



SMART BELL

Wireless and mobile networks project of

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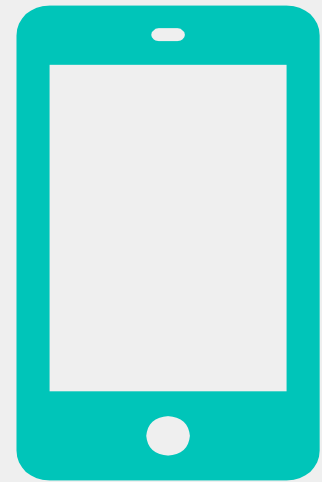


*A shop keeper spends a lot of
time in his back-shop*



*He wants to get alerted when
someone passes the door of his
shop*

*He has his smartphone always
with him*





SOLUTION PROPOSED

Wireless connected device with proximity sensor, able to send notifications to the shop keeper's smartphone

1.

Environment

Characteristics of the scenario

Characteristics of the scenario

- Small area to cover with connectivity
- One single door
- The solution has to be cheap, small and low energy

2.

Solution

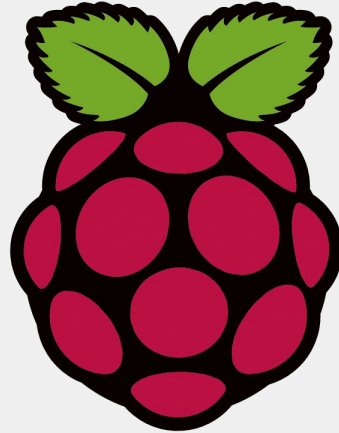


Characteristics of the solution

Characteristics of the scenario

- PIR based proximity sensor
 - To detect motion when someone passes the door
- Raspberry PI
 - To handle the PIR sensor
- Bluetooth chip
 - To let the Raspberry communicate with a smartphone
- Application on the smartphone
 - To receive notifications from bluetooth and display the alert when someone enters the shop

Why Raspberry PI



- It's cheap : the Zero version costs about 5\$
- Easily maintainable
- Adaptable to many situation
- Little need for electricity
- It's what I already had at home :)

Why Bluetooth

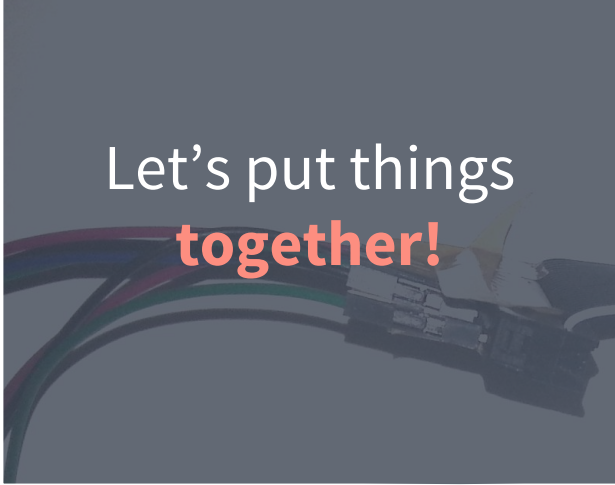


Bluetooth

- Have to transfer a small amount of data
- Available on mobile devices by stock
- Easily configurable
- Can cover the whole area of the shop

Why PIR sensor

- Very cheap and easily maintainable
- They can detect motion even in condition of low light
- No need for cameras
 - No need for authorizations
 - No privacy implications
- IT JUST DETECTS MOTION!

