Progression in Social Networks by the Impact of Advanced Software Agents

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Abstract: The emergence of Internet of Things (IOT), Mobility and Pervasive Computing has made the necessity of software agents in social networks. Software Agents used in several applications help the end users to minimize their effort and increase their productivity. Properties of software agents like autonomy, social ability and learning makes the social networks automate their functionality. Nowadays social networks have their application in various fields like education, healthcare, banking, advertisement, etc. which use software agents to simplify their job. Web 2.0 which is used by most of the social networks has the implementation of software agents in it. In this paper we are going to analyze how advanced software agents have revolutionized the features of social networks. For example, features in social networks can be regulated according to the speed of the internet connection which would disable high bandwidth consuming features if the network speed is low. A network threshold agent analyzes the network bandwidth of the underlying connection and adapts the features of social networks like photo viewing, video chat quality, etc. This makes the end user to get the best quality of service with the available connection.

Keywords: Social Networks, Multi Agents, Autonomous Systems and Web 2.0.

1. INTRODUCTION

Most of the Social networking sites are integrated into a single concept called the SNP (Social Networking Platform). The most popular SNPs are Facebook, Whatsapp, Twitter, LinkedIn, MySpace, Tumblr, Instagram, Google+ and Friendster. The differences in these SNPs has been rated in terms of how it pleases the user with itsuser interface, privacy, security, updation capability, technological affordances, supporting a wide range of interests and practices. SNPs also differ in the extent to which they integrate new information and communication medium, such as portable connectivity, underlying networks, blogging, photo/video-sharing, advertising and online gaming etc [1-3].Social networks have gained huge reputation in the last decade. This is mainly due to the services they provide like mass communication, advertisements, information sharing etc. The modern day users of social networks want services on the go. They also want services to be given as a usable product [4]. For this customization software agents can be integrated so that the end product is autonomous software which

is capable of satisfying the need of the users using the available resources. New applications change the way we use social networks. Social networks helps to bridge the gap between education, business and community building, etc.

2. ROLE OF SOFTWARE AGENTS IN SNP

The economic and technological change that has been taking place in this decade requires an analysis and design tool better than the conventional technology to handle the dynamics of automation[5][6]. The advancement in technology and economy by the use of software agents has been experienced in various fields of software development. The multi agent software applications used along with the social networks help to do multiple tasks concurrently. Moreover agents used in social networks does the all important task which humans fail to do it right i.e decision making. An analysis is done to find out the reason a person uses social networking sites[7-9]. A case study that involves people of age group 10 to 80 is done with an questionnaire. It is also noted that the people are across various sectors like students, working in government sector, working in private sector, retired people and laymen[10]. The results are tabulated as a bar chart. It is found that the major reason that a person spends his time in social networks is that he needs to get connected to his friends; he needs to reconnect with his friends. The results of the experiment is shown in Figure 1.
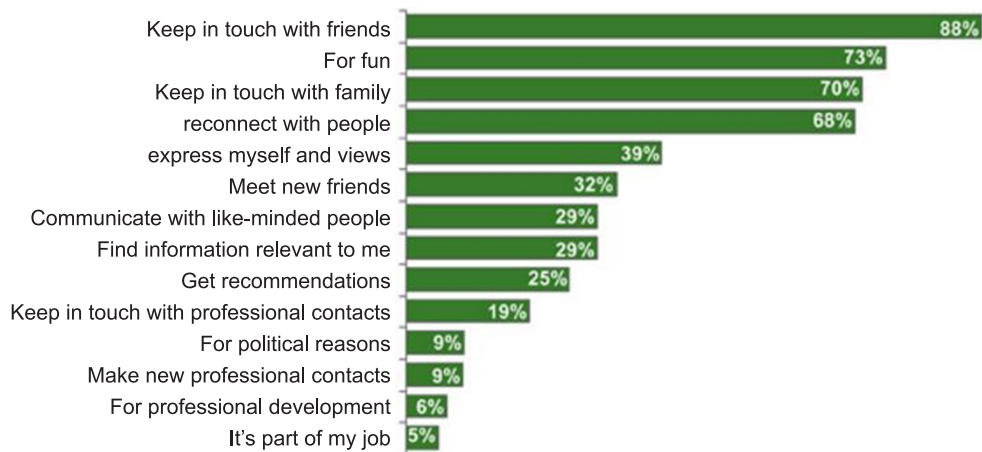

Figure 1: Reason for using social networking sites

3. PRINCIPLES OF A FRIEND SUGGESTION AGENT

Getting connected to friends is one of the most important task in any social network. As the social networks have emerged only in this decade people want to get connected with their old friends. This is not a simple task as the social networks have millions of users and the probability of people having the same name is very high. So the search time and effort to search a friend is more complex [11-13]. The users would get fed up if they are not able to find out the appropriate person they need to find out. So to overcome this issue a software agent is introduced which is responsible for suggesting friends to the users.

