Requirements Analysis for an e-Government System to Support Multi-Organisational Collaborative Groups

Joycelyn Harris, Dr. Lily Sun and Dr. Andrew Adams
University of Reading, Berkshire, England
j.a.harris@reading.ac.uk
lily.sun@reading.ac.uk
a.a.adams@reading.ac.uk

Abstract: We present a conceptual architecture for a Group Support System (GSS) to facilitate Multi-Organisational Collaborative Groups (MOCGs) initiated by local government and including external organisations of various types. Multi-Organisational Collaborative Groups (MOCGs) consist of individuals from several organisations which have agreed to work together to solve a problem. The expectation is that more can be achieved working in harmony than separately. Work is done interdependently, rather than independently in diverse directions. Local government, faced with solving complex social problems, deploy MOCGs to enable solutions across organisational, functional, professional and juridical boundaries, by involving statutory, voluntary, community, not-for-profit and private organisations. This is not a silver bullet as it introduces new pressures. Each member organisation has its own goals, operating context and particular approaches, which can be expressed as their norms and business processes. Organisations working together must find ways of eliminating differences or mitigating their impact in order to reduce the risks of collaborative inertia and conflict. A GSS is an electronic collaboration system that facilitates group working and can offer assistance to MOCGs. Since many existing GSSs have been primarily developed for single organisation collaborative groups, even though there are some common issues, there are some difficulties peculiar to MOCGs, and others that they experience to a greater extent: a diversity of primary organisational goals among members; different funding models and other pressures; more significant differences in other information systems both technologically and in their use than single organisations; greater variation in acceptable approaches to solve problems. In this paper, we analyse the requirements of MOCGs led by local government agencies, leading to a conceptual architecture for an e-government GSS that captures the relationships between 'goal', 'context', 'norm', and 'business process'. Our models capture the dynamics of the circumstances surrounding each individual representing an organisation in a MOCG along with the dynamics of the MOCG itself as a separate community.

Keywords: Computer-supported collaborative work, Group support, Local government, transformative e-government, multi-agency working.

1. Introduction

Group Support Systems (GSS) support collaboration in groups by providing predictable patterns of behaviour and clear channels of communication. However many existing GSSs have been developed for use by collaborative groups within a single organisation. Although single and multi-organisational collaborative groups experience difficulties in common, there are some that are peculiar to the latter and others that are experienced to a greater extent, particularly in the arena of local government.

Local government agencies, such as UK local councils, have a wide arena of knowledge that includes policy formation, the protection of nature, emergency planning, and environmental health, and they interact with a diverse range of stakeholders in order to meet civic obligations. As a consequence much local government work can only be achieved through collaboration. Collaborative Public Management (CPM) is an agreement between two or more departments, agencies or organisations to design and deliver government services. Such agreements are formed with the belief that participants will harness collaborative advantage; the achievement secured through collaboration that no party could achieve acting alone (Vangen and Huxham 2003). The terminology used to describe such collaborations varies, but within this paper, the term used is Multi-Organisational Collaborative Group (MOCG) (Huxham 1996; Himmelman 1996; Williams 2002; Franco 2006). MOCGs typically involve statutory, private and not-for-profit (including community, voluntary and religious) organisations that seek to produce synergistic outcomes through sharing objectives, costs, risks, resources and expertise.

MOCGs are inclined to avoid collaborative inertia, where only negligible or hard fought progress is made and the apparent rate of work is slower than what is expected (Huxham 1996; Vangen and Huxham 2003; Eden and Huxham 2001). There is a higher risk of collaborative inertia in groups that

deal with complex social problems that are often referred to as 'wicked' (Ranade and Hudson 2003; Williams 2002; McGuire 2006). In these cases the focus of collaboration is not a single problem, but interdependent problems that conceal their origins and are difficult to represent precisely (Huxham 1996; Franco 2006). There appears to be a non-causal relationship between action and outcome, which means that outcomes are often unpredictable. These problems may have been exacerbated by pre-existing processes and actions. Gray (1996) uses the term 'turbulence' to refer to the unanticipated consequences created by organisations acting independently and in diverse directions to address same problem.

