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Social Network Integrated with Information Security

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***Abstract*—In today's world social networks are a part of our daily life. There are millions of users in the social networking sites using them for connecting with their family, friends and sharing private (or) personal information. Social networks are been trusted for communicating purposes in both personal and professional needs. We are proposing a method to create an environment where individuals can express their ideas and built business over them with the help of community (or) network. Here community refers to a group of individuals who are into the same stream of profession. This could be used for helping each other in improving their ideas and developing their concepts collaboratively. In the current scenario social networks are facing a critical challenge of fake users and unauthorized access of them into the network which is leading to the bleaching of privacy to many users. The data of users is not so secured in these social networks, which can be dealt by the incorporation of security policies which improves the environment. This can improve the engagement of community members in being a part of many activities as it is the key to improve once ideas (or) business. In social network individuals are main aspect of the community, protecting them from fake information and users is also very much important and this is achieved by the implementation of security features and policies into the network.**

Keywords*—CMI, Social networks, CEI, DoS, role-based access control (RBAC)

I. Introduction

Internet is network of computers and servers which are connected in zonal, local, global area. Social network is a part or application feature of internet, which helps individuals to connect with friends and family. Social networks are viewed as collective web-based applications where multiple applications are mutually sharing data between themselves to provide the users a comfort to connect with new people and entering new communities for talking (or) sharing information that are close to their real life [2].

When a network is established then members of it would want it to be structured and secured in a way that their information is safe from lost or out into public. The number of people using social networks for stealing others private information are increasing exponentially, so whoever is in social networks need to be vigilant to protect themselves [7]. Studies have revealed that as compared to men the female users are found to be more stable, sensitive, intimated and even active in creating a social relationship with people via social network [4]. Every social network is similar to the structure of an informal office environment. One of the frequently occurring problem in social networking sites is excessive sharing of data which is leading to increase in disclosure of their private information which in the long run could have larger consequences [12]. So, choosing to train the individuals on how to share information and what not to be kept out into the internet which prevents them from losing their personal and important information, and updating them with the new threats that are growing around them like phishing [1][6].

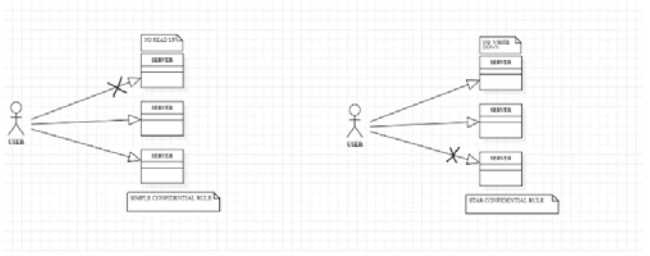


Fig. 1. Bell-LaPadula

The image is providing the aspects of Bell-LaPadula Model.

A. Bella-LaPadula

Bell-LaPadula model is one of the most influential security models as it is one of the initial modern security models developed. Bell-LaPadula model was developed to improve confidentiality aspect of curtail information. Though it provides effective protection to the information confidentiality for applications, to some extent, in the commercial implementation the users choose, information integrity over confidentiality under many circumstances. Thus, applications built on the Bell-LaPadula model are mostly used in military environments or similar spaces.

B. CEI

Trying to use the community energy initiatives (CEIs) to help each other In the community to achieve their goals as much as possible. The contribution of individuals could be as small as just a suggestion which could change the course of their thought process, and as large as investing into the idea and being a part of it which helps in growing it big. Individuals organize their social relations around certain social, psychological, legal, or physical foci (workplaces, voluntary organization, hangouts, family, etc.) which shape the opportunities of people to meet and interact [3]. So, making a good network of people is a key feature of any individual to grow in the real world it is even applicable in the internet world and creating such space is our aim. So, creating a more secure space in the network, by integration of information security policies into the application is one option available so that female users get upper hand in the network that is been developed. Which can be used to share their ideas, job requirements and get suggestions and support from the community.