The friend suggestion agent is learning, autonomous and an adaptive agent program. It uses the learning parameters like school or college where the user studied, the current and past workplace of the user, the residential location and the related friends. The agent uses these learning parameters from the account of the user, compares it with the current status of the user and further suggests the friends who are related to them [14-16].

A hysteretic agent could be used in the friend search scenario because it doesn't need to perceive its environment continuously in order to act; rather it needs to save the history of the user. In this scenario the friend

search agent needs to study the history of the user like the birth place, date of birth, schooling location, college, employment and current living place. It needs to apply the combinations among all the factors and arrive at a threshold value according to weight age given for each constraints [17-19]. The decision of the agent should display the highest rank friends who pass through the constraints given above.

Figure 2: Parameters of Friend Suggestion Agent

4.   DISPLAY ADAPTIVITY OF SOCIAL NETWORKS

We are in the generation wherein multiple heterogeneous devices are used for internet connectivity. Devices like desktop computers, laptops, mobiles, palmtops and smart televisions are used to connect to social networks. Each of these devices have heterogeneous features like display size, operating system, graphic specification, hardware compatibility etc. The end user of the social network irrespective of the device he uses, expects the best service. So the designers are posed to have a challenges with adapting different displays[20] [21].

Table 1
Display resolution of various devices

Device	Resolution
iPhone 5 portrait	320px
iPhone 5 landscape	568px
iPhone 6 portrait	375px
iPhone 6 landscape	667px
Android (Nexus 4) portrait	384px
Android (Nexus 4) landscape	600px
iPad portrait	768px
iPad landscape	1024px

The most common devices and their resolution are listed in the Table 1. The complexity in devices is that it can be used both in portrait and landscape. The website or application has to be designed in such a pattern that the same design has to be adapted in all these devices. To make it feasible are sponsive website is designed along with a resolution agent.

```
function foo()
{
alert(screen, width);
}
```

Javascript function for getting the device screen width

```
Blackberry Touch
        768px
Samsung Galaxy:
        800px
```

Screen width result using javascript function
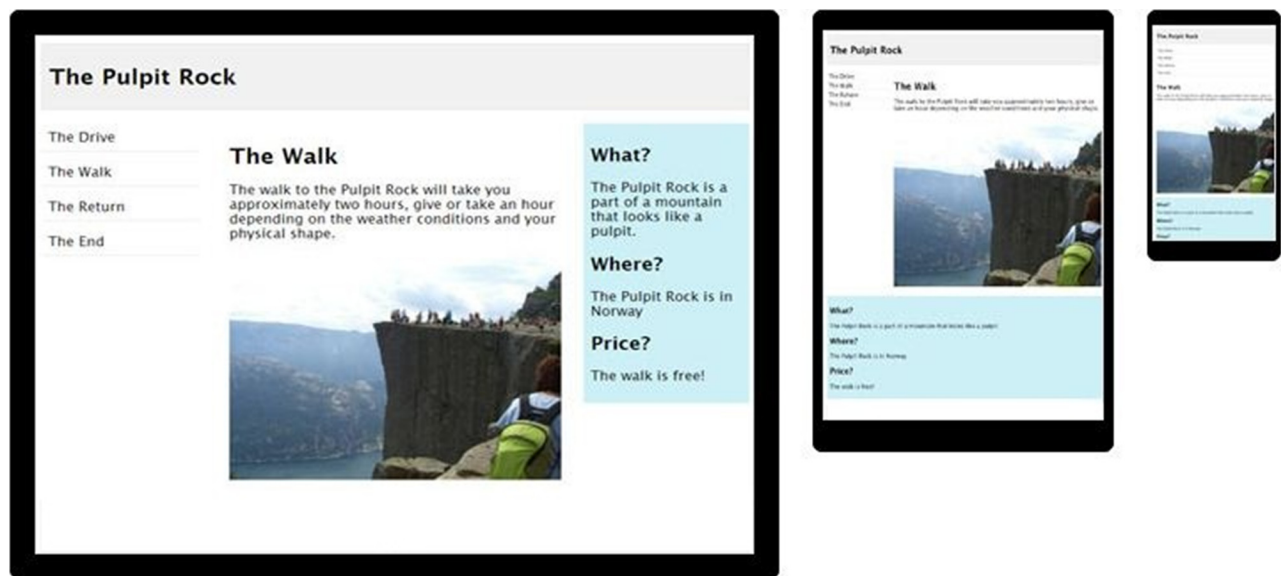
Figure 3. Screen width resolution agent

Figure 4: Resolution agent used to display the same webpage in different devices

The output of the javascript function is the input for the resolution agent. The resolution agent has the features that have to be displayed in its repository. According to the display capability found with the help of the javascript function this agent creates a customized page with would fit into the display. The use of this agent minimizes clumsy displays and hidden features.

