NUS GRIP

GRADUATE RESEARCH INNOVATION PROGRAMME

RUN 5
LIFT-OFF DAY

NUS Deep Tech Start-Up Showcase

FACTSHEETS

A Flagship Innovation Programme by:

NUS
National University
of Singapore

Industry Liaison
Office

1cool
Sustainable cooling

Cool, Fresh and Healthy Air
# Total Ownership Cost - less than Air Conditioner

Problems

Conventional air-con

- Harmful refrigerants
- Heat rejection
- High power consumption
- High carbon footprint
- High operating costs

1cool Solutions

Cooler

Duct

A patented indirect evaporative cooling unit, which can filter and cool outdoor air to near the dew-point temperature without any change in its humidity ratio.
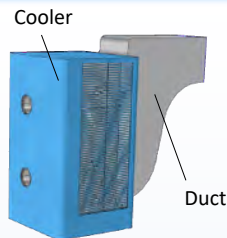
1cool dew-point cooler

- No compressor
- No CFC, HCFC, HFC
- No heat island effect

- 4 to 8 °C temperature reduction
- 100% fresh air
- No moisture added

Up to **60%** Electricity usage

Up to **60%** CO_2 emission

Competitive Advantages

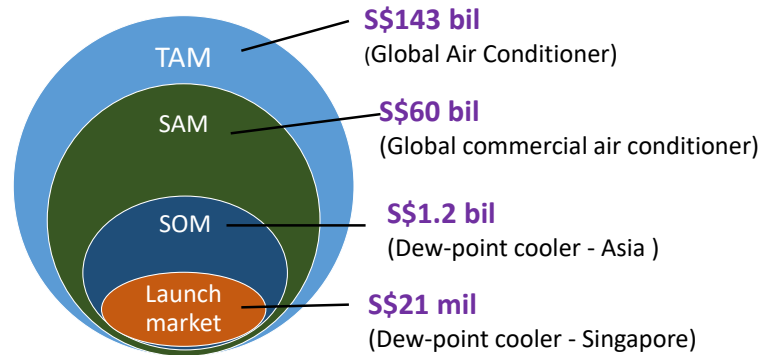|	Mist fans and direct evaporative coolers	Commercial Air-con	Our dew-point cooler
Temperature reduction	3-5 °C	4-12 °C	4-8 °C
Humidity ratio change	↑2-3 g/kg	↓2-6 g/kg	0 g/kg
Coefficient of Performance	< 1	2-3	4-8

Team Profile

Bui Duc Thuan, PhD.
Co-Founder, CTO
Senior Research Fellow, NUS
buiducthuan@u.nus.edu

Daniel Tan, MBA.
Co-Founder, CEO
tansg1cool@gmail.com

- 10 years in eco-friendly air-conditioning systems.
- 3 Patents & 5 Awards for novel air-conditioning systems.

- 3 decades experience in MNCs
- Management, BD, Marketing and Sales of industrial and consumer products and services.

Market Potential

TAM
SAM
SOM
Launch market

S$143 bil (Global Air Conditioner)

S$60 bil (Global commercial air conditioner)

S$1.2 bil (Dew-point cooler - Asia)

S$21 mil (Dew-point cooler - Singapore)

B2B Business Model

Strategy: Initially target **Commercial & Industrial** premises that are currently not air-conditioned.
In future, will launch smaller units for residential use.

1cool
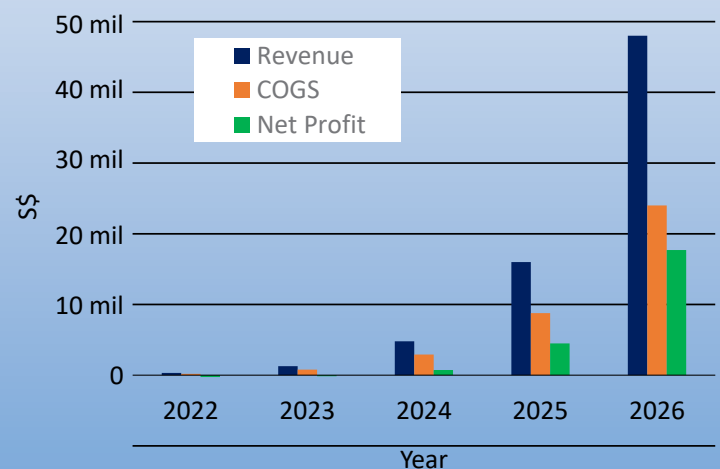IP, R&D, Design, Quality Control

Distributors

Outsource

Manufacturers

We have received Letter-of-Intent from companies interested to collaborate with us on Product Development, Manufacturing and Distribution.

Financial Projection

- Revenue
- COGS
- Net Profit

S$

2022 2023 2024 2025 2026
Year

5th Year Revenue:	**S$48 mil**
5th Year Gross Margin:	**50 %**
5th Year Net Profit:	**S$17.7 mil**
Cash Flow Positive:	**Year 3**
Net Present Value:	**S$14 mil**
Funding Gap:	**S$500,000**

Ailytics

Vision
To improve safety and productivity for any operation

We provide actionable insights to enhance construction operations

The Problem
Current methods of tracking and monitoring safety and productivity in the construction industry are **tedious**, **costly** and **prone to human errors.** Globally, **SGD$4T** is lost annually due to safety related incidents and productivity inefficiencies.

Our Solution
Our advanced computer vision system, **Ailyssa™**, can tap into any video feed to detect **complex safety hazards** and **productivity scenarios** to produce alerts and charts that enables users to make **better informed decisions.**
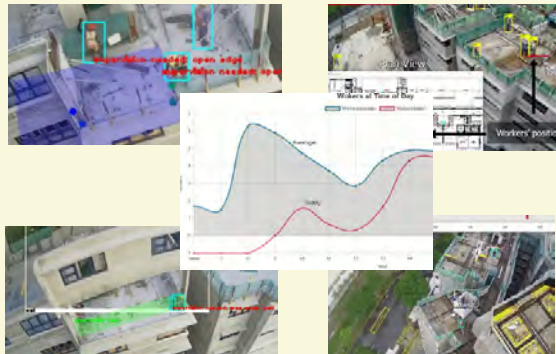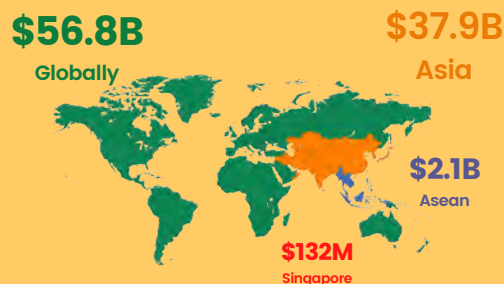
24/7 Monitoring

50% Reduction of manual inspections

~25% Increase in productivity

Market Potential
All figures are in SGD

$56.8B Globally

$37.9B Asia

$2.1B Asean

$132M Singapore

Revenue Models

Direct Sales
(Modular Subscription)

Partner Integration
(Liscencing + Man Days)

Competitive Advantages
- AI Algorithm to depict a 3D scene from a 2D video feed/image with just 1 CCTV which enables us to detect complex scenarios and have better efficiency over existing methods at a fraction of the cost.
- 1st company in Singapore to partner with HDB-ASIG on using computer vision to improve safety and productivity for construction.
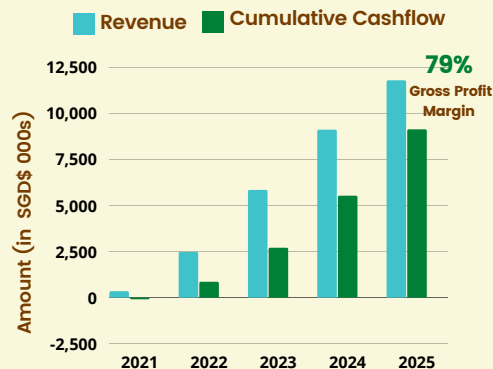- 2 Years' worth of R&D, Construction Data sets, Product feedback.
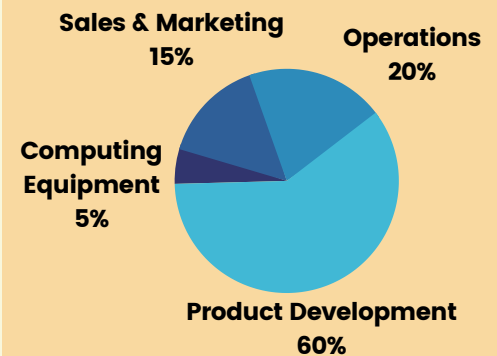
Traction