Many of the problems that MOCGs face are due to the differences in the contexts, goals, norms and business processes of participants. An E-Government GSS (eGGSS) for MOCGs tackling complex social problems must take into account the complex relationships between the concepts of goal, context, norms and business process if the system is to help such groups harness collaborative advantage and avoid collaborative inertia. In this paper we discuss the requirements for an eGGSS. Section two describes work in related fields and in section three a conceptual architecture and functionality for an eGGSS are outlined.

2. Related work

The UK Chief Information Office (2005) claims that modern technology can provide 'glue' between government organisations and others, allowing work to be passed quickly and smoothly between them. However many institutional arrangements and organisational structures found in government contexts offer incentives for single-agency work. These structures can hinder inter-organisational information integration and cross-agency collaboration (Luna-Reyes et al. 2007). In spite of this, technology could still be used to increase trust between MOCG participants, as well as to reduce the occurrence of turbulence and inertia, and cultivate collaborative advantage by creating clear and reliable channels of communication between government agencies and their stakeholders.

Organisational design is a decision process that creates coherence between organisational goals, divisions of labour and people (Hu et al. 2006). MOCGs must establish a group identity which will facilitate a sense of common ownership. The development of a working structure which includes agreement on leadership and administrative roles can reduce conflicts arising from an imbalance of power (Franco 2006; McGuire 2006). However a poor organisational design is not the sole reason for collaborative inertia or collaborative failure.

Trust provides the basis for knowledge sharing and negotiation amongst members of collaborative groups (Luna-Reyes et al. 2007; Williams 2002). Failure to build trust between members or organisations, and the existence of mistrust, are barriers to collaborative success (Williams 2002). It could be argued that the trust needed for collaborative success is a *security of assurance* where members are obliged to keep their promises to avoid harming themselves (Yamagishi 2003; Yamagishi *et al.* 1998). Security of assurance is based on inferences of incentive and not of character, and is predominant in groups where there is a low risk of being exploited by others. It seems plausible that security of assurance is the primary cause of group cohesion in MOCGs, but trust as inferences of character, such is interpersonal trust, may have a greater affect on collaborative success. Interpersonal trust is built over time through member interactions and is concerned with the relational bonds between them, such as shared values and objectives, the recognition of benevolent actions, and the integrity of individual members. These bonds provide a basis for knowledge sharing and negotiation. Institutional trust is also necessary for a collaborative success. It is a framework that regulates the relationship between the main actors within a collaborative group. In contrast to interpersonal trust, it has a formal basis that requires cultural and legal systems to support it and foster its development. It is often difficult to separate manifestations of interpersonal and institutional trust within a collaborative group and it is possible for interpersonal trust to extend to the institutional trust level. To establish trust there needs to be adequate and constant communication between participants (Hu *et al.* 2006; Luna-Reyes *et al.* 2007).

To achieve collaborative advantage there must be a well-functioning interface between participating organisations (Vangen and Huxham 2003). This interface can be strengthened by a GSS. A GSS is a suite of collaboration tools that are used to create predictable patterns of collaboration among individuals working toward a common goal (Chen *et al.* 2006). E-collaboration is the use of electronic technologies by individuals to collaborate on accomplishing a common task (Kock 2005). The remainder of this paper uses the term *GSS* to stand for an electronic collaboration system to facilitate

individuals working in groups. It is important to ensure that a GSS does not overly constrain a group and is configured in a way that allows a group to find its own way of working within a framework of mutually agreed values and standards (Bjorn and Ngwenyama 2008; Ranade and Hudson 2003).The characteristics of a GSS can be summarised as follows:

- Provides structure to group activities
- Highly visible: group members can monitor and remain aware of the collaboration
- Used to create or share information and objects-of-work amongst users
- Requires direct keyboard entry from group members
- Allows parallel input
- Maintains group memory
- Supports deliberation processes
- Open-ended: a collection of rules and procedures to guide collective decision-making and resolve conflicts
- Translucent repository and functionality: provides a common information space
- Creates simple views of the work situation

(Chen *et al.* 2006; Ackermann *et al.* 2005; Kock 2005; Traunmuller and Wimmer 2000; Vangen and Huxham 2003; Bjorn and Ngwenyama 2008).

