PARTICIPATORY HEALTHCARE SYSTEM.
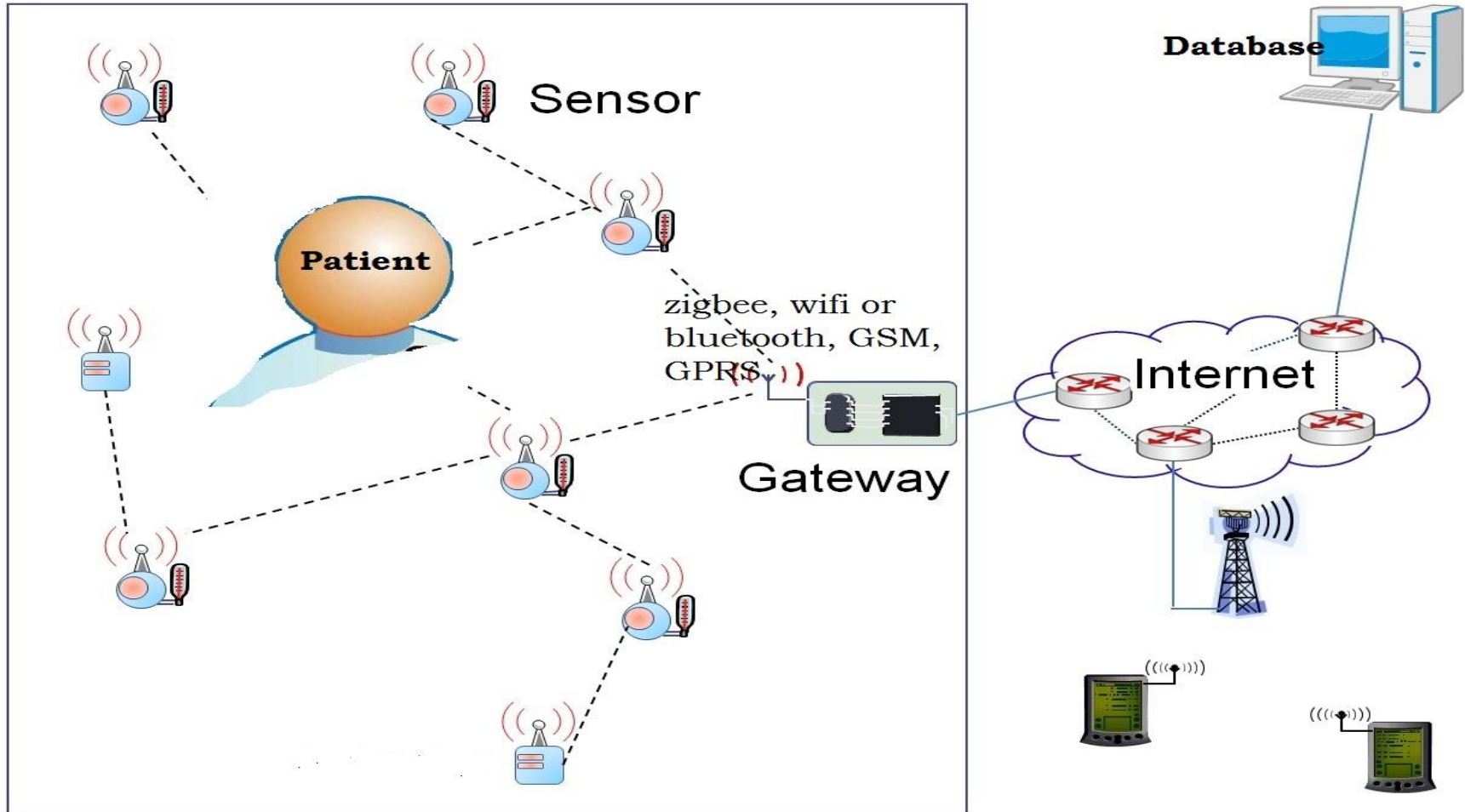
sensing and communication