4 Testbeds

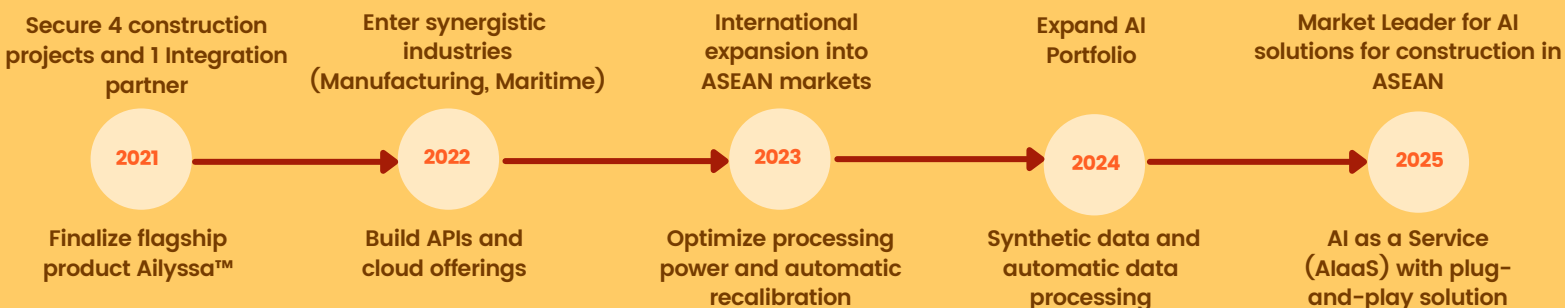**4** Strategic LOI/MOU

7 Requests for Quotations

Financial Projections
- Revenue
- Cumulative Cashflow

Amount (in SGD$ 000s): -2,500 to 12,500

Years: 2021, 2022, 2023, 2024, 2025

79% Gross Profit Margin

Funding Utilization
- Sales & Marketing **15%**
- Operations **20%**
- Computing Equipment **5%**
- Product Development **60%**

Timelines & Milestones

2021
- Secure 4 construction projects and 1 Integration partner
- Finalize flagship product Ailyssa™

2022
- Enter synergistic industries (Manufacturing, Maritime)
- Build APIs and cloud offerings

2023
- International expansion into ASEAN markets
- Optimize processing power and automatic recalibration

2024
- Expand AI Portfolio
- Synthetic data and automatic data processing

2025
- Market Leader for AI solutions for construction in ASEAN
- AI as a Service (AIaaS) with plug-and-play solution

Team

Wei Zhuang Tan
Co-Founder
Business Lead
MBA, BSc
Product and project management for optimization software

Eugene Chian Yan Tao
Co-Founder
Technology Lead
MSc(AI), MArch, BArch
Architect trained in AI, Lead data scientist and inventor of technology

Leong Siew Why
Advisor
Startup Coach. Extensive construction domain knowledge and network

Dr Goh Yang Miang
Advisor
Director of department of building, safety and resilience research unit in NUS

Amir Nivy
Venture Manager
Founder, Senior manager and mentor to many starups

Evidence-based therapeutic supplement for enhancing gut health

Akesis Biologics

Problem

Gut health deteriorates as one aged:

Inflamed Gut

Colorectal cancer (CRC)

- Healthy gut can prevent gut diseases or cancer
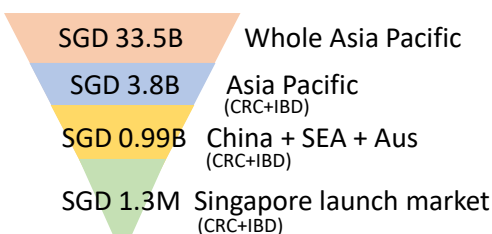- Healthy gut can prevent progression or relapse of cancer

Our Solution: MastGut

Be the Master of a healthy gut

MastGut

Daily dose of wellness

- Non-prescription
- Safe oral health supplement
- Direct delivery to gut through capsules
- Contains DUSP10 protein that is scientifically proven to reduce gut inflammation and tumour development*
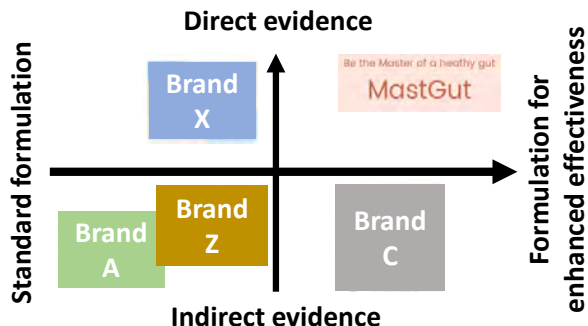
*tested experimentally in mouse models

Market Potential

SGD 33.5B — Whole Asia Pacific

SGD 3.8B — Asia Pacific (CRC+IBD)

SGD 0.99B — China + SEA + Aus (CRC+IBD)

SGD 1.3M — Singapore launch market (CRC+IBD)

Aus = Australia, SEA = South East Asia
CRC = colorectal cancer, IBD = inflammatory bowel diseases

Competitive Advantage

Direct evidence

Brand X

MastGut — Be the Master of a healthy gut

Brand A

Brand Z

Brand C

Standard formulation | **Formulation for enhanced effectiveness**

Indirect evidence
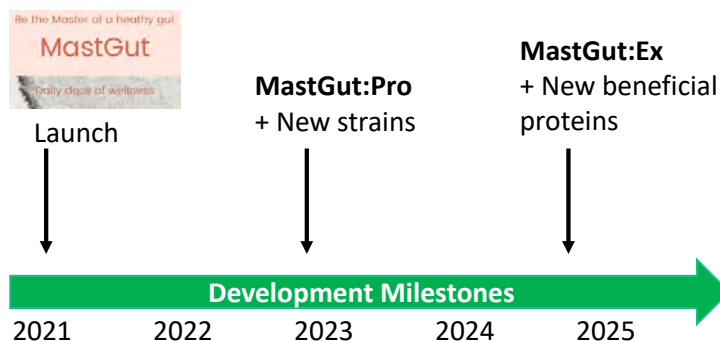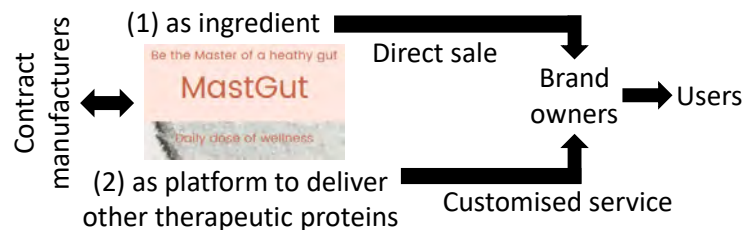
Intellectual Property

- PCT published Sept 2020 PCT/SG2020/050095
- Title: Recombinant Bacteria & Uses Thereof
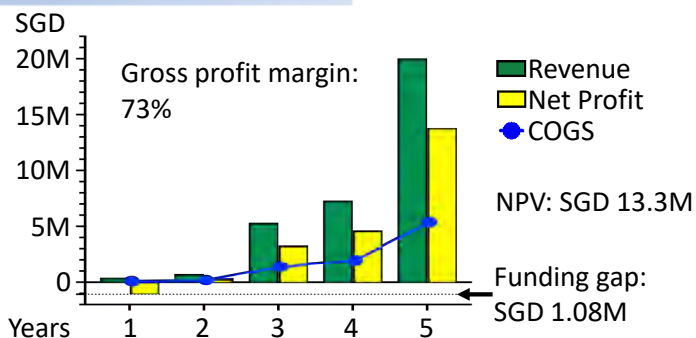- Cited reference for claims: Oncogene 2016. 35:206-217

Milestones

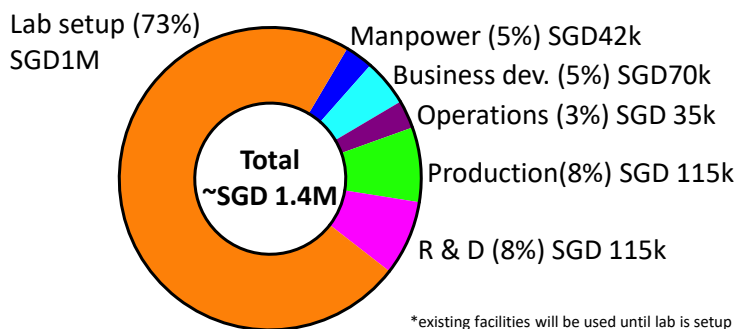Be the Master of a healthy gut

MastGut

Daily dose of wellness

Launch

MastGut:Pro + New strains

MastGut:Ex + New beneficial proteins

Development Milestones

2021   2022   2023   2024   2025

Business model

B-to-B *via* direct sale of MastGut as ingredient or as customised service to add other proteins from brand owners into MastGut

Contract manufacturers

(1) as ingredient → Direct sale → Brand owners → Users

MastGut — Be the Master of a healthy gut — Daily dose of wellness

(2) as platform to deliver other therapeutic proteins → Customised service

Financing

SGD

20M
15M
10M
5M
0

Gross profit margin: 73%

■ Revenue
■ Net Profit
◆ COGS

NPV: SGD 13.3M

Funding gap: SGD 1.08M

Years   1   2   3   4   5

Funding Usage

Lab setup (73%) SGD1M

Manpower (5%) SGD42k

Business dev. (5%) SGD70k

Operations (3%) SGD 35k

Production(8%) SGD 115k

R & D (8%) SGD 115k

Total ~SGD 1.4M

*existing facilities will be used until lab is setup

Mr Chan Sze Chun Leo
Business Lead
PhD Candidate
NUS YLL School of Medicine

Dr Png Chin Wen
Technology Lead
Senior Research Fellow
NUS YLL School of Medicine

A/Prof Zhang Yongliang
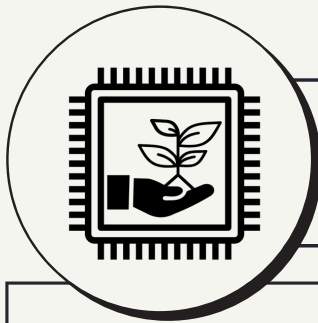Scientific Advisor
NUS YLL School of Medicine

Mr Barnabas Chan
Business Development Advisor
Managing Director
BOUNTIFOOD PTE. LTD

Contact us:
akesisbiologics@gmail.com

NUSGRIP

Ambient Systems
AI Solutions for Smart Buildings

Problem & Solution

Growing interest in adoption of AI for the built environment.

