

e-Cops : An Online Crime Reporting and Management System for Riyadh City

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Abstract

The huge success of internet and information technology have a remarkable effect on both public and private sectors within a country. The internet services and applications have drastically increased. That's why people find it more convenient to use internet applications to give an online complain regarding any suspicious activity rather than visiting a police station. This method is reasonably secure since it is possible to hide the identity of the person who reported the complain about the crime. Many cases are not registered in police station since the person complained wants to hide the identity due to the possible risk or danger. It is also feared that there are many pending investigations due to lack of proper evidences from the reporting people. An online application can bridge this communication gap between police and the individuals to send reports or other required information. This paper proposes an application that can be used by the individuals in Riyadh to report and manage their complains effectively. Further the system can be used by the people to register the complaints and is helpful to the police department in identifying the criminals. The main purpose of the application is to improve the effectiveness and efficiency of interaction procedures between the police officials and common people. It would be an outstanding tool to monitor and track the criminals around the country and also have a complete online record of crime related information.

Keywords: Complaints, Crimes, Electronic cops, Investigation

1. Introduction

This paper outlines the details of development of an electronic-cops(e-cops) reporting and management system that is easy, effective and efficient to perform the report and management of crimes within

Riyadh city. Since the people do not find convenient to go to police stations to register a case due to several reasons like security threats or lack of time. Also some cases are not investigated due to lack of proper evidences. This system allows the individuals within a city to register the complaints from and is helpful to the police and security department in identifying criminals. This application can improve the efficiency of security system in a city and case solving procedures could be enhanced to achieve better results.

The e-cops reporting and management system is an online application that can allow both the parties either the police or the individuals within Riyadh city to report and manage their complains. It can provide the management of crimes at any time from any place of the world. Thus it's a useful comprehensive crime reporting system to public, police and government agencies that offers more quick, proactive and responsive results to fight with crime and criminals.

Previously, this has been a paper-based process, and paper records were easily manipulated or lost. This application provides an E-cops reporting and management system that guarantees effective and easy solutions to crimes within a short duration of time by connecting all people (citizens/public), police officials and others who would want to directly or indirectly participate in solving the cases. The procedure begins by first receiving an online complain followed by routine investigation and gathering of evidences online/offline by a unit of police force, where those who are found guilty are arrested. A Police Complaint is a statement that a situation is unsatisfactory or unacceptable. Crime is an action or omission that constitutes an offense that possibly will be prosecuted by the state and is punishable by law.

2.Similar Systems

The following section provides few similar applications as the one proposed in this paper.

Proposed system - E-cops KSA

It provides an easy, fast and accurate online system that helps the people to register their complaints, at any time. Thus E-cops KSA is proactive and responsive to fight with crime and criminals. In previous days this has been a paper-based process, and paper records could be manipulated or lost. The proposed system supports the following features:

- 1-Easy to use and exterminates the paper use.
- 2- Offers more security than the previous paper based offline system.
- 3-Allows the people to send online complaints.
- 4-Allows the people to monitor their complaints.
- 5- Limited to residents of the city of the KSA..

E-cops Cambridge shire

A similar system that allows the people to register (and monitor) the complaints and is easy to use for all people/residents of the city of Cambridge shire.

Ecops India

This system is implemented in India and is responsible to help people overcome the difficulties encountered while issuing/registering the complaints in different places through a single application[1] and later monitor till the decision arises. This is still developing to catchup and serve several areas in India effectively.

Ecops United Arab Emirates

The main aim of this system within UAE is to provide online vigilance facilities, the stations, criminal records, licensing record online, so that privileged authorities can view / modify the records. Detectives & Magistrates have access to criminal records where they can search and justify the people in a better and faster way.

2. System Analysis

e-Cops application is made available to public for interaction with police. This section provide the details of the activities that are performed to study the tasks (operations) and procedures that could be used to realize the proposed solution most efficiently.

The Entity Relationship diagram in Figure 1 identifies the entities such as Administrator, Officer, Complaint, Criminal, Feedback and Citizen. These contain the attributes so that the required information can be recorded regarding a crime and can be used as reference to identify or monitor both the crime and the criminal by the officers of police department. The information stored could be used by different types of groups i such as the complainant, police officials and the other administrative officials.

