An Experiment on Asynchronous and Synchronous Authoring of a Service Plan Document

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Summary
Workflow has been proven to be beneficial in many, if not all, situations in providing more efficiency in an organisation, greater productivity and better process control. Real-time collaborative authoring tools have similarly been successful in many cases in allowing a group of distributed authors to construct and edit a document simultaneously. Such authoring tools may be more effective in writing part of a document, rather than the entire document, in a session(s) of same-time writing.

This paper presents findings from an experiment applying both workflow and collaborative authoring tools to a business document. Trials and experiments investigating the combination of these tools are very rare, suggesting that more needs to be learnt in using this combination to facilitate document-based processes in organisations. This paper adds to the few findings available for experiments on the combination of these two tools.

Key words: Workflow, collaborative document authoring, business document, experimental study.

1. Introduction
A great number of workflow systems have been produced for decades to automate (to varying extents, depending on the process) processes found in organisations. These systems are intended to provide benefits such as increased productivity and efficiency in an organisation.

Collaborative authoring tools are not as widespread as workflow tools, but have been found helpful for same-time group work on documents. Authoring tools benefit in allowing group members to avoid having to work separately and without direct interaction when creating a document. Examples of such tools include GROVE [1], SASSE [2] and REDUCE [3].

It is worthwhile researching the combination of a workflow and collaborative authoring tool because in union they are the method for automating a document-based process involving simultaneous work of distributed multiple authors. Such research may involve testing or trialling this combination in a real-world situation using real-world documents (i.e., a field study as opposed to a laboratory experiment). This paper describes such a study we have carried out from which to learn about the effectiveness of this combination (or lack of it) in a business situation.

The pairing of workflow and collaborative authoring tools in support of both synchronous and asynchronous document authoring has a long way to go before it is addressed sufficiently. A small number of systems exist that support collaborative creation of content assisted by workflow. As a result, there is undoubtedly a great lack of experimentation with the workflow/collaborative authoring combination and its associated experimental results in a real-world setting.

This paper covers an experiment on the application of workflow and collaborative authoring to the creation of a service plan document by a small group of employees working for Department of Human Services. The employees are based in Melbourne, Australia. The normal duties of these employees include writing service plans where a handful of employees contribute to the plan document. As is the case of so many other organisations worldwide where groups collaborate asynchronously on a document, group members here work on the document contents separately without using any workflow or collaborative authoring tool.

The service plan development process involves the three authors of a consultant, a manager and a user who all contribute to the document in different ways. The consultant is responsible for initiating the process by setting up a module. The module is the essential content of the document, e.g., the method of the service plan, reporting involved, summary of the document, etc. The consultant has an understanding of issues related to service plans and so is in a position to begin the plan. The way this process works is that the consultant finalises the document without interaction from others. The manager has the typical role of any manager in an organisation, which includes management with respect to providing services. Another employee of the organisation, who we
will simply refer to as a “user”, is any other relevant person in this particular organisation involved in providing service plans. Unfortunately, the manager in the organisation was unavailable for our experiment. However, another user who had experience in service plans was available instead and participated in authoring the document. Thus, the experimental subjects consisted of a consultant and two users.

This experiment required the researchers to write a service plan document using the collaborative word processor, CoWord [4], and the workflow tool, TrackNShare [5], which automated the entire document process.

To avoid any problems with violating copyright, screen shots of CoWord and TrackNShare have not been placed in this paper. The user interface of CoWord is very easy to understand as we are all highly likely aware of the user interface of Microsoft Word. CoWord actually exploits Microsoft Word so that the user interface of CoWord shown to every user in a collaborating group is the same as Microsoft Word. TrackNShare is a workflow tool that works generally in the same way as any other workflow tool.

Due to the simple fact that only a handful of employees in the organisation work as a group in authoring a service plan, the number of group members is three. Therefore, we investigate support of a small group; and small groups, as opposed to larger groups, are usually expected to use a collaborative word processor.

