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KNOWLEDGE SHARING THROUGH VIRTUAL LAYERS IN REGIONAL SUSTAINABLE DEVELOPMENT NETWORKS

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Abstract

Our research examines how the organisational structure facilitates knowledge sharing within the group. This case study examines a Victorian regional sustainable group using interviews and social network analysis to identify the group's organisational structure and its effect on knowledge sharing between the members. Our findings indicate that while the mixed membership, lack of hierarchy and layered structure are complex, these elements work together to provide members with a rich body of knowledge. The diversity and differences in membership are complimentary and combined can provide a more in-depth understanding of the regional sustainable development issues.

Keywords: inter-organisational, knowledge sharing, sustainable development, regional.

1 INTRODUCTION

Regional sustainable development groups, while not a new concept, have become more prevalent in recent years due to the growing concerns with regards to climate change, global warming and the depletion of natural resources. Inter-organisational sustainable development groups in a region bring a local focus to the issues with local knowledge and expertise. They can cross the boundaries between business and government offering opportunities for collaboration on projects, foster the sharing of knowledge and broaden the understanding and views of those organisations involved (von Malmborg 2003).

However, this joint collaboration at the regional level also brings about a number of difficulties in establishing co-operation. With some of these groups, there is no commercial imperative driving and motivating collaboration and knowledge sharing. Additionally, the groups include mixed membership between multiple government, business and educational organisations with potentially differing agendas. Knowledge amongst members is fragmented and dispersed but can flow between members through virtual layers in the sense of "being in effect" though "not formally recognised". These issues all have impact on how knowledge is shared within the group.

In this paper we are specifically interested in how group structure facilitates knowledge sharing within the group. Utilising interviews, observations and knowledge networks, we examine the structure of the group; how knowledge is shared between members at the group level; what informal networks have formed between members and how does the knowledge sharing in the informal network compare to that communicated at the group level.

The research is based on a number of premises. Our first is that the knowledge related to particular circumstances never exists in concentrated or integrated form, is dispersed, incomplete and contradictory, and possessed by separate individuals (Hayek, 1945). The second premise is drawn from the first one, and deals with the organisational problem of how to effectively utilise widely dispersed knowledge in any given context (Tsoukas 1996). The third premise is that network governance structures play an important role in knowledge creation, sharing and utilisation (Hedlund 1994; Kautz & Kjaergaard 2007; Manring et al. 2003). This study contributes to bridging the research gap that is apparent between the human system and the technological system in organisational information systems (Iandoli & Zollo 2007). The paper adds insights to the understanding of knowledge as a process in IS research, as opposed to knowledge as an object in IT research.

The paper is organised as follows: the next two sections discuss the nature of sustainable development in regional settings and knowledge sharing in inter-organisational groups. Research methods underpinning the study are then discussed followed by a description of the case study of the regional inter-organisational group. Lastly, we present the findings, conclusions and suggestions for further work.

2 SUSTAINABLE DEVELOPMENT IN A REGIONAL SETTING

A regional perspective is very important for sustainable development. Individuals, organisations and communities may independently appreciate and practice values of sustainable development. However, real substantial outcomes can be achieved only when all those efforts are coordinated and based on a shared vision of the region as integral natural ecosystem and human built environment. Successful triple bottom line approach where economic success for business enterprises can be created by meeting environmental and social objectives (Manring & Moore 2006) largely depends on creating and managing effective collaborative partnerships among the stakeholders, their commitment to a shared vision, and a deliberate effort to build a broad-based, long-term support among constituency (Manring et al. 2003).

Multiple aims are common to many sustainable development initiatives. Van Der Meer et al. (2009) found that sustainable development projects often covered more than one goal, including raw material reduction, energy, water or fuel reduction, process efficiency, waste management, recycling, substitution of materials used for greener options, pollution control or social improvements. Moreover, regional sustainable development is complex in nature, and often includes large numbers of closely intertwined projects.

