

Data Acquisition and Analysis Model for E-Government

A. Nazir¹, A.Farooq², T. Nawaz³, R. Abbas⁴

¹ Faculty of Information Technology, School of Software, Beijing University of Technology, Beijing 100124, China.

^{2,3} Computer Science & Engineering Department, UET Lahore, Pakistan

⁴ Information Technologies Department, Punjab University Jhelum Campus
ahsan_ravian@hotmail.com

Abstract-e-Government technology has become major tool to facilitate citizens of a country and improve performance of a government. Some countries have successfully integrated it while others are still trying to incorporate it for the betterment of their governance. In this research, we explore existing web-based systems like social media and study how these systems are used for collecting data that can be utilized to improve governance. Then we propose and develop new system, which fetches data from common citizens regarding the performance of government, analyses that data and suggests how government agencies can use this data to improve their governance. In existing systems, government agencies can interact with common citizens in one way but using our developed system common citizens can also interact with them. Using our system government can collect data from common citizens and analyze this data for decision-making and good governance.

Keywords-eGovernment, Good Governance, Big Data, Data Mining, Data Acquisition.

I. INTRODUCTION

According to World Bank, e-government is defined as “use of information and communication technologies to enhance the government processes and delivery of service from government departments and other stakeholders” [xii]. Concept of e-government first started in late-1990s and today almost all members of UN use e-government. Good governance means transparency, openness, citizen participations, efficiency, effectiveness, accountability etc. All these principles are expressed in e-government roles. E-government means use of technology by government agencies to develop relationship with common citizens (G2C), government to business (G2B), government to government (G2G). Government can use Information technology for improving services delivery to common citizens, to interact with business community and industry, filter transparency and corruption. Social media has become a major source of information since

last decade. People use social media to get latest news and express their point of view on a specific issue or cause etc. Government agencies can use social media to communicate government message immediately to the citizens in cost effective manner. Government can also take new ideas from citizens through social media before making any new policy. Social media can be seen as a bridge between Government and public. The Government can measure its performance about any specific policy by reviewing public opinions on social media. Also policies makers can have an idea what exactly people are looking for the specific policy or issue. Similarly people can have direct access to government representatives through social media. Government agencies can build strong and healthy relationship with citizens by using web-based systems like social media proactively. In existing e-government systems, government can convey messages to common citizens but common citizens do not have a mechanism to interact with government directly. We propose and develop a web-based system by using which common citizens can interact with government directly. They can give feedback immediately about the services they are getting from government and what they think of new policies of government. Using our developed model government can collect data from common citizens to improve governance. We discuss case studies from the globe where governments have taken proactive and reactive measures using social media applications to achieve good results.

II. LITERATURE SURVEY

The right of access to public information and transparency are most important for international democratic participation. Trust in government, corruption control, accuracy and delivery of information to common citizens are the key points for good governance and these can be achieved and monitored by e-government system [i]. As of January 2015, Facebook has more than 1.39 billion active users per month. This number is 6 times greater than the population of Pakistan (200 million) and over 12 times

the population of Germany (90 million). 100 hours video contents uploaded on you tube in every 60 seconds. Daily Active users on Twitter are 100 Million. 500 million tweets are tweeted per day. It is estimated that there are around 1000 social sites on Internet. Now a day where you look you can see an explosion in the use of face book, twitter and LinkedIn or other social media sites.

In [ii] has discussed how United Nations have employed social media as the main knowledge sharing mechanism during 2010 Haitian earthquake. In [iii] author has discussed in their article that social media has become the focus of top business executives. Managers and consultants in top firms try to develop applications in such a way so they can take advantage of social media for making money and promoting their product and services. In [iv] has discussed in his articles how social media was helpful during Haiti Earth quake. People used Twitter and Face book posts to help the victims and found the lost children and kids. In [v] as per the author social media have made a staging amount of information available for everyone.