II. Literature Review

The social network services are a form of webservice to develop a virtual connection with people having same interests and background. This service helps the users for finding new communities and friends. [13]. There are many ways for generating data in the social network and for sharing it into the network, now proposed technique is a new combination of method to improve the structure of network and its security components in it like **accessibility**, **availability**, **reliability.** Architecture of multiple systems in the online social network (OSN) be like Client-server and peer-to – peer architecture [2].

Studies are trying to study mainly about social network's content and user's security, using different models, protocols, mechanisms and algorithm [1]. Knowing about different types of threats that are been around us in the network so that people can be more and more causes with the present situation. This paper is trying to given a new pathway on social media security aspect using crowd computing framework, hierarchy form for the social networks [1]. This is where incorporation of **Bell-LaPadula** model into network is taking place to create secure and reliable network to the female users.

Hackers using many techniques to steel one's information from the users. In the pre-Internet world stealing once's information was too complicated and hard but now it's too easy for these phishers. The number of people using social network for stealing personal information of users, using phishing technique, so every user in the network has to be more vigilant to protect their information [7]. Talking about on how individuals are been getting influenced for revealing their confidential information like password, addresses, bank details by working on their vulnerabilities is said to be Social Engineering. Getting to this conclusion that the users have to be trained regarding the newly developed network so that they get aware of such effective threats that they might encounter.

Studies are aiming on identifying behavior of users on different gender aspects in social networks by comparing the different aspects on which the gender labels are created and how easily they can be activated and implemented into the network [4]. The conclusion from this can be that female user are been more exploited by the effects of the social networking. This is getting us to the conclusion of security requirement for female users. This can be redeemed by giving a more control to the female users like accepting of friend request, deleting the users from the friends list.

Studies are even trying to investigate the role of social networks on how individual's decisions are been influenced on trying to participate of community energy initiative. Later we are discussing about engagement of community members is crucial for the success of a CEI and thus a key question is how the initiators can reach community members and stimulate involvement [3]. Taking results of this to prove how greatly a community can impact the network to be moving forward. How well it can be initiated and how an initiated program is been affected by the associated individuals.

The biggest hurdle in social networks is access of hackers into private accounts to achieve private information and leaking of personal communication in between the users of the network, these all are after effects of hacking a user's account [9]. The usage of encryption is to protect one's privacy. They are talking about the multiple types of encryptions are been implemented in the aspects of the social network. They are talking about the multiple types of encryptions are been implemented in the aspects of the social network. Finally, there is visualizing the process of encryption and decryption in a mobile application that are been done to secure a user's information.

When trying to investigate the part of social network in effecting the user's choice on to whether to be a part of communal activity. Discussing about engagement of members is critical part for the success of a communal energy initiative and this leads to main question on how the initiators of a program can reach the community members and stimulate their involvement [10]. By which we are getting to know about the impact of individuals in the network of community. Finally getting to know the impact the community members, initiators, associates can impact the CEI. The different combinations of different members in the network have a new type of network.

By studying two different factors that affect the vulnerability of the network such as individual and organizational actions and how the creating awareness among the employees leads to the improvement of social security and reduces the risk of social attacks [8]. Theory of reasoned actions and theory of planned behavior are been used in many hypothesis conditions which are been tested and drawn to a conclusion.

III. Methodology

3.1 Bell-LaPaduala

This is an information security model which is also referred as a multi-level model, which was proposed for implementing access control in military applications. In these models there are two main parts one subjects and the other objects which are segregated into different security levels. The subject can access only objects at specific level determined by his access level.

The levels of classification are designed to protect information (or) data from unauthorized discloser.

Simple confidential rule: In this the users (or) subjects can only **read** the data on the same level of access and the lower level of access but can't read data to the upper level of access. This rule is also referred as **no read up** rule.

Star confidential rule: In this the users (or) subjects can only **write** the data on the same level of access and the upper level of access but can't write data to the lower level of access. The rule is termed as **no write down** rule.

