Evaluation of Tool-Interventions in Small Team Meetings

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Abstract: Team meetings are commonly used in decision making process within organisations. However, the tools used are not often designed to support all the potential activities within the meetings. The scope of the study is confined to small face-to-face meetings within South Australian organisations. This qualitative study focuses on the findings from an evaluation carried out to analyse the responses of team leaders when they were provided with a set of team meeting scenarios and necessary tool interventions. A grounded theory approach was used to analyse the responses. The study identified that most of the tools used in meeting scenarios were useful for the teams and team leaders are interested to introduce them in their meetings. The findings would be useful for the system designers who focus on the adoption rates of the tools during their feasibility study and system managers who would be interested in increasing the productivity by introducing new tools within meetings in their organisations. The findings can be extended to study the outcome of tool-interventions in organisations of other geographical locations.

Keywords: Tool-kit, tool intervention, team meetings, teams

I. INTRODUCTION

Team are ubiquitous in organisations and collaborate in different contexts to accomplish their targets by sharing information within its members. The contexts of team collaborations range from face-to-face meeting to distributed online meetings depending on its purpose and availability of participants. Although distributed meetings, assisted by numerous online tools in the market are emerging as a substitute for participants to collaborate at their convenience, face-to-face meetings are still prevalent in organisations and contribute towards team collaborations. However, tool-support for face-to-face meetings remains largely unexplored as the focus of system designers in the past decade has been primarily towards supporting distributed and web-mediated meetings. Tools introduced since the late 80's to support team collaborations like Computer Supported Cooperative Work (CSCW) tools [1], Electronic Meeting Systems (EMS) [2] or online tools such as Adobe Connect and SharePoint [3, 4] for distributed communications were not readily adopted by users in organisations. Research efforts in understanding the reasons for such low rates of adoption and increasing their appropriation are largely unexplored [5]. Most of the studies were based on providing support for web-mediated collaborations based on web 2.0 or social networks by taking advantage of the emergence of numerous online tools, whilst teams within organisations still prefer to use face-to-face meetings for their collaborations.

This study was a part of on an overarching project that was used in developing a tool-kit framework that supports all the potential processes within a small team meeting environment (Refer to Section 3 for more description on related work). The study discussed in this paper is based on evaluating the tool interventions within a team meeting. The tools used for interventions were derived from the tool-kit framework (removed for refereeing). The evaluations identified that most of the tools used for interventions were useful for the team meetings.

The paper is organised as follows: Section 2 reviews the existing state of tool-support for team collaborations; Section 3 focuses on the previous work carried out by authors that are related to this study; Section 4 describes the methodology of the study; Section 5 illustrates the team meeting scenarios that were used for evaluation; the subsequent section explains the findings from the study; limitations of the study and conclusions are discussed in the final sections of the paper.

II. EXISTING TOOL-SUPPORT

Teams form an integral part of any organizational structure and team setting – with necessary technology support, are critical in bringing people together to collaborate towards their team goals. A widely cited classification of the context of team collaborations based on a time-space matrix, first proposed by Johansen [6] and later in Ellis space-time matrix [7] illustrates that team collaborate in different contexts based on their need; availability of participants and tools for collaboration, that range from synchronous, co-located context to asynchronous, distributed context. The scope of this study was confined to synchronous co-located collaboration, for example, face-to-face meetings that occur at same time, within a meeting room. However, the review of existing tool-support for team collaborations in the next section includes tools from different contexts – from synchronously co-located to asynchronously distributed, as the existing literature includes observations by researchers on tool-support in these different contexts.

Numerous tools emerged in the market to support team collaborations that include CSCW tools, EMS and tools to support online or distributed collaborations. Firstly, CSCW is defined as contexts in which technology is used to mediate communication, coordination, cooperation that makes interactions within participants accessible and cheaper [1] and with an objective of articulating cooperative work, sharing information space and adapting the developed technology by the organization. CSCW tools have not been successful since their introduction in 1980's, as a study by Grudin [8] identified factors namely i) a widening gap between those who benefit from using these systems and those who perform additional work to support the application, ii) decision maker's choice to put their self-

benefits first at the cost of the actual users of the applications, and iii) difficulty in evaluating the benefits and costs of these applications, that contributed to the failure of the CSCW systems. The lack of support and issues with CSCW is notable in a citation analysis of literature review [9], where the second most cited article was that of Grudin's article [8] that focused on investigating 'why CSCW applications fail?'.