Government officials use social media like Facebook and Twitter to improve services and communication with citizens. Significant potential exists to identify issues in real time; so emergency managers can monitor and respond to issues concerning public safety. Yet, the sheer volume of social data streams generates substantial noise that must be filtered in order to detect meaningful patterns and trends. Important events can then be identified as spikes in activity, while event meaning and consequences can be deciphered by tracking changes in content and public sentiment [v]. Twitter and other social media sites have been effective in early event spotting; there response time is even faster than officials and government agencies. Governance is a process whereby societies or organizations make their important decisions; determine whom they involve in the process.

Developed countries like UK and USA are using social media applications for good governance. Governments throughout the world are trying to find ways to deliver public services more efficiently and effectively. They are trying to use Information technology to provide services to common citizens more efficiently [vi].

In [xiii] some authors have mentioned in their recent research about the key element involved in E-Government. These are different ways a common citizen tries to communicate with Government using e-Government portal and websites. They named these processes as e-involvement, e-participation, e consulting, e-collaboration and e empowering.

With the ever-changing information age, e-Government has changed and gotten better. In order for e-Government to make real and achieve fine results,

especially in the terms of e-democracy, there is need for easy and user-friendly e-government system, which people and businesses can easily explore and use. Depending on this, an interactive web based system developed on Web 2.0 technologies may be a good choice for government and common citizens for the exchange of ideas and betterment of governance [xvi].

In [xiv] authors have discussed in their recent articles about the e-government issues in developing countries. As all the developing countries are focusing on developing and implementing e-government systems to achieve good governance and hence they are facing issues because of the organizational structure and technology gap. There is a gap between results and expectation of the system because strong focus is on technical tools and very less focus is on changing organizational structure. Hence this gap is the ultimate reason for not achieving expected results using e-government system.

In [xv] author has mentioned in his paper about the role of tools and developed Applications for e-government systems for end users. As if the developed system is continuously updated and delivered to end user then end user will use this system and hence using e-government system good governance is achieved. He further described that if a public servant has in depth domain knowledge about the problem then he can use the application used by end user or common citizen to fix that specific issue.



Fig. 1. Existing E-Government System

As depicted in Fig. 1, existing e-government systems work in one direction i.e. Government to citizen one-way communication. Government can announce new policies and services through e-government and Internet systems to common citizens and citizens do not get a chance to give feedback to government instead they express their views on social media like Facebook and Twitter. In this work, we propose and develop a model through which government can fetch data from common users and use that data for decision making for new services and for the improvement of existing services.

TABLE I
E-GOVERNMENT MODELS

	Citizen	Business	Government
Citizen	C2C	C2B	C2G
Business	B2C	B2B	B2G
Govt.	G2C	G2B	G2G

Table I shows e-government models. Second column shows how e-government system works for Citizen-to-Citizen (C2C), Citizen to Business (C2B), and Citizen to Government (C2G). Third column shows the interaction of business with Citizens (B2C), Business-to-Business (B2B) and Business to Government (B2G). Fourth Column shows interaction of Government with Citizens (G2C), Government to Business (G2B) and Government-to-Government (G2G).

III. PROPOSED WORK

As discussed in section I and II, existing e-government systems do not provide a proper platform for common citizens through whom they can interact with government agencies directly and easily. Our system provides this mechanism by smart phone application as well as web-application, using these applications common users can give feed back to the government authorities about the new policies of the government and also they can share their common problems they face in their routine life related to government. By using this feedback government can take actions accordingly to improve its governance. Our application provides two-way communication between common citizens and government agencies.

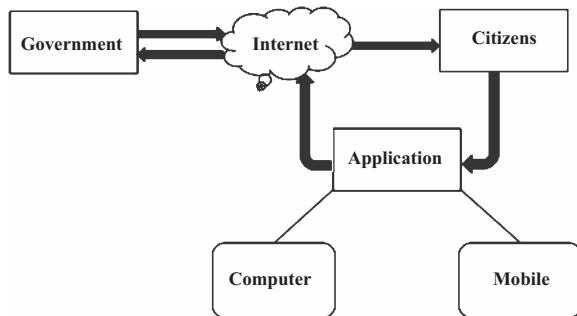


Fig. 2. Proposed E-Government Systems

E-government proposed model in Fig. 2 shows proposed model for data acquisition for e-government. Government communicates with citizens through internet and citizens can send feedback to government using application developed in this work which is available for web user as well as mobile phone users. By using this application, common citizens can tell government about the services they are getting and if they are satisfied or not.

