A Comprehensive Study on Providing Services based on User Interest in Online Social Networks

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Abstract— In recent years, Online Social Networks (OSNs) are one of the most popular interactive medium to communicate, share and distribute a considerable amount of human life information. The best entertainment for the people is given in the form of Social Networking sites. But the fundamental issues in OSNs are to give the users the ability to control the information posted on their private walls and to validate the data inputted by the users. The aim of the present work is therefore to propose and experimentally examining an automated system, called Filtered Wall (FW) able to filter undesired information from OSN user wall and to check whether the data inputted by the user is valid or not. The system use a Machine Learning (ML) based text classifier to enforce customizable Content-based Filtering and it give users the ability to control the information posted on their own private space to avoid that undesired information to be displayed in online social networking environment and to validate the data inputted by the user.

Keywords- OSNs, Filtering system, FW, OSNs, ML based text classifier, Content- based filtering, Policy based personalization.

I. INTRODUCTION

Nowadays Internet becomes more popular in the day to day activities of people. Internet is a global network connecting millions of computers and become more popular in the daily activities of human life. But, internet is not synonymous with World Wide Web (www). Because, internet forms a network in which any computer can communicate with any other computer as long as they both are connected to the internet. Online Social Networks (OSNs) increased rapidly and facilitate connections between people to exchange their interests, data and knowledge in particular groups that is with their friends, family members, colleagues etc. They make it easier for people to find and communicate with individuals who are in their networks using the web as the interface. The internet and online social media provide people with a lots of benefits and opportunities to empower themselves in a variety of ways. People can access more information from the social network using internet. The groups and social interactions that the people make out using online can be invaluable for developing people's self-confidence and social skills. OSNs make it easier for people to find and communicate with individuals who are in their networks using the web as the interface. When any people use the term social network, we all automatically think of online social networks. That is because OSNs, also known as social-networking sites, have become popular in recent years. Sites like Facebook, Twitter and LinkedIn account for three of the top most visited websites in the globe. For many users who use internet facility, OSNs are not only a way of connecting with peoples, but it is a way of life.

However, the aim of the majority of these proposals is mainly to provide users a classification mechanism to avoid they are overwhelmed by useless data. Information filtering in OSNs can also be used for different approaches. This is due to the fact that, in OSNs there is the circumstance of posting or commenting other user's posts on particular public or private areas, called general walls. Therefore Information filtering can be used to give users the ability to automatically control the informations posted on their own walls, by filtering out undesired informations and provides the services based on user interest. The goal of the present work is therefore to propose and experimentally evaluate an automated system, called Filtered Wall (FW), able to filter unwanted informations from OSN user walls. Here, the entire control is under the administrator and the admin will propose what are the contents to be filtered and what not. This complete work is done with the help of filtered wall and gaining an advantage from Machine learning text categorization technique.

The remainder of this paper is structured as follows. Section-2 reviews some of the related work, problems with existing system and the advantages of proposed system, Section-3 describes architecture of the Filtered wall, Section-4 describes gives the brief note on Results and discussions and Section-5 contains conclusion of the project work.

II. RELATED WORK

A. Existing System:

In this section I am going to discuss the recent methods over the Validation and User based preferences in OSNs. Today OSNs provide very little support to prevent undesired information on user's wall. For example, Facebook granted users to state who are all allowed to insert information on their walls that is, friends or defined groups of friends. But, there content based preferences are not supported and therefore there is lots of confusions and time consuming while tracking the information on the user wall and not possible to prevent undesired information, like political, vulgar or any undesired information that may create problems in future, no matter of the user who posts them. So, the major flaw in the current system is the lack of user satisfaction. For example, assume that if the user is interested in using any social network, for e.g. considering Facebook, user will get registered to the application and user interest is to discuss or view the things related to only on education and politics. But, it is a social medium, user cannot assume that all friends of them also have the same interest; they may like to share the information of their interest. So, proposed system uses content filtering to automatically filter undesired information from OSN user walls on the basis of both information contents and the information creator relationships and characteristics. Another objective is to verify the data provided by the users in OSNs. For example, if any user tries to input some irrelevant things means if it creates any issues in future or if an information contains any irrelevant information, the current social application will not validating or it does not check whether it is relevant or not or if it creates any issues in future after publication. So in proposed work, the application itself should block instead of publishing those kinds of information.