A collaborative group would benefit more from using a GSS for electronic communication than they would from relying solely on email due to *translucence* a composition of awareness, visibility and accountability that shapes a stakeholder's interpretation of events, which in turn informs their actions. Email does not support translucence because it can hide objects-of-work from some MOCG members, thus decreasing mutual accountability. A GSS supports translucence through the inclusion of design features that make objects-of-work visible to all members.

A GSS can provide means for synchronous and asynchronous computer-mediated communication (CMC), such as providing instant messaging facilities alongside discussion boards. The use of CMC to replace face-to-face (F2F) communication has been criticised for providing lower levels of media richness. *Media richness* is the ability of a medium to convey a range of cues to communicate information, and to clarify ambiguity and uncertainty between actors (Otondo *et al*. 2008)**.** F2F communication is the richest medium because it conveys many cues simultaneously and facilitates rapid feedback (Kishi 2008). Yet low media richness does not necessarily reduce the effectiveness of a medium to relay information. Richness is an emergent property of the medium within its organisational context and effectiveness depends on the match between the medium and the task requirements (Barkhi 2002; Otondo *et al.* 2008).

Many existing GSSs have been developed primarily for collaborative groups within a single organisation. Members of these groups are employed by the same organisation and consequently will share the goals of the organisation, the context in which the organisation operates, and ways in which the organisation operates, i.e. normative patterns of behaviour and business processes. As there is less variation amongst members of these groups than members of MOCGs, the former are likely to have a lower risk of developing collaborative inertia due to a failure to conciliate their variations.

MOCG Members are likely to bring into a group external hierarchies of status, power and resources, and any tensions that have been associated with them previously. These tensions may lead to conflict over competition for resources or one-upmanship. A major difference between a SOCG and an MOCG is that the former can resolve these types of conflict by referring them to management, whereas the latter must resolve them itself. The variations between MOCG members can be great and conciliation is crucial if a MOCG is to avoid collaborative inertia. The GSS we propose will be suitable for MOCGs led by local government agencies because it includes features that aid conciliation of variations between the goals, contexts, norms and business processes of MOCG participants.

3. Conceptual architecture for an e-government GSS

We present a conceptual architecture for an e-Government GSS (eGGSS), which builds upon our previous work (Harris and Sun 2008). Four concepts are modelled: Goal, Context, Norm, and Business Process. Figure 1 illustrates the relationships between the concepts within member organisations and in relation to a MOCG. The boxes in the first part of the figure consist of the formation of concepts and relations shown in more detail in the second part of the figure. The context of a MOCG is an amalgamation of the goals, context, norms and business processes of participants.

A member or the local council is unlikely to accept a group goal if it opposes their own goals or has little relevance to context in which the operate. The goals and context of each MOCG participant are transformed via negotiation into MOCG goals that are accepted by the majority of members. The norms of members will influence the emergence of group norms and a member's acceptance of them.