2. Related Work

We cover the main related work involving combined workflow and collaborative authoring here.

The only other work directly related to this paper is that of an experiment on authoring a research paper in an organisation [6]. That work presents results for both a different document process and a different type of user set from the set in this paper, and therefore presents different results from those in this paper. For instance, [6] discusses findings in finalising a paper by the group, whereas in this experiment there is no issue of the group finalising the document as the consultant solely finalises the document.

The next closest research to ours is the following one that involves experimentation. A co-authoring framework is presented in [7], which “fully integrates annotations into a document and introduces structured annotations that explicitly support workflow management within the co-authoring cycle” [7, p. 131]. The researchers conducted a usability study to evaluate the annotation reviewing stage of co-authoring and found that their annotation bundles assisted this stage.

Leone, Hodel and Gall [8] cover a document editing and management system. The system relates to workflow in that it stores information about workflows that can operate in conjunction with this system.

Desilets, Gonzalez, Paquet and Stojanovic [9], describe Web-based collaborative authoring of Wiki sites. In their work, they are interested in supporting language translation in a multi-lingual wiki. These researchers discuss the insufficiency of using traditional workflow in order to achieve successful use of a multi-lingual wiki. They suggest the idea of using a translation workflow instead.

3. Experimental Design

Figure 1 shows the current process in the organisation for writing a service plan. In other words, this is the manner in which employees have created a service plan prior to involvement in this experiment. The employees used Microsoft Word to write the document and email it further in the process. The Figure shows that the consultant initiates the module, from his own computer, before passing it onto the manager who will add his “questions” in the document, using his own computer. The manager can also add to the module.

Questions are points that need to be raised by group members to other group members in forming the document. “Question” is not a formal, official term for raising a point, but is the jargon that employees have lapsed into when referring to such points. The manager will raise his/her own questions that need to be addressed by other authors. The manager will email the document to a user who can add further questions or amend content. Finally, the consultant will receive the last version of the document and address questions raised whilst adding further to the module. All the above work is done from the employee’s own computer.

Figure 2 shows the experimental workflow, set up using TrackNShare, which automated employees’ tasks involving CoWord. In comparison to Figure 1, there is some same-time collaboration on the document. Subjects spent the time on tasks shown in Figure 2. The document ended up being 3 pages in length, and included several tables most of which were components in diagrams.
Structured interviews were conducted with subjects using a questionnaire (shown in the Appendix). Open-ended questions constituted the questionnaire, where many questions are concerned about:

- workflow only
- collaborative word processor only
- both workflow and collaborative word processor

Open-ended questions were asked because we are interested in subjects’ experience in performing tasks. These results indicate effectiveness or ineffectiveness of the tools in facilitating business document authoring. Quantitative results were not of interest simply because of the low number of subjects in the experiment.

4. Results of Analysis

Figure 3 shows a portion of the service plan that resulted from this experiment. Questions of different users are shown in different colours. Please note that writing errors in responses, as quoted here, are those of experimental subjects.

4.1 Consultant Experience

The consultant provided a view regarding when to use email and when to use workflow: “It is time consuming to send via e-mail for routined tasks. However, for ad-hoc document, I find this (applying workflow) time consuming because a new work flow needs to set-up. Unless, of course, a ‘generic’ workflow has been set-up for ad-hoc purpose.” The consultant found that workflow is indeed beneficial for repetitive or generic processes, but apart from this, it is tedious to design and launch workflow templates for each document they author.

Yet, the consultant appreciated automation of this document-based process: “It [workflow] governs the work and task each member has to do/participate for a successful outcome. As such, work can be streamlined, better scheduled therefore minimise redundancy”.

Another negative response was that this particular workflow tool should have a “My tasks” function. Of course, such functionality would be available in other workflow tools.

4.2 User Experience

The view of a user was that forwarding documents using workflow instead of email was “not that great, workflow set up before & stuck; email flexibility”. Clearly, the subject found that email was more adaptable to their situation than prescriptive workflow technology, although the number of tasks is small.