Ambient Overcomes the adoption dilemma through:

1. Value-driven applications
2. Increased operational efficiency
3. Building technology modernization

Market

- Planned launch market are Indoor Farms in Singapore
- Empower farmers to optimize crop performance through customized insights across key parameters
- Identify opportunities for additional savings through enhanced productivity

Funding

Scaling Pilot 20%

Building Solution 40%

Hiring Engineers 40%

Global building automation system market size is estimated to be USD273B while AI for buildings segment is predicted to grow at 28% CAGR.

Technology at a Glance

Sense

Seamless integration of sensors, smart meters, smart devices, and assets.

Optimize

Building information modelling (BIM) with operational twin combining digital model of building design and live automation data.

Control

Shift from diagnostic and descriptive manual controls to predictive and automated ones.

Team

Tenghan Ang

3 years experience across e-commerce, gaming and payments
Finance, SMU

Ivan Damnjanović

5 years experience in cleantech and deep tech
Computer Science, NUS
Civil Engineering, U of T

Patient Bed Task Management

Designed for doctors and nurses for completing daily clinical tasks efficiently

DolphinLink

VISION

Pursue of Optimal Healthcare Ecosystem

MISSION

Better Communication, Better Care.

PROBLEM

1. Hospital Bed Shortage
2. Doctor and Nurse Overload

OPPORTUNITY

To improve **Operation Efficiency** between doctors and nurses for Task Communication, Collaboration and Completion

70% doctors **Professional Burnout**

SOLUTION

"SLACK" for hospitals

- Mobile App for doctors & nurses
- Task Communication, Collaboration and Completion (3C)
- Supported by Knowledge Graph

INTELLECTUAL PROPERTY

3C Task Protocol

MARKET POTENTIAL

$22.0Bn
Total addressable market

$9.4bn
Available market

$1.0bn
Obtainable market

PRODUCT

Simple to Communicate Tasks | Discipline to Complete Tasks | Efficient to Collaborate Tasks | Escalate to Mitigate Tasks

REVENUE MODEL

- Sell by Department
- Pay by Subscription
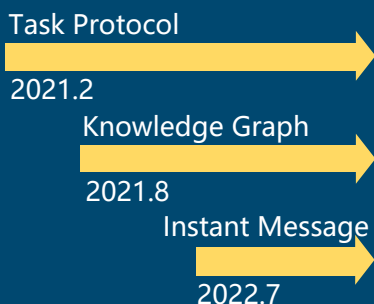- Value-based Pricing
- Charge by #Beds
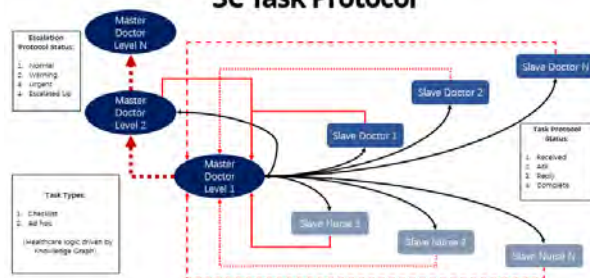
DIFFERENTIATIONS

- Healthcare Specific
- Patient Bed-based High Collaboration
- Standalone Deployment by Department
- Web Dashboard for Value Delivery

PRODUCT ROADMAP

Task Protocol
2021.2

Knowledge Graph
2021.8

Instant Message
2022.7

PLATFORM

Doctor & Nurse: Better Communication
Hospital: Operation Efficiency
Drug Company: Education Channel
Patient: Better Care
Caregiver: Transparency
Professional Community: Connection

PARTNER STRATEGY

- Channel Partners: co-sell with Hospital IT vendors.
- Tech Partners: Instant Message co-development & NLP in-licensing.

TEAM PROFILE

Jinglin Han
CEO

Daniel Zhou
CFO

David Sun
CTO

Bingqing Zhu
Dev Lead

ADVISORS

Dr. Zhang Yongjin
Orthopaedic Surgeon

Dr. James Ong
SW & AI Expert

HISEPOR

New membrane technology for highly efficient biofluid separation

Our mission is to provide individualized, convenient and cost-effective access to health monitoring and screening for the masses.

1.5 billion blood draws are performed globally per year

10% CAGR growth is projected for the microvolume sampling and POC diagnostic market

Every drop of blood contains **55%** of plasma

80% of health screening tests are performed using only the plasma component of blood

Current process of blood collection

Problem

- Time consuming — Involve travelling, registering, queuing and blood drawing ❌
- Labor-intensive — Require trained personnel ❌
- High logistic cost — Need cold chain and return in 24 hours ❌
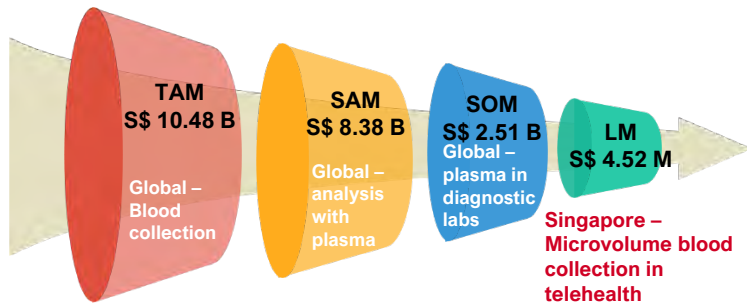- ❌ Difficulty in small volume plasma extraction
- ❌ Potential inaccurate results — Low integrity of plasma
- ❌ Limited range of tests

Health screening can also be performed with just few drops of blood!

Market size

- **TAM S$ 10.48 B** — Global – Blood collection
- **SAM S$ 8.38 B** — Global – analysis with plasma
- **SOM S$ 2.51 B** — Global – plasma in diagnostic labs
- **LM S$ 4.52 M** — Singapore – Microvolume blood collection in telehealth
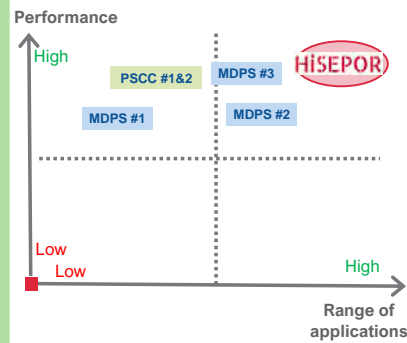
Our unique technology

A high-performance plasma separation membrane

- **Increased accuracy** — Near 100% elimination of RBC resulting in plasma with high integrity
- **High plasma yield** — Ability to generate up to **3x** plasma enabling a wider range of tests
- **Highly customizable** — Easily adaptable into various point-of-care diagnostic tests

Our main product - DPS card

Performance (High / Low) vs Range of applications (Low / High)

- PSCC #1&2
- MDPS #3
- MDPS #1
- MDPS #2
- HISEPOR

MDPS: membrane based DPS card
PSCC: paper-based serum collection card

Products

- **Dried plasma spot separation kit (DPS kit)** — HISEPOR
- **Dried plasma spot card (DPS card)** — HISEPOR
- **Plasma separation membrane**

Targeted customer segment

Telehealth
Offering chronic disease monitoring
Conducting general screening
Providing customized testing panels
Launch market

- Reduced logistic/operational costs
- Increased customer base
- Customized & pre-packed kits for different diseases

Research laboratories
Developing rapid testing kits
Performing drug discovery & development
Working on molecular researches

- More accurate results (reduced errors in research analysis)
- Wider range of conductible tests

Financial projection

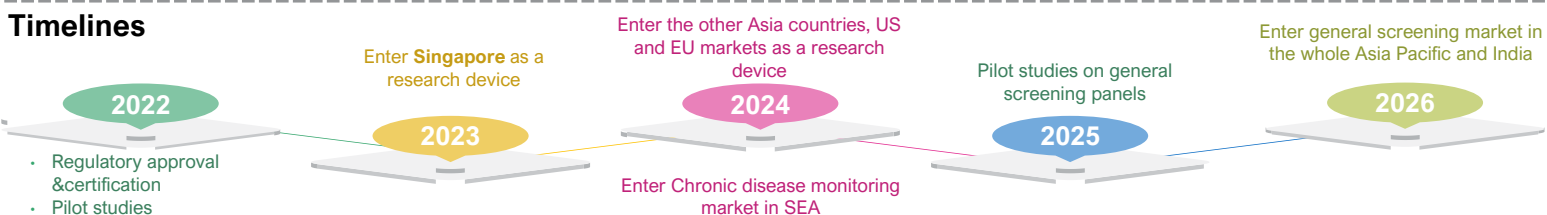Revenue / Cumulated cashflow / COGS+Expense — S$ (Million) vs Year (2022, 2023, 2024, 2025, 2026)
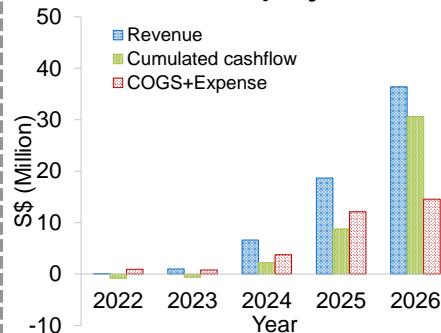
In 2026, we will have
Revenue — S$ 36 million
Gross profit margin percentage — 67 %

