The 'wicked problem construct' for organisational leadership and development

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Abstract: The recognition of tensions, contradictions and paradoxes in theory, research, and practice within organisations is important for effective organisational leadership (EOL). The extent to which managers and policy makers currently have adequately come to terms with such complexity still remains open to discussion. The wicked problem construct (WPC) is a concept, process and a framework that can be used in identifying the reasons for these tensions and contradictions, explaining how they can be managed, and pointing out the limits they create for what is needed for effective organisational leadership. This paper examines the conceptual literature on 'wicked problems', identifying the critical dimensions of the proposed construct, and exploring the lack of attention to nonlinear epistemology of practice and systems thinking by managers and policy makers. The challenges of traditional management approaches to address complexity and to increase effectiveness in dealing with wicked problems are explained. The implication for practice of the WPC as a framework for organisational effectiveness in public, private, and the third sectors is described.

Keywords: complexity theory; linear epistemology; positive deviance; systems theory; wicked problems.

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1   The necessary revolution

Wicked problems are quintessential social justice and social change problems. They are complex and messy. Their solutions are unique to the circumstance. They may not be scalable. The Wicked Problem frame was first proposed in 1973 by Horst W.J. Rittel and Melvin M. Webber's in their landmark article 'Dilemmas in the general theory of planning' in reflection of the complexity of the times; systems colliding in one of the most volatile periods of US history: racial violence unleashed by the deaths of Martin Luther King, Jr. and Malcolm X; massive student protests over the Vietnam War; the war on poverty publicly calling out the dichotomy of wealth and extreme poverty in America; environmental and public health crises over the use of cancer-causing pesticides such as DDT and defoliant Agent Orange; the 1973 oil crisis; and the nightly news reflecting the shattering of traditional boundaries of race, religion, and justice (Peterson, 2010).

Rittel and Webber (1973) used the term 'wicked problems' to name the social conditions of the times. As planners and social policy professionals, they recognised that a linear, scientific approach to problem solving would not capture the colliding of complex systems (Peterson, 2010). For example, the 'Newtonian mechanisms' would not sum up the nuance or tumult of contemporary concerns over equity and pluralism (Peterson, 2010). Through wicked problems, Webber and Rittel found a way to describe the 'waves of repercussions' that rippled through systemic networks of changing value and goals in a nation in turmoil (Rittel and Webber, 1973).

Wicked problems, as envisioned by Rittel and Webber (1973), captured the multi-dimensional nature of systems and it allowed planners and policy professionals to describe the challenges they faced, "whether concerns over the location of a freeway, the adjustment of a tax rate, the modification of school curriculum, the confrontation of crime…or The System…as an evil source of misery and suffering" [Rittel and Webber, (1973), p.160].

Camillus (2008) argues that the wicked problems frame has been largely missing from strategic management discussions. He based his conclusions on research and analysis of approximately 30 enterprises from around the world and by tracking strategies within DuPont's pharmaceutical business to understand how companies draw up strategies when returns will accrue only in the long run and are highly uncertain. This may be because organisations are still stuck in the industrial revolution mindset and to change that mindset requires a new revolution.

The traditional organisational development (OD) approach to problem solving in which data is gathered, analyzed, solutions formulated and implemented is rooted in a linear and mechanistic view of the universe (Conklin, 2006). Traditional OD also follows the normal science approach. Normal science, as defined by Kuhn (1962) is the routine work of disciplinary scientists 'puzzle solving' in their paradigm. Normal science research espouses the facts of the established theory but does not necessarily challenge it or test its assumptions (Batie, 2008). The linear epistemology of normal science can be traced to concepts articulated in Bush's (1945) report, *Science – The Endless Frontier*, which indirectly or perhaps unconsciously also informed most of the linear epistemological approaches to OD research. The linear epistemology or the normal science as traced to Vannevar Bush is in some ways an artificial construct predicated on the dominance of the USA after the Second World War (Whyte, 1995). With the rest of the world exhausted and in complete recovery, the linear epistemological approach

created an uncharacteristic and an exceptional stable system in a manner that the whole world evolved from the recovery for it to become a much more of ecological reality and the dominant epistemology (Whyte, 1995). This approach, has served organisations and led important organisational changes in the past, including several of the major advances made under the industrial revolution, but no longer allows us to meet the demands of the world of today on organisations (Yawson, 2013).

As Senge et al. (2010) put it, there is need for 'the necessary revolution' (p.4). Senge et al. (2010) contend that we are at the end of the industrial age and a new revolution is emerging out of the industrial 'bubble' and the people leading this revolution demonstrate mastery of three core areas that undergird organisational learning: learning how to *see the larger systems*; understanding the importance of *collaborating across boundaries* "that previously divided them from others within and outside their organizations" (p.44); and, "moving away from reactive problem solving mode to *creating futures they truly desire*" (p.44).

