An Integrated Public Service System (IPSS) Utilising Complexity and Network Theory in the Enhancement of Public Value (PV)

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ABSTRACT

An integrated public service system (IPSS) is highly feasible as a system geared to the production and measurement of public value (PV), utilising stakeholder engagement, relationship building and citizens' participation. This article draws on the established foundations of complexity, network and PV theory and sets out a case for intended research regarding the adoption and implementation of an IPSS in order to establish results, recommendations and limitations. An IPSS diverges from the current status quo in public management, which is characterised by bureaucracy, authoritarianism, fragmentation and excessive political-administrative control in shaping service delivery outcomes. In demonstrating the operability of an IPSS, a framework based on the principles of nonlinearity and interconnectivity and composed of four distinct 'productivity states', is outlined for the production and measurement of PV, i.e. the products of an IPSS. Network actors and stakeholders, as structural elements of an IPSS, appoint integrative leadership teams to assume responsibility for integration processes, network stability, feedback, innovation, resource utilisation and the growth of the IPSS through network strengthening and the formation of strategic alliances. IPSS management is described in relation to IPSS elements and the broad range of promoting and constraining factors emanating from stakeholder objectives and the complex environment.

INTRODUCTION

Public administration and management is generally found contained in a Weberian system of government and governance and is therefore absolutely influenced by it. The Weberian system is characterised by bureaucracy, hierarchy, an emphasis on rules and procedures, an exclusion of public participation and generally favours an 'elitist' democracy (Stoker 2006:44). This article presents an exploratory study of an integrated public service system (IPSS), based on a common set of principles derived from complexity and network theory, demonstrating feasibility for an alternative nonlinear approach to the creation and enhancement of public value (PV). An IPSS serves as a vehicle for embedding interconnectivity between the micro, meso and macro spheres of public engagement in order to effect and facilitate integration and the creation of PV. The citizen's role in an IPSS is important as citizens contribute to social and human capital generation.

The research problem in the South African context, as the pursuit for an alternative system for public management practice, characterised by efficiency, effectiveness and economy regarding the employ of scarce resources, information and capacity, networked governance and citizens' participation in terms an authorised stakeholders' status, in the creation and enhancement of PV. The follow up research question asks what system of public administration and management is suitable for the production of high levels of efficiencies in service delivery? A clear understanding and perspective of an IPSS, in terms of its nonlinearity, raison d'être, systemic 'network' elements, compatibility with complex environments and its capacity for PV creation and enhancement, becomes desirable.

The availability of literature in support of IPSS structure and operability is extensive. Complexity science is defined by Zimmerman, Lindberg and Plsek in Praught (2002:1) as "demonstrated in systems characterised by nonlinear interactive components, emergent phenomena, continuous and discontinuous change and unpredictable outcomes". Praught (2002:1) locates integration within the bounds of "chaos, self-organised criticality, complex adaptive systems, neural nets, nonlinear dynamics and far-from-equilibrium conditions". These views are shared by Capra (1997), Prigogine and Stengers (1984) and Randolph, Blasinsky, Leginski, Parker, and Goldman (1997). While complex nonlinear systems subsist in the real world, network theory emerges out of similar principles, well grounded by Burt (1992), Granovetter (1993), Gulati, Nohria and Zaheer, 2000), Ansell and Gash (2007), Breiger, Carley and Pattison, (2003) and Emerson, Nabatchi and Balogh (2011). The definition and content of PV is espoused in scholarly works by Moore (1995), Agranoff (2003), Bennington (2007), Bozeman (2009), Meynhardt (2009), Stoker (2006), Talbot (2008), Hills and Sullivan (2006) and Spano (2009).

The aim of this article is to produce a theoretical bases from which to argue that an IPSS is feasible given the permeation, penetration and exigency of complexity, network and PV theory.

A DEFINITION OF INTEGRATED SYSTEMS

The rationale employed in producing grounds for the phenomenon of complex adaptive systems, where network theory and analysis are embedded, constitutes the rationale for conceptualising an integrated system (IPSS). Bond, Curran, Francis, Kirkpatrick and Lee (2000:5–6) maintain that the formation of integrated systems would require "(i) procedural and organisational arrangements, (ii) methodological guidelines and (iii) the development of cross-disciplinary insights" with the involvement of partners.

Follet in Morse (2010:232), supported by Taylor and Doerfel (2005:122), hold that "integration is the uniting difference (points of view, interests, or ways of knowing) into something new that satisfies all interests without compromise or capitulation"; integration is thus a socio-managerial process, drawing the value potential of the parts of the system, i.e. networks, into a synergy-rich situation, resulting in accord, harmony, democracy and consensus among actors, i.e. network participants. Integration neutralises fragmentation, managerial authoritarianism and hierarchical dominance legitimised in policies and procedures which disallow large sections of society from meaningful engagement with government.

In arguing that the elemental composition of integrated systems is complexity and network theory, one sets about exploring phenomena that will open social governance modus operandi to new interpretations and possibilities. Byrne (1998:5) holds that complexity "is the precursor of order, not its antithesis". Byrne (1998:63) states that nonlinearity "reflect(s) the onset of cooperativity between the constituent elements". Mitleton-Kelly (2003:3) provides "ten principles of complexity and enabling infrastructures": "self-organisation; emergence; connectivity; interdependence; feedback; far from equilibrium; space of possibilities; co-evolution; historicity, and time and path-dependence". Estrada, Fox, Higham and Oppo (2010:7) offer a list of "quantitative features" for complex networks: (i) "clusters of well-connected communities", (ii) formation of "common sub-patterns", (iii) certain nodes (hubs) have a central role which display "special centrality or betweenness", (iv) "two groups or two nodes may have weak inter-group but strong cross-group connectivity". These features are not absolute but rather 'uncertain', implying the existence of opportunity. Juarrero (2010:1–3) provides a rationale for complexity science, and hence integrated systems, as a tool with which

one may understand cause and effect as arising naturally from the interactivity between 'actors'.

Kiel (1995:1–7) explains that complex systems "avoid mode lock-in", while they simultaneously allow the exploration of a wide "range of behaviors" in dynamic and "disproportionate" systemic states. He affirms that nonlinearity occurs in the "relationships between variables", where "uncertainty and unpredictability" are initiated by small stimuli. In line with what is expected from an IPSS, Nonaka in Kiel (1995:2) contends that complexity "widens the spectrum of options and forces the organization to seek new points of view", which is regarded as positive and progressive organisational behaviour. Plsek and Greenhalgh (2001:4) maintain that nonlinear systems such as an IPSS, support small differences in variability of social and related factors, which leads to larger variations in outcomes. This phenomenon became known as the *butterfly effect* arising from Lorenz's explanations of the interconnectedness of matter. Nonlinear systems behaviour, which proves difficult to interpret rationally, is referred to as "strange attractor" phenomena (falling outside of predictable mathematical parameters), since systemic motion, i.e behaviour is erratic and uncertain in states of non-equilibrium (Capra 1997:131; Prigogine and Stengers 1984:121; Byrne 1998:5–6). An integrated system (IPSS) would tend towards the attainment of equilibrium, stability, knowledge and enrichment; static systems such as hierarchies, do not perform in this way. Outhwaite in Byrne (1998:38) postulates that "a realist analysis of causality can account for the interaction of various causal tendencies within the complex and open systems among which we live and which we ourselves are". Open systems and all integrated systems are accorded the qualities associated with adaptivity to socio-economic and environmental demands.