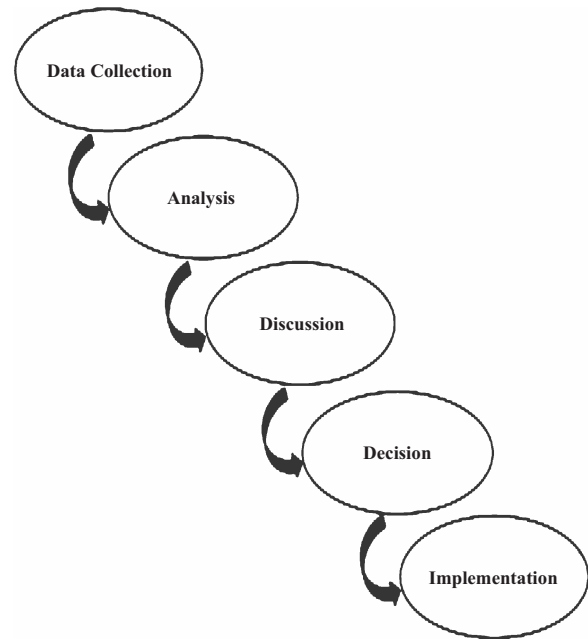


Fig. 3. hierarchy of proposed model

Fig. 3 shows hierarchy of proposed model. Following steps are involved in proposed model.

Data Collection

Data collection is the first step. In this step, data is collected from common users through mobile application or web-application. Common citizens express their views about the specific service or problem they are facing in their routine life. This data is saved on server for further processing.

Analysis

Once data is collected and stored on server, next step is analysis of the data. In this step, data is analyzed for discussion and decision-making.

Discussion

In this step, experts of relevant department conduct discussion on the specific service or policy and send their recommendations for decision-making.

Decision

In this step decision is made according to the recommendation forwarded from discussion step. After analyzing data collected through e-government systems decision can be made for good governance and for providing better services to end users and common citizens.

Implementation

In this step, decision is implemented and relevant service is updated accordingly. Once system refers towards a specific problem happening in any department then implementation process is launched to

address the issue and for the betterment of good governance.

IV. CASE STUDY

Let us consider an example where a common citizen is facing issues while visiting a public hospital. How our proposed system will help him to resolve the issue and how this will improve good governance.

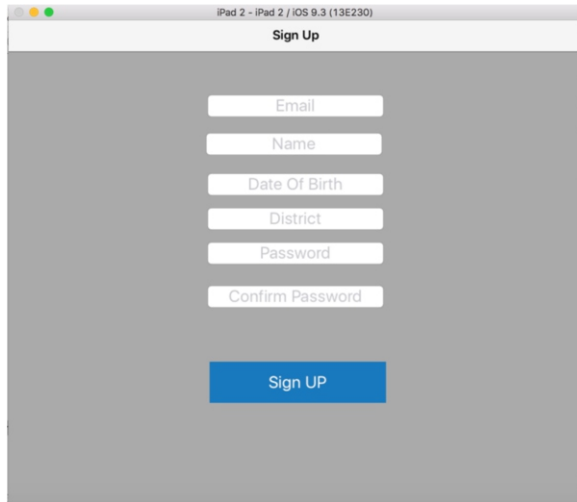
A screenshot of an iPad screen displaying a 'Sign Up' form. The form has a title bar 'Sign Up' and several input fields: 'Email', 'Name', 'Date Of Birth', 'District', 'Password', and 'Confirm Password'. Below these fields is a blue button labeled 'Sign UP'. The status bar at the top shows 'iPad 2 - iPad 2 / iOS 9.3 (13E230)'.