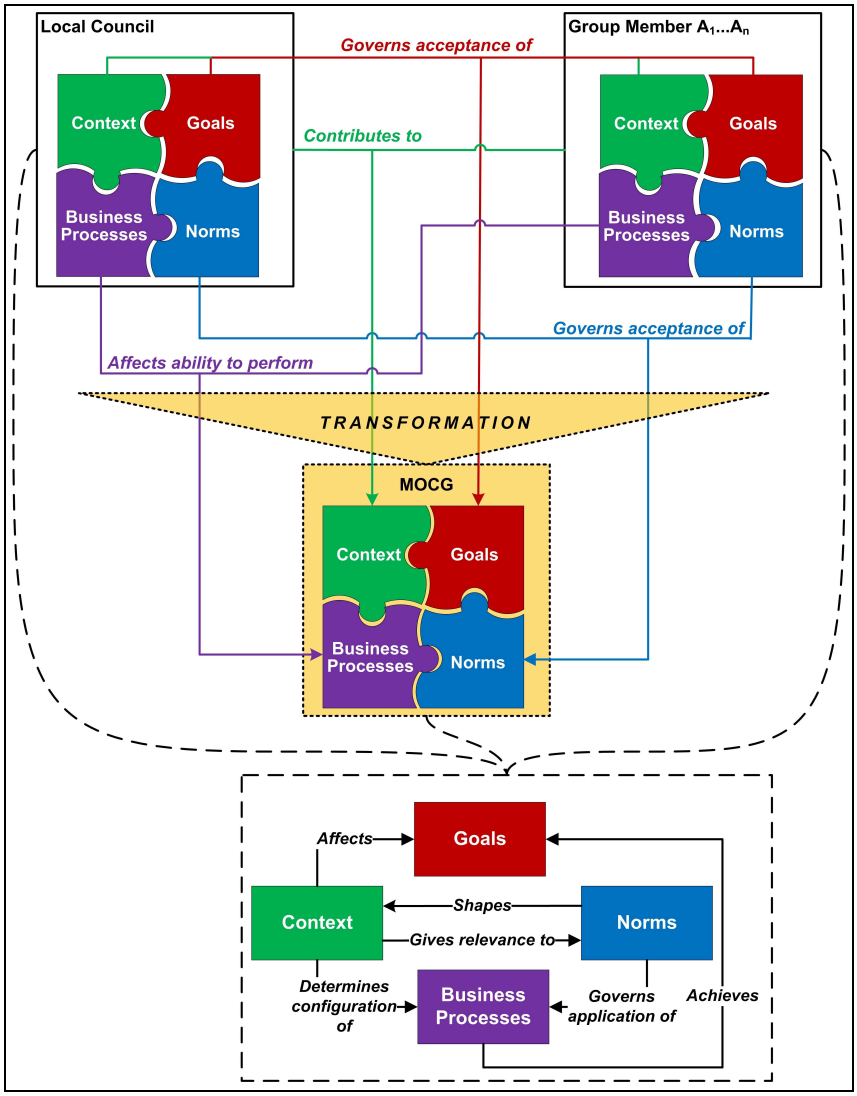

Figure 1: Conceptual architecture of MOCG working.

3.1 The four concepts

Context is the sum of circumstances and environmental factors that create the situation within which an organisation or a MOCG operates. In this sense, 'context' refers to a range of social, cultural, legal, technological, and marketplace conditions that characterise a business domain.

Government employees that participate in MOCGs often have to work within two contextual levels; a vertical context corresponding to the levels of government, and a horizontal context where they interact with an array of public and private actors (McGuire 2006). Participation in MOCGs is an instance of working in a horizontal context.

MOCG members can also be said to work in various contexts. They can be differentiated by their ideologies and values, the relationship the individual representative has with their organisation, and the relationships the member organisation has with other organisations. Individual representatives may have differing levels of authority and accountability that can affect their level of commitment to the group. They may experience a two-way pressure to participate in a MOCG and to deliver their core business targets (Bjorn and Ngwenyama 2008; Ranade and Hudson 2003; Williams 2002). They may be required to satisfy dual reporting systems and may not have the authority to instantly commit

their organisations to outcomes of joint decision-making within the group (Franco 2006; Hu *et al.* 2006). There must be trust amongst MOCG members if they are to overcome the difficulties related to their various contexts.

Goal refers to a desired outcome of a participating organisation. MOCG Member behaviour is guided by individual, organisational and group goals (Eden and Huxham 2001; Ranade and Hudson 2003; Franco 2006; Ackermann *et al.* 2005). Individual goals are a set of personal values and constraints that affect and are influenced by group decisions. They may be hidden from other members but they can also become a part of a group's identity. Organisational goals guide an individual's acceptance of an emerging purpose. Members are usually committed to their organisation's ways of working and may not easily agree to alternatives proposed in the group. Group members may be unaware of the organisational goals of other members, and a member may decide not to disclose the goals of their organisation. Conversely, the member may not be aware of the complete scope of their organisation's goals, which could make it difficult for them to obtain permission to support to a group action.

