by CST
Image					
Quality	✓ **Physical activities** • Steps count • Sport and Fitness (group challenge) ✓ **Sleep Score** ✓ **Heart Rate** ✓ **Others:** • Blood oxygen(SpO2) • Blood Pressure • ECG • Stress Management • Food (calories), Water consumption • **Battery life:10-20 days**	✓ **Physical activities** • Steps count • Sport and Fitness ✓ **Sleep Score** ✓ **Heart Rate** ✓ **Others:** • Blood Oxygen(SpO2) • Stress management • Skin temperature ✓ **Battery life: 7-10 days**	✓ **Physical activities** • Steps count • Sport and Fitness ✓ **Sleep Score** ✓ **Heart Rate** ✓ **Others:** • Blood Oxygen(SpO2) • Stress Monitoring ✓ **Battery life: 10-30 days. Continuous GPS Usage 16 hours**	✓ **Physical activities** • Steps count • All day activities ✓ **Sleep Score** ✓ **Heart Rate** ✓ **Others**: • Oxygen (SpO2). • Calories • Non-invasive Blood glucose • Skin Temperature • HRV Stress • **Battery life: 7-10 days**	✓ **Physical activities** • Steps count ✓ **Sleep Pattern detection** ✓ **Heart Rate** ✓ **Others**: • Multiple watch faces. • Calorie count. **Battery life: 24 hours**
Price	Original price: 458$ Discounted Price: 121$ (Feb 2024)	Original Price: **159$**	Original price: 241$ Discounted Price: 157$ (Feb 2024)	Original price: $185	-
Data Integration	• Android SDK support. Health Connect API. Or API works on both Wear OS and Android OS	• Android SDK support. Health Connect API. Or API works on both Wear OS and Android OS	• Android SDK support. Health Connect API. Or API works on both Wear OS and Android OS	• JC Ring App – Cloud-based Service - API work for OS and Android but only for original app	• Data Transfer to App for logging and analysis

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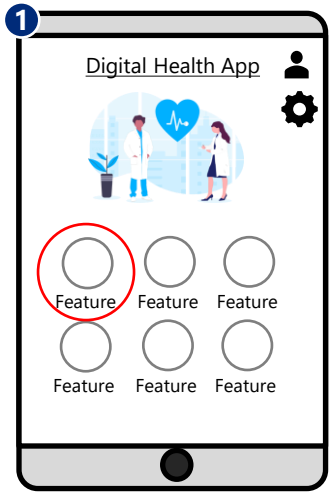
STEP 5: SUPPORT FROM ONLINE COMMUNITIES

USER: CITIZEN

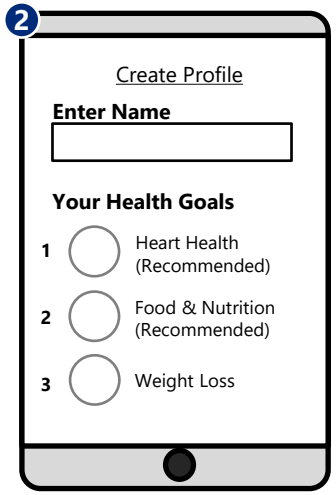
Initial Assumption Only

Wireframe

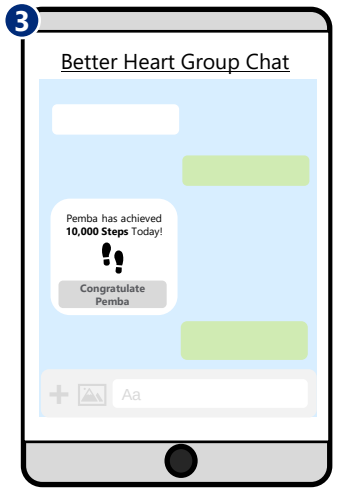
Main Menu



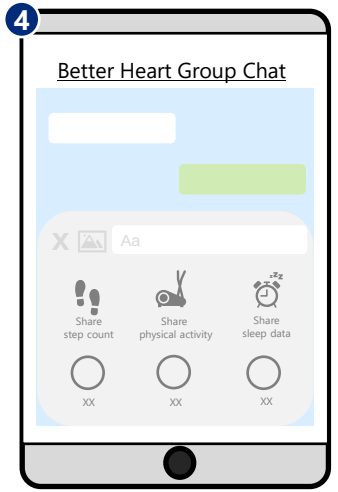
Create User Profile



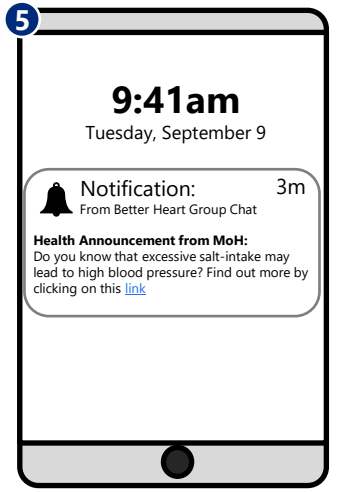
Joins Community Groups



Share Health Data



Government News



Description

1. Within the main menu, user can select a feature where they can interact with other online community members within the mobile application

2. For anonymity, user can create their own user profile, and select health goals that they want to achieve. They will also be recommended the goals based on their health data and health risk.

3. After choosing health goals, user will be recommended / related groups, and chat with people who have the same health goals anonymously

4. User can click to share health data and progress within the group chat, which allows community to gain recognition and motivation

5. Government can also share health-related news within the community group chat

Sample Data

N/A

Input Profile Name
- Name of user (anonymous)

Input Health Goals Attributes:
- Health Goals (Select from health goal list)

Data from Application's Database

Output Wearable Data Shown:
- Data within the wearable such as step count, sleep count, activity levels, etc.