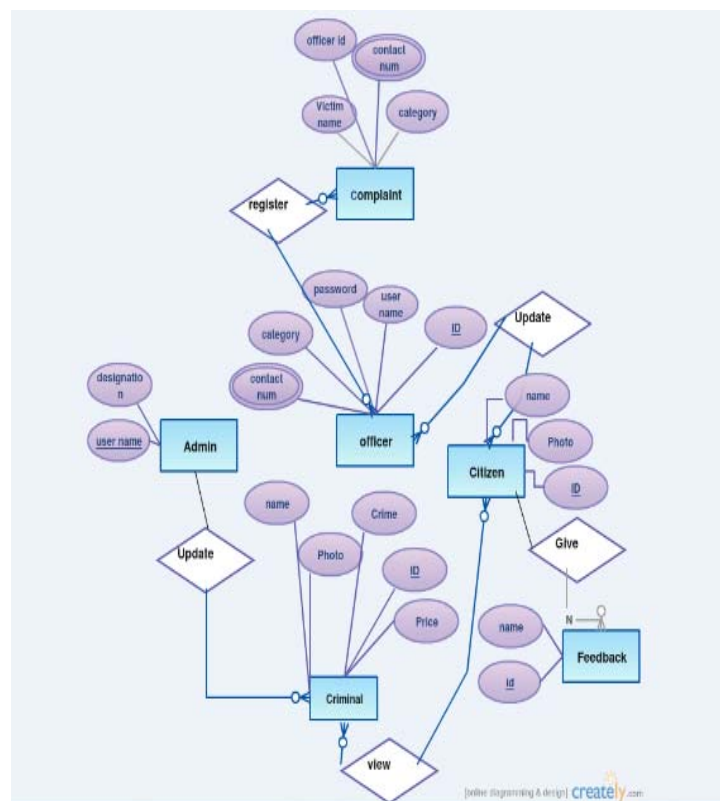


Figure 1. E-R diagram for ecops system

Figure 2 provides the details of requirements by means of a use case diagram. It highlights three actors and nine use cases [3] corresponding to the actions possible when using e-cops system. The procedure to use e-cops is as follows: The Police officers can login with valid username and password. The following activities could be performed: 1. The police officials can see their transfer details 2.They can make online case registration for any complaint received. 3. They can view the information about who have submitted cases and whether sufficient evidence is provided by the complainant so that further investigation can be done. 4. They can see most wanted criminals and criminal information area wise and department

wise also, 5. The department wise employee information can be obtained.

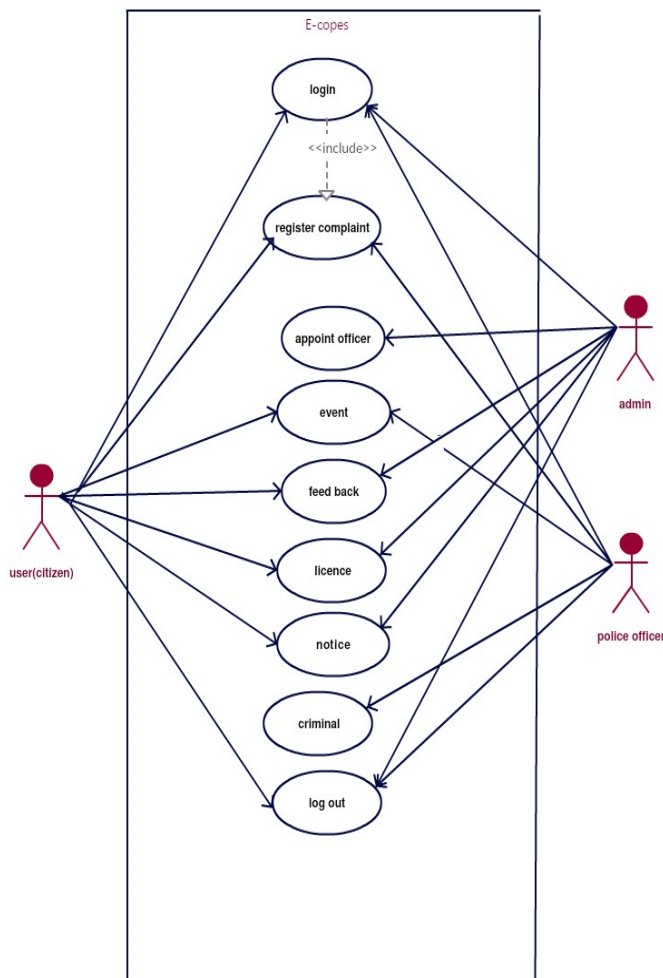
used. It is a markup language used with HTML to design the user interface of a website..