Group goals are owned collectively and by the majority of members. They may not relate to the official purpose of the group, but are necessary for developing cohesion and trust between individuals. The variety of member contexts can make it difficult to obtain a consensus on group goals and conflicts can arise from an incompatibility of goals. These conflicts have been referred to as *episodes* (Eden and Huxham 2001; Vangen and Huxham 2003). They may arise from two contrasting goals, or between group goals and individual or organisational goals, and can result in participants having varying levels of commitment to the group. An episode is not the same as a communication breakdown as defined by Bjorn and Ngwenyama (2008) because the latter is due to the failure of previously successful work practices. Participating organisations may seek to alleviate goal conflict by aligning their goals with those of the MOCG. This form of mutual adjustment may increase institutional trust because it demonstrates an attitude of interdependence (Hu et al. 2006).

Norms govern the behaviour of individuals in social groups, which includes organisations and MOCG (Stamper *et al.* 2000). Norms are dependent upon a context for their necessity, usefulness and application (Liu 2000). There are six components to norms:

- Character - states if a norm is mandatory, permissive or prohibitive.
- Content - refers to the activity
- Condition - specifies when the activity should be performed.
- Agent - the authority that issues the norm
- Subject - those that can apply the norm
- Occasion - the time and space in which the norm is issued.

Norms can generate from within an organisation. MOCG members have a close attachment to the norms of their own organisations and they will have an effect on and contribute to the norms that emerge within the group (Ackermann *et al.* 2005; Ranade and Hudson 2003; Vangen and Huxham 2003). Norms may be forced upon an organisation or a MOCG by an outside agency, such as new legislature that must be adhered to, which will modify the context of the social group.

Business processes are structured activities or methods performed to achieve a goal. Each member organisation performs a number of business processes to achieve its goals. These will have been created in response to its context and goals, and are performed in accordance with their norms. Similarly, a MOCG has business processes intended to achieve its goals in a way that is suited to its context and norms. As the work of MOCGs will be carried out by members, possibly within their own organisations, the MOCG business processes must not conflict with those of the member organisation, otherwise the member may not be able to perform them. Furthermore, a MOCG will need to record its business processes and so that any member with the required expertise is able to perform them adequately.

3.2 eGGSS functionality

Performing *business processes* in accordance with norms and within a specific context will enable an organisation to achieve its goals. Changes in the context or the goals will affect business processes and norms, and may result in conflict. For a group to remain effective it must be flexible enough to adapt to changes to the goals, context, norms and business processes of member organisations. The functions of an eGGSS must also support group adaptation. The eGGSS we propose will support adaptation and the business activities of MOCG. Figure 2 illustrates the functions that an eGGSS could provide group members.

