Leveraging Artificial Intelligence of Things to Transforming Healthcare Industry

Building Tailor made Elders care solutions with the Power of AI.

https://www.senzmate.com/medtech/

miller@senzmate.com

CWCDH

With a rapidly aging population, eldercare centers are under increasing pressure to provide quality care. However, these facilities face significant challenges,

including a severe shortage of medical professionals and frontline caregivers who often lack medical training. The absence of language proficiency among caregivers further complicates the documentation of patient records to professional standards. Medical professionals are burdened with extensive time demands to prepare individual patient records and handoff documents, leaving little room for personalized care planning.

Additionally, the lack of proper digital systems for maintaining medical records exacerbates inefficiencies, making it difficult to meet the growing needs of elderly patients effectively.

SenzMate AIoT intelligence is an award-winning AI technology company specializing in the elder care sector.
Our services are backed by cutting-edge technologies such as generative AI, large language models, AI-enabled wearable technology, camera-based vision technology, and more.

Harnessing the power of AI and IoT, we provide elder care centers with:

➜ AI-generated **care plan** reporting and documentation

➜ Fall detection and movement tracking for **dementia** patients in care home centers.

➜ Posture maintenance and activity training for **Parkinson's and stroke** patients.

➜ **Care room environmental** monitoring and alerting.

➜ Panic buttons for **emergency situations**.

➜ APIs & Tools for diet, medication, and activity planning.

➜ Disease specific solution developments.

And much more.

SenzMate's Highlights | What we bring to the table.

SenzMate AIoT Lab offers a full range of services in Strategy, Consulting, Operations and Technology that help deliver more personalized healthcare and better patient outcomes.

SenzMate has developed **over 50 Custom made medical solutions globally**, with the **majority tailored** to meet the needs of eldercare centers and related applications.

- In-house AIoT Lab to do R&D
- Business Intelligence with Dashboards
- Lower overall cost and quick revenue generation
- Start with a MVP to validate your idea
- Consultancy from ideation to commercialization
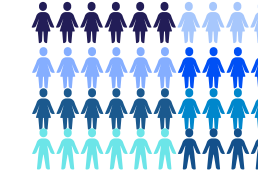- 24x7 Technical support and resources
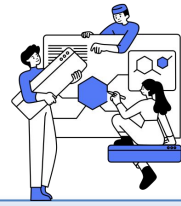
100+ Projects worldwide
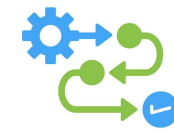
End to end No 3rd party involve.

150+ AIoT engineers

A Decade of Industrial experience.

