



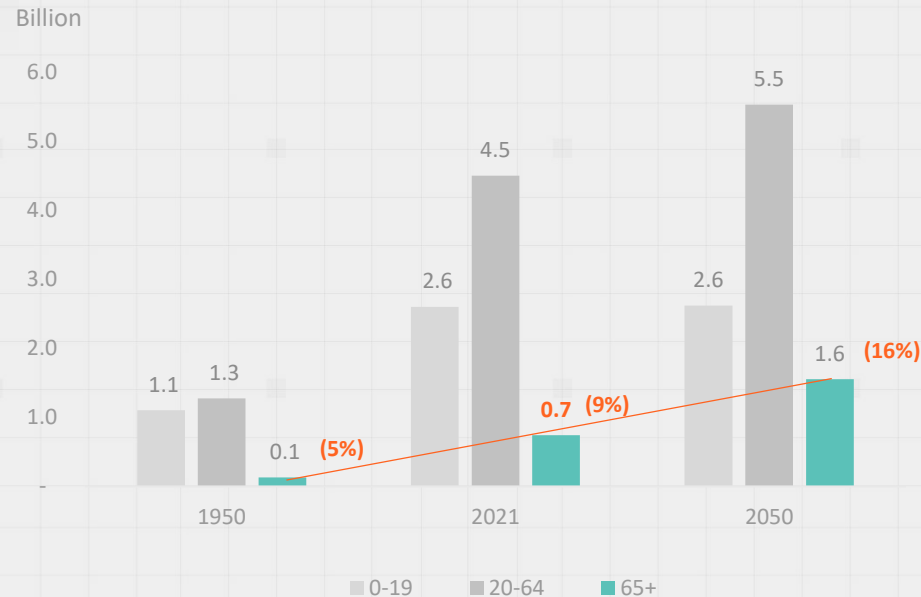
Radar-based Healthcare Solution

Securing those in need with responsive, contactless care



The Current Situation of Elder Care Industry

Aging Population



- In particular, Japan is the most prominent, with an aging population of **29% by 2021**. And Europe reached **20.3%**.
- For the elder over 65, the **average lifetime after retirement is 20 years**, and the future trend is increasing.

UN define: if a country has **7%** of its population over 65, It can be defined as an "aging country".

Problems Existing in The Elder Care Industry

Globally, the home care industry suffers from workforce shortages, as the demand for home care aides outstrips supply.



The shortage of long-term care worker

In UK, the adult care worker had a **vacancy rate of 8.2%**, more than twice the UK average. The sector is facing a daunting shortage of **105,000 workers**.



Status of long-term care workers

- Fewer employees and more mobility
- Low income
- Long working hours

Healthcare Digitization is the Solution to the Challenges



- Save labor costs
- Improving the efficiency of the organization

Pain points in the Lives of the Elder

Fear of falling at home

Falls are the primary cause of accidental deaths among the elder

- Every year, 30% of the elder will occur falls, more than 52% will cause serious accident without detected and treated in time, including fractures and stroke etc.



Bedroom

- Main activity area
- Clutter is easy to trip and fall (Bedside, cabinet corner)

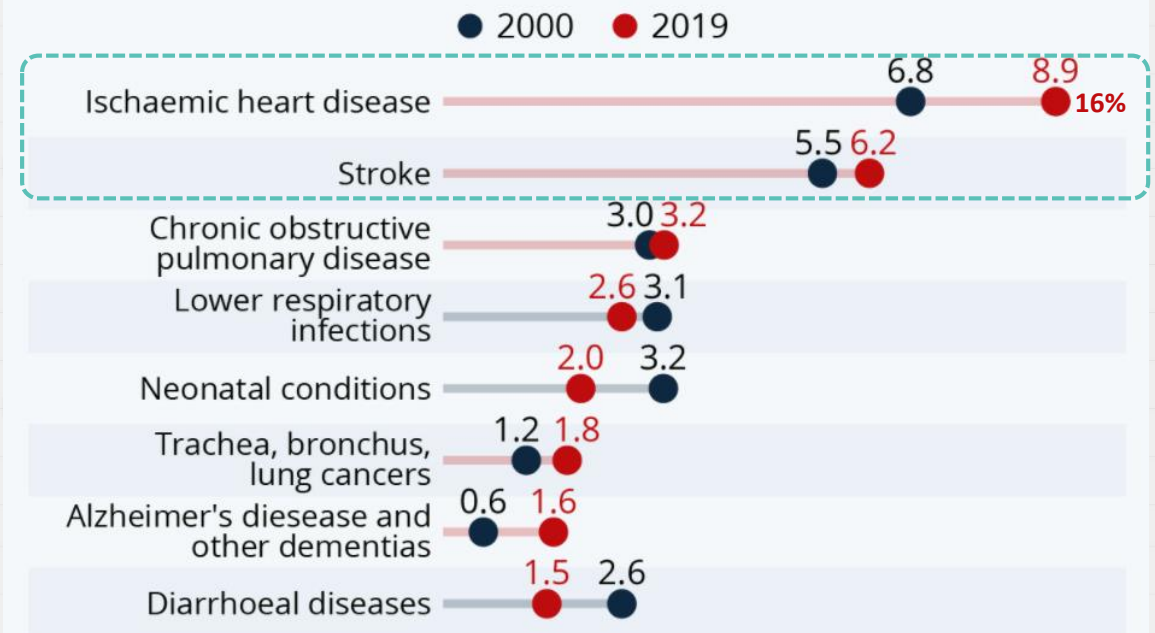


Bathroom

- Wet bathrooms always cause falls
- Sitting on the toilet for too long may cause leg numbness, leading to falls

Daily Health Management

Digital health management is needed to find issues at a early stage



Source: World Health Organization

- Cardiovascular diseases(CVDs) are the number one cause of death globally.
- Early diagnosis & continuous health monitoring can lower mortality rate by 30%-70%.