This is using these rules to improve the confidentiality of the data and users. **Confidentiality** implies that the protection of the data from being accessed by an unauthorized user. Only real users can access their personal information. The main responsibility of confidentiality is stopping information from getting into the inappropriate user's hands.

3.2 Biba

This is another type of information security model which was used to ensure the integrity of information. In these models there are two main parts one subjects and the other objects which are segregated into different security levels. The subject can access only objects at specific level determined by his access level.

Simple integrity rule: In this the users (or) subjects can only **read** the data on the same level of access and the upper level of access but can't read data to the lower level of access. This rule is called **no read down**.

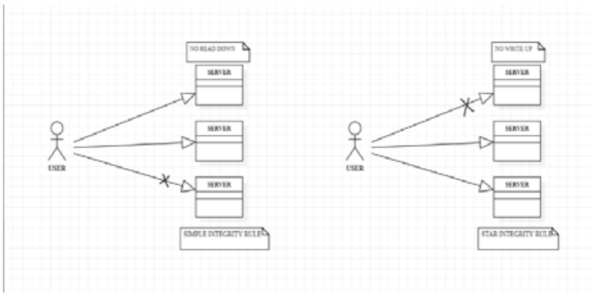


Fig. 2. Biba

This is giving the visual representation of the Biba model. Star integrity rule: In this the users (or) subjects can only write, edit the data which is on the same level of access and a level lower of their access but can't write data to the upper level of access. This rule is termed as **no write up** rule.

Biba model is using these rules to improve the integrity of the data that is been shared. The **integrity** implies that the data is been validated. It gives an authentication on whether the data available in the network is in correct format or not. It also validates data whether it is true and correct to its original source of data. Integrity makes sure that the data presented by the publisher is been received in the same way to the receiver.

3.3 Role Based Access Control

The role based access control model is been widely implemented as natural model as it is very much suitable in most case scenarios. The results of the applications built on this model are growing very rapidly in commercial and educational institutions.

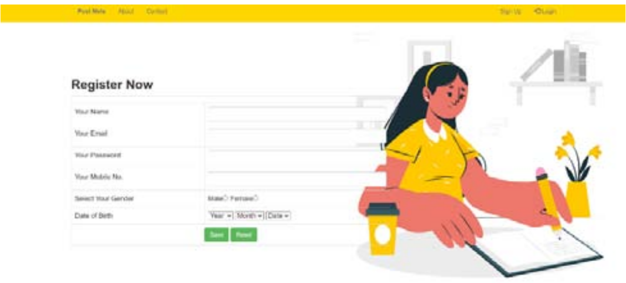
The function *Check Access* is used for authorizing decision made by the system is giving the users different roles in the network on the bases of the gender of the user *ex: female users are given role of higher level and male users are given a lower level.*

3.4 Implementation

The application created with complex combination of webpages is to create a secure network to interact with individuals who are willing to help the needed by sharing the needful. This is consisting one page for the Registration process.

3.4.1 Registration Page

One has to get registered in this page to login into their personalized account to view the posts (or) create a post. This is containing the attributes like user name, email, password, mobile number, gender, date of birth.



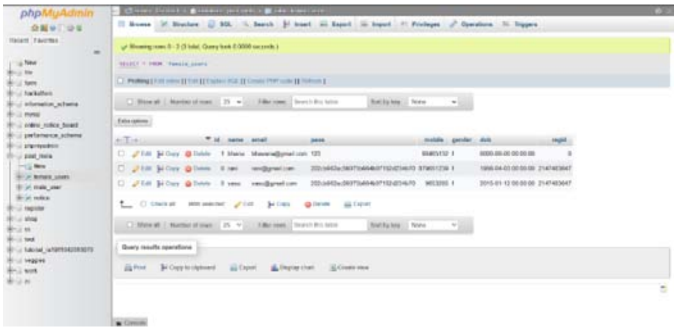
Register Now

Your Name
Your Email
Your Password
Your Mobile No.
Select Your Gender Male○ Female○
Date of Birth Year ▾ Month ▾ Date ▾

Fig. 3. Registration

This is the screenshot of the registration part of the application.