The result of these issues has been the development of inter-organisational groups that combine the resources and knowledge of both government and business organisations within a region. These groups can determine and apply sustainable development solutions that meet regional needs.

The extant literature describes different inter-organisational management (governance) structures, adopted by these groups. von Malmborg (2003) identifies three key organisational structures of the sustainable development partnerships examined in Europe based on the inter-firm classifications developed by Grandori and Soda (1995):

- Corporate environmental management where local authorities and SMEs have developed a combined bureaucratic and joint venture to develop and implement environmental management systems in the participating organisations. This method utilises a joint venture agreement to develop a specific tool for sustainable development between the government and SME participants.
- Sustainable business development where there is a joint venture between several companies and the local authority to develop a new and ongoing business enterprise such as can be found in some eco-tourism ventures. Again, in this model a formal joint venture agreement is established between government and SMEs but in contrast to the first structure, it is to create an ongoing business enterprise where all members achieve some benefit.
- Community development aimed at the sustainable growth of the entire local and/or regional community. In this partnership, SME's have less participation in the development of the programmes and are utilised in terms of a 'putting-out' (ie. provides a service or support but generally does not make any decisions) network. There is no formalised joint venture defining participation. However, the role of local SMEs is at a reduced level of participation, merely providing services identified rather than having equal input into the project.

A fourth organisational structure, called an inter-organisational network (ION) proved to be effective for managing large scale inter-organisational sustainable development projects in a number of regions of the U.S.A. (Manring et al. 2003; Manring & Moore 2006; Manring & Pearsall 2006). An ION acts as a network of affiliates rather than a supply chain network, with shifting roles, relaxed organisational boundaries and more democratic power structures. Some characteristics of the ION structure that are relevant for our research include:

- Shifting structures in an ad hoc alliance where members collaborate on projects based on their skill and expertise (Manring & Moore 2006).
- There is no one leader. Different members take the leadership role of the group dependent on their expertise and the opportunities being undertaken (Manring & Pearsall 2006)
- Virtual multi-layered interaction where the top level involves full group participation. The middle level involves the formation of sub-groups between particular members in response to needs and opportunities. These sub-groups only last as long as the purpose they serve. Some sub-groups exist on an on-going basis while others may form, disband and reform again when needed. (Manring & Pearsall 2006). The lowest level involves informal linkages between individual members of the group. The connections develop between members as they attempt to understand and clarify particular issues or to develop strategies for negotiation at the group level (Manring & Pearsall 2006).

3 KNOWLEDGE SHARING IN AN INTER-ORGANISATIONAL CONTEXT

The literature on inter-organisational knowledge sharing has focused predominantly on business collaboration. The key inter-organisational management structures that have been examined include joint ventures (Gravier et al. 2008; Heiman & Nickerson 2002; Levy et al. 2003; Lawson et al. 2009; Wagner & Buko 2005) or dyadic relationships where one member is in a subordinate role to the other (Emden et al. 2006; Mowery et al. 1996; Schildt et al. 2006). When formal relationships are the basis for inter-organisational knowledge sharing, the legal binding assists in defining and controlling the knowledge sharing that occurs. In an inter-organisational alliance between corporations, defined boundaries through equity governance structures allow the member organisations to collaborate and share while reducing the risk of diffusing capabilities (Mowery et al. 1996).

Inter-governmental knowledge sharing literature examines ventures where there is not always a contractual obligation but a formal alliance of some form does exist usually because of grant funding requirements (Austin 2000; Cordero-Guzman 2004; Hartley & Bennington 2006; Provan & Milwar 1995; Zhang et al. 2005). Inter-governmental knowledge sharing is more open than that found in corporate alliances as there are no market concerns about loss of competitive advantage. However, these collaborations often do need to deal with a broader range of stakeholders contributing to the knowledge sharing process and must consider the power relations and political aspects (Hartley & Bennington 2006).