Health Bank

Output Wearable Data Shown:
- Data within the wearable such as step count, sleep count, activity levels, etc.

Health Bank

N/A

STEP 5: DATA POINTS

Legend:
● Compulsory (Primary)
○ Optional (Secondary)

Data Availability:
✓ Yes
△ Partial
✖ No

Digital transformation

Initial Assumption Only

Data needed for Step 5: Online Community

Data Category	Data Points	Availability	Data input	Data output	Data Source	From Who
Personal Information	Full Name	✓	○	-	National Digital ID	Citizen
	Sex/Gender	✓	○	-	National Digital ID	Citizen
	Health Bank ID No, (has to be connected)	✓	●	-	Healthbank ID	Citizen
	DoB	✓	○	-	National Digital ID	Citizen
Health Information	Current Disease (Diagnosis)	△	○	-	Medical Bank	Healthcare Providers
	Medication / Prescription	△	○	-	Medical Bank	Healthcare Providers
	Family History	△	○	-	Medical Bank	Citizen
	Weight (BMI)	△	○	-	Health Bank	Citizen
	Blood Pressure	△	○	-	Health Bank	Healthcare Providers
	Heart Rate (Dynamic)	△	○	-	Health Bank	Healthcare Providers
	Cholesterol = 5 mmol/L or >= 190 mg/dl (%)	△	○	●	Health Bank	Healthcare Providers
	Blood Sugar Fasting & Control Rate	△	○	-	Health Bank	Healthcare Providers
	ECG (Electrocardiogram Heart Rhythm)	△	○	-	Medical Bank	Healthcare Providers
Health Assessment	Physical Activeness Assessment	△	○	-	Health Bank	Citizen
	Physical activity (Calorie)	-	●	-	Health Bank (from Wearable device)	Citizen
	Sleeping hours (Option)	-	●	-	Health Bank (from Wearable device)	Citizen
	Physical activity self-assessment (Physical Activeness Assessment)	-	●	-	Health Bank (from push notice QA of Digital Health App)	Citizen
	Alcohol self-assessment (Alcohol Assessment)	-	●	-	Health Bank (from push notice QA of Digital Health App)	Citizen
	Cigarettes self-assessment (Tobacco)	--	●	-	Health Bank (from push notice QA of Digital Health App)	Citizen
	Nutritional self-assessment (salt intake, vegetable intake, and Doma Pani consumption) (Nutrition Asessment) (Doma)	-	●	-	Health Bank (from push notice QA of Digital Health App)	Citizen
	CVD Risk Assessment	△	○	-	Health Bank	Citizen
Wearable Information	Step Count / Physical Activity	✖	○	●	Health Bank	Citizen
	Sleeping hours	✖	○	●	Health Bank	Citizen

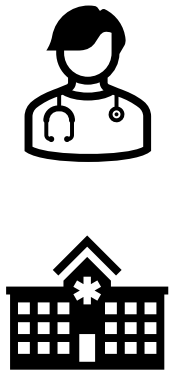
STEP 6: CONVENIENCE OF HOSPITAL VISITS

USER: HEALTHCARE STAFF IN HOSPITAL

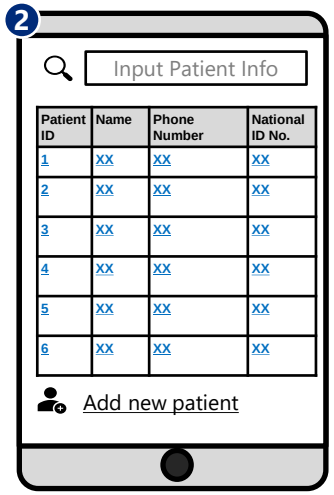
Initial Assumption Only

Wireframe

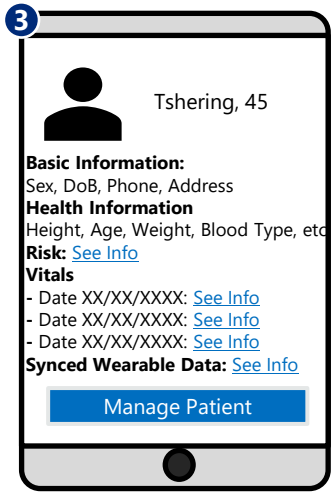
1 Physical Touchpoint



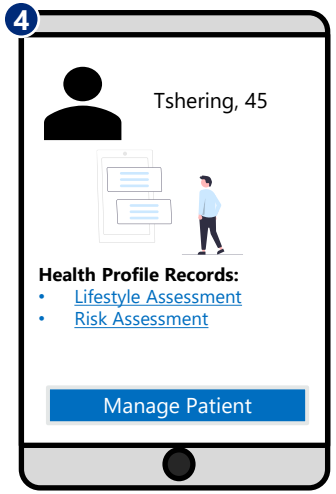
Patient Finder



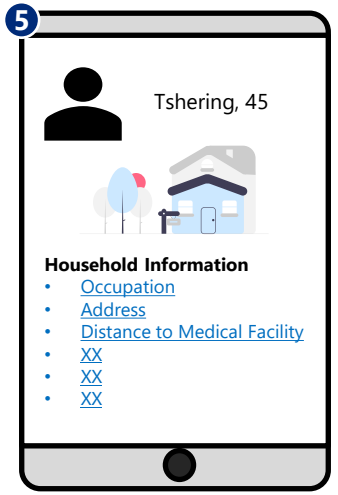
Patient Health Records



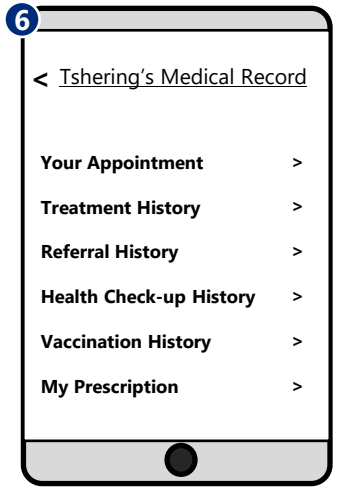
Behavior & Lifestyle Records



Family and Household History Records



Data Links to App



Description

1 Patients make a visit to the hospital based on their health issues.

2 When patients visit hospital for diagnosis, user (health care staff) can gain extensive data by searching patient data in the database. User enters one of the patient attributes to find the patient info within the database.