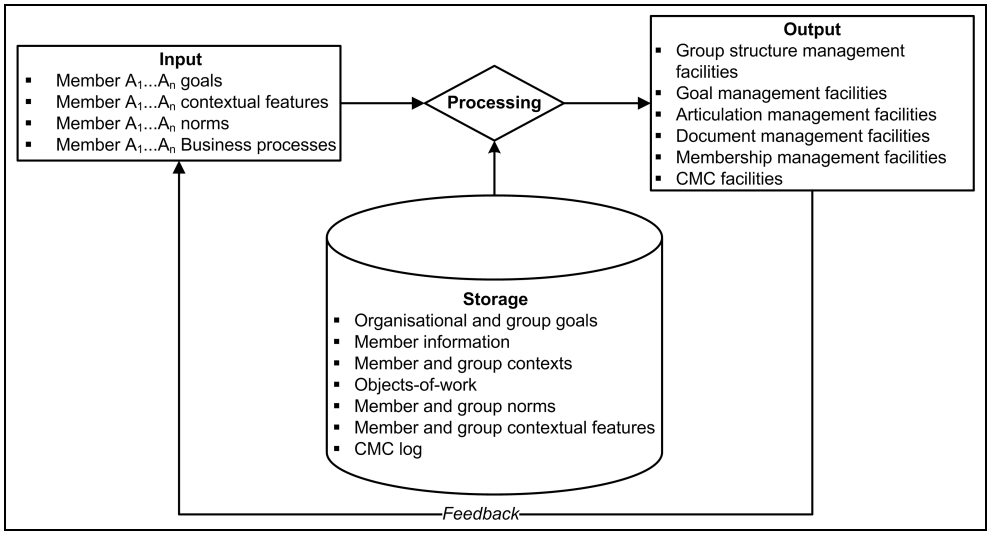

Figure 2: eGGSS functional model

An eGGSS may excel in supporting the organisational design of the MOCG. It could support the group in developing a working structure by storing guidelines for membership and modelling the structure of the group. It could assist in maintaining equality amongst members by controlling member involvement in any activity. Limiting member input on a process may assist in managing group politics by preventing a single member from manipulating a process, such as to satisfy a goal of their organisation rather than of the group. Guidelines could be entered into the system before deployment because instances of MOCGs are likely to have norms and business processes in common. However a group should have the freedom to edit these as required.

Clear group goals clarify boundaries and commitments amongst members, and provide control against a MOCG drifting off course. Yet setting group goals can be difficult. An under-estimation of these goals can confine the MOCG to marginal tasks, and over-estimation can lead to an unrealistic assessment of what the group can achieve. Furthermore, relying solely on mutual adjustment to alleviate goal conflict may undermine collaborative success. To achieve alignment there must be constant communication between the organisation and the MOCG, which may create a highly pressurised working environment for the representative. In addition, participating organisations may have been selected because of their unique attitude to or perspective of the problem to be solved. Mutual adjustment could lower the diversity of perspectives and attitudes within a MOCG, which could reduce the likelihood of finding a fitting solution. An alternative to mutual adjustment is to ensure that MOCG members are aware of goal definition best practice and provided with a means to record how the group arrived at each goal. An eGGSS could provide goal definition guidelines and a facility for recording goal rationale. When a conflict arises between an existing group goal and a proposed goal, the group can refer to the rationale behind the existing goal to identify the areas of opposition. They can then move forward by re-negotiating and re-prioritising goals as required.

MOCG members that are employed in cross-cutting posts with a core duty to participate in collaborations will be accustomed to performing *articulation work*; standard business activities performed within collaborative groups that includes allocating, coordinating, and scheduling activities amongst members. Other members may be employed in jobs where participating in a MOCG is a minor aspect of their work. These members could be unfamiliar with articulation work and may benefit from guidelines on how to perform these activities. Some members may have limited resources to undertake articulation work effectively. An eGGSS could provide all members with shared articulation tools accessed via the internet.

An eGGSS could help a MOCG to manage objects-of-work. A result of power asymmetry is that members have differing levels of access these objects. Where this is due to a lack of an adequate medium rather than information being purposely withheld, an eGGSS could provide a shared space for creating, updating, storing and circulating objects-of-work. Appropriate levels of access for each member could be set by the group leader, following negotiation with members. An eGGSS can help members locate objects by providing different user interfaces to display them, dependent upon the

types of objects the user is seeking and their level of expertise. For example, the MOCG leader may benefit from viewing the configuration of all objects in order to gain an overview of the collaboration, but this view may overwhelm a member unaccustomed to MOCG working. Care must be taken to avoid over-simplification of views of the work situation because decision-making based on such views may result in turbulence.

An eGGSS could help to foster trust amongst members by increasing information sharing and communication. Disseminating background information about member organisations, such as their goals, accomplishments, professional affiliations, and participation in projects and partnerships, could help to build institutional trust between participants. Sharing this information will allow members to learn something about their partners in advance of F2F meetings and prepare the ground for deeper interaction at these meetings. Making organisational goals explicit may help members recognise where episodes may occur, which may make them easier to manage. CMC can be used to increase communication whilst maintaining translucence. Asynchronous CMC may be used to schedule meetings and to disseminate objects-of-work. It could also give members time to seek authority from their organisation to agree to a course of action. Synchronous CMC may reduce the pressure to arrange F2F meetings.