Fig. 4. Sign Up Process Screen

Sign Up Process: Every user needs to create his/her account to use this system so that his details can be stored in database, which can be used later for data analysis and decision-making.

We are collecting name and email address of the user so government agencies can contact the citizen through this email address. Once user has created his account then he can send any complain to the concerned authority by using complaint screen of this system. When user successfully enters complain then user receives a confirmation email from the system that his complain has been registered successfully. Also once the complaint has been entered, system will analyze the entered data and forward this to the relevant department of government. Our system recognizes the complaint for relevant department from the keywords user has entered in his complain like if user has used health and hospital words while registering complain then system will automatically forward this complain to the relevant person from the health department. In our Demo application, we have Divided system into four provinces and then all districts of the provinces so that system can forward complain to the most relevant person from government department. Now assume if user is already created, then user can use Sign In screen to log into the system. Figure 5 shows the user sign in process.

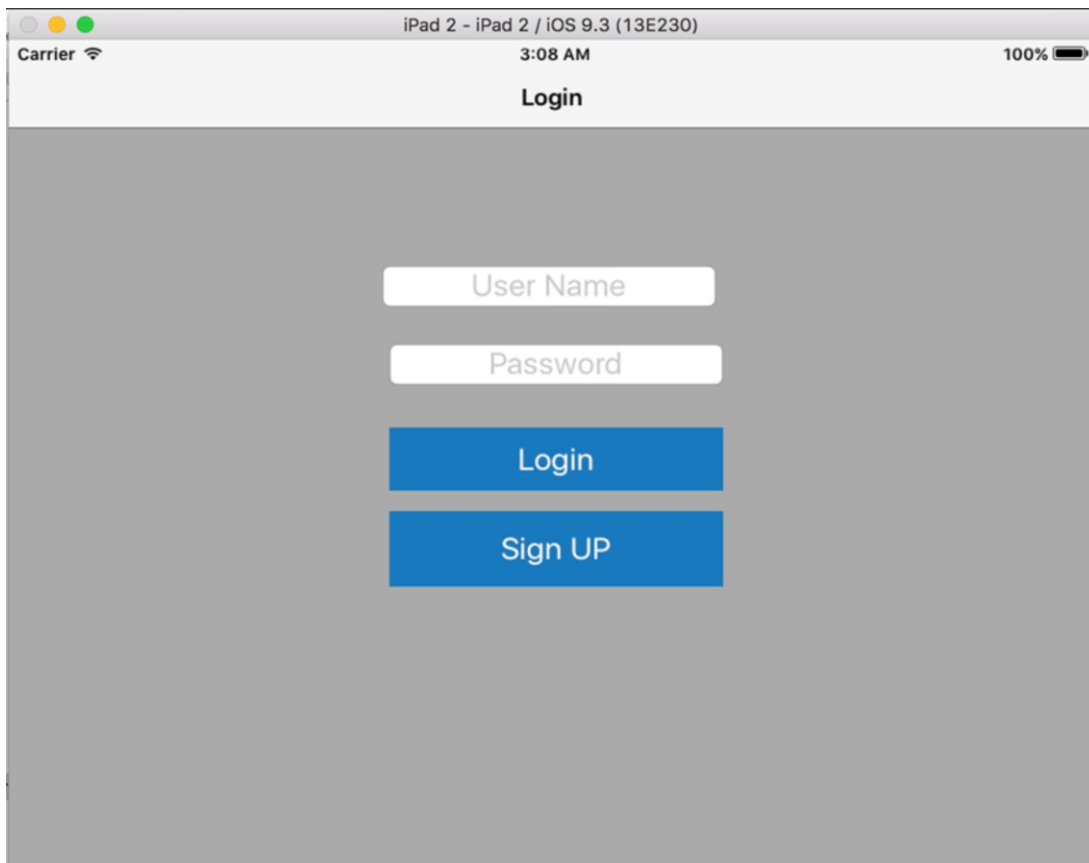
A screenshot of an iPad screen displaying a 'Login' form. The form has a title bar 'Login' and two input fields: 'User Name' and 'Password'. Below these fields are two blue buttons: 'Login' and 'Sign UP'. The status bar at the top shows 'Carrier', '3:08 AM', and '100%' battery. The title bar also shows 'iPad 2 - iPad 2 / iOS 9.3 (13E230)'.