Authentication implementation:

All the users who want to access e-cop system should authenticate using the Authentication page. For authentication the personal Identity and password are mandatory. If these details are matched (ID and password) with corresponding data stored in the users' database then they are provided the access to the system.

Database implementation

MySQL[5] is an open-source relational database management system (RDBMS) and is very common among different stockholders of websites. The data about the users are stored in tables in the form of row and column. Some of the tables maintained by E-cops are (Figure 3): Person(any user), Officer, Admin and Wanted(criminals) and record the relevant data about the complaints and crimes. Each officer is related to one department and each department has many officers (one-to many) relationship. Each department is supervised by Admin and it can add news to homepage and control the complete e-cop system.



6. The e-cops system can also provide the more

Figure 2. Show the use cases for ecops system

details about the registered cases such as Law and Order, Traffic and Cyber Crime information.

4. E-cops Implementation Details

The development of the application was in PHP. The implementation was accomplished in five stages: 1.Interface implementation 2. Server-side implementation 3. Client-side implementation 4. Authentication implementation 5. Database implementation. To implement the User Interface(UI) of the application Cascading-Style Sheets (CSS) was

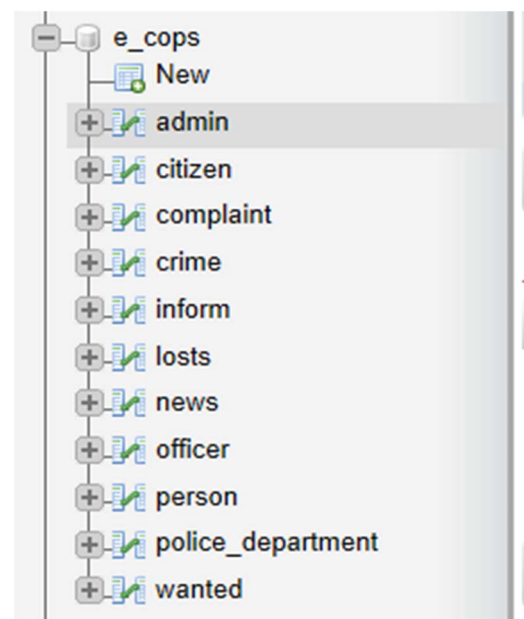


Figure 3. Show the tables(database) of ecops system

5. Result/Output Screens of the e-cop System

In this section some output screens are given that explains the way it functions.

