ATHABASCA UNIVERSITY

IDENTIFYING VALUE IN SOCIAL NETWORKING WHEN APPLIED TO COLLABORATIVE DEVELOPMENT OF INTELLECTUAL CAPITAL

BY

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DEDICATION

To my parents, without whose support I could not have embarked on this journey. To my wife who helped me untangle the spiderweb of thoughts to create this work and finally to my children Adara, Liesel and Elena who help give me strength and focus on this journey.

ABSTRACT

Social networking systems are best known for connecting individuals allowing them to maintain relationships when synchronous communication is not practical. There appears considerable academic and industry interest in the practicality of expanding social networking systems into the area of collaboration and knowledge management and the creation of intellectual capital. One challenge to effectively accomplishing this is to gain a better understanding of who is being served by the social networking system as well as how they value the network. This work focuses on defining an approach the supports the describing the stakeholders of the social network as well as exploring both monetary and non-monetary value. This work is focused primarily on social networks for collaboration, knowledge management and the development of intellectual capital.

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CHAPTER I

INTRODUCTION

Social Networking Systems (SNS) represent a growing domain of technologically simple applications that are worth billions of dollars and impact millions of people. The increased application of social networking systems in private life has increased the interest of academic and business communities in SNS and suggests that these systems can also be used for collaborative development of intellectual capital. To be effective at building social networking systems it is necessary to have an understanding of the types of individuals and groups, sometimes referred to as stakeholders, who are involved in the system as well as the ways those stakeholders value the what the social networking system delivers. This essay explores ways to describe and classify these stakeholders in order to better understand their characteristics and needs.

For many people, social media equates to Facebook. Whether you are an individual, company or government “follow us on Facebook” is a common mantra. It is understandable that Facebook has a significant place in the public's awareness, as it has over eight hundred million users[1] and an initial public offering (IPO) valuation in excess of one hundred billion dollars.[2] Facebook began as a tool to connect people with those they already knew, and as the Facebook social media platform has become more popular, entertainment organizations like Zynga[3], creators of the popular social gaming application Farmville, have grown. In about five years, Zynga has gone from a newly formed company to an organization valued at about seven billion dollars[4], and now it provides about 12% of

Facebook's revenue stream.[5]

However, the Facebook social networking system (SNS) is not the only form of social media available. The social media and internet marketing blog “Traffikd”[6] lists sites in 39 categories and there are likely tens of thousands of social networking sites currently available. LinkedIn[7] is a social networking system that helps professionals connect and “network” with other professionals. As with Facebook and Zynga, they too represent significant stock value with an IPO valuation of about four point three billion dollars,[8] while serving a much different function. There are many other examples of social media; Wikipedia, YouTube, World of Warcraft, Twitter and Second Life to name a few. Each of these systems serves very different purposes, impacting the lives of millions of people and allowing the to form a variety of different groups. In an attempt to recognize that social media serves many different purposes, Kaplan and Haenlein have proposed a classification of Social Media by social presence/media richness and self-presentation/self-disclosure as shown in Table 1.[9]

		Social presence / media richness		
		Low	Medium	High
Self-presentation	High	Blog	Social Networking Sites (eg. Facebook, LinkedIn)	Virtual Social Worlds (eg. Second Life)
Self-disclosure	Low	Collaborative Projects (eg. Wikipedia)	Content Communities (eg. YouTube)	Virtual Game Worlds (eg. World of Warcraft)

Table 1: Classification of Social Media by social presence/media richness and self-presentation/self-disclosure - adapted from Kaplan and Haenlein (2010)

This classification can be useful, however there is a different class of social networking systems represented by systems like the HP Watercooler[10] and IBM Beehive[11] which

support collaboration and provide serendipitous connections. These systems support a low and medium social presence and media richness as well as a high self-presentation as well as low self-disclosure. An example of this is the Athabasca University Landing,[12] which provides a platform for faculty and students as an e-learning support tool, and is intended for collaboration and knowledge management for the Athabasca University organization. These systems extend beyond the Boyd and Ellison definition of a social networking site:

> "We define social network sites as web-based services that allow individuals to (1) construct a public or semi-public profile within a bounded system, (2) articulate a list of other users with whom they share a connection, and (3) view and traverse their list of connections and those made by others within the system. The nature and nomenclature of these connections may vary from site to site." [13]

By incorporating blogs, collaborative features and support for content communities as well as social networking system functionality, these social networking systems for knowledge management, collaboration and the development of intellectual capital span the Kaplan and Haenlein classifications to fill a void using social networking systems.

STATEMENT OF THE PURPOSE

The position taken in this paper is that there will be greater success in creating and understanding social networking systems when stakeholders can be better described, so that the system can better serve those stakeholders. What stakeholders value should be identified and used to provide metrics to define the functionality and the success of the system. This

essay will touch on how stakeholders and value in social networks are affected when the networks are used for different purposes, specifically focusing on the needs and implications of social networks intended for collaborative development of intellectual capital. The primary concern of this work is to quantify a method of identifying who is using the social networking system and how it matters to them, and to generate a conceptual design to gather data on the stakeholders and how they value the system.

RESEARCH PROBLEM

There are many different uses of social networking as exemplified by Facebook, Linkedin, HP's Watercooler and Athabasca University's (AU) Landing. Some, like Facebook and Linkedin have a monetary value in the billions with millions of registered users. Others like HP Watercooler or IBM Beehive, are exclusive networks for commercial organizations intended to support innovation. Watercooler and Beehive, along with AU Landing have negligible monetary value but still have a base of frequent users. Each of these systems can be classified as social networking systems, though they all serve very different purposes and use very similar technological functions such as blogs, micro-blogs and wikis. We hypothesize that to effectively understand how a social networking system is used requires an understanding of who is using it and what those parties intend to accomplish in using the system. The first question asked in this research was “How can we describe the stakeholders of a social networking system?” The second question was “How can we measure the value those stakeholders obtain in a social networking system for collaboration and the development of intellectual capital?” The propositions made in this paper will be

demonstrated using Connectivity, a social networking system based on an instance of the Elgg software used by Anethum Corporation for knowledge management and the development of intellectual capital.

DEFINITION OF TERMS

Social networks are a combination of nodes, which may be individuals or groups, and the ties, such as relationships, connections or interactions, between these actors. Social networks as used in this work describe human interactions and do not include non-human interactions. The participants and relationships of guilds, unions, organizations and associations can all be described with a social network. There is a trend to use the term "social network" to describe the activities taken to add, delete or modify an individual's social network with specialized software which is referred to as a social networking system. Social Networking Systems (SNS) are the information communication technologies that can be used to facilitate the maintenance and growth of a social network. Social Networking Systems (SNS) are one type of social media, which is a term used to describe a variety of tools that facilitate interaction between creators and consumers of internet content, from blogs to virtual worlds. So while individuals have had social networks long before computers, social media enables a variety of social, entertainment, educational and creative interactions that were previously impractical or uneconomic. Social networking systems, a subset of social media, use telecommunications to facilitate maintaining and expanding a social network beyond what was previously practical, reducing communication barriers.

Chris Anderson has described the desirability of applying social networking systems as a "feature" rather than a "destination" [14], suggesting that social networking systems

should be enablers of interaction rather than drivers of interactions. Systems such as Facebook and Linkedin are examples of social networking systems as a destination, whereas our concern will be with social networking systems as a feature specifically to support knowledge management and the creation of intellectual capital applications.

Social distance is the perceived distance between two actors[15] which are effectively nodes in the social network. Social distance is not physical, but rather based on common factors such as race, religion or social class.

Social capital generally refers to the potential resources that are available through the relationships in a social unit.[16] The term has been expanded for use in this work to refer to all potential resources through relationships that are both internal as well as external to an actor.

ORGANIZATION OF THE REMAINING CHAPTERS

In Chapter II, the focus will be on a multidisciplinary literature review demonstrating the need to define structures for social entities when applying social networks to the development of intellectual capital. This will take a breadth approach, integrating sociology, psychology, distance eduction, business, strategic management and information systems to show the appropriateness of defining stakeholders along with a discussion of value and Return On Investment. Chapter III is a discussion of material from the literature and several social networking systems that have significantly contributed to the proposals for defining stakeholders and value. This includes differences in communication models and discussions of structural attributes describing groups and how they effect the definition of stakeholders. The proposals made in this work will be discussed in terms of Connectivity, an example

collaborative system intended for the development of intellectual capital. In Chapter IV, we will explore the issues and challenges of this research with Chapter V providing conclusions and suggestions for further research.

CHAPTER II

REVIEW OF RELATED LITERATURE

The literature supporting this research is grouped loosely into two categories. The first is “Actors, Structure and Stakeholders” that describes clustering and social structure, as well as Latour's Actor-Network Theory, which contributed to the premise for treating individuals and groups as having some similar attributes. The second area focuses on literature dealing with “Return and Value”, discussing issues of Return On Investment (ROI) in social networks, Beckstrom's Law and Schwartz's Value Inventory, more recently described as the Theory of Universal Values (TUV). Together, this provides the background for describing individuals and groups as actors in a social networking system, highlighting their unique attributes and common monetary value. The TUV is briefly explored as a conceptual framework for extending value with a common motivational value framework for all actors.

ACTORS, STRUCTURE AND STAKEHOLDERS

Considering the hundreds of millions of users of Facebook and the billions of dollars worth of valuation for the company, this suggests that there are other stakeholders involved beyond the individual users. Those stakeholders may be the advertisers who provide the majority of Facebook's revenue, the Facebook developer support that connects with third party developers like Zynga, or other combinations of groups. Whether the objective of the social network is interaction, as with Facebook, connection, as with LinkedIn, collaboration,

knowledge management or the creation of intellectual capital, as with AU Landing, individual and group behaviour plays a significant role. A number of authors have described this behaviour in social networks and while there is a common thread of structure and relationship, there appears to be a disconnect between the individual and group structures in the network literature. The practice of personifying corporations and other abstract entities or the use of value concepts from social psychology which are extended from individuals to groups is present in the literature, however an appropriate common thread can also be established using Actor-Network Theory (ANT) as applied to social networking sites.

Actor-Network Theory, developed by Michel Callon and Bruno Latour among others, is a theory that treats all individuals, groups or artifacts in a network as actors to be dealt within in a similar fashion. John Law described actor-network theory as,

> "relational and process-oriented sociology that treats agents, organizations, and devices as interactive effects."[17]

While ANT does not personify the actors in a network, it proposes treating all actors in a similar fashion and since the focus of this work starts with individuals it follows that all actors should be personified. With common practice as recognized by Benkler being the first and social psychology literature that will be described later being the second, ANT provides a third premise for personifying individuals, informal networks, project groups, working groups, organizations, partnering alliances or any of several hundred types of groups that form in society to be treated in a similar manner without regard to size or lifespan of the node. ANT does not clarify the lifespan necessary to be considered a valid node, as a result this work will presume that a node can exist for any period no matter how brief or indeterminate. Once a node ceases to exist, bringing together the same members creates a

new node, a different instance. This interpretation would view as nodes, both an organization like the Hudson's Bay Company, that has operated in Canada since 1670 and currently has approximately 50,000 associates,[18] and a temporary network focused on cat pictures containing only a few individuals. Each of the nodes would in turn be composed of smaller nodes down to the individuals involved in the actor.

Applying ANT in this way would also “personify” artifacts, suggesting that knowledge objects could be treated as nodes or actors just as individuals and groups. This appears to be appropriate for monetary value and benefits, but may limit the types of extended value that should be applied to knowledge objects. Using the cat example, this suggests not only could the members of the cat lovers group be represented as a node, but individual pictures would also be nodes. While the group members could attribute a monetary value to this picture, or beneficial feeling resulting from viewing the picture, it is difficult to see how human motivations could be attributed to the picture of a tabby cat. This is touched on in the Issues in Chapter V, but the socio-material issues are viewed as out of scope of this work as the primary concern is stakeholders in social networking systems rather than human and non-human networks.

Using agency or “Actors” we are saying that groups are actors, then it becomes a question of are there different kinds of groups, or commonalities that we can identify? My initial hypotheses focused on finding a set of static structures for all social networking systems which described the stakeholders of the network. This was based on a number of people identifying what appear to be ways of classifying groups of people in a network. Examples of this are Watts' real estate network example[19], Benkler's local, regional and superstar clusters,[20] Hedlund's four agents in knowledge management,[21] Nahapiet and

Ghosal's theory that social capital consists of structural, relational and cognitive dimensions[22] and the work of Dron and Anderson[23] on groups, networks and collectives which all appear to focus on specific common structures. These theories seem to be based on static types of structures as defined by a “Community Of Practice”, “Project” or an “Organization” that inhabit a dynamic network, and where the more general descriptions do not provide a language to describe the role of social structures in a social networking system. This paper provides an approach to refining and clarifying social structures not as defined entities but rather as sociologist John Martin Levi has described them, emerging dynamically from unstructured interactions like crystallization in a liquid.[24] We can attach a name to a crystallized form that we see in the liquid, but our real concern should be the variables that caused certain patterns to form. Social structures evolve from patterns and interactions, and if true in society, then it should also be true in a social networking system. It is not a particular static structure we are interested in, but the need to describe structures that are formed from relationships so that they may be created, reinforced or abandoned. With this language it is practical to articulate what needs to be defined to meet the objectives of the system as well as describing what has evolved to ensure the changes are appropriate.

Watts has argued that networks consist of many small over-lapping groups that are interconnected as a result of individual interests and affiliations. These networks are dynamic with connections constantly being created while old ones atrophy and die.[25] Watts used the example of a real estate agent's behaviour when it apparently contradicted rational economic behaviour.[26] When we examine the network, which includes structures for brokerage agencies, real estate offices and the relationship of interest rates, more information on the network is exposed. Brokerage agencies are formal organizations that provide a common

factor of legal regulations on the behaviour of real estate agents and could have regulations that prohibit or restrict the sale of the agent's property. Real estate offices are formal organizations that have a common factor of bringing together real estate agents based on certain social behaviours. As a group, some of those social behaviours may be expectations of sales or acceptable behaviours that limit or promote certain actions. An example might be making a certain number of commissioned sales in a given period. Both brokerage agencies and real estate offices as groups, demonstrate regulations or behavioural rules that constrain the individual agent's behaviour. So only with an understanding of both individual and group constraints and preferences can what is causing the real estate agent's behaviours be exposed revealing real estate agents true preferences demonstrating the agents behaviour is rational.

Generalizing five decades of social networking thought, Watts had this to say about the definitions and techniques regarding social distance.

> "But all of them [definitions and techniques] are essentially designed to extract information about socially distinct groups from purely relational network data, either in terms of some direct measure of "social distance" between actors or by grouping actors according to how similar their relations are to other actors in the network."[27]

Groups can then be described as the clustering of actors that occurs when social distance between actors is decreased through some factor common to actors. This factor could be race, profession, interest, religion, education, class, organization or objectives, among other things. The key is to recognize that actors are multifaceted and may have a short social distance in one aspect but a large distance or even disconnection in another facet.[28] Groups in themselves do not decrease social distance, but provide an environment where

additional common factors may come into play to reduce social distance such as actions intended to increase over-lapping of group members. This perspective on groups allow them to be conceived as a multitude of clusters, rather than focusing on the nature of a “Project” or a “Organization” or a “Community Of Practice” that defines the application. There are many different kinds of clusters that are labelled the same way, and clusters that are labelled differently that are structurally similar.

