Improving Online Collaboration within the IFIP Working Group on Human Aspects of Information Security and Assurance

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Abstract

In this paper a study into online collaboration methods has been carried out. Starting with the types of online collaboration, research was carried out into the existing methods of collaboration for the International Federation for Information Processing (IFIP) working group on the Human Aspects of Information Security. Further research was conducted into the field of online collaboration focussing on wikis, social networks and bespoke tools. Based on this it was decided that a bespoke online collaboration platform would be designed and built taking into account the requirements of this working group. Feedback on the bespoke platform was provided continually by the working group and helped to create a solution that exceeded their requirements and expectations. It was also highlighted that the solution would be adopted by the working group as their primary means of online collaboration.

Keywords

Online collaboration, collaborative tools, social networks

1. Introduction

The growth of the Internet has enabled people to communicate quickly across large geographic distances and access huge quantities of information. Before this time if researchers wanted to collaborate with their international colleagues they would have to communicate by telephone, post or by regular on site visits. Each of these methods has issues such as; the time differences when considering telephone calls, the delay in postal delivery and the cost of on-site visits. It can therefore be seen that the internet can help to overcome these problems and provide an effective solution for collaborating with geographically distributed colleagues.

The topic of online collaboration is becoming more important in the modern world, as technology progresses and computers are able to produce more complex data file size have increased and it has become less feasible to rely on email as the primary method of collaborating online. File size limits imposed by email service providers have made it impossible to attach certain file types to emails. In addition to this the growth of social networking has given rise to improved online collaboration software.

This paper will cover the topic of online collaboration, providing examples and literature relating to this. It will continue to present the case study of a working group within IFIP in which they migrated from a system with no collaborative elements to bespoke collaborative software. The case study will explain why it was decided that the software would be bespoke, what features of the software make it ideal for encouraging collaboration and will end with a discussion on the feedback provided by the members of the working group.

The paper will end with a discussion on the importance of online collaboration in the research environment and how bespoke software solutions could provide the best fit for this. It will further discuss the importance of user requirements in the development of online collaborative tools and how these tools can become an important part of daily working.

2. Online Collaboration

There are many examples of online collaboration that takes place in unique ways for example, the re-captcha system which makes use of massive scale online collaboration in order to digitise the world's books (Ahn, 2011.) The open source movement has produced software that rivals and in some cases exceeds its commercial rivals (Bird, 2011). This project however looks at some of the more regular methods of collaboration such as wikis, social networks and bespoke software platforms as these are more closely related to the aims of the project. There are some disadvantages to online collaboration such as the issues present in emails where a user is relying on the other user to answer before they can continue the discussion. This poses a particular problem when it takes one party some time to reply to their emails. Further issues arise with users treating this mode of communication informally which can negatively affect their professional relationships.

One method of collaboration is through the use of a wiki, there are many open source software packages available for the creation of this. A wiki is interactive software that allows members to create and edit articles about a subject as part of a collaborative conduction. This allows for the rapid creation of a large knowledge base by a community of members however does suffer from issues related to the quality of information in the articles. Furthermore as articles go through various iterations it is difficult to tell whether an article is complete when reading through it.

The modern age of mass communication and sharing online has given rise to a new type of social website known as social networks. These websites allow users to connect with people they know and share information. There are hundreds of millions of members worldwide which have become an important part of modern internet usage as they allow rapid sharing of information and in some cases they can spread news more quickly than through traditional news channels (Murphy, 2012.)

Github is an example of a code repository that has evolved to enable faster and more efficient sharing of code between developers. It allows users to create their own profile page and (Github, 2012) claims that "many developers have started referring to GitHub Profiles as the new résumé." This highlights the importance of member

profiles and shows how social networking can be used within a research environment. One disadvantage with social networks is that users often expect other users to be available instantly D'andrea et al. (2012, p.151). However this is often not the case for researchers and developers who may not have much time to devote to social networking.