EXPLORING THE STRUCTURE OF AN IPSS

In defining an integrated system's structure (arrangement of nodes, hubs and individual actors), one would examine network and sub-network structures. IPSSs are empirically and essentially integrated systems, behaving much like networks and complex adaptive systems. Network governments are viewed as "complementary" to "governing structures for authoritatively allocating resources, exercising control and co-ordination" (Niemi-Iilahti 2003:59). Network elements of control, management and authority stand to be enriched by the principles of holism, relationship ties between nodes, states of organisational entropy, autopoiesis and nonlinearity, as complexity science offers a distinct path away from hierarchy to a better understanding of organisational behaviour (Niemi-Iilahti 2003:59; Zimmerman, Lindberg and Plsek in Praught 2002:1, 9,

11). According to Capra (1997:95–98) autopoiesis is the natural process of living systems to "self-organise, self-reproduce and evolve" within the parameters of their "network operations". Complexity and network theory may be juxtaposed to hierarchy, as these offer applicability to rapidly changing society, influenced by technological and global factors. Brass *et al.* Faems *et al.* Grandori, Kogut and Powell (in Ceci and Iubatti 2011:565) believe that a network structure is "a hybrid coordination mechanism of economic activity" which incorporates government mechanisms and "market exchanges", the antithesis of fragmented linear public systems. Gilchrist (2000:264) holds that an integrated structure implies that "a well-connected community is achieved when people feel part of a web of diverse and inter-locking relationships".

The skeletal structures of organisms provide for the agility, manoeuvrability, growth and flexibility of the entire system. Adopting such an organic analogy, one may argue that 'structure' lends to integrated systems the ability required to create value. Each part of an efficient and effective system has its place in any organism known, yet its parts may be understood in terms of their unique qualities, such as the heart, lungs and limbs. Laszlo (2006:98) states that whole systems, meaning the inseparability of the parts, "need both a cultural [ontological] as well as a scientific foundation", a basis for utilising purpose, knowledge, capacity and resources in order to create value.

Network stability is in reality never attained, given the continuous vibrancy of the role players living with change and complexity. Laszlo (2006:99) holds that a "chaos point" is reached in complex systems after which a system will seek stability; such "states" may range from "dynamic stability" to higher states of stability called "breakthrough"; where stability is not achieved, a system "tips towards breakdown", e.g. non-service delivery.

Equilibrium vs disequilibrium

Nonlinear public service systems may be in equilibrium, disequilibrium or between the two extremes. Prigogine and Stengers (1984:13) explain that systems in "far from equilibrium" entropic conditions will eventually seek out a pattern that would return them to near equilibrium. Reed and Harvey (in Byrne 1998:63) hold that "in social systems, perturbations [disturbances] of far-from-equilibrium conditions can originate in the values and actions of humans themselves". Integrated systems display inherent qualities and principles of nonlinearity, disequilibrium, abilities for self-preservation and self-organisation, entropy, varying levels of complexity and states of "organised complexity" (Checkland in Capra 1977:28). In essence, integrated nonlinear systems are in continuous search for equilibrium, migrating between order and disorder.

Feedback

The concept of positive and negative feedback is integrally tied to a social system's ability to adjust, maintain and redirect itself. Feedback is regarded as "reciprocal relations" (Prigogine and Stengers 1984:137); positive feedback reinforces systemic activities, the means for ultimately achieving a measure of breakthrough, while negative feedback balances and preserves system dynamics, i.e. self-adjusting, in order to maintain direction and purpose (Capra 1977:56–59; Ormand, n.d.:2–3; Brown and Lerch 2007:3). While positive feedback enhances a system's stability, negative feedback requires careful management as it relates to strengthening governmental networks. Integrated systems, employing the principles of feedback theory, may establish "collaborative advantage", challenging conventional leadership and the attainment of social welfare objectives (O'Leary and Vij 2012:510; Morse 2010:231).

Structuralism and post-structuralism

Kilduff and Tsai (2003:114) argue that structuralists and post-structuralists tender the network qualities indicated in Table 1.

Table 1: Qualities of structuralist and post-structuralist governance system

Qualities of structuralist governance system	Qualities of post-structuralist governance as in integrated system such as an IPSS
• Economic individualism (Bozeman 2007) • Authoritarianism • Control • Hierarchy • Bureaucracy • Duplication and triplication of activities (duty) • Physical and mental fragmentation • Managerial fragmentation • Pockets of non-productive (idle) behaviour leading to poor efficiency • Silo institutional arrangements	• Democratic; team based, professional, flat structure • Holistic • Stakeholder focused • Ability to manage complexity • Ability to manage networks • Ability to manage positive and negative feedback • Integrative • Open and dynamic system • Organic and autopoietic • Task and productivity driven • Developmental, expanding, value driven

Source: (Adapted from Kilduff and Tsai 2003:114)

Assuming the context of complexity, Kilduff and Tsai (2003:112) argue that given a "critical-realist perspective", actors are unable to confront "powerful forces" over which they have little control, holding that "structuralism" has an important

place in "network research". Levi-Strauss (in Kilduff and Tsai 2003:113) explains that the structure of social relations determines the content of those relations.

Relationships in integrated systems

One may argue that relationships between network nodes, hubs and actors are linked to the formation of alliances, integrative leadership and collaborative networked governance. Four principles govern these relationships: (i) the empirics of integration, (ii) conservation and rationalising resources and capacity, (iii) relationship building, responsiveness and reciprocity, and (iv) outputs of PV.

The ideal relationship between key systemic elements would be one of equilibrial relationship. However, the action of endogenous and exogenous systemic factors does not allow for the attainment of an 'optimal' point of productivity to be reached. The point of convergence designates (i) a desired state of "near equilibrium" (Prigogine and Stengers 1984:13; Capra 1997:227) for an integrated system, (ii) the tendency to perform tasks in line with similar or the same objectives, and (iii) a concurrence of ideology. The tendency towards convergence is counterposed by its opposite, divergence, i.e. disequilibrium. An optimum point is found on the continuum between convergence and divergence, as illustrated in Figure 1. An IPSS seeks to continually enhance the relationship between strategic alliances, integrative leaders and collaborative governance, in order to create value.

