

User Trust in the BBS Communities

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INTRODUCTION

The Bulletin Board System (BBS), when it first appeared in the middle 1970s, was essentially “a personal computer, not necessarily an expensive one, running inexpensive BBS software, plugged into an ordinary telephone line via a small electronic device called modem” (Rheingold, 1993). The networked computers used to create these parallel worlds and facilitate communication between human beings constitute the technical foundations of computer-mediated communication (CMC) (Nancy, 1998). CMC systems link people around the world into public discussions. While CMC can exist solely between two people or between one person and an anonymous group, increasingly, virtual communities of many people are being formed.

With advent of the Internet, the World Wide Web (WWW) brought more new technologies to the BBS. Thousands of BBSs sprang up across the world. Many turned out tremendously successful and evolved into lively virtual communities. These communities provided forums with increasing importance for individuals and groups that share a professional interest or share common activities. Online BBS communities now play an important role in information dissemination and knowledge collaboration on the Internet.

On one hand, online forums enable people to disseminate information in an extremely efficient way without geographical restriction. On the other hand, the freedom also comes with uncertainty. Any information can be released and the content is almost beyond control, or even unreliable.

To understand the content and quality of the information in BBSs, we would split the task into two subjects: one is to assess the information sources; another is to assess the information providers, people themselves in the virtual communities. Most BBSs are anonymous, because people usually use a pseudonym rather than their real name when registering. A user does not need to provide real personal information to the system, either. Thus, how to assess the trust of the users in a BBS community and attract more trustful and worthy users to participate in the activities of the community have become crucial topics to establish a successful community.

Two subjects are important for establishing user trust in a BBS community: First, a BBS system must be able to identify a user and provide efficient security protection for each user and his/her privacy. Second, the value and the trustworthiness of a user should be assessed according to that user's behavior and contribution to the community in comparison to peers.

USER AUTHENTICATION IN BBS

The first BBS was called the Computerized Bulletin Board System (CBBS), and was developed in February 1978, with software development by Ward Christianson and hardware configuration by Randy Suess. In the 1980s, before the Internet was popularized, BBSs became increasingly popular as a base for communications between geographically dispersed users who accessed the BBS over telephone lines. Rheingold's (1993) definition of a virtual community exactly describes the characteristic of BBSs: “Social aggregations that emerge from the 'Net when enough people carry on public discussions long enough, with sufficient human feeling, to form webs of personal relationships in cyberspace.”

The typical BBS operation is that users use BBS software on their computer to dial the BBS server over a telephone line. A BBS login session consists of a user entering commands from the keyboard during the connecting time, and the BBS responding interactively. All these operations occur in the connecting time. That is, a peer-to-peer connection channel must be established and kept during the session, starting with the user login onto the BBS and ending with the user logout. The username-password authentication method, commonly used in BBSs, could be considered as enough to protect the user before the graphics-oriented, Web-based BBS forums appeared on the Internet in the mid-1990s.

The appearance of the Web-based BBS forum system is a revolution of the BBS. It replaces the traditional plain-text interface with a graphic interface. Without special BBS software, a user opens a Web browser and clicks the address link of a BBS forum. A fantastic graphic-oriented interface will appear to the user. Such friendly systems allow every layman fearful of computers to access the Internet community and to become a

fully participating citizen. The success is due to the adoption of the Hypertext Transfer Protocol (HTTP) for data presentation and transfer over the WWW. However, the HTTP protocol also brings about a side effect, by making the username-password authentication method to be not enough for the security of Web-based BBS forums.

The username-password authentication identifies a user by a password known by the user only. It is a common method to secure and protect user operation, regardless for local or remote computer service. In a traditional BBS, a user usually uses BBS client software to establish a peer-to-peer connection channel to the server over a dial-up modem or the Internet. When the connection is established, the server will prompt a user login interface. The user types in a username and password to login. The connection has to be kept until the user logs out, so the user is authenticated once in the whole BBS session. This authentication method has enough security, because the communication channel can be protected by a session key encryption and the password is only known by its owner and stored in the owner's brain.

The mechanism of the HTTP Web service is to support anonymous browsing on the Internet. By its design nature, Web servers cannot track a user's progress over HTML pages. Web-based BBS forums suffer from this situation. To identify a user, the user has to provide a password to prove him or herself in every HTTP request if the BBS depends on username-password authentication only. HTTP session technology is derived to solve this problem in combination with cookies.

HTTP session technology provides session tracking to enable tracking a user's progress in a Web site. A session is defined as a series of related browser requests that come from the same client during a certain time period. The mechanics of session tracking are depicted as the following: A request arrives at the server, requiring that a session be created. The server creates a session object, associating a session ID with it. The session ID is transmitted back to the browser as part of the response header and stored with the rest of the cookies in the browser. On subsequent requests from the browser, the session ID is transmitted as part of the request header, allowing the application to associate each request for a given session ID with prior requests from that user.

However, the session technology cannot guarantee that the information stored in a session is only viewed by the user who created the session. There are also several ways to leak an existing session ID to third parties. A leaked session ID enables the third party to access all resources associated with a specific ID. First, URLs carry session IDs. If a user links to an external site, the

URL—including the session ID—might be stored in the external site's referrer logs. Second, a more active attacker might listen to the user's network traffic. If it is not encrypted, session IDs will flow in plain text over the network. The current efficient solution is to implement Secure Sockets Layer (SSL) on the server and make it mandatory for users.

USER TRUST RANKING MODELS IN A BBS COMMUNITY

In general, a BBS forum provides an asynchronous online discussion platform for people to disseminate information and share knowledge with each other. The regular behavior of a user is reading the messages (usually called posts in BBS), submitting a topic post to issue a discussion and replying a topic to join the discussion. The main contribution of a user to a BBS community is the posts disseminated by that user.

Consequently, filtering and ranking the content based on its quality and reliability become vital to establishing a successful BBS community. To our knowledge, modern information retrieval and linguistic technology can not enable a computer to understand and evaluate the content of posts efficiently. A common approach to filtering and ranking is to rely on people, who rate the content based on its quality and reliability. There are two main variations, based on whether the system for recording and publishing the rating itself is open or closed: In a closed rating system, a group of "editors" is pre-qualified so that their ratings are known to be of adequate quality (e.g., Yahoo!). In an open rating system, not only can anyone publish content, they can also publish ratings to this content (Ramanathan, 2004).

We consider a BBS forum system as a hybrid of BBSs, because BBSs often assign few re-qualified users as moderators to control the quality of posts. On the other hand, the number of posts can grow rapidly enough to get out of the control of moderators when a BBS becomes larger and larger. Our recent work proposes a group decision approach to assess the posts based on an open rating to solve this problem (Hung, 2005).

Within the past few years, Google has become the far most-utilized search engine worldwide. The idea behind PageRank (Lawrence, 1999; Sergey, 1998) is that good pages reference good pages. Hence, pages that are referenced by good pages have higher PageRank. This algorithm calculates an aggregation rank of pages. We think the same idea can be used to present and analyze the social relationship among users in a BBS community, and it is also helpful to find out the distillate posts that can be assessed as good and valuable.

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