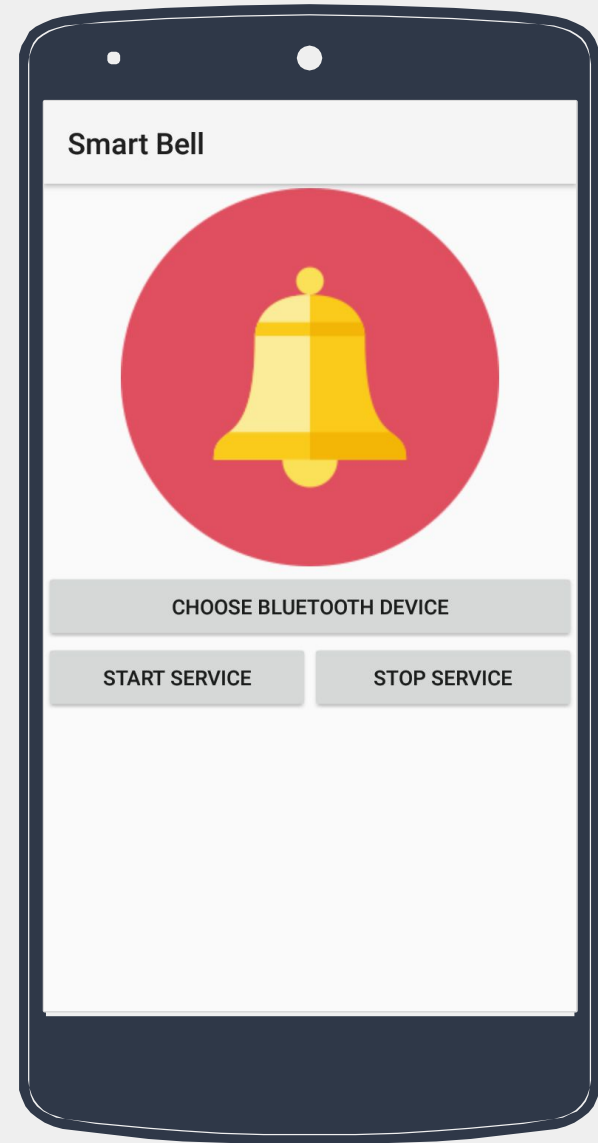


Let's put things
together!



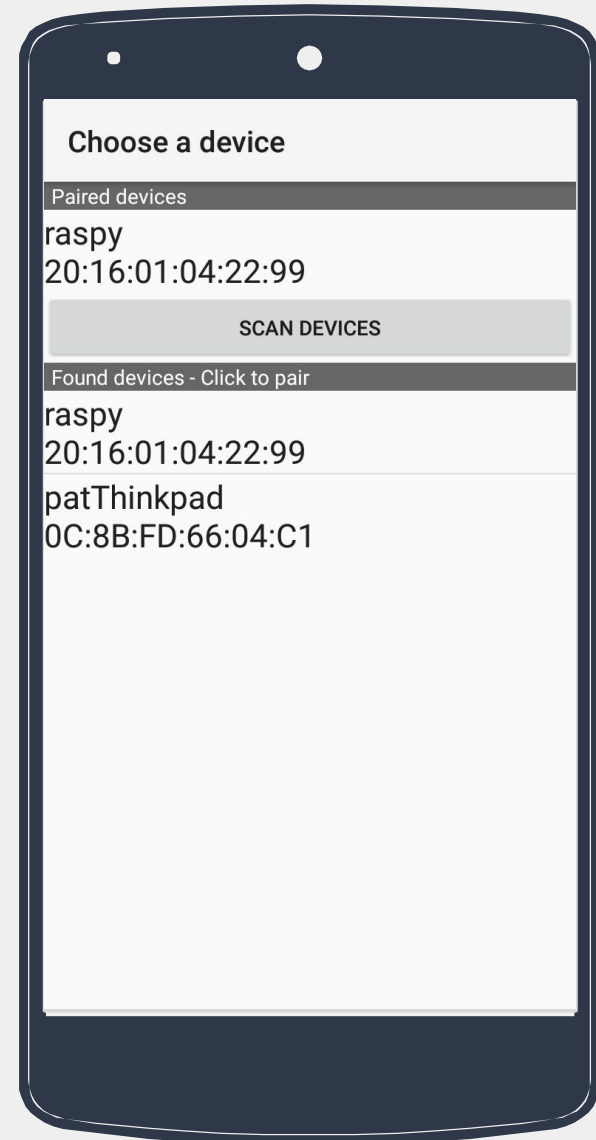
Smartphone APP

- Developed with Microsoft Visual Studio and Xamarin Framework (C# language)