Huxham and Vangen (in Morse 2010:231) hold that through collaboration one may attain the 'optimum point' of operability (Figure 1); that in networks, opportunity exists for achieving benefits through engagement. Carr and Wilinson (in Morse 2010:233) maintain that the "transformation to [ideal] integration" implies the utilisation of formal and informal means, resources and

Figure 1: Optimality of integrative leadership, strategic alliances and collaborative governance in equilibrium relationship

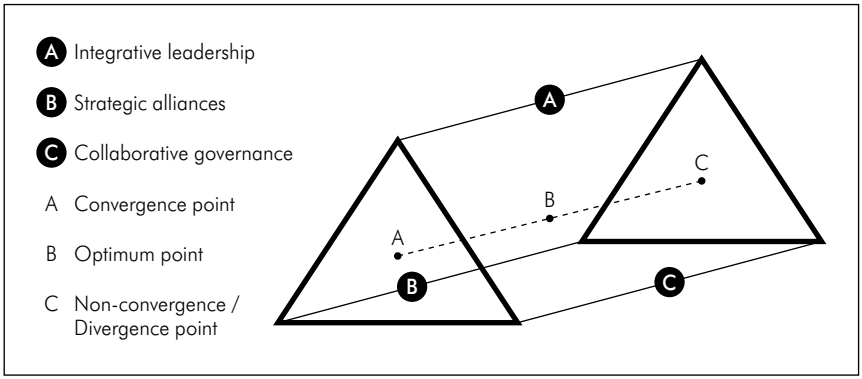
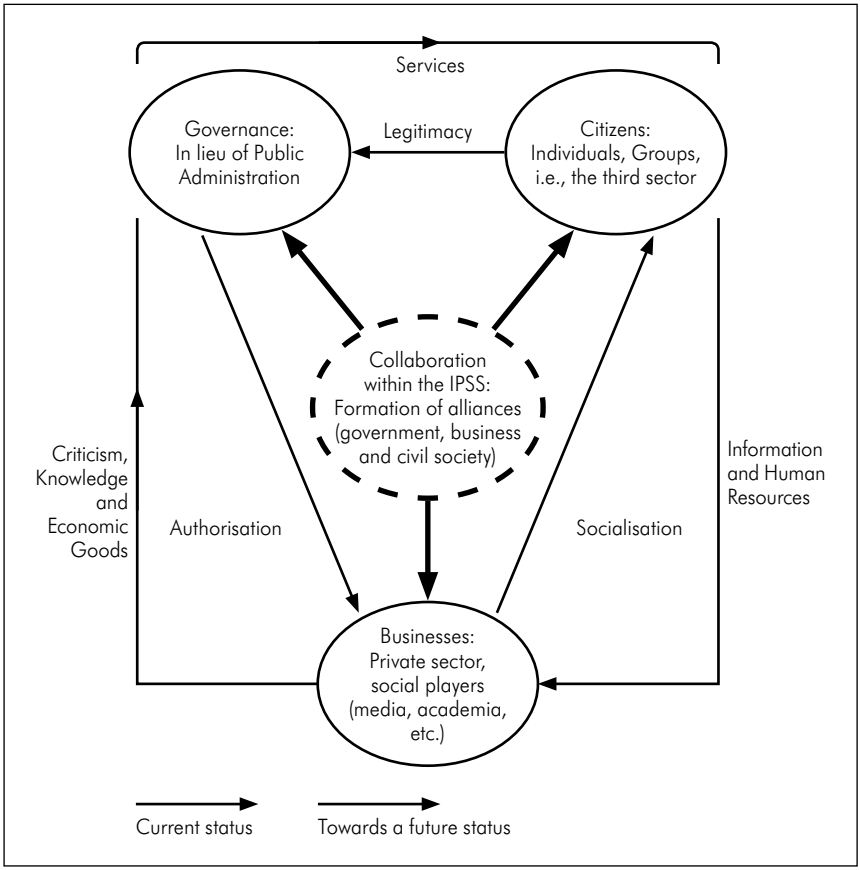


Figure 2: A "future status" model for collaboration



Source: (Adapted from Vigoda-Gadot 2003:37)

capacity to achieve (i) common "agendas", (ii) "multiple perspectives", and (iii) "convergence of multiple knowledge systems".

Vigoda-Gadot (2003:37,149) presents a "future status" model illustrating collaboration between government, civil society groups and the business sector, i.e. an integrative view of collaboration, in the context of an IPSS, illustrated in Figure 2.

The "future status" model, illustrated in Figure 2, employs "legitimacy, authorization and socialization" to effect the shift from the current status to an advanced "future status" of collaborative governance; linearity is replaced with collaboration in a nonlinear manner, thereby stimulating relationships with government bodies.

IPSS GROWTH

It is presumed that integrated networks have much in common with IPSSs. Network growth will be explained for the purpose of establishing a basis for understanding the complex dynamics of networked government, as proposed for the materialisation of an IPSS.

Structural holes and network ties

Networks and sub networks are able to grow in size, diameter, density and in complexity. Network study has also revealed breaks (Burt 2004) between groups of people working in the same and between different organisations. When these breaks are closed, through purposeful collaboration between role players, the networks grow by the multiplier effect of added actors, nodes or hubs. Ceci and Iubatti (2012:567) explain that when breaks in associations between role players are closed, i.e. when disconnected "bridges" are connected, "advantages for both flourish"; advantages are opportunities for innovation, exchange of ideas and information flow. Structural bridges may cause efficient and effective network connections which may improve or advance relationships among the role players, i.e., "facilitate goals achievement" (Taylor and Doerfel 2005:123).