Adding many types of clusters means relationships develop between those clusters, and new structures are formed. Since hierarchical[29] structures are common in North American organizations it might be assumed that this structure is also appropriate for a social networking system. Unfortunately, equating structure with hierarchy may result in stratifying a social networking system and lead to communication congestion, making the system less effective as a communication tool. Martin's discussion of hierarchy points out that it is an optimum structure for control, not decision making or efficiency.[30]

For a social networking system with the objective of knowledge dissemination or the creation of intellectual capital, a non-hierarchical structure is preferred because of the tendency of a hierarchy to cause communication congestion when moving farther up the hierarchy. To decrease that congestion, Watts has described a locally optimal algorithm that creates a direct link between two nodes which are communicating the most, and by-passing congested intermediaries farther up the hierarchy.[31] In a social networking system this algorithm can be applied to local teams that are expressed by the clustering of actors. The underlying difficulty is to express this as an organizational form.

When we look at Crumley's work on complex societies[32] and Hedlund's on organizations, there is support for both hierarchical and non-hierarchical organizational

forms. Crumley describes heterarchy as the relationship of elements that are unranked or may be ranked in multiple ways, and ranking that is dynamic as well as relative to other elements in the system. While we recognize the role of hierarchy in society there are also other structures such as coalitions, federations and other shared structures that are examples of heterarchies and should be transferable to a social networking systems.

Hedlund described a form of organization based on temporary connections between specialists in organizations rather than top managers, and communication was primarily lateral instead of vertical. The term "N-form" was coined for this type of organization, as compared to the more well known Multi-divisional, or "M-form" common in North America. The N-form versus M-form corporation[33] demonstrates other types of management and control structures for organizations as outlined in Table 2 [34] that would also be appropriate for social networking systems intended for the development of intellectual capital.

Table 2: N-form vs M-form – Adapted from Hedlund 1994

	N-Form	**M-Form**
Technological interdependence	Combination	Division
People interdependence	Temporary constellations, given pool of people	Permanent structure, changing pool of people.
Critical organizational level	Middle	Top
Communication network	Lateral	Vertical
Top management role	Catalyst, architect, protector	Monitor, allocator
Competitive scope	Focus, economies of dept, combinable parts	Diversification, economies of scale and scope, semi-independent parts
Basic Organizational Form	Heterarchy	Hierarchy

This is transferable to social networks, because what Hedlund describes as the N-form

corporation fits very well within a social networking system for communication and information dissemination.

Instead of a single form however, the optimum would be transitions from heterarchy to hierarchy and back depending on the interactions within the system. This is supported by Crumley's suggestion that the re-emergence of heterarchy reminds us that all structures are not exclusively hierarchical and that rankings and relationships are not permanent. Some relationships may shift to become either a heterarchy or hierarchy and then shift back.[35] In the context of social networking for the development of intellectual capital both organizational forms are appropriate depending on the need at that time.

Groups are dynamic and affected by a variety of characteristics in the social network. This perspective is a result of Watts' arguments on the dynamic nature of a social network, Hedlund's perspectives on the varied forms impacting knowledge management and Crumley's positions on the role of heterarchy and hierarchy in complex society that suggests a different perspective on social networking systems. To identify those characteristics it is necessary to explore what groups occur in a social networking system. These groups vary, and could include organizations, communities of practice or some other groups as shown in Table 3 [36] though this is not a comprehensive list of groups.

Table 3: A Snapshot Comparison of Groups – Adapted from Wenger and Snyder 2000

	What's the purpose	**Who belongs**	**What holds it together**	**How long does it last**
Community of Practice	To develop members capabilities; to build and exchange knowledge	Members who select themselves	Passion, commitment and identification with the group's	As long as there is interest in maintaining the group.

	What's the purpose	Who belongs	What holds it together	How long does it last
			expertise	
Formal Work Group	To deliver a product or service	Everyone who reports to the group's manager	Job requirements and common goals	Until the next reorganization
Project Team	To accomplish a specific task	Employees assigned by senior management	The project's milestones and goals	Until the project has been completed.
Informal Network	To collect and pass on business information	Friends and business acquaintances	Mutual needs	As long as people have a reason to connect.

A “for-profit corporation” and an “incorporated social enterprise” are both legal organizations that include individuals, relationships and business rules that define their purpose and operation, as well as sub-groups such as “projects” or “departments”. They also have some facets are that significantly different, such as requirements for profitability, that can impact their behaviour. A “community of practice” or an “informal network” are also composed of individuals and relationships, thus part of a network can also be considered a type of group. Groups, therefore, may be composed of individuals, parts of a network, and/or other groups.

The objective, then, is not to list all of the potential groups, but rather to construct a common language and framework for clustering and establishing value for these groups as actors. For the purposes of this work, groups are abstract structures with attributes and these structures can be treated as nodes in the network which can be used to provide a better understanding of the behaviours in the network. The application of this approach to extend

the proposals of Dron and Anderson for their group, network and collective[39] is described in Chapter III.

RETURN AND VALUE

In this section I will explore different ways that values might be attributed to actors in a network as opposed to Return On Investment. By identifying both individuals and groups as actors it becomes practical to technically implement a common framework for value attributed to each actor. Value, rather than Return On Investment (ROI) should be the preferred measure for actors in general, or even the specific organizations that are paying for the social networking system. Value is more appropriate, whether defined loosely in a generic fashion or tailored to specific objectives for the social networking system.

The organization that is paying to build and maintain a social networking system needs to be able to justify their expenditures. In business, it is common to use Return On Investment (ROI) as part of this justification, showing how money expended is well allocated. This premise has propagated a growing interest in using Return On Investment (ROI) to establish a monetary value for social networking systems.[40] Oliver Blanchard argues for the use of Return On Investment (ROI) as the appropriate measure for social networking systems and describes the equation for ROI.[41]

ROI = (gain from investment – cost of investment) / cost of investment

Unfortunately, as DeMarco and Lister point out, the systems of today are less likely to provide direct cost savings[42] or increased direct revenues, instead they improve an overall position. Examples of improved position are increased competitive advantage or increased customer satisfaction through customer service, both of which influence fiscal gain

but are not directly attributed and as such inappropriate for ROI. When considered in the context of actors, it is fairly easy to identify the impact of direct influences, but more difficult to identify the impact of indirect influences, especially in a dynamic network. Appropriate measures for social networking systems might include attention as demonstrated by an individual's time on the site, or individual interactions as shown through clicks or comments. [43] Neither of these provide direct ROI, yet both can provide important information.

The second concern with using ROI, is that not all actors are interested in monetary return. The organizational actors that are fiscally responsible for the social networking system may be concerned about ROI, but the individuals using Facebook or the cohorts in the AU Landing are not driven by ROI. A more appropriate approach is to use a subjective value to measure the impact of a social networking system as well as the actors within the system. This could include both monetary and non-monetary measures so that benefits are more transparent and the need to track influence is alleviated.

One approach to generating a total monetary value has been the use of Metcalfe's law to value a social networking system, [44] as this has already been used to explain the growth of phone, cell phones and fax networks. Initially proposed by Bob Metcalfe in the early 1980's, he suggested that the cost of network grows linearly with each connection while the value is proportional to the square of the number of connections. There have been arguments such as those made by Reed that for social networking sites the value is in the creation of subgroups and the number of subgroups grows exponentially.[45] While this does include the impact of groups on the number of connections, it does not include costs. In 2009 Rod Beckstrom proposed a solution to the network valuation problem by exploring value to each user based on the net benefit value for all transactions conducted over the network.

Beckstrom's law considers tangible costs and tangible benefits as well as the ability to apply this to part or all of the network,[46] so it is an appropriate method to quantify the monetary value of a social networking system. However, not all of an actor's behaviours in the network will be dependant on monetary exchanges. Social recognition, trust, social capital and learning can all be concerns so the valuation of the network should include monetary and non-monetary values. The intangible benefits and the monetary value could be stored as an attribute with each instance of the actor, and this could then be used to increase the transparency of the actors in the social networking system.

There are a variety of sources to extend the value concept beyond a single subjective monetary value and a short textual description of the intangible benefits. There have been a variety of proposals from economics that include monetary and non-monetary values such as the Genuine Wealth approach, that measures five capitals of human, social, natural, built and financial wealth, [47] or the triple bottom-line that measures financial, personal and environmental bottom-lines.[48] However, these are economic macro approaches scaled down to the micro level which contradicts the approach of scaling up from the individual or micro to the macro level. This suggests exploring social psychology rather than economics.

We have chosen to explore individual motivation, as societies are generally composed of relationships between individuals. Therefore if we are treating all actors as individuals then by extension we should attempt to apply the ideas of individual motivation to all actors. There is a wealth of published material on values from sociology and psychology, as demonstrated by Cheng and Fleishmann's review of twelve value inventories.[49] For the purposes of demonstrating a value framework, consider Rokeach, who was a recognized leader in the field[50] and his statement of the value concept.

”The value concept... [is] able to unify the apparently diverse interests of all the sciences concerned with human behaviour.”[51]

More recent is the work of Schwartz, which is sometimes now referred to as the Theory of Universal Values (TUV) and is grounded in the work of Rokeach. Cheng and Fleishmann developed a meta-inventory, which consists of sixteen value categories that are aggregated from individual, work, managerial and technology design values. They found the Schwartz's Value Survey was the only inventory of the twelve reviewed that appeared to satisfy all sixteen criteria in their Meta-value inventory.[52]

The Schwartz Value Inventory is based on the premises of cooperative relations, motivations of individuals and gratification of some self-orientated needs which prevent withdrawal from the group the individual is part of.[53] Schwartz summarized the basic concepts regarding values that have emerged in social sciences since 1950 ;[54]

- Values are beliefs, that are tied to emotion not objective thought.
- Values are motivational, in that they refer to the goals people attempt to attain.
- Values go beyond specific actions and situation. They are abstract and that distinguishes them from norms and attitudes.
- Values influence the selection of actions, policies, people and events. They serve as standards.
- Values are relative to one another. An individuals values can be viewed as an ordered system that characterize the individual. This feature of values differentiates them from norms and attitudes.

The five features above are common to all values and have been used by Schwartz to

generate distinct, broad categories derived from the human requirements of;

- Coordinated social interaction.
- Survival
- Group needs.

The Schwartz Value Inventory identifies ten distinct motivational value orientations common to sixty seven cultures from around the world [55] as described in Table 4.

Table 4: Schwartz Value Inventory

Dimensions	Value	Motivational Goal
Openness to Change	Self-Direction	Independent thought and action; choosing, creating, exploring.
Openness to Change	Stimulation	Excitement, novelty, and challenge in life.
Openness & Self-Enhancement	Hedonism	Pleasure and sensuous gratification for oneself.
Self-Enhancement	Achievement	Personal success through demonstrating competence according to social standards.
Self-Enhancement	Power	Social status and prestige, control or dominance over people and resources.
Conservation	Security	Safety, harmony, and stability of society, of relationships and of self.
Conservation	Conformity	Restraint of actions, inclinations, and impulses likely to upset or harm others and violate social expectations or norms.
Conservation	Tradition	Respect, commitment, and acceptance of the customers and ideas that traditional culture or religion provide the self.
Self-Transcendence	Benevolence	Preserving and enhancing the welfare of those with whom one is in frequent personal contract (the 'in-group')

Dimensions	Value	Motivational Goal
Self-Transcendence	Universalism	Understanding, appreciation, tolerance, and protection for the welfare of all people and for nature.

The ten composite values can be arranged in a pie chart to demonstrate conflict and congruity among the values. Using a pie chart, adjacent values are likely compatible while more distant or opposing values will be actively not valued.[56] For example benevolence and universalism are adjacent, they share the motivations of concerns for others, both the in-group as well as tolerance and protection for the welfare of all people. The values at the opposite pole are achievement and power which focus on self-enhancement. In Fig. 1 the values are organized by similarities and dissimilarities.

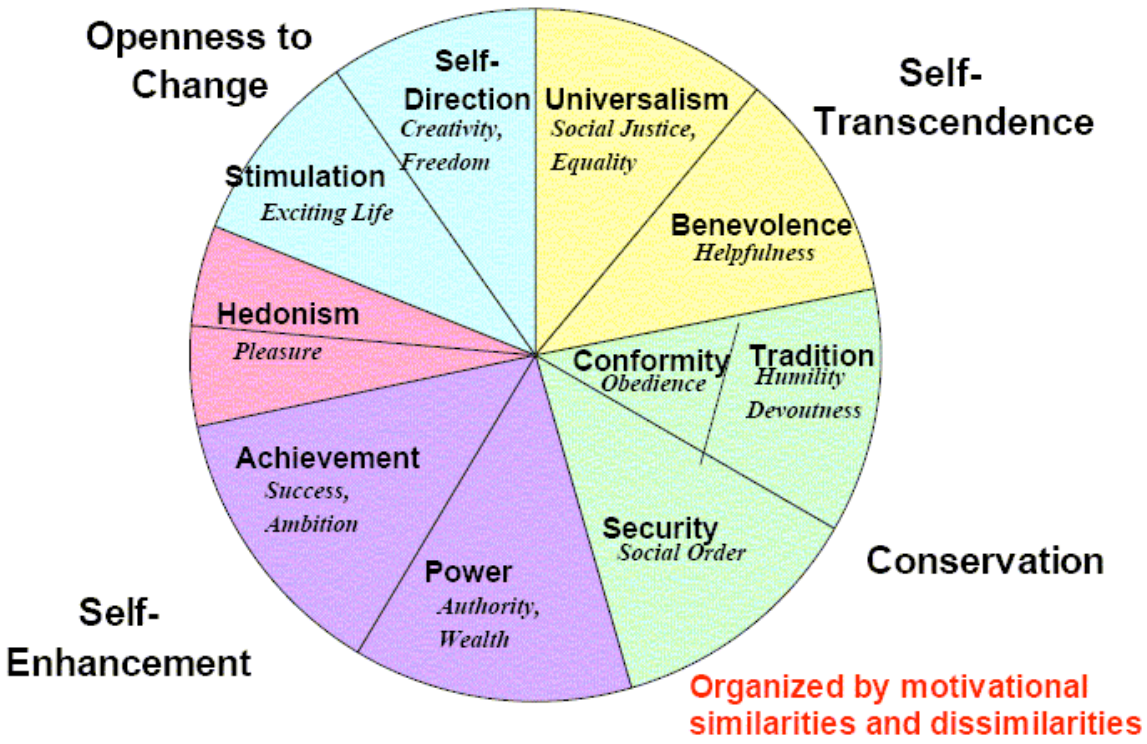

Figure 1: Motivational Types - Adapted from Schwartz [57]

The Schwartz Value Inventory has been applied to show that some attributes can be

specifically linked to certain values such as creativity, which is associated with the values of self-direction, universalism and stimulation but not with the values of security, tradition, power or conformity.[58] This demonstrates how inventory results can be used to show that creative actions are affected by particular motivations. The conceptual design proposed later in this paper suggests that those findings could be extended to blog, podcast and other intellectual capital development that occurs in a social networking system. Preliminary research suggests the Schwartz Value Inventory could be appropriate for individual actors, and the value survey questions in Appendix A could be modified to clarify the behaviours in the social networking system. That is to say, a blog post may have been made to demonstrate the actor's expertise, and would support an “achievement” value. If the post was made with the intention of benefiting of the actor's in-group, this would demonstrate “benevolence” or if it was for the benefit of all participants it would demonstrate “universalism”. For use as a value framework this would have to scale to the other actors in the network.