Limitations of the Existing System:

- Lack of user satisfaction in OSN
- Less Efficient
- Lots of confusions while viewing the messages in OSN
- Time consuming for tracking text messages in OSN
- Less Reliable
- Displaying unwanted messages for the users in OSN
- Lack of customized services for the users in OSN

B. Proposed System:

The aim of the present work is to propose and experimentally evaluate an automated system, called Filtered Wall (FW), able to filter undesired information from OSN user walls. Machine Learning (ML) text categorization technique is used to automatically assign with each information a set of categories based on its content. Recommender systems have become popular in recent years. It is a type of information filtering system that predicts the preference that user might give to an item or to the social element. It takes into account user interest and recommends an item.

This work has an association both with the content-based filtering & also with the field of policy-based system for OSNs.

1) ***Content-based filtering:*** In content-based filtering each user is assumed to operate independently. As a result, a content-based filtering system selects information items based on the correlation between the content of the items and the user preferences as opposed to a collaborative filtering system that chooses items based on the correlation between people with similar preferences. Documents processed in content-based filtering are mostly textual in nature and this makes content-based filtering close to text classification. Content-based filtering is mainly based on the use of the Machine learning model, according to which a classifier is automatically induced by learning from a set of pre-classified examples. Focusing on the OSN domain, interest in access control and privacy protection is quite popular in recent years.

   The overall goal of our proposal is completely different, since we mainly deal with filtering of unwanted contents rather than with access control. As such, one of the key ingredients of our system is the availability of a description for the message contents to be exploited by the filtering mechanism as well as by the language to express filtering rules. In contrast, no one of the access control models previously cited exploit the content of the resources to enforce access control. This is a fundamental difference.

2) ***Policy-based personalization:*** There have been some proposals exploiting classification mechanisms for personalizing access in OSNs. The filtering policy language allows the setting of FRs according to a variety

of criteria that do not consider only the results of the classification process but also the relationships of the wall owner with other OSN users as well as information on the user profile. Moreover, this system is complemented by a flexible mechanism for BL management that provides a further opportunity of customization to the filtering procedure.

The only social networking service we are aware of providing filtering abilities to its users is MyWOT, a social networking service which gives its subscribers the ability to: 1) rate resources with respect to four criteria: trustworthiness, vendor reliability, privacy, and child safety; 2) specified preferences determining whether the browser should block access to a given resource, or should simply return a warning message on the basis of the specified rating. Despite the existence of some similarities, the approach adopted by MyWOT is quite different from the proposed system. In particular, it supports filtering criteria which are far less flexible than the ones of Filtered Wall since they are only based on the four above-mentioned criteria. Moreover, no automatic classification mechanism is provided to the end user.

III. FILTERED WALL ARCHITECTURE

An architecture description is a formal description and representation of a system, organized in a way that supports reasoning about the structure of the system which comprises system components, the externally visible properties of those components, the relationships (e.g. the behavior) between them, and provides a plan from which products can be procured, and systems developed, that will work together to implement the overall system.

The architecture in support of OSN services is a three-tier structure as shown in the figure: The first layer, called Social Network Manager (SNM), commonly aims to provide the basic OSN functionalities (i.e., profile and relationship management), whereas the second layer provides the support for external Social Network Applications (SNAs). The supported SNAs may in turn require an additional layer for their needed Graphical User Interfaces (GUIs).

As depicted in Figure 1, the path followed by a message, from its writing to the possible final publication can be summarized as follows:

1) After entering the private wall of one of his/her contacts, the user tries to post a message, which is intercepted by FW.

2) A ML-based text classifier extracts metadata from the content of the message.

3) FW uses metadata provided by the classifier, together with data extracted from the social graph and users' profiles, to enforce the filtering and BL rules.

4) Depending on the result of the previous step, the message will be published or filtered by FW.

