

NFC University Applications

The main issue this project is addressing is how to get the most out of Near Field Communication (NFC) wireless technology that is becoming more available in Egypt whether in Mobile phones in the market or in the supporting hardware and tags. NFC technology is being utilized in many countries today including even developing countries such as Brazil; its main uses are in transportation systems and electronic payment systems using mobile phones. Unfortunately, people awareness of NFC technology in Egypt is very limited when compared to other wireless technologies such as Bluetooth, Infrared or WiFi; this limits any business opportunities in front of companies which may consider investing in this field. Our aim is to unleash this potential and raise public awareness of this technology and its uses through a set of applications developed for our faculty to facilitate day to day activities which might eventually increase investment opportunities in this field.

We have designed and implemented 8 different applications that are discussed briefly below:

1. **Payment System:** Students can use their NFC-enabled student IDs as prepaid cards. These prepaid cards are charged with balance and afterwards are used for paying in cafeterias.
2. **Automated Attendance System:** An automated NFC-reader device is used to record attendance of students by reading their NFC-enabled student IDs. Upon that, the list of attendance is sent to professor automatically by email.
3. **Access Control System:** In restricted and limited access areas, NFC-reader is connected to automatic door-lock in order to only give access to authorized personnel through their NFC-enabled IDs.
4. **Election Authentication System:** An automated authorization NFC-reader is used to authenticate voters and ensure voting integrity by reading the NFC-enabled IDs.
5. **Smart Poster NFC Tag Reader/Writer:** It is a marketing approach using NFC-enabled tags. These tags are mounted with advertisements or any specific information such as (URL, map location, calendar entry, SMS or email) using a writer Android application. Afterwards, the data on these tags can be retrieved by one tap from an NFC-enabled mobile phone.
6. **NFC Schedule matching:** It is an android application by which, each student saves his own schedule on his phone. Afterwards, he can send it to other colleagues to find common free slots vi simple NFC tap. Additionally, each student can scan professor's office hours NFC tag, match them with his schedule and send an e-mail to the professor to for an appointment.
7. **Result Announcement System:** NFC tags containing results can be used instead of long result sheets hanged on building walls. Therefore, each student scans the tag, gets his grade as well as useful statistics such as average grade, max, min, etc...
8. **NFC Navigation System:** NFC tags containing the co-ordinates of its locations are used to provide directions inside Cairo University Faculty of Engineering. When a student scan an installed NFC tag, a web application including a map is displayed on his mobile phone which gives him directions and shortest path to his destination.