Business plan

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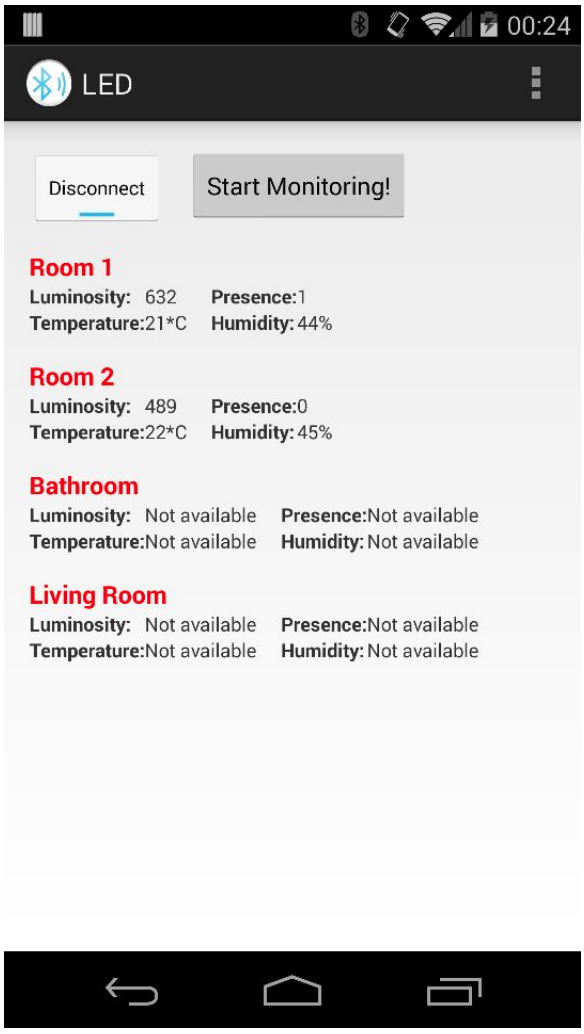
ABSTRACT

The main purpose of our project is to develop a scalable house automation system that will be enhanced in the future. In order to achieve that, we have used Bluetooth modules, a Central Android Device, trinket devices, and different kinds of sensors such as humidity, temperature, movement and luminosity. All of these sensors will be together in each room, in what we'll call a sensor box.

We have also created an Android application in charge of displaying the information received from the sensor boxes through Bluetooth.



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INTRODUCTION

The idea of this paper is to demonstrate a project undertaken to demonstrate the ability to transfer the current status of our house to our smartphone. This way we would be able to know all the information of our house, like: humidity, temperature, presence of people, etc. all that information will be a click away from anywhere in the world.

When we talk about home automation, we are referring to the use of Information Technology in order to have the whole control of our house. For example, we can control the temperature, amount of light in a room or even the presence of people in the house. Eventually, we would be able to open a window to control the temperature of the house or turn on/off a light if necessary. For these reasons, home automation is a very beneficial system for the owners due to an increase in security and an improvement in the energy efficiency.

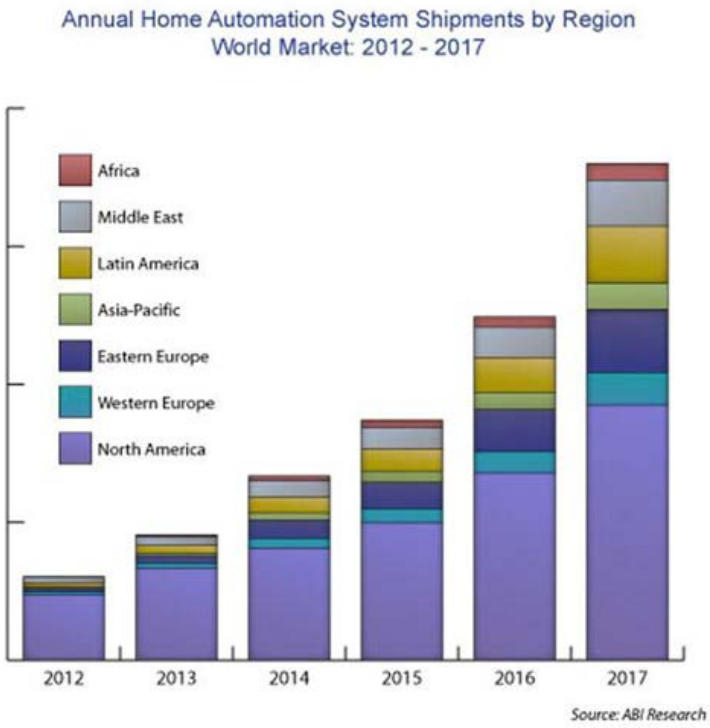
Home automation has been related to science fiction for too many years, but that changed when it became a reality since the early 20th century. That happened due to the fast growth of information technology and the introduction of electricity inside the houses. Nikola tesla was the first to patent an idea for the remote control of vehicles, and there were other home automation ideas during the World's Fairs in 1930s. The first person who develops a home automation system was an engineer named Jim Sutherland, in 1966. He named the system 'Echo IV', but this project never was commercialized. The change that improved the house automation market was the invention of the microcontroller, which allowed companies to reduce the electronic cost and adopt remote and intelligent control technologies.