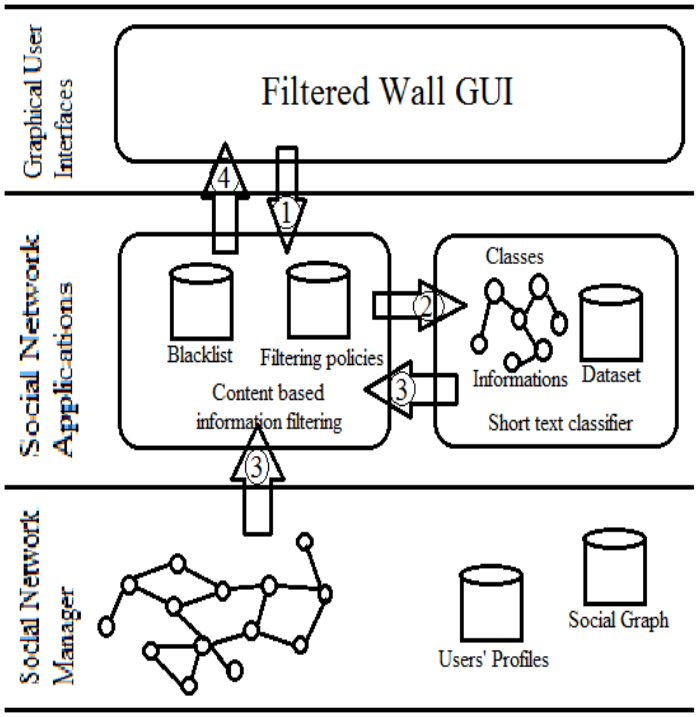

Fig.1: Filtered Wall conceptual architecture.

IV. RESULTS AND DISCUSSIONS

Fig.2 shows the Home page of the application. This is the startup page any user can get when using this application.

Fig.2: Home page of the application

Fig.3 Shows the Registration page for the new user. It will display the error message when user gives the wrong email id format. On Successful registration, user can get login to the application and make use of the services provided.

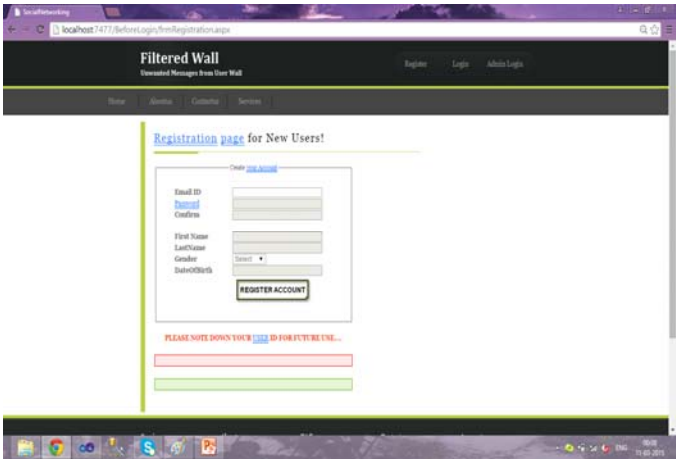

Fig.3: Registration page for the new user.

First of all, the Administrator of this application needs to add the Content types that the users can make use of those to specify their area of interests. The Admin of the application also adds the irrelevant keywords in each category. Fig.4 gives the snapshots of how the Administrator can manage content types and keywords. After Administrator specified all the categories users can create his area of interest to filter undesired information to be displayed in his wall.

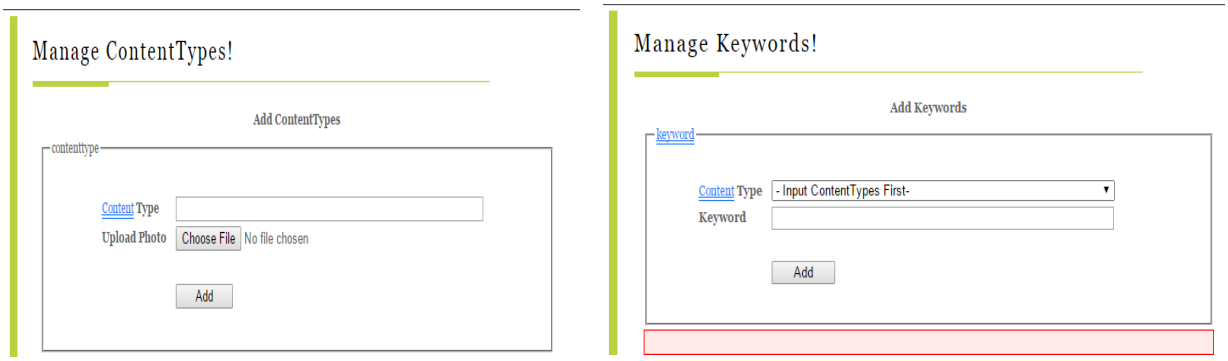

Fig 4: Managing content types and keywords

Then all the users of this application need to add their area of interest by selecting the specified categories while registration or profile updation. Based on user area of interest, information will be displayed on their walls and if any information contains irrelevant words or vulgar words then that information will be blocked by the filtering system.

