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Secure Communication System

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ABSTRACT

Information is an essential resource today and is the key to growth and success. To ensure that the information's are protected, user need to ensure that the information held on his organization is secure. The loss of sensitive or critical information may not only affect the competitiveness and cash flow but also damage the reputation - something that may be impossible to restore. In most organization, as in universities, the essential files such as the allowance, excuse, resignation, grades and confidential reports need privacy. The problem is that these files may be seen by unauthorized people, making it difficult to transfer it, add to that the fear of modifications.

Secure Communication System (SCS) is developed to provide security in maintaining the confidentiality of the files exchange online during the Internet (via website) or offline (via external storage device as USB) between faculty members at Faculty of Computing and Information Technology (FCIT) in King Abdul Aziz University (KAU). The purpose of SCS is to ensure that information is secure from unauthorized user to gain access, deploy it or make some changes on it while exchanging confidential files between members. SCS website provide services to members to create their own profile consist of favorite list as a social network. Each member can add another member to his favorite list. Then, he can share the essential files with them using the system, files and massages, history of files (Inbox, Sent, Draft), encryption and decryption processes. SCS also provide desktop application that can be downloaded in the member's computer to facilitate the encryption /decryption processes offline. Figure1 describes the online and desktop encryption/ decryption processes. SCS provide the feedback to members when send or approve or pending the friend request.
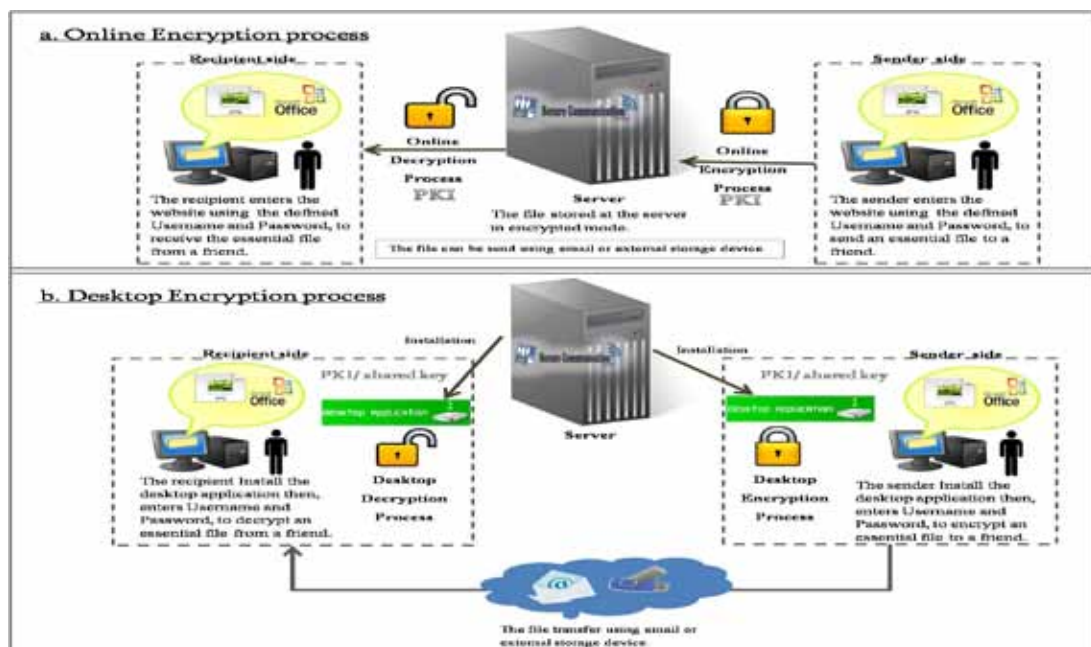
Figure1: The system architecture online and the desktop encryption/decryption processes

SCS is developed using Java to build desktop application, WAMP server that contains PHP to build the website and CSS (Cascade Style Sheet) to design the web site, MySQL data base, Open SSL to encrypt/decrypt comment and Zend Framework to encrypt/decrypt file and public key infrastructure (PKI). SCS provide (1) Authorization: the encrypted files will only be accessible and seen by users who know the key to decrypt; (2) Confidentiality: accessed only by authorized parties; (3) Integrity: unauthorized users can not modify or change because they do not know what is inside the file (encrypted file); (4) User protection: if a user added anyone more than five times and each time the receiver rejected then the user's name is blocked at user friend list who requested; (5) User notification; (6) Security: encrypt user comment, name of encrypted file, and password in database.

Class Attendance System Using Fingerprint

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ABSTRACT

Currently, most universities adopt traditional and manual way for recording students' attendance using attendance sheet. The attendance sheet is a paper that is used by lecturer to take the attendance that include date of lectures, name, ID, serial number and the class number that they should cover in the semester. The students have to put check marks next to their names at lecture sessions or signed during the examination day. They do not using any computerized system to record the attendance. This method has created problems for students, lecturers and faculty due to lack of features and credibility.

In term of students, the manual attendance sheet is not reliable because the student may sign up for another student who did not come to the class. This happen because they want to fulfill a certain percentage of attendance rate in order to be admitted to the final examination at the end of the semester. Another problem is that students who come late can sign up themselves as these students who come to the lecture on time. For the lecturers, they cannot monitor all students who came early or late. They also cannot record and compute the attendance easily and accurately. For the faculties, they have found many errors and problems by using papers. They cannot track students and lecturers attendance easily.