Fund utilization

- 43 % Equipment
- 12 % Manpower
- 2 % Comsumable and chemicals
- 21 % Pilot study
- 22 % Other operating cost
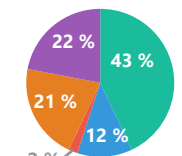
Investment required = S$ 850 k

Timelines

- **2022** — Regulatory approval & certification; Pilot studies
- **2023** — Enter **Singapore** as a research device
- **2024** — Enter the other Asia countries, US and EU markets as a research device; Enter Chronic disease monitoring market in SEA
- **2025** — Pilot studies on general screening panels
- **2026** — Enter general screening market in the whole Asia Pacific and India

Team

Gao Jie, Dr (Technical)
Membrane technology & biodevice

Senthil Kumar Kirthika, PhD candidate (Business)
Stretchable sensors, Medical devices, entrepreneur

Lim Sheng Yang, MBBS (Clinical)
Medical doctor, Entrepreneur

Advisors

Prof. **Neal Chung** (Scientific Advisor)
Ms. **Pooja Kinra Bishnoi** (Commercial Champion)
Dr. **Mayank Gurnani** (Venture Manager)
Ms. **Yong Yoke Ping** (Technology Manager)

Contact us:
chegaoj@nus.edu.sg
contact@hisepor.com

lalia

Learning From Bits
Redefining English education by augmenting teachers with AI-enabled tools and activities that better engage students, creating an adaptive learning environment for English as a Foreign Language (EFL) mastery.

Contact Us
grip.lalia@gmail.com

Problem

Low English Proficiency among local teachers
↳ B1 Common European Framework of References for Languages (CEFR)

No Personalized Learning
↳ Large Class Size
1 teacher : 30-40 students

Low contact time with native English teachers
↳ Less than two hours each week

Market Size

TAM: USD 15B
↳ Global digital English learning market

SAM: USD 1.9B
↳ Japan's elementary, Junior High and High schools

SOM: USD 1.52B
↳ Japan's urban elementary, Junior high and high schools

LM: USD 3M
↳ Aomori City

Solution
| Browser-based English learning platform with AI-enabled activities for students and analytics for teachers.

Student's Interface

Write a sentence with the following word.

Temperature | noun
a measurement that indicates how hot or cold something is

Answer
water of temperature is 100 degrees

SUBMIT

The temperature of the water is 100 degrees
- Missing definite article "the" for the noun "temperature"
- Missing definite article "the" for the noun "water"
- Incorrect sentence structure "water of temperature"

Pronounce the following word

Light | L·igh·t | Noun
the form of energy that makes it possible for the eye to see.

00:02

L·igh·t

Teacher's Interface

Total Students	Students' Accuracy	Average Time Spent
152	72.4% on average	0.8 hours per day
	View individual statistics	View individual statistics

Worst Module (Monthly)
Grammar Module 6
36.7% accuracy on average
82% of students struggle with verb tense

Least Completed Module (Monthly)
Pronunciation Module 2
42.1% completion rate
Due in 6 days' time
Remind students

Manage/Edit Assignments

+ Create New Module

Student Performance (question type)
Pronunciation | Vocabulary | Grammar

Students Underperforming (% per class)
Pronunciation | Vocabulary | Grammar

AI-generated English Feedback (IP)
Assisting teachers and students with personalized AI-generated real-time feedback, increasing learning efficiency and shortening feedback loop.

Pronunciation Visualizer
Train pronunciation of EFL students with Lalia's phoneme recognition technology with visualizations for better comprehension of accurate pronunciation.

Dashboard
Monitor students' progress and performance at a glance and be notified of students that require more attention. Highlight commonly made mistakes to help teachers better-tailor future lessons.

Business Model

Free	Education	Add-Ons
-	USD$50,000/year*	Contact Us
• Basic Sentence Correction	• Advanced Sentence Construction	• In-class Collaboration Activities
• Single Word Pronunciation	• Advanced Pronunciation Exercises	• Help Desk
• Personal Statistics	• Listening and Vocabulary Exercises	• Endorsed Curriculums
	• Dashboard & Class Statistics	• Video Communication with Tutor
		• Video Communication with

* Based on average school size of 330 students

Funding Gap: 466k

Licenses	6.9%
Miscellaneous	9.6%
Production Expense	12.6%
Business Development	22.5%
Research & Development	48.4%

Timeline

Breakeven

Lift-Off	Beta	Product	Add-on	Partner	Upgrade
2021	2022	2023	2024	2025	

2021
- Filed patents
- 2 LOIs
- MVP

2022
- Free users (B2B & B2C)
- Feedback and reiteration

Product
- Stable platform
- Lalia Super Sensei & Training programme

Add-on
- Help desk
- In-class collaboration activity

Partner
- Curriculum Providers
- Video Communication

Upgrade
- Video Communication with Real-time correction

Phang Wei Jun, CEO
Founded a startup, sold products & services to NUS, SMU and SIT
3 years of experience in sales and business development

Daichi Shoji, CRO
13 years of experience in sales
Founder of an English language learning platform

Francis Lee, CTO
5 years of software development experience
AR/VR researcher at Keio-NUS CUTE center
Multi-time hackathon winner

MALL NAUTICS

## WE OFFER SHOPPER ANALYTICS TO PHYSICAL RETAILERS

Our vision is to provide digital connection between physical retailers and shoppers. Our mission is to build innovative solutions to help shopping malls increase shopper traction and retention. To begin with, we have identified unique solutions to enable malls to influence shoppers' buying journey.

TECHNOLOGY & IP

Transformers Based Customer Analytics Using Shopper Specific Profiling

NUS ILO REF: 2021-120-01

MARKET POTENTIAL

TAM — S$ 80 B

SOM — S$ 14B

LM — S$ 156M

REVENUE MODEL

- Annual Subscription
- Ad placement charges
- Shoppers insight reports

ACHIEVEMENTS

- Functional MVP
- LOIs from launch customers
- Forged partnerships

PARTNERS

Navigine

Stratosfy

MILESTONES

2021 MVP	2023 New Tech	2025 New Markets
2022 Beta Version	2024 Final Product	2026 New Segments

PROBLEM

Malls lack a mechanism to tap shoppers' data. Lack of insights leads to sub-optimal strategies, reduced average spent and poor shopper engagement.
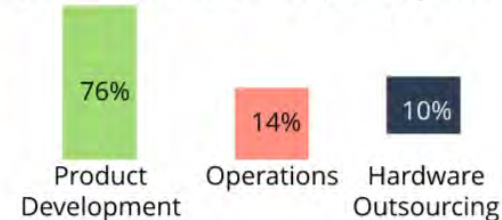
SOLUTION

Mall Nautics is an AI-based platform that allows malls to track their footfalls using its indoor positioning system captured through the mobile app. The platform allows malls to develop a tirade of metrics through the captured data and enables them to predict future footfall, establish one-to-one connection with shoppers and provide retailers with a solution similar to e-commerce marketplace – to list their prevailing offers to the in-mall crowd. The information will be communicated via a mobile-ready platform giving shopper a convenient way to explore a shopping mall while the app recommends the path & products as the shoppers navigate the mall.
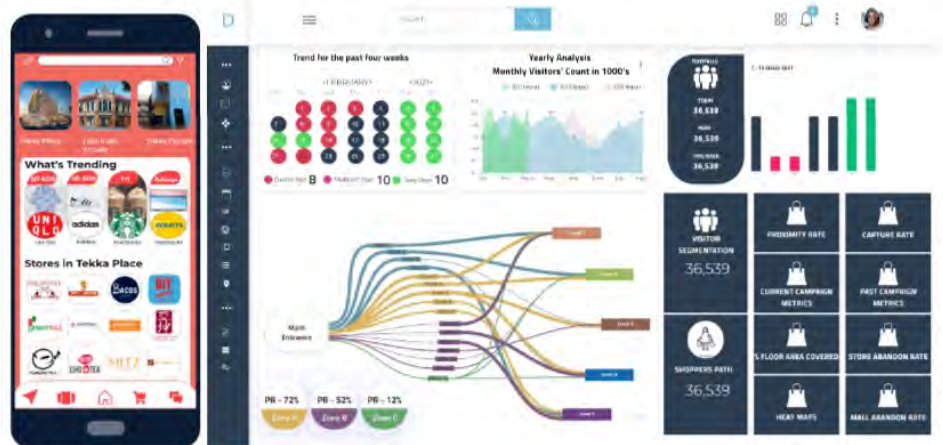
COMPETITIVE ADVANTAGE

- AI backed analytics platform
- Makes use of customer insights to create personalized shopping experience
- Tracks & influences every shopper's journey

FUNDING GAP - S$ 650,000

- 76% Product Development
- 14% Operations
- 10% Hardware Outsourcing

TEAM PROFILE

Sriman
Founder & CEO
14 years professional exp
Consulting & sales
NUS National University of Singapore

Tarun
Founder & CTO
3 years professional exp
Trained AI/ML specialist
NUS National University of Singapore

NEU BATTERY MATERIALS

Clean, Profitable, Commercial Lithium Battery Recycling

NEU Battery Materials aims to be the **world leader in lithium battery recycling**. With the cleanest battery recycling technology with **zero secondary pollution**, NEU aims to be the **largest lithium (Li) and raw material producer** without owning a single mine.