World bank Climate Ambassadors awards 2021

John Keells X Innovation Awards 2017

Slush Global Impact awards 2018, Helsinki

Commonwealth Digital Health Awards 2018

Microsoft Amplify awards 2022

ICTA Spiralation Awards 2016, Ministry of Defence Sri Lanka

Good Life X, 2023, Berlin

Asia Pacific Innovation Submit Awards 2020

Climate Launch pad awards 2018, Edinburgh

WRI Land Accelerator Awards 2020

Asia berlin, Enpact Awards 2021, Berlin

SenzMatica **Platform** sector specific Adaptation

Agritech
2021 — < 100 Data points
2024 — 40,000 Data points

Medtech
2021 — < 100 Data points
2024 — > 100,000 Data points

Gen AI
2021 — <0 Data points
2024 — 0.5 Million Data points

Clients
2021 — < 25 projects
2024 — > 150 projects
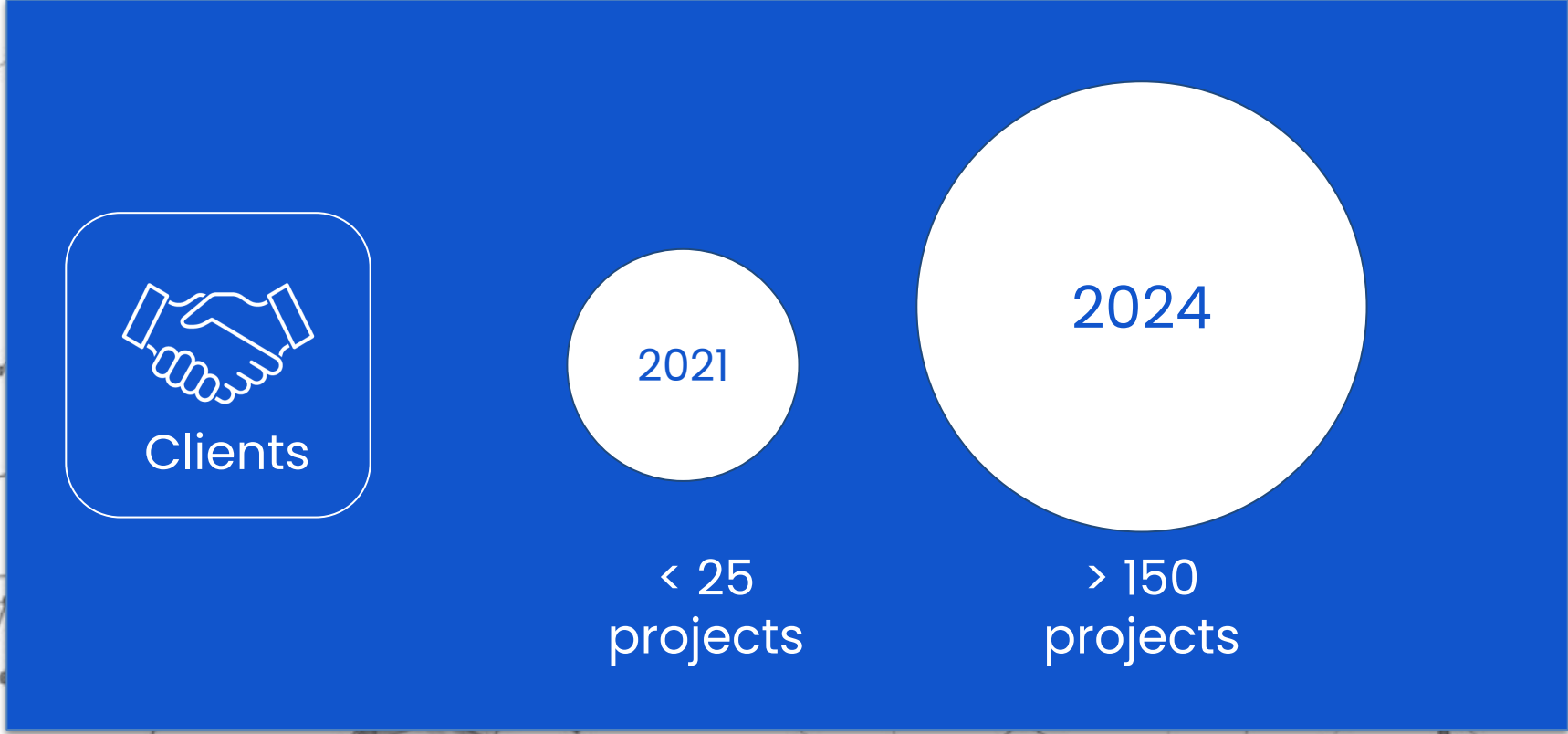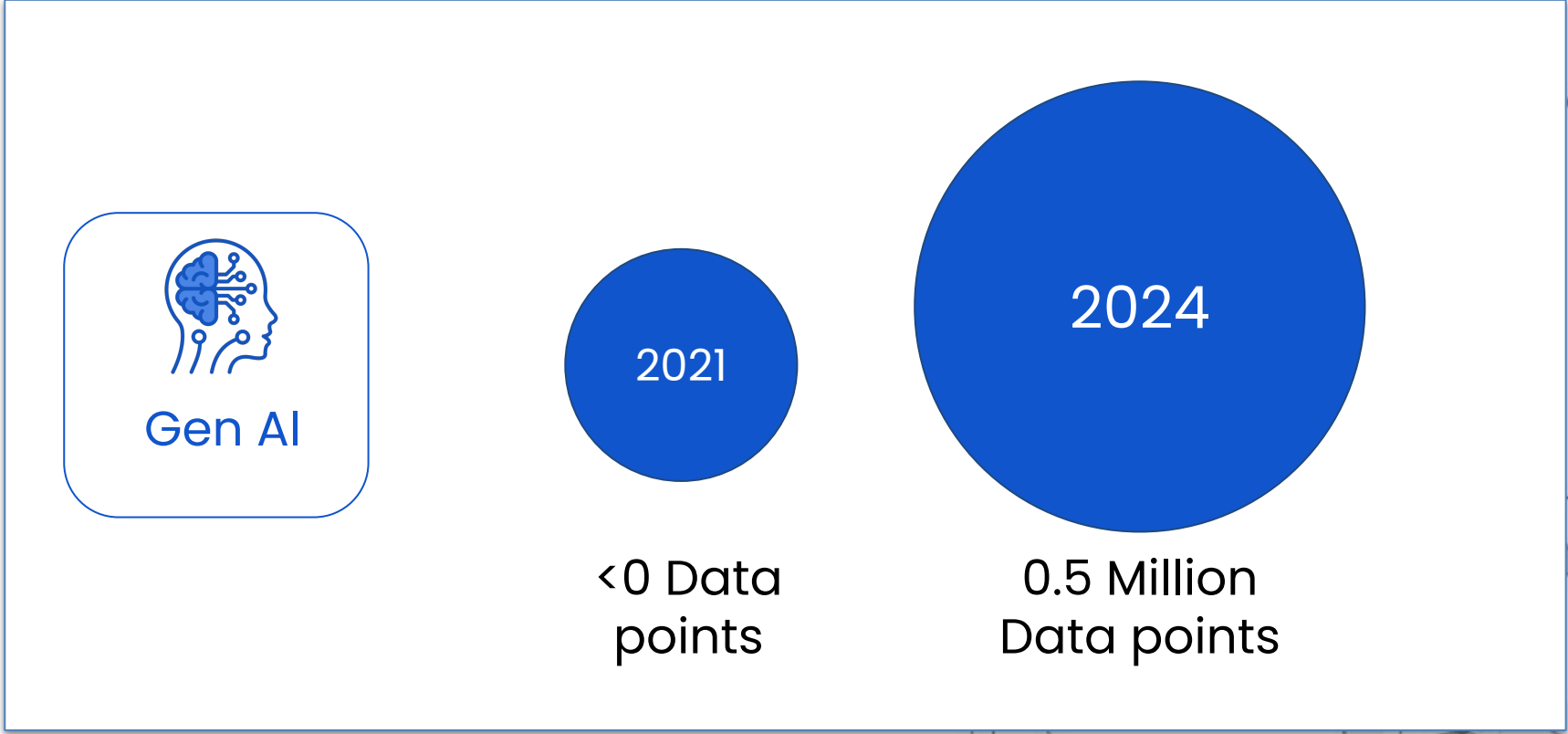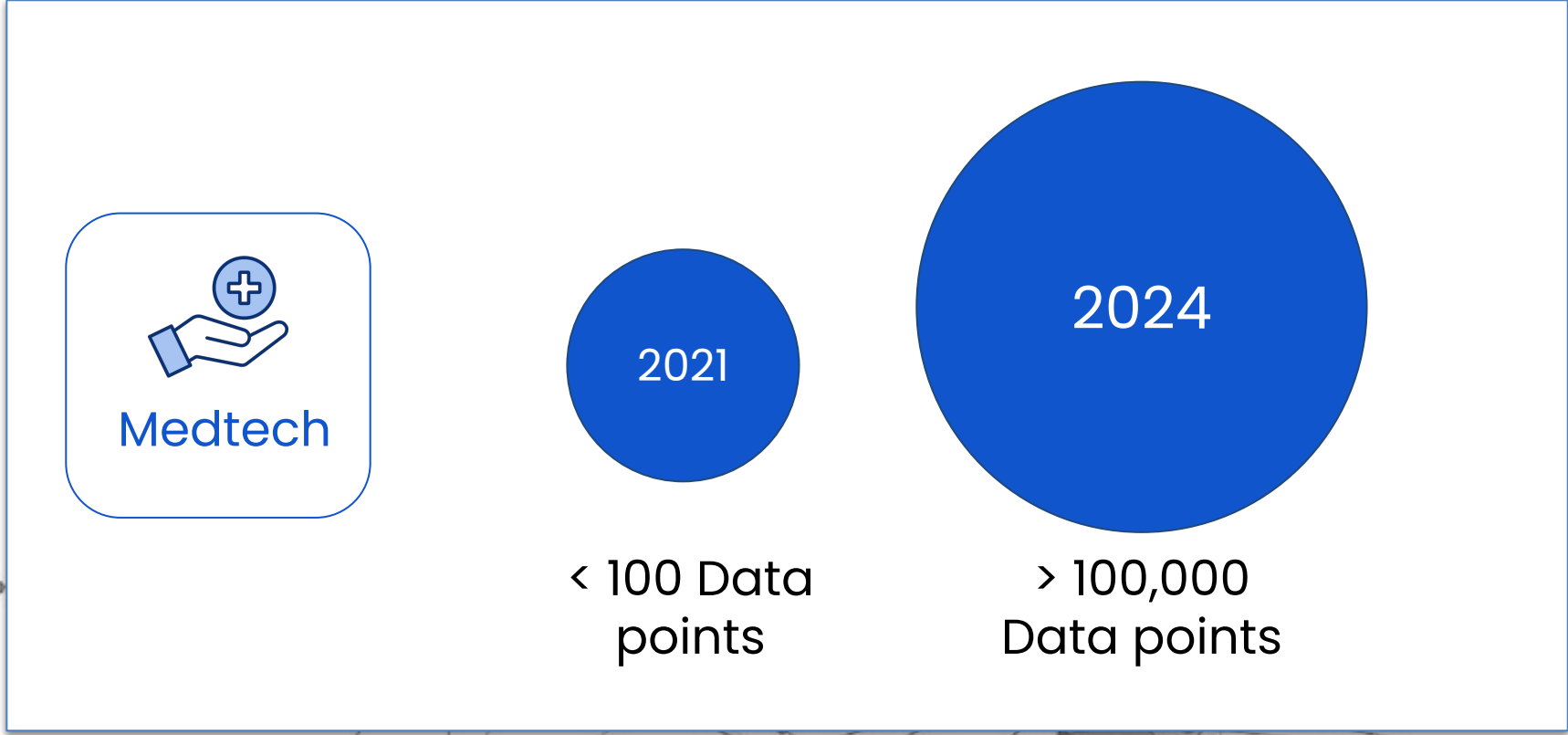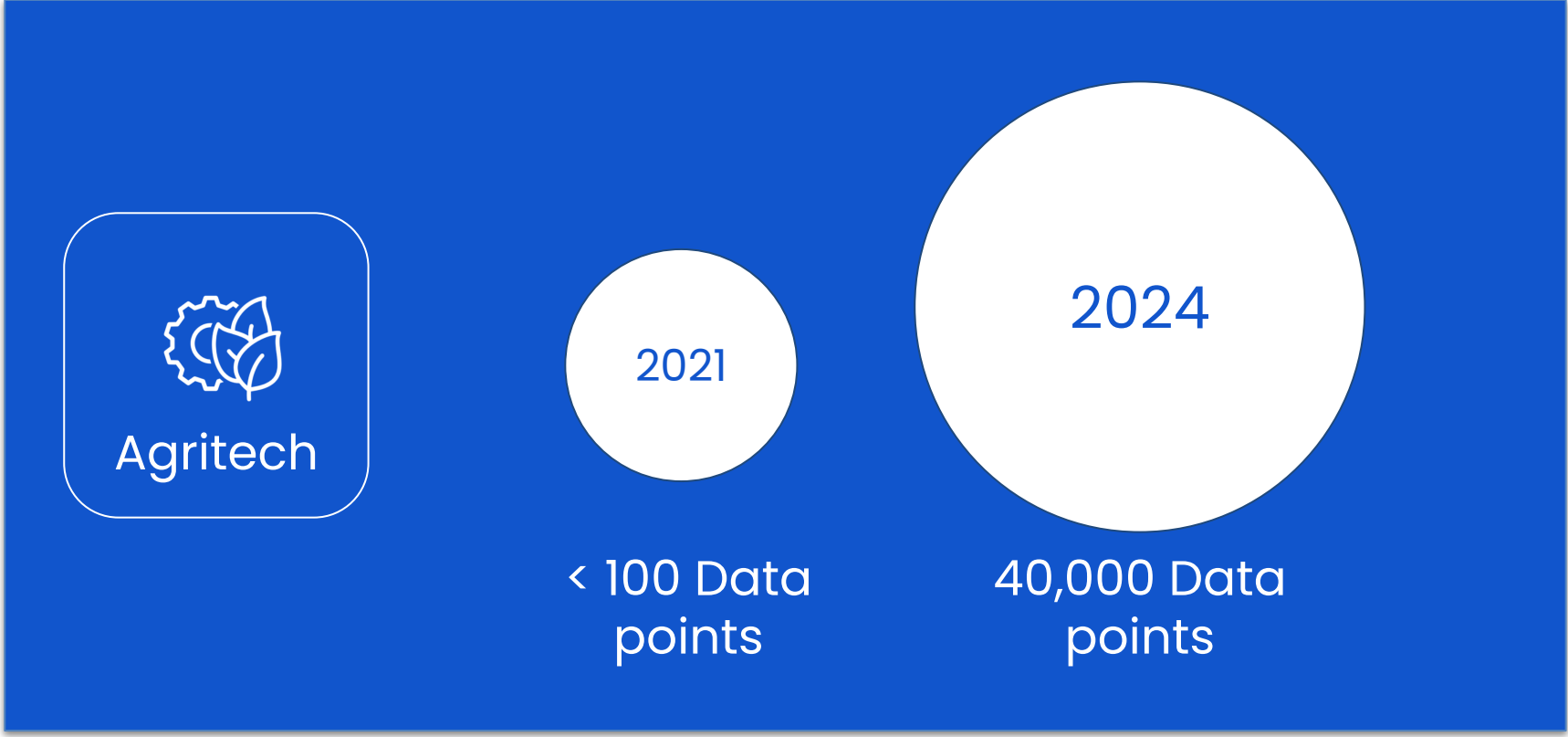
SenzMate SmartCare | case studies