Jayanti (2011) has also contended that:

> Linear epistemology is the dominant epistemology in the field of Human Resource Development (HRD) and as such undergirds a majority of HRD models. Although a linear epistemology's usefulness is implicit in its widespread impact on models and on their use, a linear epistemology has several limitations, including a tendency to privilege particular Western cultural and masculine worldviews, short-term measures, and effects close to the organization (p. 101).

What Jayanti (2011) referred to as 'linear epistemology' is borne out of normal science and is preserved in policy manuals, academic and practitioner treatises, consultancy and marketing manuals for strategic management process, and the most advanced and popular organisational tools and methods. Jayanti's assertion that linearity is a Western bias and a masculine perspective is debatable, but several cultural studies have linked linear thinking with individualistic culture, which is the dominant Western culture as well as masculinity (Hofstede, 1999; Trompenaars, 1993). The emerging contention therefore, is that managers be it private, public or the third sector are confronted with wicked problems which cannot be solved by the traditional OD approach to problem solving – the linear epistemology.

The term 'Wicked Problem' as stated earlier was coined by Horst Rittel (Rittel and Webber, 1973) 40 years ago to describe "ill-defined problem sets which are too complex to be solved by rational systematic processes" [Whelton and Ballard, (2002), p.1].

> "Wicked problems often crop up when organizations have to face constant change or unprecedented challenges. They occur in a social context; the greater the disagreement among stakeholders, the more wicked the problem. In fact, it is the social complexity of wicked problems as much as their technical difficulties that make them tough to manage." [Camillus, (2008), p.100]

Managers are constantly confronted with issues of long-term social, commercial or policy in nature. These issues are the complex, ever changing societal and management problems which in most cases have not been solved with much success, because it is difficult to define and structure them properly (Ritchey, 2005). "They are messy, devious, and reactive, i.e., they fight back when you try to resolve them" [Ritchey, (2005), p.1]. These are wicked problems. Most managers may not call them wicked problems, as different scholars have named them differently, but they are what they are – wicked

problems or whatever one may choose to call them all grounded in complexity theory and systems theory.

There are also factors that contribute to the creation and sustenance of wicked problems in organisations which cannot be explained using linear epistemology. These are the non-rational and hidden dimensions often involved (Marshak, 2009). There is also a dearth of academic and practitioner literature on wicked problems and concepts to address wicked problems (Marshak, 2009). Savage et al. (1991) and Courtney (2001) pointed to globalisation as a factor in the growing number of wicked problems in organisations. "It would seem that globalization will lead to increasingly wicked planning problems for all kinds of organizations, both for profit and non-profit, and privately and publicly owned" [Courtney, (2001), p.21]).

OD can be many things at the same time. It is as cluttered as it is exciting, as exasperating as it is fulfilling, as chaotic in its creative process as it is a rational process (Yawson, 2011). The recognition of these tensions, contradictions and paradoxes for theory, research, and practice is important for sustainable OD. The extent to which organisations (public, private, and the third sector) currently have adequately come to terms with such complexity still remains open to discussion. The wicked problem construct (WPC) is a concept, process or a framework that can be used in identifying the reasons for these tensions and contradictions, explaining how they can be managed, and pointing out the limits they create for what is needed for effective organisational leadership (EOL). The purpose of this paper is therefore to describe how the WPC can be used as a framework for EOL.

2   Organisations and OD

Organisations come in many forms and shapes. According to Yawson (2009, p.4) every organisation should be seen as an ecosystem and that "an ecosystem is not linear, it is a web of interrelationships, different systems, niches and pathways coming together to sustain life". "The context of an organization is of course its physical, economic and technological environment, as well as other organizations, individuals and the cultural and social realities of the moment" [Allen et al., (2008), p.2]. In this paper, organisations are placed within the main sectors operating in many economies: public, private and the third sector, and a fourth, the educational sector, which depending on the ownership can fall under any of the three main sectors operating in many economies. Each has its own unique features that make them less able to adapt to new realities (Heifetz et al., 2009). Public sector organisations are governmental, intergovernmental, and pseudo-governmental organisations and are security oriented with the tendency to be risk averse, and shielded from the pressure to adjust from market place competition (Heifetz et al., 2009). Private organisations are the corporate, business and for profit enterprises and are usually driven mainly by profit and function in a very competitive environment (Yawson, 2009). The 'third sector' is a collective term for all those organisations that are not-for-profit and non-government, in addition to activities of volunteering and giving which sustain them (ANZTSR, 2008). Although there are vast differences among them, third sector organisations are completely different as a group from public and private organisations (ANZTSR, 2008). They are characteristically mission driven and have a tendency to value consensus decision making (Heifetz et al., 2009). Understanding that organisational leadership is not the preserve of the private sector and that management

professionals and change agents operate in multiple systems at the same time is a necessary part of seeing and taming wicked problems.

There are numerous and varying definitions in both the academic and practitioner literature of OD. The intent of this paper is not to give one universally accepted definitive description of OD or OL. The attempt here is to outline what is generally agreed as the purpose of EOL and development. OD is a broad trans-, inter-, and multidisciplinary field where underlying theories are situated in different disciplines and practitioners come at it from a number of different angles. It is also laden with paradox. It is a science but also an art (Dalton, 2010).