Problem Statement & Solutions

Problem
- Global electrification will lead to a surge in demand for Li batteries
- Not all Li batteries can be recycled profitably; specifically, Lithium Iron Phosphate (LFP)
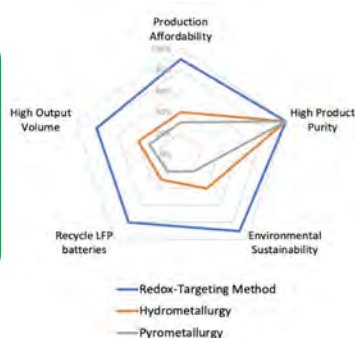- High environmental pollution for Li recycling
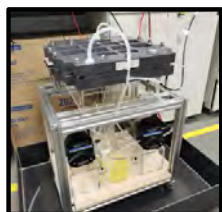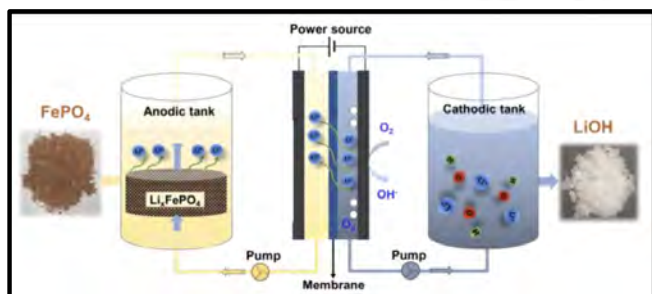
Solution
- **Electrochemical** Technique
- **Near-zero** pollution
- **Regenerative** electrolytes

Competitive Advantage

- **No** secondary pollution
- **90%** reduction in operating costs
- **Double** the volume output of current methods
- **99.9%** purity of battery grade lithium hydroxide

Radar chart axes: Production Affordability, High Product Purity, Environmental Sustainability, Recycle LFP batteries, High Output Volume
- Redox-Targeting Method
- Hydrometallurgy
- Pyrometallurgy

Intellectual Property

Redox targeting method for lithium battery recycling
PCT Application No.: PCT/SG2019/050523

Achievements
- S$200k funding to upscale technology
- Attained 2 pilot site offers; in Singapore and overseas from reputable companies
- Obtained 6 LOIs from potential customers and partners

Potential LIB Recycling Market

LM: $31M   SAM: $52B   Total Market
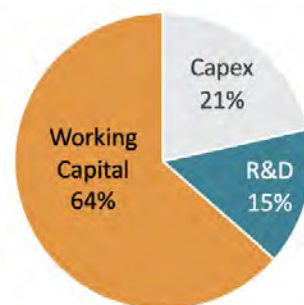SOM: $12.5B

$127B

Revenue Model

Sale of Lithium and battery raw material to battery manufacturers

Funding & Financing

Funding Stage:
Seed Stage
Raised Till date:
S$0.2 million
Funding Target:
S$ 1.1 million
Closing Date:
Dec 2021

Pie chart:
- Working Capital 64%
- Capex 21%
- R&D 15%

Timeline & Milestones

Year 1
Tech Dev
- Achieve 150T/yr LFP output
- Proof-of-Value test
Biz Dev
- Seed funding

Year 2
Tech Dev
- Achieve 1,600T/yr LFP output
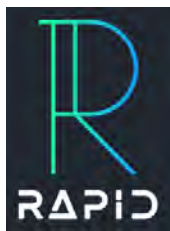- Primary commercial test
Biz Dev
- Series A funding

Year 3
Tech Dev
- Achieve 4,100T/yr LFP output
- Achieve NMC recycling
Biz Dev
- Series B funding

Year 4
Tech Dev
- Achieve 8,300T/yr LFP output
- Upscale NMC recycling
Biz Dev
- Series C funding

Team Profile

Alexander Tan
CEO & Business
MBA (Quantic), B.Eng (Mech Eng) NUS
Experience in scale-up operations, System Eng

Kenneth Palmer
CTO
B.Eng (Mech Eng) NUS
Experience in manufacturing and product development

Bryan Oh
CFO
BBa (Fin. & Mgmt.) NUS
Management consultant and Startup experiences

Advisors

A/P Wang Qing
Leading battery technology expert, 100+ publications on battery tech

Raphael Ji
Commercial Champion
Ex-CEO FAW International

Powered By NUS GRIP
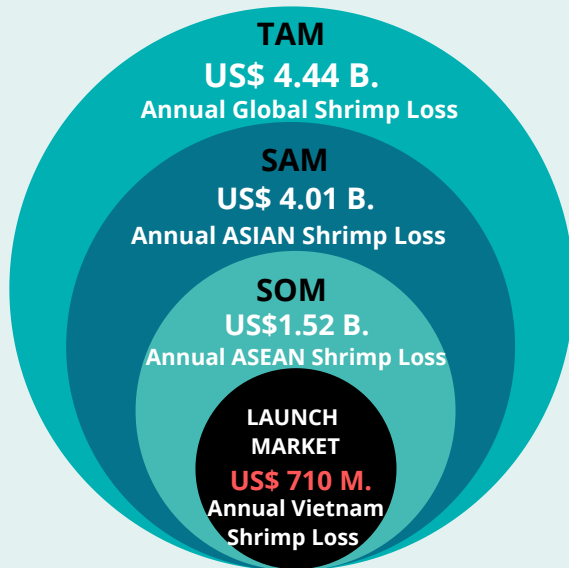GRADUATE RESEARCH INNOVATION PROGRAMME

RAPID
(Really Accurate Prawn Infection Detection)

RAPID aims to help rural farmers increase productivity by bringing easy-to-use lab-grade diagnostics to the farm-side

THE SOLUTION:
WE BRING THE LAB TO THE FARM

RAPID'S MARKET OPPORTUNITY

TAM
US$ 4.44 B.
Annual Global Shrimp Loss

SAM
US$ 4.01 B.
Annual ASIAN Shrimp Loss

SOM
US$1.52 B.
Annual ASEAN Shrimp Loss

LAUNCH MARKET
US$ 710 M.
Annual Vietnam Shrimp Loss

Derived from cash loss attributed to diseased shrimps (Conservatively calculated based on 10% of the industry size)

REVENUE STREAM
DIRECT SALES MODEL

Reagent sales generates most of revenue

Device: US$300

Reagent: US$ 7-20 per dose

SERVICE MODEL

Untapped market → RAPID aims to provide value-add through serviced diagnostic partnership with farmers.

RAPID model → Facilitates sale of impacted prawns. Farmers recover value of otherwise-lost prawns. RAPID takes commission on these prawns.

TARGET MARKET

- **Rural farmers** (Mekong Delta)
  - **Reliant** on shrimp farming
  - Difficult to access tech/labs/funding

THE PROBLEM

With a **20-50% PREVALENCE, shrimp diseases cause 7-12% CASH LOSS** annually to smallholder farmers in ASEAN.

Current methods of diagnostics are too slow **(1-3 days)**, too expensive **(10 USD - 20 USD per test per disease)** for rural farmers to take effective action.

THE PRODUCT
DEVICE
- Removable water bath, LED screen and integrated WIFI & sensor unit.
- Field-ready, convenient to maintain
- IP STATUS: Filed patent thru NUS, ILO ref: 2021-101

SAMPLE PREPARATION KIT
- Pipette-free use; novel silica-tipped stick for DNA transfer between containers
- Disposable containers prevent contamination
- IP STATUS: Filed patent thru NUS, ILO ref: 2021-101

REAGENTS
- No cold chain required; freeze dried reagents comes in shelf-stable blister packs
- Quick lead-time for creation of new primers

COMPETITIVE ADVANTAGE

10X FASTER **EASY TO USE** **DAILY TESTING** **LARGE RANGE OF PRIMERS** **IOT SUPPORT & TELEMETRY**

FINANCIALS & MILESTONES
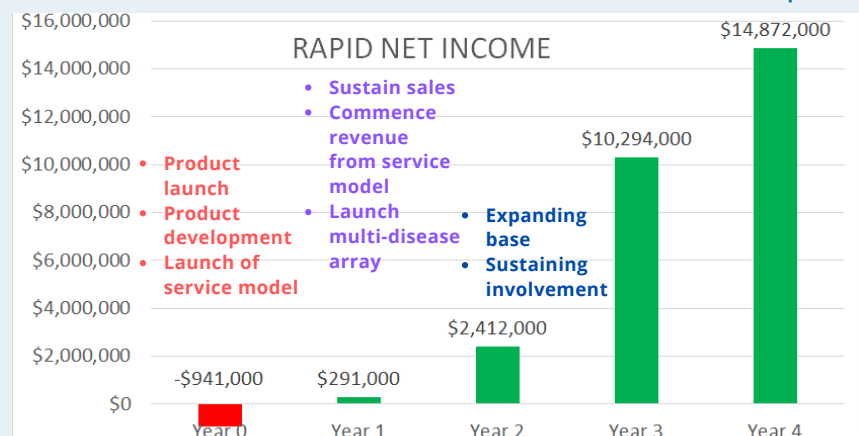
US$ 1.2M
FUNDING GAP
Working capital for 2 years. SG$100k from NUS to be used for product dev. for beta test & business set-up