In Figure 3A, two nodes in the defined network are unlinked, illustrating structural breaks. An IPSS grow through the process of homophily, matching 'like' and new actors, through the strengthening of weak ties (Granovetter 1983)

Figure 3: Growth and emergence of integrated networks forming IPSSs

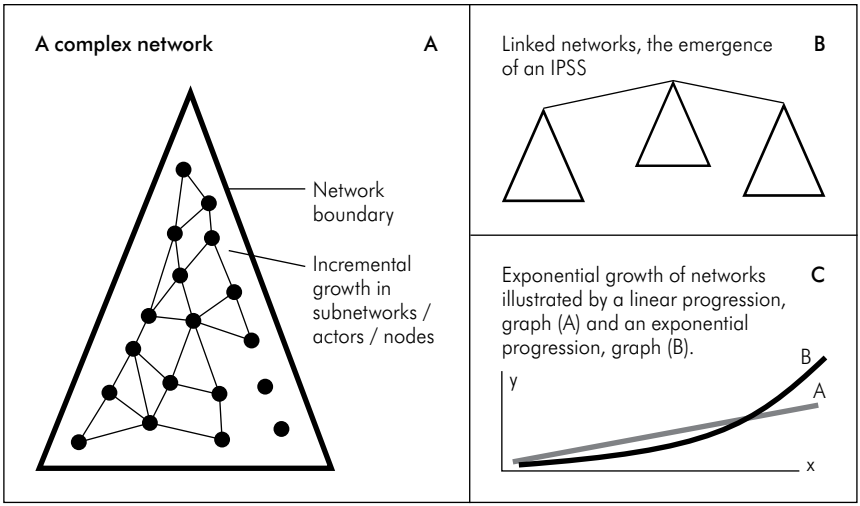
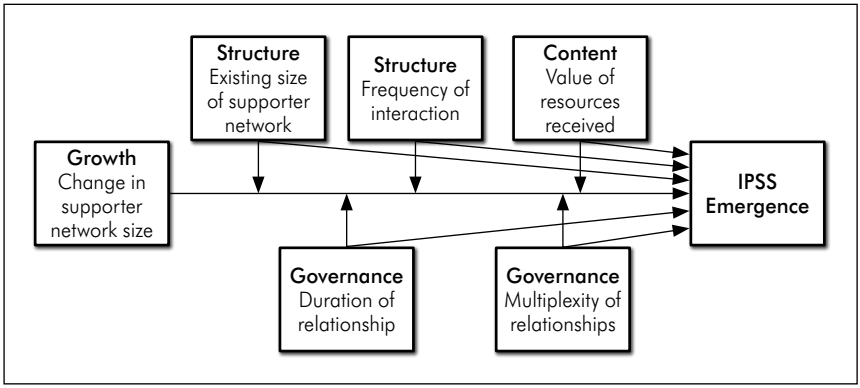
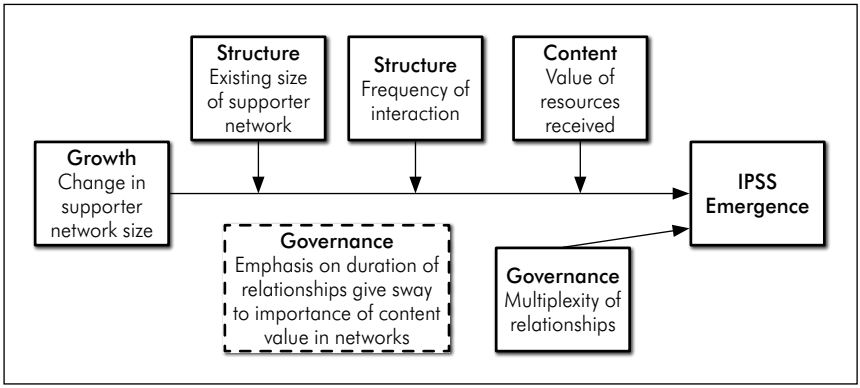


Figure 4a: Supporter networks and IPSS emergence: poor efficiency



Source: (Adapted from Newbert and Tornikoski 2012:148)

Figure 4b: Supporter networks and IPSS emergence: integrated, high efficiency



Source: (Adapted from Newbert and Tornikoski 2012:148)

and increasing the "density of weak ties" between actors, nodes and hubs (Breiger, Carley and Pattison 2003:33; Newbert and Tornikoski 2012:142; 146). Freeman (in Breiger *et al*. 2003:33–36) holds that the growth in networks may be studied in terms of (i) structural linkages between nodes, (ii) graphic data collected, and (iii) mathematical models. The authors note that the analyses of nodes, position size, density, modularity, centrality and path length are measures for network growth; one may conclude that networks grow exponentially (Figure 3C) and if networks have defined boundaries, networks may merge to form larger networks (Figure 3A and 3B). Figure 3B illustrates the formation of large integrated networks, which is the basis for presuming that large network structures are akin to integrated public service systems (IPSSs).

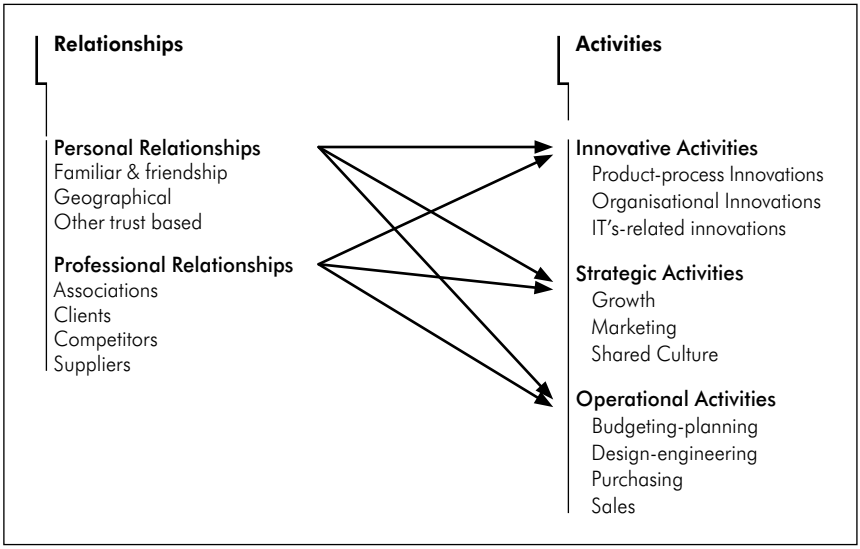
An IPSS grow in terms of their "structure"; (i) when patterns of social ties between actors become more dense, i.e. stimulated by common purpose and motivation, (ii) through "governance" methods, exercising wider authority and legitimacy, and (iii) in relation to acquiring "content", public benefits, sharing information, capacity and resources (Hoang and Antoncic; Burt; Ostgaard and Birley in Newbert and Tornikoski 2012:142–143). IPSS growth does not necessarily imply a reduction of network effectiveness, nor does it imply an increase in uncertainty (Newbert and Tornikoski 2012:145).

Newbert and Tornikoski (2012:142) argue that further growth may also be impacted on by "supporter networks", i.e. agents and actors supplying resources to outsider networks, i.e. "nascent entrepreneurs", without necessarily becoming part of other networks. Government bodies occasionally rely on 'supporter networks' while retaining their status of independence, fragmented relations and slow growth, illustrated in Figure 4a. However, a more efficient 'growth' IPSS model is illustrated in Figure 4b, where there are fewer conduits, i.e. network paths and improved management of information, resources and capacity of an IPSS.