Application Scenarios



Nursing Home

Nurses or doctors will be informed in time if there is any abnormal situation.



Home-based Care

Family members can receive abnormal alarm in time and check the health status of the elder.

Rehabilitation Center

Detecting falls and the patient's sleep condition.



Confinement Center

Detecting postpartum mothers' and babies daily activities sleep condition to avoid accidents and help with quick recovery.

System Topology

Alert Mechanism

Timely Response

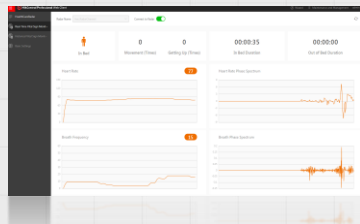


PC Alarm



APP Alarm

Basic Vital Signs Reports



Timely Response and Service SOP Flow



PC Alarm



APP Alarm



Medical
Workers



Care Service

Detailed Health Repots



Vital Signs Repots
Sleep Reports
Health Reports
...

HikCentral
Professional



Existing 3rd Party Care
Service Platform

1. Local radar and cameras device management
2. Building & campus video surveillance system management
3. System integration interface

1. Falls alert management and care service SOP management
2. Deep health reports analysis such as sleep report display
3. Other applications if needed from Hikvision systems

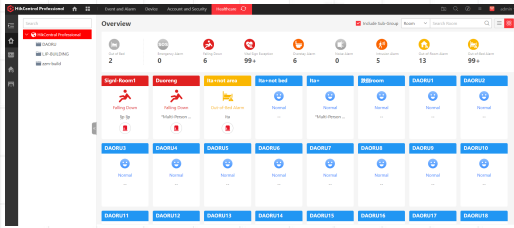
Home/Personal Space

Basic data detection to solve indoor emergencies



Fall Detection Radar Auxiliary care Radar Thermal Presence Detector

System Topology



Healthcare Overview



HCP Client



HCP Server

LAN

Room 1



Fall Detection Radar



Auxiliary Care Radar



Thermal Presence Detector



Thermal Radar Presence Detector

Room 2



Fall Detection Radar



Auxiliary Care Radar



Thermal Presence Detector



Thermal Radar Presence Detector

Room N



Fall Detection Radar



Auxiliary Care Radar

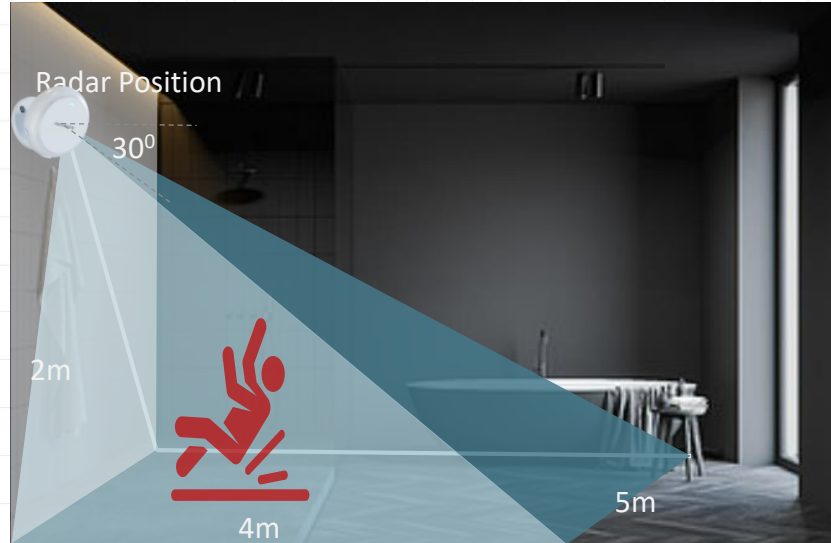


Thermal Presence Detector



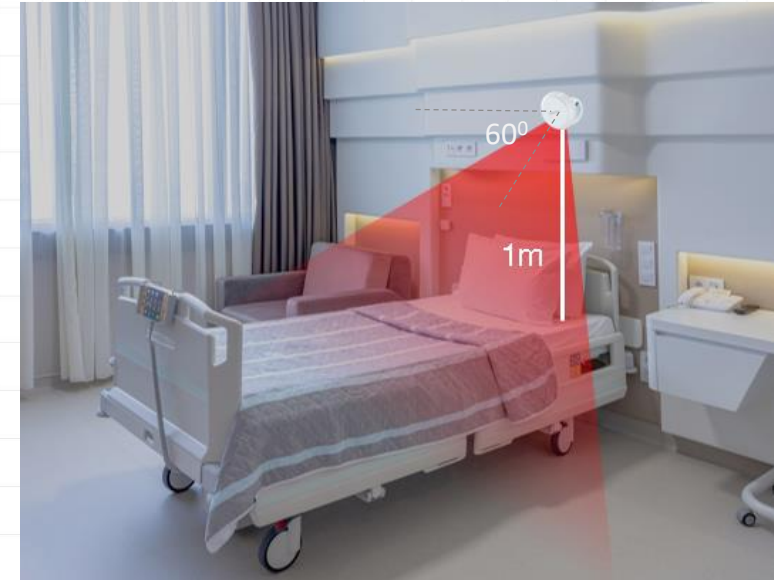
Thermal Radar Presence Detector

Deployment



Fall Detection Radar(Self-developed)