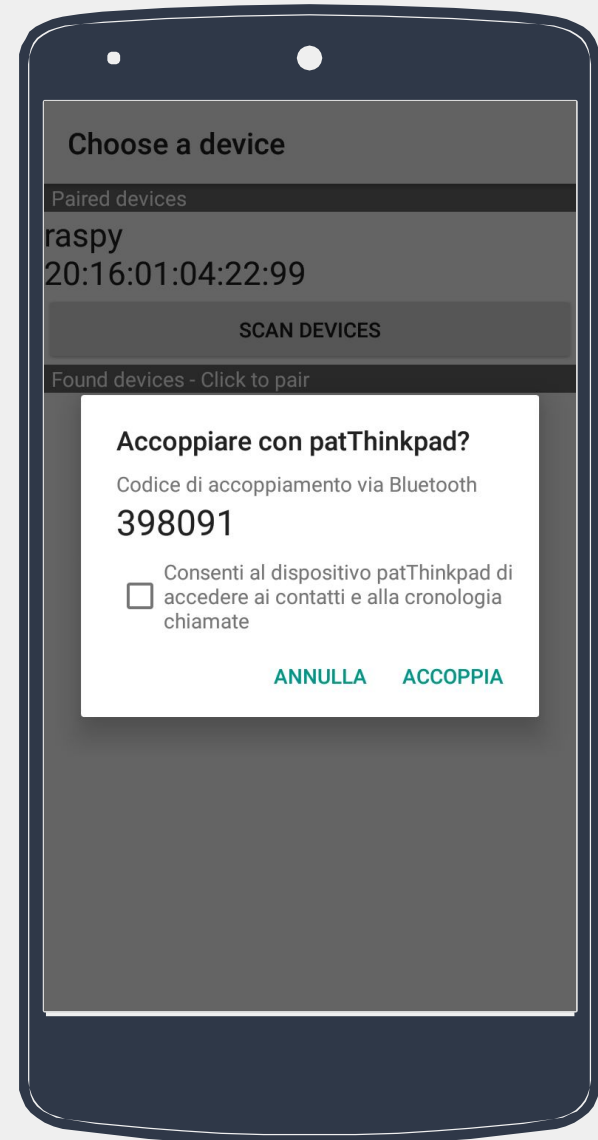
Smartphone APP

- Developed with Microsoft Visual Studio and Xamarin Framework (C# language)
- It allows the user to inquiry bluetooth devices



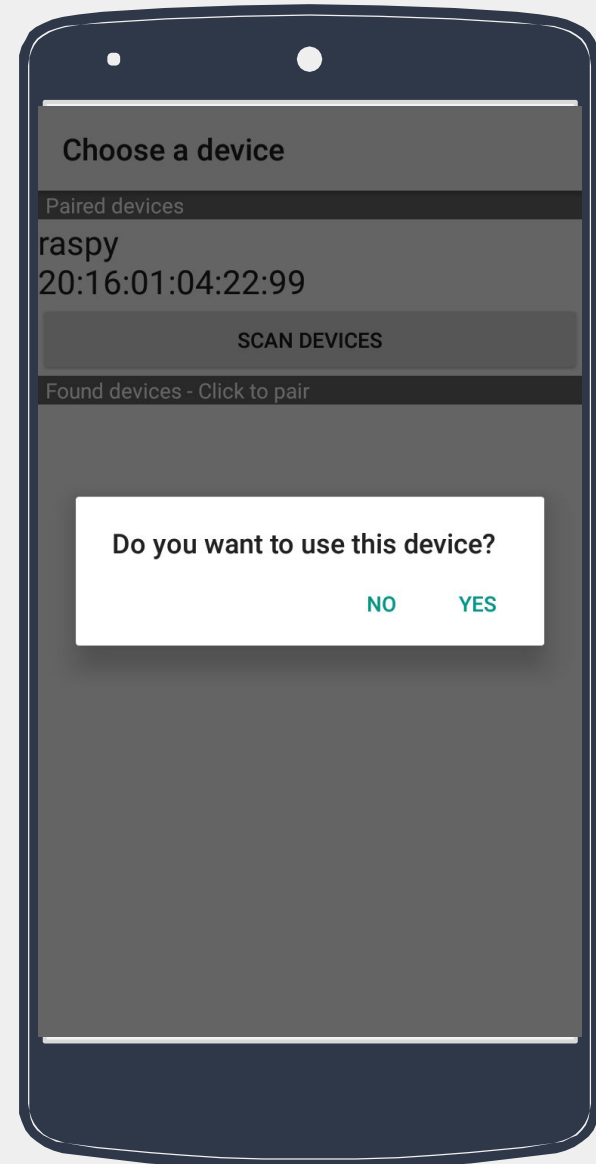
Smartphone APP

- Developed with Microsoft Visual Studio and Xamarin Framework (C# language)
- It allows the user to inquiry bluetooth devices
- It allows the user to pair a bluetooth device with the smartphone