SenzMate AIoT intelligence Technology stack

Embedded AI and Systems

NVIDIA JETSON · C++ · ARM · C

intel nuc · python · TensorRT

Atmel · onsemi · Bluetooth

MQTT · UWB · STM32

verneMQ · RabbitMQ

LoRa · LTE-M

sigfox · NB-IoT

AI Vision

Easy OCR · Node-RED · TensorFlow

LlamaIndex · 飞桨 PaddleOCR · OpenCV

PyTorch · YOLO VISION

MediaPipe · Google Cloud Vision API · pandas

Transformers · Tesseract

NumPy · seaborn · scikit learn

Keras

Generative AI

OpenAI · PaLM 2

Hugging Face · Microsoft AUTOGEN

Google AI · stability.ai

Google Cloud Vision API · Meta AI

MISTRAL AI_

AIOps and Bigdata

hadoop · docker

git · aws · Google Cloud

APACHE STORM · Azure

trino · elasticsearch

HIVE · kibana · logstash

Apache Kafka · APACHE Spark · amazon DynamoDB

Stomp · APACHE ACTIVEMQ

User Layer

Java · spring boot

Unity · React Native

ANGULAR · NEXT.JS · MySQL

NODE.JS · mongoDB
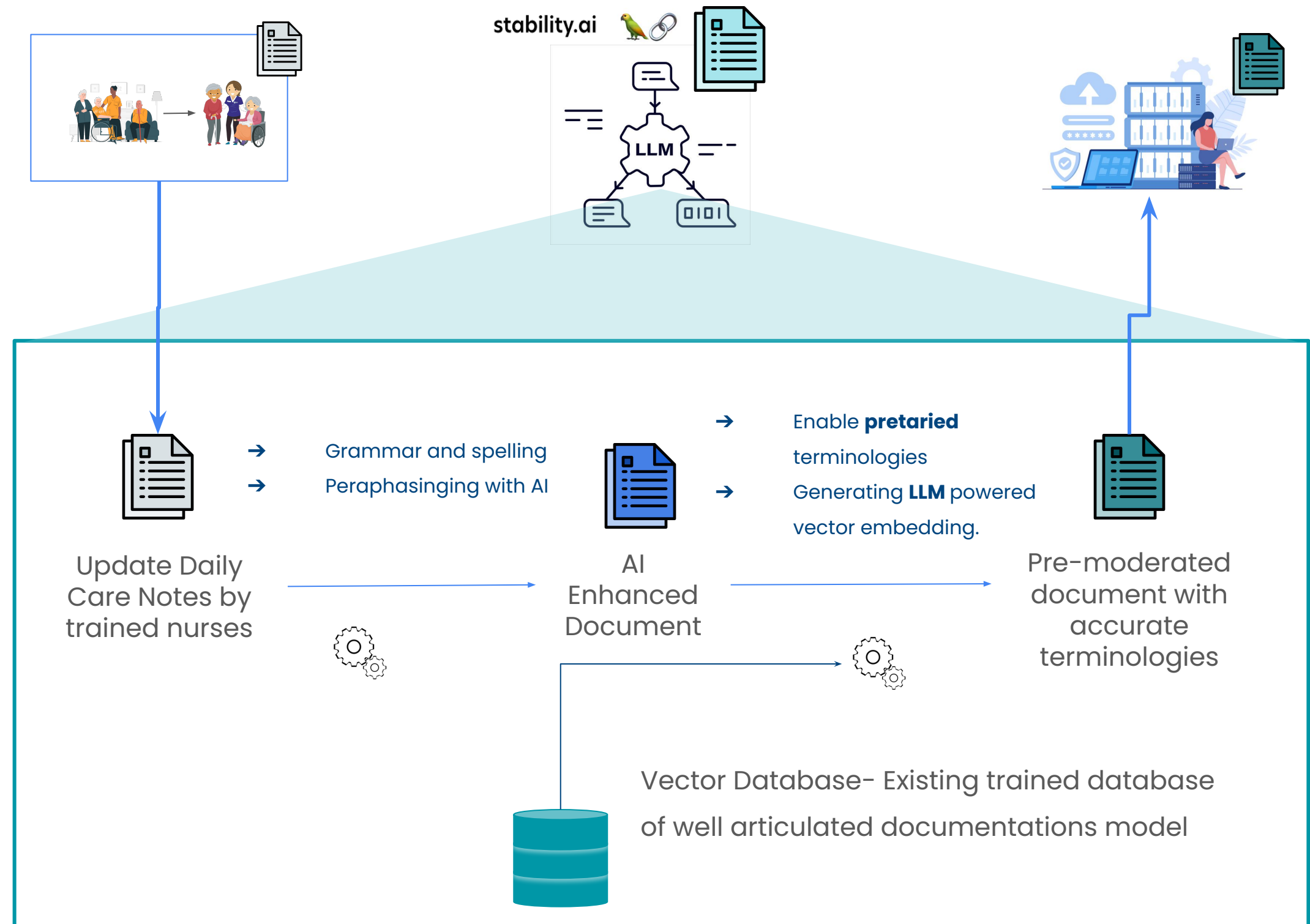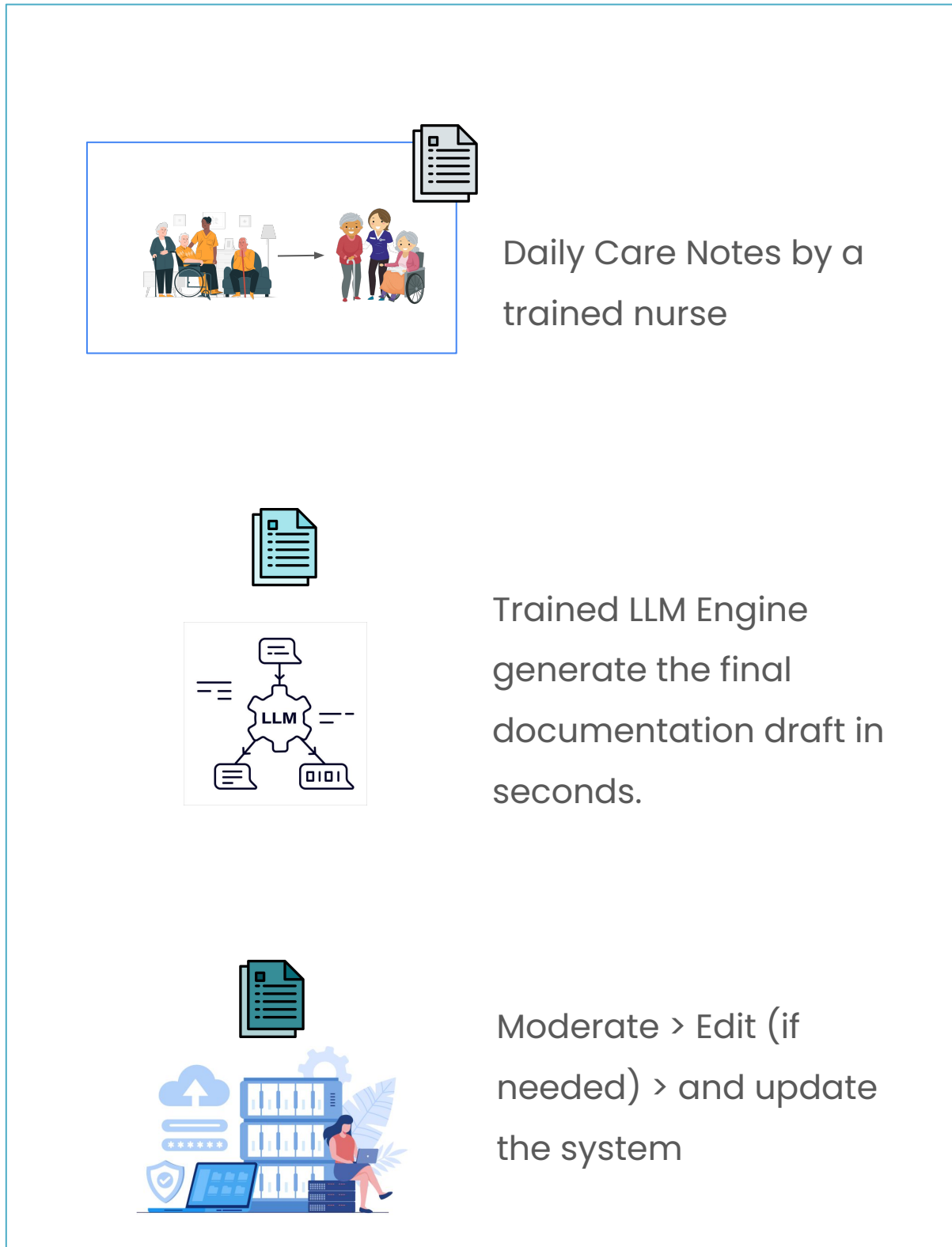
HTML5 · React