- The radar needs to be installed at a height of 2m and the detection area is centered horizontally. The detection area supports a maximum of 4 x 5m.
- Install the radar against the wall, ensure that the front of the radar panel is tilted down by 30°.



Auxiliary Care Radar(Self-developed)

- Use tools to fix the radar on the wall or ceiling, make the radar to bed height 1m, and the maximum detection range of the bed is 2*2m. Wall is recommended.
- The radar is aimed at the upper body, and ensure the arrow on the radar points to the foot of the bed.

Healthcare Management

HIKVISION

Functions

Vital Signs



Heart Rate



Respiration

In Bed State



In Bed



Out of Bed

Fall Detection



Overstay



In Bathroom

Video Check



Non-visible

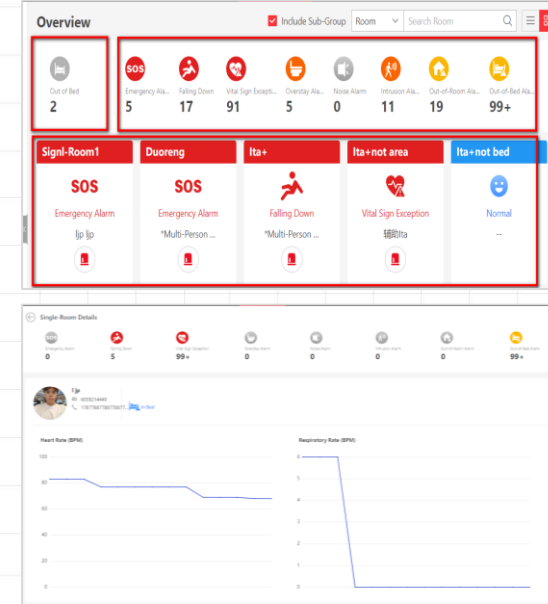
Intrusion Detection



People Overstay



HCP



8 Alarm Types

Fall Detection Radar



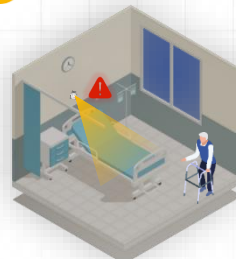
Fall Alarm



Vital Sign Alarm



Out-of-Bed Alarm



Emergency Alarm



Only 3rd Gen auxiliary care radar support

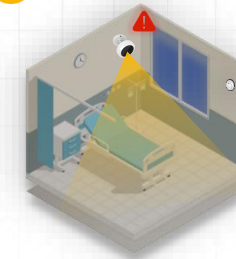
Auxiliary Care Radar



Restroom Overstay Alarm



Out-of-Room Alarm



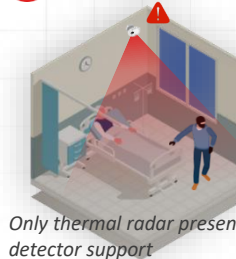
Noise Alarm



Thermal Presence Detector



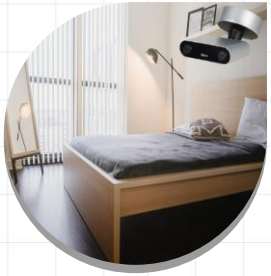
Intrusion Alarm



Only thermal radar presence detector support

Existing Solutions for the Fall Detection

Existing Solutions



Fall Detection Camera

- Loss of **privacy**
- Being a constant **undersurveillance**



Elder Watch

- **Lower comfort** degree
- Need to charge frequently and wear it **all the time**



Emergency Button

- Lack of **intelligence**
- Unable to push the button **in time**

What we Need



Privacy Protection



Non-Contact



Intelligent

Fall Detection – Radar + Thermal Camera (Solution A)