Dalton (2010) describes OD as an "influential field of theory and practice which enables organizations to work towards strategies for managing change" (p.394). Dalton (2010, p.394) further explained that "OD involves 'whole systems change' and the selective use of interventions that shape the invisible, intangible but essential aspects of organizational process – values, norms, beliefs, symbols, ideologies, relationships and behaviors". Most definitions agree that the total (holistic) organisational system is the focus of change. The paradox is the normal science and linear epistemological and even ontological approaches of organisational development and change (OD&C) practice. Normal science or linear epistemology is not suitable in addressing wicked problems. The unsuitability lies with the conflict between rationality and values as against high uncertainty about system components and outcomes. The need for the co-creation of knowledge to tame wicked problems defies many of the assumptions underlying normal science and linear epistemology. Rittel and Webber (1973) clearly articulated that:

> "The classical systems approach … is based on the assumption that a … project can be organized into distinct phases: 'understand the problems', 'gather information,' 'synthesize information…,' 'work out solutions' and the like. For wicked problems, however, this type of scheme does not work. One cannot understand the problem without knowing about its context; one cannot meaningfully search for information without the orientation of a solution concept, one cannot first understand, then solve." (p.161)

There is therefore the need for a new paradigm of OD&C approach to tame the increasingly wicked problems organisations face.

It is important however, to note that the call for paradigm shift in OD to addressing wicked problems is not a call to completely ditch normal science or linear epistemology or what is mostly referred to as traditional or classical OD. Instead, it is a call to approach OD by incorporating resources of normal science and linear epistemology into a post-normal science of nonlinearities, disequilibria, path dependences and unpredictability to system components to address wicked problems. "Many of the same tools and concepts used in addressing tame problems will be used in addressing wicked ones. Normal science can be used to address the 'what is' and 'what if' components of both wicked and tame problems" [Batie, (2008), p.1186]. Most aspects of organisational life and change theory are based on assumptions of rationality as in normal science and its linear epistemology. Marshak (2009, p.59) described this assumption of rationality as that "people will change if presented with a rational case for change or the proper facts and figures". He however, contended that "this is almost always a necessary, but rarely sufficient, condition for change in organizations" (p.59). Alvesson and Spicer (2012) described the dominance of rationality in organisations as 'functional stupidity'. They described functional stupidity as an organisationally-supported lack of reflexivity, substantive reasoning, and justification. In dealing with wicked problems, functional

stupidity addresses the symptoms and subordinate wicked problems to socially acceptable forms of management and leadership. This is what create "the negative consequences such as trapping individuals and organizations into problematic patterns of thinking, which engender the conditions for individual and organizational dissonance" [Alvesson and Spicer, (2012), p.1196].

3   What is a wicked problem?

Although, there is a paucity of literature on the construct and conceptualisation of wicked problems (Marshak 2009), there abound in the literature, especially the grey literature, numerous definitions of wicked problems. Most of these definitions are, however, traced to the definition by Rittel and Weber (1973) stated earlier in this paper. Marshak (2009, p.58) described the nature of wicked problems in organisations as that "they are both pernicious and problematic to address". Marshak (2009, p.58) further explained that "people may know there are ongoing difficulties and complain loudly about them … Proposed solutions tend to ignore or not account for the depth or complexity of the factors, keeping the problematic conditions in place and consequently wicked". Wicked problems are not 'wicked' in the sense of being 'evil', but rather like an 'ensnarled mesh of tentacles' (Mason and Mitroff, 1981). Wicked problems are tied to social pluralism having multiple stakeholder interests and values, institutional complexity, and scientific uncertainty of fragmentation and gaps in knowledge (Head and Alford, 2008).

Wicked problems, according to Rittel and Webber (1973), as restated in Camillus (2008, p.100), Peterson and Sherman (2009, p.1), Ritchey (2005, 2011), and several dozens of other papers have ten characteristics:

1   *There is no definitive formulation of a wicked problem*: It is impossible to write a well-defined problem statement about wicked problems. Formulating the problem and the solution are essentially the same thing. Each attempt at creating a solution changes the understanding of the problem.

2   *Wicked problems have no stopping rule*: Since you cannot define the problem, it is difficult to tell when it is resolved. The search for solutions never ends; the problem solving process ends when resources are depleted, stakeholders lose interest or political realities change.

3   *Solutions to wicked problems are not true-or-false but good-or-bad*: Choosing a solution to a wicked problem is a matter of judgment. Since there are no unambiguous criteria for deciding if the problem is resolved, getting all stakeholders to agree that a resolution is 'good enough' can be a challenge.

4   *There is no immediate and no ultimate test of a solution to a wicked problem*: Solutions to wicked problems generate waves of consequences, and it is impossible to know how all of the consequences will eventually play out and measurement is hard.

5   *Every implemented solution to a wicked problem has consequences*: Solutions to wicked problems have consequences that cannot be undone.