BACKBONE.JS · android · iOS

ANSIBLE

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Elders Care plan notes enhancement using AI

Enhancing the readability of the care notes in the healthcare documentation through a cutting-edge LLM powered tool is the key objective of this proposal. Improve patient handoffs between nurses/Doctors with generative AI.

stability.ai

Daily Care Notes by a trained nurse

Trained LLM Engine generate the final documentation draft in seconds.

Moderate > Edit (if needed) > and update the system

Update Daily Care Notes by trained nurses

→ Grammar and spelling
→ Peraphasinging with AI

AI Enhanced Document

→ Enable **pretaried** terminologies
→ Generating **LLM** powered vector embedding.

Pre-moderated document with accurate terminologies

Vector Database- Existing trained database of well articulated documentations model

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Personalising Diet plans with LLM and Knowledge Graph Backend.

The System Uses a Knowledge Graph backend instead of a conventional database for the learning period.

- By implementing a knowledge graph (KG), we leverage semantic understanding to better comprehend the relationships and semantic meanings of different entities within the care context. That leads to define better rules on optimising the personal care plans.

- Easy to update in entity , relationship and a character to the KG networks. This behavior allow us to continuously learn and upgrade.

Leveraging Computer vision and GEN-AI Powered Physiotherapy for Eldercare | Digital Therapeutics + DIGITAL REHAB

Developed a comprehensive physiotherapy system with potential for transformative applications in the medical field. This system is particularly suited for addressing **Parkinson's disease and stroke-induced partial paralysis**, leveraging advanced Gait and Posture analysis to enhance patient outcomes and rehabilitation processes.

Secure and Privacy protected

Edge level processing

De-identification models

Vision AI & ML models

Realtime consultation with Doctors

Well done!