HIKVISION



Fall Detection Radar



Thermal Presence Detector

Designed For Indoor Prevention



No Privacy Disclosure



Non-Contact



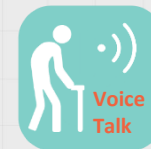
No Buttons



Alarm linkage video



Privacy protection



Intelligent Detection



Presence Detector



Immediate response after a fall

② Activate thermal detector and Intercom

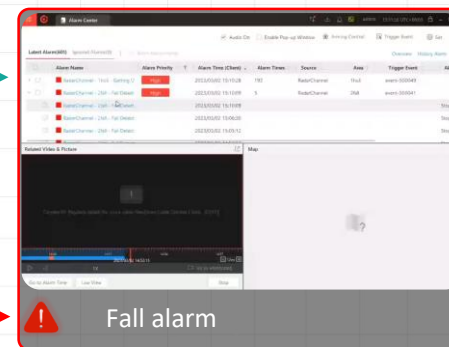
① Send an alarm

③ Rescue

Thermal Presence Detector

Fall Detection Radar

Fall

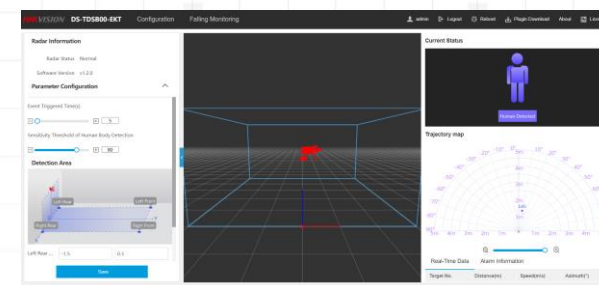


· Add visual validation

· Reduce false positives



Check and rescue



Installed in the living room

Alert immediately if a fall occurs

Fall Detection Radar



DS-TDSB00-EKT/POE/4M

Working Frequency	60 to 64 GHz
Modulation Wave	FMCW
Detection Range	20 m ²
Data Cycle	70 ms
Horizontal & Vertical FoV	-45° to 45°, -45° to 45°
Communication Mode	WIFI, RJ45 interface
Working Voltage	Type-C DC5V IEEE 802.3af POE
Working Electric Current	≤700mA
Weight	180 g



Large detection range

- The detection area supports a maximum of 20m² (4*5m);
- For a standard 30m² single room, it is recommended to install two or three devices.



High accuracy

- Bending, sitting, and squatting will not be recognized as falls.



No effect on human body

- Using millimeter wave radar, and the radiated power is below 10dbm, which is smaller than mobile phones.

Tips

1. The device cannot pass through walls or glass objects.
2. Please avoid fanner blowing directly at the radar, which will affect the device judgment.

Thermal Presence Detector



HM-TD1017-1/QW-
HS111(O-STD)(B)

Resolution	160*120
Pixel Pitch	17 μ m
Monitoring height	2.7m
Field of View	90.0 °(H) × 65.3 °(V)
Focal Length	1.9 mm
Communication Mode	WIFI, RS-485
Working Voltage	5 to 16 VDC, Type-C POE
Alarm Output	1, alarm output
Weight	100 g



Privacy protection

- Thermal image only, GDPR risk free
- Support privacy mask



Intelligent Detection

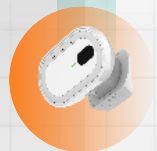
- Out of room alarm
- Out of bed alarm
- Restroom overstay alarm
- Audio exception

Tips

1. The device cannot pass through walls objects.
2. Principle: Identify people by judging the head-to-shoulder ratio of the image and count the number of people.

Fall Detection – All in One Device (Solution B)

HIKVISION



Thermal **Radar** Presence Detector
= **Fall Radar** + Thermal Presence Detector



Fall Detection



Audio Exception



Out of Room Alarm



HM-TD1018-1/QR



Privacy Protection



Built-in Radar



- Corner mounting
- Recommended height: 2.4m

Display thermal images to protect privacy

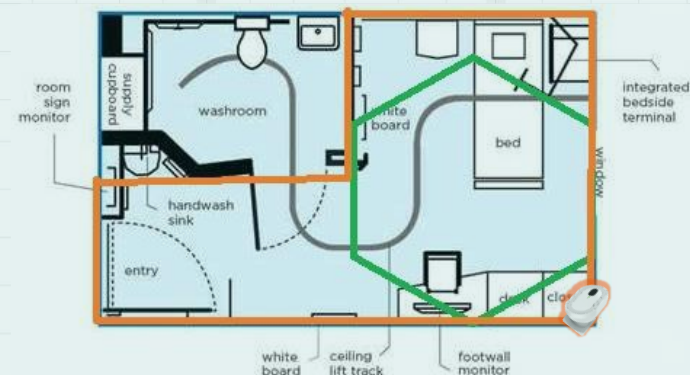


Sit down and fall



Walk in and fall down

Detection Range



Fall detection range

Thermal imaging range

Tips:

- The fall detection range is smaller than the thermal imaging range.
- If fall detection is to achieve whole-house coverage, more radar equipment is needed

Existing Issues in Nursing Home Service

Pain Points

What We Need



Inefficient daily ward rounds

- Go from room to room may cost a lot of time
- Unable to know the status of elder in real time



View if everyone is in bed in real time



Lack of precise and meticulous management



Abnormal events alarm facilitate timely action



Lack of long-term health data records

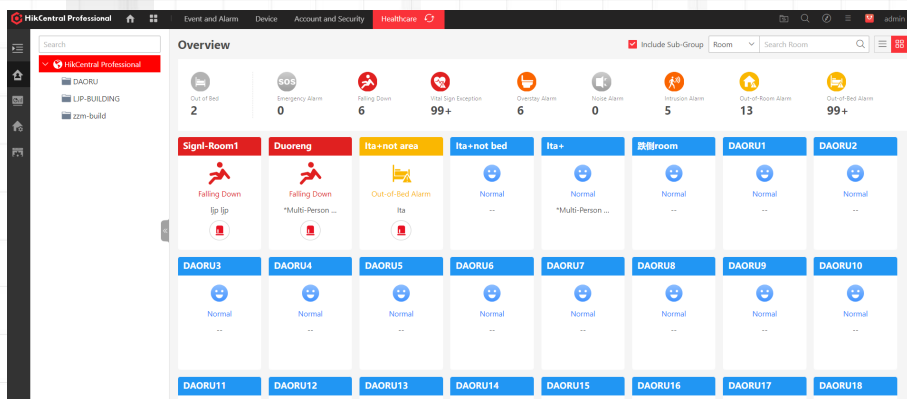
- Lack of evidence such as sleep quality, heart rate to detect disease at an early stage