US$ 12.5M
5 YEAR NPV
Profitability within 2nd year of operation, expansion expenses high; 10Y NPV: US$70M

- **Consolidate business structure**
- **Franchising prep beyond Vietnam**
- **Sustained innovation & renewal**
- **Creating new opportunities in aquaculture**

RAPID NET INCOME

- **Product launch**
- **Product development**
- **Launch of service model**
- **Sustain sales**
- **Commence revenue from service model**
- **Launch multi-disease array**
- **Expanding base**
- **Sustaining involvement**

Year	Net Income
Year 0	-$941,000
Year 1	$291,000
Year 2	$2,412,000
Year 3	$10,294,000
Year 4	$14,872,000

MEET THE TEAM

KIT YONG
6 years business experience
NUS B.Sc (Life Science) 2018

JAE CHAN
Brand & Mkt Expert
NUS B.A (Psyc.& New Media) 2019

DR OU CHUNG-PEI (ADVISOR)
Ph.D in Bio-engineering
Veteran in diagnostics field

MR COLIN CHUA (ADVISOR)
32 years in MNCs based in London, Tokyo & SG
Headed global and regional (Asiapac + ME) businesses.

Aztech
TECH DEV. PARTNER POTENTIAL INVESTOR

TIMCARE
FARMING PARTNER & CUSTOMER

reActo

Sustainable treatment for industrial wastewater

NUS GRIP

To provide a sustainable solution to treat persistent organic pollutants in industrial wastewater to protect our health and environment.

The Problem

Globally, 70B tons/year of Industrial wastewater with Persistent Organic Pollutants (POPs)

Some POPs are:

Antibiotics, Pesticides, Hormones, Phenols, Dyes

POPs Hazards:

- Accumulated and transmitted through the food chain
- Serious Health and Environmental hazards

Current Solutions

Concentrated and incinerated off-site
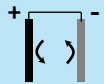- Expensive
- Personnel Health
- Public Safety

Diluted before discharge into sewage
- Municipal bioreactor risk
- Environmental damage
- Human health hazard

Our Solution

A breakthrough in electrochemical wastewater treatment and advanced materials

Electrochemistry   Graphene

Benefits

Energy Savings Performance:
- 50% less cost vs Incineration
- 100% Water Recovery

Resilient Process:
- Full range of POPs (0-100,000mg/L)
- 100% unaffected by wastewater fluctuations

Safe:
- On-site, no transportation, 0% residues
- Minimize liability

Market

Industrial Wastewater Treatment
S\$68B
CAGR (7.2%)

Advanced Oxidation Processes
S\$8.7B
CAGR (8%)

Target Industries

F&B   Textile

Petrochemical   Pharmaceutical   Paper & Pulp

Technology

3 Patents
3 Trade Secrets

Traction

300L Pilot
(under development)

300L Pilot

6 years of R&D at NUS
(~S\$1M funding)

2 Letters of Intent for expansion in South-East Asia

Financial Projections

Roadmap

Q3.2021	Q4.2021	Q4.2022	2023	2024	2025
Pilot Trial (300L)	Launch 1st product in SG	1st full Deployment in Singapore (SG)	Launch in Malaysia and Indonesia	Expand in China and India	Global Expansion

The team

Massimo SPINA, PhD
CEO & co-Founder
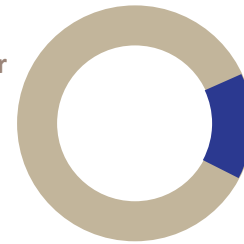12yrs in Material Science and Water Filtration

Jianxiong XU, PhD
CTO & co-Founder
6yrs in Environmental Engineering and Advanced Oxidation Processes

Work with us:
reactowater@gmail.com
21 Heng Mui Keng Terrace
Singapore 119613

ROPLUS
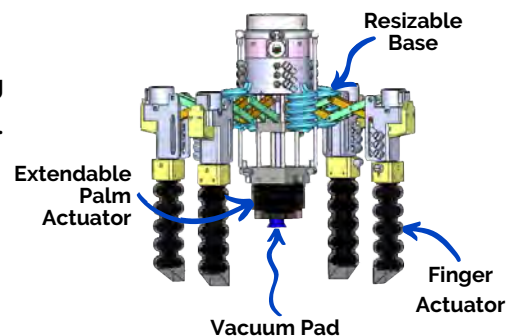## AUTOMATE YOUR FUTURE
UnisoGrip™

PROBLEM ⚠

Current gripping technologies are not optimized to handle diverse packaging materials and irregularly shaped products, thus limiting production efficiency.
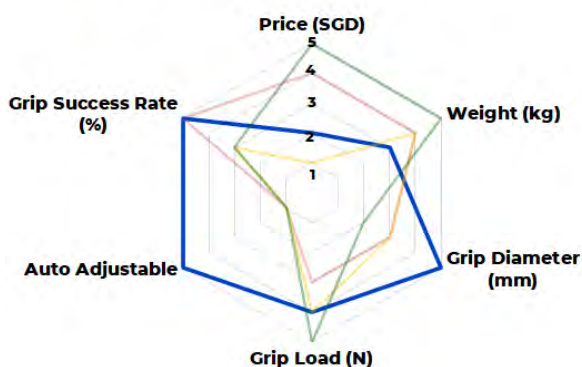
SOLUTION 💡

A multi-modal soft gripper which can be reconfigured on the fly, is able to handle a diverse range of objects using either vacuum suction or gripping without damaging the objects.
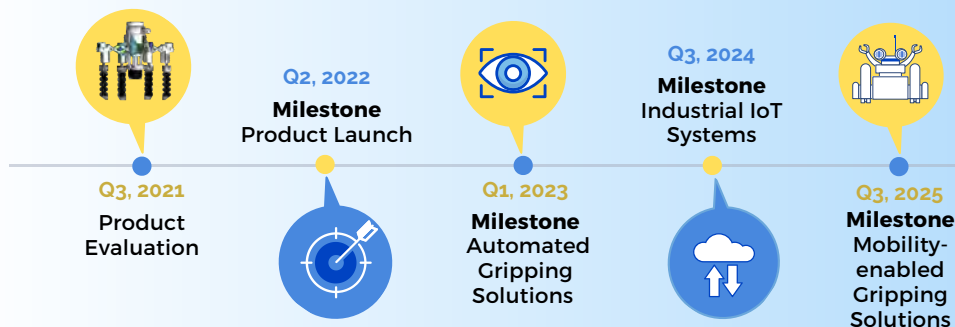
Resizable Base
Extendable Palm Actuator
Finger Actuator
Vacuum Pad

COMPETITIVE ADVANTAGE 🏆

— RoPlus — Gripper A — Gripper B — Gripper C

Radar chart axes:
- Price (SGD)
- Weight (kg)
- Grip Diameter (mm)
- Grip Load (N)
- Auto Adjustable
- Grip Success Rate (%)

🗺 PRODUCT ROADMAP

- **Q3, 2021** — Product Evaluation
- **Q2, 2022** — Milestone: Product Launch
- **Q1, 2023** — Milestone: Automated Gripping Solutions
- **Q3, 2024** — Milestone: Industrial IoT Systems
- **Q3, 2025** — Milestone: Mobility-enabled Gripping Solutions

BUSINESS MODEL 🤝

👤 Customer Segments
- Supermarkets – handle FMCG products (NTUC FairPrice, Sheng Siong, etc.)
- FMCG Companies –produce FMCG products (P&G, Nestlé, etc.)
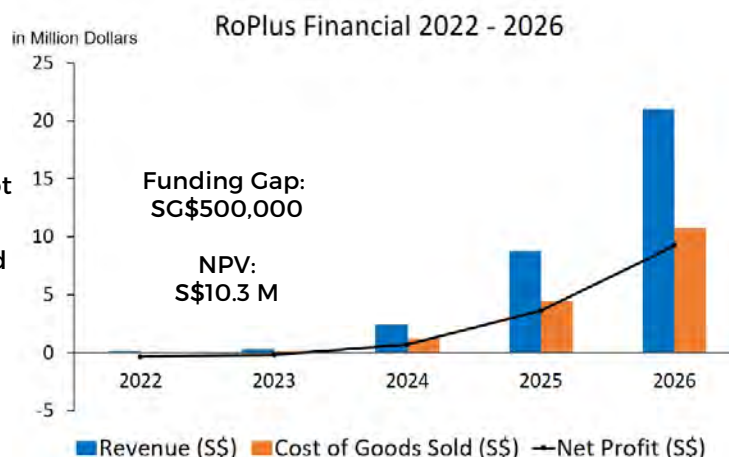
🤝 Key Partners
- Robotic arm companies (ABB, Omron and Universal Robots)
- Component suppliers
- System integrators
- Research collaborators (A*STAR, NUS)

💲 Revenue Streams
- 1-time upfront purchase **(S$11,800)**
- Leasing model with cobot **(S$2,000/month)**
- System maintenance and software upgrade **(S$1,800/year)**