Diffusion of innovation

When public organisations integrate (merge) on the basis of pioneering innovations, IPSSs tend to strengthen and are able to produce more PV. Ceci

Figure 5: Enabling "diffusion of innovation" to enhance integration



Source: (Ceci and Iubatti 2012:570)

and Iubatti (2012:566–573), borrowing from Rogers, employ the concept of "diffusion of innovation" to illustrate that network growth and the stimulation of innovation among role players are highly correlated with "innovation, strategy and operations" Furthermore, as illustrated in Figure 5, innovation is positively stimulated through the increase in personal and professional relationship ties set up between actors, nodes and hubs. Similarly with IPSSs, an increase in stimulation (or demand) for innovation, once effected, lead to the strengthening of structures, strengthening of relationship ties (between government and public bodies), and growth in the networks which are contained in an IPSS.

TOWARDS A FRAMEWORK FOR AN IPSS

IPSSs operating in the micro, meso and macro arenas are interconnected, producing efficiencies, among them PV. Radin (in Uys 2014:6–7) outlines "macro-level instruments" for the successful integration of stakeholders over a broad spectrum as "structural, programmatic, research, capacity building and behavioural instruments". On the meso level the "approach" embodies the integration and utilisation of "policies and guidelines, governmental and regulatory governance principles" and the "creation of PV" (Uys 2014:6–7). The micro-level "approach" utilises "generic practical strategies" seen in terms of ethical behaviour, accountability, trust building and motivation with respect to integrated public management (Uys 2014:7). A framework for an IPSS is theoretically contained in complexity and network theory and operationally based in the production of PV.

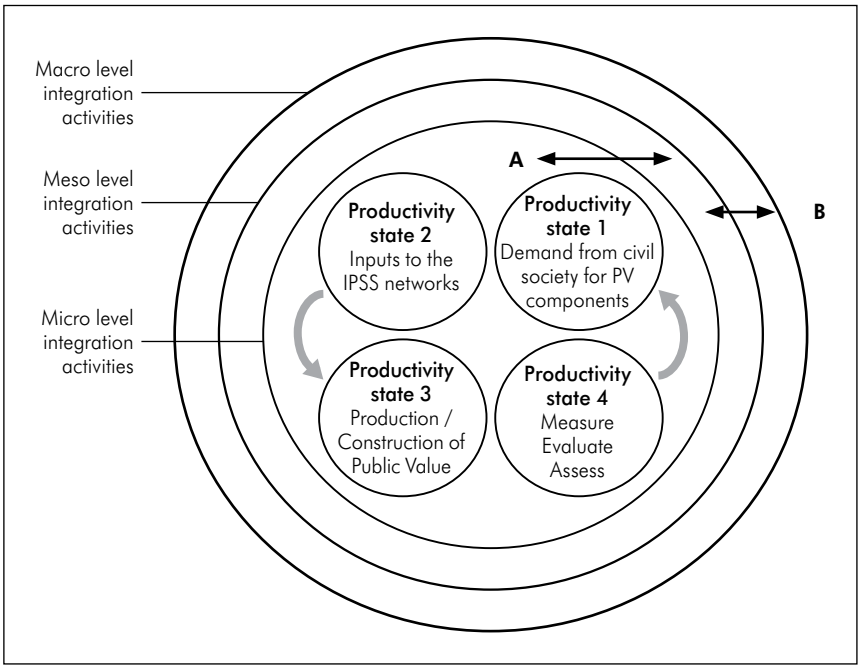
Presenting nonlinear bases for an IPSS model

In constructing a framework for an IPSS, illustrated in Figure 6, a circular diagram is chosen to represent the integrated IPSS model, since, (i) linear and hierarchical stages are replaced by integrative productivity states, (ii) lines which signify linearity are replaced by nonlinear notation, (iii) the outer circle represents a permeable IPSS boundary, (iv) interconnectivity (and dependency) between the nodes are presumed to be non-prescriptive. Four IPSS 'productivity states' are defined in terms of the management of the IPSS process, opposed to the employ of 'stages' in linear productivity.

Explanatory description of Figure 6:

- Scott (2000:146) employs circle diagrams to represent "multidimensional spaces" "centrality"; "arbitrary visual (graphic) framework for organisational data … to make the structure of a set of relations clear … as it embodies no specific mathematical properties".

Figure 6: A framework for an IPSS process illustrating integration between the micro (four productivity states), meso and macro levels



- Kapiriri, Norheim and Martin (2007:78) hold that "decision making" and "priority setting" authority are vested in each of the three levels, namely, the macro, meso and micro levels.
- Arrows A and B illustrate interconnectivity between the micro, meso and macro domains of operability, influenced by a multiplicity of networks and a multiplexity of exogenous and endogenous factors which impact upon IPSS outputs and outcomes.
- McGaughey and De Cieri (1999:241–22) caution that at the macro, meso and micro levels analysis tends to show that an "over-simplification of complex causal dynamics" operating in and between the levels may lead to erroneous interpretations of "convergence, divergence or maintenance of position".

Four productivity 'states' essential to IPSS operation

On the micro level the proposed IPSS framework involves the integration of four 'productivity states' based on network theory and collaborative governance principles;

its 'products' are therefore assumed to be measurable. Each 'productivity state', explained below, bears a unique role and purpose in the interest of PV production.

IPSS Productivity State 1: Pressure from civil society for PV benefits

Material and non-material demands and needs emanating from civil society, including the business sector and government institutions are captured by the institutional organs of society. Key PV elements such as services, goods, interest, social values and the need for participation are lodged with the integrated entity for implementation. IPSS actors, i.e. stakeholders, collaborate and generate feasible solutions for processing.

IPSS Productivity State 2: The inputs required by the IPSS

Resources, capacity and information are procured from stakeholders and quantified (audited) by IPSS agents (actors). Integration of stakeholder interests, the employment of computer-assisted (ICT) communication and management by teams are primed for efficient, effective and economic utilisation. Organisational goals and objectives are aligned to stakeholder objectives.

IPSS Productivity State 3: The production of material and non-material 'products' and services

The physical production of PVs as defined stakeholders collaboratively, is executed. The development of citizens' quality of life is the subject of this 'productivity state'. Related tasks are innovation, social harmony and the advancement of inter- and intra-organisational development.

IPSS Productivity State 4: Effecting the quality-quantity measures of material and non-material 'products' and services

The production of PVs is quantified, audited and evaluated by stakeholders collaboratively. Positive and negative feedback processes are utilised to further advance social benefits.

The coordination of IPSS, particularly 'state 2', and networks analysis, will utilise information technology software. Bacon (1998:468) proposes the utilisation of "middleware" for integrating stakeholder needs and information in the accomplishment of IPSS enablement and citizens' access to services; Gephi software is employed in network analysis to map network actors, nodes and hubs.