The progress of CSCW since the last decade was largely focused on collaborations that are remotely located and web mediated. In a extensive literature review on the CSCW domain, Shumarova and Swatman [5] find little evidence on the progress of the tools that addresses the three issues of CSCW identified by Grudin. It is also evident from their study, that the diffusion of developed CSCW applications from research labs to organizational use has been minimal, except for Lotus Notes and NetMeeting. Their finding is not unique as identified by Lewis, Bajwa, Pervan, King, Munkvold [10] on their investigations on the lack of adoption of synchronous collaborative applications and by Blackburn [11] who acknowledges the findings in his extensive literature review. Matushkina and Nevalennaya [1] upheld Grudin's observations on the lack of the impact of CSCW tools and argues that a lack of motivation among employees as a potential reason for the limited impact. However, literature on exploring the reasons for their failure and making them more adoptable are largely unexplored.

Secondly, EMS were developed to provide a set of tools that support processes within a collaborating group [2]. The tools were used for brainstorming, voting, discussions, agenda preparations and recording automatic minutes. EMS tools focused on producing results that involves the responsibility of the whole group. Investigations on the adoption of these tools into organizations across the globe by different research groups [10, 12-15] reveal that these tools were not successfully adopted. As Blackburn and Hodges [11, 16] argue, EMS tools have been in existence for the past twenty years but they were not readily adopted by organizations.

Thirdly, numerous online tools [3, 4] have emerged in the market to support distributed collaborations. An evaluation study on distributed collaboration tools by Christian and Rotenstreich [17] lists a number of distributed tools that can also be used within synchronous collaborative workspaces namely Aceproject, Adobe Connect, Atlasian, Base Camp, Central Desktop, Clearspace, Coefficient, Dimdim, Google Docs, Group office, Lotus notes, Open Exchange, SharePoint, Teamwork, Yahoo groups and Zimbra. However, Christian and Rotenstreich find little evidence from the literature on the successful adoption of these tools within organizations.

More insights are required for Information Systems (IS) community on the reasons for the unsuccessful adoption of these tools used in team collaborations. Evaluating the use of new tools and their intervention within team meetings are necessary to understand why the tools were not appropriated by users and what factors are required to be considered that would potentially be useful in encouraging the adoption of these tools.

III. RELATED WORK

The study discussed in this paper is a part of an overarching project [18] that focused on developing an integrated tool-kit framework for small team meetings. Four different studies of the project that are related to this study are listed below:

a. A pilot study [19] in observing a simulated meeting recording from a meeting corpus [20] was conducted. The study was used in identifying processes within a team meeting that would require tool-support and the activities that can be supported by some form of technology.

b. The lessons identified from the pilot study [21] were used in a follow-up study that observed a series of simulated team meetings in developing a tool-kit framework to be used as a base in designing an integrated tool-support for team meetings.

c. The lessons from the follow-up study [22] and the framework were refined using another study that observed a series of real team meetings within organizations in South Australia. The study was used to identify if the tools required within a simulated meeting would be warranted for real meeting environments and vice versa.

d. The refined tool-kit framework [23] was used as a foundation to generate concepts that were used within another study to initiate discussions and generate lessons on tool-support using focus groups. The tool-kit framework was refined using the focus group inputs. Four tools from the tool-kit framework were used for interventions within team meetings.

IV. METHODOLOGY

Team leaders were provided with a response sheet consisting of the four scenarios and their potential intervention. Text boxes were provided under each scenario to respond as an open ended feedback. The responses in the form of comments were tabulated in a spread sheet. Each comment was manually read repeatedly in order to group similar comments to generate concepts, which were then grouped in a similar method to generate categories. Grouping similar categories resulted in a collection of stories. The generated stories represent the summary of the team leader's responses for each meeting scenario. The data analysis is similar to a Ground Theory approach proposed by [24].

V. SCENARIOS USED FOR EVALUATION

Team leaders were given a response sheet to provide their feedback in the form of an open ended response on the proposed intervention strategies for each scenario. The response sheets were sent to all the team leaders of the eight groups that participated in the focus group study. Seven of the eight team leaders provided their responses. One of the team leaders declined to respond. The four team scenarios and their potential intervention used for evaluation are illustrated below.

