

EXPERIENCES WITH USING MICROSOFT SHAREPOINT WORKSPACE FOR COLLABORATIVE RESEARCH

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Abstract

Most academic institutions encourage inter- and intra-institute and industry research collaboration. Experience suggests that there are usually several discussions and iterations during the drafting stage before the final paper is mutually agreed and submitted. To ease this process, when they work together on any research project, academics and industry professionals can benefit from using collaborative software or tools to produce their papers. This paper reflects on experiences of using Microsoft SharePoint Workspace as an example of a collaborative communication platform – or more specifically, a virtual research environment – to produce joint research papers, and presents recommendations for researchers interested in using this software for collaborative research.

The use of such groupware can be extended to other collaborative practices within the educational arena, such as assessment moderation and reviews. Students can also be encouraged to adopt such tools for collaborative group work in a virtual environment.

Keywords: collaborative, research, SharePoint, tool, moderation, groupware, virtual

1 INTRODUCTION

Collaborative research has increased substantially over the past few decades. More collaboration is widely assumed to be better, whether it is for the advancement of knowledge or for exploiting results of scientific accomplishments [1]. As most researchers positively correlate collaboration with quality, length and number of research outputs [2], the notion that positive gains can be achieved from collaborative research appears to be influencing many institutions to encourage partnership and collaboration between researchers – both within the institution and beyond.

The concept of collaboration is understood in various ways and is difficult to define. According to Katz and Martin [1], collaboration for research purposes can take several forms ranging from providing materials, and offering guidance and insights, to actively contributing to complete the research. Further, research collaboration can be between individuals, groups, departments, institutions, sectors and countries, and collaborative contributions can vary in degree, from the very substantial to the almost negligible. For the purpose of this paper, we have approached collaboration as active participation in the process of undertaking research and/or reviewing existing knowledge and completing the collaborative effort.

1.1 Forces Influencing Collaborative Research

Katz and Martin [1] note that unless political forces drive collaboration (for example, funding requirements), it is usually social and intellectual forces that encourage researchers to form networks and collaborate for research. They also state that, in the past, experimentalists often tended to collaborate more than theoreticians, and spatial proximity encouraged collaboration as it facilitated informal communication and sharing of labs and equipment. Thakur, Wang and Cozzens [3] note other driving forces at the individual level, including economics (such as sharing resources and equipment), opportunity to enhance personal reputation and career development, and common culture. On the other hand, co-authorship between universities and industry is considered to be “influenced by the match of scientific specialization of the universities and the industry specialization of the respective country or region, by the R&D intensity of an industry sector, by the size and R&D capacity of firms” [4, p.19]. However, even though personal or institutional forces have stimulated collaboration in the past, technology appears to be influencing the growth of collaborative research practices in today’s virtual working environment.

1.2 Influence of Technology on Collaboration

According to the OECD [5], collaborative efforts within single institutions were the major form of collaboration during much of the last century. In addition, collaborative research has traditionally been a norm within the field of sciences, largely as a result of the need to share expensive and complex equipment, amongst other reasons. However, more recently, technology appears to have played a significant role in changing collaborative patterns among researchers. Technological advancements have not only led to an increase in collaboration in the social sciences disciplines but have also had a significant influence in other areas too. In addition, international research collaborations have also increased substantially in all areas. For example, Hamermesh & Oster [6] found that, in three economic journals, during 1992-1996 almost 20% of the authors of jointly-produced articles were from distant locations, in comparison to only 5% of the authors of articles published during 1970-1979.

Demand for virtual collaboration is increasing at a very fast pace and, as an example, research suggests that two thirds of the workers in the United States expect to go fully virtual in a few years from now [7]. As communication is fundamental for collaboration, developments in communication technologies have made collaboration from a distance easier, faster, and cheaper than ever before. Communication technologies appear to be enabling researchers and organisations to innovate collaboratively, enhance their international standing, and achieve a number of other advantages for their organisations as well as countries.

Technology provides a variety of communication platforms for people to put forward their views and allow others to comment and discuss the merit of each other's position more easily. Schaffner [8] takes a step further and says that the "prime role of technology in collaboration is to highlight and even foster disagreement". As this aspect is likely to be highly appreciated by academics and researchers, who view academic debate as important, it is also likely to be one of the main reasons for the growth of collaborative research in the last few decades which have witnessed enormous developments in technology.