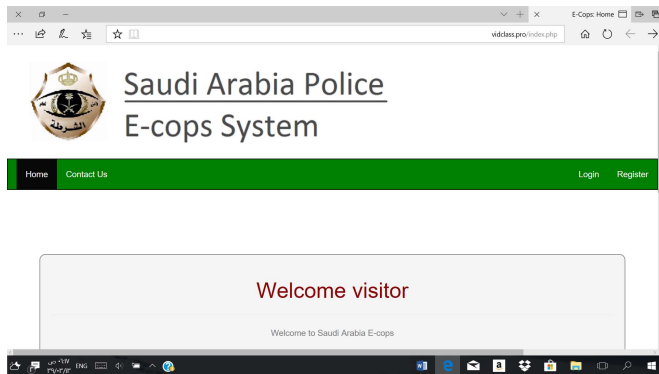


Figure 1. Home page-1

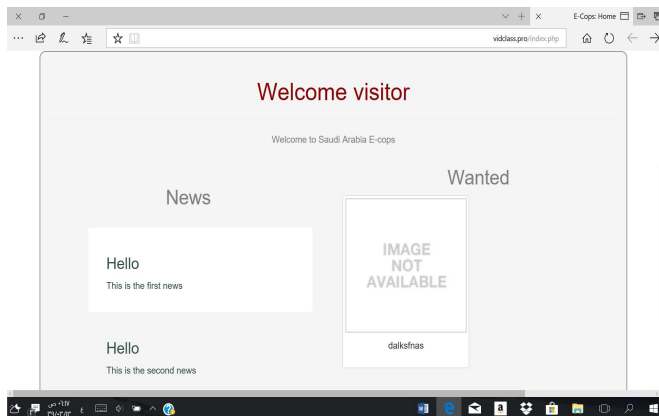


Figure 2 Home page-2

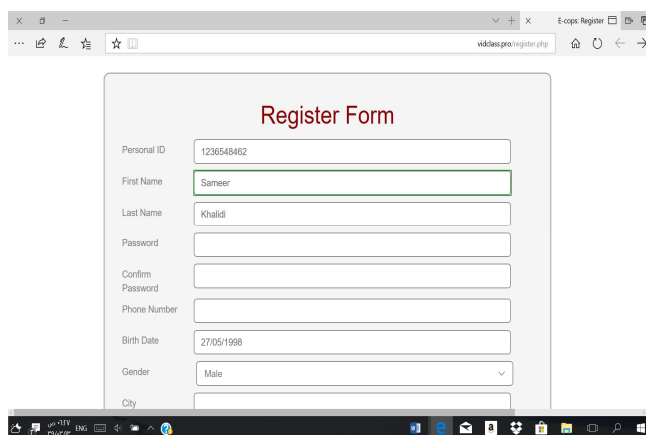


Figure 3. Registration –to access services of ecops

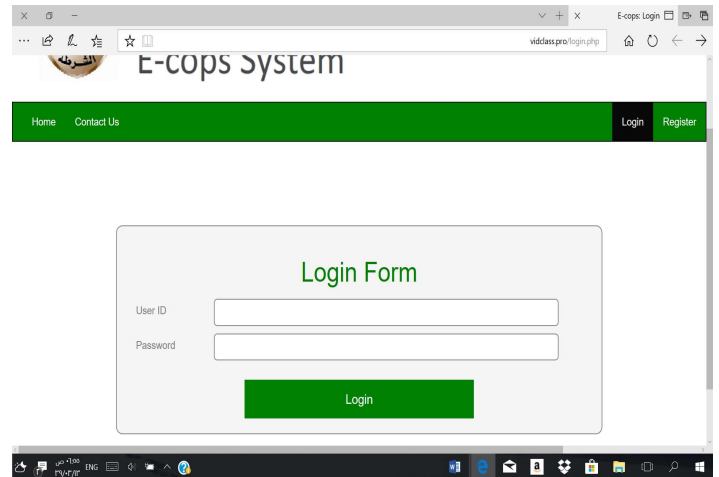


Figure 7. Authentication of Users

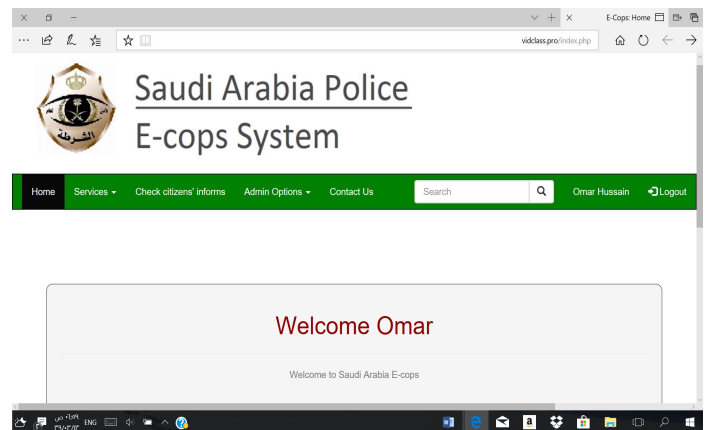


Figure 8. Administrator – controls the e-cops system

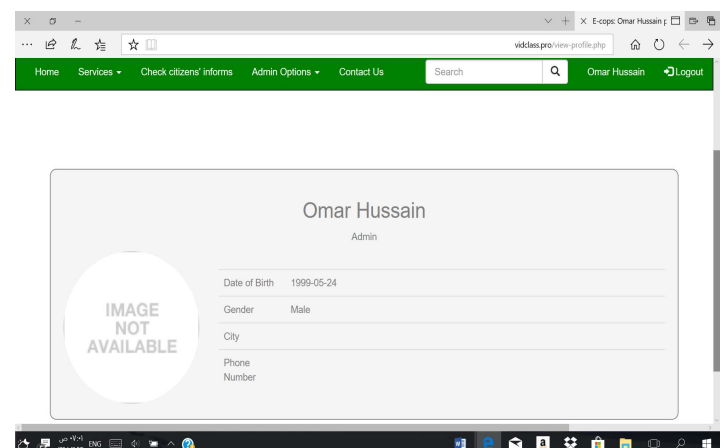


Figure 4 User Profile activated

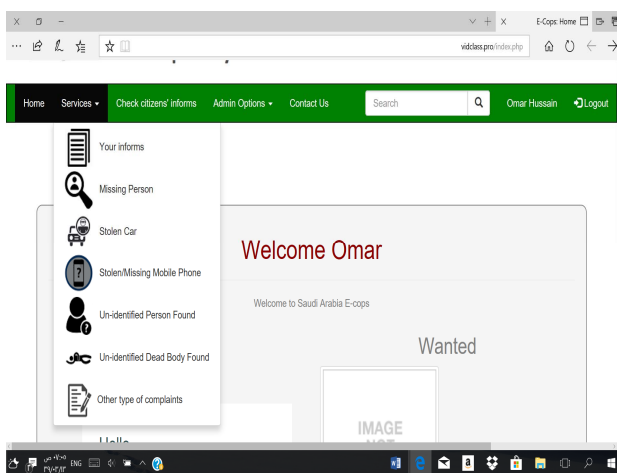


Figure 10. Types of Services offered by e-cop System

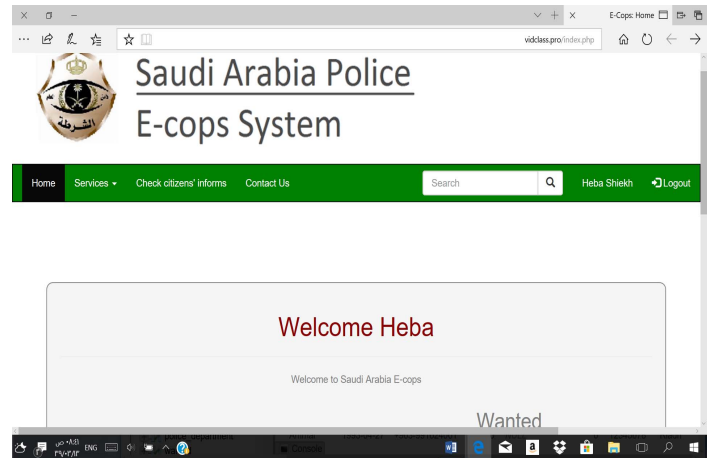


Figure 12. Police Officials (Employees) Page

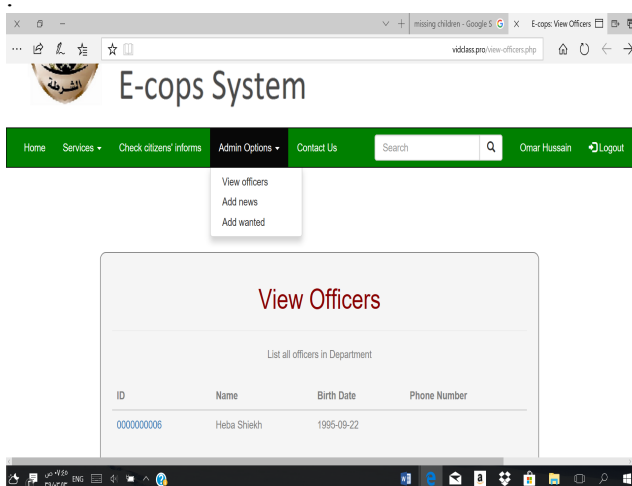


Figure 11. View officers - Information