A. Scenario 1: Accessing Calendars:

The scenario was observed during the team meetings within organisations where team leaders were involved in discussions on organising a follow-up meeting. Team leaders requested if team members would be free on a proposed date and the process consumed more time as each member had to look at their dairies or look for free slots on their personal calendars. Few assumptions were required before selecting a

specific tool for intervention in this scenario. The assumptions include: i) the proposed tool-kit be installed in a laptop or an equivalent device like tablet or desktop, preferred by the team ii) the team leader would use the tool-kit for this scenario and the laptop be connected to a projector to enable the team members to view the display, iii) the tool-kit be provided access to integrate with a calendar tool that is currently used by the organisation (Microsoft Outlook calendars, in this case) and iv) the details of the team members be provided by an employee database used within the organisation.

The intervention for the scenario would be provided by 'Calendar access component' tool from the refined tool-kit framework. The team leader uses the tool by selecting the required participants and their details from the employee database. The team leader also selects the required month for the follow-up meeting. Once the participants and the month for the meeting are selected the tool searches the individual calendar of the participants and list out the potential dates and free time-slots for the meeting.

The potential support for the team members for this scenario includes the projection of the list of potential dates on the screen for discussion to finalise a meeting time and selection of a provisional meeting time by the team leader. Further, the team leader can select an alternate meeting time, as a backup, if the provisional meeting time was cancelled. Additionally, if the provisional meeting time is approved, the tool can request the team leader to interact with other components in the tool-kit to perform additional actions associated with this scenario. For instance, to send reminders for team members through a *reminder component*, booking meeting rooms using an automated e-mail to a 'meeting-room management system' in the organisation or reminding the team leader to prepare meeting agenda.

B. Scenario 2: Using reminders:

A team leader wishes to send reminders to the team members once the date and time of the next meeting is confirmed. It is assumed that the team members have provided information on their preferences in receiving the reminders like the information about the devices other than the desktops like personal laptops, iPad, tablets, mobile phones or office telephones to receive voice or text alerts and the frequency of the recurring reminders. The team leader is assumed to be using the proposed tool-kit. The *reminder component* tool from the refined tool-kit framework tool was used to intervene in this scenario.

The tool can receive the proposed date and time of the next meeting either from the *calendar access component* or as an input from the team leader. The tool can intervene by issuing reminders that recur at specific intervals to team members in the mailing list to their respective preferred devices as texts or voice alerts. The other potential support provided by the tool includes providing additional details of the meeting venue and a copy of the meeting minutes, once they are available in the system. For instance, team members can request for additional details of the meeting room when the venue is located off-campus, like the distance between the current location and the off-campus venue and time taken to walk or drive to the venue.

C. Scenario 3: Internet access during meetings:

In one of the team meetings team members were observed to be planning for an outdoor event to be organised

in a community gathering. The team had very little information on the venue and the participants were observed to be using their imaginary vision and rough landscapes in planning the activities for the event. Before intervening with the scenario it is assumed that the team is provided with the proposed tool-kit in its meeting. The team leader uses the tool-kit installed in his laptop or other preferred device like tablet or iPad and the device is connected to a projector to display the information to the team members. Assuming that the team is provided with a reliable internet connection, *Internet access component* tool can be used to intervene in this scenario.

The team leader is required to input the date, item and location of the community gathering for the component, which can use the web search engines to list the details of the location like the location map, transport sources and other necessary travel information. Other potential support from the component includes providing additional details on the location like the weather forecasts for the location to assist in planning the outdoor events or details of the landmarks closer to the location. The information about the location can be projected on the screen to assist the team's discussions and planning. If the team has finalised the details of the event, then the component can request the team leader to interact with other components within the tool-kit (for example, to use the calendar access component to block the time-slot on the calendars of team members or to use reminder component to send reminders for team members on the event).