THE MANAGEMENT OF AN IPSS

The formulation of IPSS management principles, constant shaping and implementation of the management function of an IPSS is governed by the

theoretical prescripts for an IPSS as described above. Complexity and network theory forms the basis of the management theory for an IPSS and will be used to guide the discussion on aspects of management in integrated systems.

Management objectives for an IPSS

Objectives which drive integration and the operation of integrated public systems necessitate an awareness, more a consciousness by managers, of the nature and character of the integrated system, which determines the manner and mode in which PV productivity and measurement will proceed.

These objectives are influenced as follows: (i) Gilchrist (2000:273) maintains that the purpose of an integrated system is to shape citizens' networks in order to "facilitate the emergence of flexible, effective and empowering forms of collective action"; (ii) Guba and Lincoln; Creswell; Creswell, Hanson, Clark Plano and Morales; Patton; and Savage (in Vasilachis de Gialdino 2009:1) hold that "ontological (the nature of being; how citizens live, learn and desire), epistemological (empirical educational bases), axiological (how citizens interpret and infuse value) and methodological" elements subsist in integrated systems (iii) Randolph, Blasinsky, Leginski, Parker and Goldman (1997:370) believe that an effective integrated system should eradicate duplication, improve services, restore accountability and reduce inefficiency; (iv) Kagan (in Randolph *et al*. 1997:370) identifies four levels on which an integrated system operates, namely the organisational, policy, programme and the direct service delivery level; (v) Uys (2014:1) and Konrad (in Randolph *et al*. 1997:370) suggests three levels for an integrated system's operation, namely, collaboration (incorporating coordination and cooperation), consolidation and information sharing. As complexity and network principles guide management policy in an IPSS, the benefits which arises in the South Africa context are (i) the eradication of waste regarding scarce resources, (ii) openness, transparency and accountability, (iii) efficient and effective services delivery and (iv) accommodating New Public Management initiatives (PPPs).

Management challenges in an IPSS

A number of challenges concerning an IPSS may be studied: (i) the phenomenon of intellectual and physical integration between agencies and organs, (ii) the public, i.e. the representative organs of the public, (iii) production, delivery and measurement of value outputs, and (iv) network, open engagement, practices and analysis, understood in the context of complexity.

Collaboration, coordination and cooperation, i.e. the 3Cs (Uys 2014:1) are integration tools available to agents (actors) that are based on common purpose,

and common vision. The implementation of the 3Cs must be intentional, leading to harmonious action that requires commitment, planning, allocation of resources and capacity for the production of public value(s). Novak, Rennaker and Turner (2011:36–37) state that network actors "must model cross-silo thinking", to build relationships "across boundaries".

Krueger, Walker and Bernick (2011:686) hold that resources utilisation are subject to local and global economic conditions, laws, regulations, policies of government and political persuasions. The element of globalisation demands a re-examination of public systems in order to bring about the management of "change and complexity" (Adejuwon 2012:135; Barnes, Raynor and Bacchus 2012:97).

IPSSs experience "natural state(s)" of entropy in relation to their purpose, influencing the need for productivity and profitability; actors will strive to achieve strategic ends through the adoption of means to restore "order through fluctuations", i.e. striving to attain equilibrium when conditions are entropic, in chaos (Prigogine and Stengers 1984:120, 159). Gulati, Nohria and Zaheer (2000:203–204) contends that "agencies and organs" are not "autonomous" when bound in relationships characterised by "performance, resource availability and capabilities", since endogenous and exogenous factors determine the environment.

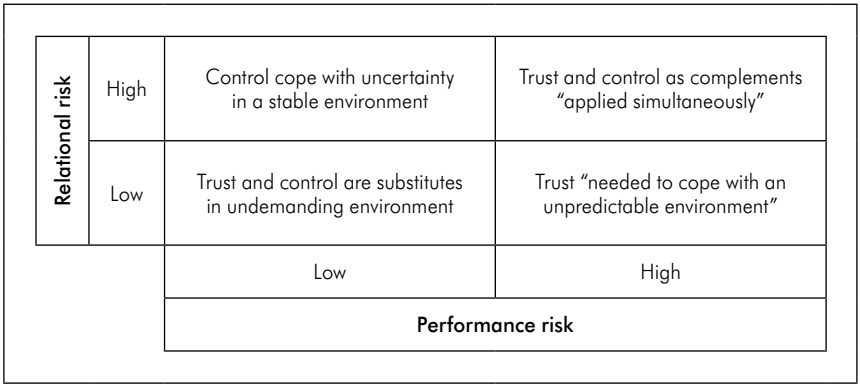
Managerial factors influencing collaborative governance in IPSS's

Collaborative governance assumes a flexible nature insofar as regulation and control do not thwart the growth and systemic soundness of the IPSS. The analysis of promoting and constraining factors are necessary as these factors impact upon the performance of the IPSS in relation to productivity, organisational performance and stakeholder satisfaction on one level and on another, the prospects for successful collaborative governance within a network domain.

Promoting factors

Cegarra-Navarro and Arcas-Lario (2011:609) found in their study on collaboration between network actors that network ties are strengthened through (i) mutual knowledge, interests and information that arise out of need, (ii) "unlearning" old modes and perceptions, (iii) freedom to act and make decisions, and (iv) trust in their existing knowledge and between actors. The authors contend that an accumulation of organisational "intelligence and co-operative knowledge" play a major role in the delivery of "superior" products and services resulting in improved performance. Cooperative need, it is argued,

Figure 7: Management framework for control and trust in different risk scenarios



Source: (De Man and Roijakkers 2009:78)

supersedes the clinging to stereotypes in networks; network demands therefore take prominence over individual demands and excessive control.

A "framework" for the management or balance of control and trust, (Figure 7), devised by De Man and Roijakkers (2009:78), brings an understanding of "control and trust" to collaborative governance. Figure 7 demonstrates that the High-High quadrant is the favoured position for stakeholders to assume, as trust and control mechanisms are collectively controlled and managed, leading to higher motivation in the achievement of collective goals, at high risk and higher uncertainty. The Low-Low quadrant illustrates a situation where actors are yet to enter into collaborative scenarios, thereby maintaining low risk.

Emerson, Nabatchi and Balogh (2011:10–15) supported by Ansell and Gash (2007:544–545), hold that an 'integrative framework' for collaborative governance entails outcomes of "actions, impacts and adaptation" and "principled engagement, capacity of joint action and shared motivation".

Constraining factors

Capacity "constraining factors" related to collaborative governance are (i) "personal, financial, organisational, capacity building, technical expertise and time", (ii) "building alliances" with stakeholders, (iii) initiating "institutional configurations", (iv) the process of integration, (v) the attainment of objectives, (vi) economic utilisation of capacity and resources, and (vii) serving the interests of stakeholders (Ananda and Proctor 2012:105). Vigoda-Gadot (2003:19–20) also hold that the "integration of common political views and shared policy targets" are constraining to effective collaboration.

