

PROPOSALS

I. TRAINING & EDUCATION



VR MEDICAL EDUCATION AWARENESS & EMPATHY

MAIN
USAGE

Build empathy in PT care journey

BENEFIT

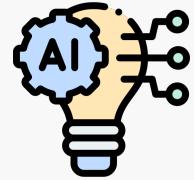
Insight dissemination
Awareness & empathy towards PT
Effective engagement format



AR CLINICAL & PT USE COMMUNICATION & UNDERSTANDING

HCP & PT communications

II. EMOTION & PSYCHO PROFILING



AI CLINICAL USE EMOTION & PSYCHOSOCIAL ANALYSIS

HCP decision making & internal
insight engines

Insight gathering & analysis
In-depth PT understanding & insights
More efficient decision-making

I.1 A walk in the patient shoes

XR MEDICAL EDUCATION
AWARENESS & EMPATHY

CREATING A SITUATIONAL VR PROGRAM TO PROMOTE
PATIENT CONDITION AWARENESS & EMPATHY IN THE
HEALTHCARE SYSTEM



Description

Interactive experiential tool for HCPs & other healthcare workers to walk in the shoes of a patient (VR) or visualise the effect of medications on internal organs & patient body. Create more disease awareness, build empathy towards the PT conditions, learn the insights on better communications with PT and tips on disease management

Target usage

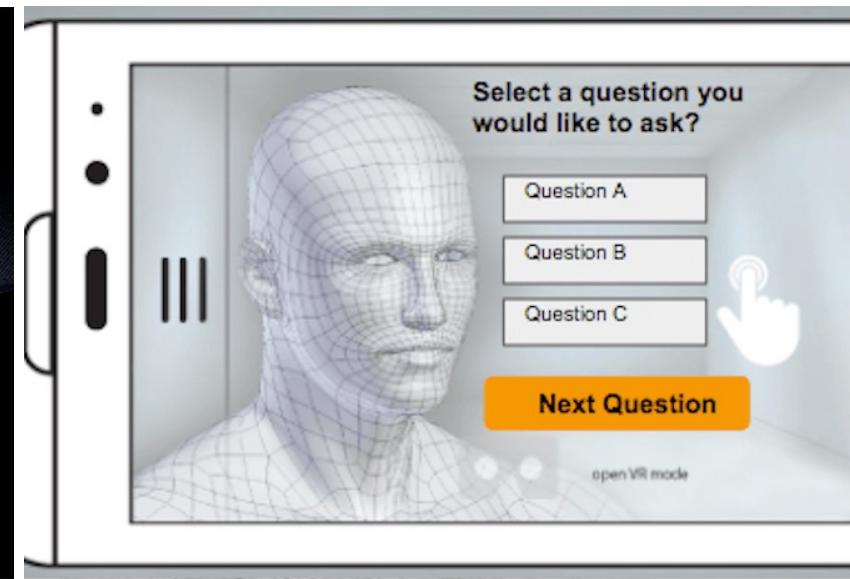
HCPs & other healthcare workers;

Potential usage

Public facing;
Structured training materials for local schools and institutions
Toolkit guide for PT & caregivers;
Pop-up campaigns & special events

I.1 USE CASES

XR MEDICAL EDUCATION
AWARENESS & EMPATHY



“Walking in the patient shoes”

Simulate what a patient experiences in different contexts, such as

- Clinic consultations
- Check-ups (e.g.: endoscopy)
- Pharmacies
- Public places (e.g.; public toilets or salons, etc)
- Simulate certain discomfort, such as dizziness (Would be great to have haptic responses)

See disease & treatment in action

Visualisation of the disease, medication & side effects on PT body, such as

- Medication/Injection dissolve and absorb into blood streams
- Internal organ decay / abnormal WBC or platelets, etc
- Highlight areas with pain & discomfort
- Simulate certain discomfort, such as dizziness
- (Would be great to have haptic responses)

Practice communications

Build in interactive modules for training & practices, such as

- Selecting different ways of making diagnose to patient
- Communication tactics for different patient motivations
- Observe virtual patient responses based on HCP inputs

I.1 EXTENDED USE CASES

XR MEDICAL EDUCATION
AWARENESS & EMPATHY



Social awareness events / campaigns

“Walking in the patient shoes” special events or campaigns, such as

- Public places (e.g.; public toilets or salons, etc)
- During awareness days

Education in institutions

Structured training & education in local institutes and schools, to build empathy for future HCPs and healthcare workers

Japan university cloud VR training (MedTech)
<https://opecloudvr.com/en/>

Patient support program

Patient can also get prepared and educated for the treatment procedures and treatment options

I.1 XR awareness & training examples

XR MEDICAL EDUCATION
AWARENESS & EMPATHY



Top

Janssen UK 2018
Nurse training program for Multiple Myeloma

^ 100% usefulness reported by nurses



Bottom

GSK US 2016
360-degree migraine awareness program
while promote Excedrin Migraine product

^ 41% increase in brand favourability;
20+% sales uplift; increased social presence



Right

Embodied labs
Immersive caregiver learning solutions to
build empathy with customers

^ Higher learning retention & faster
Greater job confidence

I.1 IMPACT – why should we do this

XR MEDICAL EDUCATION
AWARENESS & EMPATHY

KEY PLAYERS

Healthcare workers **Empathy** towards patient, enable better communication with patients while prioritising patient needs;