D. Scenario 4: Document Sharing:

A team was observed to be engaged in a follow-up discussion on a specific document that was posted on a shared workspace to receive feedback from the team members. A shared workspace used by team members refers to a shared folder where the documents were uploaded. Participants were using a hard copy of the document or their feedback written on their personal diaries, for discussions. It is assumed that the proposed tool-kit is installed in the team leader's laptop or a similar device like iPad or tablets and a shared workspace or an archive will be created, where all documents related to their teamwork are stored. Team members are assumed to use the shared workspace to upload documents, modify them and provide comments on each document or item that is listed on the webpage. The *Document sharing component* can be used to intervene in this scenario.

The team leader can select the appropriate team meeting and the specific document or item from the shared workspace. The component lists the details of the document or item to assist the team members in their discussions. For example, the document name, history of responses, summary of feedback and recent activities corresponding to the document can be used assist the team whilst discussing on the outcome of the feedback on the document that was posted for review by team members. Potentially, the history of responses can be projected on the screen to assist with their discussions and the component can list other items that are related to the document by searching the shared workspace.

VI. FINDINGS FROM THE STUDY

The following section summarises the responses of the team leaders for the four meeting scenarios and the potential interventions that were provided to them for evaluation.

A. Calendar access componenet:

Most of the team leaders observed that the calendar support for team members would be very useful and agreed that the scenario with the potential intervention would be effective for their team meetings. However, one of the team leaders was of the view that the component is similar to a calendar tool in Microsoft Outlook and finds the component to be less useful as it replicates an existing tool. However, he acknowledged that the support for selecting an alternate time-slot for a follow-up meeting (discussed in Scenario 1) was a new function and would be useful for their meetings. Although the team leader argued that the *Calendar access component* was similar to a calendar tool in Outlook, the earlier observations of their team meetings identified that the team was not using Outlook calendars in their meetings. This analogy then raises an interesting question: If the team has Outlook at its disposal to use during meeting then why hasn't the tool been used at all? Or were the functions of Outlook too complex or were the additional features other than calendar support in Outlook prevented the team from using them during meetings?

B. Initiating reminders to participants:

In general, most of the team leaders argued that the support provided by the tool-kit for issuing reminders is similar to the reminder functionalities provided by Outlook. Many team leaders are reluctant to use this component as they are currently using the reminders from Outlook. Hence, the observations informs that Outlook has been predominantly used by team members for issuing reminders and were reluctant to use an alternate tool as it creates an 'electronic overload'–as one team leader puts it. If Outlook were used by team members then why were the team members late for their team meetings?, why were the team members not using calendars in outlook to manage their appointments and relate them with items discussed within team meetings? However, the additional features of the reminder component namely, providing the distance between the participant's workplace and the meeting venue, time taken to travel to the meeting location, GPS coordinates or accurate address of meeting location and the ability to display the additional details in the calendar on a specific item that is posted on the specific date, to be taken up for discussion in a meeting were identified to be useful. Hence, team members use Outlook to initiate reminders, but certain additional features (discussed above) are not available with Outlook and were not tailored to assist team members based on the activities and process that occur within a team meeting. A generic reminder from Outlook may be sufficient to alert the team member on the meeting time but those additional features are necessary to assist them in meetings, and are necessary to be bundled in a single tool-kit especially when team members are concerned of the information overload with the use of multiple tools to support their team activities that are related to a specific calendar entry. Hence, team leaders are reluctant to use an alternate for Outlook in issuing reminders but require additional features that are not supported by Outlook. Hence, a stand-alone reminder component is less useful and redundant but the reminder functions of outlook can be integrated with this component that would support additional features in initiating reminders.

C. Access to online data during meetings:

Team members had a mixed response to the intervention of meeting scenario that provides online weather data for organising outdoor events. Few team leaders found the component to be less useful as they observed that any third party application on weather forecast can be used for this scenario. Further, not all teams require support for weather forecasts as the nature of their meetings does not require planning for outdoor events. These observations inform that each team members may use a different third party application and the presentation of weather data might not be consistent. Further, it would be time consuming and difficult when team members are required to rely upon a third party application for each process within a team meeting. However, few team leaders whose teams require planning for outdoor events said that the component would be very useful for them. They prefer the component to provide additional information like traffic conditions, transport and parking facilities near the outdoor venue to assist the participants. Hence, team members reflect that the use of a component to access online data (weather data, in this scenario) would be necessary for team members during team meetings, but they differ in the type of application to be used in accessing such data. Given the difficulty and lack of consistency in using different application by each team member to access the online data, it would be useful if the component within the tool-kit, uses a common data source (weather application, in this case) to provide a consistent data for the team. Hence, team members found the use of online data to be essential during meetings and suggested to provide a consistent source of such data using the component from the tool-kit.