Nowadays, home automation systems are still considered a system focused to rich people, but there are studies that show that 1.5 million of home automation systems were installed in the USA in 2012, and it's going to increase to 8 million in 2017.

Existing market

In all the science fictions movies of the past years, we get the impression that house automation is an IT product present in many houses. However, the reality is that it has been in the market for many years but never really took off. But during 2012 home automation and energy management have moved forward and the interfacing of these services within the wider Home Area Network looks set to become the major synergistic force in the future as it lowers costs and improves operational efficiencies. The US home automation market is now up for grabs and our project is looking forward to be the first to grab it and offer the best prices.

In the following graph we can see an expectation for next years of home automation market. We can see that, despite the slow beginning of sales for the past few years, this market is going to have an exponential increase during the next years.



The main reason for this kind of increase is the presence of smartphones and tablets in every house and pocket. Smartphones are capable of greatly improving the quality of service offered by home automation, because you can make any changes and check the status of your house from anywhere in the world. In addition, most people carry their smartphones always with them, making it the perfect remote controller of your house.

Many big companies of the United States, like AT&T, Verizon or Xfinity, are starting to offer this kind of services, but our company is looking forward to have the most attractive prices.

PRODUCTION COST ANALYSIS

Bluetooth Module ($22.50 per unit)

This module is a Bluetooth Serial Link client device, which can be connected with any computer or tablet, and it appears as a new serial/COM port. It also has the power to

detect or change the serial baud rate. We have used a total of 4 Bluetooth, one per trinket. Each Bluetooth is in charge to send a stream of data containing the values of the different sensors. This data is directed towards the central Android device.

Central Android device ($350 per unit, if needed)

In the Central Android device is where we store the Android applications to manage the sensors. In a first moment the role of this device is played by an android phone, but the future idea consist in using an Android tablet.

Temperature/Humidity sensors ($9.95 per unit)

This device uses a capacitive humidity sensor and a thermistor to measure the air of the environment, and it also takes out a digital signal on the data spin. We can read data from this the sensor once every 2 seconds, so the sensors reading can be up to 2 seconds old. We just need to connect the first pin to 5V, the second pin to the data input pin and the last pin is ground.

Luminosity sensors ($0.95 per unit)

These sensors act as a common resistance. The more light that hits the face of the sensor, the lower resistance it will have. The resistance value will vary from 200k**Ω** (total dark) to 10k**Ω** (10 lux brightness). In addition to this sensor, we will need an extra 10k**Ω** resistance from the entry of the trinket to ground.

Movement sensors ($9.95 per unit)

The movement sensors (or PIR sensors) are capable of detecting movement from 20 feet away. It allows us to insert a duration of the alarm, in order to allow the central device to receive the information. In addition, it has modifiable sensitivity to adjust it to our needs.

Trinkets ($7.95 per unit)

Trinkets are microcontrollers with 5V voltage and a small memory of 8KB flash. It can work at 8 MHz or 16 MHz. It has 5 I/O pins: one for sending info through Bluetooth, other for the temperature and humidity sensor, the third for the luminosity sensor and the fourth for the movement sensor. Therefore, we would still have a free pin that could be used to receive information from the Bluetooth in case we want to interact with the sensor boxes. It uses a mini-USB connection in order to connect to power or to the PC to upload new data.

Total price

In conclusion, the price per room is $51,3. Therefore, for a simple house with two rooms, one bathroom and a living room, the price for the hardware parts would be $205,2. In the event of a mass production, the saves would be at least of $10 per room.

SWOT Analysis

Opportunities

• Smart energy grid

- Rising utility, water and waste disposal costs
- Safer and comfortable way of living
- Reduction in cost of renewable energy generation technology
- Monitoring and controlling home at any time
- Proactive detection of faulty equipment and devices

Strengths

- Competitive price
- Growing industry
- Strong emphases on customer relations and development
- Strong web presence and client connection via Internet
- Focus on leading edge technology acquisition
- Unique installation report/plan products, combination packages give flexibility to clients

Threats

- Recession
- Technology changes
- Technology educated level
- People opposed to putting money upfront

Weaknesses

- Limited capital
- Technology changes in hardware and software
- Rapid technology growth needs large budget
- Customers do not easily trust a new company

SUMMARY

As we have seen in this paper, house automation is that kind of futuristic product that everyone wishes for. However, this market is closer in time than we think and the prospective installations are high. In particular, the house installations are expected to grow exponentially in the next years.

In this context of growth and development, we expect to get in the market in the perfect moment and become a competitive brand mainly because of our cheap prices and scalable software.

There will be big companies fighting in this area. But little by little, we expect to be able to compete with them for a percentage in the house automation market. Our goals are big, but so is our desire to obtain them.