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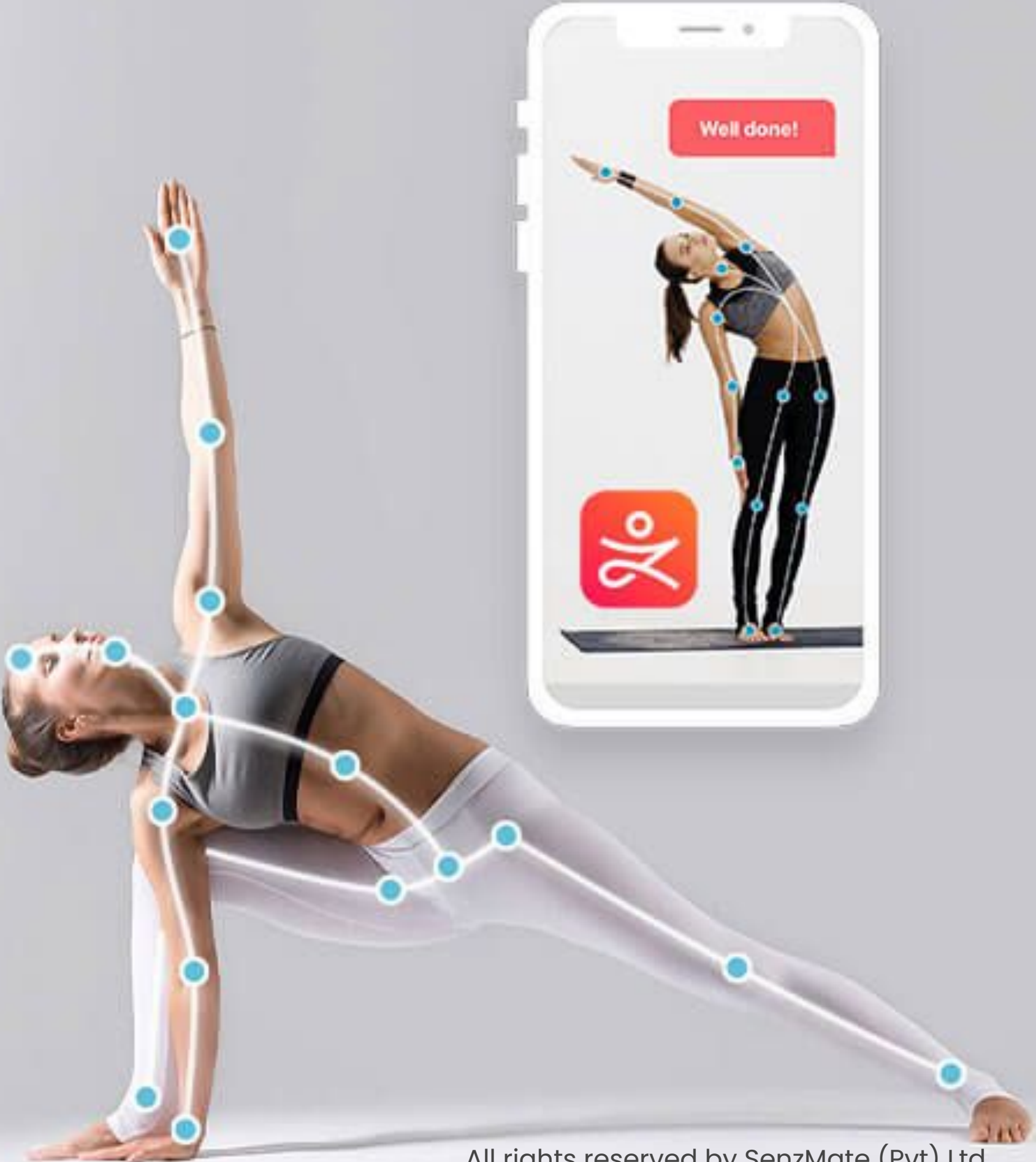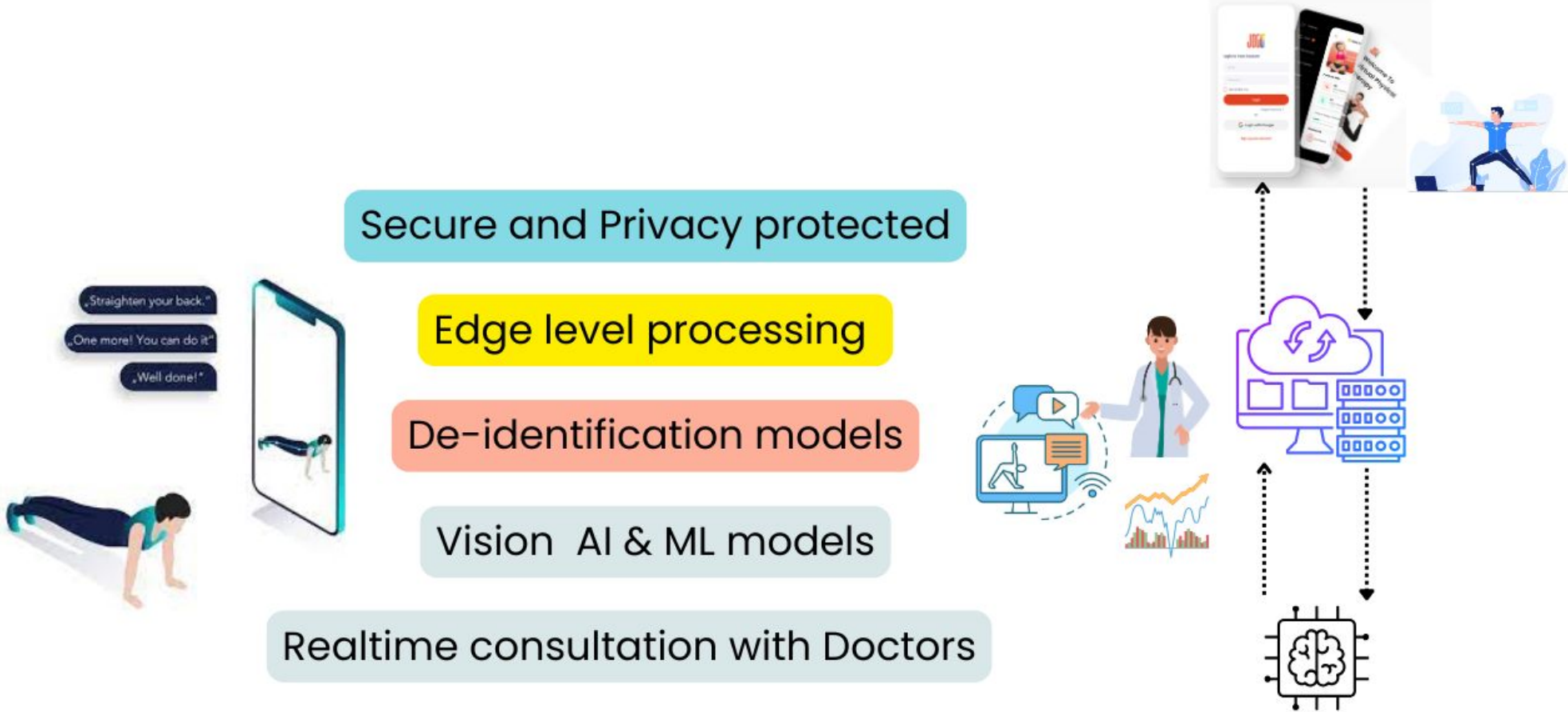
Case Study | Computer Vision

Embedded AI-powered Computer Vision in Analog Dial Reading for Medical Equipment In the healthcare field, accuracy and efficiency are paramount. Traditional methods of reading analog dials on medical equipment, like manual reading or mechanical sensors, can be prone to errors and inconsistencies. This is where embedded AI-powered computer vision (CV) steps in, offering a revolutionary solution.

Embedded AI-powered Computer Vision in Analog Dial Reading for Medical Equipment

**Benefits of Embedded AI CV for Medical Equipment:**

- Enhanced accuracy: CV algorithms can achieve significantly higher accuracy than manual reading, minimizing human error and leading to more reliable data.
- Improved workflow efficiency: Automating dial reading reduces the time and effort required, allowing medical professionals to focus on patient care.
- Real-time monitoring: CV systems can continuously monitor dials, providing immediate alerts and notifications if readings fall outside of acceptable ranges.
- Non-invasive and sterile: By eliminating the need for physical contact, CV ensures a sterile environment and minimizes the risk of cross-contamination.
- Reduced cost: CV-based solutions can be cost-effective compared to frequent maintenance and calibration of mechanical sensors.
- Adaptability: CV algorithms can be easily adapted to different types of analog dials and equipment, making them a versatile tool.