4. Conclusion

We have proposed an eGGSS that takes into account the relationships between the contexts, goals, norms and business processes of participating organisations and the group, in order to mitigate collaborative inertia and harness collaborative advantage.

Collaborative working is advantageous in the statutory sector because solutions to complex social problems span organisational, functional, professional and jurisdictional boundaries. Through working in MOCGs local government agencies hope to harness collaborative advantage and avoid turbulence. However MOCGs that are charged with solving complex social problems are at a higher risk of inertia. This risk could be mitigated through the use of an eGGSS.

A GSS provides predictable patterns of collaboration among individuals working in groups towards a shared goal. Many GSSs have been primarily developed for single organisation collaborative groups and are insufficient for the requirements of MOCGs. MOCG members collaborate in a horizontal fashion and conflicts arise due to the differences between them. To overcome contextual difficulties members must establish trust between each other and set clear group goals. However setting the right amount of group goals can be difficult. In addition, the organisational goals and individual goals of members may conflict with each other and with emerging group goals. Members will bring into the groups their organisation's norms. Theses can clash with each other and with emergent group norms. Business activities may be difficult to perform because of conflicts between the business processes of participating organisations. The eGGSS we propose is intended to mitigate these conflicts. The underlying conceptual architecture depicts the relationships between 'goal', 'context', 'norm', and 'business process' and has a two-way application. Firstly, it captures the dynamics of the circumstances surrounding each individual representing an organisation in a MOCG. Secondly, it captures the dynamics of the MOCG itself as a separate community.

Further investigation is needed into the practices of MOCG led by local government agencies. To this end, an interview-based study of MOCG participants employed by local councils and other public sector organisations is being conducted. In the future we will detail how the eGGSS will provide the features we described and the techniques we will use to interpret and model goals, context, norms and business processes.

References

Ackermann, F., Franco, L., Gallupe, B. & Parent, M. (2005), "GSS for Multi-Organizational Collaboration: Reflections on Process and Content". *Group Decision and Negotiation,* Vol. 14**,** No.4, pp. 307-331.

Barkhi, R. (2002), "Cognitive Style May Mitigate the Impact of Communication Mode". *Information & Management,* Vol. 39**,** No. 8, pp. 677-688.

Bjorn, P. & Ngwenyama, O. (2008), "Virtual Team Collaboration: Building Shared Meaning, Resolving Breakdowns and Creating Translucence". *Information Systems Journal,* doi: 10.1111/j.1365-2575.2007.00281.x

Chen, F., Briggs, R. O., Corbitt, G., Nunamaker Jr., J. F., Sager, J. & Gardiner, S. C. (2006) Project