3 User clicks on the patient info. The patient's health data retrieved from the Health Bank will be shown. User can check patient health data as a supplementary data for diagnosis along with information in ePIS.

4 User can also use data such as behavior and lifestyle (e.g. tobacco, alcohol, diet) both input by IoT device and manually by patient, to see whether the patient's lifestyle correlates with the illness / NCD risk they might have

5 User can also dig down further to see family and household history records that was input during previous NCD screenings, government initiatives, or manually input by patient. This is to assess their background as well as proximity to high-risk environment / areas.

6 After user updates diagnosis within ePIS, ePIS data will also be reflected on user's profile within the mobile application in real-time *(No data flowing back to ePIS)*. Here, both citizens and health workers can also see summarized treatment information (Not the actual medical record)

Sample Data

Input Patient Attributes:
- Patient Name
- National ID No.
- Phone Number
- Address

Data from Application's Database

Output Health Data:
- Patient's Health Data

Health Bank

Output Health Data:
- Patient's Health Data
- Lifestyle, Risk survey assessment conducted by patient

Health Bank

Output Health Data:
- Patient's Health Data
- Household Bank data

Health Bank | Household Bank

Output Health Data:
- Patient's Health Data

Output Medical Data:
- Patient's Medical Records Data

Health Bank | Medical Bank (ePIS)

STEP 6: DATA POINTS

Legend:
● Compulsory (Primary)
○ Optional (Secondary)

Data Availability:
✓ Yes
△ Partial
✖ No

JICA Digital transformation

Initial Assumption Only

Data needed for Step 6: Treatment at hospital visits or telemedicine

Data Category	Data Points	Availability	Data input	Data output	Data Source	From Who
Personal Information	Full Name	✓	●	●	National Digital ID	Citizen
	Citizen ID No.(for reference check)	✓	●	●	National Digital ID	Citizen
	Health Bank ID No, (has to be connected)	✓	●	●	Healthbank ID	Citizen
	Sex/Gender	✓	●	●	National Digital ID	Citizen
	DoB	✓	●	●	National Digital ID	Citizen
	Permanent Address	✓	●	●	Household Bank	Citizen
	Daily Active Users			●		
	Residential Address	✓	●	●	Household Bank	Citizen
	Mobile Phone Number	✓	●	●	Household Bank	Citizen
Health Information	Current Disease (Diagnosis)	△	●	●	Medical Bank	Healthcare Providers
	Medication / Prescription	△	●	●	Medical Bank	Healthcare Providers
	Allergy	△	○	○	Medical Bank	Healthcare Providers
	Vaccination	△	○	○	Medical Bank	Healthcare Providers
	Lab Tests	△	○	○	Medical Bank	Healthcare Providers
	Family History	△	●	●	Medical Bank	Citizen
	Weight (Static)	✓	●	●	Medical Bank	Healthcare Providers
	Weight (Static)	✓	●	●	Household Bank (Annual Health Survey, MoH)	Healthcare Providers
	Weight (Dynamic)		●	●	Health Bank (from Digital Health App)	Citizen/Healthcare Providers
	Height (Static)	✓	●	●	Medical Bank	Healthcare Providers
	Height (Static)	✓	●	●	Household Bank (Annual Health Survey, MoH)	Healthcare Providers
	Height (Dynamic)		●	●	Health Bank (from Digital Health App)	Citizen
	BMI (Static)	✓	●	●	Medical Bank	Healthcare Providers
	BMI (Static)	✓	●	●	Household Bank (Annual Health Survey, MoH)	Healthcare Providers
	BMI (Dynamic)		●	●	Health Bank (from Digital Health App)	App
	Blood Pressure (Systolic(mmHg)) (Static)	✓	●	●	Household Bank (Annual Health Survey, MoH)	Healthcare Providers
	Blood Pressure (Systolic(mmHg)) (Dynamic)		●	●	Health Bank (from BP monitor via Digital Health App)	Healthcare Providers
	Blood Pressure (Diastolic(mmHg)) (Dynamic)		●	●	Health Bank (from BP monitor via Digital Health App)	Healthcare Providers
	Heart Rate	△	○	○	Health Bank	Healthcare Providers
	Cholesterol = 5 mmol/L or >= 190 mg/dl (%)	△	○	○	Health Bank	Healthcare Providers
	Blood Sugar Fasting & Control Rate	△	○	○	Health Bank	Healthcare Providers
	ECG (Electrocardiogram Heart Rhythm)	△	○	○	Medical Bank	Healthcare Providers

STEP 6: DATA POINTS

Legend:
● Compulsory (Primary)
○ Optional (Secondary)