The data that is entered by the users is been stored into the data base and segregated into two different tables according to the gender of the user to give a specific hierarchy to the users according to the gender of the user.



SELECT * FROM `female_users`

id	name	email	pass	mobile	gender	dob	regid
1	[illegible]	[illegible]	123	[illegible]	1	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1	[illegible]	[illegible]

Fig. 5. Female User's Database

This is the database of application.

The few of the main features of the form is that the user's password can't be viewed even by the developer to get the better of security aspect of the users and all the details filled by the users is visible to whoever can access the data base.

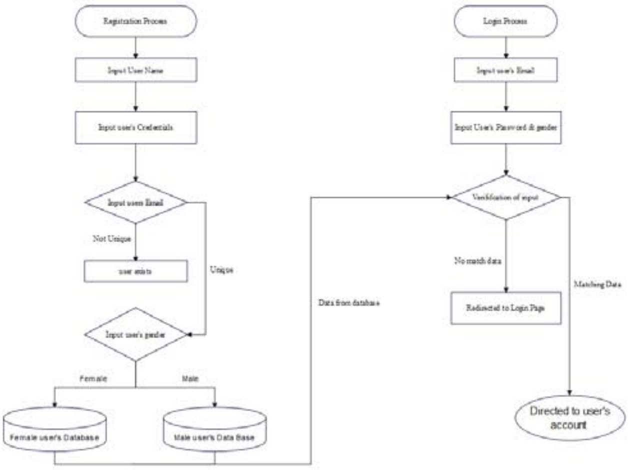


Fig. 6. Flow Chart

This gives a clear view on how the user's data is been flowing the stream line created in the network.

3.4.2 Login Page

Here the page is used for logging into the personal account to view their posts and post their new posts into the network. This is taking the user's email id, password and their gender to login into their account.

The login credentials are been verified with the database of the male users and female users while logging into user's account. Once the user longs into his /her account then they give few features to use the application and communicate with the network of users.

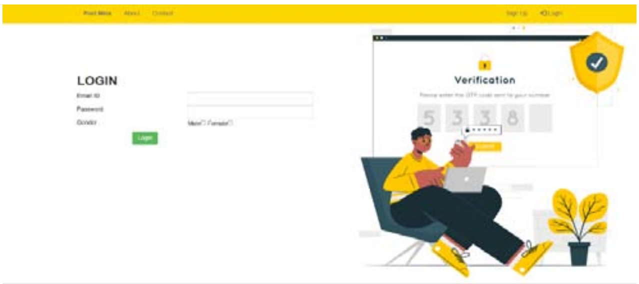


Fig. 7. Login Page

This part of the application is been used for the user's login.

3.4.3 Female Users

Once logging into the account, the female users are able to view their dashboard with the options like **Manage Users, Update Password, Manage Notification, Add New Notice** are the features that are available for the users.

By this they view the members of the network, they can create (or) edit (or) delete the posts they have posted into the network and can choose the option to share the information to a particular individual or not is completely in their hands. ***But they can't edit the comments of the male users (or) any other user but can only view them.***

This is where the Information security policies are been incorporated into the application this is said to the *Bella-LaPadula model.*

