

# **A MULTI-PERSPECTIVE APPROACH TO FACILITATE COLLABORATION: A CASE STUDY ON AUSTRALIAN PUBLIC SECTOR ORGANISATIONS**

*Completed Research Paper*

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## **Abstract**

*This paper presents a multiple perspectives approach that can help to improve the understanding of knowledge flows in changing collaborative environments. It differs from majority of current modelling methods use analytical or reductionist approach. Our approach is adaptive in that it introduces ways to look at change from different perspectives to help identify changes in complex organisation and provides an effective solution to addressing wicked organisational problems. Our case study focused on the Australian Government's Nation Building Economic Stimulus Plan (NBESP) which involved three government agencies working together in a complex collaborative setting. In this paper we focus on organisational, social and business perspectives in addition to the knowledge perspective. Furthermore, we show that a multiple perspectives framework could play a significant role in solving wicked problems, and enabled organisations to respond to a rapidly changing environment.*

**Keywords:** Wicked problem, multi-perspective, collaboration, boundary role

## **Introduction**

Information systems are increasingly required to support complex or what are sometimes called wicked problems. These are problems where neither requirements nor solutions can be precisely specified. They often appear in large contexts and require unique solutions that satisfy multiple stakeholders. Knowledge management plays a crucial role here – both in providing knowledge needed in the design process, and in its role in the designed systems. The continually emerging complex environments require designers to quickly identify where new knowledge is needed and ways to deliver it. This paper describes a new approach to address these issues based on perspectives rather than on predefined flows that follow an analytical reductionist approach to address predefined problems. The paper describes a way to visualise knowledge management from different perspectives to discover new knowledge requirements.

In the research we increasingly used methods found in design thinking (Martin 2009) in contrast to analytical thinking (Brown and Wyatt 2010). Design thinking calls for continuous innovation with an emphasis on visualisations and searching questions to draw out innovative contributions to solutions. Our proposal is to use perspectives to provide visualisations that provide additional cognitive support to generate innovative heuristics that characterise design thinking. Using perspectives is consistent with dealing with wicked problems as the perspectives can be seen as different fragments of any solution. In this paper we focus on three perspectives in addition to the knowledge perspective. These are organisation, social networks and the business perspective. These include knowing where the knowledge is needed by using an organisational perspective. It also requires knowledge of social structure to see who owns the knowledge and who includes the tacit knowledge skills to interpret the knowledge given the emerging situation. It also identifies how the knowledge flows through social relationships. The business activity perspective describes how the knowledge is used.

This paper uses open modelling as a way to develop the visualisations of these perspectives. The multi-perspective approach complements design thinking as it provides ways for designers to consider different solutions through different choices in each perspective. It provides a design canvas where stakeholders see a complex problem from a number of different perspectives.

Our research has indicated that focusing on perspectives provides good outcomes. This paper extends to place the methodology in the context of design thinking an approach that was used. The emphasis on design thinking is to provide the opportunities to come with searching questions and encourage a holistic approach through visualisations. It is the combination of these that have led to the successful outcomes.

## **Understanding a Wicked Problem**

The term ‘wicked problems’ can refer to an issue that is highly resistant to resolution. The original focus of the wicked problem literature was on systems design, but the concept has gradually been applied to broader social and economic policy problems (Head and Alford 2013). Some of these characteristics are:

- There is no definite specific formulation of the problem; there are just general goals such as increased sales in a new market, or increasing tourism in some region. Often different stakeholders may have different versions of what the problem is.
- Have no stopping rule – for example when can we stop research that leads to better health.
- Solutions are not true or false, but better or worse.
- There is no test of whether a solution will work. Often solutions lead to changes in behaviour, which requires further change.
- Every solution is unique and solutions that apply in one environment cannot be used in others.
- There are a large number of possible solutions.
- Every wicked problem is unique – every city needs a different solution to become smart.
- There are often many entities involved – both private and government.

Solutions in wicked environments call for collaborative innovation which in turn calls for better ways to make sense of the problem. A wicked problem is often characterised by social complexity. Complexity

provides some guidelines in tackling wicked problems through providing understanding on ways to manage emergence through self-organisation. This is particularly the case where organisational change demands better business processes and new social structures. The work of Heylighen (2001) and Adriani (2005) provide valuable understanding of the emergence of these new structure and adaptability in a dynamic environment. Merali (2006) argues the significance of self-organisation and she also points out that a model requires capturing the emergent dynamics of complex system. Literature also suggests that complexity theory (Cohen 1999; Dagnino 2004) is difficult to translate into practice if its precise mathematical structure is used. Our approach uses a number of perspectives to model the complex system and use complexity as a guideline for identifying change in terms of these perspectives.

The literature on collaborative innovation suggests several approaches for dealing with different design models to support new process implementation in self-organised business processes. New implementation is defined as the creation of knowledge and coordination across organisational boundaries (Gasson and Elrod 2006). Placing value on collaborative innovation, dimensions of new multi perspective performance are explored and examined so that new ways of modelling will be able to assist in resolving the issues posed by new organisational process implementation and enable swift responsiveness to change. Hence, this study focused on the development of a new model to solve wicked problems.

Further, facilitate collaboration across different organisational boundaries, according to Briggs:

“Working more successfully across organisations relies on better information-sharing and requires structured approaches to the collection and sharing of information and data. On a practical level this includes continuing the progress towards the adoption of common information policies, standards and identifying information management needs early in the planning process around wicked problems” (Briggs 2007, p. 17).

In summary, recent research (Heylighen 2001; McElroy 2000; Merali 2006) indicated that there is a need for integration of multiple perspectives to understand the complex problems in a rapidly changing environment. A key area of research is to validate the use of multi perspective (Alman 2003; Ferlie 2007) framework and its impact on knowledge flow analysis.