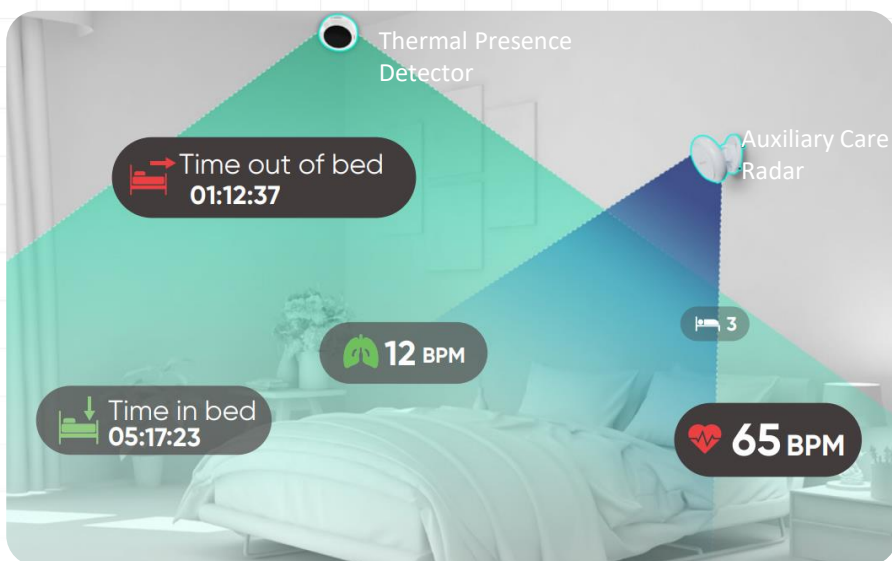
Daily basic vital signs and sleep data

Healthcare Management

HIKVISION



- Auxiliary Care Radar provides significant medical information for better analysis of sleep quality and overall health.
- Thermal Presence Detector detects if the patient is in room or not.



Auxiliary Care Radar



DS-TDSB00-EKH/POE/2M

Working Frequency	60 to 64 GHz
Modulation Wave	FMCW
Detection Range	1 to 2.7m
Data Cycle	200 ms
Horizontal & Vertical FoV	-45° to 45°, -45° to 45°
Communication Mode	WIFI, RJ45 interface
Working Voltage	Type-C DC5V IEEE 802.3af POE
Working Electric Current	≤700mA
Weight	170 g



High measurement accuracy

- Heart rate deviation within ± 5 bpm
- Breath rate deviation within ± 2 bpm
- The accuracy rate is over 90%



No effect on human body

- Using millimeter wave radar, and the radiated power is below 10dbm, which is smaller than mobile phones

Tips

1. **Heart attack** can't be detected, if there is chest pain, chest tightness and other physical discomfort, please call emergency services.
2. Different **positions will affect accuracy** (back and lying positions are more accurate, side position will be slightly affect).
3. **The iron bed** may have an impact on accuracy.