Fig. 5. Login from iPhone Application

After user is logged in the system he/she will be able to register complain for the specific issue he/she is facing that can be a complaint or simple suggestion for the government. We have divided complain types in to different categories so our system can forward the complaint to the relevant department directly. We can filter data on the bases of complain type, on the basis of districts and on the basis of province. Once there is enough data in database then we can perform different action for achieving good governance.

If we have hundreds of complains about a specific

police station then government can take up action accordingly. Similarly if common citizens complain about specific hospital of a district then government can improve that hospital as per the needs of common citizens and hence health department can be improved using this system. If government want to launch new scheme or policy they can take up end users reviews about that policy and law before Implementing that. All members of National assembly and provisional assembly can track the development projects and their progress using proposed system.

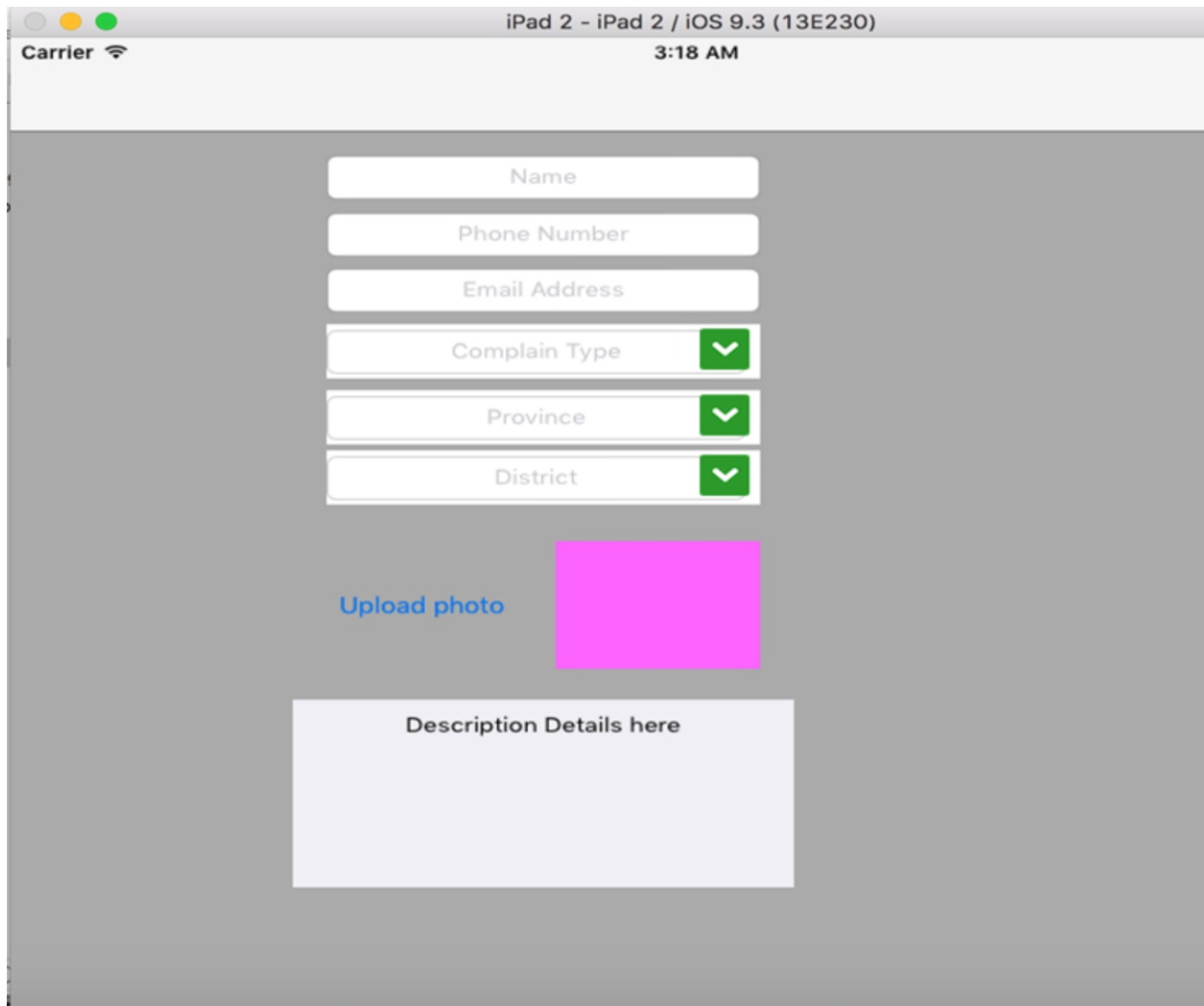
The image is a screenshot of a web application running on an iPad 2. The status bar at the top shows 'Carrier' with a Wi-Fi icon and the time '3:18 AM'. The title bar of the app says 'iPad 2 - iPad 2 / iOS 9.3 (13E230)'. The main content area has a grey background. It contains a form with several white input fields: 'Name', 'Phone Number', 'Email Address', 'Complain Type' (with a green dropdown arrow), 'Province' (with a green dropdown arrow), and 'District' (with a green dropdown arrow). Below these fields is a blue text link 'Upload photo' next to a solid pink square. At the bottom of the form is a large white rectangular box with the text 'Description Details here' in bold.