D. Sharing Documents:

All the team leaders found the component to be very useful and effective when it is introduced within meetings. They observed that the component would be useful to reduce the cost of printing and stationeries, increased response from team members on every item discussed within meetings leading to effective decision making, manage meetings from being off-track, streamline meetings with large agenda and gather historical information on each item. However, one of the team leaders referred the use of share point tool for this scenario, but as discussed in the previous chapter; share point was not effectively used by team members and was eventually abandoned. Another team leader argued that their team would prefer to use the existing shared folders available on their organisation's network for this scenario. But, as argued in the last section, using different applications for each process within a team meeting is likely to create inconsistencies and difficulties to use numerous applications to support the team processes. Hence, introducing tools that support different process within a team meetings under an integrate tool-kit would be effective. Team leaders found the use of a shared workspace component to store necessary team documents and share them within the team meetings to be very useful.

VII. DISCUSSIONS

In a summary, team leaders found the components used for intervention in three of the four team meeting scenarios to be useful.

a. Team leaders observed that the calendar access component would be useful for the team members and can be included in the proposed tool-kit. Team leaders found the component to be useful, especially the function to select a back-up date for the next meeting, if the proposed meeting date is cancelled, to be very useful. Despite the component being similar to an Outlook calendar, team leaders prefer to include the component in the tool-kit.

b. The introduction of a reminder component to alert participants before a team meeting is observed to be a redundant tool that reflects the functions of a reminder alert used in Outlook. Team leaders find the component to be less useful to the team members as it replicates the functions of the Outlook. If the team leaders find the component to be less useful and replicates the functions of Outlook, then it is not clear why Outlook was not used by team members to issue reminders and why team members were arriving late for their meetings as observed during their recurring team meetings. However, team leaders prefer to integrate Outlook with the tool-kit and include additional features proposed by the reminder component namely providing the distance between the participant's workplace and the meeting venue, time taken to travel to the meeting location, GPS co-ordinates of meeting location and the ability to display the additional details in the calendar on a specific item that is posted on the specific date, to be taken up for discussion in a meeting.

c. The use of a component to access online data in assisting team members during their discussions was observed to be useful. Team leaders responded that the component would be effective when the source of online data used for each scenario is consistent.

d. Team leaders found the use of a shared workspace component to store necessary documents and access them during meetings to be very useful. The component would be useful to reduce the cost of stationeries, assist in effective decision making with a reduce response time by using a common area to share documents and tracking the history of responses of team members for a specific document.

VIII. LIMITATIONS

The evaluation was confined to four meeting scenarios/interventions that were designed based on the tool-kit framework derived from the earlier study. Given the maximum duration of time the team leaders were willing to contribute towards the evaluation, only four scenarios and their potential interventions were designed. The evaluation could be enhanced if more scenarios and potential interventions were generated and evaluated by team leaders

The evaluation was carried out only with the team leaders of teams that agreed to participate in the study. The outcome of the evaluation of the tools would not be complete without the participation of the individual team members of each team. As observed by Shumarova [25] the diffusion of tools and their uptake should be executed from a bottom-up approach starting from a low-level team member towards the team leader or senior manager within organisation.

The meeting scenarios and intervention tools that were presented to the team leaders were envisaged as the potential interventions strategies and could vary for each meeting. The feedback of the team leaders would vary in such circumstances.

IX. CONCLUSIONS & FUTURE WORK

The analysis of responses identified that the tools used in three of the four scenarios were useful for the team leaders. The use of tools namely the calendar access component to assist in managing appointment for team members, using an online access component to provide a consistent source of online data to assist with meeting discussions and the use of a shared workspace to store and access team documents in a common shared folder were found to be useful for the team leaders. The functions of a reminder component used to initiate reminders for team members before team meetings was similar to the use of outlook reminders and team leaders found the component to be less useful. The evaluation can be enhanced with the use of all team members as respondents and with the use of other tools from the tool-kit to intervene within other potential meeting scenarios. The findings of the study can be compared by extending the observations of team meetings of organisation to different geographical locations.

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