Intelligent Healthcare –Anomaly Warning

Typical Automatic warning of abnormal status

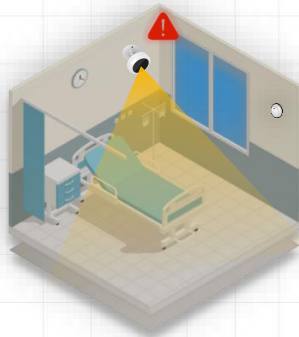


Fall Alarm

- Automatic fall detection

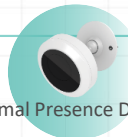


Fall Detection Radar

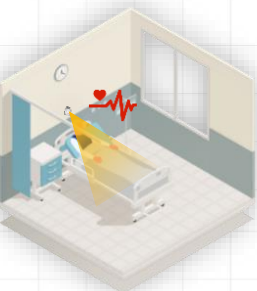


Out-of-Room Alarm

- Triggers alarm when room vacant at night for an extended period



Thermal Presence Detector



Vital Sign Alarm

- Triggers alarm when the vital sign is higher or lower than preset value



Auxiliary Care Radar



Restroom Overstay Alarm

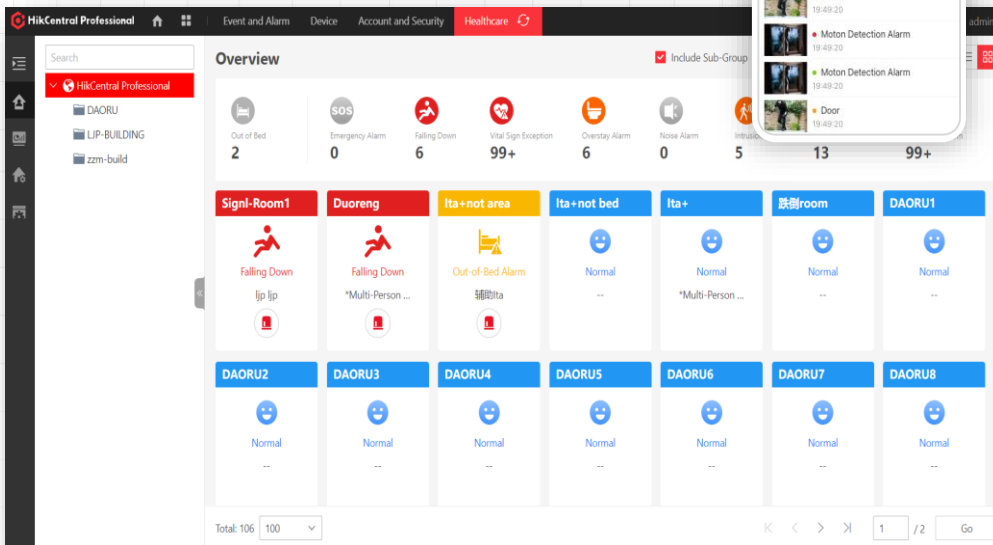
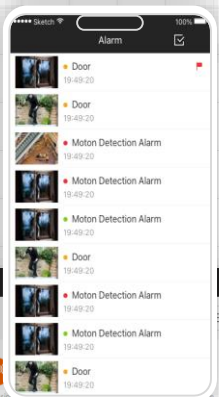
- Triggers alarm when patient remains in bathroom for an extended period



Noise Alarm

- Detects screaming, shouting, and other noises

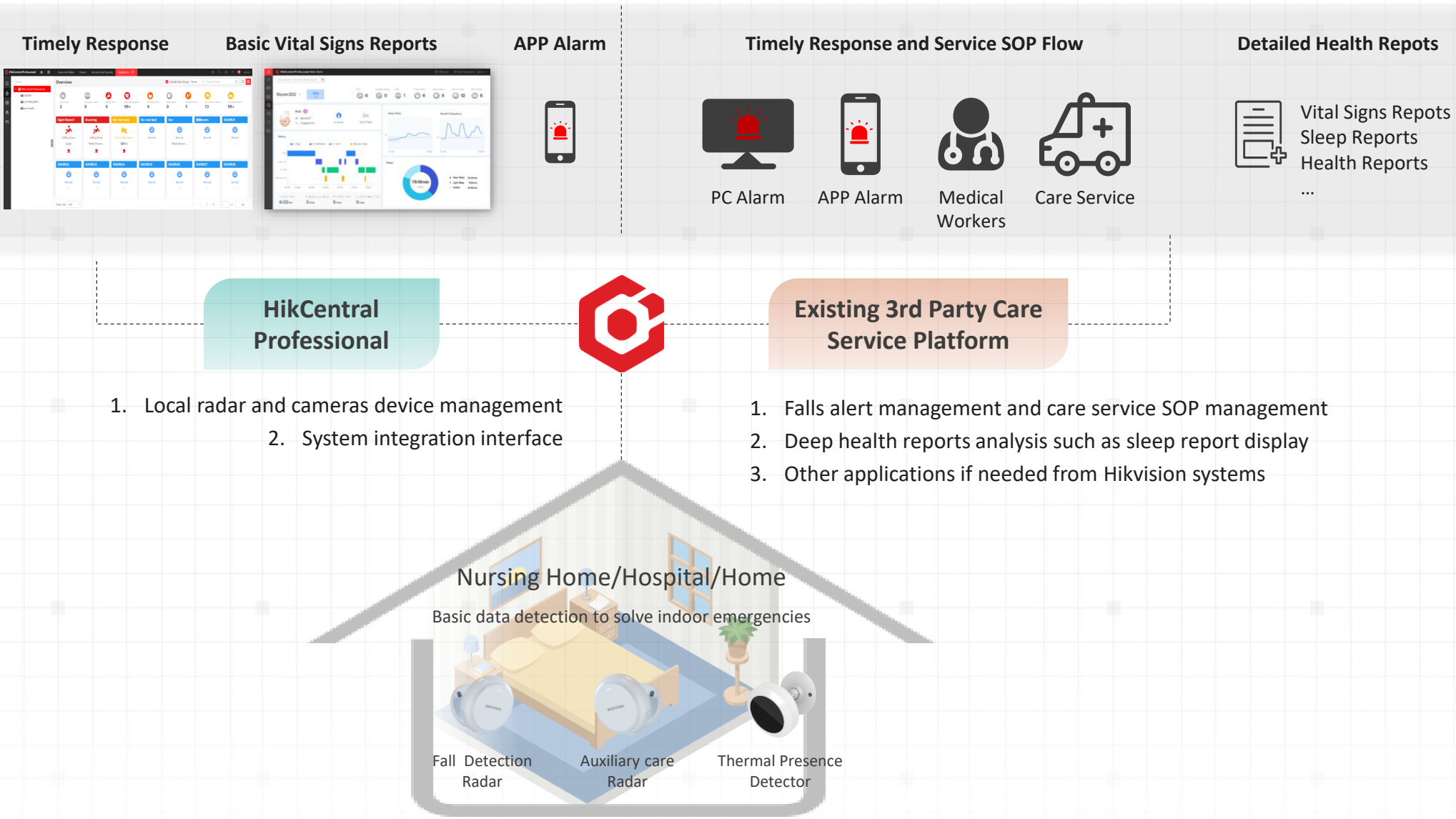
- Seven unique alarms with radar sensors and presence detectors
- Unified management and configuration of radar sensors through a web interface
- Visual charts to help improve
- Management efficiency