Our interest is primarily on knowledge sharing in public-private collaborations where there is a sustainable development focus. Research into public-private environmental collaboration indicates that the inter-organisational network plays an important role in facilitating knowledge sharing between participants. Examples of some of the public-private collaborations formed include the Roanoke River ecosystem (Manring & Pearsall 2006); the development and management of fish resources in North-East Brazil (Costa-Neto 2000); North Carolina textile-processing industry (Manring & Moore 2006); regional collaboration in Sweden (von Malmborg 2003) and Monroe County collaboration (Manring et al. 2003).

There are a number of distinctive features by sharing knowledge within public-private inter-organisational collaborations. It allows members to explore different ways of thinking about the environmental issues they confront (Manring et al. 2003). This is in contrast to the boundaries and constraints the individuals face within their own organisations such as business interests and budgetary responsibilities (Manring et al. 2003; Manring & Moore 2006). Members can then consider the merits of these new ideas at their organisations.

Additionally, members are able to embrace the bigger picture of the region, rather than just their individual organisations. By being able to examine the complexities of the regional impacts and the options available, the inter-organisational group are able to make decisions that included informed social and environmental considerations while maintaining economic improvement. A good example of this occurred in the Monroe 2020 project, where a problem with scenery-obscuring billboards was overcome through a combined examination across the whole of the region that allowed for continued signage without obscuring the scenery along highways (Manring et al. 2003).

Paquette and Wiseman (2006) also highlight public-private network collaboration as an opportunity for wider access to knowledge and ideas from sources that are beyond the participating individual organisations boundaries. The collaboration of these IONs or public-private partnerships can lead to the development of network learning that can result in new actionable sustainable development knowledge for the whole network as found by Halme (2001) when investigating European tourism networks.

Manring and Pearsall (2006) make reference to the multilevel nature of interaction between the members of the inter-organisational network. However, there is very little discussion in the literature

on the differences in the knowledge shared at these different levels. Manring and Moore (2006) describe the example of knowledge sharing in such a multilayered network in the case of a textile industry sustainable development ION. The network layer was 'bubbling' with small groups, clusters and coalitions focusing on their specialist aspects of the overall toxicity problem. These sub-groups, or bubbles of concentrated knowledge sharing, formed the middle layer of the network. These sub-groups "*knew little about the intricacies of each other's operations and did not trust each other*" (p894). However, being part of the whole virtual network layer, they were able to make connections to the needed information sources, and retain those sources and the links as long as needed. Another good example of how multiple layers have different roles and inform each other is given in a study on informal network negotiations between biotech firms. Tang (2008) found that executives regard informal knowledge transfer as the key to determining which organisations to develop formal contractual agreements with.

4 RESEARCH DESIGN

This research is a case study based on an environmental inter-organisational group. The research question at the core of this study is how the group's structure facilitates knowledge sharing within the group and beyond? In resolving this question, we identified several points requiring investigation: what is the management structure of the group; how is the knowledge communicated between members at the group level; what informal networks are developed between members and how does knowledge sharing work at this level?

Data was collected through interviews and direct observations. The combination of methods provided us with the ability to check for consistency in the data collected. To ensure reliability of data collection, interviews were held independently and field observations were carried out by an independent researcher. Additionally field observations were used together with the data provided through the individual interviews to ensure construct validity and internal validity (Yin 2009).

The interviews included a small, preliminary questionnaire containing closed questions to collect demographic and network data.