Data Availability:
✓ Yes
△ Partial
✖ No

Digital transformation

Initial Assumption Only

Data needed for Step 6: Treatment at hospital visits or telemedicine

Data Category	Data Points	Availability	Data input	Data output	Data Source	From Who
Health Assessment	Physical Activeness Assessment	△	●	○	Health Bank	Citizen
	Alcohol self-assessment (Alcohol Assessment)	△	●	○	Health Bank	Citizen
	Cigarettes self-assessment (Tobacco)	△	●	○	Health Bank	Citizen
	Nutritional self-assessment (salt intake, vegetable intake, and Doma Pani consumption) (Nutrition Asessment) (Doma)	△	○	○	Health Bank	Citizen
	CVD Risk Assessment	△	○	○	Health Bank	Citizen
	Nutritional self-assessment (salt intake, vegetable intake, and Doma Pani consumption) (Nutrition Asessment) (Salt)		●	○	Health Bank (from push notice QA of Digital Health App)	Citizen
	Nutritional self-assessment (salt intake, vegetable intake, and Doma Pani consumption) (Nutrition Asessment) (Vegetable)		●	○	Health Bank (from push notice QA of Digital Health App)	Citizen
	Dynamic Household Bank assessment (GNH-1: Health Barriers)		●	○	Health Bank (from push notice QA of Digital Health App)	Citizen
	Dynamic Household Bank assessment (GNH-2: Community Vitality)		●	○	Health Bank (from push notice QA of Digital Health App)	Citizen
	Dynamic Household Bank assessment (GNH-3: Psychological Wellbeing)		●	○	Health Bank (from push notice QA of Digital Health App)	Citizen
	Dynamic Household Bank assessment (GNH-4: Healthy Days)		●	○	Health Bank (from push notice QA of Digital Health App)	Citizen
	Dynamic Household Bank assessment (GNH-5: Health Assessment)		●	○	Health Bank (from push notice QA of Digital Health App)	Citizen

STEP 6: DATA POINTS

Legend:
● Compulsory (Primary)
○ Optional (Secondary)

Data Availability:
✓ Yes
△ Partial
✖ No

Digital transformation

Initial Assumption Only

Data needed for Step 6: Treatment at hospital visits or telemedicine

Data Category	Data Points	Availability	Data input	Data output	Data Source	From Who
Health Assessment	Static Household Data ((GNH-1: Health Barriers))		●	○	Health Bank (from push notice QA of Digital Health App)	Citizen
	Static Household Data (GNH-2: Community Vitality)		●	○	Household Bank (GNH survey)	Healthcare Providers
	Static Household Data (GNH-3: Psychological Wellbeing)		●	○	Household Bank (GNH survey)	Healthcare Providers
	Static Household Data (GNH-4: Healthy Days)		●	○	Household Bank (GNH survey)	Healthcare Providers
	Static Household Data (GNH-5 Health Assessment)		●	○	Household Bank (GNH survey)	Healthcare Providers
	Housing Conditions		●	○	Household Bank (GNH survey)	Healthcare Providers
	Living environement		●	○	Original: Household bank Modify: Health Bank (Survey for Household bank)	Citizen
	Family Number		●	○	Original: Household bank Modify: Health Bank (Survey for Household bank)	Citizen
	Distance to medical facilities		●	○		
	Household income and expenditures		●	○	Original: Household bank Modify: Health Bank (Survey for Household bank)	Citizen
	Stress level		●	○	Health Bank (from push notice QA of Digital Health App)	Citizen
Wearable Information	Step Count / Physical Activity	✖	○	○	Health Bank	Citizen
	Sleep Count	✖	○	○	Health Bank	Citizen
App Information	Time needed to screen a patient (based on timestamp)	✖	-	●	App	App
	Telemedicine access rates for residents in remote areas	✖	-	-	App	App
Outcome Indicator	NCD Screeing result	△	●	●	MoH NCD Screening	Government
	Data utilization for healthcare providers: Report Generating	✖	-	●	App	App

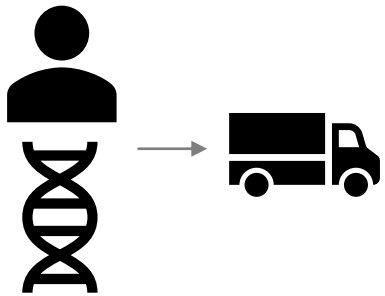
STEP 7: DNA TO BIOBANK

USER: HEALTHCARE STAFF IN HOSPITAL

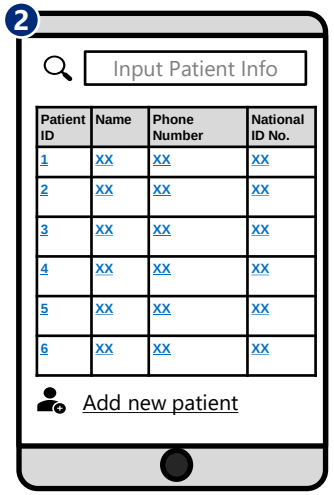
Initial Assumption Only

Wireframe

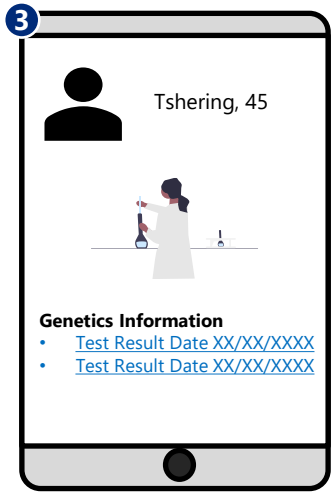
1 Physical Touchpoint



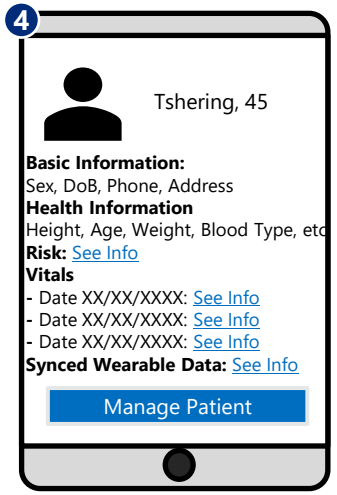
2 Patient Finder



3 Patient Health Records



4 Patient Health Records



Description

1 In cases where patient's condition persists, their DNA samples can be sent to RCDC for further diagnosis.

2 In cases where patient's data will have to be sent to BioBank for further diagnosis, the data will also be updated to the health application. User enters one of the patient attributes to find the patient info within the database.