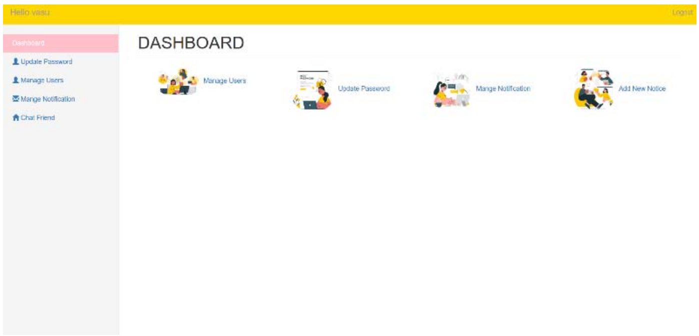


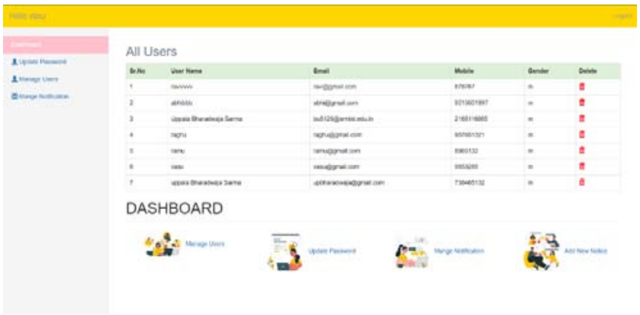
Fig. 8. Dashboard

Update password

They can update their passwords at this page. The Old password is been compared with the data base and if it matches then password of the user can be changed.

All users

Here the female users can view all the members of the network and can choose to delete any user of their choice from their network of members.



All Users

Sr.No	User Name	Email	Mobile	Gender	Delete
1	ravivvvv	ravi@gmail.com	878787	m	🗑
2	abhiiiiii	abhi@gmail.com	9213601897	m	🗑
3	Uppala Bharadwaja Sarma	bu5129@amrita.edu.in	2165116865	m	🗑
4	raghu	raghu@gmail.com	957651321	m	🗑
5	ramu	ramu@gmail.com	8960132	m	🗑
6	vasu	vasu@gmail.com	9953265	m	🗑
7	uppala Bharadwaja Sarma	ubharadwaja@gmail.com	730465132	m	🗑

Fig. 9. All Users

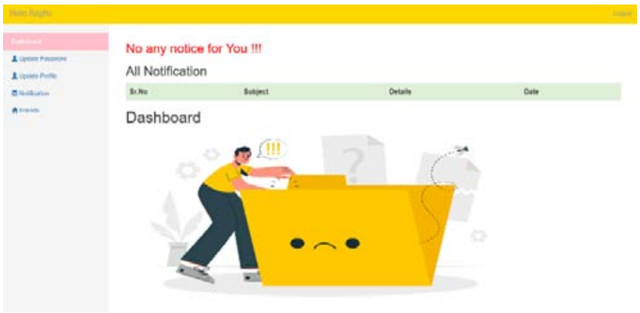
The female users can view the users of the network and start a communication with them if they want to have initial point of connectivity with the users.

All notices

The users can delete (or) Update their post to the members of the network at any point of time which gives them complete control over their posts into the network. Once the user can view the notices, they posted in the network then they can even create completely a new notice and upload it into the members of the network.

3.4.4 Male Users

If a user is logging using the credentials and selecting the gender as male, then they are navigated into a new page dash board where they can view all the notices that they receive from the members of the network.



No any notice for You !!!

All Notification

Sr.No	Subject	Details	Date

Dashboard

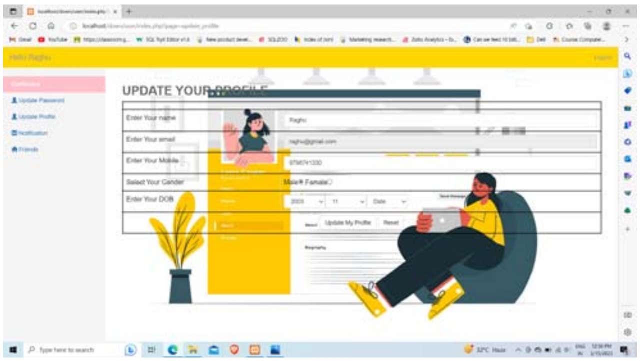
Fig. 10. View Notice

Update password

At this page is used for the same purpose for male and female users, to update their passwords for logging in their accounts. The old password is been verified with the data base from the registration process.

Update profile

This page is used for the updation of user's information like user name, mail id, mobile number, gender and DOB.The changes made in this page is been modified even in the database as they save the dat is been changed.