Another method for online collaboration is provided by bespoke software solutions, these solutions overcome the file size limits imposed by e-mail providers by providing their own file uploading and sharing facilities. ActiveCollab is one such software that allows users to upload the software on their own server which gives them control over the software and the security of the system (ActiveCollab, 2012). This means that the users are not tied to the updates and changes made by the software provider as would happen with social networks however it does mean that they have to implement any features or purchase additional modules to extend the functionality of the software.

Other methods of online collaboration based on cloud technology are now in existence. Google docs and skydrive allow users to create and edit files online and share them with others, the cloud technology means that the software is not run on the local machine; this provides them with the ability to access and edit their files from any computer. This is useful for sharing information and work between researchers who may not have compatible software which is often a problem found in online collaboration. Further solutions exist such as video conferencing software and instant messaging programs. With websites such as Facebook adding instant chat and video calling features (BBC, 2011) it is clear that the future of online collaboration lies in the integration of different collaborative software.

3. Case Study – IFIP working group 11.12

A particular example of an implementation of online collaboration software is presented by the case study of the IFIP working group on human aspects of information security. In this case study the IFIP working group had a public facing website with membership functionality however it maintained no facilities for collaboration between members. Furthermore, the website suffered from frequent SQL injection attacks and spam which had to be manually removed from the database by the administrator. From this and several consultations with the working group a very clear set of requirements was created.

In this situation it was decided that a bespoke online collaboration platform would be created that would include aspects from social media, wikis and bespoke software to create a solution that was fit for purpose and met the working group's requirements. It was considered to be important to implement social networking features into the software in order to help build relationships between the researchers which would in turn lead to more productive collaboration efforts. The decision to create a bespoke platform was due to some very specific pieces of functionality that the working group required, this overall set of features was not present in an existing system. Furthermore, the effort involved in tailoring an existing platform to include these features would have been similar to that of developing a bespoke solution.

Using an agile development methodology and modular approach to design it was possible to work closely with the working group to regularly deliver functionality and reduce the risk of the user's requirements not being met. Furthermore the agile methodology also allowed the focus of the project to be on delivering functionality rather than on documentation.

The bespoke solution was delivered on time and to specification and contains particular features that help to encourage collaboration through the system. The software itself does not present any novel features however the combination of features provides a novel and interesting example of online collaborative software. One key element of this solution is the inclusion of a profile for each user with a profile picture, this idea is expanded by including the user's name and profile picture whenever they post or message on the site. By using a profile and a profile picture in this way it helps to make the website feel more personal and social, by doing this it helps to accelerate the forming of new social and professional bonds. In turn this helps to encourage collaborative working and the sharing of information.

The messaging system on the IFIP working group's website has taken its design from social media website and in particular Facebook. Instead of each user having an inbox, sentbox and an outbox, a user has a conversations list showing the latest received message and the number of new unread messages in the conversation. The advantage of this is that a user is then able to open the conversation and see all of their previous messages with the user in reverse chronological order. This feature helps to reduce the risk of messages being lost, as often happens with email inboxes. This is like a wiki as it allows a user to quickly see the information related to the message they are seeing and provides a way for members to easily view the historical trail of a discussion. Furthermore, this feature helps to make the process of collaboration more simple and organised by removing unnecessary complications and features.

The key point of collaboration for the IFIP working group's website is the projects feature. This allows members on the site to create a new research project which other website members can then join and contribute to. The creator of a project can select whether the project is open to anyone or whether they will need to be approved; they can also choose to allow any file uploads or to approve those also. Furthermore, each project page has a discussion area on which users can post their ideas and thoughts on the project. This is not deleted and as such provides a record of the discussion and development throughout the project. A further collaborative element is provided through the uploading of files to the project page, these are then shown in reverse chronological order. This provides a record of the development of documents related to the project and allows members to share their findings and resources.