Effective education format;

Patients Improved quality of **care** and quality of **life**;

Social support network Better **understanding** of PT condition & knowledge on disease management

Build **rappor**t around the PT through the disease journey

Extended benefit

General public General **awareness**;
Societal **normalisation** & acceptance

MAF

Customer **engagement** opportunities for MSLs & MRs;

Gain customer insights

TA Insight dissemination

Develop prospect KOL

Social awareness & mentioning

Brand favourability & sales **uplift**

JPKK

Payors

May promote **early detection** of easily overlooked diseases (e.g.: PAH) by building the public & GP awareness – reduce HC cost

COMPETITIVENESS

M

Relatively novel in pharma; competitive with long-term strategy

Emerging 5G & opportunity-scape in JP;

Rapid growth in XR

Embrace what would be here eventually

FEASIBILITY

M

Data handling; solution development; clinical & patient adoption

SCALABILITY

M

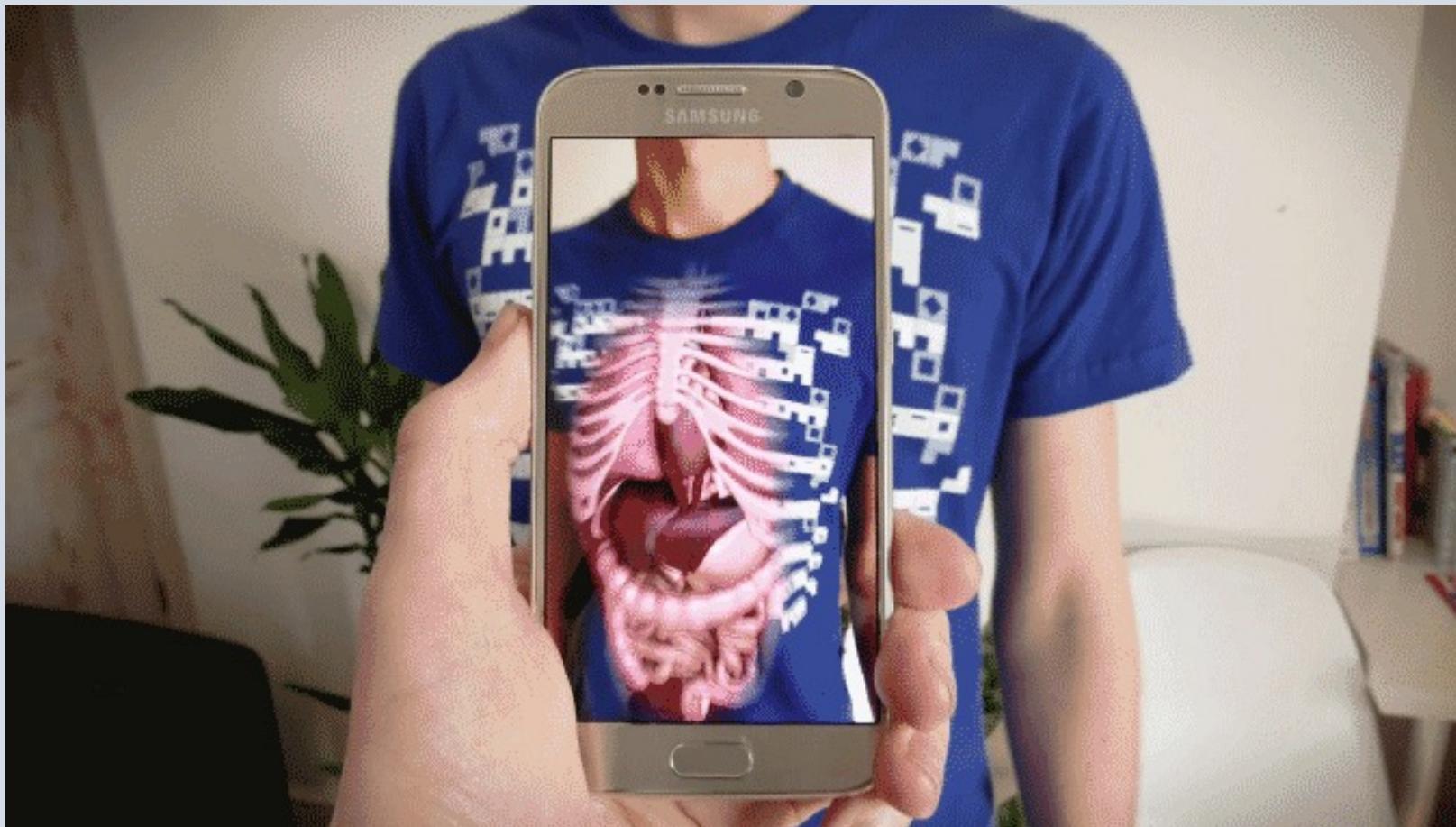
TA/Treatment specific program development



I.2 Don't tell, SHOW me instead

XR CLINICAL / PT USE
COMMUNICATION & UNDERSTANDING

CREATING AN INTERACTIVE AR TOOL TO FACILITATE PT
CONDITION REPORTING, IMPROVE ENGAGEMENT &
DISEASE MANAGEMENT



Description

Building an interactive AR application for patients to better communicate their conditions with HCPs and for HCP to better explain disease to patients;
Potential to allow symptom & condition tracking, side effect reporting, facilitate patient disease management