5. SOCIAL NETWORKS ADVANCEMENT- A CASE STUDY- FACEBOOK

The successful evolution of social networks depends on several internal and external parameters. It should have clear vision of their deliverable. The users of the social network regardless of the age and computer knowledge should use the social network. One such successful network is Facebook[21-23]. The Facebook website was launched on February 4, 2004, by Mark Zuckerberg, along with fellow Harvard College students. Initially Facebook was restricted to students of Harvard university later it was made global. Users of Facebook after registering in it can create their user profile, create a profile picture, add friends, chat with their friends, update their status through text, photo, video and can receive notifications from others.. As on 2016 Facebook has 1.59 billion users. The latest feature release was on February 24, 2016, Facebook launched Facebook Reactions, which allows users to respond to posts with multiple reactions in addition to "liking" it.

Figure 5: User count comparison of different social networks

6. TREND ADAPTATION OF SOCIAL NETWORKS USING SOFTWARE AGENTS

Social networks have a paradigm to keep updated according to the trend and needs of the user. If they fail to do so they would not keep trending. That was the reason why social networking giants like Orkut, Hi5, etc have lost reputation and users. They failed to satisfy the needs of the user because they were static in the context of needs of users. A successful social network is one which identifies what the end user needs it also correlates it with the current technology and comes out with a successful product. So as we know communication and connection with friends is the major utility of any social network. A triumphant social network is one which provides ample space for communication. It has to analyze the latest technologies in communication and work towards achieving perfection in that. The major mode of communication in any social network is chat. The evolution of chat ranges from a simple text chat, voice chat to video chat. While considering the latest chat mechanisms they are bandwidth consuming. So the toughest part is to employ the latest features with the available features like bandwidth and hardware capabilities[24-25].

Here a software agent can be used which studies the capacity of the network and the underlying hardware on regular basis. It makes use of the usage analysis logs and hardware performance analytics to rate the system. The social networking site or application is designed to work in different modes according to the inputs from the agent. It has a threshold value for shifting to the different modes. For an instance the video chat will work with 1080p if the connection speed is more than 4 mbps, it would work in 720p if the connection speed is between 2 to 4 mbps and will work at 240p if it is less than that[26].

Software agents have changed the utility rate of social networks and have been instrumental in taking the social network to the next generation of users. Here are some features that have been changed by the use of software agents.

Feature	Without Software Agents	With Software Agents
Video and Audio chat	Basic chat	Agent based bandwidth adaptable chat
Friend search	User searches	Agent suggests friends
Photo tagging	User tags	Agent finds appropriate person and tags
Posts view	User searches	Agent suggests the related posts

A case study that involves people of age group 10 to 70 is done with a questionnaire. It is also noted that the people are across various sectors like students, working in government sector, working in private sector, retired people and laymen. The results are tabulated as a bar chart. The study suggests that there is a drastic improvement in the usage statistics of the social network with the application of software agents.

This figure portrays that how users are attracted to the features of social networks which in corporating the advanced software agents. People of this generation want services at their door step and they spend less time in working towards it. So unless software agents are accommodated with the existing social networks this task would not be feasible. Software agents have capabilities like reactivity, proactivity and social ability which are closely related to advanced features of social networks.

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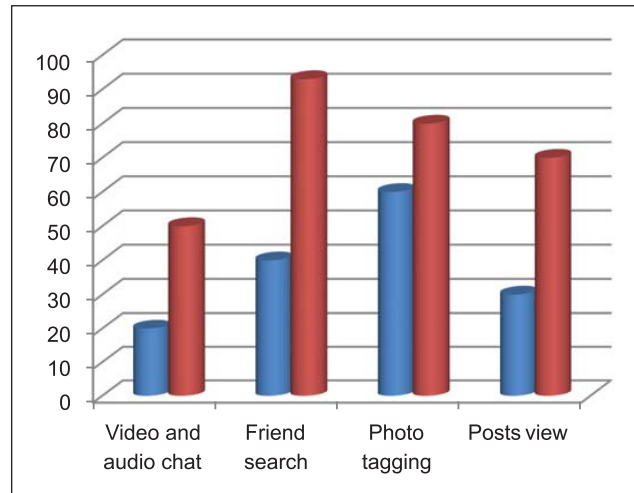
Blue - Users who were used social networking site features before the addition of advanced software agents
Red - Users who were used social networking site features after the addition of advanced software agents
Figure 3: Improvement in usage of features of social networks using advanced software agents

7. CONCLUSION

As the trend shift in social networks is very rapid, the developers who were posed with a huge challenge. Unless they adapt to the recent trend and technology the underlying social network would not survive. The introduction of web 3.0 which would enhance the user communication with the application that creates structured data. It uses semantic web which is data driven. Semantic web ensures secure and efficient access of data. The reengineering of social network with the addition of these technologies would make it more qualitative. These technologies integrated with social networks make it ubiquitous, reliable and secure.

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