Hamel, Doz and Prahalad (in Khanna, *et al.* 1998:193–5) note that in an integrated system (IPSS) "tension" is found between cooperation and competition; the "tension" (competition) factors arising in strategic alliances are given as (i) public versus private benefits, (ii) the nature of incentives (for whom, when and why), (iii) opportunity and scope in alliances, (iv) the proportion by which actors benefit from the "synthesis of knowledge" as value, (v) the degree to which common purposes are justified to partners, (vi) uncertainty regarding the utilisation of resources outside of a "ratio", (vii) levels of trust, and (viii) levels of transparency among partners. Anderson, Geringer, Herbert and Kogut (in Zollo, Reuer and Singh 2002:702) list the challenges in entering strategic alliances as (i) a "lack of consensus around a typology of collaborative agreements", (ii) the study of performance outcomes and (iii) inter-firm differences and strategic intentions.

Nealer and Naude (2011:112–113) list collaborative governance "challenges" as (i) definitions requiring greater specificity, (ii) a neglect in the practice of integrated approaches, (iii) need to harness a citizens' focus, (iv) promoting support for sustainable development, (v) abuse of resources, and (vi) non-implementation of monitoring and evaluation processes.

Parks, Joireman and Van Lange (2013:119) state that "social antagonism(s)" and opposition between actors (agencies, organs or individuals) are in conflict with the aims of collaboration in the production of "collectively beneficial", public goods. Parks *et al.* (2013:138–140) hold that IPSSs may be subjected to "in-group / out-group biases", gatekeeping and other organisational antagonisms, which may lead to negative outcomes.

Integrative leadership

• *The role of integrative public leaders*

Integrative leadership relates to the way in which theoretical and practical knowledge are applied in implementing an effective integrated system, i.e. an IPSS. Winston and Patterson (2006:7) and Morse (2010:231, 244) contend that an integrative leader is "one or more persons who selects, trains, and influences one or more follower(s) who have diverse gifts, abilities and skills, and focuses the follower(s) on the organization's mission and objectives" to procure PV efficiently. Silvia and McGuire (2010:264–266) emphasise "people"-orientated elements; holistic representation, relationship building, integrated structures, multiple linkages, formal and informal as well as cross-boundary collaboration as factors distinguishing the 'integration approach' of leadership from the 'bureaucratic approach'. The broader objectives of integrative leadership are related to the development of PVs, namely social capital, satisfaction of public needs and demands, the utilisation of scarce resources in the attainment

of quality of life. Van Wart (in Silvia and McGuire 2010:269) outlines three categories of leadership behaviour, listed in Table 2.

Table 2: Integrative leadership criteria

People-oriented	Task-oriented	Organisation-oriented
• Network members are equal • Share information freely • Caring • Trust • Brainstorming • Use own judgement in finding solutions; ethical • Teams share leadership roles motivation • Putting suggestions into practice • Conflict resolution • Incentives, developing staff • Consultation	• Select key performance measures- • Taking charge in emergencies • Clarification and setting standards • Compelling role specification • Scheduling • Setting standards and regulations • Coordination • Agreement on nature of tasks • Movement and flow of work • Assign members to tasks • Monitoring, delegating, • Operations and planning	• Support from superiors • Identifying resources • Gaining stakeholder support • Identifying stakeholders • Environmental scanning • Establish a shared vision • Commitment to mission • Publicise goals • Publicise achievements • Influence values and norms • Changing network structure • Relationship building, partnering

Source: (Van Wart in Silvia and McGuire 2010:269)

Uys (2014:1) contends that the importance of acknowledging the "what" and the "how" of integrating "the functioning of government and governance", the practical engagement of the 3Cs and a holistic vision guiding a "change in focus" is what brings the integrated approach nearer to the objective of systemic harmony between players. Espousing the views of Emerson and Wright, Uys (2014:10) builds an argument for integrative leadership in relation to qualities of "balanced decisions", "effective accountability", a reduction in loyalty to any specific political party, greater incorporation of technology, being consensus driven "amid diversity" and effecting emotional / social relationships in the arena of inter-organisational dynamics.

• *Leadership by teams*

Fernandez, Cho and Perry (2010:308) assert that integrated leadership constitutes "not of one person", but a team of experts representing key (pertinent) stakeholders and focusing on relationships, diversity, integrity and the task that is to be accomplished. Fernandez *et al*. (2010:309) argue that integrated leaders "re-conceptualize leadership as a shared, collective process". Morse (2010:234)

contend that the qualitative and quantitative development of leading team actors in integrated systems, i.e. networks, are dependent upon collaborative efforts to develop (i) accountable behaviour among actors, (ii) integration of "knowledge, abilities and perspectives", (iii) "efficiency, effectiveness, fairness and mitigation of public problems", and (iv) value as defined by the actors. Gulati *et al.* (2000:204) argue that stakeholders experiencing effective integration behave "relationally" and that their behaviour could be understood in terms of their external and internal environment, conforming to (i) the rationale, guidelines and principles of complex operating entities, and (ii) the particularisation of PV as the focal output.

- ***Paradigm shift***

Capra (1977:9–10) notes that the implementation of an integrated system requires a paradigm shift by public leaders involving three essential elements equally, viz. perception, values and thought; perception and understanding of integrated systems demands "self-assertion" when making "value" shifts. He lists "thought" elements as intuition, ability to synthesise, holism, and nonlinearity, and "value" elements as collaboration, cooperation, sustainability and quality consciousness in collaborative relationships. Novak, Rennaker and Turner (2000:37) support this view and emphasise the need for "cross-silo thinking [and] relationship building across boundaries".

Strategic alliances in an IPSS

Successful strategic alliances rely on realistic and effective synergies between actors, nodes and hubs in networks, vertical and horizontal integration, alignment of objectives, regular and meaningful feedback and sharing information, resources and capacity. Gulati *et al.* (2000:203) refer to the "interorganisational ties" in integrated systems as having "strategic significance" for "making strategic alliances". Novak, Rennaker and Turner (2011:36–37) state that "strategic relationships and critical interdependencies, economic value, supporting structure and systems" are focal points responsible for increasing PV. Recognition is given to citizens' bodies as a complex and core component and agency in the alliance-making process, where "learning in alliances and interfirm partnerships" are inseparable from network operations, and value production and measurement (Gulati *et al.* 2000:204).