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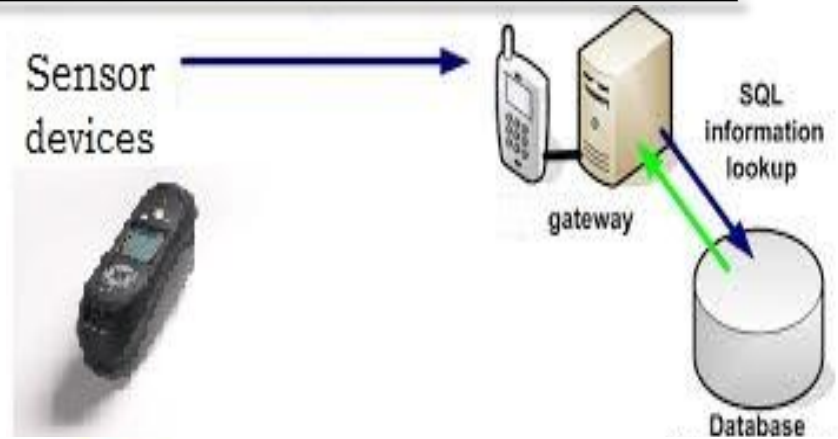
Project description

Participatory healthcare system is a patient distance monitoring system using sensor devices.

The sensing and communication

> **Sub-tasks**
>
> - **Sensing.**
> - **Communication.**
>   - ❖ **Sensors-Gateway.**
>   - ❖ **Gateway-Database**

Sensor devices

SQL information lookup

gateway

Database

Airflow Sensor (Breathing)

Patient Position Sensor (Accelerometer)

Electrocardiogram Sensor (ECG)

Pulse and Oxygen in Blood Sensor (SPO2)

e-Health Sensor Shield for Arduino and Rasberry Pi

Body Temperature Sensor

Galvanic Skin Response Sensor (GSR - Sweating)

User requirements

- **Sensing mechanism.**
  - *Vital parameters reading*
- **Communication system**
  - *Data transfer*
- **Security**
  - *Avoid unauthorized access*
  - *Avoid interference*
- **Display system.**
  - *Data visualization*

Requirements Analysis

- *Reading patient's vital parameters.*
  - ❖ *Need sensor devices.*
  - ❖ *Different libraries(ehealth, raspberry pi and different sensors libraries).*
- *Send the collected information to a database.*
  - ❖ *Communication technologies(wifi, bluetooth, GSM, Zigbee, …).*
  - ❖ *Secure the information to avoid interference.*

Tools

- *Ehealth sensor platform, raspberry Pi and different sensor devices*
- *Communication Technologies (Zigbee, Bluetooth, Wi-Fi, GSM and GPRS).*
- *Gateway and visualization devices .*
- *Patient, Doctors and Nurses(Optional).*

Project Plan

Term 1	- Reading related papers that are related to: sensor networks in healthcare, communication technologies . - Use's requirements identification.(talked to a doctor and other none medical professionals) - Project website updating. - Requirements analysis and project progress presentation.
Term 2	- User interface design and implementation. - Designing a sensing data transfer prototype(can at least sense one vital signs and populate it in a database). - Project website updating. - Project progress presentation.
Term 3	- Project/system implementation, coding, configuring the security in the communication protocol, sensing and communication intergration. - Project website updating. - Project progress presentation.
Term 4	- System testing /different kind of testing. - Project website updating. - Project progress presentation.

References /Bibliography

1. Gao, T., Greenspan, D., Radford, RJ., Welsh, M., Alm, A., *Vital sign monitoring and patient tracking over a wireless network.* In proceedings of the 27th annual International conference of the IEEE EMBs, Shanghai, September 2005.

2. Madola,Z., *Participatory Healthcare System : Sensing and Communication.* Technical report, honours project , University of Cape Town, 2013.

3. Bagula, A. Zennaro, M. Inggs, G. Scott, S and Gascon, D. *Ubiquitous Sensor Networking for development (USN4D): An Application to Pollution Monitoring.* Sensors ISSN 1424-8220, Vol 12, Pages 391-414.

4. Ko, J. Lu, C., Srivastava, M.B., Stankovic, J.A., Terzis, A., Welsh, M., *Wireless sensor networks for healthcare.* vol. 98, No. 11, November 2010, proceedings for the IEEE.