Fig. 6. Complain Page

This screenshot is taken from web Application; user needs to fill the above form shown in figure 6 and once user has chosen his province, district, complain type and user can also attach any audio, video and image file with complain. Once complain is registered then our system will detect the complaint type, province and district of complain and will forward this complain to the relevant department of the system. Now as complain has been registered now our system

will start working over this. There are factors involved in the success of system but most important is how government adopts this system and how they are keen to resolve common man issues related to the government. As every problem faced by a common citizen is forwarded to the government representative of that specific problem related department. Like law and order related issue will be forwarded to police and daily basis problems related to roads and cleanliness of

the city and town are forwarded to the local government department Now from here government can use data for good governance. At any time government agencies can fetch data for a specific date, for specific issue, for specific province, or for specific district.

If the complaint type is law and order and complain is launched from Lahore district of province Punjab then DCO Lahore will be able to check reports and using this data he can take precaution measures etc. Now similarly if any of the government wants to check the performance of health sector for a specific district they can see simply selecting the health and district and they will be able to see all complains registered for health issues. Using this system law and order situation of every district can be managed and common citizens can participate in it and update government about the current law and order issues and terrorist suspect

activities around them. This system is by all means helpful for government and common citizens who use this e-government developed system.

With the ever-changing information age, e-Government has changed and gotten better. In order for e-Government to make real and achieve fine results, especially in the terms of e-democracy, there is need for easy and user-friendly e-government system, which people and businesses can easily explore and use. Depending on the big picture, an interactive web based system developed on Web 2.0 technologies may be a good choice for government and common citizens for the exchange of ideas and betterment of governance. We have proposed a user-friendly e-Government system not only web application but mobile applications which make this system interactive and all times available for users and government agencies.