There is support for attributing values to both individuals and groups in the value definitions of Kluckhohn, Guth & Tagiur[59], Braithwaite & Blarney[60], Friedman, Kahn & Borning and Schwartz as referenced by Cheng and Fleishmann.[61] According to Schwartz, [62][63] the same basic value structure is active at the individual, cultural and institutional levels and he states that the average of individual values is one way to describe cultural values. Braithwaite and Blarney describe values as micro-macro concepts. At the micro-level of the individual behaviour, they describe the motivations of the individual, while at the macro level they represent shared understanding that provide meaning and order for the group. They used their 125 question value survey as a reference point for democratic deliberation to understand individual preferences as well as shared group values. There is

literature on applying the Schwartz Value Inventory to organizational characteristics,[64] in which the values of the Chief Executive Officer drive the organizational culture that effects the organizational outcomes or country level structures, [65] and identifies similarities in motivational value types but recognizes some divergence. Since these studies were restricted to individuals and countries, there is insufficient data to identify at what group size the motivational types diverged. Implementation of the design that will be proposed could be used to gather that data for analysis purposes. Mills, Austin, Thomson and Devine-Wright have done work on applying Schwartz TUV in construction management[66], again supporting the application of individual motivational types to groups.

Based on the works of Schwartz, Cheng, Fleishmann, Borg, Groenen, Jehn, Bilsky, Fischer, Vauclair, Fontaine, Mills, Austin, Thomson and Devine-Wright, it appears that the Schwartz TUV is appropriate to apply to groups in a social networking system. Some of the work also suggests that certain structures are predisposed to support specific values. An example of this is that the values of "Achievement" and "Power" are appropriate for corporations, which are legal organizations intended to create profit, so it would be unlikely to have a for-profit corporation focused on "Universalism", "Benevolence" or "Hedonism". However, social enterprises, can also be legal organizations but intended for social good rather than profit, and would be based on either "Universalism" or "Benevolence" values. Universities, where there is a focus on scholarly publications demonstrates "Achievement" values. Other social structures such as an informal network for sexual gratification could value "Hedonism", while a community of practice might support understanding, appreciation, tolerance and protection of welfare for all people, which is "Universalism" and a project team building a next generation entertainment system might value excitement,

novelty and challenge which is “Stimulation”. This work will introduce the Schwartz TUV as applied to all actors, both individuals and groups, as a method to explore why stakeholders pursue certain actions.

SUMMARY

The purpose of this study is to describe an approach to identify stakeholders in the dynamic environment of a social networking system as well as exploring a common value framework that can be applied to the actors in the system. The literature review has led to the hypothesis that both individuals and groups can be conceived of as actors, driven by concepts from Actor-Network Theory, social psychology as well as common practice and this in turn can be used to build a terminology to describe stakeholders. This terminology simplifies the analysis and description of the type of participants in the social network so that group behaviours and relationships can be explored. It also allows common attributes such as value to be attributed to all actors while not limiting further definition of the types of groups. In this way, the differences in the types of groups such as “projects” and “communities of practices” can be recognized while not excluding a value framework. This leads to the hypothesis that with the inclusion of a monetary value attribute it will be possible to use Beckstrom's law to calculate the monetary value for part or all individuals and groups in the network.

CHAPTER III

METHODOLOGY

The purpose of this study is to discover effective ways to describe groups as actors in a social networking system, and to demonstrate that hypothesis on an example system. This will also include a conceptual design for basic value as well as an exploration of an extended stakeholder value framework applying the Schwartz Theory of Universal Values (TUV) that could be used for a social networking system for knowledge management and the creation of intellectual capital. There are several sub-hypothesis that may allow the application of this framework to align our existing understanding of communities of practice or projects. This framework may also reveal ways to differentiate things we think are the same.

The first step will be to find indicators and criteria and is based on multidisciplinary literature review and the use of Facebook, LinkedIn, Athabasca University (AU) Landing and the Anethum Connectivity social networking system over an eighteen month period. The second step uses the concepts of generalization and abstraction from object analysis and design are used to generate a logical model using the Unified Modeling Language (UML) to describe stakeholders and value for those stakeholders in a social networking system. This approach facilitates a clear specification of the stakeholders of a social networking system and is the initial phase to support a technical implementation of the concepts where appropriate. This work will describe both basic and extended models with the extended model using the Schwartz TUV to support the third step of a conceptual model that demonstrates the implementation of different value concepts for different types of social

networking systems. The logical model described by the extended model is intended for social networking systems that are applied to knowledge management and the creation of intellectual capital. The next step is to demonstrate example application of the basic stakeholder component of the model and this has been included in Chapter IV to demonstrate how this would be applied to a social networking system for knowledge management and the creation of intellectual capital in a for-profit business. This has been applied to the Anethum Corporation Connectivity social networking system as part of a business process study to explore issues in applying social networking systems for knowledge management and the creation of intellectual capital. Ethics approval has not been sought as the terms of use of this site allows the use of the data as directed by Anethum Corporation senior management.

Methodologically, there are flaws in this approach, but the intention is to only show that it can be done and not that any of the characteristics or TUV values are most suited. This is a proof of concept, not an attempt to perform a rigorous analysis so statistical validation of the survey process would be accomplished in future steps. This is not comprehensive and it is expected that important attributes have not been included, nor is this the only way to categorize groups. However, this is intended to demonstrate value in the approach and the potential as a framework for future research.

The benefits of this approach include the provision of abstract conceptual designs that are intended to provide a starting point for describing stakeholders in a social networking system. By using UML models for the stakeholders, a level of detail is provided so that the model can be applied to other social networking systems with no coding effort. The focus is on analysis, and the highest priority stakeholders could be further analyzed with tools

appropriate to their size and volume. An example of this is to use an empathy map to better understand a key stakeholder group.[67] The Connectivity example has been included to demonstrate how the model can be applied to describe and improve the business application of a social networking system. This approach provides an initial iteration of the model so that it can be applied against other examples of social networking systems to refine and validate the model so that the model can be applied to other social networking systems that are used for different purposes. The primary concern is to demonstrate an approach to providing a more detailed specification of the stakeholders of a social networking system.

The limitations of this approach include limiting the scope to stakeholders and value as well as applying the model only to a limited example case. The example case is not intended to prove the model is the only model, or that it is comprehensive. The focus has been limited to social networking systems for knowledge management and the creation of intellectual capital and as such, will reference the knowledge management theories of Hedlund[68] and social capital theories of Ghoshal and Nahapiet[69] and their affect on the stakeholders of a social networking system for knowledge management and intellectual capital development. The development and implementation of a classification system for different types of social networking systems could be useful, however it is outside the scope of this work. The description of different applications of social networking systems may help highlight Chris Anderson's description of social networking systems as a destination[70] as opposed to a feature. But this work is focused on a method of describing stakeholders and what they value, not on increasing value in a particular type of social networking system. The Schwartz's TUV is intended to open discussion on using alternate value definitions in the

implementation and evolution of social networking systems. It is not intended to be comprehensive, as we hypothesize that social networking systems used for different types of applications would use different extended value systems.

The next section will begin with a discussion of how stakeholders are defined through the use of actors to represent both individuals and groups, and then continue with an overview of the nine structural attributes describing groups. These are followed by the proposal for the extended value framework using the Schwartz TUV.

DEFINING STAKEHOLDERS

Social networking systems allow individuals to communicate, interact and engage. The individual can have a purpose or motivating factor such as economic benefit or recognition, often this is discussed as static interests on the part of individuals. Individuals however, are complex organisms with diverse motivations that change over time and describing them as having static interests is highly inaccurate. Today, an individual may seek to connect with other individuals with whom they have strong ties but are geographically or temporally separated. They may seek to connect with others of like interest, explore existing knowledge or create new intellectual capital. They may also search for experts, strive for recognition in personal and professional domains, or any combination of these purposes and motivations. These behaviours may be driven by monetary and non-monetary factors; professional recognition may generate more work or increased compensation but personal recognition does not affect compensation and is motivated by non-monetary concerns. Applying the personification and the abstract classes based on concepts from object analysis and design, individuals and groups are aggregated to the Actor class as shown in Fig. 2.

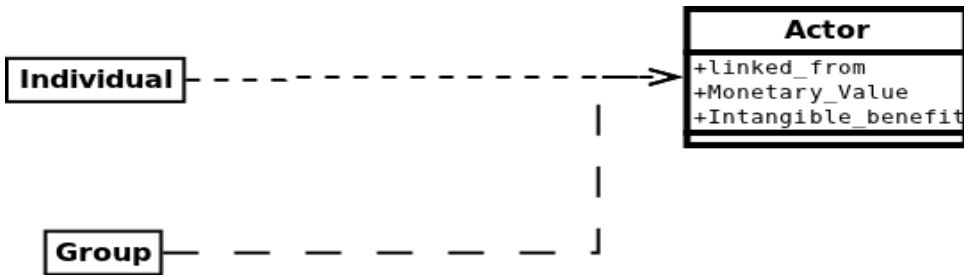

Figure 2: Actors - Individuals and Groups

This class provides a single location for all actors, whether they be individual or group actors. The attribute “Monetary_Value” is a subjective fiscal value from the actor, or an average of the monetary values from the actor's membership which allow is the calculation of subjective monetary value for all of the network or any subset of actors using Beckstrom's law. The “Intangible_benefit” provides a location for short descriptions of intangible benefits to be included for the actor, or for all the membership of an actor. The inclusion of intangibles attached to each actor provides for greater transparency for the value of the nodes in the network.

Groups are defined in this work as social structures consisting of actors that are clustered through some overlapping dimensions which have the potential to reduce social distance. They are an intermediate structure that is then further specified to define the stakeholders and the actions necessary to serve those stakeholders. The definition of groups used by Dron and Anderson[71] does not provide that level of specificity. They describe groups as cohesive, often with formal lines of authority and roles, consisting of individuals who see themselves as part of the group and possibly structured as hierarchies. The group may be structured around a particular task and the term may be fixed or flexible. The Dron and Anderson definition might include, crews, gangs, teams, working groups, cohorts, communities of practice, companies, organizations, social enterprises, non-governmental

organizations (NGO), alliances, as well as other types of groups. One definition of group does not sufficiently describe the audience and objectives of a crew versus an alliance since the groups have different characteristics.

The attributes used to describe the groups are drawn from the literature review, the Dron and Anderson description, and the inclusion of an attribute for communication model which extends Blanchard's [72] comments on communication models in social networking systems. They have also been influenced by observed behaviours in AU Landing and Connectivity over an eighteen month period.

NINE STRUCTURAL ATTRIBUTES

The nine structural attributes used to describe groups are;

- External Tie strength
- Internal Cohesion
- Organizational Structure
- Communication Model
- Access
- Membership
- Initiated
- Terminated
- Social Behaviours

As stated earlier, these attributes are not comprehensive, but rather intended to demonstrate the benefit of describing stakeholders in a social networking system by the use of specific attributes modelled with the Unified Modelling Language (UML). Defining the types of groups as sub-classes of groups enables a clear specification to define objectives and drive

behaviours. They are not intended to provide metrics, but rather provide clarity so that objectives and metrics can be ascertained in later steps. As sub-classes, the designers of the system can make specific choices that will drive the tactics and strategies for a “Team”, “Project”, “Community Of Practice”, “Organization” or “Partnering Alliance” that all create the social networking system. This is the first step in creating programming patterns that define the stakeholders of social networking systems in general. It is expected that certain attributes, as is the case of “Internal Cohesion”, would be expanded upon as literature develops that shows a consensus.

EXTERNAL TIE STRENGTH.

The first attribute identified is “**External Tie Strength**” which describes ties external to the actor, and based on Granovetter's[73] discussion of strong, weak and absent ties. Granovetter suggested that absent, weak and strong ties would show the existence or strength of the relationship between two individuals, where weak ties sometimes act as bridge links between cliques. It is used here to describe the existence or strength of the relationship between two actors rather than individuals, meaning that potential bridges for diffusion can exist between any type of actor. The tie strength is also a simplification of the relational dimensions of trust, norms, obligations and identification[74] among the actors, leveraging the social capital to generate intellectual capital as described by Nahapiet and Ghoshal and diagrammed in Appendix C. At this time we are hypothesizing that increased tie strength demonstrates increases in the relational dimensions of social capital. This attribute is an enumerated list consisting of “absent”, “weak” and “strong” values.

INTERNAL COHESION.

The second attribute, "**Internal Cohesion**" describes the quantity of cohesion desired for the actor. Cohesion is generally defined as the inclination to form social bonds that result in the group remaining united.[75] There are currently a number of measures of cohesion, and the definition and measures remain a topic of discussion, so it has been included as a subjective value. This differentiates between the internal behaviours necessary to grow and sustain a "team" of a dozen individuals in frequent contact versus an "organization" of several thousand individuals with many unknown to each other. This attribute is a single field which is an enumerated list consisting of "weak", "moderate" and "strong" values.

ORGANIZATIONAL STRUCTURE.

The attribute "**Organizational Structure**" describes management oversight, in terms of "Hierarchy", "Heterarchy" and "Market" forms. Hierarchies such as found in the M-form described in Table 1 are useful for promoting the rate of adoption because the groups tend to be homophilous, [76] or internally alike, and support management control. If the objective of the social networking system is knowledge management then actors that facilitate adoption could be important to design consideration. Heterarchies such as found in the N-form described in Table 1, and identified by Crumley[77] as an appropriate structure for complex societies. They are useful for decreasing communication congestion, as a local optimization strategy described by Watts[78], and introducing innovation in heterophilous,[79]or dissimilar groups. The final organizational form in the list is a "market" which is premised only on a medium of exchange. This attribute is a single field which is an enumerated list consisting of "Hierarchy", "Heterarchy" and "Market".

COMMUNICATION MODELS.

The fourth attribute is "**Communication Models**" described as an enumerated list consisting of "Uni-Directional Vertical", "Bi-directional Vertical", "Lateral" and "Networked" communication models. Because a key purpose of a social networking system is to facilitate communication, connection and engagement between one or more stakeholders, lateral and networking communication models based on the dual concepts of vertical and lateral forces as described by Blanchard[80] are of significant interest for a social networking system. This attribute recognizes that different stakeholders may require any one of the four communication models, rather than assuming it will be lateral or networked. The communications models identified here were not common in the literature reviewed as part of this research so a brief description of each type has been included, starting with the most basic model.

Uni-Directional Vertical communications are typically broadcast communications. They may be delivered through websites, television, radio or print advertisements, but they are messages that are crafted, packaged and then transmitted to the target audience. The Uni-Directional Vertical communication is shown in Fig. 3.

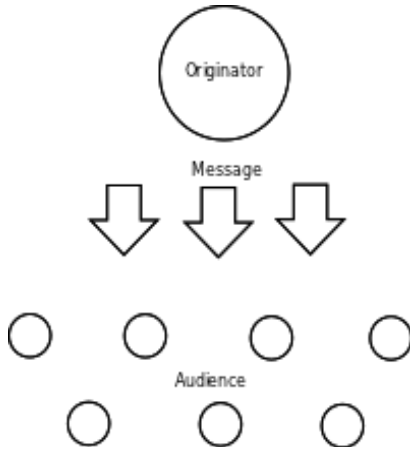

Figure 3: Uni-Directional - Adapted from Blanchard 2011

In this model there is no interaction between the originator of the message and the audience. The assumption is that additional frequency and channel bandwidth will produce greater results, but there is no feedback mechanism to confirm or deny whether the message has been effective. An example of this could be a website where comments are disallowed and system logs are not reviewed.

Bi-Directional Vertical communication is a modification of broadcast communication that includes feedback as shown in Fig. 4.

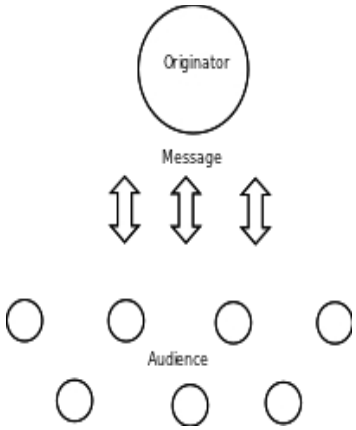

Figure 4: Bi-Directional -
Adapted from Blanchard 2011

This is the much more common model which has interaction between the originator of the message and the audience. The feedback might be in the form of market studies, comment cards, polls, website comments or system log reviews. The inclusion of a feedback mechanism provides an opportunity to assess the effectiveness of the broadcast, however the

results are usually filtered though a third party.