Target usage

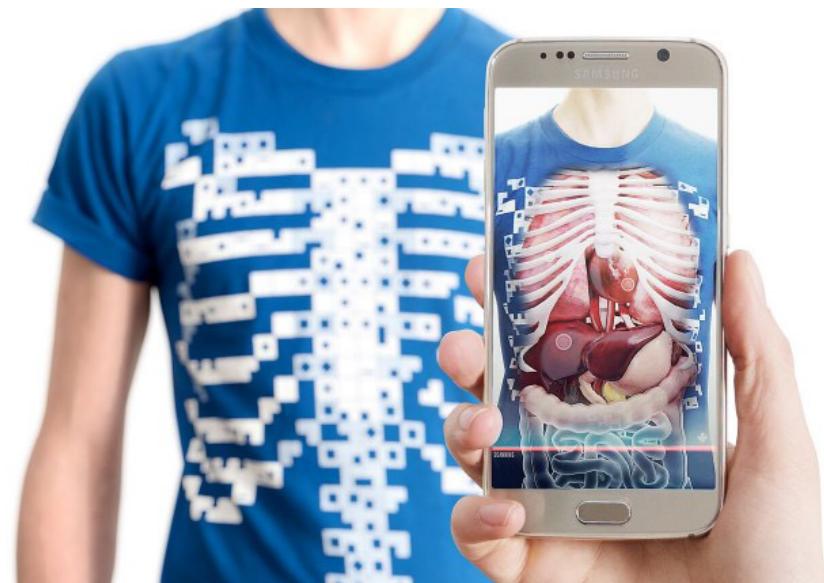
HCP & PT consultation

Potential usage

PT & caregivers disease management

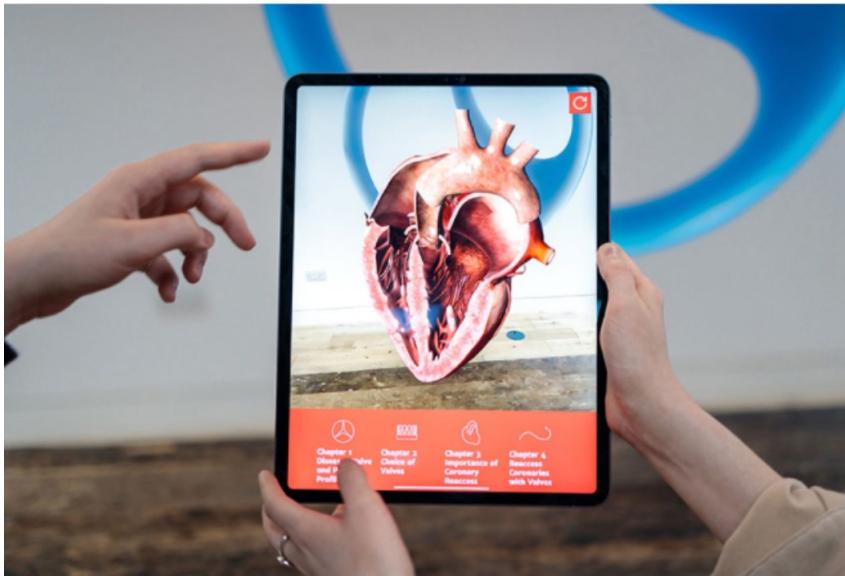
I.2 USE CASES

XR CLINICAL / PT USE
COMMUNICATION & UNDERSTANDING



Pin-point pain & discomfort

Allow patient to more accurately describe pain and discomfort during consultations



Explain disease/conditions to patient

Allow HCPs to explain the disease, conditions, treatment options to the patients more effectively



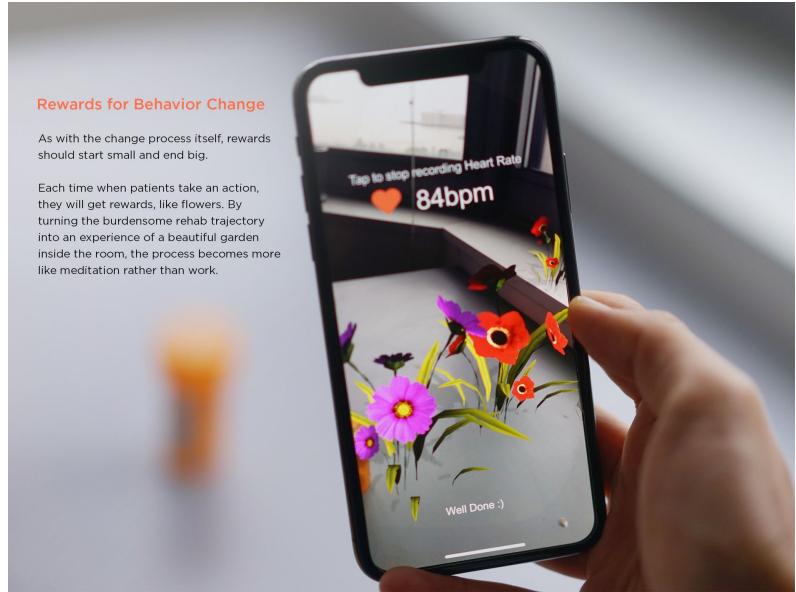
Interactive toolkit & medical instructions