## **Research Method and Design**

### ***Research focus***

The research described here focuses on visualisations that provide stakeholders with ways not only to focus on the capture and distribution of knowledge but to create collaborative networks to promote the development of valuable interrelationships between stakeholders. As a consequence more effective approaches to model knowledge flows in complex organisations are required. Such new approaches are needed for organisations to analyse Information System (IS) requirements. Literature indicates that using existing methods (Aversano et al. 2004; Moller 2007) do not provide the structures to model the increasingly complex relationships now found in practice. Our research is to show that a multi-perspective approach can easily show such relationships and allow users to quickly adapt to changing situations.

The major purposes of the present study were as follows: 1) to examine whether a multiple perspectives framework improves the ability to manage change in complex organisation, 2) identify suitable perspectives 3) to examine whether the model is based on a multi perspective approach that will help to identify knowledge flow for unforeseen circumstances, 4) to examine how the organisation responds to unforeseen circumstances needed for better knowledge flow.

In relation to the holistic model of multiple perspectives, it was initially approached with an individual perspective that applied for identifying the critical factors in complex projects. The researcher describes the following perspectives as a distinct aspect of the combined model including organisation, business, knowledge and social perspective.

Especially, the research identified the following perspectives (Hawryszkiewicz 2010) for its study:

- The organisational perspective shows top management positions in different organisations;
- The knowledge perspective refers to the knowledge that is shared between communities;

- The business perspective refers to how people achieve common goals through business activities and the interaction with different roles in organisations.
- Consequently, the fourth dimension, the social perspective, illustrates the social complexity and process of change within and across other perspectives.

In the process of building the framework, the researcher initially analysed four single perspectives and gaps existing in literature to present an integrated model designed for complex systems. The amalgamation of these single perspectives forms a holistic view to tackle wicked problems which arise within collaborative work places.

### **Research Method**

The research used the case study research method to provide rich descriptions of complex phenomena and the characteristics of case (Yin 2003). Moreover, the case studies as part of a qualitative research method described cases in-depth and addressed the research questions. The case study explored how participating organisations are influenced by wicked problems. The main purpose of qualitative study was to understand the complex processes and collaboration issues being faced by participating organisations. The sample was obtained as part of a research into the multiple perspectives framework on preferences in tackling the wicked problem in organisations. The government public sector was the preferred environment, as it better relates to the researcher's workplace and practice. It was also most suitable approach to understand the complex social and organisational phenomena of knowledge flow.

The research design proposed four case studies involving interviews and examinations of complex organisations for knowledge based systems in real organisational setting. In particular, the case study focused on the Australian Government's Nation Building Economic Stimulus Plan (NBESP) which involved three government agencies working together in a complex collaborative setting.

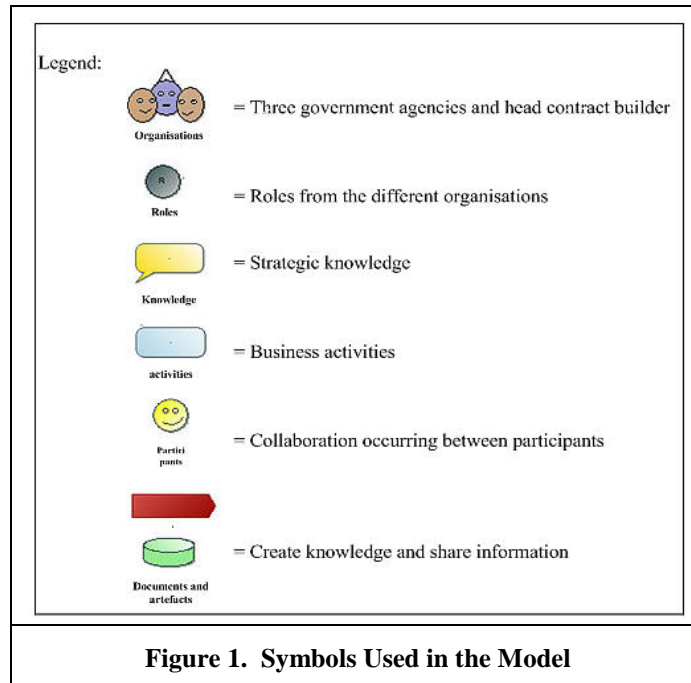
The researcher employed a common set of questionnaires to gather data from the participating organisations. The researcher interviewed thirty-five participants (mainly executive officers and division managers) individually, suggesting that the responses were reasonably balanced. The questionnaire consisted of 58 questions to validate research questions in measuring the success of multi-perspective modelling through participants' experience in their organisations. The questionnaire had 8 sections: satisfaction; model quality; model content; model use; policy impact; process development impact; information flow; collaboration impact. The researcher continuously analysed the results of experiments and carried out statistical analysis of these data and archived materials in order to expand and test the validity and reliability of modeling dimensions. The researcher used NVivo© software to code each participant's transcribed semi-structured interview (DeNardo & Lopez-Levers 2002). The researcher read the codes from each participant interview.