Lateral communications provide a facility for the audience to interact as shown in Fig. 5.

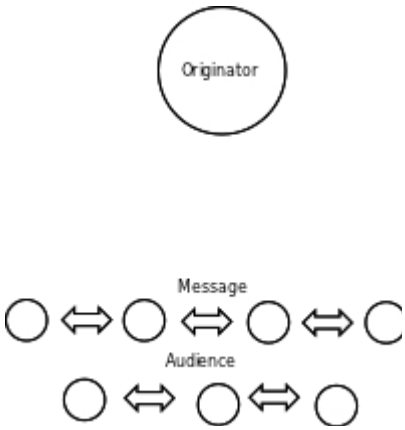

Figure 5: Lateral communications – Adapted from Blanchard 2011

This model features communication amongst the audience but does not fulfil the need of the organization to interact with the audience. It results in difficulty communicating a message, but does provide the service of enabling the audience to interact with itself. A good example of this is model is Facebook.

The networked communication model allows a message to be broadcast to the audience and then responded to by that audience, creating opportunity for dialogue between the originator and among the target audience as shown in Fig. 6.

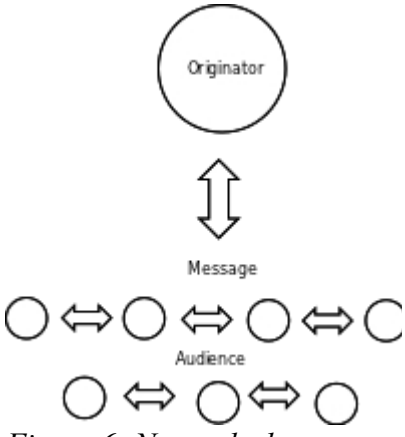

Figure 6: Networked - Adapted from Blanchard 2011

This model allows for a messages to be communicated bi-directionally between the originator and audience as well as facilitating communication amongst the audience. When the originator does not monopolize the discussion, this also results in a decrease in bandwidth between the originator and audience but does not necessarily decrease the frequency of message transmission. The interactions made possible through this network of communication provide the opportunity to increase the depth of communication surrounding the message as well as the strength of the relationship between the originator and audience, and between members of the audience. The result of this relationship changes the advertising environment, and may be the main cause of decreased spending in traditional broadcast channels as is suggested by the position of Robert McDonald, CEO of Proctor and Gamble, where he discussed moderating his advertising budget because Facebook and Google can be more efficient.[81]

The networked communication model offers a distinct advantage in social networking systems in that it enables mass media reach while reducing temporal and geographical barriers in the maintenance of contacts with a number of actors. Members who were once passive receivers of information from a stakeholder can become active participants in the success of that stakeholder. What was once limited to comments on an individuals blog, can now be directed at any actor and may include blogs, discussions, bookmarks, podcasts, files or a variety of other forms of interaction.

ACCESS.

The fifth attribute is "**Access**" which is used to identify access privileges to the content developed by any given actor and classified as being restricted or open. This was identified by Dron and Anderson and intended as a preference or guideline for the actor and not a technical constraint which limits access . The objective of this attribute is to communicate what knowledge is available to this actor.

MEMBERSHIP**.**

The sixth attribute is the "**Membership**" attribute, described as "Inclusive" or "Exclusive". In the case of a partnering alliance or organization, exclusivity is traditionally used to preserve competitive advantage. Benkler argues that in a digital economy, radical new approaches enable effective large-scale cooperative efforts suggesting that inclusion rather than exclusion is preferable for competitive advantage.[82] The membership attribute is derived from the Wenger and Snyder material in Table 3 of who belongs to a specific group as well as the Dron and Anderson description of groups.[83] When applied to a community of practice inclusion is important to widen the information distribution within the community and potentially expand the community, while a project might be inclusive if it is an open source project to increase participation. A team could use exclusivity as part of a strategy to help build group member loyalty, while an educational institution might use it as part of a legitimate peripheral participation plan.[84]

INITIATED AND TERMINATION**.**

The "**Initiated**" and "**Termination**" attributes provide a starting and ending date for the actor. Some types of actors such as an organization, like the Hudson's Bay Company described in the literature review, or community of practice have an indeterminate end while

the accepted definition of a project includes the premise of a termination point.[85]

SOCIAL BEHAVIOURS.

The final attribute is "**Social Behaviours**" which is used to described expected social rules. As Watts points out there are a variety of unspoken behavioural rules for operating in groups, whether it is behaviours on a New York train,[86] crew or organization. Articulating these rules for stakeholders on a social networking system exposes them to discussion and the potential to reach a consensus agreement.

GROUPS AND STAKEHOLDERS

The actor class is linked to the group class that is defined by the nine structural attributes. The proposed structural attributes are shown in Fig. 7.

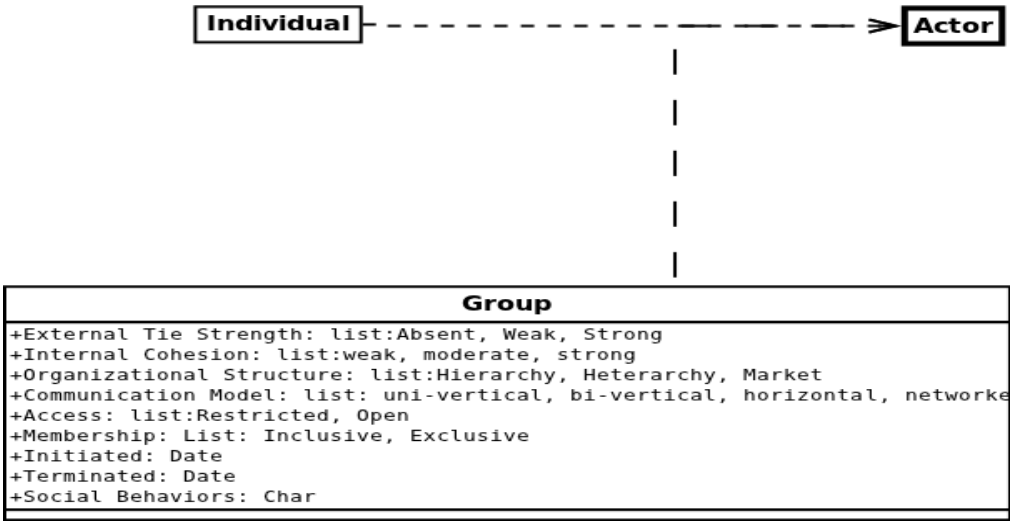

Figure 7: Nine structural attributes of groups

To define stakeholders, groups are sub-classed using the attributes of the group class so that a clear specification is generated and specific strategies appropriate to the stakeholders can be

planned and implemented. An example of this sub-classing for a social networking system is shown in Fig. 8 where this network would include five types of stakeholders.

This example includes "Partnering Alliance", "Organization", "Community of Practice", "Project" and "Team" as the stakeholders in this specific social networking system.

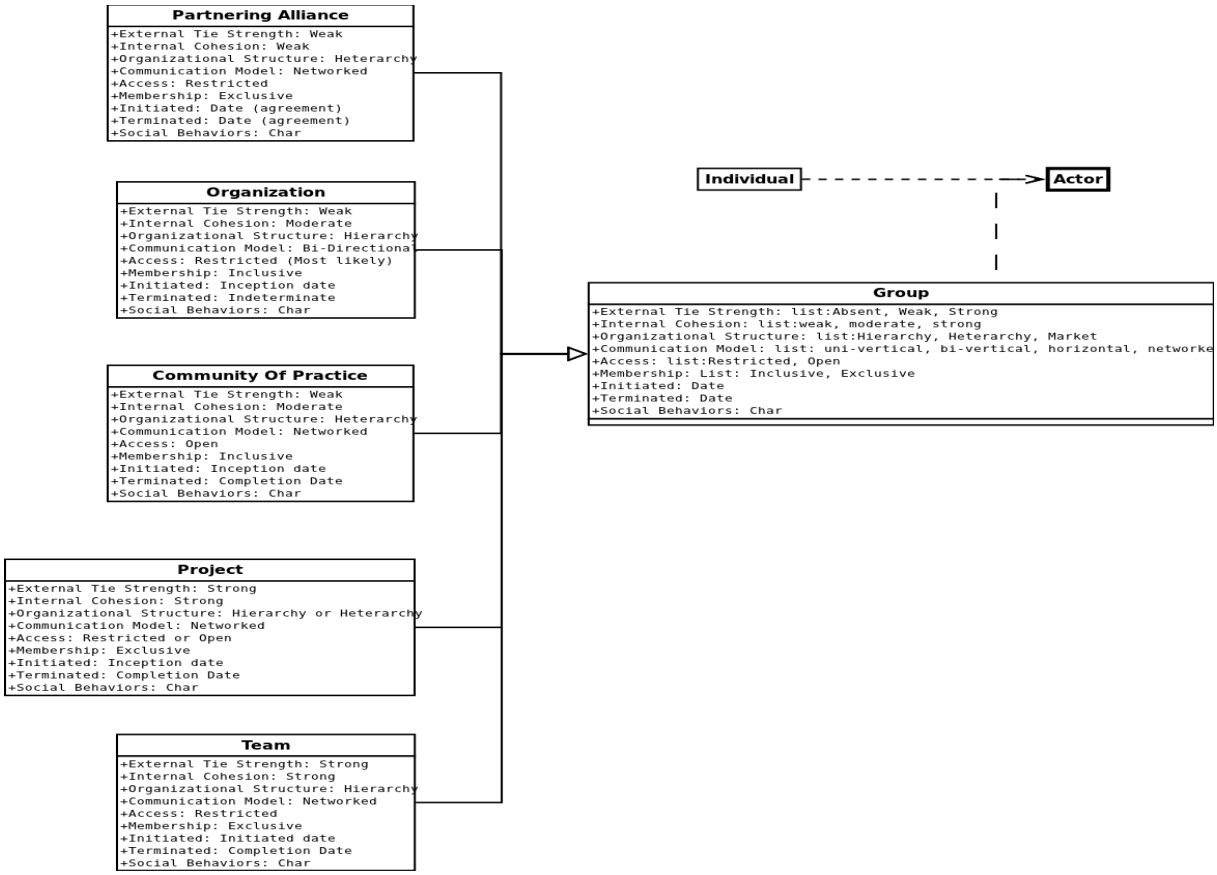

Figure 8: Stakeholders in an example social networking system

Clarification on whether all actors within a class have the same values has been left for future work. It is clear that there will be some variance but no clear boundaries have been set to differentiate a "Team" from a "Project" or when evolution within the class constitutes a new class. It is hypothesized that the stakeholders will be specific to the social networking system, but re-occurring patterns may form based on how the social networking system is used. Validating that hypothesis is left for future research. Using the nine structural attributes

each stakeholder class is described facilitating a better understanding of each class and allowing behaviours to be targeted as appropriate.

Actors connect individuals and groups, while groups are sub-classed to form stakeholder classes in the social networking system as show in Fig. 9.

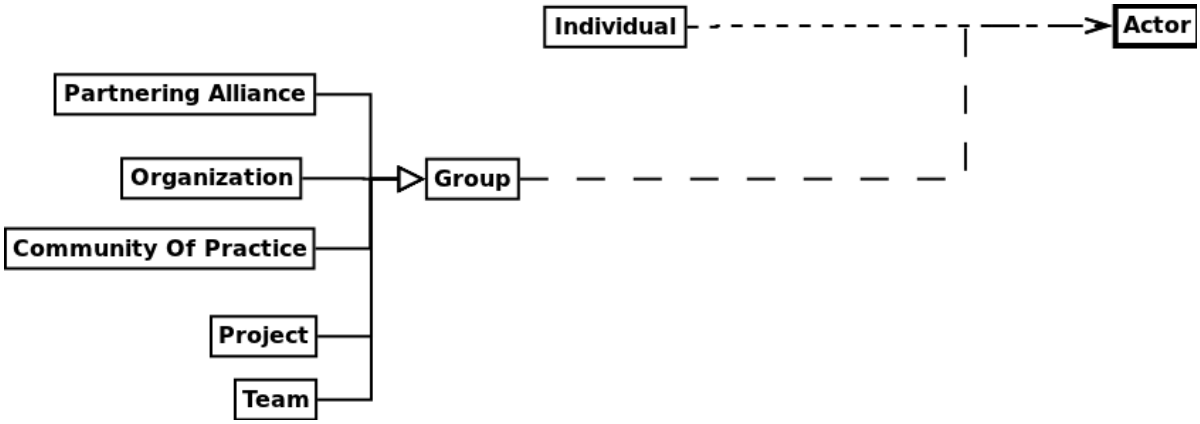

Figure 9: Actors, Groups and Stakeholders

This approach creates a link through the Actor class between the Individual and Group classes and from Group to all of the stakeholder classes involved in the social networking system. This allows the monetary value and intangible benefits in the Actor class to be tied to each stakeholder which in this example includes “Partnering Alliance”, “Organization”, “Community of Practice”, “Project” and “Team”. The Basic Stakeholder Value (BSV) allows any number of stakeholders to be described and valued, even as they evolve in the dynamic environment of a social networking system.

The Nahapiet and Ghoshal theories on social capital [87] suggest that structure, relationship and cognitive dimensions impact the creation of intellectual capital, so by allowing any number of structures to be tracked, the BSV and ESV-TUV facilitate the design of social networking systems for the development of intellectual capital. When monetary

value is attached to each actor, it allows measurement of the monetary value either across the network or for specific groups within the network by applying Beckstrom's law. The detailed specifications developed when using the BSV allows designers to better conceptualize the needs of the stakeholders and to develop appropriate strategies and plans to support positive growth in the social networking system. As structures evolve, clear specification helps identify if the unplanned behaviour is positive and should be supported, or if it is negative, how those behaviours can be mitigated.

USEFULNESS OF BASIC VALUE**.**

The treatment of individuals and groups as actors does not presume to argue consciousness or moral agency[88] for any type of group, rather, this approach provides a consistent treatment for all actors, at all levels in the network. As discussed in Chapter II, attaching values is preferred over ROI because of the difficulty tracking influence in the social networking system. There is insufficient information in a dynamic network to definitively attribute to what extent a node or combination of nodes have contributed to a financial return. As discussed in Chapter II under Return and Value, ROI may be inappropriate and the use of value is complicated by the lack of consensus on what constitutes “value” and how it should be measured. Using a subjective monetary value with the value being set by the actor postpones this issue until such a time that a consensus is reached and provides potentially useful information in the interim. For actors with multiple members, the monetary value can be averaged or accumulated across the membership that composes the actor, and forms the basis to calculate monetary value for the network. The position that value should be averaged or accumulated rather than weighted is a

simplification as any weighing system suggests more information on the relationships in the network than is currently available. The use of monetary value has been proposed because the concept of a medium of exchange is well known and it is expected at some point it will be necessary to justify the cost of the social networking system or some of the components in that system. The use of a subjective monetary value is applied in the same way that Demarco and Lister have used sensitivity analysis[89] for risk management purposes in that it provides a subjective estimate of what the actor is prepared to forgo for the benefits achieved by some aspect of the social networking system. The intangible benefits as short textual descriptions that have been included for each actor or member of an actor provides transparency and may over time show patterns of benefits for an actor or stakeholder class. The Schwartz TUV is used to provide motivational values in this proposal to extend the basic subjective monetary value and intangible benefits stored in the Actor class. This application of the TUV will be discussed next.