🚗 Channels
- Online marketing
- B2B sales channels
- Distributors

💰 FINANCIAL MODEL

RoPlus Financial 2022 - 2026 (in Million Dollars)

Funding Gap: SG$500,000

NPV: S$10.3 M

■ Revenue (S$)   ■ Cost of Goods Sold (S$)   — Net Profit (S$)

MARKET POTENTIAL

APAC

Launch Market: Singapore (US$3.3 M)

- TAM US$7.8 B
- SAM US$4.8 B
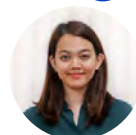- SOM (APAC) US$1.1 B

👥 TEAM PROFILE

- **Low Jin Huat** — Co-Founder | CEO, Research Associate — bieljhu@nus.edu.sg
- **Chen Chao Yu** — Co-Founder | COO, Research Engineer — biecc@nus.edu.sg
- **Raye Yeow Chen Hua** — Co-Founder | Advisor, Associate Professor — rayeow@nus.edu.sg
- **Khin Phone May** — Co-Founder | CTO, PhD Candidate — biekpm@nus.edu.sg
- **Han Qian Qian** — Co-Founder | CMO, BEng (Hons) — e0323794@u.nus.edu
- **Tan Wee Jin** — Commercial Champion
- **Roger Cheong Swee San** — Venture Manager

GROWTH STRATEGIES 📈

- License Roplus technologies to co-venture partners in China and SEA
- Collaborate with Professor from Beijing Institute of Technology
- Establish regional distributorship with automation system integrators
- Identify new strategic partners to integrate mobile base for mobility-enabled system

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NUSGRIP
GRADUATE RESEARCH INNOVATIVE

RO+

5 Engineering Drive 1, Block E6 Level 07-01, Singapore 117608
www.linkedin.com/company/roplus

Spacematch
The Airbnb of flexible workspace

We match people and spaces for better occupant comfort, productivity and space efficiency

SPACE MATCH

Current problems:

1M sqf — Vacant office space in Singapore -- Cost ranges from S$5 to S$13 /sqf

57 % — Of talents prefer flexible work scheme after COVID-19

10K S$ — Turn-over cost per employee sitting -- Talent retention is #1 Risk as of CEOs

77 % — Of talents have indicated a convenietn office location is a must have for the next job.

98 % — Of Employee workspace search, allocation, and observation is done manually

14K S$ — Average savings per employee by adopting work from home half of the time

Competitive advantage:

1. Six-layer deep learning matching algorithm.
2. Real-time dynamic multi-objective optimization of workspace-workforce schedule.
3. Digital twin dashboard of workspace.
4. Large database of job-titles, job descriptions and employee collaboration
5. State of the art spatial-temporal data analysis.

B2B SaaS platform

Space owners
Space utilization and digital twin dashborad.

Space occupancy — 15%

Building Name: NUS-SDE4 — 76% — Space occupancy: 45% — Total revenue: S$ 2172

Monitize vacant space

Space efficiency dashboard

COVID-19 solutions

Floorplan optimization

### Workforce
Find suitable workspace near activities

Space Search — Pasir Panjang, Singapore

Find Workspace

Integrate with PM platforms

1 Workspace owners

2 Workspace users

4 Service providers — HR service platforms / Job listing platforms / Space listing platforms

SPACE MATCH — Platform

3 Collab. platforms

Revenue model

10-12% per transaction — For each workspace renting transaction 50 - 130 $/workspace.

S$0.5 per rented sqf — For integrating ditital twin floor plan dashboard and booking system. ~ 5,000 $ for 10,000 sqf floor area

S$50|150 per employee — 3 teir subscribtion fees per empoloyee

The value

Employee — Save commuting cost / Save time / Save energy / Reduce carbon footprint / Flexible work scheme
S$ **10K** /employee/year

CHRO* - CREM* - FM — Dynamic workspace allocation. / On demand renting. / Workspace utilization / Auto maintenance/fault detection report / Reduced maintenance cost
S$ **10 Mil** /year

Landlord / Corporate owner — Downscale office space / Lease extra spaces / Reduce operational cost / Monetize office spaces
S$ **24 Mil** /year

Singapore

Today's tasks — Spacematch me

Funding and financing

Pre-seed funding : 100,000 (NUS GRIP)
Raised till : January 2022
Funding target : S$ 242,000
Closing date : 1 November 2022

Fund usage

The ask 242.0K

Manpower 168.0K — Product development 24.0K — BD staff

Software 15.8K
Equipment 24.0K
PaaS 24.0K
BD 10.0K

Year1 S$123k
Year2 S$118k

Q3 - 2021 (S$ 15.0 K) Total Year 1 (S$ 123K)
Q4 - 2021 (S$ 15.0 K)
Q1-2022 (S$ 15.0 K)
Q2-2022 (S$ 15.0 K)
Q3-2022 (S$ 15.0 K)
Q4-2022 (S$ 15.0 K) Total Year 2 (S$ 118k)
Q1-2023 (S$ 15.0 K)
Q2-2023 (S$ 15.0 K)

The team

Mahmoud Abdelrahman — CEO — Buildng data science ML - IoT - SaaS

Jia Yi Lee — CBO — Real-estate NUS Overseas college (NOC)

Dr. Clayton Miller — Scientific Advisor — Building and Urban Data Science BUDS lab

Andeed Ma — Commercial champion

Cato Gullichsen — Venture manager

Jonathan Tan — Technology advisor
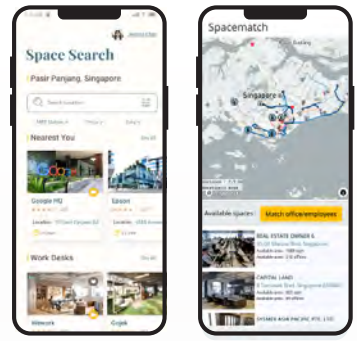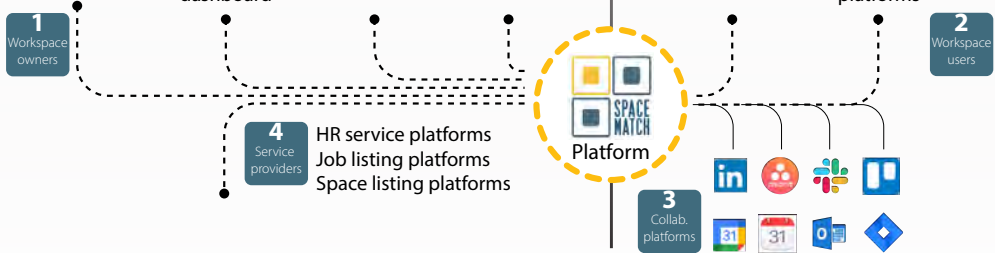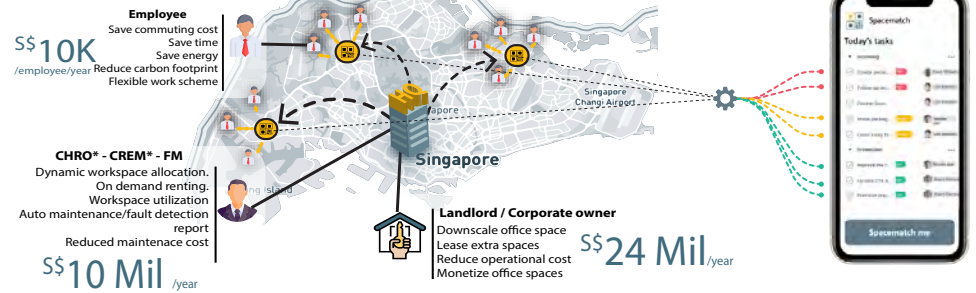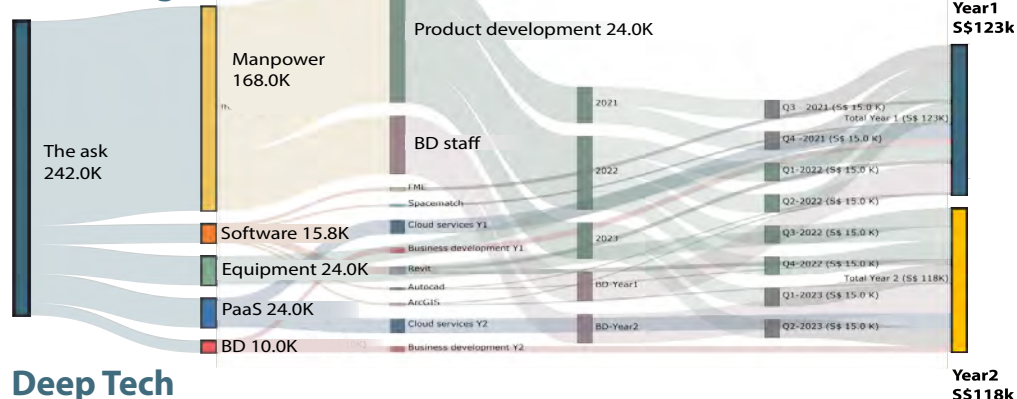
Deep Tech