. Figure 10. shows a list of options the user can select among the services which are listed then he can enter the type of the crime, category, closest city, title details, etc. This page in figure 11 allows the admin to view officers.

The interface for the police officials who can view the citizens' complaints and add any complaints is depicted in figure 12 and the interface that could be accessed by any citizen is given in figure 13.

6. Testing

This section discuss about the testing[5] which was accomplished to check the functionality of the various interfaces that formed e-cops system.

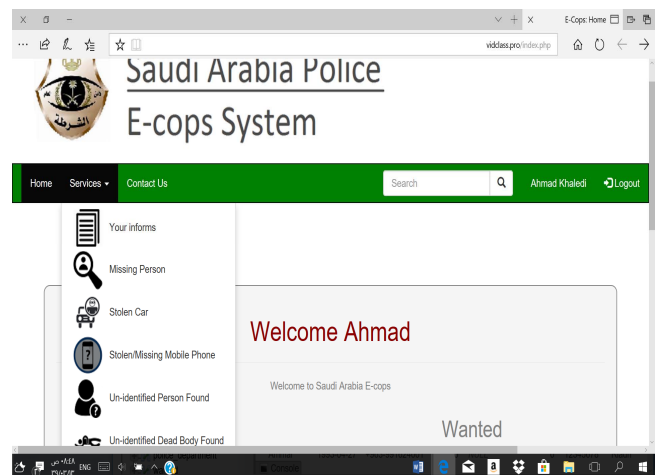


Figure13. Service page of e-cops for any citizen

Performance testing

This type of testing verifies the following aspects: The concurrent users that requesting the web application and the response time. The main goal of this test is to verify the availability and responsiveness.