The very nature of the research process and its management are being considerably influenced by technological advancements. The academic research lifecycle includes a number of stages, from topic selection to the final report, with no clear-cut lines of demarcation, and each of these stages pose different challenges and opportunities which can influence the quality and speed of the final output. In addition, a large number of academic research activities involve the building of theoretical knowledge which requires a significant amount of time to collect, review and manage data and/or existing knowledge in order to build new knowledge to achieve the desired outcome of the research. The problem of time and effective data and/or information management and exchange between the various parties is critical to the success of any collaborative research, and technology can assist in various ways to manage the whole process effectively. For example, technology has considerably revolutionised data and information sharing and management. A huge variety of tools, software and services are available today to assist organisations to achieve these goals and manage the research process.

However, a paper published by UK Data Archive [9, p. 21] notes that the use of technology for collaboration "can be demanding when it comes to facilitating data sharing, transfer and storage, and providing access to data across various partners or institutions". It further states that whilst various virtual research environments (VREs) exist, "they can require significant set up and maintenance costs, and are usually mono-institutional" [9, p. 21]. Furthermore, many researchers are not comfortable with the features offered by various VREs [9]. Nevertheless, we believe that the use of virtual collaborative technologies such as Microsoft SharePoint Workspace (hereafter SharePoint Workspace) can ease the process of many theoretical research efforts and help address some of these issues. This paper reflects on our experiences with using SharePoint Workspace, as an example of a collaborative work environment (CWE), or more specifically as a VRE, for producing joint research papers.

We will first define the terms 'collaborative work environment' and 'virtual research environment' which provide the basis for facilitating collaborative research. We will then discuss our experiences of using SharePoint Workspace as a tool for producing joint research papers.

1.3 Collaborative Work Environment

The term collaborative work environment (CWE) is usually understood to be "a combination of physical, IT-based and social or organisational infrastructures supporting – or hindering – people in

their individual and collaborative work” [10, p.12]. Largely virtual in nature, these environments are supported by a variety of collaborative tools which enable efficient collaboration between professionals especially those situated in different locations of a company and/or with collaborators from different companies [11]. However, due to inadequate inter-operability between various collaborative tools, these professionals (or organisations, where collaboration is meant to take place within an organisation and/or with those outside) often create their own CWEs which consist of a range of computer and collaborative technologies, such as email, instant messaging, chat rooms, discussion boards, shared whiteboards, mobile communication, media spaces, blogs, shared workspaces, radio conferencing, video conferencing, and other technologies [11].

1.4 Virtual Research Environment

A VRE is a form of CWE and may be defined as “a set of online tools, systems and processes interoperating to facilitate or enhance the research process within and without institutional boundaries” [12, p. 3]. Such an environment includes a “workspace for storing, enriching, annotating, and sharing data and information”, and its purpose is to “help its users to carry out cooperative activities like data analysis and processing, data generation, integration, enrichment, and curation, and more generally the production of new knowledge using specialized tools” [13]. Essentially, a VRE aims to enable researchers to complete their research in a controlled environment and as effectively and efficiently as possible. SharePoint Workspace is a powerful collaborative tool which provides a VRE encompassing of a number of useful features to facilitate virtual collaboration for research.

1.5 SharePoint Workspace

SharePoint Workspace 2010, and more specifically Groove Workspace within SharePoint Workspace, is a tool which provides a shared workspace (an essential requirement of a VRE) to enable users to collaborate and manage documents virtually. The workspace offers document sharing and management features and, together with other supporting features, can assist with collaborative work for research purposes. This tool, also regarded as a groupware, can also be used for academic practices within the educational arena, such as moderations and reviews, which may be completed within the walls of the institution or from a distance.

SharePoint Workspace permits collaboration with trusted parties outside the corporate firewall [14]. This paper discusses the experiences of using SharePoint Workspace with colleagues within an organisation (with connectivity to the Internet and to the local area network through their personal computers) and also with those external to an organisation.

Discussions do not cover experiences of installing the software and so experiences have been documented under the assumption that workspace members have already created an account for themselves to use SharePoint Workspace. Users are prompted to create an account when they use the software for the first time.

There are many attractive features within SharePoint Workspace, but in this paper we are limiting our discussions to only the tools that were relevant for us and which helped facilitate document sharing and management during our research.

2 METHODOLOGY

In an effort to document our experiences systematically, we have used the headings Phase 1 and Phase 2 as documented below. This is consistent with how our research efforts progressed over a period of one and a half years. Experiences during both the phases involved the three roles available in SharePoint Workspace - as a Manager, Participant and Guest, each with a different level of control and permissions to work items.