EXTENDED VALUE FRAMEWORK – SCHWARTZ TUV

The nine structural attributes describing groups can be used to provide a clear picture of who is involved in the social networking system. The monetary value and intangible benefit attributes provide a monetary perspective on value and to helps flag factors the actors consider to be important benefits. Due to the lack of consensus on what constitutes value, an extended value framework should be customizable so that it supports the purpose of the social networking system, as well as maintainable as the implementation is expected to change. In this work there is a particular interest in social networking systems as applied to the creation of intellectual capital. We hypothesize that motivated individuals are more

productive in generating intellectual capital than non-motivated individuals. As the Schwartz Theory of Universal Values focuses on cross-cultural human motivational types it has been chosen to demonstrate Extended Stakeholder Value (ESV) from a conceptual perspective. The ability to compare the motivational values between an actor and the membership of that actor creates data that could support tactics to increase group performance. This data may also be applicable to better design and grow social networking systems. In a social networking system like the AU Landing, the focus might be on satisfaction rather than motivation, so the extended value might be more appropriate through the use of measurements for each stakeholder class such as tutors, students, faculty and administrative staff. For the purposes of demonstrating extended value, the Schwartz TUV can be used to generate stakeholder motivational data that can be further analyzed by social scientists.

Applying a motivational value framework is particularly difficult because the same action may have different motivations. The actor representing a business or university operating a social networking system will have some concern for the monetary value of the network, while the actors representing individuals or teams are more likely to be concerned with improving their reputation or obtaining recognition rather than monetary value. Different actors will have different motivations which may change over time, either driven by changes in the motivational values of the actor's membership or by factors external to the actor. The relationship of the actor to its membership may suggest actions that increase productivity[90] and decreased cognitive dissonance to help motivate and align individuals, organizations, institutions, industries and society[91]. This conceptual design when implemented provides data to validate this possibility.

When an actor explores a concept and creates a new response, the motivation type driving this action may be self-direction, or the same actions may have been motivated by the excitement and challenge of creation, so the motivational type would be stimulation. But the same content may have been created to gain recognition by peers or expert status, and the financial compensation that goes with it, driven by achievement and power values that conflict with self-direction and stimulation. The creator's intent could also be to communicate the content to promote social justice in general, motivated by universalism values, or it may be only for the actor's regular in-group and thus benevolence. Effectively, only the actor can determine the motivation driving the actions at that moment suggesting the data entry system should be be easy to use with little duplication of effort.

Using the Schwartz Value Inventory described in Chapter II under Return and Value, the standard questions would be modified to attribute behaviours to a specific motivational values for the actor. In cases of actors with multiple members the motivational values are averaged. Note that actors such as organizations might be composed of multiple projects, which may be composed of multiple teams which may be composed of multiple individuals. A blog post or wiki contribution for an actor would trigger a survey response form specific to that individual. Considering the number of questions in a value survey, setting individual default values at the time the individual opts-in, or on the acceptance to the group that defines the actor will reduce data entry, allowing individuals to only change defaults as appropriate. Sample questions from a standard Schwartz Value Inventory are included in Appendix A. The responses from these questions would generate values that are stored in the attributes and can be used to compare values between groups and the component parts of

those groups. The addition of attributes for each of the ten values on each "Actor" class would store the motivational values for the actor in addition to the monetary value and intangible benefits. The motivational value is intended as an extension, not a replacement of monetary values and intangible benefits. The "Actor_member_defaults" class serves as the motivational values for each member of the actor. These classes are shown in Fig. 10 as the Theory of Universal Values applied to actors.

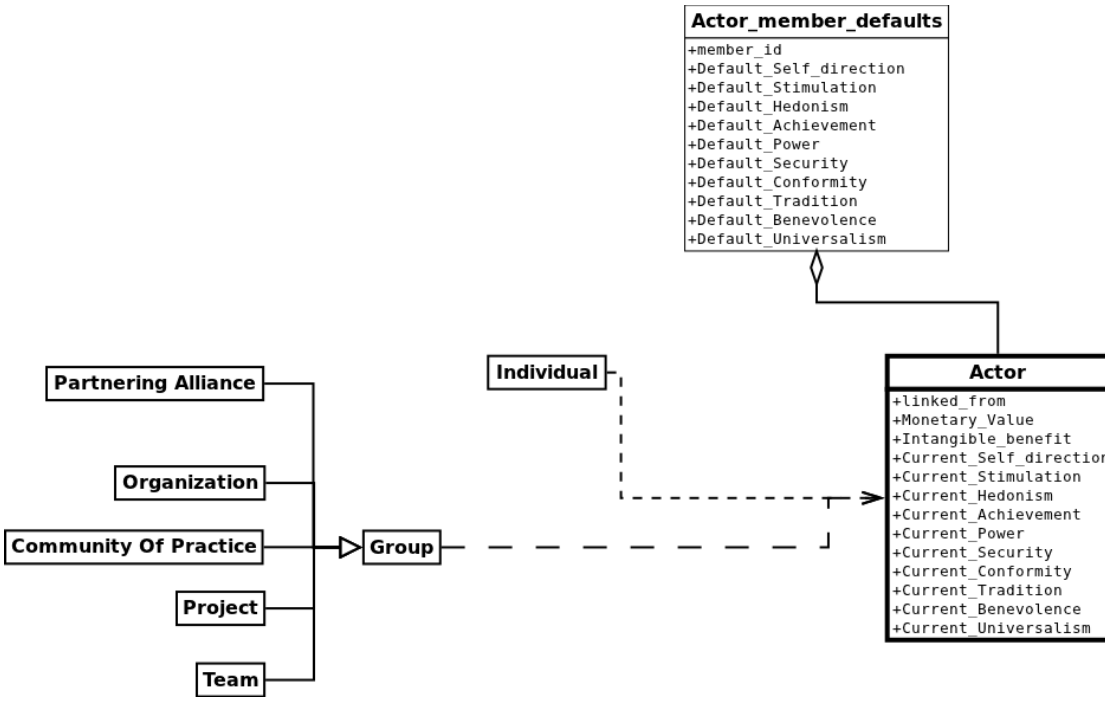

Figure 10: TUV applied to actors

This allows TUV data from an actor to be compared against the TUV data of the members that compose the group actor or default data for the individual actor. This data could then be analyzed to help validate or refute whether it is appropriate to apply TUV to specific types of groups, whether individual and group alignment increases satisfaction, or if this is appropriate to measure actor's satisfaction. An example of the current TUV values generated

using the Schwartz Value Inventory questions in Appendix A for an individual actor is shown in Fig. 11.

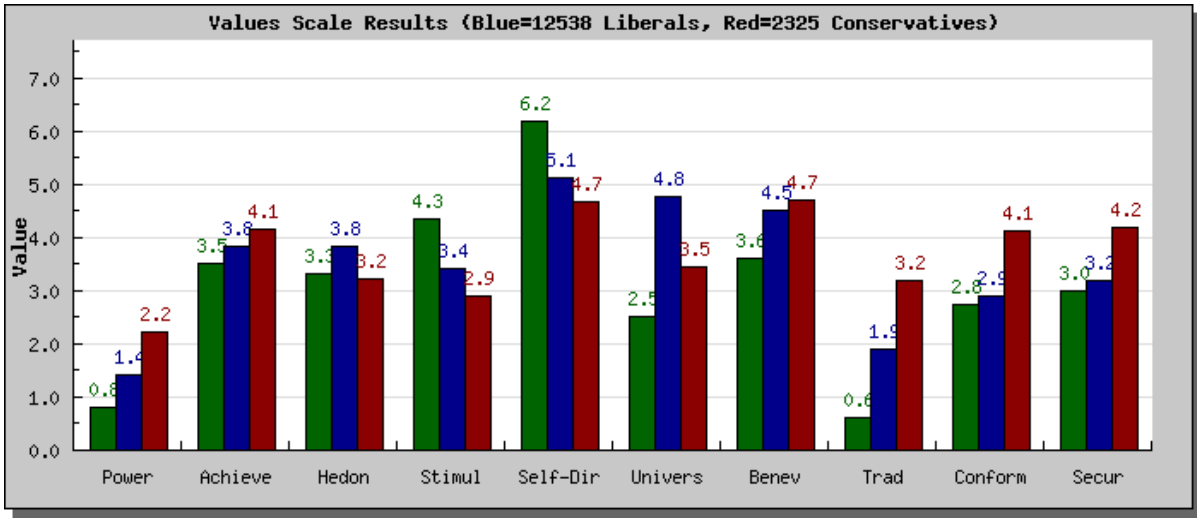

Figure 11: Example TUV results for an individual actor

The values in Fig. 11 provide a picture of what motivates this actor compared to two other groups. In this case the comparison is against political liberals and conservatives, suggesting that as a member of the liberal group there could be differences in power, hedonism, stimulation, self-direction, universalism, benevolence and tradition. As a member of the conservative group there would be differences in power, achievement, stimulation, self-direction, universalism, benevolence, tradition, conformity and security. The actor member defaults class serves to average the memberships and based on Fig. 11 this would contain 12,538 records for the liberal group, and 2,325 for the conservative group. The Extended Stakeholder Value applying the Theory of Universal Value (ESV-TUV) would generate similar data for all actors based on why those actors generated specific types of content. The development of the specific questions and the delivery of those questions in the Elgg environment to the actors is outside the scope of this research.

SUMMARY

This chapter focused on step three of the methodology which is the conceptual design for the Basic Stakeholder Value (BSV) and Extended Stakeholder Value applying the Theory of Universal Values (ESV-TUV) that would be used in future research on a larger social networking system than the Connectivity example. Both models are based on the integration of observations from Facebook, LinkedIn, AU Landing and Connectivity and material from the literature review. The BSV outlines the process of identifying structural attributes that clarify the stakeholders in a social networking system so that strategies appropriate for those stakeholders can be implemented more effectively as well as basic monetary and non-monetary values attributed to the stakeholders. This will be discussed further in the example application in chapter IV and how it has been implemented in Connectivity. This chapter has described the ESV-TUV which is intended for use on social networking systems for knowledge management and the creation of intellectual capital. The ESV-TUV is only explored as a conceptual design and it has not been implemented in Connectivity.

CHAPTER IV

Chapter III introduced the BSV, this chapter will describe the partial implementation of BSV on the Connectivity social networking system and how the stakeholders in Connectivity are better described using the BSV. This chapter will also discuss some of the lessons learned when applied to a social networking system for knowledge management and the creation of intellectual capital. This will not touch on the value component of the BSV and the ESV-TUV is only available as a conceptual design and has not been applied to Connectivity. The chapter will conclude with some remarks on issues, challenges and trends relevant to BSV and ESV-TUV.

EXAMPLE APPLICATION - CONNECTIVITY

Anethum Corporation's Connectivity is a social networking system implemented as an instance of the Elgg[92] social networking framework. Anethum Corporation is a private for-profit Information Technology consulting company with personnel distributed throughout North America. The company's focus is on the application of innovative solutions to business needs which results in the application of new tools and techniques for their clients primarily in North America and Europe. Anethum attempts to target projects that meet the needs of early adopters [93] requiring significant attention to innovation, education and change management. In this example three clients have been identified; AU a public research and teaching post-secondary institution, KC a private for-profit Alberta business entity and SKG a pre-revenue public for United States business entity with personnel dispersed throughout

North America, along with six individuals; JD, EvS, MC, WV, DB, PO, from Anethum and the three clients used in this example. There is a need to distribute and engage on projects as well as for specific concepts such as the application of specific research or engaging new entrepreneurial business practices.

CONNECTIVITY WITH NO MODEL

The first iteration of Connectivity was developed with no consideration of the BSV model. It consisted of the SKC and Elgg projects and included approximately thirty individuals. The functionality in terms of micro-blogging, blogging, files and wikis were effectively the same as when the BSV model was applied. The first iteration produced three main lessons.

Individual relationships produced very little shared communications. Most of the communications were direct connections through email, phone or chat rather than using Connectivity. While social bookmarking functionality exists, specific URL's were shared through email rather than using Connectivity. Based on these behaviours groups were first added in an ad-hoc manner without the BSV or ESV-TUV. This generated a number of groups with limited activity and the groups soon fell into disuse as they lacked a sustainable purpose.

The second lesson was that without a method to gather either subjective or objective value there is no way to identify what value the individual, a project or Anethum Corporation received from the operation of the social networking system. Without that information, it is difficult to justify the fiscal and time expenditures on the system from an individual, project or organizational perspective. This lack of monetary value or list of benefits attributed to an individual, project or the organization actors increased the difficulty in achieving adoption

because there is no measurable benefit and it is more difficult to quantify the distinct advantage produced by Connectivity.

The third lesson was the negative result of restricting access in response to client concerns about confidentiality. This demonstrated the effect of Metcalfe's in a negative manner demonstrating that the reduction of each node in the network quickly reduced the overall value not by a single node, but by each connection to that node.

BSV APPLIED TO CONNECTIVITY

In the second iteration the BSV was applied to Connectivity to generate three social structures of "Organizations", "Communities of Practice" and "Projects" that consist of fourteen actors. Six actors are individual actors and ten are group actors, four of the group actors are "Organizations" or legal entities that include AU, KC, SKG and Anethum Corporation. There are also two "Communities of Practice" named Research Interests and Entrepreneurship which serve as key business areas for Anethum Corporation, and four "Projects", including MPT and rPet, which are sub-projects of a Transmedia project, and the SKC project. A logical diagram of BSV as applied to Connectivity is shown in Fig. 12

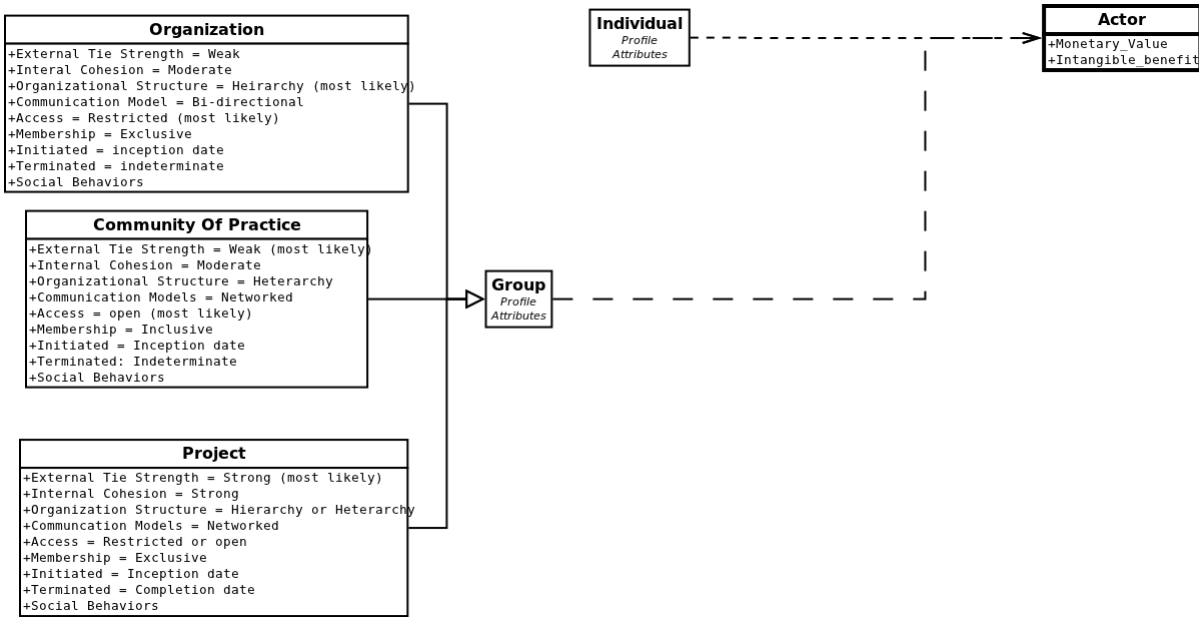

Figure 12: BSV applied to Connectivity

ORGANIZATIONS.