The overall application of workflow to their document writing process was successful, but as one subject stated, it was only a “marginal improvement” over using normal email. The basic carbon copy function in email was
For example:
1. The LGA split table created from commitments may look like this:

<table>
<thead>
<tr>
<th>Agency</th>
<th>Serv/Plan</th>
<th>Activity</th>
<th>LGA split</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABC P/L</td>
<td>Small Rural</td>
<td>35030</td>
<td>Region-wide</td>
</tr>
<tr>
<td>ABC P/L</td>
<td>Child Care</td>
<td>31205</td>
<td>Region-wide</td>
</tr>
<tr>
<td>ABC P/L</td>
<td>Disability</td>
<td>17200</td>
<td>LGA1 20%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>LGA2 30%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>LGA3 50%</td>
</tr>
</tbody>
</table>

This is the default for ALL combinations

**Minor Works, Indexation etc.**

The LGA split is Activity/Service Plan based, so these are automatically accounted for.

**Conversion**

The requirement for users to complete LGA splits will be enforced as part of the data conversion. That is, all agency commitments will have an LGA split applied during data conversion. Fine, we should seed the data at the most appropriate time.

This will be part of the conversion screen used for the breakdown of SAMS funding data into BMS.

**Reporting**

Reporting will use the LGA split table held for each Activity/Service Plan combination.

If there is no history of changes to an activity/Service Plan, there is a possibility that a change may impact on past figures inadvertently. Therefore, if the table for the Activity/Service Plan below was:

<table>
<thead>
<tr>
<th>Agency</th>
<th>Serv/Plan</th>
<th>Activity</th>
<th>LGA split</th>
</tr>
</thead>
</table>

Fig. 3 Service plan document written in experiment.

viewed as sufficient as it provides information about who else will receive the document, and it is easy to add users to the process by including them in the carbon copy list.

However, this subject believed that using both collaborative authoring and workflow tools was useful for processes like initiator-reviewer-accepter-endorser processes as compared to a document-based process, which is not pre-defined. These two tools would likely match this particular type of process, so these tools could be relevant specifically to this type of process.

The other subject believed that the combination of tools was relevant for writing requirements documents and Software Testing Incident Reports (STIR). In the case of STIR, there is potential for the document to be forwarded to other group members before it is sent to the consultant for amendments and changes.

**Acknowledgement**

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**References**


Appendix

Questionnaire

1. How successful/unsuccessful did you find editing the document when other users are also editing at the same time?

2. How did you find forwarding the documents using workflow instead of e-mail?

3. Scenario 1: Editing a document with Microsoft Word, all users sitting at one computer.

   At the final phase, you finalize a document at the same time while sitting at your own computer. How did you find finalizing a document at this phase using the collaborative word processor sitting at your own computer when compared to Scenario 1?

4. Scenario 2: Editing the document all alone with Microsoft Word, and then forwarding to the next user.

   Before the last phase of finalization of documents, there were two phases of authoring the documents sitting at your own computer. How did you find two of you editing the documents using the collaborative word processor during these phases when compared to Scenario 2?

Collaborative word processor:

5. a. How generally successful was it editing the documents using a Collaborative word Processor?

   b. If there were any problems/difficulties, what are they?

6. If using the collaborative word processor was not generally successful what were the reasons for this?

Workflow:

7. a. How generally successful was workflow software in assisting users to carry out the entire process of authoring a document?

   b. If there were any problems/difficulties, what are they?

8. If using workflow was not generally successful what were the reasons for this?

Workflow and collaborative word processor:

9. a. How generally successful was it authoring documents using a collaborative word processor and workflow?

   b. If there were any problems/difficulties, what are they?

10. If using collaborative word processor and workflow was not generally successful what were the reasons for this?

11. What suggestions do you have to improve the workflow and collaborative editing?

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