The purpose of the preliminary questionnaire was to collect data on who the members of the group feel are the experts on specific types of knowledge and who they talk to outside of the group. The questions utilised were adapted from research by Giuliani (2005) who used social network analysis to examine cluster knowledge networks in the Italian and Chilean wine production industries. Similar to Guiliani's research, we wanted to examine who among the group are the most knowledgeable in different areas. The only changes to Giuliani's questions where to suit our sustainable development context and knowledge areas. This would then allow us to develop a knowledge map on specific knowledge areas dealt with in the group. From an initial analysis of group meeting agendas four knowledge areas were identified: group operation matters; regional and sustainable development policies; practical applications leading to regional sustainable development; and funding related matters. The knowledge map is developed by asking questions such as:

> *Which members of the group have the **most knowledge** about issues of sustainable development **policy**?*
>
> *Which members of the group have the **most knowledge** about sustainable development **practical applications**?*

These questions aid in establishing the network of contacts members have developed with each other for informal sharing of knowledge on the main issues that they are dealing with in sustainable development.

To improve accuracy of responses in the questionnaire, we utilised a free choice approach to the questions, allowing participants to name as many or as few as they wished (Wasserman & Faust 1994). We also chose a rostered recall approach rather than free recall in the listing of names in the

group (Wasserman & Faust 1994). Participants were provided with a list of the group member's names to aid as a prompt to who was part of the group. As the case study has membership changes and not all members can attend every meeting, provision of a roster of names aided participants in naming the members they felt best suited to each question.

The actual interview utilised semi-structured, focused, questions to allow us to talk to individual members about the group and who they communicate with. The interview questions were adapted from Tang (2008) on knowledge sharing in inter-organisational collaborations in the biotech industry. Tang's questions looked at why members of the inter-organisational group would participate in knowledge sharing and what they received from that participation. These questions resonated with our research to understand why members would participate in inter-organisational sustainable development knowledge sharing, particularly industry member's that risk loss of competitive advantage through participation. We adapted Tang's questions on why member's would collaborate and what they would discuss, adjusting them for our sustainable development context. The questions included:

> *What benefits does your organisation receive through membership with this group?*
>
> *What does the group **discuss** or collaborate on and can you give examples?*
>
> *For those you indicate have the most knowledge about sustainable development practical applications, what types of knowledge do you communicate to them, or they communicate to you?*

These questions allow us to see why an organisation has agreed to be a part of this knowledge sharing group as well as what the group actually discusses. Additionally we examined whether the participant communicated specifically on certain types of knowledge and whether that was done inside or outside group events.

The first interviews were utilised as a pilot. Responses were compared and examined against the field observations for reliability. Based on this examination, minor amendments were made to the instrument to ensure any identified gaps in the data collection were addressed.

To examine the group interactions in real time in a setting that the members of the group are both familiar with and as a part of the normal operations we also utilised direct observation (Yin 2009). Observing the group allowed us to acquire knowledge on the patterns of social interaction in their natural environment (Henn et al. 2009). Specifically we were able to observe how the group communicates as a whole, the group structure, what knowledge was being shared and how the members interact. Through observation of the group meetings, we are able to build an understanding of the types of issues discussed within the group, the interactions between members and the projects undertaken. Additionally, direct observation can give a different perspective to what the participants themselves think may be happening. Observation also allowed us to develop a connection with members of the group and to build familiarity and trust that aid in carrying out the interviews.

Data analysis involved social network analysis complimented by analysis of interview data. The main purpose of social network analysis is to examine the relationships between actors (Wasserman & Faust 1994). One aspect of social network analysis is its use in determining the relational ties between actors as channels for transfer or 'flow' of resources, in this case the resource is knowledge. The questions specifically address the issue of who each member considers to be the most knowledgeable with regards to the specific knowledge type. Data collected was directional, indicating who members talk to rather than the assumption of reciprocal communication. Due to the early stage of the study, social network analysis was limited to the development of network maps and division of the network by knowledge type. This allowed us to visualise the individual networks developed within the group, identify recognised experts in particular knowledge types and identify the complementary nature of individual networks.

Interviews were used to complement the social network analysis with rich data about knowledge sharing. The interview instrument allowed us to do three things:

- Build up an understanding of why members seek out specific group members for discussion and sharing knowledge.
- Develop an understanding of how the group members share knowledge at the group and informal network levels.
- We also developed insight into the group structure and how it has evolved over time.