2.1 Phase 1 – Internal Collaboration

We commenced our research using Microsoft Office Groove 2007 (hereafter Groove 2007) as a tool with the Windows XP Professional operating system on our personal computers. Phase 1 was purely an internal collaborative research effort with colleagues from different areas within our organisation.

In this phase, the analysis and information gathered was based on experiences of preparing a conference research paper. The need to use this tool arose as we were exploring ways in which collaborative work could be carried out more efficiently than through the traditional means of

communicating by email and holding face-to face meetings. As this tool offers a common collaborative workspace, questions initially arose about the level of security exposure that the internal work items could be exposed to and the level of technical expertise that would be required to use the tool.

Fig. 1 below shows the option (shown by the purple arrow below) used to create a workspace using Groove 2007.



Fig. 1 MS Office Groove 2007 launchbar showing option used to create a workspace

2.2 Phase 2 – Internal and External Collaboration

As we were completing Phase 1, Groove 2007 was upgraded to SharePoint Workspace 2010 within our organisation since Microsoft had renamed Groove 2007 to SharePoint Workspace 2010 to provide a seamless experience and for easier deployment through Microsoft Office Professional Plus 2010 [15]. The Groove environment was now one of three workspace options (called Groove Workspace) that could be selected using the latter version.

Fig. 2 below shows the three types of workspaces which can be created using SharePoint Workspace, namely:

- 1) SharePoint Workspace,
- 2) Groove Workspace, and
- 3) Shared Folder.

For the purposes of our research, we used the second option, Groove Workspace (as highlighted in Fig. 2 below), which enabled the sharing of content and the level of permissions we required of members.

The first option, SharePoint Workspace was not chosen because we did not require our workspace to be synchronised with a server. If the purpose of synchronisation was to maintain a backup, we achieved this by creating a shortcut of the workspace icon residing on our desktop (i.e. C:\ drive) to our personal folders on the local area network. This helped to synchronise and back up our work regularly when workspace items were created or updated. In this way even if the workspace icon residing on the desktop was to be mistakenly deleted for any reason, researchers could still rely on the backup copy residing in the local area network.

The third option, Shared Folder was not chosen because workspace members have independent work areas and there were no sharing of documents outside the workspace. If members had a common work area filled with documents they wished to share for collaborative purposes then this option would be useful.

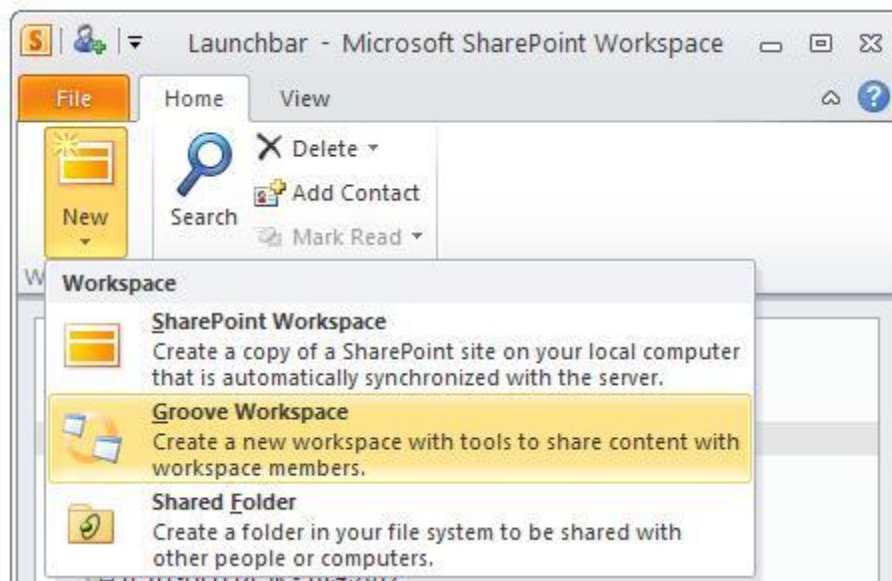


Fig. 2 MS SharePoint Workspace 2010 launchbar showing options available to create a workspace

In Phase 2, the research environment was more complex involving a structured test with two versions of the operating system (namely, Windows XP Professional and Windows 7 Professional) and two versions of the workspace (namely, Groove 2007 and SharePoint Workspace 2010). Different combinations of the operating systems and the workspaces were tested in an effort to understand the usability and limitations (if any) of the software. Furthermore, collaboration efforts in Phase 2 involved both internal and external colleagues.