The actors of the organization type are Anethum Corporation, KC, AU and SKG. The initial values for the nine attributes for organizations in Connectivity are shown in Fig. 13 as well as the link to the Actor class. This link provides data storage for the subjective monetary value and intangible benefits for each instance of the class and in this example that would be for Anethum, AU, KC and SKG. These groups are moderate to large and focus on adoption and implementation as well as the control processes to meet organizational objectives.

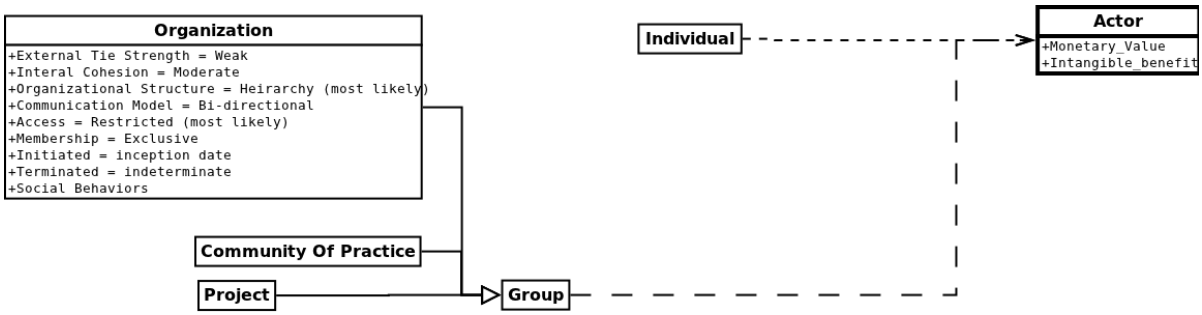

Figure 13: Attributes of Organizations in Connectivity

This design is implemented in the Elgg framework through group wikis, discussions, blogs, podcasts and RSS feeds to view external support materials. All four organizations in Connectivity are implemented as "closed" Elgg groups and require an invitation. The widgets on the main group page such as polls serve the purpose of demonstrating and reinforcing perspectives shared among the actor's membership as well as gathering information. The inheriting of security defaults, rights and privileges would have been useful at this level as significant work is related primarily to the organization. One group also raised confidentiality concerns and these concerns could have been mitigated with group level defaults applied to this class.

The attributes are used as a tool to analyze stakeholder groups and while all four entities are legal organizations the objectives of the Anethum entity is quite different that the objectives of AU, KC and SKG in this social networking system. The attributes and their values are shown in Fig. 14 with attributes targeted for change highlighted.

Figure 14: Organizations in Connectivity

The Anethum group is used to facilitate human resource requirements by focusing

communications on the audience of Anethum's employees and contractors. This includes policy, mentoring and collaboration tools to facilitate communication, engagement and loyalty with geographically separated personnel. The audience for this group consists of four interns, one employee and four contractors in the province of Alberta, British Columbia and the state of New York. The intent of this actor for Anethum is to increase effectiveness in Human Resources Management and overall organizational performance. From the model there is an intention to move the **External Tie Strength** from weak to strong suggesting the need for the business to develop appropriate client relationship building programs and training for personnel as well as the potential for changes in marketing approaches. The **Communication Model** is identified as moving from bi-directional to networked suggesting significant interaction and engagement between all personnel as a method of strengthening **Internal Cohesion** with management's intention of increasing productivity, retention and workplace satisfaction.

The AU, KC and SKG are examples of the clientele to whom Anethum Corporation markets their services. This includes a variety of artifacts that may include policies, processes, knowledge exchange, intellectual capital creation, digital artifacts and educational materials including course materials. The intent of these actors are to describe the target market, facilitate communication to those clients and to increase customer loyalty and the effectiveness of Anethum's services. The **External Tie Strength** for all clientele is weak, as the intention is to attempt to create many bridges rather than few strong relationships. The **Communication Model** is identified as moving from bi-directional to networked suggesting that there will be a movement from communication between Anethum and individual clients

to interaction and engagement among all members of the network.

The remaining attributes are descriptive but are the same for both Anethum and the three example clients. However there are some limitations in the model as Anethum has an **Internal Cohesion** that is strong as opposed to moderate for the three other actors in the class. This highlights that the Anethum group is used differently than the AU, KC and SKG groups and could have been described as a unique group. All of the clientele moving to a networked **Communication Model** supports engagement and the potential for serendipity in the creation of opportunities which is positive but also comes at a risk of clientele engaging each other directly. The theoretical solution to this is that positive relationships will build trust and identification[94] to create social capital as the actors interact and those relationships will trump knowledge exchange or pricing. This social capital would be leveraged to generate intellectual capital as described by Nahapiet and Ghoshal and diagrammed in Appendix C, but is not communicated by the model. The as-built description of the actors in Fig. 14 describes **Internal Cohesion** for AU, KC and SKC as moderate, however there was an increase in ownership and commitment to using the Elgg group when branding in the form of customized graphics was included for SKG. So while the implications of the branding behaviours on cohesion are unclear, the specification accomplishes the task of exposing the need to consider the strength of cohesion desired. The organizations as specified support the application of some of Hedlund's knowledge transfer ideas[95] between organizations and inter-organizational domain as diagrammed in Appendix B. This would be used to increase the rate of adoption of an innovation as each organization effectively forms clusters of homophily,[96] or like groups. One such strategy

would be to engage the management hierarchy as part of influencing the group as a whole. As an analysis tool, applying the BSV has facilitated a better understanding of the activities and actions related to the operation of Anethum and supporting the organizations human resources functions. For the organizations that contribute to the client base the specification provides a better understanding of the target market and can facilitate the development of brands of similar clients for marketing purposes.

COMMUNITY OF PRACTICE.

The first iteration of Connectivity showed the need to have a focal point beyond a project. Using the BSV we elaborated on two common areas to exchange knowledge in a particular area of interest facilitating the application of this knowledge by professionals in their practice. The two Communities of Practice, Research Interests and Entrepreneurship serve as key business areas for Anethum Corporation. These are directed to an audience based on a specific interests and active professional use that forms the basis for the community of practice, where membership cuts across other groups in the network. These groups have a moderate membership and focus on knowledge management and transfer diffusing innovation across organizations.

The initial values for the nine attributes for communities of practice in Connectivity are shown in Fig. 15 as well as the link to the Actor class. This link provides data storage for the subjective monetary value and intangible benefits for each instance of the class and in this example that would be for Research Interests and Entrepreneurship.

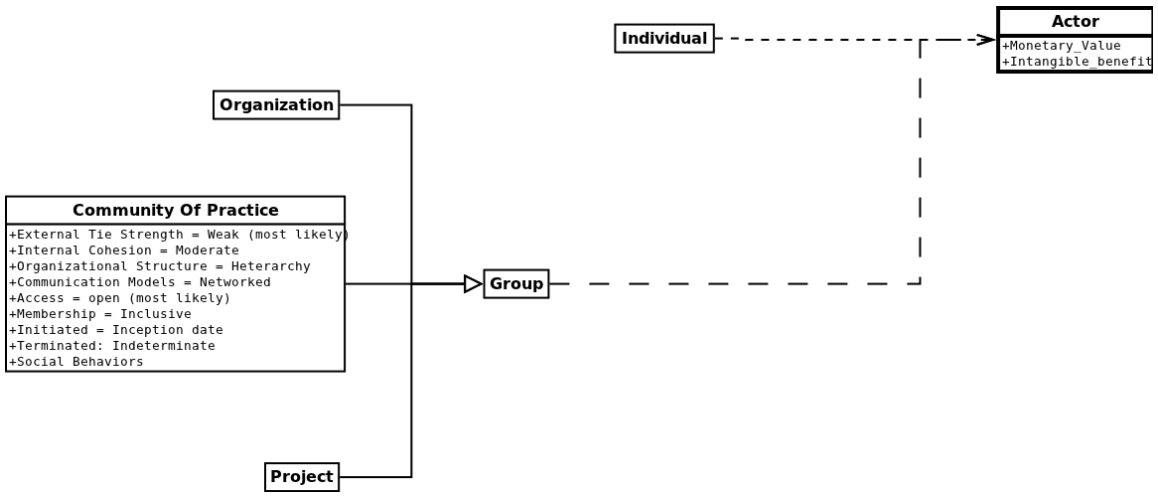

Figure 15: Attributes of Communities of Practice in Connectivity

Here the attributes are used as a tool to analyze stakeholder groups for two groups that are informal groups that are supported by the Anethum Corporation. Both communities focus on engagement and knowledge transfer. The attributes and their values for the Research Interests and Entrepreneurship communities of practice are shown in Fig. 16.

Figure 16: Communities of Practice in Connectivity

The Community of Practice (CoP) as specified are implemented in Elgg as an "open" group with a default privacy setting of logged in user, as opposed to public. This facilitates certain norms and behaviours within the group that Anethum wishes to promote, while not

being too exclusive and thus reducing the ability for the community of practice to expand and enrol new members. The main group page has several widgets including polls and discussions as well as RSS feeds to provide external supporting materials with crafted group blogs and podcasts, and the RSS Import functionality, which takes a RSS feed and imports it into the system so that it can be manipulated. These widgets are important in a Community Of Practice, as the purpose of the group is not increased consumption of broadcast materials, but rather to consume and comment, allowing the shared interpretation of the material. As used in Connectivity, Communities Of Practice rely more on wiki support for the creation and maintenance of the knowledge repository than blogs for communicating individual opinions.

The Research Interests and Enterpreneurship groups are intended to increase the quantity of ties rather than strengthening existing ties, based on the premise that many heterophilous weak ties[97] increases the diffusion of an innovation, that will subsequently accelerated through a homophilous group. With Anethum, most innovations are typically newly created intellectual capital. In the Connectivity case, the community of practice groups provide the initial diffusion of the innovation, while the organizational groups are intended to accelerate the rate of adoption within organizations. This design supports serendipity in the creation of intellectual capital which is appropriate for both community of practice actors. Communities of practice support the four relational dimensions for developing social capital as described by Nahapiet and Ghoshal which is diagrammed in Appendix C. The as-built description of the actors in Fig. 16 describes **Internal Cohesion** for Research Interests and Entrepreneurship as moderate, however given the positive experience with ownership and commitment as demonstrated by customized graphics it may be appropriate to have an

increased **Internal Cohesion**. The communities of practice as specified support the application of some of Hedlund's knowledge transfer ideas[98] as diagrammed in Appendix B. This would be used to increase the rate of adoption of an innovation as each organization effectively forms clusters of like groups. The BSV provides a language to solidify the need of a common area to discuss research and entrepreneurship into Communities of Practice. The specification facilitates strategic thinking for the organization as demonstrated by the focus on two Communities of Practice as well as the tactics that are used to grow the communities.

PROJECTS.

The first iteration of Connectivity used Elgg development and SKC project groups which demonstrated their usefulness in facilitating discussion and as resource centres for the projects. Projects are effectively temporary abstract structures that may evolve to more formal or permanent structures. As a temporary structure they act as a resource centre and focal point for a project. The second iteration of Connectivity that resulted from applying the BSV generated four projects, Transmedia, MPT, rPet and SKC. These groups are small in size focusing on the creation of intellectual capital and knowledge transfer. The members of these actors are also involved in other actors, such as organizations or communities of practice.

The initial values for the nine attributes for projects in Connectivity are shown in Fig. 17 as well as the link to the Actor class. This link provides data storage for the subjective monetary value and intangible benefits for each instance of the class and in this example that would be for Transmedia, MPT, rPet and SKC.

The attributes are used as a tool to analyze stakeholder groups for the four temporary

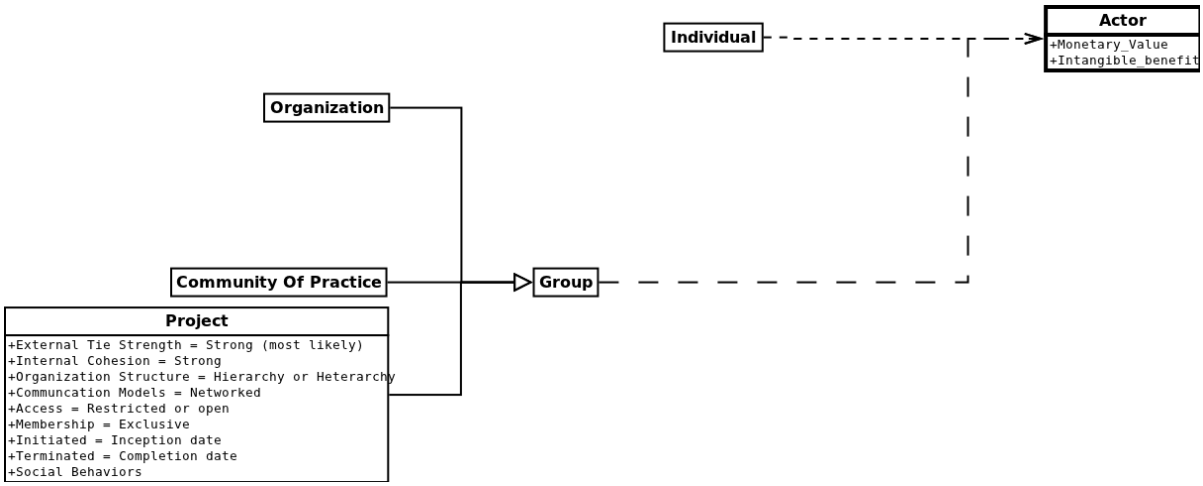

Figure 17: Attributes of Projects in Connectivity

groups in this example. These projects focus on intellectual capital creation and knowledge transfer. The attributes and their values for the Transmedia, MPT, rPet and SKC projects are shown in Fig. 18.

The projects as specified have been implemented in Elgg as a "closed" group. The

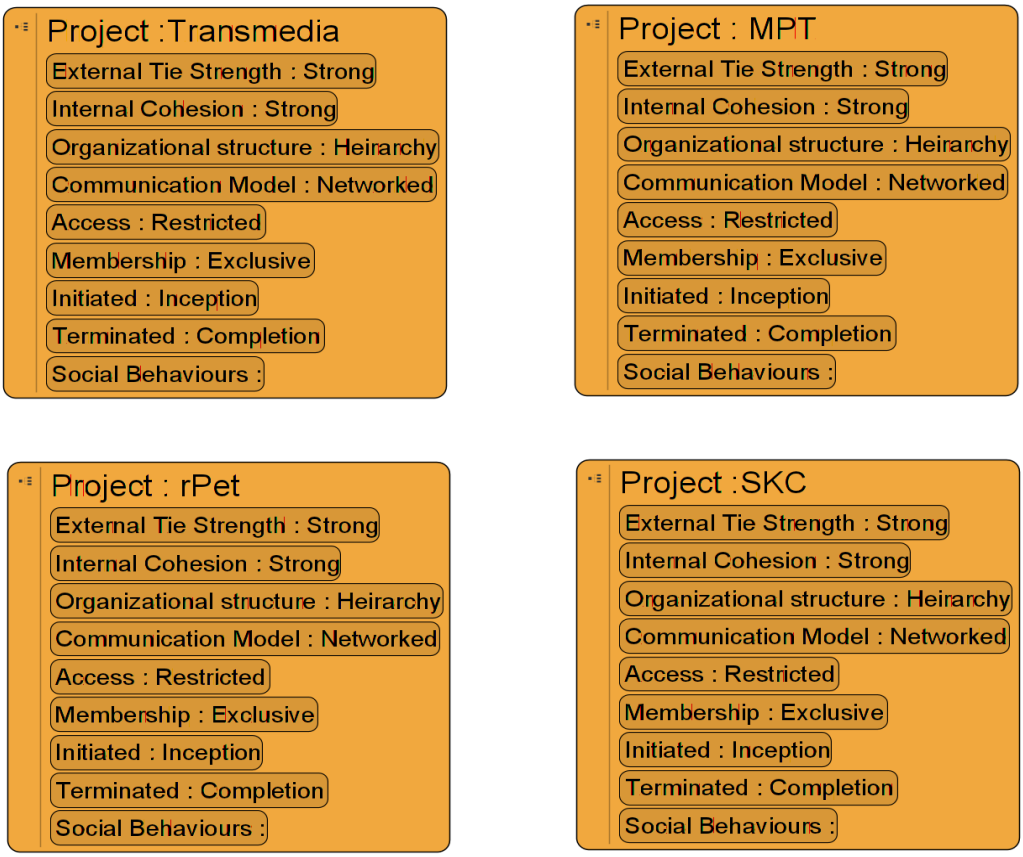

Figure 18: Projects in Connectivity

main group page has several widgets including discussions as well as RSS feeds to provide external supporting materials informational group blogs and podcasts. The RSS Import functionality, which takes a RSS feed and imports it into the system to ensure comments and reference material are available if necessary is especially useful for project knowledge repositories. Like the community of practice, these widgets are important for projects because the purpose is to consume and comment generating a shared interpretation of the material as well as new intellectual capital. As used in Connectivity, projects rely more on wiki support for the creation and maintenance of the knowledge repository and social bookmarking for reference materials rather than blogs for communicating individual opinions or reflections. Some projects are best dealt with as sub-projects and in those cases the ability to inherit default settings would be useful.