3 User clicks on the patient info. The patient's genetic-related data is retrieved from BioBank to be displayed here.

4 User can check genetic-related data, along with other health data and risk assessments to give personalized treatment that is targeted towards the patient.

Sample Data

Input Patient Attributes:
- Patient Name
- National ID No.
- Phone Number
- Address

Data from Application's Database

Output Health Data:
- Patient's Bio Bank Data

Bio Bank

Output Health Data:
- Health Bank
- Household Bank
- Medical Bank
- Bio Bank

Health Bank | Household Bank | Medical Bank (ePIS) | Bio Bank

STEP 7: DATA POINTS

Legend:
● Compulsory (Primary)
○ Optional (Secondary)

Data Availability:
✓ Yes
△ Partial
✖ No

JICA Digital transformation

Data needed for Step 7: DNA for Personalized BioBank

Initial Assumption Only

Data Category	Data Points	Availability	Data input	Data output	Data Source	From Who
Personal Information	Full Name	✓	●	-	National Digital ID	Citizen
	Citizen ID No.	✓	●	-	National Digital ID	Citizen
	Health Bank ID No, (has to be connected)	✓	●	-	Healthbank ID	Citizen
	UHID	✓	●	-		
	Sex/Gender	✓	●	-	National Digital ID	Citizen
	Mobile Phone Number	✓	●	-		
	DoB	✓	●	-	National Digital ID	Citizen
Health Information	Current Disease (Diagnosis)	△	●	-	Medical Bank	Healthcare Providers
	Consent Management		●	-	DHP	Citizen
	Medication / Prescription	△	●	-	Medical Bank	Healthcare Providers
	Allergy	△	○	-	Medical Bank	Healthcare Providers
	Vaccination	△	○	-	Medical Bank	Healthcare Providers
	Lab Tests	△	○	-	Medical Bank	Healthcare Providers
	Family History	△	●	●	Medical Bank	Citizen
	Weight (Static)	✓	●		Medical Bank	Healthcare Providers
	Weight (Static)	✓	●		Household Bank (Annual Health Survey, MoH)	Healthcare Providers
	Weight (Dynamic)		●		Health Bank (from Digital Health App)	Citizen/Healthcare Providers
	Height (Static)	✓	●		Medical Bank	Healthcare Providers
	Height (Static)	✓	●		Household Bank (Annual Health Survey, MoH)	Healthcare Providers
	Height (Dynamic)		●		Household Bank (Annual Health Survey, MoH)	Healthcare Providers
	BMI (Static)	✓	●		Household Bank (Annual Health Survey, MoH)	Healthcare Providers
	BMI (Static)	✓	●		Health Bank (from Digital Health App)	App
	BMI (Dynamic)		●			

STEP 7: DATA POINTS

Legend:
● Compulsory (Primary)
○ Optional (Secondary)

Data Availability:
✓ Yes
△ Partial
✖ No

JICA Digital transformation

Data needed for Step 7: DNA for Personalized BioBank

Initial Assumption Only

Data Category	Data Points	Availability	Data input	Data output	Data Source	From Who
Health Information	Blood Pressure (Systolic(mmHg)) (Static)	✓	●		Medical Bank	Healthcare Providers
	Blood Pressure (Systolic(mmHg)) (Dynamic)		●	●	Health Bank (from BP monitor via Digital Health App)	Healthcare Providers
	Blood Pressure (Systolic(mmHg))(Static)	✓	●		Medical Bank	Healthcare Providers
	Blood Pressure (Diastolic(mmHg)) (Dynamic)		●	●	Health Bank (from BP monitor via Digital Health App)	Healthcare Providers
	Blood Pressure (Diastolic(mmHg))(Static)	✓	●		Medical Bank	Healthcare Providers
	Blood test result (LDL Cholesterol)		●			
	Blood test result (Cholesterol = 5 mmol/L or >= 190 mg/dl (%))		●		Household Bank (Annual Health Survey, MoH)	Healthcare Providers
	Blood test result (hemoglobin A1C -HbA1c)		●		Medical Bank	Healthcare Providers
	Blood test result (Blood Sugar Fasting & Control Rate)		●		Medical Bank	Healthcare Providers
	Blood test result (Blood Glucose rate)		●		Medical Bank	Healthcare Providers
	Blood test result (γ-GTP)		●		Medical Bank	Healthcare Providers
	Blood test result (Creatinine)		●		Medical Bank	Healthcare Providers
	Heart Rate	△	○	-	Health Bank	Healthcare Providers
	Cholesterol = 5 mmol/L or >= 190 mg/dl (%)	△	○	-	Health Bank	Healthcare Providers
	Blood Sugar Fasting & Control Rate	△	○	-	Health Bank	Healthcare Providers
	ECG (Electrocardiogram Heart Rhythm)	△	○	-	Medical Bank	Healthcare Providers
Health Assessment	Physical Activeness Assessment	△	○	-	Health Bank	Citizen
	Alcohol Assessment	△	○	-	Health Bank	Citizen
	Tobacco Assessment	△	○	-	Health Bank	Citizen
	Nutrition Assessment (Salt Intake, Vegetable Intake, Betel Use)	△	○	●	Health Bank	Citizen
	CVD Risk Assessment	△	○	-	Health Bank	Citizen
	Living Environment		●	●	Modify: Health Bank (Survey for Household bank)	Citizen
	Stress Level		●	●	Health Bank (from push notice QA of Digital Health App)	Citizen
Wearable Information	Step Count / Physical Activity	✖	○	-	Health Bank	Citizen
	Sleep Count	✖	○	-	Health Bank	Citizen
Genetics	DNA	✖	●	-	BioBank	Citizen
	Saliva	✖	●	-	BioBank	Citizen
	Genetics Result	✖	-	●	BioBank	Healthcare Providers
Outcome Indicator	NCD Screening result	△	●	-	MoH NCD Screening	Government