Image detection based space rating

Couch 76%
Cabinetry 74%
Chair 65%
Table 58%

Dominant Colors
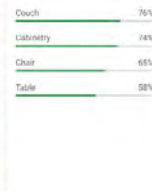
Multi-layer dynamic graph link prediciton using Graph Neural Networks

listings

Layer w1 Workspace Clustering
Layer w3 workspace satisfaction prediction
Layer u2 user cluster
Layer u1 Location (travel time) optimization
Layer u3 user-user schedule optimization (from salck, google calendar ...)
Layer w2 workspace scedule optimization

VILOTA
Omnidirectional Eyes for Advanced Robotics
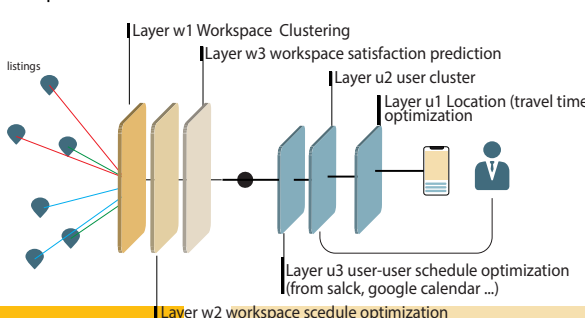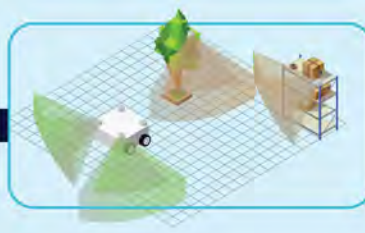
The Industry

80% reduction in delay + made possible by robotics

>50% are sensing cost ^

86% users calls for better sensing products ^

+ Source: Geek+ and Deloitte Report

^ Source: Interviews conducted by Vilota in 2021

Problems

Unable to Navigate in Busy Environment
- Robots have to be confined to certain area
- Human Intervention required

Low Responsiveness
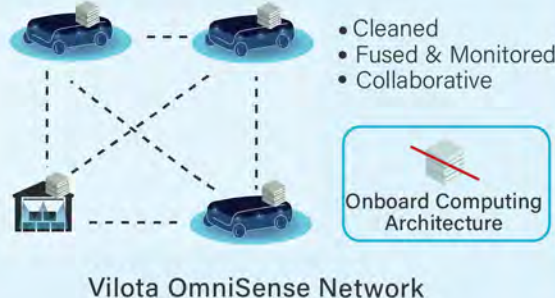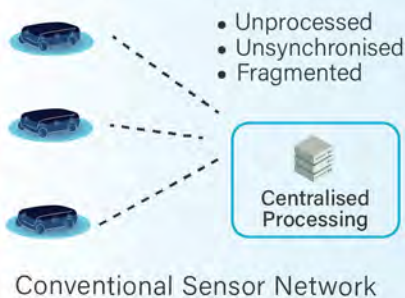- Slow to react to changes & dangers in the surroundings

Safety Concerns
- Endangering of human lives
- High cost to organization

Solutions

OmniSense

Patent-pending Visual Sensor Architecture — 2021 Q4

- Unprocessed
- Unsynchronised
- Fragmented

Centralised Processing

Conventional Sensor Network

- Cleaned
- Fused & Monitored
- Collaborative

Onboard Computing Architecture

Vilota OmniSense Network

V Cube

Real-time Visualisation & Predictive Maintenance — 2022 Q4

Virtual replicas of your physical devices visualised on a dashboard

Sensor Management
- ONLINE
- IDLE
- OFFLINE
- Area A ONLINE

Real-time sensor & fleet operations management

Predict
- 99% Sensor A Performance
- Sensor B 80%
- Sensor C 30%
- Failure rate: 0.01%
- Accuracy rate: 99.9%
- Maintenance required: Sensor C

Data-driven predictive analysis

Utility Optimisation
- Space Utility
- Robots: Tasks Allocation

Efficient resource allocation for productivity

Optimisation of resources
Simplification of manual workflow
Reduced turnaround timings

Modelling and Simulation

Founding Team

Cheng Huimin
CEO (MComp)
Research Scientist

Lexdan Lim
CMO (MBA)
Marketing Strategist

Low Yin Yi
COO (MBA)
Commercialisation

Alex Tham
Commercial Champion
MNC CEO & Ex-VC

Dr. Bi Yingcai
Technical Advisor
PhD (Automation & Robotics)

Huimin and Yingcai have a cumulative 18 years of research & industrial experience in the field of robotics
Lexdan and Yinyi have business exposure in MNC projects and start-up ecosystem
Alex, a former VC who managed a US$200m fund, advices extensively on product-market fit, business planning and financials

---

FACTSHEET

Our Hardware Product
Vision-based sensor

OmniSense

Features
- 360° omnidirectional coverage
- Indoor-Outdoor seamless navigation
- Onboard edge computing for real-time visual data processing
- Modular and easy for integration
- Able to perform vision-related tasks e.g. object identification, dynamic object movement

Wide range of applications
- Autonomous Mobile Robots (AMRs)
- Service Robots (Hospitality)
- Warehouses
- Retail

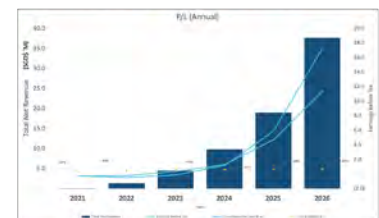## Market Outlook
Total Available Market
GLOBAL 243B

Launch Market
SINGAPORE 980M

Financials & Funding
FINANCIAL PROJECTION

FUNDING GAP 500K

Partners
Customers
- Local AMR company [LOI secured]
- Service Robot company based in Europe [under discussion]
- 2 companies in hospitality industry expressed interest for POC
- Simulation company [under discussion]

Suppliers
- Local PCB company [LOI secured]

Powered by
NUS GRIP
GRADUATE RESEARCH INNOVATION PROGRAMME

VIRTUAI — ADVANCING HEALTHCARE VIRTUAL SIMULATIONS
Revolutionise Healthcare Trainings for A Globalised Practice-ready Workforce

PROBLEM

Existing Healthcare Trainings are Inefficient to Support Multi-disciplinary Education for Patient Safety
1. Physical manikin simulation is 83% less cost-effective
2. Disruptive multi-disciplinary relations account for 70% of preventable medical errors
3. Costing OECD US$606 billion annually

SOLUTION

AI-powered Virtual Simulation Training Platform for Healthcare Workforce
- >90% Cost-savings & Manpower Optimisation
- Breaking Training Bottleneck
- 24/7 Personalised Recommendation
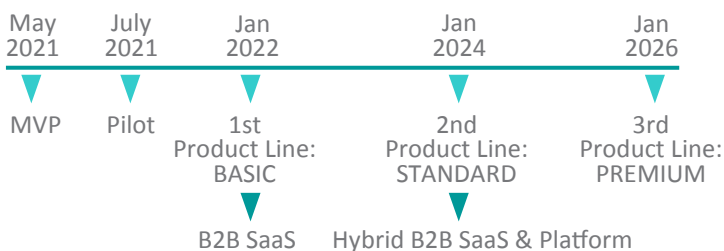- Real-time Feedback

COMPETITIVE ADVANTAGE

1. Higher Degree of Deep AI Learning
2. Greater Ease & Range of Customisation
3. Evidence-based Pedagogy

INTELLECTUAL PROPERTY

Provisional Patent
- Auto-population of Virtual Scenarios & Environment with Document Uploads
- Augment Assessment Rubrics with Machine Learning

MILESTONES

May 2021	July 2021	Jan 2022	Jan 2024	Jan 2026
MVP	Pilot	1st Product Line: BASIC	2nd Product Line: STANDARD	3rd Product Line: PREMIUM
		B2B SaaS	Hybrid B2B SaaS & Platform	

MARKET POTENTIAL

Global Virtual Training & Simulation	S$439 BILLION
Global Healthcare Simulation	S$4.9 BILLION
SEA, AU, NZ Healthcare Schools & Hospitals	S$1 BILLION
Launch Market: Singapore Healthcare Schools & Hospitals	S$3.2 MILLION

REVENUE MODEL

B2B SaaS Tier-based Package : Per 100 Users Per Annum*
Per Institution Per Annum^

BASIC	STANDARD	PREMIUM	ADD-ONS
S$25,000*	**S$30,000***	**S$35,000***	**S$10,000^**
• Soft Skills	• BASIC	• STANDARD	• Analytics Report
• Customisation	• AI-driven	• Clinical Skills	**S$10,000^**
• Dashboard	• Personalised Recommendation	• VR Headset Compatible	• IT Support

Platform Marketplace: Platform Fee 30% Per Module Purchase

PRE-SEED FUNDING

S$650,000 For 18 Months Runway

- Manpower (Software Developers) 35%
- Product Development 40%
- Pilots (Servers & Man-hours) 5%
- Content Development 15%
- Operations & Start-Up 5%

CO-FOUNDERS & ADVISOR

MAYBELLINE OOI
CEO
Nurse Researcher with 4 years of Cardio/ICU Experience, Internship in HealthTech Start-up, NOC Stockholm Alumni

XUANNY OOI
CMO
A&E Nurse with Prior Marketing Internship in Femtech Start-up, NOC Israel Alumni

WONG ZHI KAI
CTO
Full-stack Product Manager with UX/UI, Project Management & Programming Skills

A/PROF LIAW SOK YING
PEDAGOGY ADVISOR, PI
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