6 *Wicked problems do not have a well-described set of potential solutions*: Various stakeholders will have differing views of acceptable solutions. It is a matter of judgment as to when enough potential solutions have emerged and which should be pursued. Wicked problems do not have an exhaustively describable set of potential solutions.

7 *Every wicked problem is essentially unique*: There are no 'classes' of solutions that can be applied to a specific case. Every wicked problem is unique, without precedent; thus, experience does not help you address it.

8 *Every wicked problem can be considered a symptom of another problem*: A wicked problem is a set of interlocking issues and constraints which change over time, embedded in a dynamic social context and they have no single root cause.

9 *The causes of a wicked problem can be explained in numerous ways*: There are many stakeholders who will have various and changing ideas about what might be a problem, what might be causing it, and how to resolve it.

10 *The planner has no right to be wrong*: Problem solvers dealing with a wicked issue are held liable for the consequences of any actions.

After Rittel and Weber (1973) came up with these ten characteristics of wicked problems, they have been adapted and used in disparate disciplines including public administration, political science, and public policy (Briggs, 2007; Fischer, 1993; Harmon and Mayer, 1986; Head, 2008, 2010; Roberts, 2000); natural resource management and urban and regional planning (Allen and Gould, 1986; Freeman, 2000; Innes and Booher, 1999; Salwasser, 2004); cybernetics research (Conklin, 2006); and recently organisation development (Marshak, 2009; Peterson and Sherman, 2009; Sherman and Peterson, 2009).

Not all problems are wicked. Some problems are tame and these are the problems that can be solved using normal science and traditional linear epistemologies in an acceptable time frame (Conklin, 2001, 2005, 2007). A tame problem has the following characteristics [Conklin, (2001), pp.9–10]:

1 "a well-defined and stable problem statement

2 a definite stopping point, i.e., when the solution is reached

3 a solution which can be objectively evaluated as right or wrong

4 belongs to a class of similar problems which are all solved in the same similar way".

Heifetz (1994) categorised problems into three types. He described situations where there are no obvious definitions of the problem or the solution as Type III situations or adaptive problems. Type II as situations where the problem is apparent but the solution is not. Type I situations, as technical problems, where the problem can be defined and can be solved with technical know-how and skills. Heifetz (1994) further explained that Types II and III situations are increasingly becoming problems that organisations face and thus calls for "new leadership skills and competencies, a dynamic process that

emphasizes the need for quality, flexibility, adaptability, speed, and experimentation" [Beinecke, (2009), p.2]. Type II and III situations are complex, multi-framed, cross-boundary, and hard to solve and are wicked problems. Type I problems or tame or technical problems can also be very complex but are not messy. For example, heart surgery is a very complex situation, but it is technical and needs technical solution (Heifetz et al., 2009). It is not a wicked problem.

Senge (2006) distinguished between these two types of complexities as *detail complexity* and *dynamic complexity*. The complexity of wicked problems are dynamic and "cause and effect are distant in time and space" (p.782); whereas complexity associated with tame problems are detailed and there are many variables.

4   The WPC and implications for practice

One cannot tame wicked problems without appreciating the fact that rational approach has its limits to problem solving. As Marshak (2009) explained:

> Instead, other nonrational dimensions need to be accounted for, including internal politics; inspirations in the form of people's untapped values, hopes, and dreams; suppressed emotions and reactive feelings including fear, anger, and loss; implicit mindsets such as assumption sets, mind maps, and culture; and the psychodynamics associated with change, anxiety, and loss (p.59)

It is also impossible to tame a wicked problem if you do not know if it is a wicked problem in the first place. This is what creates a lot of problems within organisations. Technical solutions are used to address wicked problems. The question then is: How do you know what kind of problem you are facing and what kind of approach to take? First and foremost there is the need to identify the wicked problem through a simple diagnoses. Figure 1 is a diagram depicting a very simple means of identifying wicked problems. If you want to know the kind of problem it is that the organisation is facing, then you have to ask whether you know how to solve the problem. If your answer is yes then it is probably a critical problem or a tame problem. If the answer is no, then perhaps it is a wicked problem. You will need to further ascertain if anyone else know how to solve the problem. If the answer is no or unknown then you most likely have a wicked problem. This is when you will need to act as a leader and tame the wicked problem.

The WPC proposed in addressing wicked problems is depicted graphically in Figure 2. It is a nonlinear, iterative process and approach to OD involving diagnosing or identifying the wicked problem as an observation process; interpreting the wicked problem using different perspectives; and intervening to tame the wicked problem. These processes are cyclical and include various nonlinear dimensions and use of some traditional OD methods at each stage. These processes and methods are not cast in stone, but very flexible and adaptive. Pries-Heje and Baskerville (2008) have concluded that the design theory nexus, for example, provides a viable conceptualisation that enables the construction of effective wicked problem-solving artefacts. However, it is important that to tame wicked problems organisational leaders and OD professionals will have to observe and interpret the problem.