### **Describing the Perspectives**

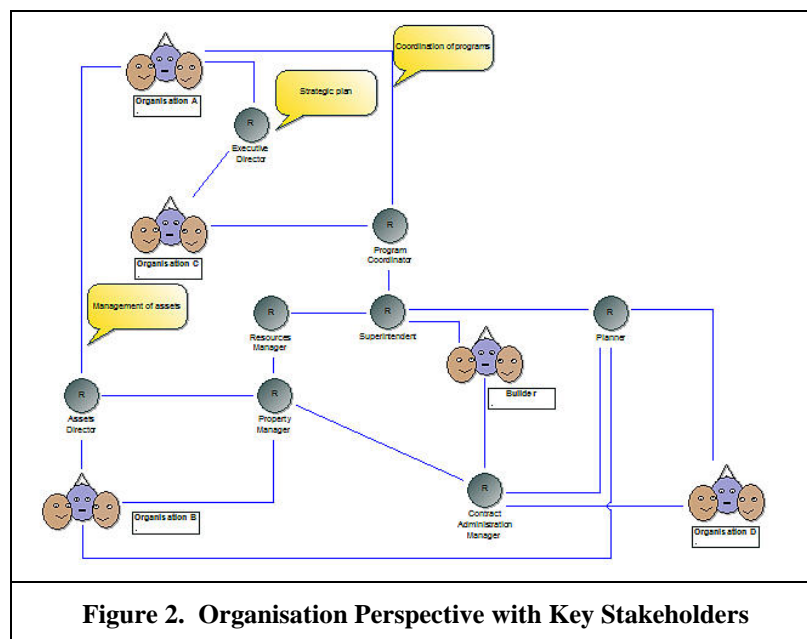
Individual perspective work from four different dimensions in modelling complex system and it derived from the literature namely; organisational perspective (Maguire 2006; Mason 2007), business perspective (Hammer and Champney 1995), knowledge perspective (Li et al. 2004; McElroy 2000) and social perspective (Baum and Ingram 2002; Conklin 2005; Head and Alford 2013). Figure 1 shows the symbols used in modelling the perspectives.

#### **Organisation Perspective**

The current study investigates the nature of organisational change as the most fundamental dimensions of perspectives. According to Seel (2000), there are different kinds of change in organisations include system, structural and organisational change. In particular, organisation perspective is most essential part in conceptual modelling and it is a co-creating pattern of relationship (Seel 2000). Seel indicates that the term pattern can refer to some regularities and consistencies where unpredictable relationships likely to occur. While organisational structure will emerge, it is usually imposed from external influence such as political, economic and environmental impact. It is important to be aware of which functional units and different boundaries of roles are being changed.



In terms of the system change, there are claims (Amagoh 2008) that the “open systems approach views the organizations’ interaction with the external environment as vital for organizational survival and success” (p. 2). On the other hand, the closed systems view focus on the internal environment. Thus, organisation perspective approach helps transformation of organisation’s architecture and information by use of the systems and social interactions and produces the best results (Yoon and Kuchinke 2005, p. 17).



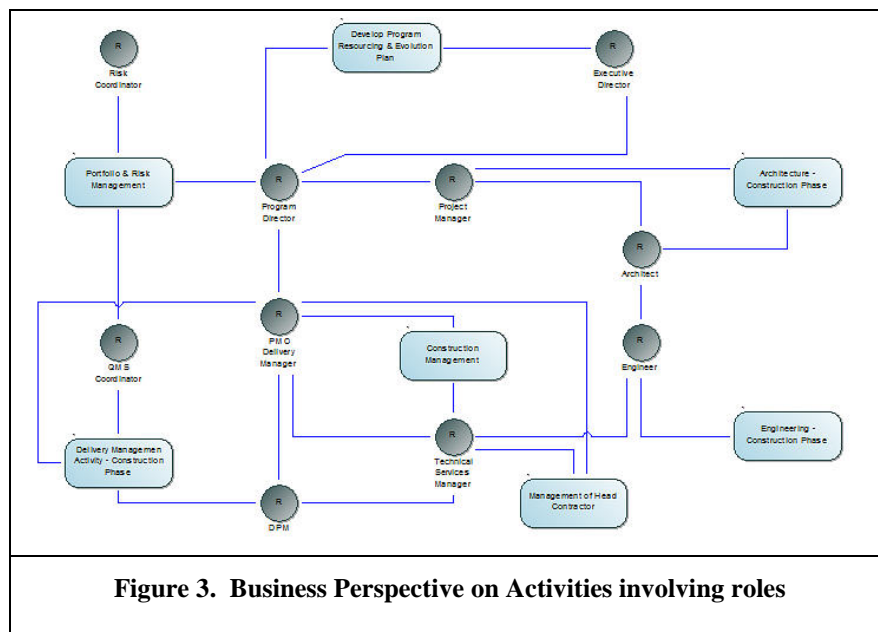
In the first organisation perspective, the researcher demonstrated Figure 2 above reveals participants involved in the discussion regarding the main stakeholders in each department were. For example, regular meetings for strategic decision making with executive director, program coordinator and assets

director between organisations take place. As shown in the diagram above, organisation perspective is helpful for identifying key stakeholders to be engaged where information will continue to flow between organisations.

This permits question like “How does the organisation respond to the unanticipated event required for better knowledge flow?” It also provides the general understanding of the causes and tackling of complex issues. Furthermore, it displays the key stakeholders for effective decision making process in collaborative environment.

### Business Perspective

One way to describe business processes (Hammer and Champney 1995) is as, “a collection of an activity that take one or more kinds of input and creates an output that is of value to the customer” (p. 35). In question of how the work gets done, business perspective approach helps to identify the flows of steps that translate the inputs to generate the outcomes. Moreover, this approach identifies the procedures to achieve the tasks and manage with the focus on the business activities and objectives. Thus, business perspective approach helps to obtain an overview of the whole process and it displays the information in other activities. Further, it provides about the relationship between organisation and processes.