3 FINDINGS

We found that the Groove environment in both versions (i.e. Groove 2007 and SharePoint Workspace 2010), offers collaborative features for online discussions, informal online and real-time chats, and various word-processing operations such as viewing, creating, updating, reviewing and deleting of documents in a private workspace with controlled permissions. The features and functionality offered are reasonably intuitive. The interface in SharePoint Workspace is more consistent with other Microsoft Office applications when compared to Groove 2007. The tool simultaneously offers some degree of flexibility and constraints based on the type of role a member has in the workspace.

The Groove environment can be effectively managed by adopting mutually agreeable communication practices (with the support of relevant workspace tools) and organisational policies (such as a suitable file structure as shown in Fig. 3 below) to achieve the desired level of governance and control of research documents.

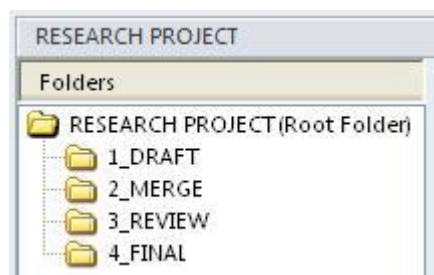


Fig. 3 An example of a simple file structure

3.1 Establishing a Remote Connection

In this paper, the person initiating the collaborative connection with other members is labelled the Initiator. The Initiator automatically gains the role of a Manager with full permissions and control to all the workspace items within the SharePoint Workspace. Invitees can either be a Manager, Participant or Guest in the workspace. Participants, by default have less permissions than the Manager with the ability to invite other members and create work items within the workspace. Guests, on the other hand, have the least permissions with read access only to workspace items.

When initiating a connection, the desired role for the invitee can be set. It was discovered that the role must be determined upfront before a member is invited into the workspace because the permissions level (determined by the role) can only be increased but cannot be decreased later. The invitation process generates an email for the Initiator to send to the invitee which includes the new workspace as an attachment (‘.grv’ file) together with two hyperlinks prompting the invitee to click on the appropriate one depending on whether the invitee was new to SharePoint Workspace or whether he/she already had SharePoint Workspace installed on their personal computer. Upon receiving the invitation, clicking on either of the hyperlinks led to mixed results, where either the remote connection could not be established effectively or the workspace attachment received could not be opened. It turned out that dragging and dropping the workspace attachment to the desktop was the most reliable way of establishing the remote connection where the invitee could open the new workspace attachment.

3.2 Compatibility of Groove versions

Table 1 below shows findings from the structured test carried out with different combinations of the Windows operating system and the Groove environments. Remote connections could be established successfully with internal colleagues within the organisation and also with external colleagues outside the organisation, regardless of which version of the Windows operating system they used.

Remote connections could also be established successfully if the Initiator’s Groove environment was at the same or lower level than the Recipient’s version of the Groove environment. This has been shown with a tick (✓) in Table 1 below to highlight that there were no problems with the level of permissions to the workspace and its contents. However, if the Initiator was using a higher version of the Groove environment (e.g. SharePoint Workspace 2010) and the Recipient was using Groove 2007, then the remote connection could not be established because Groove at the Recipient end is not able to process the invitation message received from the Initiator. The Recipient is able to receive the invitation to connect but is not able to open the workspace received from the Initiator. The inability to connect successfully is shown with a red cross (✗) in Table 1 below.

Table 1 Findings using different combinations of the Windows operating system and the Groove environment

INITIATOR (Manager role) (Windows XP Professional or Windows 7 Professional)	REMOTE CONNECTION (Permissions Level)	RECIPIENT (Manager, Participant or Guest roles) (Windows XP Professional or Windows 7 Professional)
MS Groove Workspace 2007	✓	MS Groove Workspace 2007
MS Groove Workspace 2007	✓	MS SharePoint Workspace 2010
MS SharePoint Workspace 2010	✗	MS Groove Workspace 2007
MS SharePoint Workspace 2010	✓	MS SharePoint Workspace 2010

Legend:

- ✓ Denotes a successful remote connection between the Initiator and the Recipient without any problems with the assigned level of permissions.
- ✗ Denotes an unsuccessful remote connection highlighting incompatibility with the versions of the Groove environment used.