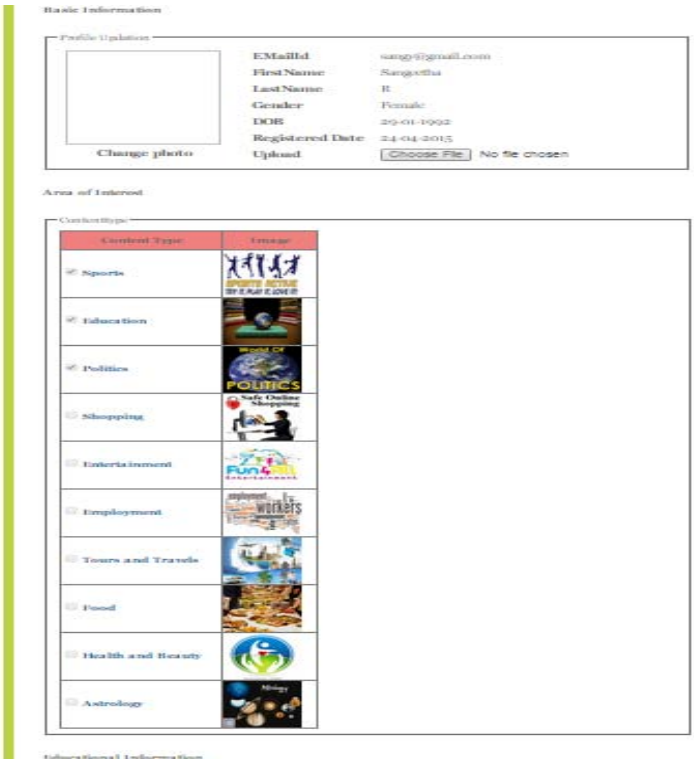

Fig 5: Selection of user interest in Profile updation.

If any user of the OSN application wants to share the information, then user needs to select the specified content type of that information and also give the title name and description of that information, user can also attach photo or video to share with that. That information will be shared to all the friends of that user who are interested in that field and it also checks the validation of the information before submitting to any user wall.

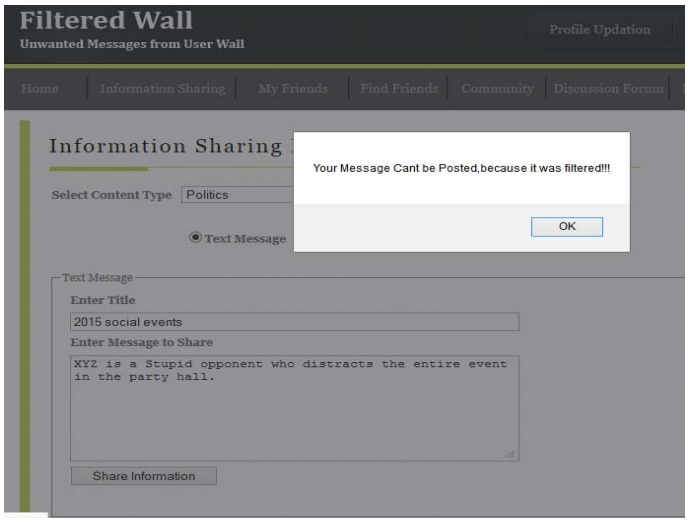

Fig 6: Filtering of the information if it contains any irrelevant words.

V. CONCLUSION

- Content based filtering for the users is to prevent undesired information and to provide the service based on the customer interests in OSN.
- Exploiting Machine Learning (ML) text categorization techniques to automatically assign with each short text message a set of categories based on its content.
- Provide users a classification mechanism to avoid they are overwhelmed by useless data.
- Provide user specified services in OSNs.
- Validate the data inputted by the user.

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