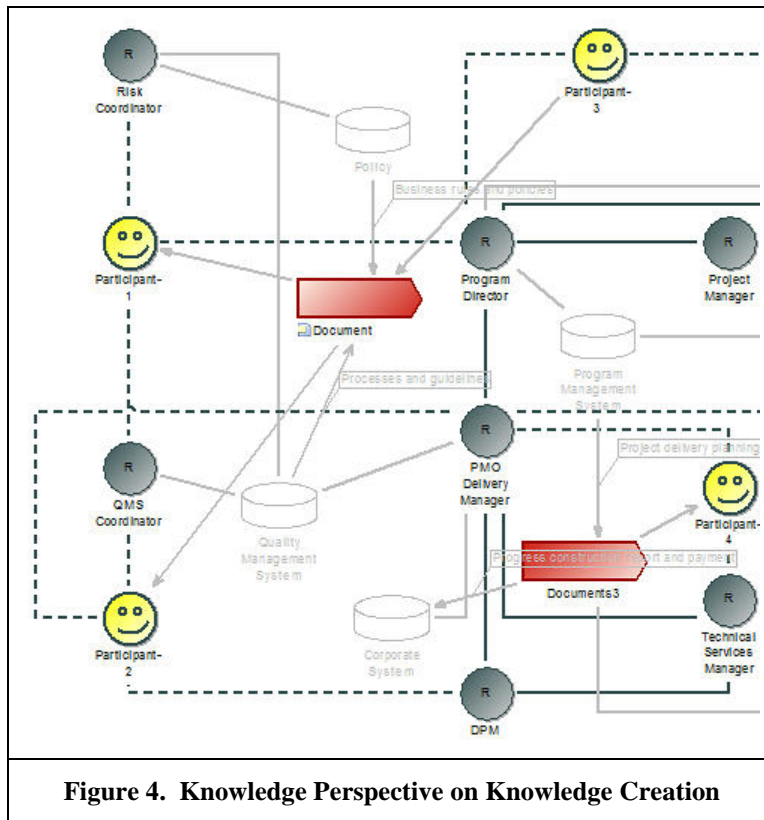


In the second business perspective, Figure 3 illustrates the collaborative business activities to achieve the objectives and goals through meeting and forums. For example, there are regular plan meetings to discuss the progress of the projects for each professional unit between the roles. However, it is limited to display where to find the information organisation needed for effective operations. The researcher showed to participants in the case study that the business perspective can be used for identifying the common goals and for recognising the different business cultures between organisations. As a consequence, the researcher draws particular attention to knowledge perspective to improve the information flow of where information comes from and how to capture the necessary knowledge that organisation need.

### Knowledge Perspective

A new knowledge management paradigm and its support framework (Li et al. 2004), multiple dimensions of perspective approach is suitable for the collaborative knowledge flow in the wicked problem solving process. This support framework (Li et al. 2004) defines knowledge flow as “a process of knowledge objects changing between people or knowledge processing mechanism in organizational memory” (p.

896). Nevertheless, organisational structure and systems are shared by all workers for resources and information within a complex environment. Thus, knowledge perspective approach helps to improve the accessibility, accuracy and illustrates the interaction processes in communities of practice.



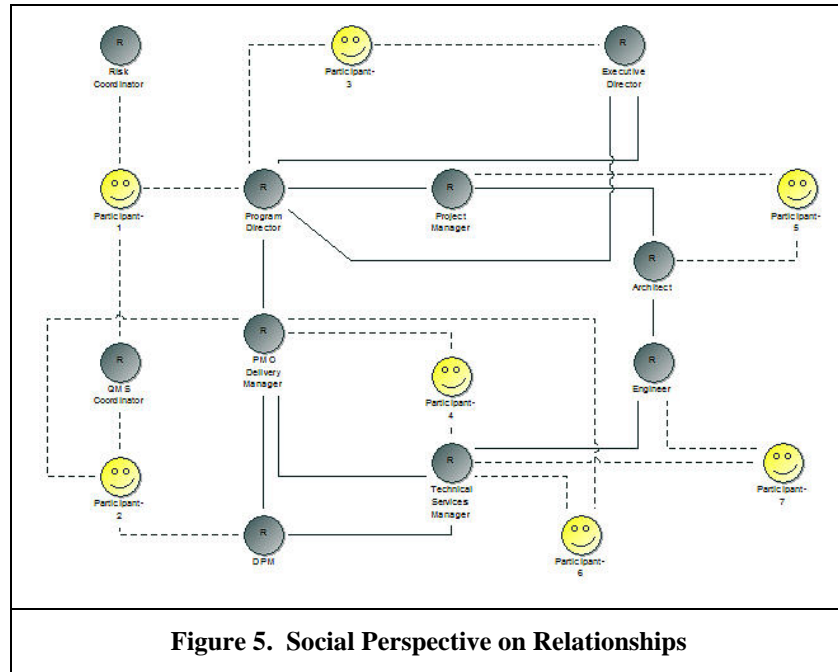
In relation to knowledge perspective, the process in which knowledge is created between the roles and participants is displayed in Figure 4.

While demonstrating the capability of knowledge perspective, participants expressed that this approach would help to identify how knowledge is created and stored in the artefacts for sharing information. For example, a risk coordinator works with participants from other organisations to create knowledge for all stakeholders in collaborative environments. Furthermore, knowledge can be stored in the artefacts to generate the business rules, guidelines and projects management plans for effective operations. The difference between the document and artefact is the primary and secondary source of information for collaboration respectively. Some participants agreed that the form of documents would be created from the collaboration and then it stored into the artefacts for recording and future sharing.

