A Survey on Smart Posters in Android using NFC and QR-Code

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ABSTRACT - *Smart posters are a promising new use case for NFC\QR-Code -enabled mobile devices, but there has been a general lack of security mechanisms for NFC/QR-Code smart posters'-SPAN - a secure smart poster system consist of three parts: an administrative web interface for managing posters, a backend server for storing and serving data, as well as an Android application for end-users. S-SPAN enforces and integrity of smart poster data as well as authentication/authorization of administrators and end-users, thus ensuring that only authorized users can access the content.[1] This project is useful for college assignments. It is very secure technique to share assignments with students.*

Keywords

NFC/QR-Code, Smart Posters, NFC/QR-Code enable Smart Phone, Security.

I.   INTRODUCTION

NFC is short-range communication. It is an expansion of Radio Frequency Identification (RFID) Technology Near Field Communication (NFC) is one of the most popular technologies in the field of mobile application services now days. The integration of NFC technology and smart mobile device (e.g., smart phones,) replicate the daily increasing popularity of NFC-based mobile applications which having proliferated in the mobile society.[2]

The QR Code is a very common 2-D barcode in use today. A QR code is square and its size varies between 21x21 (version 1) up to 177x177 (version 40) modules (a module is a small black or white dot that represents the actual data). QR codes of 25x25 (version 2) are very common as they are able to store a simple URL for accessing to a website. The Quick Response code helps customers to find valuable information fast. QR codes are used in transport ticketing, entertainment, commercial tracking, and product labelling/marketing, just to name a few. This is becoming very popular in mobile apps also, where you scan the QR code. By using a QR Code scanner app and it will show you the text or redirect you to the web page if it's URL for access website.[3]

Smart posters combine visual information of traditional posters and interactivity that NFC technology provides. The users can receive requested information after touching with their mobile devices specific images (icons) or data behind which NFC tags are located. Such tags store small amounts of read-only or rewritable data. A typical use case for NFC\QR-Code smart posters is to provide users of NFC\QR-Code-enabled smartphones with quick access to a URL related to the poster content. Smart posters are a promising new use case for NFC-enabled mobile devices, but there has been a general lack of security mechanisms for NFC/QR-Code smart posters.[2] The confidentiality and integrity of smart poster data as well as authentication/ authorization of administrators and end-users is not checked. There are situations that call for smart posters to contain sensitive information only informs to particular users. The NFC protocol currently has some weaknesses, e.g. the standardized NFC Data Exchange Format (NDEF) does not ensure integrity and authenticity, even in the presence of a digital signature[1].

II.   EXISTING SYSTEM

We all knows standard poster, which contains all the information inside poster. The information is in broadcast mode so that anybody can read that information Hence poster are always stick in public places.

Fig 1. Broadcast Poster

But what if we wanted to have a poster in public place but its contains should NOT be broadcast. Rather only selected users should be able to see that poster contents. The solution is "**Smart Poster**".

For example In College if staff wants to display any assignment/notices on notice board then they used to do paper work for assignment for each class. If student want to see any assignment display on notice board. Then student used to search their assignment of their class or division. So, it becomes very difficult for them to read that assignment. Then student take photo of that assignment. Staff used to send assignment through email for each department or classes.

III.   PROPOSED SYSTEM

The idea is that a college level assignment & notices can be made "smart", First the NFC/QR-Code Smart Poster are designed by admin. NFC tag or QR-Code barcode contains information; the tag or barcode can be placed behind the article. For example, the poster is created for TE student and it contains information about assignment. The article can be placed to notice board. When the TE student touch or scan his android mobile phone to tag or barcode, it will connect to server. After that authentication server will check all details of student and also check whether the student is TE student or not. If yes, then it will share that assignment information with that student.