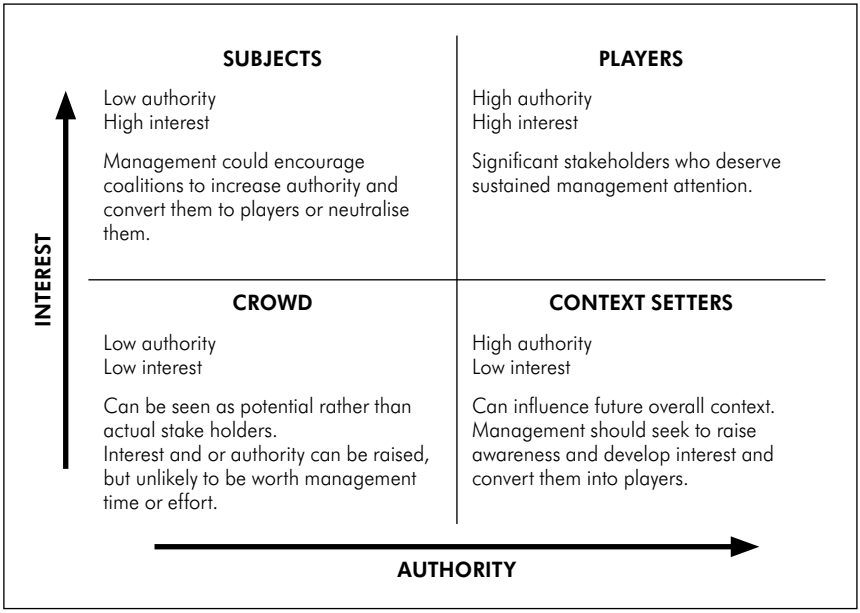
Kennedy and Lubell (in Ananda and Proctor 2012:97) argue that "behavioural cooperation" is not easy to achieve between actors, since the issues around scarce resources tend to be problematic (i) in respect of virtual organisation, (ii) solidifying strategic alliances, and (iii) when decisions are required in relation to who the beneficiaries will be. Zollo *et al.* 2002:702) hold that greater success is

obtained from strategic alliances when stakeholders have accumulated mutual experience. Zollo *et al.* (2002:701) assert that in respect of IPSSs, strategic alliances imply "stable patterns of interaction" and partnering at organisational level. The authors hold that strategic alliances influence performance positively and that benefits accrue from knowledge accumulation, opportunities, growth and the achievement of strategic objectives.

The 'Stakeholder Power-Interest Grid'

According to Ackermann and Eden (2011:181–188) the 'Stakeholder Power-Interest Grid' (matrix), illustrated in Figure 8, may be utilised strategically as an adaptable instrument for the assessment and analysis of leading and non-leading stakeholders in an integrated system (such as an IPSS). Some stakeholders have critical roles, while others have auxiliary roles in the IPSS. The authors hold that the "Players" quadrant determines which stakeholders should be allocated high status owing to their leadership position. The 'Stakeholder Power-Interest Grid' is a facilitating instrument for network organs to be motivated strongly enough to enter the "Players" quadrant, where both interests and authority are ranked high. "Players" would therefore aid and facilitate "Subjects", "Context Setters" and "Crowd", based on information utilisation, need, leverage, capacity

Figure 8: Stakeholder Power-Interest Grid



Source: (Adapted from Ackermann and Eden 2011:183)

and resources. The "Subjects", owing to their high level of interest in network activities, are able to spearhead innovation and the activation of new knowledge, while "Context Setters" are seen as IPSS drivers of growth. The 'Stakeholder Power-Interest Grid' may reveal subtle changes in IPSS composition over time. According to the authors, the following strategic elements influence strategic alliances and stakeholder positioning;

- Stakeholder specificity and uniqueness,
- Stakeholders' equality,
- Acknowledging stakeholder demands as "multifarious",
- "Stakeholder salience" i.e. visibility,
- The power of weak stakeholders should not be undermined as stakeholders can influence networks through behaviours, attitudes, beliefs and stakeholder coalitions.

Public private partnerships (PPPs) in integrated systems

PPPs may be considered discrete productive entities, namely, actors, nodes or hubs, within an integrated system (IPSS), bearing network objectives related to shared responsibilities, readiness for innovation, collaboration, strategic intention and added PV. A process of adjustment by PPPs to nonlinear structures and functioning is conceivable. Rangan, Samii and Van Wassenhove (2006:738) argue that PPPs have an added advantage in networks when (i) external conditions "are shrouded by high uncertainty", (ii) the need for "industrial-specific competencies" are required, and (iii) economic opportunities arise and the matrix (Figure 8) are utilised. Dyer (1997:552) found that inter-organisational collaboration increases the value of outcomes of citizens" such as commitment, information sharing, goodwill, trust, reputation, and contends that there are "indispensable principles which apply to PPPs, firms and representatives negotiation and regard for the market as a place of immense opportunity for "effective collaboration".

FINDINGS AND CONCLUSION

The findings, recommendations and normative points of discourse, may be derived with the understanding that the article is largely theoretical. Firstly, a positive relationship was established between the structure and operability of an IPSS, networked governance and PV production and measurement. A recommendation is made that this relationship can be explored utilising a qualitative research methodology in order to establish a normative view. Secondly, a framework for an operating IPSS is recommended, indicating (i) four distinct 'productivity states', (ii) nonlinearity, (iii) integration between the

micro, meso and macro spheres of operability, and (iv) a networked governance model. A study regarding the implementation of the framework may be pursued in order to examine the PV outcomes. Thirdly, networked governance criteria were explicitly stated and are recommended, particularly in Tables 1 and 2. In addition, four sets of PV criteria which are stated in the OECD Ireland Report (2008), indicated in the addendum, should be implemented in an IPSS. These criteria are viewed as 'normative' in integrated systems. Fourthly, IPSS management functions should be used to initiate (i) networked and collaborative governance practices, (ii) strategic alliances and PPPs, (iii) integrative leadership and (iv) the utilisation of stakeholders' unique resources, capacities and knowledge. A normative set of integrative criteria for management practice within an IPSS may therefore be compiled.

Limitations (problems to resolve) with respect of the above findings and recommendations may be found in;

- the paradigm shift for management from linear to nonlinear systems,
- the implementation of collaboration, coordination and cooperation across boundaries,
- policy amelioration in respect of IPSS requirements
- the management of 'entropy' with regard to consensus concerning exogenous and endogenous factors, political influences, negotiation of 'multiplexity' issues, i.e. consolidating common ties between network actors regarding knowledge diffusion, and finding commonality on objectives and agreements.

If the dictum that public management practices subsist in the system that governs it holds true, then one may deduce that an IPSS will produce outcomes reflecting (i) social and human capital generation, (ii) the careful utilisation of scarce resources, (iii) PV creation, (iv) inclusive stakeholder networks, and (iv) norms and standards for quality of life and sustainable futures.

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