Figure 1 Problem diagnosis (see online version for colours)
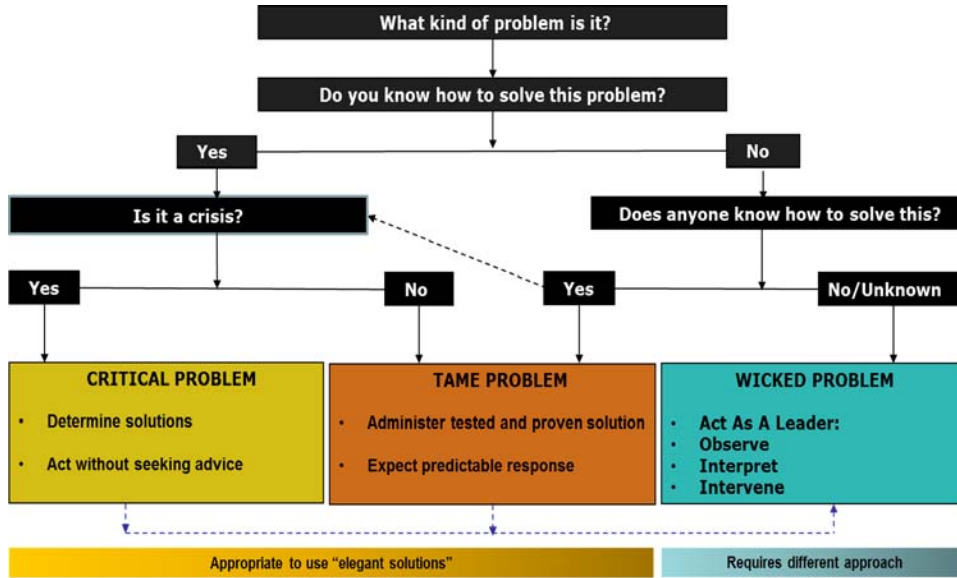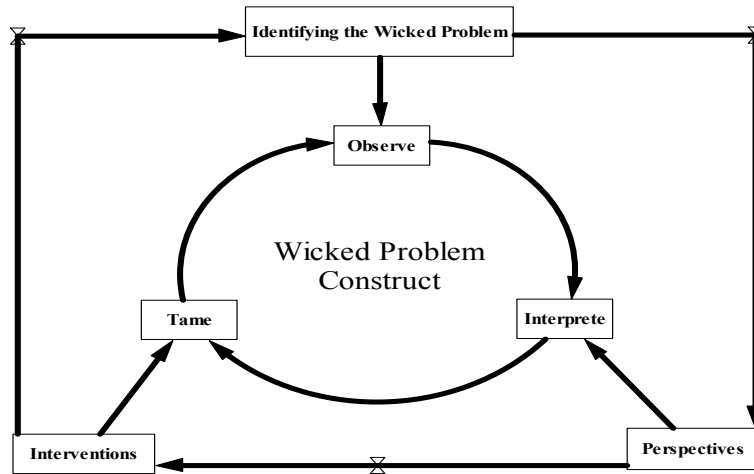

Figure 2 The WPC for OL

It is also important to note that interpreting the problem is not to define the problem, because wicked problems are not definable. The problem definition develops as new possible elucidations are considered and/or implemented. Although wicked problems cannot be simply and objectively defined, they are open to interpretation from an unlimited array of angles (De Wit and Meyer, 1999). As an OD practitioner, whether intrinsic or extrinsic to the organisation, the role is to put the construct in place so that with or without you the cycle will go on. Taming wicked problems has no time frame; however, no organisation in practice will hire an external OD practitioner forever. Organisations will therefore need to be learning organisations to fully be able to use the

WPC as a framework for OD&C. The following sections will discuss each of the three components of the construct in detail and their implications for theory and practice.

4.1   Diagnosing or identifying the wicked problem as an observation process

Diagnosing a wicked problem is a wicked problem in itself. Observation is highly subjective, but in diagnosing a wicked problem, the aim is to make the observation as objective as possible. There are endless questions that need to be asked. Gathering data as it is done in traditional OD is a critical first step, but it is just a tiny component of the observation process. As Heifetz et al. (2009) described, the questions should include inter alia:

> "Who's talking with whom? Who responds to whom? What are the alliances and relationships beyond the organizational chart? What is the history of the problem we are facing? What are the different views of it? What are the patterns of behavior relevant to the problem that are not visible unless you are looking for them? How are the organization's culture and structure affecting people's behavior?" (p.33)

During the observation process, there are key wicked problem archetypes that need to be watched out for. Senge (2006) and Heifetz et al. (2009) have discussed into detail some of these archetypes. Senge (2006) referred to them as systems archetype and Heifetz et al. (2009) called them adaptive challenge archetypes. All these are what I refer to as wicked problem archetypes. In this paper, four main archetypes are described. These are combinations and consolidations of several of the related archetypes described by Senge (2006) and Heifetz et al. (2009).