UPDATE YOUR PROFILE

Enter Your name	Raghu
Enter Your email	raghu@gmail.com
Enter Your Mobile	9756741330
Select Your Gender	Male● Female○
Enter Your DOB	2003 ⌄ 11 ⌄ Date ⌄
	Update My Profile Reset

Fig. 11. Update Profile

Here the Male Users can only view the posts and add a comment to the posts that are been posted can only view them but can't edit the data that they are sent.

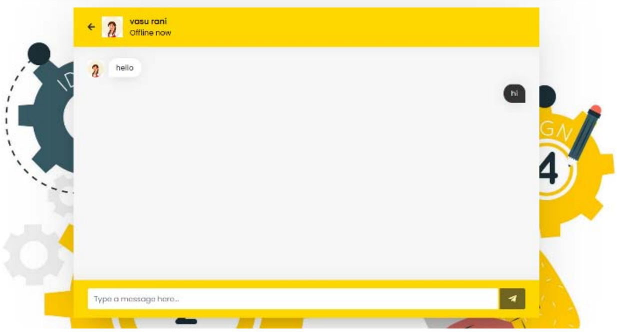
This is the phase where the second phase of the security policy Bell-LaPadula is been kept into application.

Once the user logins to his/her page they can view the option to communicate with the members of the network and start a communication directly rather than trying to contact them via mail (or) mobile for basic communication which can develop a more secure in the aspect of privacy of the users.

3.4.5 Friends Chatting

The users are giving the users a feature to have a communication with each other which enhances the user's experience of using the network.

Once the user logins then he/she can view the number of user's they can communicate with. They can chat with the users by using this feature of the network.



vasu rani
Offline now

hello

hi

Fig. 12. Chat Space

3.5 Architecture

Here the point is to create clear picture on how the integration of Information Security Models into the social network is been held from a bird's eye view. There are multiple modules which make the things keep moving and get a greater understanding.

Which user is getting what sort of features in the network can be understood by viewing the architecture of the network that is developed.

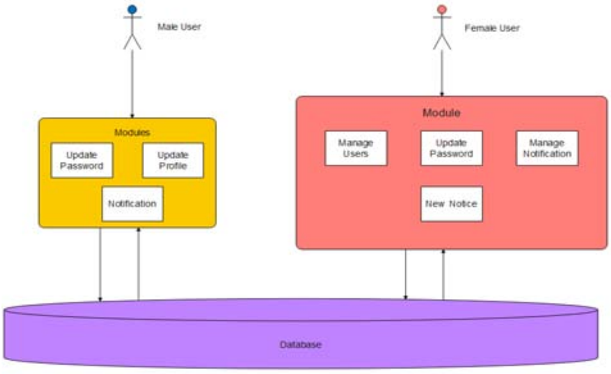


Fig. 13. Architecture Diagram

IV. Conclusion and Future Enhancements

This paper is mainly trying to introduce a new way of creating a network to have a more secure, accessible and reliable network by using Information Security methodologies incorporated into the process of creating the network and establishing it. Then tried to use it to improve the way the users interact in the network and build it for a better communal environment which encourages users to be a part and grow themselves. The effects of good network will improve the way one can create communal energy to achieve a specific goal, encourage users for initiating anything that they thought of (or) can be a part of it. This paper is trying to take a leap onto find the way to integrate Information Security into the network to develop a more secure environment. Where we can develop a more secure and dependable network, more users could be encouraged to be a part of the network in the present times, as the present scenario of new social networks being developed every day and available in the internet. This paper is trying to provide an insight on how the integration of information security models impact the working of the social network in real time in various aspects. Trying to get a foresight on how the impact of community energy initiative (CEI) to build systems which are effective in indulging members of it.

In the future the network can improve more in the aspect of the security of the user. This one is a very basic template of registration. The inclusion of the real time verification of user's email id by OTP generation could be next step in the process of development. Later to this we can create more sophisticated process where when user registers themselves the photo, they use for the *DP* can be compared with the real time user's face using facial recognition from stopping fake users in the network where male users can be controlled from creating fake female accounts in the network.

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