Progress Tracking Template — Using a Repeatable GSS Process to Facilitate Project Process Management *Proceedings of the 39th Annual Hawaii International Conference on System Sciences (HICSS'06) Track 1.* Hawaii IEEE Computer Society.
Chief Information Office (2005), *Transformational Government – Enabled by Technology*, Cabinet Office, available at: http://www.cio.gov.uk/transformational_government/localgovt/index.asp (accessed February 2008)
Eden, C. & Huxham, C. (2001), "The Negotiation of Purpose in Multi-Organizational Collaborative Groups". *Journal of Management Studies,* Vol. 38**,** No. 3, pp. 373-391.
Franco, L. A. (2006), "Assessing the Impact of Problem Structuring Methods in Multi-Organizational Settings: An Empirical Investigation". *Journal of the Operational Research Society,* Vol. 58**,** No. 6, pp. 760-768.
Gray, B. (1996), "Cross-Sectoral Partners: Collaborative Alliances Amongst Business, Government and Communities", In Huxham, C. (Ed.) *Creating Collaborative Advantage,* Sage Publications Ltd, pp. 57-79
Harris, J. & Sun, L. (2008) A Conceptual Model for a Group Support System in Local Councils' In Cordeiro, J. & Joaquim, F. (Eds.) *10th International Conference on Enterprise Information Systems.* Barcelona, Spain.
Himmelman, A. T. (1996), "On the Theory and Practice of Transformational Collaboration: From Social Service to Social Justice", In Huxham, C. (Ed.) *Creating Collaborative Advantage,* Sage Publications Ltd, pp. 19-43
Hu, P. J., Cui, D. & Sherwood, A. C. (2006) Examining Cross-Agency Collaborations in E-Government Initiatives. *Proceedings of the 39th Annual Hawaii International Conference on System Sciences 2006.*
Huxham, C. (1996), "Collaboration and Collaborative Advantage", In Huxham, C. (Ed.) *Creating Collaborative Advantage,* Sage Publications Ltd, pp. 1-18
Jive Software (2001) *Clearspace*, available at: http://www.jivesoftware.com/products/clearspace (accessed 23 July 2008)
Kishi, M. (2008), "Perceptions and Use of Electronic Media: Testing the Relationship between Organizational Interpretation Differences and Media Richness". *Information & Management,* Vol. 45**,** No. 5, pp. 281-287.
Kock, N. (2005), "What Is E-Collaboration?", *International Journal of e-Collaboration,* Vol. 1**,** No. 1, pp. i-vii.
Luna-Reyes, L. F., Gil-Garcia, J. R. & Cruz, C. B. (2007) Collaborative Digital Government in Mexico: Some Lessons from Federal Web-Based Interorganizational Information Integration Initiatives. *Government Information Quarterly,* doi:10.1016/j.giq.2007.04.003
McGuire, M. (2006), "Collaborative Public Management: Assessing What We Know and How We Know It". *Public Administration Review,* Vol. 66**,** No. s1, pp. 33-43.
Microsoft (2007) *SharePoint Server 2007*, available at: http://www.microsoft.com/Sharepoint/default.mspx (accessed 23 July 2008)
MindTouch (2008) *MindTouch Deki*, available at: http://wiki.mindtouch.com/ (accessed
Otondo, R. F., Van Scotter, J. R., Allen, D. G. & Palvia, P. (2008), "The Complexity of Richness: Media, Message, and Communication Outcomes". *Information & Management,* Vol. 45**,** No. 1, pp. 21-30.
Ranade, W. & Hudson, B. (2003), "Conceptual Issues in Inter-Agency Collaboration". *Local Government Studies,* Vol. 29**,** No. 3, pp. 32-50
Stamper, R., Liu, K., Hafkamp, M. & Ades, Y. (2000), "Understanding the Roles of Signs and Norms in Organizations - a Semiotic Approach to Information Systems Design". *Behaviour and Information Technology,* Vol. 19**,** No. 15-27.
Traunmuller, R. & Wimmer, M. (2000) Processes-Collaboration-Norms-Knowledge: Signposts for Administrative Application Development. *Proceedings. 11th International Workshop on Database and Expert Systems Applications 2000.*
Vangen, S. & Huxham, C. (2003), "Enacting Leadership for Collaborative Advantage: Dilemmas of Ideology and Pragmatism in the Activities of Partnership Managers". *British Journal of Management,* Vol. 14**,** No. S61-S76.
Williams, P. (2002), "The Competent Boundary Spanner". *Public Administration,* Vol. 80**,** No. 1, pp. 103-124.
Yamagishi, T. (2003), "Trust and Social Intelligence in Japan", In Schwartz, F. J. & Pharr, S. J. (Eds.) *The State of Civil Society in Japan,* Cambridge University Press, Cambridge, pp. 281-297
Yamagishi, T., Cook, K. S. & Watabe, M. (1998), "Uncertainty, Trust, and Commitment Formation in the United States and Japan". *The American Journal of Sociology,* Vol. 104**,** No. 1, pp. 165-194.