Specific Applications in Medical Equipment:

Blood pressure monitors, Infusion pumps, Anesthesia machines, Dialysis machines Respiratory equipment

PATIENT WANDERING SYSTEM FOR DEMENTIA SUFFERERS

In order to increase the safety of residents with orientation disorders and to relieve the nursing staff, the location of persons in need of protection is determined in strategically relevant areas. The system registers when a person with dementia leaves the facility and automatically triggers a notification to personnel. The resident can then be accompanied by an employee or prevented from leaving the area.
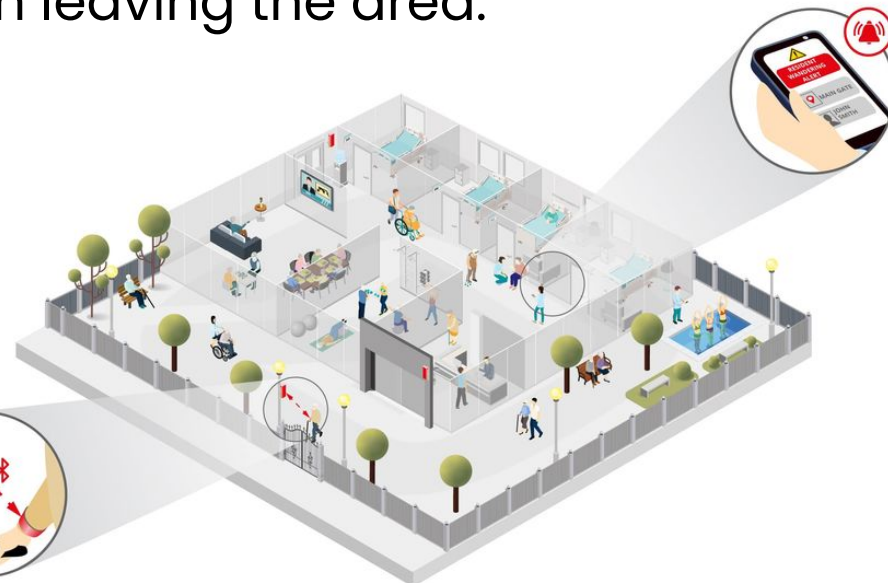
How does it work?

The patient wandering system is a Low Energy (BLE) beacon, which is worn permanently by the residents in the form of a **wristband**.

Locator Nodes are installed at each building or property exit. The Locator Node receives the Bluetooth signals from beacons within range and transmits the data to the SenzMatica platform, where it is processed and made available via web services. The Locator Node registers when a resident leaves or passes a defined area, and the system triggers an alarm. That includes the location and name of the affected person. Conditions and actions are defined via the web-based portal.

Tailor-made insights

- Monitor patients,
  - Indoor moments and heat map logging.
  - fall detection and alert generation
  - Guide nurses to situations
- Detailed reporting about nursing home services.
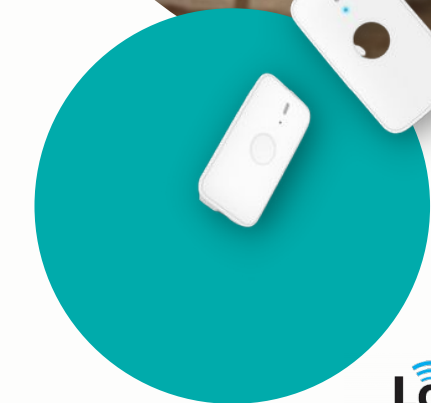
Technologies
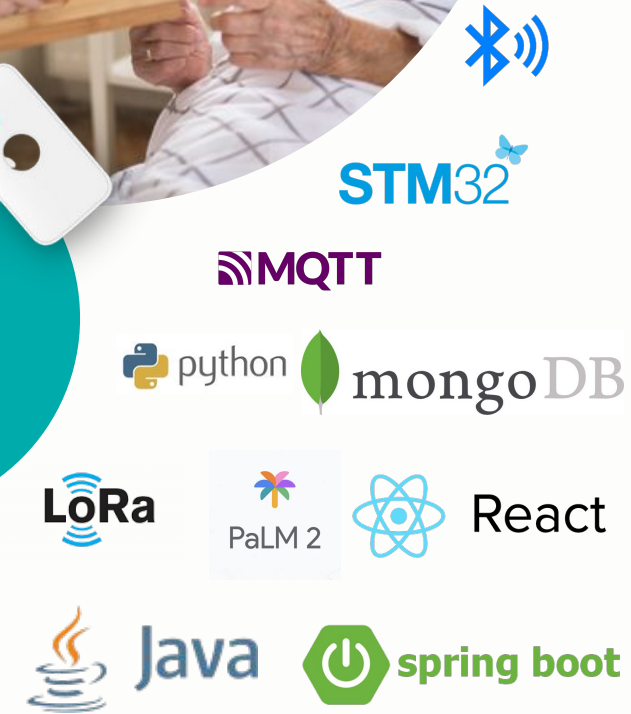
- BLE + LoRa Mesh technologies
- Beacon + Tag technologies
- ML based indoor heat map generation
- Advance MED-Palm AI- based Personalised patient care.

SenzMate Polar wireless temperature and environmental monitoring solution allow healthcare facilities to leverage one network to ensure all departments meet compliance standards and prevent product loss. Recording and tracking data remotely eliminates manual processes, enabling greater staff efficiency. With SenzMate Polar's Internet of Things (IoT) sensing solution, healthcare facilities that implement environmental monitoring can easily scale to SenzMate Polar other location-based services
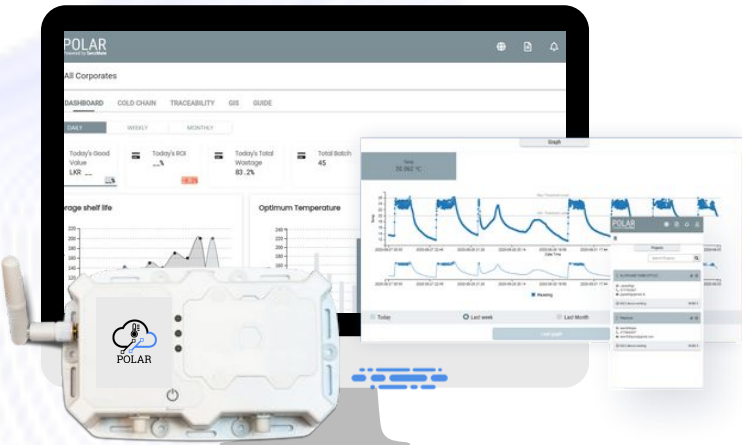
Vaccination Storage

Sperm banks

Pharmaceutical Storage

Medical Labs

Comprehensive software, like nothing else.