HCP Web Interface

Radar System Topology

Alert Mechanism



HealthCare Platform

Room Overview

HIKVISION

Overview

Include Sub-Group Room Search Room

Out of Bed 2 SOS Emergency Alarm 0 Falling Down 6 Vital Sign Exception 99+ Overstay Alarm 6 Noise Alarm 0 Intrusion Alarm 5 Out-of-Room Alarm 13 Out-of-Bed Alarm 99+

Signl-Room1	Duoreng	Ita+not area	Ita+not bed	Ita+	跌倒room	DAORU1	DAORU2
Falling Down ljp ljp	Falling Down *Multi-Person ...	Out-of-Bed Alarm Ita	Normal --	Normal *Multi-Person ...	Normal --	Normal --	Normal --
DAORU3	DAORU4	DAORU5	DAORU6	DAORU7	DAORU8	DAORU9	DAORU10
Normal --	Normal --	Normal --	Normal --	Normal --	Normal --	Normal --	Normal --
DAORU11	DAORU12	DAORU13	DAORU14	DAORU15	DAORU16	DAORU17	DAORU18

Overview of all alarms

• Easy to view the elderly status

The alarm is happening

- Ranking ahead the alarm which is happening

All Rooms

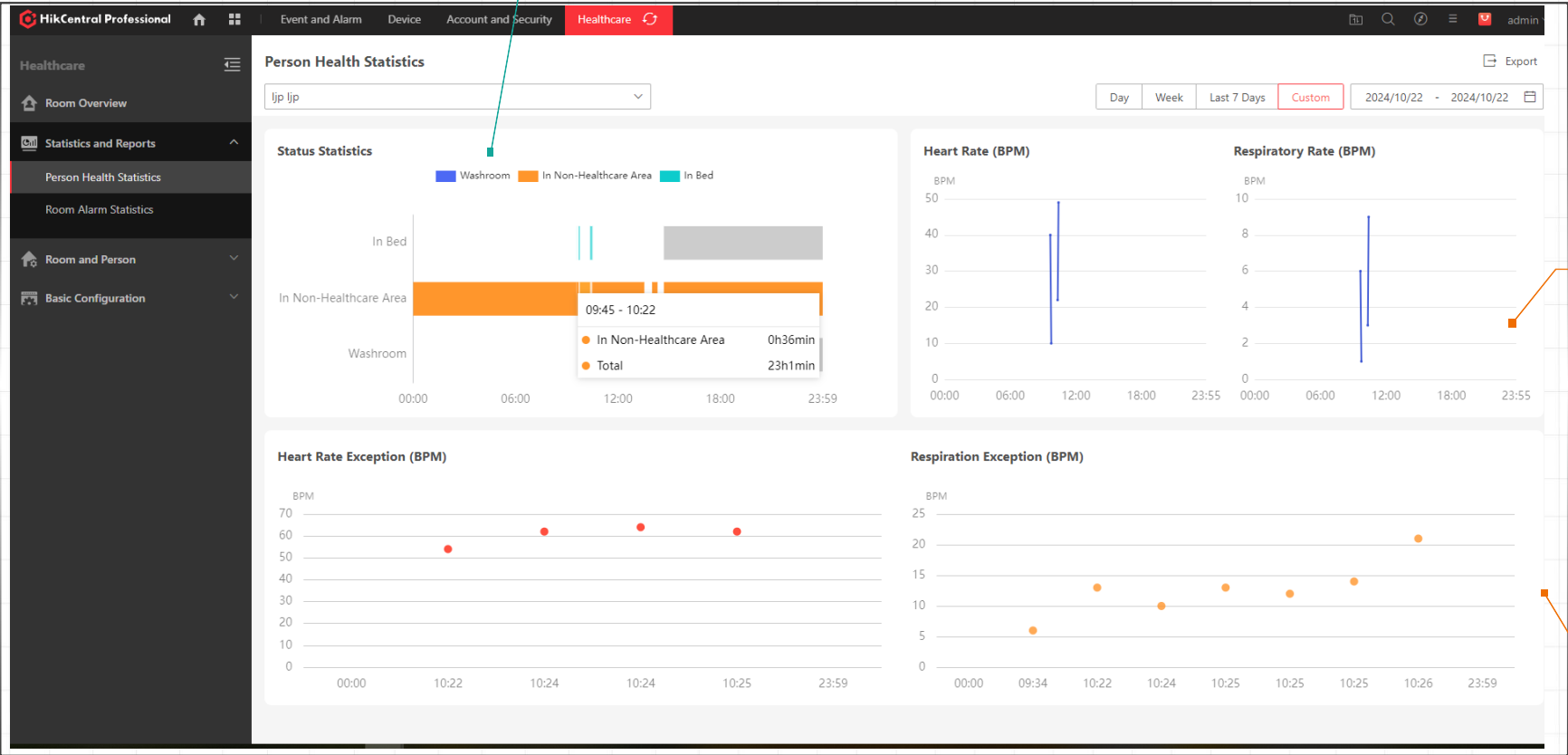
- All normal rooms

HealthCare Platform

Person Health Statistics

Show Person overview

- Status and Time Period










vital signs

- Heart Rate & Breath Rate

vital signs Exception

- Exceptions

Device	Product Name	Code	Picture	No.
Fall Detection Radar	DS-TDSB00-EKT/POE/4m	314400141		<ul style="list-style-type: none"> • Self-developed • Support POE; • Web configuration;
Auxiliary Care Radar	DS-TDSB00-EKH/POE/2m	314400140		<ul style="list-style-type: none"> • Self-developed • Support POE; • Web configuration; • Side wall installation (1m from bed height)
Fall Detection Radar (3 rd Gen)	IRS-BFDR6-H1AG	Release In end of the year		<ul style="list-style-type: none"> • Self-developed • Support POE; • Web configuration;