Microanalysis was applied to interview data in order to identify major themes, issues and concepts that shape knowledge sharing activities and relationships within the group (Strauss and Corbin 1998).

As interview data can be individualistic and focused on the individual participant, the responses from the participants can be limited somewhat to their recall and their priorities (Kvale & Brinkmann 2009). To minimise the errors and biases in the study (Yin 2009) and to counter the possibility of not getting a full understanding of the issues discussed, we utilised group observation. Additionally data from individual interviews was cross-checked to verify the roles of key experts in the knowledge networks. Field notes from observations were analysed to develop an understanding of synergies within the group and the member's interactions. We also utilised observational data to validate our findings from the interviews and social network analysis.

5 CASE STUDY BACKGROUND

Our case study focuses on an environmental group established as a sub-group of a regional alliance between five municipal councils and a number of independent organisations in regional Victoria in 2002. Based on documents provided by the group Chairman, the purpose of the alliance is:

- To develop a platform for the region to be able to communicate with all levels of government using one voice.
- Facilitate multi-agency collaboration and sharing of information and resources.
- To promote cross-border collaboration between the municipalities with a focus on 'big picture' regional issues.

The environmental sub-group is one of several sub-groups formed through the regional alliance with focus on particular aspects of concern within the region. These sub-groups included focus on regional economy, transport, health and wellbeing, and the environment.

The environmental group has approximately 30 members at this time. The membership includes representatives from the council and council officers of each municipality and members from state government departments and agencies that have a focus on sustainable development including such organisations as the Department of Primary Industries, the Environmental Protection Agency and Sustainability Victoria. Additionally there are several members from industries within the region and private citizens with experience in the field of sustainable development.

The purpose of the environmental group is to "provide a forum for participating interest groups to discuss important regional environmental issues with a view to developing strategies and project plans to address them". The group runs according to an established 'terms of reference' which includes:

- Share information on current and planned programs so that synergies between them can be identified and promote collaborative approaches.
- Facilitate a common position on important regional environmental issues.
- Support the creation of working groups to provide specific advice, deliver projects and undertake targeted activities.

Undertakings developed by the environmental group are presented to the Board of Directors by the environmental group's Chairman and the alliance CEO. These projects are then voted on by Board members to determine if they should be allocated a status of 'priority project'. Priority projects are then promoted by the Board of Directors to the State and Federal governments for future funding allocations.

The group was selected as the case study as it fits the differing issues identified in the literature as being facets of regional inter-organisational sustainable development groups, including the mixed membership of government and enterprise and the large scale regional sustainable development focus. A number of aspects of the group have also aided our interest in studying their structure. That the group operates only according to a terms of reference and has no formal alliance to define the knowledge sharing between members. Additionally, the group has an active informal network which certainly has implications on how knowledge is shared within the group.

6 EXAMINATION OF AN INTER-ORGANISATIONAL NETWORK ON REGIONAL SUSTAINABLE DEVELOPMENT

Over a period of six months we have observed the group's operational meetings. We have also completed seven interviews including interviewing key members such as the group Chairman and the alliance CEO. Other participants have included a council officer from one of the municipal councils, three government department officers and a member from one of the participating SMEs'.

6.1 Organisational Structure

As noted in the outline of the case study, the group has no formal hierarchical structure but instead operates based on a 'terms of reference'. Members participate as and when they can but there is no obligation to attend or join in discussions at each meeting.

Secondly, the group is focused on the region and the sustainable development issues that affect it. Projects undertaken and decision making are focused on regional issues. For example, one project was the development of a new 2050 scenario for the region. The original scenario was produced in 2006 and as one member described it, "*climate change was not as high on the agenda as what it is now*." The new scenario now takes in not just the economic and social vision of the region but also a more sustainable vision.