An easier to follow interactive toolkit for PT & caregivers, especially

- Follow specific treatment instructions (e.g.: self-injections)
- Medication and symptom monitoring instructions
- Multiple medications sequences, etc

I.2 EXTENDED USE CASES

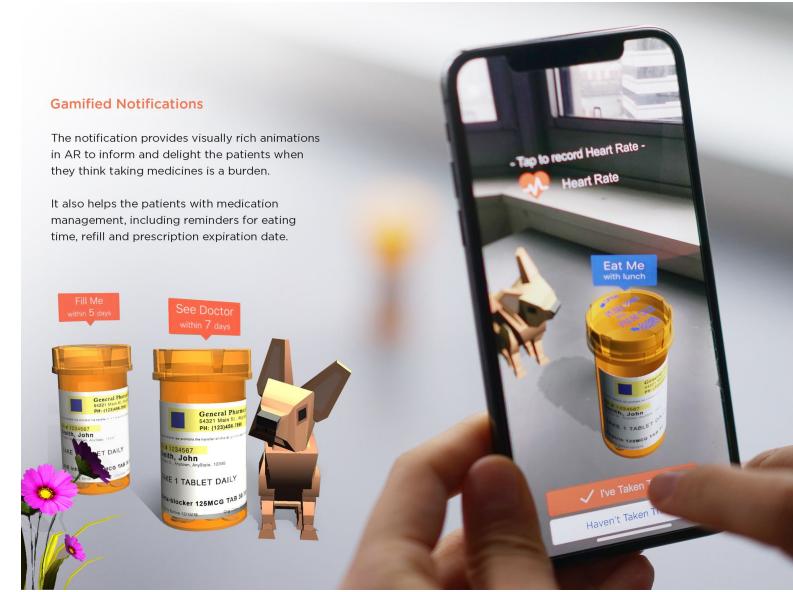
XR PT USE
COMMUNICATION & UNDERSTANDING



Rewards for Behavior Change

As with the change process itself, rewards should start small and end big.

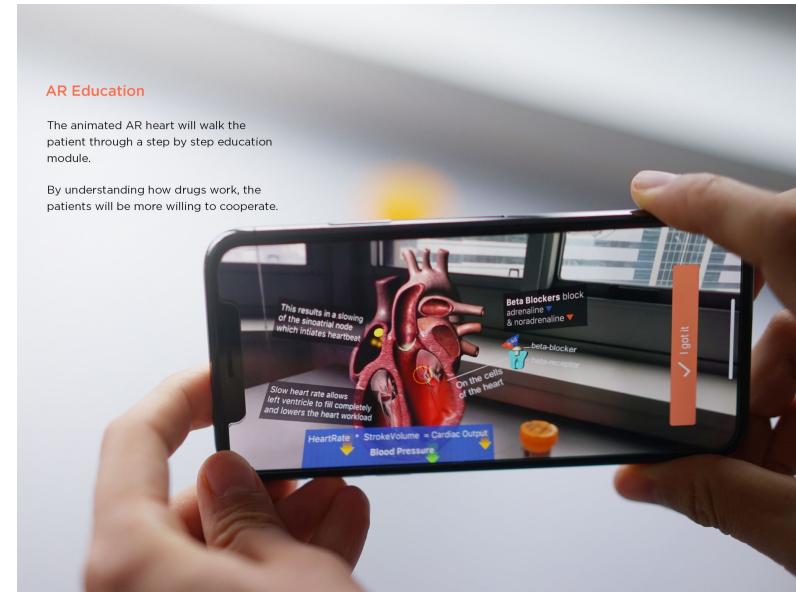
Each time when patients take an action, they will get rewards, like flowers. By turning the burdensome rehab trajectory into an experience of a beautiful garden inside the room, the process becomes more like meditation rather than work.



Gamified Notifications

The notification provides visually rich animations in AR to inform and delight the patients when they think taking medicines is a burden.

It also helps the patients with medication management, including reminders for eating time, refill and prescription expiration date.



AR Education

The animated AR heart will walk the patient through a step by step education module.

By understanding how drugs work, the patients will be more willing to cooperate.

Symptom & condition tracking

Monitor and allow patient or caregivers to record symptoms & side effects

Gamification & adherence management

Using reminders and gamification elements to enhance patient adherence

Knowledge on disease management

Educate patient with relevant disease management tips and knowledge

I.2 XR in diagnostics & demonstration

XR CLINICAL / PT USE
COMMUNICATION & UNDERSTANDING

EXAMPLES

Disease	Recent Technology	Future Scope
Breast Cancer	<p>Depending on the stage of the cancer, treatments of breast cancer are given. It might comprise of chemotherapy, radiation, hormone treatment and surgery. As these traditional methods have few side effects Virtual Reality is being adopted mainly for reducing the pain and stress the patient goes through, improving the drug design process for the treatment of breast cancer and making the screening process of breasts harmless.</p>	<p>For future scope, breast imaging tries to incorporate methods to enhance screening affectability and specification of women who has no signs of cancer with greater progress in mammographic technology. Also, uses of ultrasound in the both the screening and demonstrative setting. There might be a role in future screening of breast with a few more advancements that uses molecular imaging and CT of breasts.</p>