- *WPC Archetype 1*: Gap between espoused values and exhibited behaviour. Just like individuals can be hypocritical, organisations can exhibit the same behaviour (Yawson et al., 2006). In many organisations, there is a yawning gap that exists between the values espoused by the organisation and its actual behaviour (Heifetz et al., 2009; Yawson et al., 2006). Closing the gap is a wicked problem "because people in the organization have been successful through their patterns of behavior and will want to continue to do what earned them success" [Heifetz et al., (2009), p.79]. There comes a time when it can no longer be ignored. Senge (2006) described using the 'left-hand column' exercise developed by Argyris (1990) to close the gap. Senge (2006, p.788) stated that "the idea that mental models can dominate business decisions and that these mental models are often tacit and even contradictory to what people espouse can be very threatening to managers who pride themselves on rationality and judicious decision making". The 'left-hand column' exercise can therefore be a very powerful tool during the diagnosing or identifying the wicked problem as an observation process, by not only bringing hidden assumptions to the surface but induce organisational members to be able to speak the unspeakable.

- *WPC Archetype 2*: Competing commitments and charting strategic dilemmas. Organisations are constantly conflicted with competing dilemmas and to address them, organisations must make painful choices that will not satisfy all stakeholders. These are wicked decisions and as such most organisations, avoid making them, or instead make compromises that ultimately aggravate the wicked problem (Heifetz et al., 2009). A classic example of this archetype given by Senge (2006) is how for several years manufacturers in the USA faced the low cost-high quality dilemma,

with low-cost becoming the prevailing choice. The results of this perceived either-or choice have been disastrous (Senge, 2006). Hampden-Turner (1990) presented a variety of tools for addressing this archetype through a seven-fold process of: eliciting the dilemmas; mapping by locating the conflicting commitments; processing; framing or contextualising; sequencing; waving or cycling; and synergising.

• *WPC Archetype 3*: Shifting the burden. Organisations tend to shift burdens to avoid taming wicked problems. "A short term 'solution' is used to correct a problem, with seemingly happy immediate results" [Senge, (2006), p.785]. This approach is not sustainable and the situation becomes 'an even more severe wicked problem' overtime. Senge (2006) proposed a template for identifying this archetype.

> "In the shifting the burden template, two balancing processes (B) compete for control of a problem symptom. Both solutions affect the symptom, but only the fundamental solution treats the cause. The symptomatic 'solution' creates the additional side effect (R) of deferring the fundamental solution, making it harder and harder to achieve." [Senge, (2006), p.786]

Shifting the burden archetype has several facets and related antecedents such as, balancing process with delay; limits to growth; eroding goals; escalation; tragedy of the commons; and growth and under investment.

Figure 3 Shifting the burden WPC Archetype template
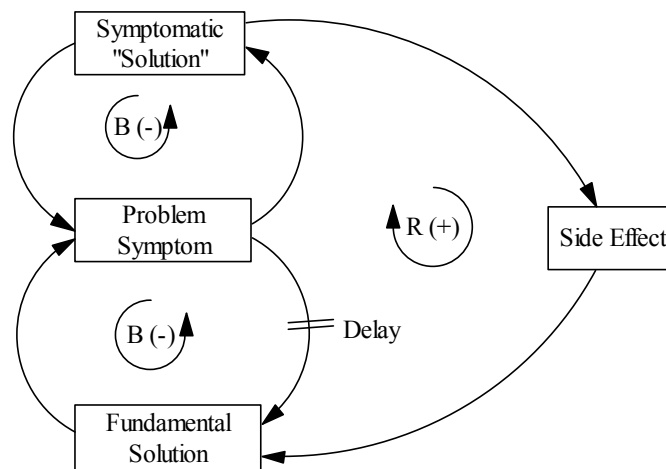
Source: Adapted from Senge (2006)

• *WPC Archetype 4*: Resistance to change and work avoidance. Resistance to organisational change is normally addressed using linear epistemology with the conventional wisdom that resistance to change is a tame problem and it is addressed using technical solutions. "These often provide change aphorisms related to perceptions, structures, and anxiety" [Grieves, (2010), p.358]. Heifetz et al. (2009) described two patterns where resistance to change becomes a wicked problem: "Diversion of attention, and displacement of responsibility" (p.84). This comes about when prospects for change reach unbearable height of intensity; and with sustained distress, employees may focus on just surviving and are no longer engaged. This

often produces misdiagnoses in organisations. In most instances the work avoidance mechanisms are easier to identify than the wicked problems and the timing and nature of these avoidance mechanisms may serve as signal to the existence of wicked problems which remain hidden (Heifetz et al., 2009). Kegan and Lahey (2009) described this archetype using the medical metaphor of immunity

4.2   *Interpreting the wicked problem using different perspectives*

Interpreting a wicked problem is even more challenging than observing. However, as challenging as the practice may be, there is no way interpretations can be avoided in addressing wicked problems. Heifetz et al. (2009, p.34) described interpreting a wicked problem as "listening for the 'song beneath the words'". In building on Bolman and Deal's (2003) multi-pronged approach to organisational diagnosis, development, and change, Gallos (2006) described how the four frames developed by Bolman and Deal (2003, p.349) "rest in the fact that organisations are messy and complex". Gallos (2006, p.349) contended that organisations "operate simultaneously on these four levels at all times, and can require special attention to address problems in one area while remaining strong and functioning in others".