The group has a mixed membership that includes elected municipal councillors, council officers, government department personnel, education institution and SME organisation representatives. The mixed membership also alters over time with new representative's joining the group as previous representative's move on to other positions. For some organisations, time constraints mean that attendance at group events is rotated through several personnel.

The group has a multilayered structure operating across several virtual layers that aid the operations. The top layer in effect consists of the entire group and their involvement at the group meetings. At the lowest virtual layer is the informal network that has developed between members aided by the interactions of the members at the top, group layer. A recent addition (in the last 18 months) to the group's organisational structure has been the creation of a middle virtual layer consisting of working groups that involves members collaborating on specific projects. Participation in these middle layer projects is based on the individual member's skills and interest and also their availability. Development of these projects is based on the decisions made at the top group layer and participation is aided by the knowledge of each member's skills and knowledge developed through the interactions at the lower level informal network. Originally two working groups were established but in a recent group meeting it was decided to form another four working groups for identified projects.

The recent inclusion of a collaborative middle layer demonstrates the developing maturity of the group over time. One member in describing their evolution in recent times, said that they had moved from

"*…discussing planning, through to planning to actually now starting to apply for funding to implement what they've planned*."

6.2 Knowledge Sharing

As mentioned, the group has a very diverse membership involving personnel from several different types of organisations. The group has evolved over time to include not just personnel from governmental organisations but also to include personnel from businesses within the region. However, that evolving membership in conjunction with the virtual layers of operation within the group has provided new members with an interesting dichotomy. New members joining the group have a steep learning curve at the group level to develop the same shared understanding as long term members of the regional issues. At the same time, their involvement at the group level accelerates their development of their own networks at the informal network layer of the group. One member described this opportunity as, "*Without the (group)…it would've taken five years for me to get around all those agencies probably and make those contacts*." and "*Being able to attend the (group) meetings within months, you've got a good understanding of who's who and what agencies operate within the region*".

Our observations also found that through the mixed membership, the level of knowledge each member has on sustainable development and knowledge of the region differs depending on the type of position they hold. Their background education and experiences are also very different. For example, elected council representatives generally do not have much experience in sustainable development, but members from government organisations such as the Department of Primary Industries do have education and experience in the field.

Nevertheless, we did find that the differing levels of knowledge can provide a positive aspect to the group. When examining the knowledge networks developed between two key members of the group, the Chairman and the alliance CEO, we found through the interviews, that their differing views on the other members knowledge actually provided them with complimentary knowledge that when combined gave a much more in-depth and complete picture of the regional situation than at first appeared through our observations.