Top

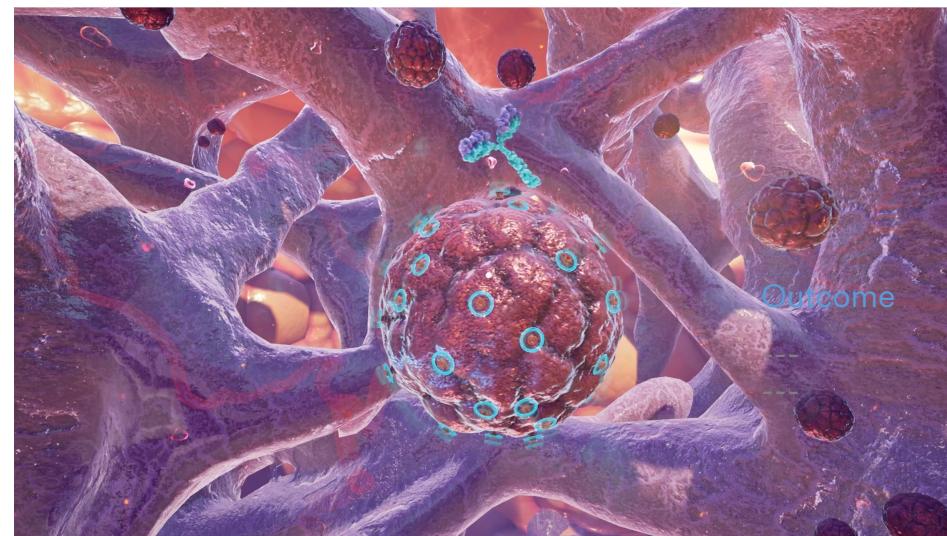
VR used in diagnostics for Breast Cancer, Colorectal Cancer & Alzheimer's

Bottom

AccuVein | AR medical tool to locate veins for starting IV

Right

Janssen Belgium | Explain the effects of a complex drug in the body



I.2 IMPACT – why should we do this

XR CLINICAL / PT USE
COMMUNICATION & DISEASE
MANAGEMENT

KEY PLAYERS

Healthcare workers	Better understanding of patient condition
	Easier decision making (diagnosis or treatment adjustment)
Patients	Easier communication with HCP
	Better PT engagement (& relationship with HCP) with interactive technologies

MAF

Customer **engagement** opportunities for MSLs & MRs;
Improved patient reported data **accuracy**
Promote **digital PT** engagement
Gain insight for further **dissemination**

Social support network

Disease progression visualisation

Better **understanding** of condition & knowledge on disease management

COMPETITIVENESS



Novel; low precedence

Emerging 5G & opportunity-scape in JP;

Rapid growth in XR

Embrace what would be here eventually

FEASIBILITY



Data handling; solution development; clinical & patient adoption

SCALABILITY



DA specific program development



I. IMPLEMENT – how can we do this



Discover

Identify opportunity areas;
Co-creation workshops;
Project proposals & high-level workplan

Define

Research & concept development;
Short & long-term strategy definition;
Service blueprint & wireframes;
Feature list & concept validation

Set a long-term plan ensure longevity and continuation of project value

Gather first-hand user & market insights

Develop

High-fidelity design, usability testing & iterations;
Agile product development;
Change management & launch plan;
Testing & evaluations

Create a holistic launch plan that covers strategy from adoption to continuous use

Deliver

Market-ready MVP product deliverables

PRODUCT JTBD

FEB

Finance & contract

APR

Resource planning & RACI;
Team capability building
(tent) Vendor/partner selection;
(tent) Acquisition strategy;
Stakeholder mapping & engagement;
Target user engagement

JUL

Success metrics development;
Internal stakeholder alignments;
Compliance, regulatory & legal;
Acquisition & partnership discussions;
Regional level alignments

DEC - JAN'23

Local market launch & next step planning

BUSINESS JTBD

High level estimation – to be discussed in more details after selecting the opportunity pathway

I. Other considerations



CONSTRAINTS

COST

Cost & complexity involved in development

CHANGE MANAGEMENT

While new solution shouldn't be implemented in silo, should have a holistic and long term plan of integrating solution into today's workflow and ensure adoption across different stakeholders

DATA

Due diligence of data privacy and data security, especially when patient data is being collected

