Ad-hoc Sensor Network over Mobile Devices

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Ad-hoc Sensor Network

- Nodes included with different type of sensors, connected to each other to collect information.

Problems with Sensor Networks?

- Defficulty to deploy nodes on ground
- Cost of nodes
- Power constraints
- Node tracking issues
- Networking complexity
- Nodes security concerns

Proposed Solution

- Use mobile devices as sensor node & construct a network.
- Todays mobile devices equipped with different kind of sensors.
- Most mobile device are idel for about 70% of the time.
- Naturally deployed across the globe.
- No power constraints.
- Avoid initial cost and effort.

Requirements

- Magnetometer, the most common sensor on mobile devices.
- Use GPS service to get location data.
- Individual can specify the data requirement.
- Mobile application will work on that requirement to record data.
- Run as background service to record data.
- User ranking scheme according to users contribution to system.

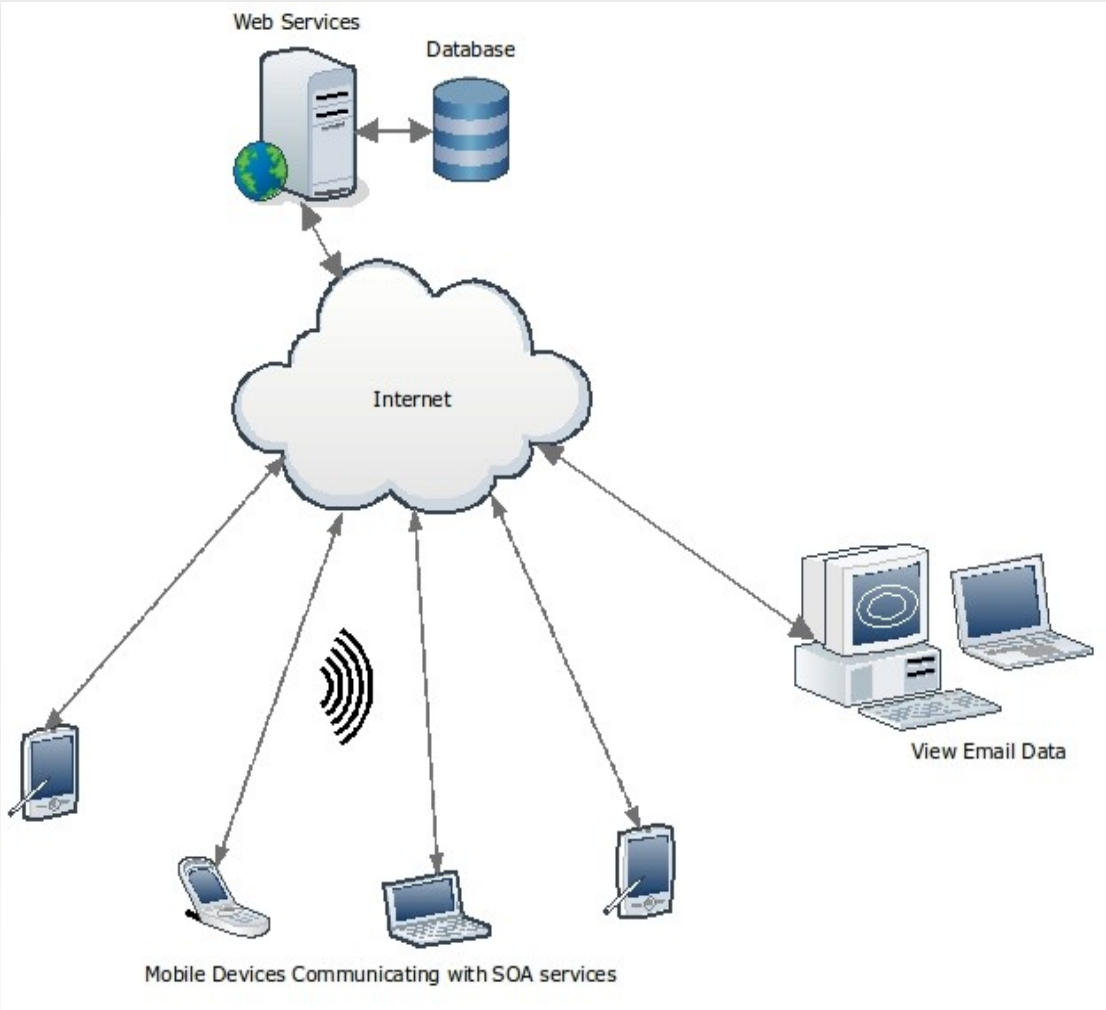
Application Details

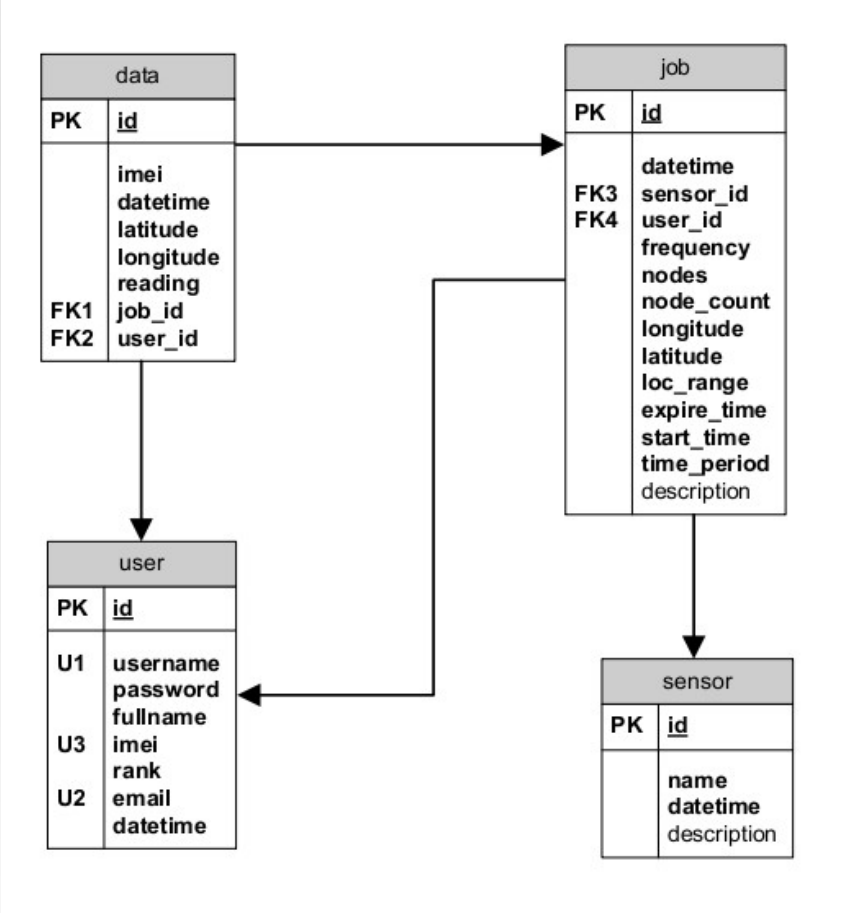
Mobile App implemented on Android 2.2

- Able grab large user segment because of popularity
- No need of specific hardware.
- Free and open source platform.

- Work with android 2.1 Eclair and upwards
- Client server based architeture.
- User needs live data connection.
- Any mobile device with android can user this system.

System Architecture





Evaluation

- Test cases were developed based on requirements and varified against the implemented system.
- App was distributed among selected 15 individuals to run it on their devices.
- There feedbacks were collected using questionnaire.
- That help to improve the system a lot.
- Also identified some important enhancements & expansion as future work.

Conclusion

- Any similar system?
- Why this is imortant?
- Currently this app work only for Magnetometer.
- But with minimum change to the system this can be extended to work with other sensor.
- This is not a replacement for the traditional sensor networks but alternative.
- handy tool for researches/ students who use sensor networks with low budget.
- Shared as Google Project.

Thank You