In order to address the abovementioned problems, Class Attendance System (CAS) had been designed and developed. CAS uses fingerprint technology to authenticate both students and lecturers by using their fingerprints in order to record the attendance more accurate and reliable. It allows the students to upload their absence excuses, provide attendance and late rate for both lecturers and students to the faculty's administrators generated different types of reports for both lecturers and administrators and calculates student deprivation. The system device will be provided at each class and laboratory. The fingerprint technology is cheaper and easier to implement compared to other biometrics technology. The system will be a Web-based system that is link to the fingerprint device to record the attendance of students and lecturers and providing a lot of features for them and the faculty via PC or mobile. CAS uses personal computer and screen that is running under Windows 2007 platform and is developed using PHP, MySQL, BioAdmin software of fingerprint device and TBS fingerprint device. The implementation of the project had been set at the Faculty of Computing and Information Technology (FCIT) in King Abdul-Aziz University (KAU). Figure 1 illustrates the system architecture.

Figure 1: How fingerprint device links To CAS (CAS architecture)

CAS with the fingerprint features can make the system secure because no student can attend on behalf of another student who did not come to the class and no student or lecturer can record their attendance except to be authenticated by the system. CAS provides easy and fast way to mark the attendance and eliminate class attendance sheet. CAS can provide efficiency to administrators by giving the statistics about attendance rate. In conclusion, CAS is important to provide the reliable and efficient record for class attendance.

Automatic Detection of Accidents with Street Light Bar System

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ABSTRACT

Government assets are very important to be protected from damages. As a result, the Saudi government has a manual strategy to check the assets and monitor them which leads for long process and efforts. They reported that most damages of government assets caused by car accidents and street light bars have the highest percentage. Two cases are formed for car accidents with light bar. First, the driver escapes after he knocks a street light bar which cost the government to pay for fixing of the light bar damage or changing it. Second, the driver waits the police officer to come and register the accident case. Most drivers in Saudi Arabia have complains about after accident producers. They informed that they had to wait for police officers for a long time. Sometimes they could not describe the location of the accident correctly to the police station and paper based procedures took a long time which irked the drivers. These are the main motivations for building a system that will detect car accidents with street light bars and notify the police station system automatically.

In 2011, there are approximately 100 cases of accidents with the light bars in Jeddah. 40% of them are recorded as anonymous. Statistics shows that, 5% of the accidents cause slight damages and 1% causes complete damages. For the anonymous cases, it costs the government from 80,000 SR to 100,000 SR each year. The municipality employs employees for periodical tours around the city twice a day to check the street light bars conditions. The checking process requires incur operation and maintenance cost for transportation.

Automatic detection of accidents with street light bar system is a system for monitoring and managing the accidents related to light bars on the streets via digital camera network that are connected with light bar sensors. Automatic detection will be enable to detect the driver who caused the accident and responsible for the cost of damage. In addition, automatic monitoring of light bars will eliminate the manual checking process that will reduce the governmental extra costs. Indirect profitability will be increased because the government will enforce any one cause damages to the asset to pay the damages. The indirect benefit of the system is minimizing the fast drives which lead to minimize the accidents with light bars.

The system needs sensors and digital cams that connected to the municipality system through fiber network. First, to detect the accident vibration sensors at the top of each light bar will be needed. Second, these sensors are connected to cameras placed on the roads in each direction. Once the car knocks the light bar, the sensor will send alert to the cameras to capture the car's plate number and the whole scene of the accident and send it to the police station system. Automatic accident identification will be created and from the plate number image the driver's information will be extracted from data base. After that, Municipality employee evaluates the accident and estimates the charges for the damages. Finally, an SMS will be sent to the driver's phone number that contains an accident ID with the cost of damages. The architecture of the proposed system is shown on figure 1.
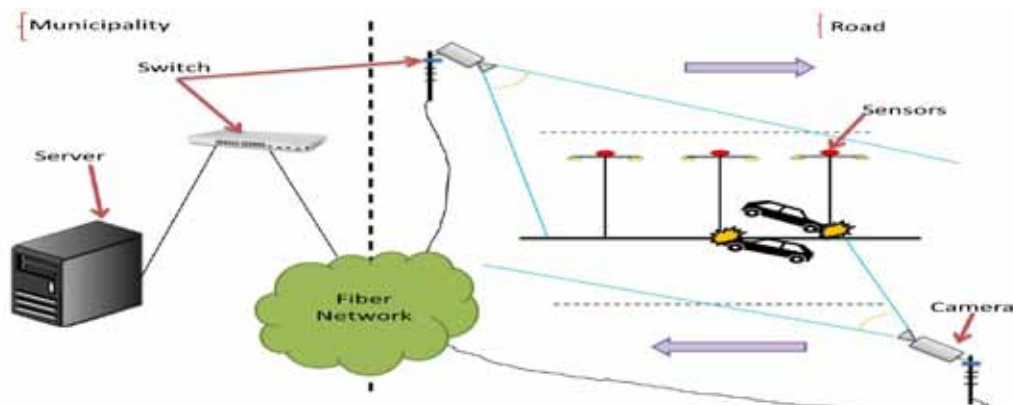

Figure 1: Architecture of Automatic Detection System