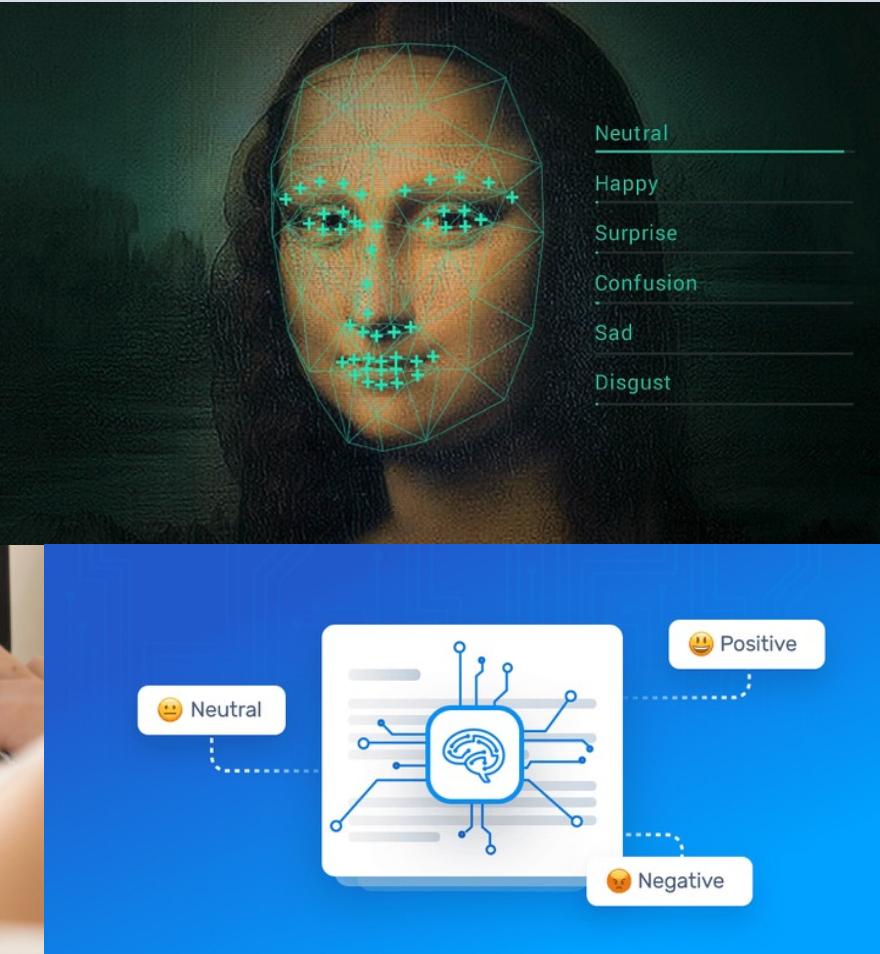
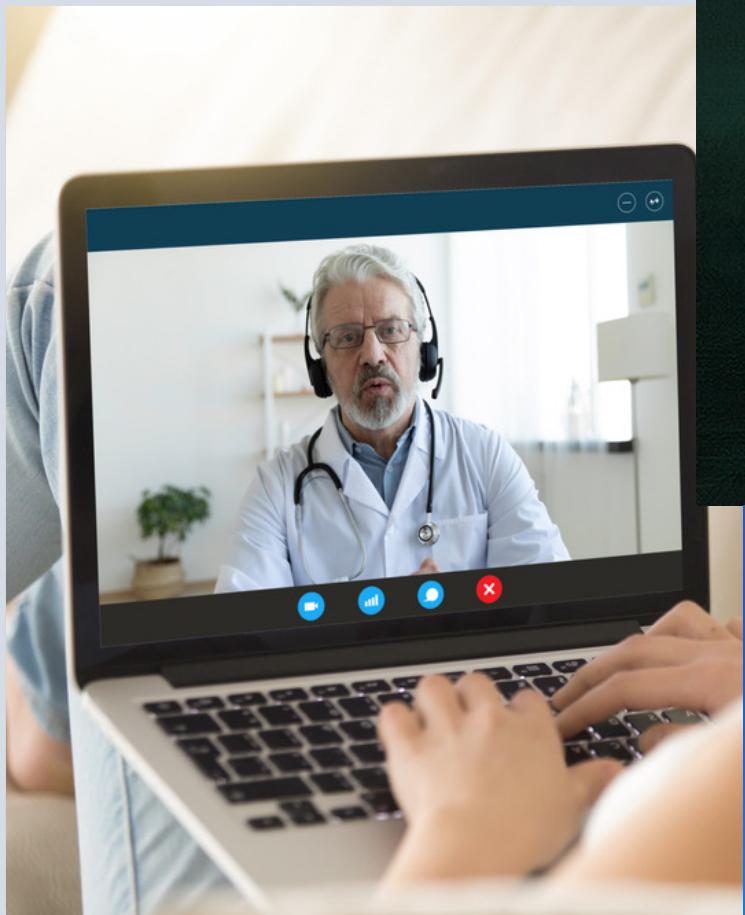
ACCESSIBILITY

While less immersive, AR can be more broadly adopted compared to VR software

II. Be confident to say, “I feel you.”

USING AI FOR PATIENT EMOTIONAL & PSYCHOSOCIAL ANALYSIS TO IMPROVE CLINICAL DECISION & COMMUNICATIONS

AI CLINICAL USE
EMOTION & PSYCHOSOCIAL ANALYSIS



Description

AI as part of decision-making process - based on PT motivation & psychosocial status to generate treatment recommendations; integrate to remote consultation PT cameras or as part of in-clinic set-up

(like how ACE is MSL to HCP)