These groups focus on strengthening existing ties among the actors membership as well as high cohesion to increase performance. This design does not inherently support serendipity, however carefully choosing to periodically open specific blog posts or wiki pages to the network may be advantageous. For projects, the BSV as used was more of a documentation rather than analysis tool. The groups provides a single location for discussions, files, wikis and resources with a relatively simple read/write capacity and the specific requirements are documented through the BSV.

LESSONS LEARNED FROM APPLYING BSV TO CONNECTIVITY

Several lessons were learned during the second iteration using BSV on Connectivity. The first lesson was the importance of multiple types of structures to facilitate and propagate interaction. The relatively simple example of Connectivity used only three types of social

structure, specifically Organizations, Communities of Practice and Projects, and interactions increased from sporadic in the first iteration to twenty or thirty posts on a single discussion topic in the second iteration with the communications becoming directed broadcasts to a small audience.

Second, the design of sub-classes that represent stakeholders is non-trivial and requires special attention to objectives and metrics to prevent groups from blending together into less effective sub-groups. The objectives and measures for success were unclear, resulting in a lack of clear purpose for "Organizations" and that had a negative effect on marketing activities. Additions to the BSV and ESV-TUV in the future should resolve these issues. These same issues impacted the Anethum Corporation group, in deciding whether it should have a separate definition or continue to use the established "organization" pattern. With increased definition, the implications of additional types of groups such as "Partnering Alliances", to describe the legal working relationships that cross organizational and project boundaries, become more clear.

The third lesson was the need to expand the scope of the example to go beyond structure and include value. There is insufficient data in the Connectivity example to do a statistical validation of the data or even demonstrate how basic or extended value is collected. While this example succeeds with the initial intention of showing that BSV provides a better description of the stakeholders so that strategies and tactics for those stakeholders can be implemented there is no provision to for value.

Connectivity has served as the impetus for creating the BSV, with the second iteration described in this work as an example application to clarify how the BSV model could be

implemented and the impact that could have on a social networking system. The stakeholder component of the model is an analysis tool and is platform independent. It requires no additional code, describing the stakeholders of a social networking system that serves knowledge management and intellectual capital creation functions. The basic value component is premised on data gathering and transparency and has only been discussed as a conceptual design. Implementing the BSV would provide a solution to the problem of what value the social networking system provides as well as transparency to facilitate adoption of the system. If new types of stakeholders emerge it is appropriate to have a language to understand why they have come into existence and ascertain whether they should be supported by the system, as well as the impact they will have on the system and the other stakeholders. The simple network created in Connectivity is a heterogeneous network composed of multiple “Individuals”, “Communities Of Practice”, “Projects” and “Organizations”. Using the BSV the similarities and differences between actors are clarified and strategies to achieve higher levels of satisfaction can be implemented. Quinn expressed the viewpoint that,

> "with rare exceptions, the economic and producing power of the firm lies more in its intellectual and service capabilities than its hard assets-land, plant and equipment . . . .”[99]

The BSV and ESV-TUV help clarify the intellectual and service capabilities of an organization making the stakeholders contributions more transparent. Additional data gathering will assist in understanding whether the Ghoshal and Nahapiet hypothesis on applying social capital to generate intellectual capital shown in Appendix C generates

positive results. The conceptual design of the ESV-TUV applied to Connectivity has been included in Appendix D as a proposed system for data acquisition. The stakeholder specification may be driven by the objectives of the social networking system, however the design for the TUV is driven by whether this is the appropriate extended value system. As such, either BSV, or ESV-TUV could be applied to a different social networking system like the AU Landing where only the analysis of the stakeholders would change, while the code for the Actor and Actor_member_defaults classes would remain unchanged.

ISSUES, CHALLENGES AND TRENDS

Actor-Network Theory and the premise that all nodes could be treated the same is the theoretical underpinning that led to "personifying" abstract social structures. When groups are viewed simply as clustering based on common factors that can reduce social distance, it supports separating the similar and dissimilar attributes of the actors. The dissimilar attributes can be attached to sub-classes of groups for a more complete description, providing a clearer picture of the stakeholders in a social networking system. What constitutes value for those stakeholders is more difficult to identify, but identifying stakeholders and applying subjective monetary values provides a basic perspective on stakeholder value in social networking systems for developing intellectual capital. Value can be extended using a framework of motivational values. These proposals have been developed based on multidisciplinary research, Actor-Network Theory contributing to the personification of actors and the application of a motivational value theory.

The approach used presents several challenges, in that multidisciplinary readings from sociology, business, economics, management, e-learning and information technology,

result in the coverage being breadth first, rather than depth first. This raises the issue that there may have already been coverage in another discipline, but more importantly there may be conflicts in terminology from different domains. This work used an Information Systems integration approach to bring concepts from different domains to produce a conceptual design, however it is not conclusive. This would allow the gathering of data, but requires additional statistical validation and does not assist in the interpretation of that data

The Schwartz Theory of Universal Values was used to generate a conceptual design because studies have shown it is valid across numerous cultures and has some application when scaled to larger clusters. Initial research shows application in a number of fields at the individual and organizational levels in the work of Schwartz, Borg, Groenen, Jehn and Bilsky as well as application to creativity research from Dollinger, Burke and Gump and organizational leadership behaviour in Berson, Oreg, and Dvir. What is proposed as a conceptual design needs to be implemented on a social networking system with sufficient users to produce data to refute or verify the usefulness of applying TUV to actors in a social networking systems.

Future analysis including statistical validation of the data gathered through the application of the ESV-TUV might validate or refute hypothesizes that divergence from the group may provoke certain behaviours, or cause specific structures to form. The results of the Schwartz's Value Inventory may not have significant variation except in terms of critical life events. If that is the case, then it may be more appropriate to design as a single questionnaire rather than multiple responses perhaps with default values. This would appear to limit the effectiveness of using this as a frequent feedback mechanism, a limitation when

frequent feedback is considered good practice. Overall, at this point we are only able to through an implementation of the ESV-TUV to gather data and any interpretation of that data should be part of future social science research.

The use of Actor-Network Theory, is not intended to suggest abstract social structures gain consciousness or the ability to act as moral agents[100], but rather that it is useful for understanding and modelling behaviours in a social networking system. In this model the use of ANT has been limited only to individuals and clusters of individuals primarily because this work deals with stakeholders and uses human values in the ESV-TUV, a Heterogeneous Network rather than the Multidimensional Network described by Contractor, Monge and Leonardo[101]. If at some future point a consensus is reached on a value definition for non-humans then a unified or parallel value theory might be practical but that would still focus on value definitions of the actors. The appropriateness of personifying groups is also supported by the use of abstract data types being a common practice in developing business software as demonstrated by actors in UML being either humans or systems,[102]; Benkler also recognizes that it is widely accepted to treat organizations or communities as legal entities or "persons".[103]

The lack of a common definition of value, especially considering both monetary and non-monetary aspects is a concern. Gathering subjective monetary values and short descriptions of benefits is an implementation decision recognizing that even if a discipline had a single value concept, the multidisciplinary nature of this work complicates any standard definition. By constructing what is proposed and gathering the data from a social networking systems, patterns of intangible benefits are likely to occur. These patterns could

suggest the appropriateness of extending the value, or some other value that may be indicated by an emerging concept that can encapsulate a single value.

CHAPTER V

FUTURE RESEARCH

This work provides a number of opportunities for future research the first being a classification system that encompasses how social networking systems can be applied in the domains of;

- Knowledge management
- Social and intellectual capital development.
- Education for both distance and blended learning.
- Customer relationship management
- Relationship marketing
- Therapeutic applications.

This could be similar to how Kaplan and Haenlein classified Social Media by social presence/media richness and self-presentation/self-disclosure [104] but instead represents how they could be applied in these domains. Both Connectivity and the AU Landing provide social networking systems that support blogs, collaborative projects and content communities suggesting the need to extend beyond Kaplan and Haenlein proposition of classification based on social presence / media richness and self-presentation/self-disclosure.

The second opportunity would be the extension of the BSV and ESV-TUV with objectives and metrics. The initial question focused on describing stakeholders which has

been done, but now we have the basis to move beyond simple descriptions. The first step would be to validate the nine structural attributes and then develop appropriate objectives and metrics.

The third area is to explore the monetary versus non-monetary perspective on value that has been demonstrated in business with the triple bottom-line[105] and how that would map to social capital or recognition. The question of the costs of exclusion[106] is particularly interesting in the context of this work as the use of the modified Beckstrom's law suggests that both monetary and non-monetary exclusion costs could be identified, or perhaps viewed as opportunity costs.[107]

The fourth area of exploration would be to implement the ESV-TUV in an active social networking system to gather TUV data for all actors in the system. This would provide data that may help to validate or refute the use of TUV for both individuals and groups as well as the impact of differences in values between actors and the members of that actor. Additional exploration of values in social psychology versus value in economics, and research on which is more applicable for the development of social networking systems, is a rich area for exploration.

CONCLUSIONS

Social networking systems can be used for many different purposes, the focus in this work has been on applications for collaboration and the development of intellectual capital. Their complexity is not technological, but rather sociological in that their value is hidden in the interactions between individuals and a variety of social structures. Some of the most well known are not the most complex, but as we stand poised for extensive growth in the

application of social networking systems it is prudent to have a better understanding of what to construct. The first question asked was “How can we describe the stakeholders of a social networking system?”. This work has proposed the Basic Stakeholder Value (BSV) as a method to clarify who the stakeholders of a social networking system are, described through the use of nine structural attributes so that strategic and tactical actions can be taken to better serve those stakeholders. The application of this part of the BSV has been demonstrated using the example of the second iteration of the Connectivity, a social networking system implemented for knowledge management and intellectual capital generation in a geographically distributed technology consulting firm. The second question was, “How can we measure the value those stakeholders obtain in a social networking system for collaboration and the development of intellectual capital? This work has proposed a subjective monetary value and intangible benefits that can be quickly implemented and used to calculate network value using Beckstrom's law. In this work an Extended Stakeholder Value applying the Theory of Universal Value (ESV-TUV) has been proposed to explore more detailed valuation approaches that may be tailored to specific types of social networking systems such as systems for the knowledge management and the creation of intellectual capital.

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GLOSSARY

actors - individuals or groups that interact in a socio-technological system.

actor-network theory (ANT) – a "material-semiotic" theory that best known for attributing agency to non-humans. The theory maps relationships between material (things) and semiotic (concepts).

basic stakeholder value (BSV) – a simple form of value that includes a subjective monetary value as well as text descriptions of intangible benefits for stakeholders.

blogging – a verb to describe the actions of creating or adding to a web log, or discussion about some topic which is accessible through the internet. Typically blogs will allow some user comment capability. Adoption has moved from individuals in the 1990's to multiple individuals or organizations.

beckstrom's law – A theorem developed by Rod Beckstrom which proposes that the value of a network is equal to the net value of each user's transactions summed over all users.

empathy map – a tool to help analyze user needs. It is based on separating a workspace into four quadrants containing quotes and defining words on what the users say, actions and behaviours the users took, an examination of what the user might be thinking and what emotions the user might be feeling.

genuine wealth – the economic and well-being framework developed by Mark Anielski which includes human, social, natural, built and financial wealth

heterarchy – a system of organization where no one method of ranking is better than the other but rather difference. In networks heterarchies may have elements which play an equal role. It is an effective model for information dissemination.

heterogenous networks – are composed of dissimilar nodes, in the case of social networks they have been described in this work as individuals and multiple types of groups composing the network.

heterophilous – the love of the different or tendency to collect in diverse groups. Recognized as most notable in organizations that are successful in promoting innovative environments.

hierarchy – a system of organization where items are represented as "above", "below" or "at the same level" This is commonly referred to as a tree-structure and a very common organizational model in North America. It is a very effective model for control.

homophilous - the love of the different or tendency to collect in similar groups.

initial public offering (IPO) – the first time a public company's shares are offered to the public. This typically marks the transition of the company from a private company to a public company.

intangible benefits – benefits that do not have direct measurable monetary value.

intellectual capital - refers to all of the intellectual skills and information resources available to an actor, whether that actor be an individual, project, organization or some other type of group. It is a measure of intellectual potential or resource for creation and construction.

intellectual property (IP) - refers to the legal rights to creations of the mind. Intellectual property focuses on who owns inventions, literary and artistic works, and symbols, names, images and designs.

knowledge management – the domain that focuses on strategies and practices used to identify, create, represent, distribute and facilitate the application of insights and experience. This includes different types of knowledge such as "tacit knowledge" and "explicit

knowledge".

metcalfe's law – the theorem attributed to Robert Metcalfe which states that the value of a telecommunications network is proportional to the square of the connected users. This has more recently been applied to social networks.

m-form corporation – a multi-divisional form of organization consisting of a number of divisions using a top-down management structure.

micro-blogging – a broadcast form of blogging that consists of short messages. An example of this is twitter with a 140 character maximum posting size.

multidimensional networks – the premise that networks may be material-semiotic or contain both people and things both of which can interact and have relationships with each other.

n-form corporation – a suggestion for a different style of corporation that is focused on rapid innovation and information dissemination rather than the control that is more common to the m-form corporation.

podcasts – typically short audio broadcasts rather than the textual broadcasts of blogs. This may also refer to the video casts which are steaming video often available for download.

reed's law – the assertion of David P. Reed that social networks scale exponentially with the size of a network growing much more rapidly than what should be expected with Metcalfe's law.

return on investment (ROI) – is a way of defining profit from the money that was invested.

sensitivity analysis – is an approach in defining how uncertainty in output can be apportioned to uncertainty in the input. As used in this work a subjective monetary value is attached to a network node that is subject to indistinct influences.

social capital - refers to the potential resources that are available through the relationships in a social unit

social distance - is the perceived distance between two actors that are nodes in the social network. It is not a physical distance, but rather based on common factors such as race, religion or social class.

social media – defines a class of media systems that facilitate interaction between individuals and groups. These systems vary in the amount of social presence, media richness, self-presentation and self-disclosure enabling a variety of new ways for geographically distributed actors to interact.

social network – is a combination of actors and relationships which define the mesh in which an actor exists. This is sometimes used as a shorthand terminology for social networking systems.

social networking systems (SNS) – are the information communication technologies used to build and maintain a social network.

stakeholders – a person, group or member who affects or can be affected by the actions of the system.

schwartz value inventory – is a 56 item questionnaire developed by Shalom H. Schwartz to measure basic human values. It has been tested in over 67 countries and has been used to study motivations in religious belief, political orientation, social group relations and consumer behaviour.

tangible costs – a cost that has a direct monetary value.

tangible benefits – a benefit that has a direct monetary value.

