

## Group 5 - Bedside Monitoring:

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To be printed on A3 paper, cut out and folded into a heart shape, as seen in hard copy submitted to the teaching office.

### COST

- LIFELINE IS THE **CHEAPEST** OF ITS KIND ON THE MARKET TO DATE, COSTING BETWEEN **£44-£166** TO MASS PRODUCE, DEPENDING ON CHOSEN CUSTOMISATION OPTIONS.
- **MODULAR DESIGN** ALLOWS BROKEN OR MISPLACED PARTS TO BE REPLACED WITHOUT HAVING TO REPLACE THE WHOLE DEVICE.

£166

### MARKET SIZE

- OUR INITIAL **TARGET MARKET** IS **DEVELOPING COUNTRIES** AROUND THE WORLD, WHERE BASIC HEALTHCARE IS LESS ACCESSIBLE.
- IN **2018**, THE MARKET SIZE FOR REMOTE VITAL SIGN MONITORS WAS VALUED AT **\$684 MILLION** AND IS EXPECTED TO RISE TO **\$1,727 MILLION** BY **2026**<sup>3</sup>.

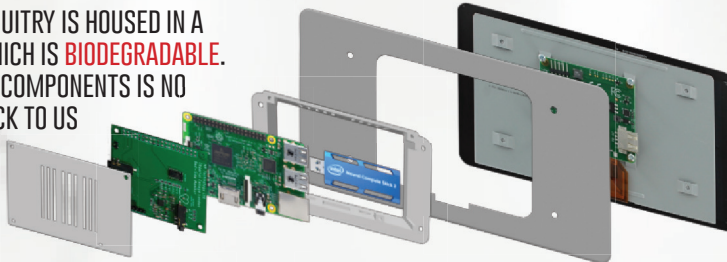


# LIFELINE

## THE LOW-COST, IOT VITAL SIGNS MONITOR

### COMPOSITION AND RECYCLING

- LIFELINE'S PCB AND ALL CIRCUITRY IS HOUSED IN A **3D-PRINTED PLA CASING**, WHICH IS **BIODEGRADABLE**.
- IF THE DEVICE OR ANY OF ITS COMPONENTS IS NO LONGER NEEDED, SEND IT BACK TO US AND WE WILL **RECYCLE** OR CORRECTLY DISPOSE OF IT FOR FREE!



<sup>1</sup> Source: World Bank and WHO: <https://bit.ly/2KIJlwc>

<sup>2</sup> Source: World Health Organisation: <https://bit.ly/2XtGtdW>

<sup>3</sup> Source: Acumen Research and Consulting: <https://bit.ly/2KzOVEL>

## THE NEED FOR A REMOTE PATIENT MONITOR

VITAL SIGN MONITORS MEASURE THE BODY'S TEMPERATURE, OXYGEN, AND HEART AND RESPIRATION FUNCTIONS WHICH ARE CRITICAL SIGNALS DOCTORS NEED TO MAKE LIFE SAVING DECISIONS.

CONVENTIONAL VITAL SIGN MONITORS ARE UNAFFORDABLE FOR RURAL HOSPITALS IN DEVELOPING COUNTRIES LEADING TO LONG WAITING TIMES, OVERCROWDING OF HOSPITALS AND NEGLECTION OF LESS CRITICAL PATIENTS.

52%

OF PEOPLE IN DEVELOPING COUNTRIES DON'T HAVE ACCESS TO HOSPITAL CARE<sup>1</sup>

\$10,000

AVERAGE COST OF A CONVENTIONAL VITAL SIGN MONITOR

20%

PERCENTAGE OF PEOPLE IN DEVELOPING COUNTRIES ADMITTED TO HOSPITAL DUE TO OVERCROWDING<sup>2</sup>

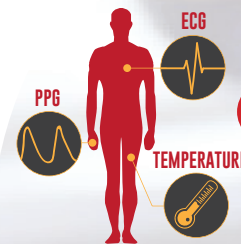
LIFELINE IS A LOW-COST, IoT DEVICE WHICH REMOTELY STREAMS VITAL SIGN MEASUREMENTS TO A NEARBY HOSPITAL, ALLOWING DOCTORS TO LOOK AFTER MANY PATIENTS IN MANY LOCATIONS AT ONCE.

## WHAT MAKES US DIFFERENT?

UNLIKE OTHER EXISTING REMOTE MONITORS, LIFELINE FEATURES:

- 1 MODULAR DESIGN ALLOWING UNITS TO BE BUILT CUSTOM TO PATIENT NEEDS AND / OR BUDGET.
- 2 ACCURATE SENSORS ALLOWING FOR MEDICAL CERTIFICATION AND IS COMPLIANT WITH DATA SAFEGUARDING REGULATIONS.
- 3 MACHINE LEARNING ALGORITHMS TO DETECT, PREDICT AND ALERT DOCTORS OF ABNORMALITIES IN A PATIENT'S VITAL SIGNS.
- 4 INTUITIVE USER INTERFACE FOR HOSPITALS TO MONITOR SEVERAL PATIENTS LIVE AT ONCE.

## HOW DOES IT WORK?



### SENSORS

- ECG: USED TO DERIVE HEART RATE
- PPG: USED TO DERIVE SPO2 AND RESPIRATION RATE
- TEMPERATURE: INDICATION OF INFECTION AND INFLAMMATION



### CUSTOM RASPBERRY PI HAT

- CUSTOM MADE PCB INTERFACES SENSORS WITH ANY RASPBERRY PI WHICH SENDS RAW SENSOR DATA TO THE HOSPITAL'S DATABASE USING THE INTERNET



### INTEL NEURAL COMPUTE STICK 2 (OPTIONAL)

- RUNS MACHINE LEARNING ALGORITHMS TO DETECT AND PREDICT ATRIAL FIBRILLATION AND OTHER ABNORMALITIES



### LOW-LATENCY CLOUD DATABASE

- STORES REAL-TIME PATIENT DATA AND PATIENT HISTORY



### WEBAPP

- ALLOWS DOCTOR TO REMOTELY MONITOR THEIR PATIENTS IN REAL-TIME AND RECEIVE ALERTS ABOUT ABNORMALITIES



### RASPBERRY PI SCREEN (OPTIONAL)

- ALLOWS MONITORING AT THE BEDSIDE FOR CARERS