STEP 8: TELEMEDICINE FOLLOW UP

Out of scope for this PoC

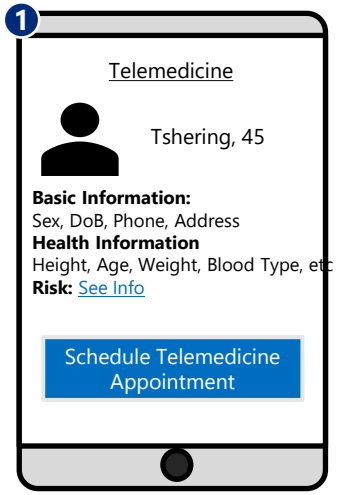
JICA | Digital transformation

USER: CITIZEN

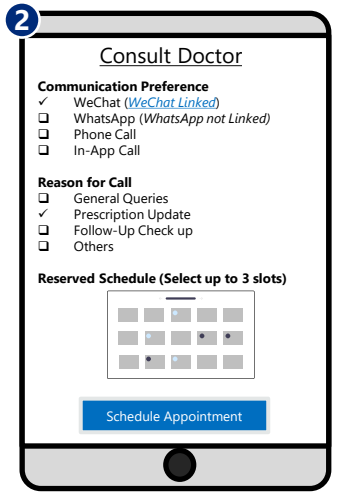
Initial Assumption Only

Wireframe

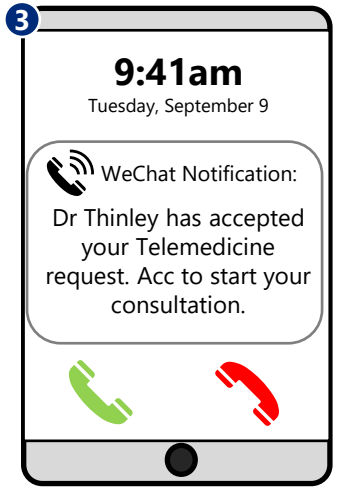
Schedule Telemedicine Appointment



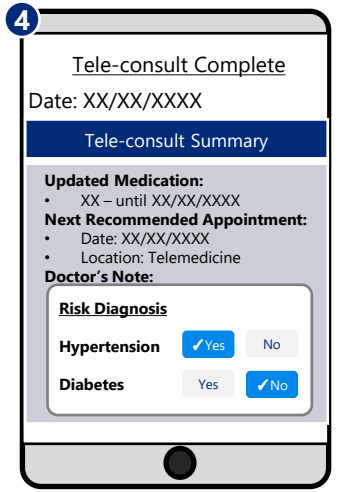
Input Telemedicine Data



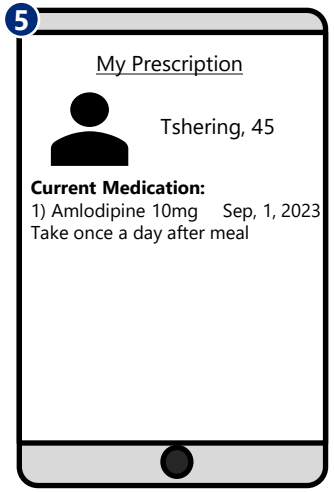
Tele-consultation with Doctor



Receive Diagnosis & Prescription



Updated Prescription



Physical Touchpoint

Description

1. Within the telemedicine feature, user can contact hospitals directly and vice versa for non-emergency consultations. User can schedule an appointment with doctor.

2. User can schedule a call by inputting the information. The availability of the doctor is calculated based on location proximity, and user's treatment history. User can also select communication preference with the Social Media Account that is linked to the device.

3. The request information will be sent to the doctor. Notification will be sent to the user once the doctor accept the tele-consult appointment. Once appointment is accepted, user can consult with the doctor on the scheduled date.

4. After completing the telemedicine consultation, user receives diagnosis from the doctor. Doctor can recommend user to come in for further extensive health checks. Or if it is a follow-up case, doctor can update the prescribed medicine to the user that they can receive at the nearest PHC.

5. Within "My Prescription", user can check the prescribed medicine and can go to the local PHC to obtain the medication.

6. User can show Prescription to the local PHC to receive the medicine from HAs

Sample Data

N/A

Output Consultation Attributes
- Doctor's availability based on schedule

Input Consultation Attributes
- Communication Preference
- Reason for Tele-Consultation
- Reservation Schedule

Data from Application's Database

N/A

Output Teleconsultation Outcomes (Based on Doctor's Inputs)
- Updated medication
- Recommended Appointment
- Risk Diagnosis
- Doctor's Notes
- Etc.