3.3 Opportunities

SharePoint Workspace provides a holistic view which helps in tracking the progress of collaborative work. As we were compiling our research documents and working through several iterations of our documents, we found that SharePoint Workspace significantly reduced administrative time and effort which would have been otherwise spent tracking through emails and holding face-to-face discussions. Although this tool does not replace emails and face-to-face meetings, the integration of the communication features, such as the real-time chat and discussion tools, together with the document sharing and management features, eased the whole research process significantly. In addition, we found the following features offered opportunities to enhance the integrity of the collaborative tasks:

- *Pause Workspace* – SharePoint Workspace does not notify members when they are working on the same item until the item is saved. So the Pause Workspace feature is useful in preventing workspace members from updating or creating workspace items when another member is working on an item. When the workspace is paused, the member initiating the pause appears to be online to other members within the workspace but any updates or changes carried out can only be viewed by other members after the workspace is un-paused. If members end up working on a document at the same time, then SharePoint Workspace prevents any conflicts from arising by giving preference to the member who accessed the document first and labels the file accordingly when it is saved, with the member's name. If members are working on multiple SharePoint Workspaces, then this feature permits the member to selectively pause a particular workspace and choose to remain online for other workspaces. Real-time messaging can continue to take place between members.
- *Work offline* – This feature is similar to the Pause Workspace feature except that the member initiating the offline mode appears inactive (rather than active which was the case using Pause Workspace) in the member panel although he/she may still be working within the workspace. The member can selectively work offline for one workspace and choose to remain online for other workspaces or globally work offline in all workspaces. Contrary to the Pause Workspace feature, this feature does not permit real-time messaging with the offline member and all messages are delivered when the member resumes online presence again.

3.4 Challenges

Overall, challenges experienced were minimal. The following experiences, which could potentially interfere with the work flows or interests of the research group, need to be noted:

- *Display of files* – We discovered that the order of files displayed within the workspace could sometimes differ between workspace members, although this was not a regular occurrence. Regular monitoring led us to believe that this discrepancy could have been a technical problem at the time. It is not fully clear if this discrepancy is related to the functioning of the software but the experience was noted as part of the testing exercise.
- *Reminders* – Calendar and Meetings tools can help members to co-ordinate and manage their activities and time effectively, particularly if they are working towards a deadline to complete their research projects. The reminders are in the form of alerts which could be customised with a preferred sound file ('.wav' file). However, it was discovered that the alerts were only generated to inform members that there were unread data items in the Calendar or Meetings tools to be viewed rather than remind members at the scheduled time about the event. So the alerts were not timely reminders. Instead they were only generated for members who had not viewed the scheduled Calendar or Meeting entries yet. It was also discovered that the alerts were received by recipient members as soon as they were created (and not prior to the scheduled time) prompting them to view the unread items. If members had read the scheduled Calendar or Meeting entries ahead of the scheduled time, then no further alerts were generated even though the alert levels were set to high and even though the scheduled time had arrived. So it appears the alerts are only generated if there are unread data items. This has not been highlighted as a limitation of the product by Microsoft [16], although not receiving timely alerts could potentially disrupt workflows. This requires members to find an alternative mechanism to set reminders for themselves.
- *Message History* – This tool provides a member with a global view of all messages pertaining to his/her workspaces. If a member is part of several workspaces, then this can create some confusion in recalling the context in which a particular message was sent or received.

- *Real-time message deliveries* – Delays in message deliveries can be experienced ~~within the workspace~~—if the recipient member(s) are offline from the workspace. The sender gets the notification, 'message waiting to be delivered' until such time when the recipient goes online. It should be noted that the lack of timely delivery is not a result of the limitation of the software but is simply related to the availability of the recipient member(s) within the workspace to receive messages. Any messages sent are delivered when recipient member(s) become active in the workspace. The Message History tool enables historical messages to be easily retrieved and eliminates any chance of missing messages which may have been sent while the recipient member(s) was away from their desk.
- *Parallel processing of documents* – The Groove environment does not alert members when a document is being updated by more than one person at the same time. Any conflicts that arise are only realised when the document is saved. This can lead to confusions which could be reduced by using the Pause Workspace feature. Refer to section 3.3 for further details about the Pause Workspace.
- *Moving of folders and documents* – Discrepancies were experienced with the moving of folders and documents within the workspace. It was discovered that sometimes the 'drag and drop' functionality did not work and documents and folders could not be moved to a level higher than the originating position unless the item was copied and pasted.
- *Participants with default 'invite' permission* – By default, Participants have the ability to invite other members into the workspace. This may not be desirable and could potentially work against the interests and ethics of the research group.