1.   Backend Server

The backend server is for the smart poster application which consists of two crucial parts: A web interface for administrators and an API for the mobile application. In which only particular authorized users are allowed to access the administrative web interface. Formerly logged in, an administrator can add two types of smart posters: link posters or poll posters. A link poster contains a brief explanation and a URL to the web version of the poster or a related webpage. A poll poster consisting a question as well as up to ten choices, from which the user can choose. These responses are sent to a URL that the administrator specifies. When adding a poster, the administrator also has the option to set an expiry date; Once the expiry date has been set the poster will be automatically disabled after that date. In addition, for auditing and accountability reasons, all actions performed on the administrative web interface are logged. After an administrator adds a poster, the server generates a pseudorandom (312-bit) tag identifier for that poster. The administrator should write the tag ID into an NFC tag and stick it onto the poster so that users of the smart poster app can see the additional content.[4]

2.   Mobile Application:

Our API give the mobile app with read-only access to the database of tag IDs. For security, all API requests must be made via HTTPS, and all input is validated before being acted on it. The main API request, get the poster, takes a tag ID for a particular poster and returns an XML file containing the poster content. If the tag ID is not in the database or the poster has already been disabled, then the XML file instead contains an error code. The mobile app can appropriately analyse the XML file to retrieve the poster contents and display them to the user.[1]

3.   Authentication Server:

All pages and scripts are on our backend server which are protected, so that Smart Poster app should check the user's authentication status on each request to the server. To fulfil this check, the app takes advantage of the fact that will automatically redirect requests with invalid credentials to a login page; if the check fails, then the app asks the user to once again provide credentials.[1]
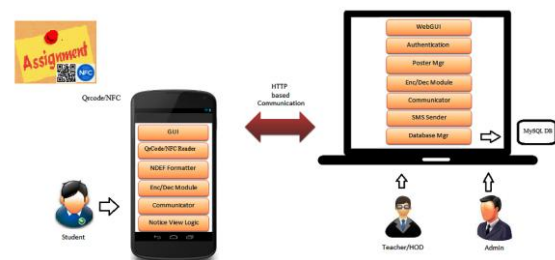

Fig 2. Block diagram for proposed system

IV.   METHEDOLOGY

Modules

a)   Web based GUI

Server will be web based application. This module will be responsible to take inputs from admin. The GUI is developed in HTML and Java-script. Through this GUI our server input will be taken where proper validations are supported which includes new student registration, new assignment are uploaded, etc.

b)   Database Manager:

Database Manager is a module which will help to handle all database related activity. All the SQL queries will take care in this module. A database connection polling system will be introduced to avoid repeatedly opening and closing database connection. The JDBC driver manager assures that the correct driver is used to access each data

source. The driver manager is capable of supporting multiple concurrent drivers connected to multiple heterogeneous databases.

c) *Communication Manager:*

Communication Manager will handle the client server interaction part. We have used REST over HTTP Standard communication technique for communication. REST stands for Representational State Transfer. REST is an architecture based that how networked resources are define or addresed. The idea is that, instead of using complex mechanisms such as CORBA, RPC or SOAP to connect between machines, we have use simple HTTP for making calls between machines.[4]

d) *Assignment & Notice Logic:*

In this module all assignment and notice related logic are handled. It also uniquely maintains each transaction sessions so that it can differentiate each system user. It takes help of database manager to complete all its transaction related database commits. It fetches records from database as per student's class and type of request.[4]

e) *System Configuration:*

The configuration manager which will be holding IP address of the entire client which will be singleton in nature. The singleton pattern is a design pattern that restricts the instance of a class to one object. This is convenient when exactly one object is needed to coordinate actions across the system.[4]

f) *Encryption/Decryption Module:*

Base64 encryption/decryption technique has been implemented in system. This module will handle all encryption and decryption logic of all types. This encryption is applied on database where each user's password is stored.[4]

g) *SMS Notification:*

This module takes care of sending SMS's to eligible students when its account get created and any new assignment is uploaded by Admin.[4]

V.   CONCLUSION

The idea of "Smart poster" will help user to change their way of communication. This will be a very good example of "HCI" domain.

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