Health Bank

Output Prescription Info:
- Based on data updated within health bank

Health Bank

STEP 8: DATA POINTS

Out of scope for this PoC

JICA Digital transformation

Data needed for Step 8: Telemedicine Follow Up

Initial Assumption Only

Data Category	Data Points	Availability	Data input	Data output	Data Source	From Who
Personal Information	Full Name	✓	●	●	National Digital ID	Citizen
	Citizen ID No.	✓	●	●	National Digital ID	Citizen
	Sex/Gender	✓	●	●	National Digital ID	Citizen
	Health Bank ID No, (has to be connected)	✓	●	-	Healthbank ID	Citizen
	DoB	✓	●	●	National Digital ID	Citizen
	Permanent Address	✓	●	●	Household Bank	Citizen
	Residential Address	✓	●	●	Household Bank	Citizen
Health Information	Current Disease (Diagnosis)	△	●	●	Medical Bank	Healthcare Providers
	Medication / Prescription	△	●	●	Medical Bank	Healthcare Providers
	Allergy	△	○	○	Medical Bank	Healthcare Providers
	Vaccination	△	○	○	Medical Bank	Healthcare Providers
	Lab Tests	△	○	○	Medical Bank	Healthcare Providers
	Family History	△	●	●	Medical Bank	Citizen
	Weight (BMI)	△	●	●	Health Bank	Citizen
	Blood Pressure	△	●	●	Health Bank	Healthcare Providers
	Heart Rate	△	○	○	Health Bank	Healthcare Providers
	Cholesterol = 5 mmol/L or >= 190 mg/dl (%)	△	○	○	Health Bank	Healthcare Providers
	Blood Sugar Fasting & Control Rate	△	○	○	Health Bank	Healthcare Providers
	ECG (Electrocardiogram Heart Rhythm)	△	○	○	Medical Bank	Healthcare Providers
Health Assessment	Physical Activeness Assessment	△	○	○	Health Bank	Citizen
	Alcohol Assessment	△	○	○	Health Bank	Citizen
	Tobacco Assessment	△	○	○	Health Bank	Citizen
	Nutrition Asessment (Salt Intake, Vegetable Intake, Betel Use)	△	○	○	Health Bank	Citizen
	CVD Risk Assessment	△	○	○	Health Bank	Citizen
Wearable Information	Step Count / Physical Activity	✖	○	○	Health Bank	Citizen
	Sleep Count	✖	○	○	Health Bank	Citizen
Genetics	DNA	✖	○	○	BioBank	Citizen
	Saliva	✖	○	○	BioBank	Citizen
	Genetics Result	✖	○	○	BioBank	Healthcare Providers
App Information	Time needed to screen a patient (based on timestamp)	✖	-	●	App	App
Outcome Indicator	NCD Screening result	△	●	●	MoH NCD Screening	Government
	Data utilization for healthcare providers: Report Generating	✖	-	●	App	App

Legend:
● Compulsory (Primary)
○ Optional (Secondary)

Data Availability:
✓ Yes
△ Partial
✖ No

STEP 9: Centralized Data for EBPM

USER: GOVERNMENT

Initial Assumption Only

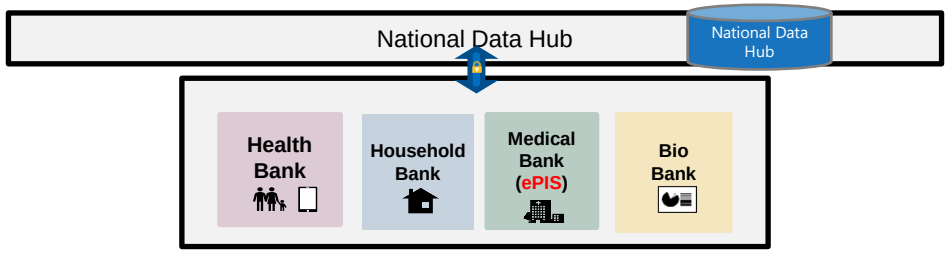
Wireframe

Healthcare Analytics Dashboard

Description

1 Data from all sources (Health Bank, Medical Bank, Household Bank, BioBank) will be consolidated into the National Data Hub which is a centralized data stored for government to analyze health trends. Through use of **enterprise data platform**, users can manage data, analyze, and share across different departments.

Sample Data



1.Healthcare Policy Development

- Developing a model for rational consumption of treatment options based on income
- Appropriately allocating budgets for various diseases, ensuring funds are directed towards disease with highest prevalence and impact on public health
- Properly allocating budgets for hospital infrastructure
- Formulating new healthcare integration policies across departments to improve coordination and delivery of healthcare
- Developing new policies to regulate and widespread use of traditional medicine to ensure safe and effective use that meets health needs of the citizen

2. Medical Research and Evaluation

- Allocate Conducting research on targeted medicine development and effectiveness evaluation.
- Studying the impact of self-monitoring and lifestyle changes on health outcomes.

3.Public Health Data Analysis & Intervention Planning

- Be able to analyze out of total, how many is treated (medicated) and how many is known as NCD, hypertension but not treated
- Analyzing NCD patterns to identify high-risk groups and sources of outbreaks, developing targeted prevention strategies
- Identifying disparities in health outcomes among different populations (e.g. by income, or geography) developing interventions to address those disparities
- Tracking vaccination rates to identify low coverage areas and implementing targeted outreach efforts to improve coverage
- Analyzing data on lifestyle behaviors such as tobacco, diet, and physical activity to identify effective behavior change programs
- Using predictive analytics to forecast health trends and identify areas where intervention is likely to be most effective

STEP 9: DATA POINTS

Legend:
● Compulsory (Primary)
○ Optional (Secondary)