### **Social Perspective**

Recent research study indicates that a paradigm shift towards a social perspective (Pralahad and Krishnan 2008) that the way people interact within a social situation. According to Baum and Ingram (2002), organisational practice is “socially constructed programs of action that embody the knowledge, capabilities, beliefs, values, and memory of the organization and its decision-makers” (2002, p. 11). The social content of interorganisation (Baum and Ingram 2002) structure creates the dimensions of perspective. It intends to provide organisation leaders to plan how the collaboration and social interactions occur between different boundaries of organisation. Examples include trust relationship, and reach of social networking for collaborative work moreover the impact of social aspect on collaborative environment. Thus, this emerging field raises important organisational challenges, but little research has been explored in the integration of other perspectives.

As noted above, it is widely acknowledged that each perspective in its own right but that when integrated them can offset each other's drawback and it also is a part of an emerging perspective in a complex organisation. It is, therefore, important to develop the multiple perspectives framework and see how its performance.



The social perspective, shown in Figure 5 displays the interaction between the different roles. For example, project managers interact with each professional unit to improve the design and procedure of the projects for instance, a project manager faced with the environmental issue of removing a heritage listed tree for building social housing within a given timeframe. As well as the PMO (project management office) the delivery manager consults the technical services manager to allocate professional resources for all projects. It indicates the different roles and collaborators' interactions where the social network will be created and where it can be useful for adapting changes effectively in the unanticipated events. Therefore, the social perspective is important for collaboration and participants agreed that organisations must recognise the formal and informal social behaviors in order to work together effectively.

As noted above, four different perspectives were shown to the participants and discussion regarding the impact of each model was raised. Furthermore, the researcher addressed the importance of integrating the multiple perspectives to display the relationships between the different boundaries of roles for collaboration.

### Multiple Perspective Approach – Putting the perspectives together for a holistic solution

From earlier descriptions we see individual perspective modelling methods which are understood to be theoretically and practically self-dependent but it is not relevant in solving wicked problems in many cases. Nevertheless, the current modelling methods are important to both theoretical and practical terms. A major goal of study is to develop the multiple perspectives framework that would combine all of these individual perspective methods into one integrated model. The proposed framework is a holistic model consisting of organisational, business, knowledge and social perspectives. These were chosen to describe the evolving environment and self-organisation is needed to manage the complex processes within the environment. In brief, this paper outlines a design method that uses a multi perspective framework as a tool for modelling and will help to tackle the wicked problems.



Innovative perspectives rise to identify and capture the different dimensions of emergent structure as below Figure 6. The transformation of the self-organisation (Ferlie 2007) to a new structure thrives on the interaction within and across organisations from various perspectives. It shows that the collaborative infrastructure platform across all organisation and the knowledge flow from one to other perspectives. A multi perspective model displays the relationship between the activities and the roles that change in a dynamic environment (Yoo et al. 2012). Moreover, a multiple perspectives approach will complete the gaps in the integration of different views to understand the complex issues. Some of the previous research (Heylighen 2001; McElroy 2000; Merali 2006; Smith and Humphries 2004) indicated that there is a need for integration of multiple perspectives to understand the complex problems in a rapidly changing environment.

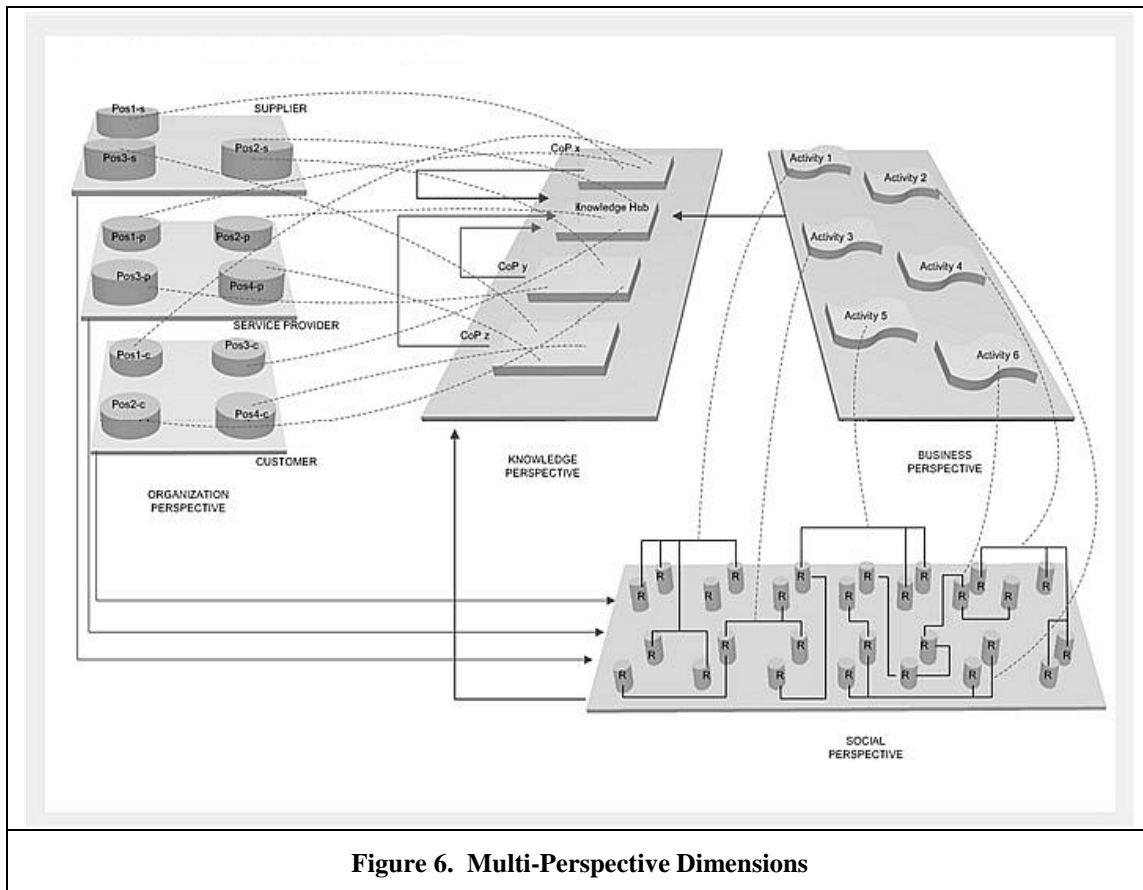


Figure 6. Multi-Perspective Dimensions

Source: (Yoo et al. 2011)

Moreover, current studies indicated that efforts to improve the collaborative process require new solution to complex issues. However, their effectiveness can be limited without some additional tools to improve collaboration between the different dimensions of perspectives from the theoretical to the practical. Thus, a further aspect of dynamic complexity can be evaluated which will support higher levels of adaptability to manage system evolution.

