Research Chapter

This chapter will focus on Radio-Frequency Identification or RFID. RFID uses electromagnetic fields to read and write tags attached to objects. The tags contain electronically-stored information about the object. RFID tags are used in many industries, from supply chain management to contactless card payments.

In this project Near Field Communications or NFC technology which is a subset of RFID technologies will be used. Most modern smartphones can read and write NFC tags. NFC tags are passive devices which means they operate without a power supply of their own. They simply transfer information to an active device such as a smartphone. 0

There are five types of NFC tags:

**Type 1** tags have 96 bytes of memory. Its communication speed is 106 kbps.

**Type 2** tagsare like type 1 except they can have 48 bytes or 144 bytes of memory.

**Type 3** tagshave between 1 and 9 kilobytes of memory. They have a communication speed of 212 kbps. This tag is suitable for more complex applications and has a higher cost per tag. They are more expensive than type 1 and 2 tags.

**Type 4** tags are the largest and fastest with up to 32KB of storage and speeds of up to 424kbps. These tags are pre-configured at manufacture.

All these tags are read/re-writeable. They can also be set to read-only so that they can’t be tampered with.

In this project the main function of the tags will be to store product information. When the tag is scanned by an NFC enabled device the information will be sent to the application. Only a minimal amount of storage is required. Type 1 or 2 are perfectly suited for this application.

The technologies used in NFC are simple. They include NFC readers and the actual NFC tags themselves. Tags contain a microchip, a small amount of memory and an antenna all held together by a thin sheet of plastic.

The tags could be placed behind the price stickers for each product on the shelves. This will allow the users to place their phone near the price tag which will bring up information about that product. Every product in the store will get an NFC tag placed behind the price tag. The employees can tap an area of the map and then scan a product’s NFC tag which will add it to the map.

Advantages

* Simple. Just place your phone near the tag and the user doesn’t have to do anything else.
* Most phones nowadays are NFC enabled as contactless payments solutions such as Google Pay and Apple pay become more popular.

Disadvantages

* Cost. The individual tags can cost around 30 cent each.

References

https://electronics.howstuffworks.com/nfc-tag1.htm

<https://nfc.today/advice/nfc-tags>

<https://www.radio-electronics.com/info/wireless/nfc/near-field-communications-tags-types.php>

<https://gototags.com/nfc/nfc-chip-types/>

http://www.rfwireless-world.com/Tutorials/NFC-Type1-Tag-vs-NFC-Type2-Tag-vs-NFC-Type3-Tag-NFC-Type4-Tag-Types.html