Data Availability:
✓ Yes
△ Partial
✖ No

JICA Digital transformation

Data needed for Step 9: Collected Data for EBPM

Initial Assumption Only

Data Category	Data Points	Availability	Data input	Data output	Data Source	From Who
Personal Information	Sex/Gender	✓	-	●	National Digital ID	Citizen
	DoB	✓	-	●	National Digital ID	Citizen
	Address (Region Only; Deidentified)	✓	-	●	National Digital ID	Citizen
Health Information	Current Disease (Diagnosis)	△	-	●	Medical Bank	Healthcare Providers
	Medication / Prescription	△	-	●	Medical Bank	Healthcare Providers
	Allergy	△	-	●	Medical Bank	Healthcare Providers
	Vaccination	△	-	●	Medical Bank	Healthcare Providers
	Lab Tests	△	-	●	Medical Bank	Healthcare Providers
	Family History	✓	-	●	Medical Bank	Citizen
	BMI (Static)	✓				
	BMI (Static)	✓				
	BMI (Dynamic)					
	Blood Pressure (Systolic(mmHg)) (Static)	✓				
	Blood Pressure (Systolic(mmHg)) (Dynamic)					
	Blood Pressure	△	-	●	Health Bank	Healthcare Providers
	Heart Rate	△	-	●	Health Bank	Healthcare Providers
	Cholesterol = 5 mmol/L or >= 190 mg/dl (%)	△	-	●	Health Bank	Healthcare Providers
	Blood Sugar Fasting & Control Rate	△	-	●	Health Bank	Healthcare Providers
	ECG (Electrocardiogram Heart Rhythm)	△	-	●	Medical Bank	Healthcare Providers
Health Assessment	Physical Activeness Assessment	△	-	●	Health Bank	Citizen
	Alcohol Assessment	△	-	●	Health Bank	Citizen
	Cigarettes self-assessment (Tobacco)					
	Nutritional self-assessment (salt intake, vegetable intake, and Doma Pani consumption) (Nutrition Asessment) (Doma)					
	CVD Risk Level (Dynamic)	△	-	●	Health Bank	Citizen
	CVD Risk Level (Static)					
Wearable Information	Step Count / Physical Activity	△	-	●	Health Bank	Citizen
	Sleep Count	✖	-	●	Health Bank	Citizen
Genetics	DNA	✖	-	●	BioBank	Citizen
	Saliva	✖	-	●	BioBank	Citizen
	Genetics Result	✖	-	●	BioBank	Healthcare Providers

STEP 9: DATA POINTS

Legend:
● Compulsory (Primary)
○ Optional (Secondary)

Data Availability:
✓ Yes
△ Partial
✖ No

JICA Digital transformation

Data needed for Step 9: Collected Data for EBPM

Initial Assumption Only

Data Category	Data Points	Availability	Data input	Data output	Data Source	From Who
Personal Information	Sex/Gender	✓	-	●	National Digital ID	Citizen
Household Information	Dynamic Household Bank assessment (GNH-1: Health Barriers)		-	●	Health Bank (from push notice QA of Digital Health App)	Citizen
	Dynamic Household Bank assessment (GNH-2: Community Vitality)		-	●	Health Bank (from push notice QA of Digital Health App)	Citizen
	Dynamic Household Bank assessment (GNH-3: Psychological Wellbeing)		-	●	Health Bank (from push notice QA of Digital Health App)	Citizen
	Dynamic Household Bank assessment (GNH-4: Healthy Days)		-	●	Health Bank (from push notice QA of Digital Health App)	Citizen
	Dynamic Household Bank assessment (GNH-5: Health Assessment)		-	●	Health Bank (from push notice QA of Digital Health App)	Citizen
	Static Household Data ((GNH-1: Health Barriers))		-	●	Health Bank (from push notice QA of Digital Health App)	Citizen
	Static Household Data (GNH-2: Community Vitality)		-	●	Household Bank (GNH survey)	Healthcare Providers
	Static Household Data (GNH-3: Psychological Wellbeing)		-	●	Household Bank (GNH survey)	Healthcare Providers
	Static Household Data (GNH-4: Healthy Days)		-	●	Household Bank (GNH survey)	Healthcare Providers
	Static Household Data (GNH-5 Health Assessment)		-	●	Household Bank (GNH survey)	Healthcare Providers
	Housing Conditions		-	●	Original: Household bank Modify: Health Bank (Survey for Household bank)	Citizen
	Living environement		-	●	Original: Household bank Modify: Health Bank (Survey for Household bank)	Citizen
	Family Number	✓	-	●	Original: Household bank Modify: Health Bank (Survey for Household bank)	Citizen
	Distance to medical facilities		-	●	Household Bank (Living Standard Survey)	Citizen
	Household income and expenditures		-	●	Original: Household bank Modify: Health Bank (Survey for Household bank)	Citizen
	Stress level		-	●	Health Bank (from push notice QA of Digital Health App)	Citizen

STEP 9: DATA POINTS

Legend:
● Compulsory (Primary)
○ Optional (Secondary)

Data Availability:
✓ Yes
△ Partial
✖ No

Data needed for Step 9: Collected Data for EBPM

Initial Assumption Only

Data Category	Data Points	Availability	Data input	Data output	Data Source	From Who
App Information	App Registration Number	△	-	●	App	App
	Time needed to screen a patient (based on timestamp)	△	-	●	App	App
	Telemedicine access rates for residents in remote areas	△	-	●	App	App
Outcome Indicator	NCD Screeing result	△	-	●	MoH NCD Screening	Government
	Rate of change in GNH "Community Vitality"	✓	-	●	GNH Survey	Government
	Rate of juvenile deaths from NCD illness	✓	-	●	NSB	Government
	Rate of death from cardiovascular disease	✓	-	●	NSB	Government
	Disability-adjusted life year (DALYs)	✓	-	●	NSB	Government
	Data utilization for Government: Secondary research / EBPM	✖	-	●	National Data Hub	Government
	Data utilization for healthcare providers: Report Generating	✖	-	●	App	App