## Results

From the generated categories, the researcher labelled each perspective that connects to the themes. The themes and the invariant constituents responses serve as general conclusions to describe how thirty five participants perceived their knowledge and understanding of complex processes and multiple perspectives approach. The themes were supported therefore the multiple perspective model helps in understanding complexity. Invariant constituents are defined as a word or phrase that share meaning based on the syntax or structure of the words themselves. Hence, invariant constituents during qualitative

analysis are similar groupings of words that are used by various participants (Patton 2002, p. 465). Table 1 shows a listing of words and phrases were combined forming themes and categories. Uncovering the regularities or patterns among categories is a process called thematic analysis (Shank 2006). The researchers' codes from the NVivo revealed the major categories for classifying and coding complex information.

Methods used to manage complex problem Responsibility for activities Quality control Efficiency in problem solving Ease of use	Social perspective Stakeholder participation Effectiveness of information sharing
Organisational perspective Strategic importance Political impact Effectiveness of decision Flexibility to adapt Satisfaction	Multiple perspective Authorisation Common framework Process efficiency Effectiveness of governance
Business perspective Communication Business activities/culture Roles and responsibility	Change adaptation practices Responsiveness Adaptability to changes
Knowledge perspective Improve knowledge flow Decision making process Information relevance Information resources	

### **Theme 1: Organisation Perspective**

Organisational objectives, resources for improvement, and performance, provided evidence for suggesting a general understanding of organisational perspective in controlling changes in the unlikely event of unforeseen circumstances. Organisational objectives were the most cited type of organisational perspective. The groups for the most part represented perceptions and ideas that showed good knowledge of organisational perspective. The researcher asked participants in this study about the importance of the organisational perspective in controlling changes in the unlikely event of unforeseen circumstances. Participant #3 stated, *"I continuously improve process that, what is work and what is not through brainstorming and place right processes to set up and get approval in most effective way. And also consider on evidence basis to analyse benefit of the changes."*

Participant #10 stated, *"In most cases, policy and political decision are the influencing factors. I have to understand new standards and government regulation for building and environmental impact for public housing. It is imperative to understand government policies and procedures."*

Therefore, the general understanding of the causes and tackling of complex issues, an important factor of responsiveness and compliance, impacted on policy changes for decision making process.

### **Theme 2: Business Perspective**

Business activity or plan, and business culture, provided evidence for suggesting a general understanding of the business perspective as an important factor in responding to unforeseen circumstances in a rapidly changing environment. Business activity/plan was the most cited type of business perspective. The groups for the most part represented perceptions and ideas that showed good knowledge of business perspective. Participants mentioned business activity/plan when they described a situation where the rules and guidelines were not clear. Participant #4 stated, *"During the delivery of NBESP projects, I come across*

*that planning requirement and procedures are not clear from the commonwealth government. I have to exercise my best ability to clarify the issues with all stakeholders and develop procedure for implementation.*" Participants mentioned business culture when they described the key drivers for process integration or collaborative structure within the organisation. Participant #5 stated, *"Policy and process changes are key drivers for collaboration and I'm always adapting changes effectively in a rapidly changing environment."*

Thus, participants understanding of both role and culture changes in a rapidly changing environment.

### ***Theme 3: Knowledge Perspective***

Information flow and effectiveness of decision process provided evidence for suggesting a general understanding of the knowledge perspective for unforeseen circumstances. Information flow was the most cited type of business perspective. The groups for the most part represented perceptions and ideas that showed good knowledge of knowledge perspective. 49% of the sample described the importance of information flow such as other experts' knowledge and stated, *"I seek information from project experts and investigate fully on all aspects of programs to manage the projects within deadlines. It is critical for the business. I obtain the knowledge from everywhere, for example, meeting, forums, information system, discussion, social network, workshop, seminars, training etc."*

Two participants described the importance of information flow such as other experts' knowledge and stated, *"I consult with client, peers, special consultant and other experts' knowledge. Especially, I have to make sure all stakeholders to understand status of all projects and place the systemic process to monitor performance, continuously checking and tracking to measure effectiveness of all projects."*

It shows that participants understanding of access information for better knowledge flow and learn how to discover knowledge.

### ***Theme 4: Social Perspective***

Relationship or exchange experience was the most cited type of social perspective. The groups for the most part represented perceptions and ideas that showed good knowledge of social perspective. Some participants were faced with challenges while they were coordinating work with other units and departments, and felt that other units and departments were uncooperative. Participant #7 was faced with challenges when he stated, *"I have noticed that there are different political views and generally speaking, others are uncooperative. I also faced with different challenges in particular issues individual capabilities for collaboration. I consult with senior management to get advice through meeting and report to resolve the issue."*

Participant # 14 was responsible for managing to break down the work into micro levels when he stated, *"I manage to break down the work in micro levels that staffs clearly understand the tasks and project deliverables within in a defined timeframe. I delegate the work and program according to staff's skill set and provide mentoring and motivation."*

It indicated that developing better relationships amongst stakeholders allows identifying experts and sharing information.