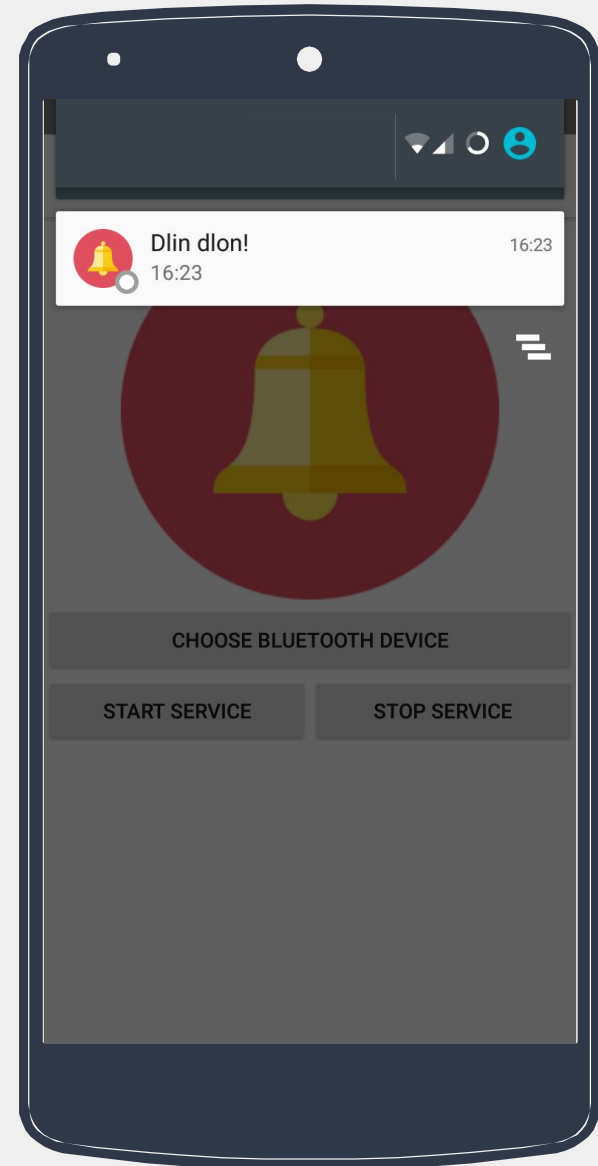
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- It allows the user to inquiry bluetooth devices
- It allows the user to pair a bluetooth device with the smartphone
- It allows the user to set the device as default



Smartphone APP

- Developed with Microsoft Visual Studio and Xamarin Framework (C# language)
- It allows the user to inquiry bluetooth devices
- It allows the user to pair a bluetooth device with the smartphone
- It allows the user to set the device as default
- When someone passes the door and shows an alert with sound and vibration



Process

**John Doe, the shop
keeper, is in his backshop**

**Someone enters in
the shop**

**THE PIR SENSOR
DETECTS HIS
MOTION!**

Process

The Raspberry PI receives a signal

It sends a message to the smartphone

The shop keeper gets alerted and can serve his client as well

Costs evaluation

Things to buy

- Raspberry PI Zero : € 8
- PIR Sensor: € 1
- HC-06 Bluetooth Adapter: € 5
- Wires: € 1

Equipment need

- Soldering station
- A computer
- An Android smartphone

Development costs

- 40 hours of development:
 - 1200€

But you don't really need it! I made it open source!

Source code available at <https://github.com/patriziotufarolo/BluetoothProximitySensor>

So...

what are you waiting for?

Build your own!

Thanks!

Any questions?

You can find me at:

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