Target user

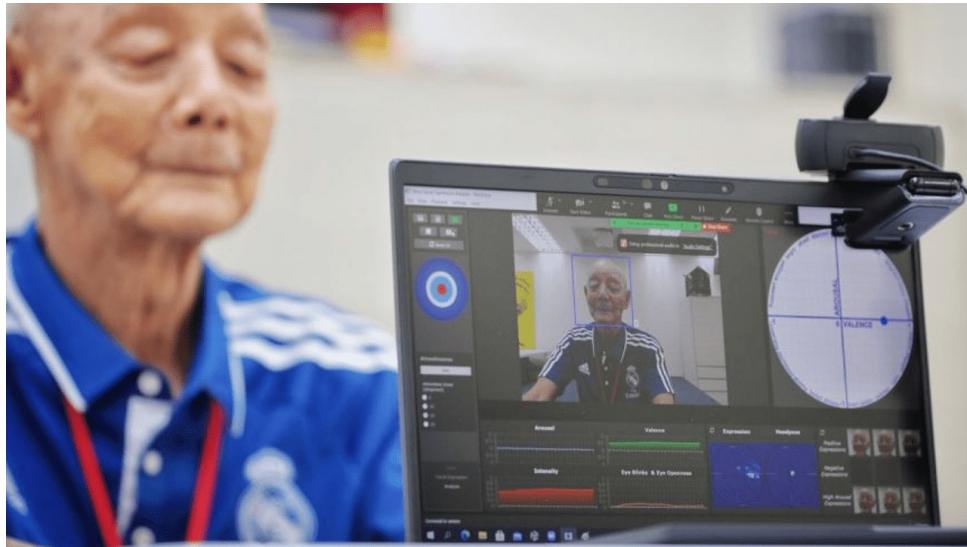
Clinical use for HCPs
Insight integration internally

Potential usage

Link to ACE Medical 2.0 & CAE, use for MSL recommendation and marketing predictions
Connect to regional PXP initiative

II. Emotional AI examples

AI CLINICAL USE
EMOTION & PSYCHOSOCIAL ANALYSIS



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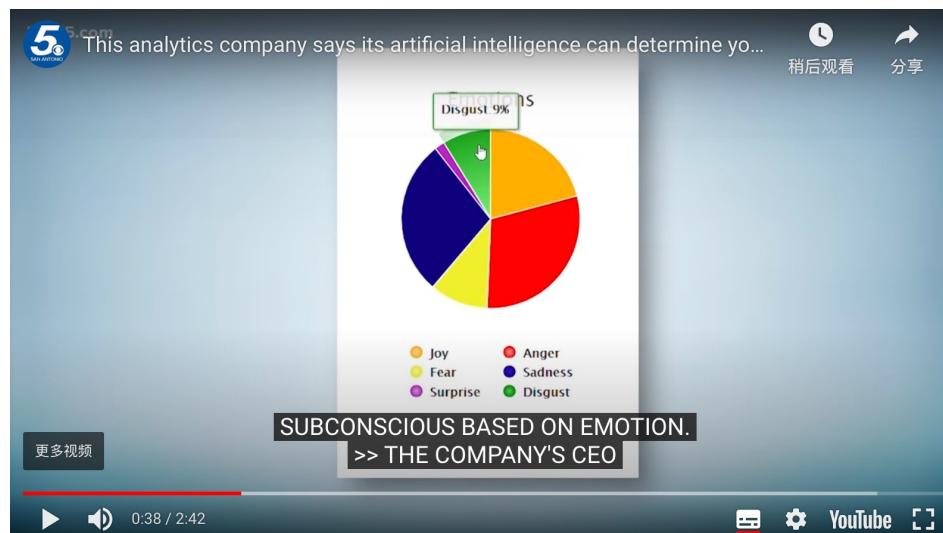
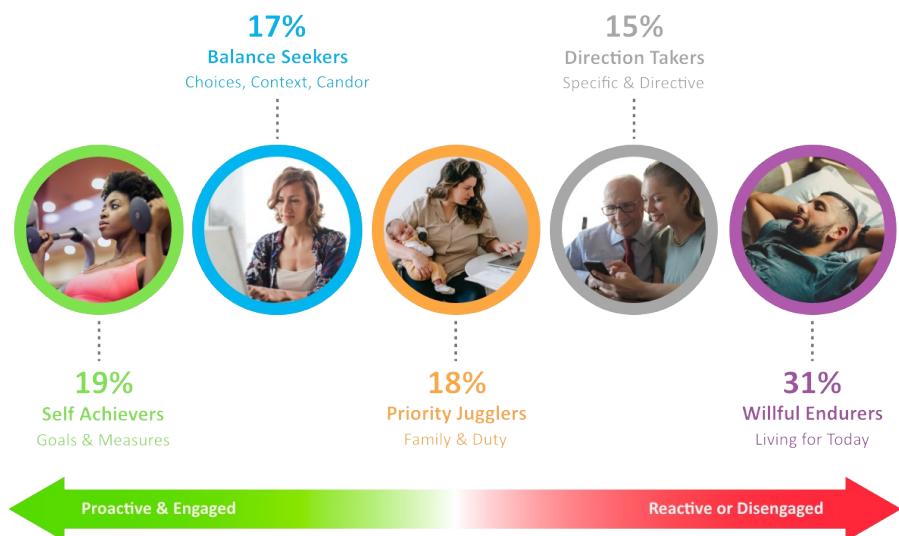
Singapore | Opsiis Emotional AI in elderly screening for mental health problems (analysis via facial expression recognition)

Bottom

PatientBond | Machine learning to target interactions based on personal motivations and channel preferences that drive patient behaviors (survey & questionnaires)

Right

Cognovi Labs | Coronavirus Panic Index to track consumer sentiments and trends about the pandemic and spread of Covid-19 (via social media sentiment analysis)



Possible info source

Facial (image) analysis

Speech analysis (NLP)

Physiological analysis
(e.g.: heartbeat,
temperature, breathing,
etc.)