### ***Theme 5: Multiple Perspectives***

The common framework, approval workflow and effectiveness of decision process provided evidence for suggesting a general understanding of the multiple perspectives. Common framework was the most cited type of multiple perspectives. The groups for the most part represented perceptions and ideas that showed good knowledge of multiple perspectives. Most participants mentioned that a common framework is important for collaborative environments. Participant #12 stated, *"Multi perspective framework is very important for multiple stakeholders. Organisation must create the common platform for all key stakeholders prior to complex project commences."*

Thus, the common framework platform provides effective and efficient collaboration, to successfully help manages change in complex environment.

### Combining the perspectives

The diagram below displays combined perspectives to help business operating in complex environments to clearly identify the relationships and collaboration taking place across various organisations. It also demonstrates some possible open modelling techniques used in the different perspectives which focus on the boundary roles. These draw on existing methods currently employed in organisations and the researcher's multiple perspectives framework approach facilitates the realisation of modelling goals catering for evolution and self-organisation. In the case study, the researcher focused on the Australian Government's Nation Building Economic Stimulus Plan (NBESP) which involved three government agencies and nine development project management (DPM) firms working together in a complex environment. The model displays the collaboration amongst multiple stakeholders and organisations. In particular, it visualises the characters and the relationship between the boundary roles. Based on the multiple perspectives framework, the open model allows for an easier understanding of organisational complexity and effective identification of knowledge flow where organisations face emergent changes in unanticipated events. The open model design methods focus on processes that support knowledge sharing and creation through collaboration. They identify the social structures and a community that must be supported in such processes and tools needed to support a complex organisation. The case study shows that the use of open model tool allows for successful management of collaborative environments.

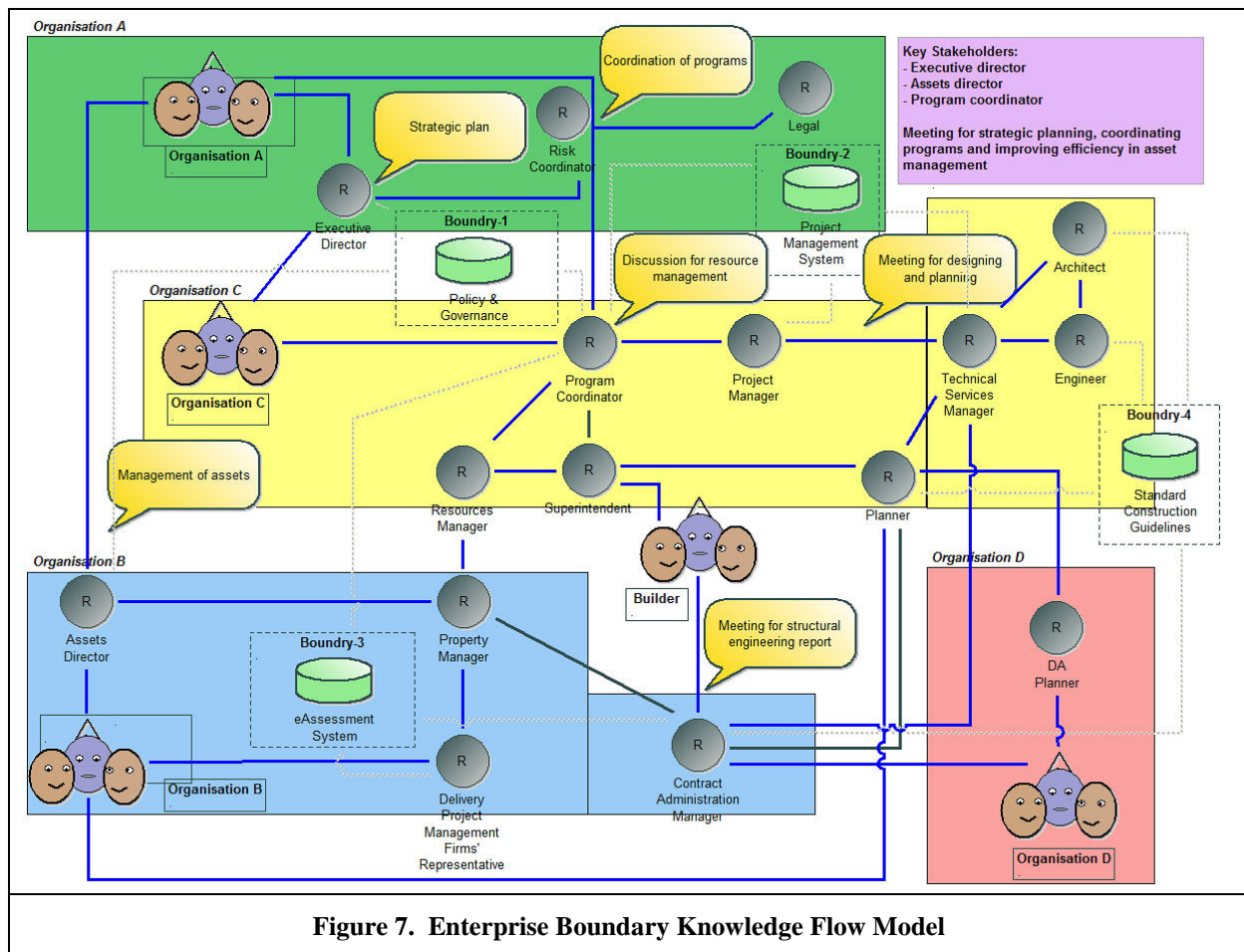


Figure 7. Enterprise Boundary Knowledge Flow Model

Figure 7 illustrates the enterprise model framework using methods for designing large scale collaborative processes (MeLCa). There are three major government agencies with two external organisational boundaries comprising the local government and contract builder. These three anonymous government

bodies which deal with social housing mentioned in the diagram above are namely; organisation A, B and C. The model above also reveals the boundary roles that exist between the organisations. Boundary roles refer to the positions held by individuals which encourage direct interaction for collaboration. The open model clearly demonstrates the distinct relationships between the stakeholders and artefacts they share in order to acquire information. In particular, Figure 7 highlights the detailed activities undertaken by key stakeholders such as creating and sharing knowledge in order to achieve common objectives. Moreover, the open model allows organisations to identify any role changes which may arise within a collaborative environment.