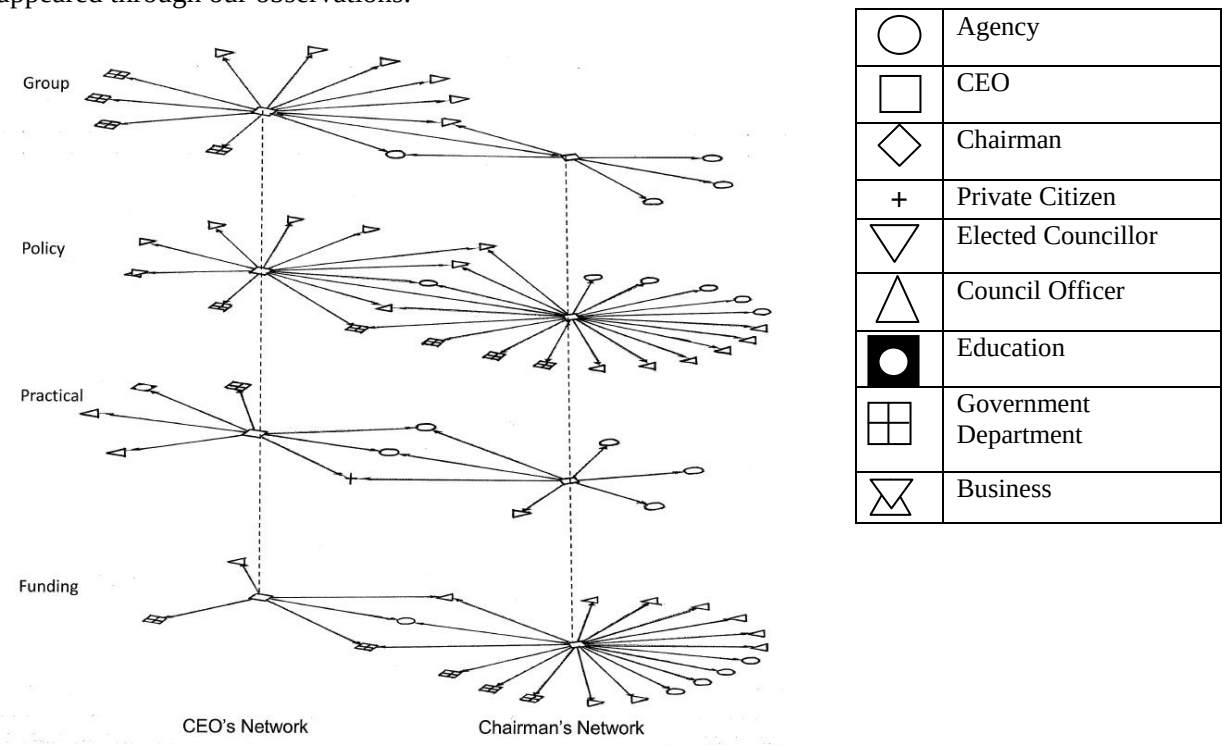

Figure 1 *Knowledge networks for the CEO and Chairman participants based on the types of knowledge discussed in the group.*

The CEO, represented by the square in Figure 1, views the council members and members from the government departments as the most knowledgeable when it comes to group knowledge or sustainable development policy though she has a much smaller knowledge network developed for practical sustainable development or funding discussion. However, the Chairman, represented by the diamond in Figure 1, views the council officers, agency and government department members as those holding the most knowledge with only a few councillors, represented by the down pointing triangle, as part of his network.

When explaining her role, the CEO indicated that her focus is on the council members. As they are the primary partners of the regional initiative and thus the environmental pillar she needs to know their position in order to *"…get their buy in"*. With both the council and government departments she indicates that she needs to understand their imperatives in order to ensure success of the chosen projects, *"Because it's no use putting up something…that's at odds with what the council's doing…And same with the government departments. …You need to know what the government's agenda is so you can cast your submission"*. Her increased engagement with the municipal councillors and government department representatives is due to her role as the initiatives CEO.

The Chairman's view contrasts this in that he engages more with the council officers, agency and government department members. His reasoning is that *"They're professionals, they have professional qualifications in the area and it's their duty to be informed and knowledgeable."* When asked why he doesn't view the municipal councillors in the same way or regard them as a knowledge source, he stated *"Councillors are a very diverse group of people, generally lacking professional qualifications in the areas"*.

However, while having very different views on who are the knowledge sources within the group, the different roles of the CEO and Chairman these views actually provide complimentary support to their positions than is indicated by the knowledge networks shown in Figure 1. The CEO's role is to aid and support in presenting projects for consideration by the Board of Director's while the Chairman does the actual presentation. Her knowledge of the council views aids in what and how to present the project while his knowledge of the actual project is necessary to outline and explain the purpose and goals of the project to those with less knowledge of sustainable development issues, *"…at some stage they'll want to present these projects…and it's no use if I can't articulate what the goal of the (group) is. I know (the Chairman) would be leading any presentation, but I want to be able to support him as the Chair. It's important that I'm there as a CEO to do that."*