To be able to interpret wicked problems as objectively as possible, OD professionals should approach the interpretation using different lenses or frames and the Bolman and Deal (2008) framework is recommended. The four frames proposed by Bolman and Deal (2008) are the structural, the human resource, the political and the symbolic. Each of the four frames provides one aspect of organisational life and gives a definite and contracted range of ideas, techniques, and processes that may be used to interpret wicked problems in organisations. Table 1, adapted from Gallos (2006) describes the frame-related issues and areas of focus when interpreting wicked problems.

Table 1   Frame-related issues and areas of focus

Frame	*Potential issues and areas that factor into interpretation*
Structural	Rules, regulations, goals, policies, roles, tasks, job designs, job descriptions, technology, environment, chain of command, vertical and horizontal coordinating mechanisms, assessment and reward systems, standard operating procedures, authority spans and structures, spans of control, specialisation/division of labour, information systems, formal feedback loops, boundary scanning and management processes
Human resource	Needs, skills, relationships, norms, perceptions and attitudes, morale, motivation, training and development, interpersonal and group dynamics, supervision, teams, job satisfaction, participation and involvement, informal organisation, support, respect for diversity, formal and informal leadership
Political	Key stakeholders, divergent interests, scarce resources, areas of uncertainty, individual and group agendas, sources and bases of power, power distributions, formal and informal resource allocation systems and processes, influence, conflict, competition, politicking, coalitions, formal and informal alliances and networks, interdependence, control of rewards and punishment, informal communication channels
Symbolic	Culture, rituals, ceremonies, stories, myths, symbols, metaphors, meaning, spirituality, values, vision, charisma, passions and commitments

Source: Gallos (2006)

4.3   Intervening to tame the wicked problem

The next stage in the WPC after an interpretation of the wicked problem is the intervention to tame the problem. The objective of the WPC is coherent action, not final solution [Conklin, (2007), p.5]. Designing an intervention will not follow a particular tool kit. It depends on the type of wicked problem as shown by the observation and interpretation. This is the stage where new OD tools which are nonlinear can be applied. There is wealth of these new OD tools and organisations have to opt for compilations and combinations of these tools, theories, and concepts of leadership, rather than any single intervention to tame wicked problems. These compilations of concepts and practices in most instances function interdependently in the taming process (Hickman, 2010). The caution here is that the use of these tools, concepts and approaches should be adapted as a follow up of the observation and interpretation stage to not get caught up in the same old ways of approaching wicked problems as the WPC is seeking to reverse. The following approaches *inter alia* are recommended:

- *New leadership models*: to guide organisations in transitions from the bubble bust and mindset of the industrial age to the age of dynamic, complex, nonlinear, interdependent environment of disequilibrium and turbulence (Yawson, 2013). This is important whether developing or transforming, including effective leader/follower strategies that draw in a true diversity of voices and require leaders to maintain intellectual flexibility and open-mindedness in the new 'necessary revolution' (Senge et al., 2010). The leadership component of taming wicked problems should be a collective process in which no single form or concept of leadership should be sacrosanct (Hickman, 2010).

- *Boundary-less organisations*: to break down silos to share knowledge more easily and work more intentionally and collaboratively to tame wicked problems. Organisations unaccustomed to viewing the world outside their silos have a problem understanding that wicked problems are not compartmentalised, and that to be able to tame wicked problems they will have to be boundary-less organisation where:

  > "Departments collaborate (instead of sticking to themselves); conflict is seen as creative (instead of disruptive); people can do anything not explicitly prohibited (instead of doing only what is explicitly permitted); and decisions are made by the people with the most knowledge (instead of the ones with the highest rank."
  > [Kanter, (2006), p.860]

- *Scenario planning*: to provide for both programme design and reshaping OD structure. The uncertainty and dynamic complexity of wicked problems present an uncertain landscape for organisations to strategically plan. Organisations need a framework that allows them to manoeuvre in an uncertain environment and to make decisions that can prepare them in dealing with future wicked problems. Malik et al. (2009), described the use of the *strategic flexibility framework* (SFF) developed initially by *Deloitte Consulting LLP* as a scenario planning tool based on post-modernist epistemology. The SFF Framework is based on the idea that organisations "require flexibility to adjust decisions within given constraints and that strategic uncertainty requires strategic flexibility, the ability to change strategies" [Malik et al., (2009), p.47]. The SFF is predicated on two key constructs: scenario-based planning and real options. Scenario-based planning creates potential future conditions and aims to anticipate the future rather than predict it, because

wicked problems cannot be predicted. Options for alternative strategies are also explored, either for alternative scenarios or for a given scenario, which provides the ability to change strategies to tame wicked problems (Malik et al., 2009).