Theory of Universal Value (TUV) – a theory developed by Shalom H. Schwartz defining

ten universal human values and arranging those values in a wheel to demonstrate the opposition of certain values. The ten motivational types are achievement, benevolence, conformity, hedonism, power, security, self-direction, stimulation, tradition, and universalism.

triple bottom-line – measures an organization or initiative with financial, personal and environmental bottom-lines. This multivalued approach is intended to produce a better overall result than a focus only on financial results.

wikis – are internet applications that allows users to add, modify and delete content in a collaborative manner. The term "wiki" is Hawaiian in origin and means "fast" or "quick".

virtual world – is an online world where users can interact either with each other or persistent world objects. These worlds may be focused on a specific game universe (eg. World of Warcraft) or a more generic system (eg. Second Life) for training or collaboration.

APPENDIX A – SCHWARTZ VALUE SURVEY

As a guiding principle in my life, this value is...

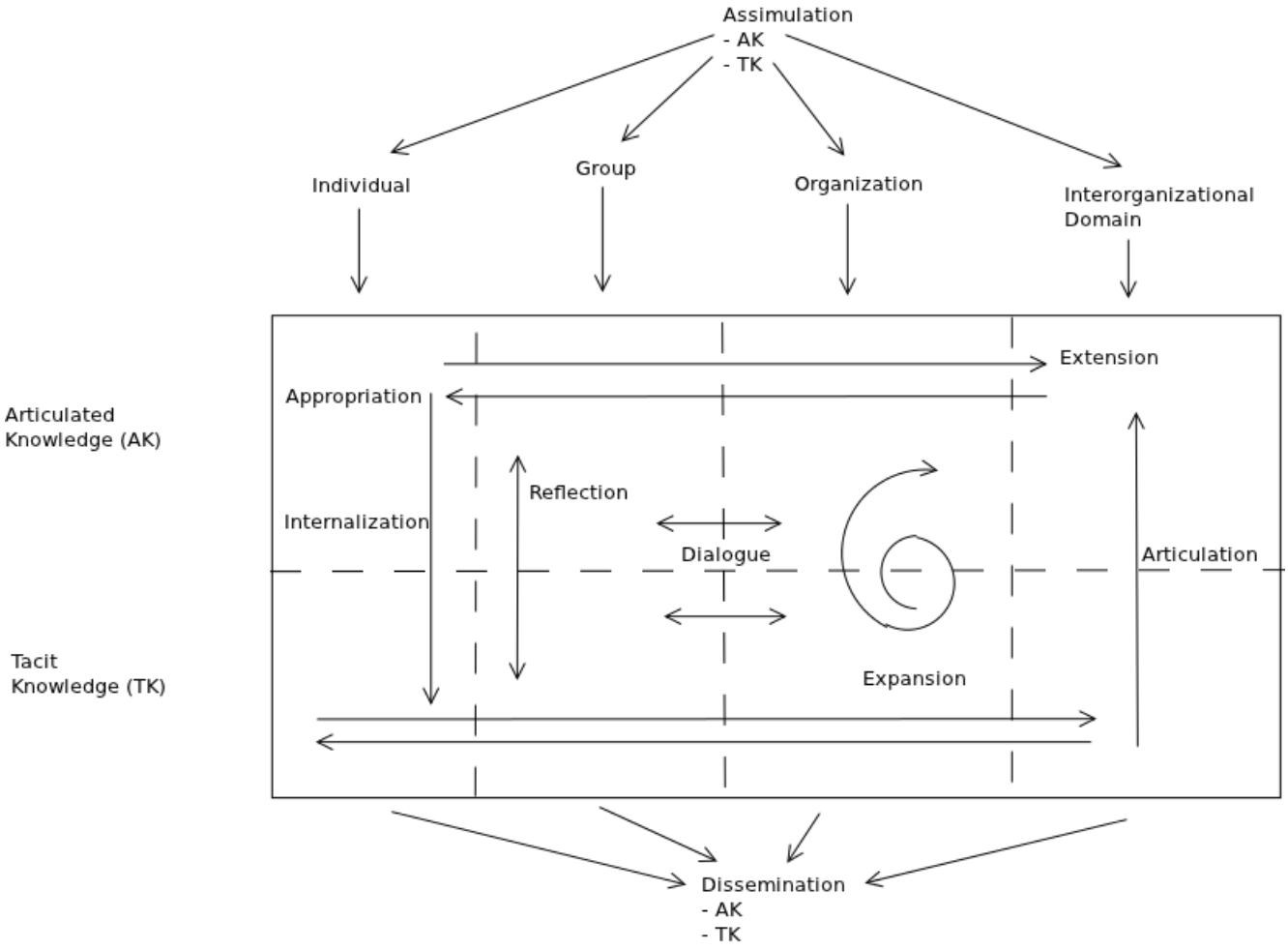
opposed to my values	-1
not important	0
important	1, 2, 3, 4, 5
very important	6
of supreme importance	7

1. Equality (equal opportunity for all)
2. Inner harmony (at peace with myself)
3. Social power (control over others, dominance)
4. Pleasure (gratification of desires)
5. Freedom (freedom of action and thought)
6. A spiritual life (emphasis on spiritual not material matters)
7. Sense of belonging (feeling that others care about me)
8. Social order (stability of society)
9. An exciting life (stimulating experiences)
10. Meaning in life (a purpose in life)
11. Politeness (courtesy, good manners)
12. Wealth (material possessions, money)
13. National security (protection of my nation from enemies)
14. Self-respect (belief in one's own worth)
15. Reciprocation of favors (avoidance of indebtedness)
16. Creativity (uniqueness, imagination)
17. A world at peace (free of war and conflict)
18. Respect for tradition (preservation of time-honored customs)
19. Mature love (deep emotional and spiritual intimacy)
20. Self-discipline (self-restraint, resistance to temptation)
21. Detachment (from worldly concerns)
22. Family security (safety for loved ones)

23. Social recognition (respect, approval by others)
24. Unity with nature (fitting into nature)
25. A varied life (filled with challenge, novelty and change)
26. Wisdom (a mature understanding of life)
27. Authority (the right to lead or command)
28. True friendship (close, supportive friends)
29. A world of beauty (beauty of nature and the arts)
30. Social justice (correcting injustice, care for the weak)
31. Independent (self-reliant, self-sufficient)
32. Moderate (avoiding extremes of feeling and action)
33. Loyal (faithful to my friends, group)
34. Ambitious (hard-working, aspiring)
35. Broadminded (tolerant of different ideas and beliefs)
36. Humble (modest, self-effacing)
37. Daring (seeking adventure, risk)
38. Protecting the environment (preserving nature)
39. Influential (having an impact on people and events)
40. Honouring of parents and elders (showing respect)
41. Choosing own goals (selecting own purposes)
42. Healthy (not being sick physically or mentally)
43. Capable (competent, effective, efficient)
44. Accepting my portion in life (submitting to life's circumstances)
45. Honest (genuine, sincere)
46. Preserving my public image (protecting my “face”)
47. Obedient (dutiful, meeting obligations)
48. Intelligent (logical, thinking)
49. Helpful (working for the welfare of others)
50. Enjoying life (enjoying food, sex, leisure, etc.)
51. Devout (holding to religious faith and belief)
52. Responsible (dependable, reliable)
53. Curious (interested in everything, exploring)

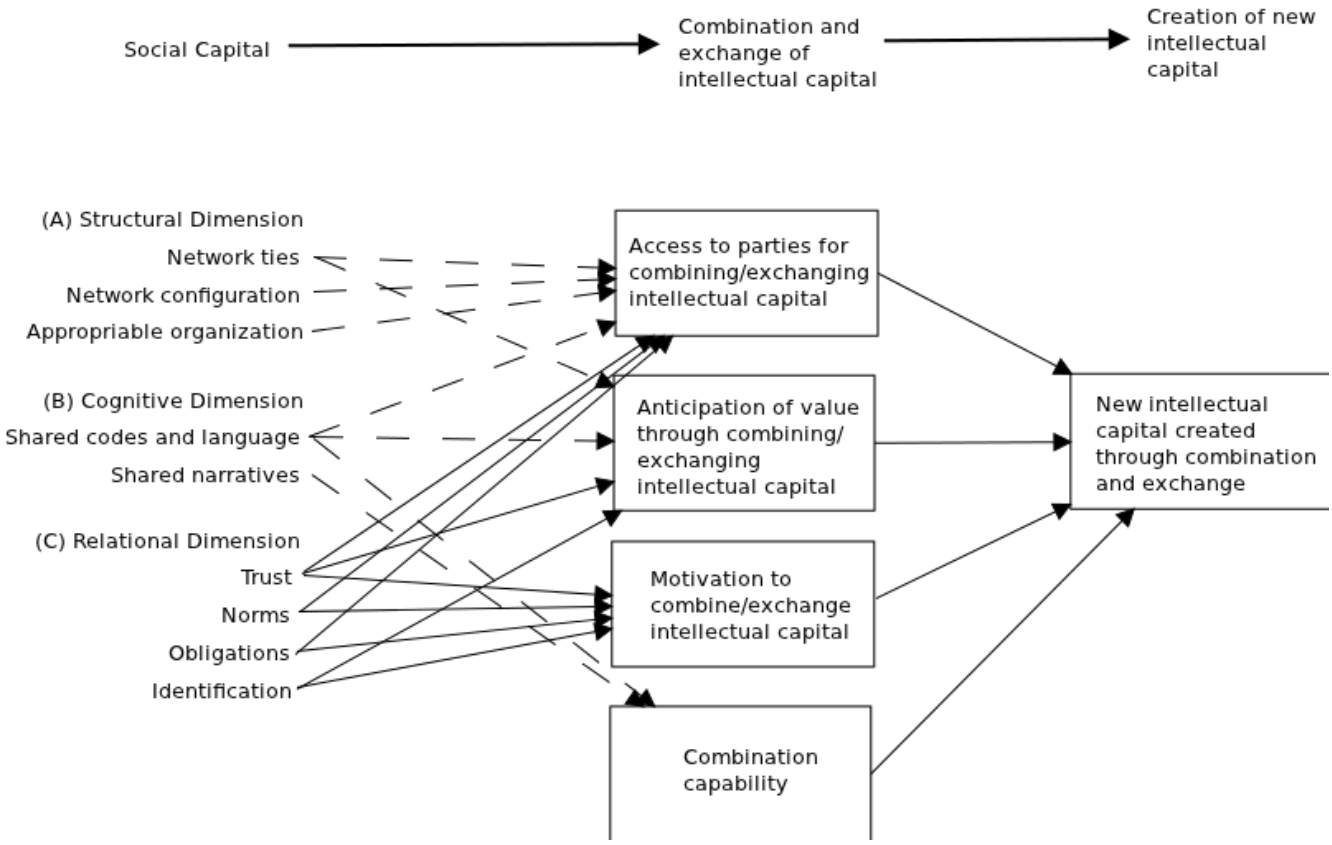
54. Forgiving (willing to pardon others)
55. Successful (achieving goals)
56. Clean (neat, tidy)

APPENDIX B – KNOWLEDGE TRANSFER



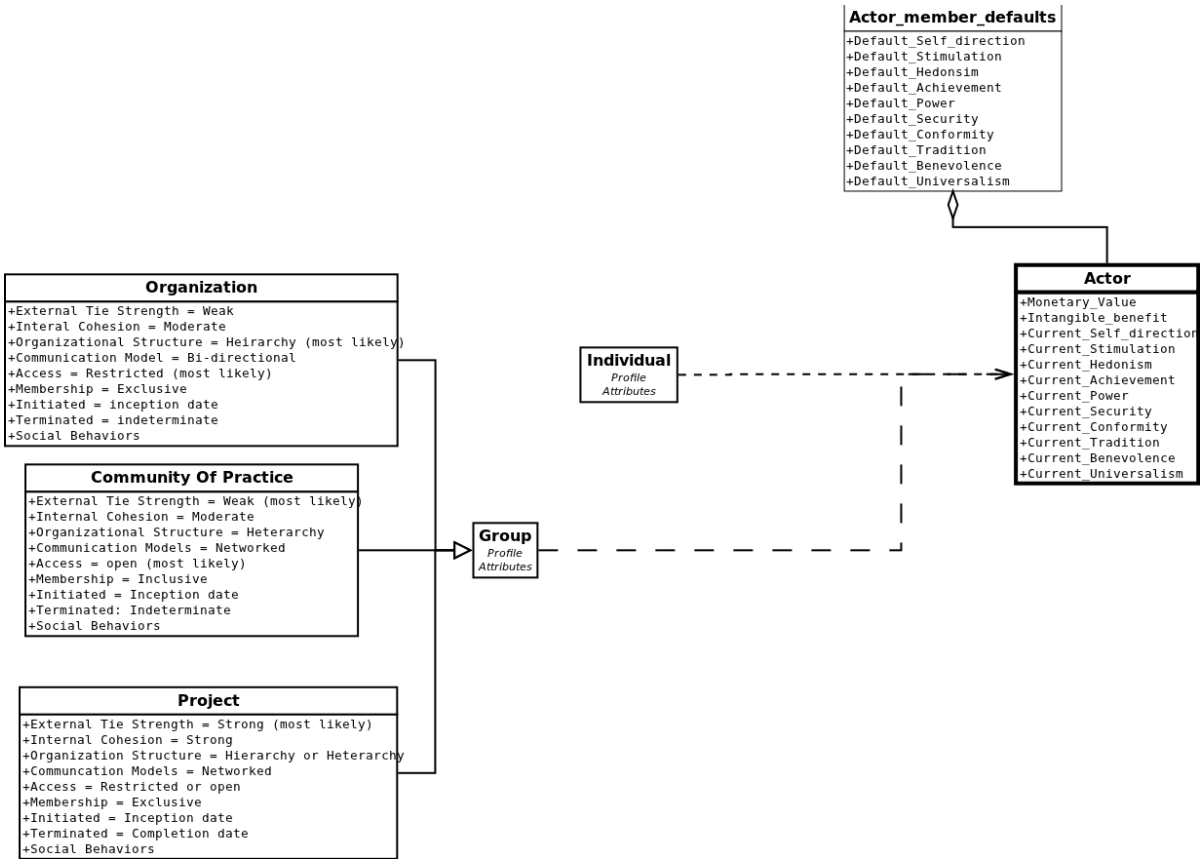
Different types of knowledge transfer accomplished through actors. There is an interplay of structure in the form of Individuals, Group, Organization and Inter-organizational Domain. Processes which cross structures, for example dialogue, extension and appropriation or are within the structure, for example internalization, reflection, expansion and articulation. The articulated knowledge and tacit knowledge suggest different types of knowledge.

APPENDIX C – SOCIAL CAPITAL TO CREATE INTELLECTUAL CAPITAL



Note the relational dimensions which suggest alignment with the external ties between actors. Cognitive dimensions were not discussed and likely would be best described through data passing through a relationship or interaction.

APPENDIX D – ESV-TUV APPLIED TO CONNECTIVITY



Note the default values class that provides detail data for every member of an actor group. This is a “default” because it is the motivational values validated by each member in context of the actor. It is unknown if motivational values will be stable when put into context of a group.