The virtual layers in the structure of the group have also facilitated knowledge sharing. At the top, group layer, the meetings are based on agenda items proposed before the group meeting. This has resulted in the group meetings providing a high-level information exchange but does provide members with the ability to build a more complete picture of the regional issues. For example, "*…it's not like I'm learning a lot of things from scratch but there might be just little bits of information that come up that just further develop your understanding of a topic you already know quite a bit about*". The interactions at the group layer also help to establish and develop the networking at the lower, informal layer. One member described this opportunity as, "*Without the (group)…it would've taken five years for me to get around all those agencies probably and make those contacts*." and "*Being able to attend the (group) meetings within months, you've got a good understanding of who's who and what agencies operate within the region*". The interaction at the group level also triggers the development of the middle layer projects. For example, the group understanding on the importance of sustainable development within the region has led to the development of the 2050 scenario project that was carried out at the middle layer. Members can "*…learn through the (group) that a project is occurring, where we can get together to discuss those projects in more detail*."

At the informal network layer, the knowledge sharing here is more specific to the member's job roles and work places but it also occurs more spontaneously than is available at the group level. Through interviews, members described the informal network knowledge sharing as "*…spontaneous…getting information that you're unaware of that can help you to do better work*" and as an opportunity to ask

"*…nitty-gritty type questions*". The knowledge learned at the informal layer in time is added to the knowledge established at the group layer helping to develop and direct the group understanding of sustainable development issues and the regional impact such as occurred with the development of the 2050 scenario project Additionally, knowledge from the informal layer can aid in directing the outcomes of projects at the middle layer to ensure regional acceptance. In the development of the 2050 scenario, knowledge obtained through the informal network layer allowed for a scenario that met the sustainable development needs of the region and the political requirements of the municipal councils. "*If we came up with a scenario that any of the municipalities objected to, it would never see the light of day*."

The development of a middle virtual layer for collaboration on specific projects has meant that members involved can exchange more in-depth knowledge. It enables "*…smaller groups to perhaps get, and have that creativity, innovation, conversation*" that is not possible at the larger group layer. Knowledge at the middle layer through working group projects can also filter up to the group layer or down to the informal layer. At the group meetings, members are brought up-to-date on the knowledge developed in a working group project, as described by one member"*…it will enable thinking to come back to the broader group*." Members involved in a working group project may also utilise their lower layer, informal networks to gather specific knowledge or to test responses to decisions made in the working group as described with the 2050 scenario project.

7 CONCLUSIONS

In our examination of a regional inter-organisational network on sustainability in regional Victoria, we have found that the group involves a mixed membership that has dispersed knowledge. As highlighted, the differing members based on their work roles provide a membership that has very different levels of education and background experience. The group structure follows closely that of an ION (Manring et al. 2003; Manring & Moore 2006; and Manring and Pearsall 2006) with the exception of the shifting structures outlined in section 2. Our initial observations have not found any evidence of this occurring so far.

Our findings on knowledge sharing amongst the sustainable development group support the extant literature in terms of members being able to embrace the bigger picture of the region (Manring et al. 2003) and wider access to knowledge (Paquette & Wiseman 2006). Our contribution, however, is in identifying how this diversification of members and knowledge allows for the combining of knowledge that creates a much richer understanding of the regional impact of sustainable development. It also allows for the complimentary development of presentations of the group activities that provide the sustainable development necessities with the understanding of the political agendas of the municipal councils within the region.

We have also found that knowledge sharing happens at all three virtual layers (Manring & Pearsall 2006) and that knowledge shared between individual members and at each layer of the network inform each other and support each other's activities. The absence of any formal hierarchical obligations has not been a deterrent to knowledge sharing with members actively sharing knowledge through the virtual layers of the inter-organisational group. Our contribution is to show that the knowledge shared at each virtual layer filters through the other layers, informing and directing the discussions and decisions made at each layer.

This is an early stage in a larger research project and as such has only focused on one case study. Future research requires more analysis of the data and comparative analysis with subsequent cases. Additionally we aim to include further use of social network analysis when data collection has been completed.

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