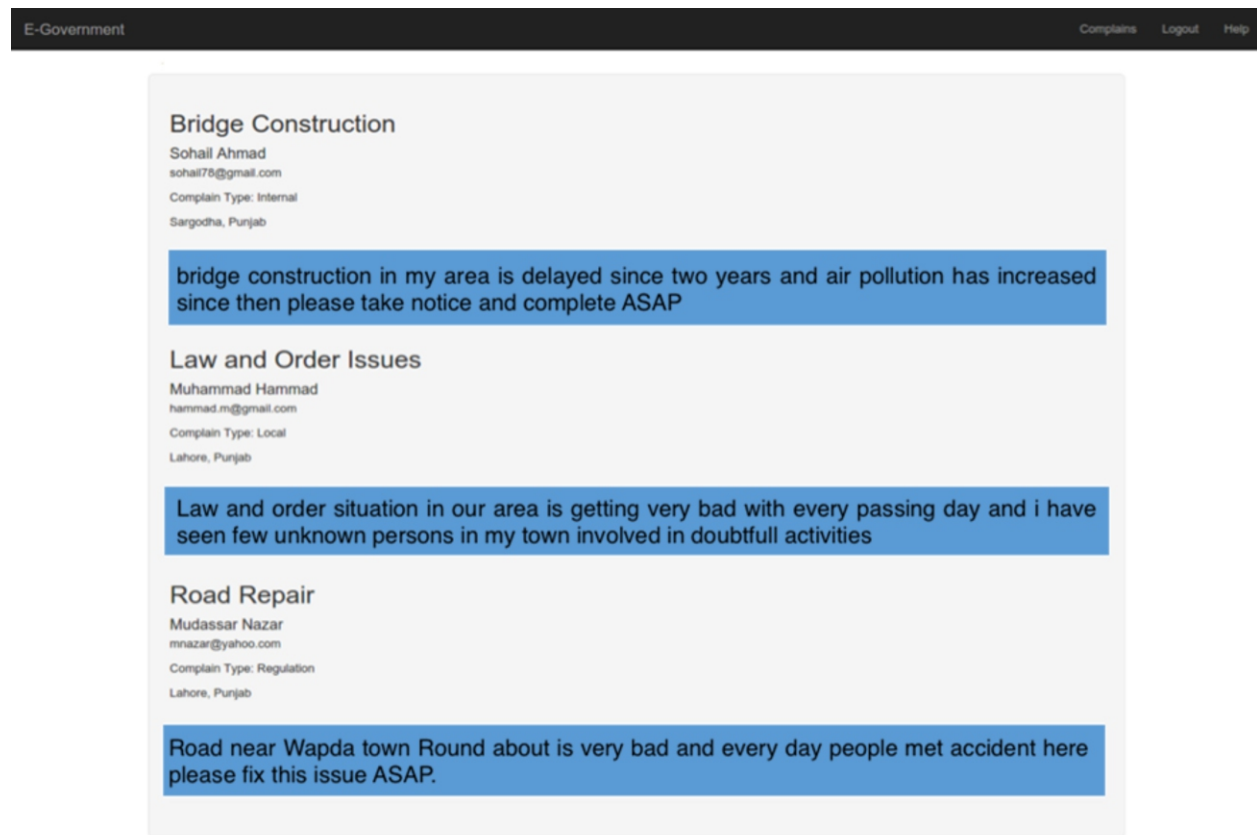


Fig. 7. Complain View on Web

Fig. 7 is showing different complains registered by the specific user for road repair, bridge construction and law and order. Government agencies can contact the user for further details.

Following are the features of e-Governance, which can be achieved using our proposed model for E-Government.

- 1- Increased efficiency due to connectivity.
- 2- Increased accountability.
- 3- Increased Transparency.

- 4- Reduced Corruption.
- 5- Easy access to Government for common citizens.

V. CONCLUSION

In this work, we have completed a demo application for E-Government through which government agencies can collect data from common citizen and use this data for decision-making and good governance. Using this system, common citizens can

access government agencies and elected members of parliament directly using smart phone application or web-application. This model is equally beneficial for both developing and developed countries. After the implementation of this model, people, businesses and all departments of governments will have access to the all available services of government, 24 hours a day and 7 days a week hence this will improve quality of the services and improves standards of good governance.

Why This Model?

- 1- Pressure from citizens
- 2- Reduce administrative costs better levels of service
- 3- New kinds of services
- 4- To Control fraud
- 5- To Achieve Good Governance.

Future Work.

In future work, this system can be used in real time and government can use this system for decision making based on big data collection through developed system. Different techniques of data mining will be applied on data to achieve good governance.

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