Managing environmental data has never been so easy – whatever and whenever you need it – from wherever you are.

20%
Eliminate overtime maintenance fees

40%
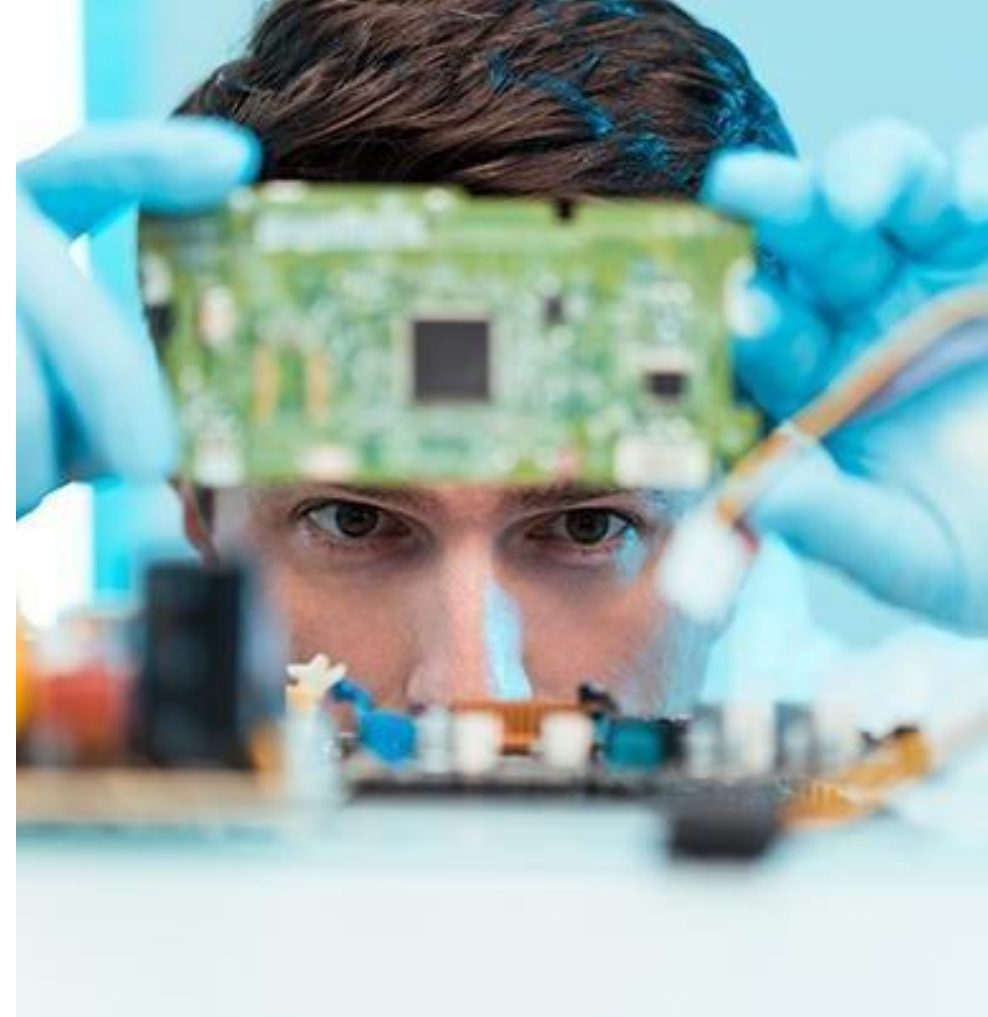Reduce labor costs

Protect against human error

POLAR

For Farm2fork optimization

SENZMATE

Why Choose SenzMate AIoT Intelligence

SenzMate AIoT Labs healthcare application used by over **10,000** skilled medical professionals in over **14** countries:

- Focused on **Outcomes**
- **Proven** Results
- **Faster** Speed to Value
- **Reduced Risk** due Pre-built Platforms and Apps

End-to-end development under one roof

35%

of faster delivery time than distributed development facilities.

Award-winning technology team

150+

Cutting-edge AIoT

Experienced engineers

Cutting-edge AIoT technology spectrum Drives Performance

20%

higher efficient for future-ready product building

SenzMate Core Team

Jeyjenthan Thramakulasingam
Co-founder, CEO

MSc DS & AI Eng University of Moratuwa

John Niraj Anton
Co-founder, CTO

BSc ENTC Eng University of Moratuwa

Miller Rajendran
COO

BSc CS, University of Jaffna

Ruban Kanapathippillai
Adviser

Sr. Global Director, Technical Sales Architect at Western Digital
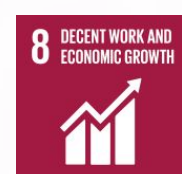
Bernard Sinniah
Adviser (SenzAgro)

Former CITI bank Managing Director.

Balathasan Sayanthan
Adviser

Director, Yarl IT Hub

SENZMATE

Let's explore how The artificial intelligence of Things (AIOT) can optimise your company.

Corporate address

Srilanka office:

27/1, 1/1, Melbourne Avenue,
Colombo 04
Sri Lanka.

Phone: (+94) 11 424 8299
Email: info@senzmate.com

USA Office:

1007 N Orange St. 4th Floor 567
Wilmington, DE
19801

Phone: (415)997-7727
Email: info@senzmate.com

UK Office:

161 Shirley Road,
Croydon Surrey
CR0 8SS

Email: info@senzmate.com

Social Media

CONTACT

Miller Alexander Rajendran

Chief Operating Officer

SenzAgro Solutions

Email: miller@senzmate.com

mobile : +94 75 0395802

/rajendranmiller