4 OTHER USES

4.1 Moderations and Reviews

Assessment development and pre-assessment moderation, course prescription development and course writing, are examples of other academic activities which involve a significant amount of collaboration, such as during planning, development, evaluation, editing and enrichment of the work, before it is finally published. A number of people are often involved in these processes, such as the course leader, editor, instructional designer, internal moderator or technical editor and, if required, one or more external editors or moderators. More specifically, pre-assessment moderation, for example, involves reviewing and validating the suitability, clarity, accuracy, and standard of assessment materials before they can be used for assessment purposes. Good communication with other members of the team at the time of assessment development and pre-assessment moderation can significantly reduce the number of issues (such as, issues with clarity of instructions or assessment questions) which may arise at the time of student assessment and thereafter during post-assessment moderation. Similarly, good communication during course prescription development and course writing can minimise a number of issues that could arise during course delivery.

SharePoint Workspace can assist with the above activities in a number of ways, such as:

- Collaborators do not have to deal with the management and the difficulty of tracking multiple versions of documents exchanged between them during the development of the document.
- All members can interact to exchange ideas and resolve issues promptly in real time using the discussion and chat facilities, regardless of whether they are within the organisation or at a distance.
- Updated content can be made available instantly as members are automatically notified when workspace content either changes or when new additions are made to the workspace.

Groove Workspace can be effectively used for moderation and review purposes. Reviewers can be invited into the workspace temporarily to review and comment on a document instead of sending the document to them through other means. However, members who are invited into the workspace have full visibility of the workspace content and their view cannot be limited to certain sections of the workspace. Having full visibility for temporary invitees may not be desirable. Therefore the ability to limit visibility to certain folders or documents within the workspace for a particular role would be desirable for such activities without having to set up a separate workspace.

4.2 Student Group Work

Students can also be encouraged or expected to use this tool for completing collaborative work in courses. Their collaboration is likely to be smoother and more efficient in comparison to using tools such as discussion forums in a learning management system (LMS), commonly used by distance education providers. This is not to say that the LMS should be replaced, but distance education providers could benefit from encouraging the use of SharePoint Workspace alongside their LMS to enable students to undertake group work more easily and efficiently.

5 RECOMMENDATIONS

We highly recommend SharePoint Workspace as a tool for collaborative research. It provides an effective and efficient platform for data sharing and management within a private and secure workspace. What makes it more attractive than the traditional methods of collaboration is that the supporting tools such as the real-time chats and discussions can be used during the research process. This makes SharePoint Workspace a cohesive environment for collaborative work. Together with this tool, the following practices are recommended:

- Novice researchers can bypass the need to synchronise with the server by creating shortcuts of the SharePoint Workspace icon in their personal drives to achieve the same goal of synchronisation. Having a backup of the workspace is essential to maintain integrity of the collaborative work and to avoid any frustrations that can be caused by accidental deletions of workspaces.
- Compatibility of the Groove versions is essential to establish a successful remote connection with recipient members. The Initiator of the workspace should use a version that is the same or lower than the Recipient's version.
- It is best to determine the type of role and their default permissions before members are invited into the workspace to ensure workspace items are managed with appropriate roles and permissions.
- A suitable file structure can help to minimise any conflicts that may arise when updating workspace items.
- The Pause Workspace feature can help to ease the process of maintaining a document that requires multiple authoring.
- ~~It is best to determine the type of role and their default permissions before members are invited into the workspace to ensure workspace items are managed with appropriate roles and permissions.~~
- ~~Compatibility of the Groove versions is essential to establish a successful remote connection with recipient members. The Initiator of the workspace should use a version that is the same or lower than the Recipient's version.~~

6 CONCLUSIONS

It was a rewarding experience to use SharePoint Workspace for collaborative research. It served as an effective and efficient VRE to complete our research efforts. The ability to invite and work with people in a common workspace enhanced collegiality. The holistic view, together with the document management and communication features, contributed significantly towards a smooth and pleasant experience. Collaboration worked well with internal and external professionals, without any technical or incompatibility problems with the level of Windows operating systems used. However, users who initiate a remote connection through SharePoint Workspace need to bear in mind that their version of SharePoint Workspace should be the same as or lower than that of the invitee's version.

ACKNOWLEDGEMENTS

The authors would like to thank Josephine Bourke from the School of Business, Open Polytechnic, for her contributions in Phase 1 of this research. The authors would also like to extend their appreciation to other colleagues at the Open Polytechnic such as the Helpdesk for the Information Systems

services and to Richard Drummond and Jonquil Brooks for their editorial support in reviewing this document.

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