Patient reported
information (e.g.: surveys)

II. IMPACT – why should we do this

AI CLINICAL USE
EMOTION & PSYCHOSOCIAL ANALYSIS

KEY PLAYERS

Healthcare workers Better understanding of patient emotions & mindset

Adopt more **suitable** communication & intervention tactics while interact with patients

Patients Easier **communication** with HCP

Better PT **engagement** (& relationship with HCP)

Better quality of care

MAF

Develop expertise in understanding how PT emotion affect engagement effectiveness;

Patient psycho-social insights;

Customer **engagement** opportunities for MSLs & MRs;

Gain insight for further **dissemination**

COMPETITIVENESS

H

Low precedence in market clinical use
However, valuable use cases need to be identified / impact need to be tested

Insight dissemination potentials

FEASIBILITY

L

Data handling & integration; accuracy consideration; usage monitoring

SCALABILITY

H

Can be TA-agnostic (Easier to scale)



II. IMPLEMENT – how can we do this



PRODUCT JTBD

BUSINESS JTBD

Discover

Identify opportunity areas;
Co-creation workshops;
Project proposals & high-level workplan

Define

Research & concept development;
Use cases definition;
Short & long-term strategy definition;
Solution options evaluation (e.g.:
feature enhancement, acquisition,
integration, etc.);
Feature list & concept validation

Define high-impact TA & use cases where
patient emotion affect behaviors

Develop

Usability evaluation & iterations;
Agile feature development;
Change management & launch plan;
Testing & evaluations;
Internal system integrations

Create a holistic launch plan that covers
strategy from adoption to continuous use

FEB

Finance & contract

APR

Resource planning & RACI;
Team capability building;
Existing platform analysis;
Vendor/partner selection;
(tent) Acquisition strategy;
Stakeholder mapping & engagement;
Local clinic engagement

JUL

Privacy & consent management;
Success metrics development;
Internal stakeholder alignments;
Compliance, regulatory & legal;
Acquisition & partnership discussions;
Regional alignments

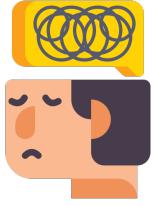
Deliver

Market-ready MVP
product deliverables

DEC - JAN'23

Local market launch
& next step planning;
Insight dissemination
planning

II. Other considerations



CONSTRAINTS

PRIVACY

If facial recognition is involved, need to acquire relevant consents from patient

DATA

Due diligence of data privacy and data security, especially when patient data is being collected

TECHNOLOGY

Reliability and accuracy of AI system is critical to the patient insight outputs

Technological bias, social and cultural context need to be considered

CHANGE MANAGEMENT

Long-term planning of integrating patient insights into the broader internal data network; early engagement of internal stakeholders

ACCESSIBILITY

Evaluate existing PT-HCP digital interaction channels on feasibility of integration

PROPOSAL COMPARISON

Overall	VR medical education 	AR clinical & PT use 	AI clinical use 
Focus on	Awareness & empathy	Communication & understanding	Emotion & psychosocial analysis
Target to	HCP & care journey	HCP & patient	HCP & internal insight engine
Feasibility	Medium	Medium	Low – Accuracy, reliability, etc.
Scalability	Medium	Low – DA specific	High – TA agnostic
Competitiveness	Medium	High – Novel	High* - use case dependent
Impact - external	Build HCP's awareness & empathy towards patient	Improve communications & understanding between HCP & PT	Enhance HCP's understanding towards patients' emotion & mindsets
	Better quality of care & quality of life for patients	PT knowledge & disease management	More relevant HCP decision making
Impact - internal	Customer engagement opportunities for MSLs & MRs	Customer engagement opportunities for MSLs & MRs;	Customer engagement opportunities for MSLs & MRs;
	Gain customer insights	Improved patient reported data accuracy	Patient psycho-social insights;
	Develop prospect KOL	Promote digital PT engagement	Gain insight for further dissemination

PROPOSAL COMPARISON

Other consideration	VR medical education	AR clinical & PT use	AI clinical use
Cost & resources	Complexity of solution development	Complexity of solution development	Partnership & internal system integration
Technology	<p>Device / technology related physical discomfort has been reported</p> <p>Usability is critical to solution design</p>	<p>While less immersive, AR technology is more broadly adopted compared to VR</p> <p>Usability is critical to solution design</p>	<p>Reliability & accuracy of AI system is critical to the solution success</p> <p>Technological bias, social & cultural context must be taken into consideration</p>
Data	May not involve privacy data	<p>If patient data is being collected, plan for consent management, data privacy & security rules & regulations, etc.</p>	<p>If patient data is being collected, plan for consent management, data privacy & security rules & regulations, etc.</p> <p>Additional considerations depending on technological implementation (e.g.: camera set up in the clinics.)</p>
Accessibility	Limited	High	Limited
Change management	<p>Develop holistic & long-term strategy which integrates and scales the solution into evolving workflow;</p> <p>Ensure adoption across stakeholders;</p> <p>Develop success criteria for close-loop evaluations</p>	<p>Develop holistic & long-term strategy which integrates and scales the solution into evolving workflow;</p> <p>Ensure adoption across stakeholders</p> <p>Develop success criteria for close-loop evaluations</p>	<p>Detailed and long-term planning of patient insight integration into internal data network;</p> <p>Early engagement & adoption plan across stakeholders</p> <p>Develop success criteria for close-loop evaluations</p>