As part of the IFIP project a questionnaire was distributed and feedback was sought, in this the members were asked to contrast the new website to the old one and provide feedback on the collaborative potential of the software. The response to the question 'Do you think that this website will bring more people to join your collaborative research efforts' was very positive and consisted of the following statement 'Yes, insofar as it creates a very professional impression of the WG, and will consequently present a more encouraging, credible shop window aspect to

encourage engagement.' This is a key finding as it emphasises the success of the website in promoting collaboration and ensuring involvement in the research group. Further feedback was stated that 'I think it will allow a much more effective relationship with the WG membership and a direct opportunity to involve them in project activities and other participation". This response emphasises the success of the website in delivering online collaboration functionality.

Figure 1 The Old and New Website Interface

Figure 1 contrasts the old website with the new website; this in particular highlights the improvement in the professional appearance of the new website. Furthermore there is more dynamic data and content displayed on the home page that is user-generated; this allows the users to share information rapidly with the public and other members through the website.

4. Discussion

Collaboration is becoming increasingly important in the modern working environment and online collaboration is a key driver behind distributed software development, a methodology that has been adopted by large companies such as Microsoft. These kinds of projects tend to suffer from issues related to collaboration including lost emails and lengthy delays in communication. The case study of the IFIP project has created a software environment that can aid collaboration and build professional bonds between researchers. The key feature in the project was that the software was a tool that could be used for collaboration but also allowed members to collaborate outside of the tool using methods that they prefer such as email. This is important as it provides multiple points of contact which can make collaboration easier and more efficient. Furthermore this project could be taken and applied to distributed development projects to help introduce team members to each other and develop sub-projects.

The IFIP case study also demonstrated the success that an agile development methodology can have when combined with regular close contact with the end use. In doing this it ensures that the software is on course to meet the user's requirements and also allows any major design issues to be overcome or removed from the project during its lifetime. Furthermore, the project demonstrated the fact that a bespoke platform can often provide the best solution to an organisation's requirements rather than trying to retrofit existing software.

A key finding of this paper is that online collaboration is a growth area and that the future of this lies in the integration of elements from existing software solutions. It is important to integrate social elements into any collaborative solution in order to build social bonds between the users of the system. Furthermore, integrating elements of wikis can be useful as it can provide a way for members to look back over previous discussions and to review the progression of ideas and work. This is important as it helps to build a deeper understanding of the thread of discussion and also provides a reference point for the future.

The rise of software companies such as facebook, twitter and dropbox are testament to the fact that sharing online is becoming a central part of internet usage. With the rise of mobile and cloud computing this is going to become even more prominent in the coming years, therefore complex collaboration software will be required. Software such as that produced in the IFIP case study is a very useful way to facilitate the sharing of information and the building of a community based around a particular subject. Forums can be thought of as a similar method of building online communities however they lack the functionality provided by the bespoke software solution and therefore do not provide the same level of collaboration.

From the review of the IFIP case study, feedback was provided by the chair and co-vice chair of the working group. Feedback such as "Prior to this site, collaboration was a time consuming and difficult task – both in finding interested parties but also then undertaking the collaboration. This will no longer hold true," helps to highlight the success of the project and the improvements that will be delivered to the online collaboration of the working group. Further feedback "Yes, whilst other systems such as email will be used to contact members and enable a level of collaboration, I would expect all primary collaboration to published via the site." helps to highlight the fact that whilst the system will be an enabler for the working group. Whilst it will be the primary means of collaboration for the working group it will be an enabler and not impede the working group from collaborating through other means.

The rapid sharing of information can become a vital feature in the work environment as it will allow people to have access to data in near real-time, this will reduce the time spent waiting for information and therefore help to improve efficiency in the work place. Website projects such as the IFIP case study highlight the importance of online collaboration and how the application of user's requirements can lead to bespoke software solutions that are a good fit. These software solutions can act as enablers for collaboration and also help to improve existing collaborative efforts.

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