Figure 7 may be difficult to interpret visually and whilst it is complex to a certain extent to identify the individual relationship across stakeholders working in collaborative environments. Alternatively, the researcher explored and demonstrated in the case study, single perspectives to simplify the holistic model of multiple perspective approach.

## **Discussion**

A significant work in this research was completed by visualising a complete diagram of complex environment and the relationships across multiple stakeholders. As the design thinking was in the introduction, make a coherent flow to describe how the visualising a complex environment relates to “Design Thinking”. In order to acquire an understanding of the effectiveness of organisation’s complex projects, a multi-perspectives model was used to help visualise the problems into solutions. This information may enable them to simplify decision processes to coordinate their projects and better meet the needs of partnership alliance. Collaborative knowledge flow is consequently created through a multi perspective approach. Furthermore, the case study confirmed that the integration of multiple perspectives helps to complete the gap in the recent research (Alman 2003; Ferlie 2007; McElroy 2000) literature review.

We found that a multiple perspectives framework improved the ability to manage change in complex organisation. For example, common framework for collaboration, this finding correlates with findings of the above studies that multiple perspectives significantly affected on the ability to manage change in complex organisation. However, some researchers have raised questions about the causal ordering of changes in circumstances and knowledge flow in organisations.

In the present study, the model based on a multi perspective approach helped to identified knowledge for unforeseen circumstances. For example, managers showed clear illustration of information flow and effectiveness of decision making process. This finding correlates with findings of the above studies that the multi perspectives approach helps identify knowledge flow for unforeseen circumstances. However, there appears to be little evidence on the importance of the integration of multiple perspectives to tackle wicked problems.

The case study results show that the organisation responded to unanticipated events needed for better knowledge flow to adapt changes rapidly in collaborative environments. Moreover, organisation perspective had an impact and was crucial to enhancing the quality of decision-making. For example, managers mentioned that clear organisational objectives, improvement of resource management and strategic direction are needed to deliver effective decision-making in unforeseen circumstances. However, changes in complex organisation appear to be a significant factor to consider when given its relationship with knowledge flow in collaborative situations as indicated in the present study. Thus, additional research to further clarify the relationship between changes in organisational situation and knowledge flow in organisations is warranted.

Individual perspective works from four different dimensions with each assisted by varying modelling techniques as outlined earlier but it is difficult to visualise the problem in solving wicked problems in a collaborative environment. Therefore, it is important to develop the multiple perspectives model in order for it to work across complex organisational boundaries. In this research, the model based on a multi perspective approach helped to create knowledge in an unanticipated event. For example, managers showed clear illustration of information flow and effectiveness of decision-making processes. These findings correlate with studies carried out by researchers (Cil et al. 2005; Courtney 2001; Hall and Davis 2007) that the multi perspectives approach helps to create knowledge flow in collaborative organisation.

However, there appears to be little evidence on the importance of the integration of multiple perspectives to tackle wicked problems.

## **Conclusion and future study**

The study confirmed that multi-perspective model verification and efforts to improve the collaborative process required innovative solutions to complex issues. Moreover, this study offered the experiences and perspectives of the users to develop a collaborative common framework in order to have an understanding of the effectiveness of their complex projects. This information may enable them to simplify decision processes to coordinate their projects and better meet the needs of partnership alliance for sustainable communities. The case study showed that the integration of multiple perspectives helps to complete the gap in the literature review. The proposed multiple perspectives model comprises of four constructs:

- (1) organisation perspective: impacting on and crucial to enhancing the quality of decision-making process;
- (2) business perspective: important in the model to change adaptation practice;
- (3) knowledge perspective: influencing the management of knowledge flow;
- (4) social perspective - which was used for collaboration and the display of social exchange.

It was widely acknowledged that each perspective in its own right when integrated can offset each other's drawback. Nevertheless, managing a complex collaborative organisation's knowledge flow depends on having a common framework. A proposed multiple perspectives model can be used in various ways for collaboration across the organisation to deliver effective decision-making.

Furthermore, this study outlines the management of self-organisation and the analysis of knowledge flows, which pose a serious challenge to the public sector. The proposed framework characterised an unstructured knowledge flow for effective management of collaborative interactions between stakeholders. The model enabled organisations to respond to a rapidly changing environment. In addition, it helped to manage system evolution and will have a significant impact in the public sector. These outcomes substantially contribute to a deeper insight into research on social perspective and the modelling of multiple-perspective methods. Significant findings on the effectiveness of the emergent structure for improving organisational collaboration were made. The empirical findings in this study presented a new understanding of the model's ability to manage system evolution and provided a practical approach for integrating multi-perspective views.

However, their effectiveness may be limited in the absence of some additional tools to improve collaboration between the different dimensions of perspectives, from the theoretical to the practical. The result of the model verification process is therefore changeable. Other findings showed that future study should focus on economic perspectives for the business side and explored more aspects of other perspectives.

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