Auxiliary Care Radar (3 rd Gen)	IRS-BVSMR3-H3AG	Release In end of the year		<ul style="list-style-type: none"> • Self-developed • Support POE; • Web configuration; • Side wall installation (1m from bed height)
Thermal Presence Detector	HM-TD1017-1/QW-HS111(O-STD)(B)	305401807		<ul style="list-style-type: none"> • Thermal camera
Thermal Radar Presence Detector	HM-TD1018-1/QR(O-STD)	305401987		<ul style="list-style-type: none"> • Thermal camera • Falling down detection
HCP License	HikCentral-P-HealthCareRadar-1Unit	401000514		Depends on project size
	HikCentral-P-HealthCareThermal-1Unit	401000635		Depends on project size
	HikCentral-P-VSS-Base/0Ch	401000147		1



Note: HCP HealthCare Version is a customized version based on HCP 2.6 add on

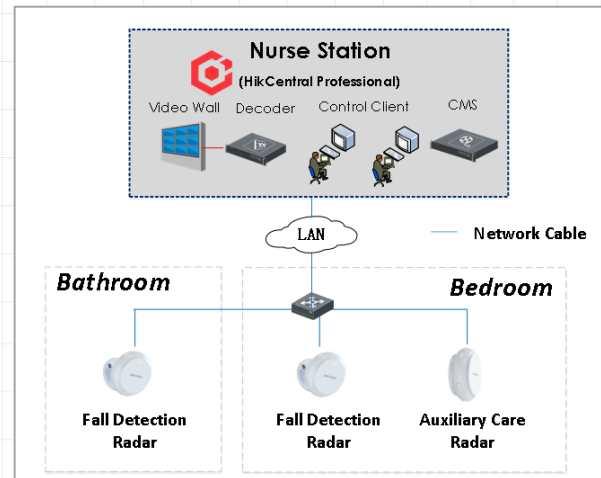
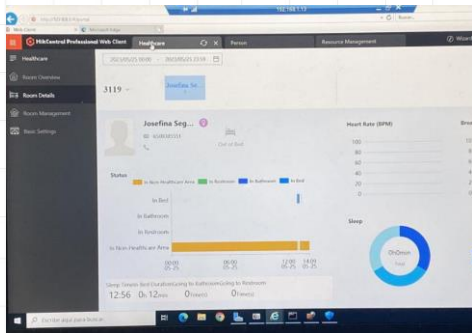
Barcelona PALAR POC case

- Auxiliary care radar + Fall detection radar + HCP.

Project Background

Benito Menni is a elderly care center located in Barcelona, Spain, with a highly specialized treatment center in the fields of rehabilitation, psychotherapy and geriatric care. The senior center aims to provide patients with comprehensive medical services to help them regain their health and quality of life.

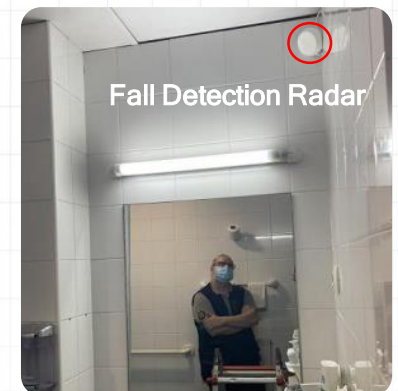
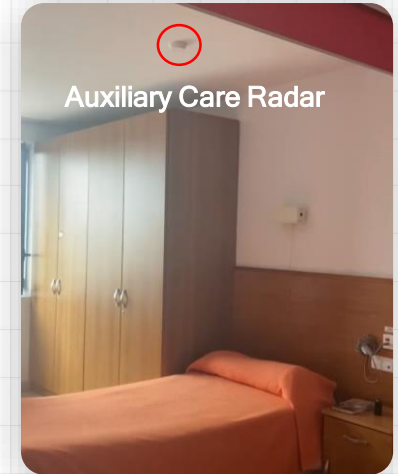
Solution Introduction



Customer Benefit

- Bedroom:** each bed is equipped with auxiliary care radar to monitor the vital signs of the elderly and alarm for leaving bed at night;
- Living room:** install the fall radar to detect the elderly fall alarm;
- Bathroom:** fall detection radar monitoring personnel fall and bathroom overstay alarm;

Deployed Onsite





olutions by Function

Thanks