Compatibility testing

This is done to ensure the Browser compatibility of the website and therefore determine the hardware and operating system platforms that are supported by the application to understand the behavior of the system in different environments.

User interface testing

This test is meant for detecting the correct functionality of the graphical user interface (GUI) of the system and ensure that specifications are conformed.

User acceptances testing:

User acceptances testing (UAT) marks the end of the test plan. This step is required to ensure the correct functionality of the website (application) in case of multiple users and also whether it is acceptable in the real-world. The table 1 outlines the details of the testing that was accomplished on e-cops system.

Conclusions

Saudi Arabia e-cop System application provides simple and user-friendly interface. This paper discussed about the development of the interface that will help citizens in Saudi Arabia to communicate with security services (police departments) quickly and easily. Users can report a crime or a complaint from anywhere online. The police officials can view the reports and take appropriate actions against the crimes or complaints by applying a systematic, quick and easy approach. This project could be later integrated into the Smart [2] e-Government system in Saudi Arabia and is available in other languages like Arabic, French, etc.

Acknowledgments

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Test Case (TC)	Case description	Test data/ input	Expected result	Pass (yes /no)
TC0.1	User register	Personal ID, First Name, Last Name Password, Confirm Password, Phone Number, Birth Date, Gender, City, Image	Register success, and go to home page	Yes
TC0.2	User register	Enter a personal id already registered.	Error Message: "ID already exists!"	Yes
TC0.3	User register	Enter an invalid personal id (valid id is 10 digits)	Error Message: "ID must be 10 digits long."	Yes
TC0.4	User register	Enter an invalid first or last name (valid name is between 3 and 16 letters long).	Error Message: "Firstname/Last name is not valid only 3-16 characters"	Yes
TC0.5	User register	Enter an invalid phone number.	Error Message: "Phone number is not valid."	Yes
TC0.6	User login	Personal ID Password	Login success, and go to home page	Yes
TC0.7	User login	Enter personal id that is not registered, or a wrong password	Error Message: "Username or password is incorrect."	Yes
TC0.8	Add inform, Add news	Enter an invalid title (valid title is at least 10 characters long).	Error Message: "Title should be at least 10 characters long."	Yes
TC0.9	Add inform, Add news, Add wanted	Enter an invalid details (valid details is at least 20 characters long).	Error Message: "Details should be at least 20 characters long."	Yes
TC0.10	View News	View valid news (with id that exists in database).	A page that shows the news details.	Yes
TC0.11	View News	View invalid news (with id that doesn't exist in database).	Empty page with a message: "News not found."	Yes
TC0.12	View News	Trying to view news by a visitor that is not logged in.	Go to home page	Yes
TC0.13	View Wanted	View valid wanted (with id that exists in database).	A page that shows the details of the wanted person.	Yes

TC0.14	View Wanted	View invalid wanted (with id that doesn't exist in database).	Empty page with a message: "Can't find this wanted person."	Yes
TC0.15	View News	Trying to view news by a visitor that is not logged in.	Go to home page	Yes
TC0.16	Search Users	Give a query that match one or more users' names in database.	Show search results.	Yes
TC0.17	Search Users	Give a query that doesn't match any user OR an empty query OR trying to not give a query parameter OR a citizen trying to search by users by personal id.	Empty page with a message: "No results found."	Yes
TC0.18	Search Users	An admin or officer gives a query that matches a personal id of a registered user.	Show search results.	Yes
TC0.19	View profile	View valid profile (with id that exists in database).	A page that shows information about the user.	Yes
TC0.20	View profile	View invalid profile (with id that doesn't exist in database).	Empty page with a message: "User not found."	Yes
TC0.21	Add news	Title Details	Success Message: "Successfully added news."	Yes
TC0.22	Add Wanted	Title Details	Success Message: "Successfully added this user as wanted."	Yes

Table 1. Test cases