- *Positive deviance*: to give organisations authentic voice to determine what works and how it might adopt and/or expand those practices. Positive deviance traditionally belongs to asset and strength-based approaches to organisational change (Saco, 2006). It is predicated on the conception that within every organisation or system there are few entities which can be individuals, self-organising teams, or communities of practice, "who are the positive deviants, who have managed to cope with apparently intractable problems within the same resources as their peers" [Saïd Business School, (2010), p.6]. One of the main characteristics of positive deviance is its extremely practical loom to crafting and re-framing a social or behavioural problem and in learning from existing successful practices, within resources that are already available (Pascale et al., 2010). The organisations then devise best means of amplification and put into practice these existing discovered behaviours as a way of taming wicked problems (Pascale and Sternin, 2005).

- *Chaos theory, complexity theory, and complex adaptive practice*: to put in play an ecosystem model for change. Chaos theory and its offshoots, complexity theory and complex adaptive systems (CAS), are underlined by the features of systems theory, although they may represent a new and distinct generation of thought (Yawson, 2013). These theories maintain that "relationships in complex systems, like organisations, are nonlinear, made up of interconnections and branching choices that produce unintended consequences and render the universe unpredictable" [Tetenbaum, (1998), p.21]. Complexity theory posits "that some events, given our knowledge and technology, are unknowable until they occur, and may indeed be unknowable in advance" [Schneider and Somers, (2006), p.354]. Complexity theory includes three interrelated elements that are not accounted for in general systems theory (GST). These are nonlinear dynamics, in which structures are characterised by high states of energy exchange with the environment and extreme instability (Hickman, 2010); chaos theory which is nonlinear, deterministic (rather than probabilistic), sensitive to initial conditions, and continuous irregularity in the behaviour of the system (Taleb, 2007); and adaptation and evolution, in which an ability to modify or change is evidenced through a process of interdependent self-organisation among individuals or sub systems (Schneider and Somers, 2006). Within complexity theory, the concept of CAS may provide the best organisational capacity to tame wicked problems. An organisation that develops CAS can function as a 'poised' system that has the capability to tame wicked problems.

- *Double-loop learning*: to deepen strategic learning to promote innovation and to be pre-active in taming wicked problems. For an organisation to be able to tame wicked problems, it is imperative for it to practice double-loop rather than just single-loop learning. It will be difficult to tame wicked problems just by using single-loop learning. Single loop learning for wicked problem is characteristic of 'shifting the burden archetype'. In double-loop inquiry, approaches and even the values connected to the observation and interpretation of wicked problems are questioned, ensuing in free and learned alternatives, more applicable information, and elevated intrinsic dedication to any new behaviour exhibited (Argyris and Schön, 1978).

People learn to speak the unspeakable and question what might even be considered sacred (Raelin, 2009). The importance of double-loop learning in taming wicked problems can be seen in at least two important ways. They can improve case-in-point discourse allowing for productive engagement (Putnam, 1999). Secondly, double-loop learning can invoke the fundamental causal factors that inform the way people interact the way they do (Raelin, 2009). "So, in order to bring about fundamental and lasting improvement in the quality of discourse, practitioners learn to reflect upon and alter the assumptions embedded in their behavior and reasoning patterns" [Raelin, (2009), p.26].

- *Alignment framework*: to understand intention and experience for organisations to practice espoused values. In taming wicked problems, one of the main challenges to overcome is the tendency for individuals within an organisation to relate the strategic direction to what they believe they personally can attain. There is a need to keep an organisation focused and, at the same time, allow it to be creative and flexible in order to deal with wicked problems that arises. Alignment framework is the ability to clearly articulate what is important and then to allow this to be the main driver of all activities performed throughout the organisation. Individuals in an organisation should be both aligned to the strategy and the needs of other stakeholders in the organisation (Simons, 2006). Developing a framework that provides a means for linking the entire organisation offers the mind-set where everyone knows how decisions are made, and how they add to the organisational value and existence (Simons, 2006).

- *Appreciative inquiry (AI)*: to focus on aspects of the organisation which, are working well. AI also rejects the traditional OD's linear problem-solving interventionist approaches of normal science and heavy emphasis on positivist methods (Marshak, 2006), and "employs a less linear approaches such as stories, narratives, dreams, and visions that stimulate human imagination and meaning systems" [Hickman, (2010), p.93] as a way of taming wicked problems. Watkins and Mohr (2001, p.26) affirm that AI is of post-normal science in orientation and is "grounded in the theory of social constructionism". Unlike linear epistemology, post-normal science, or postmodernism, or nonlinear epistemology, on the other hand, rejects the idea of an elemental structure and of a fundamental truth (Watkins and Mohr, 2001). Watkins and Mohr (2001, p.27) further assert that "post-modern thought embraces the idea of multiple and contextually determined realities and that social constructionism is a formative theory of the post-modern era".

5 Conclusions

The nature of dynamic complexity of wicked problems lends itself to a whole new paradigm of approach to organisational leadership and development. The WPC as laid out in this paper describes this new paradigm. The implication of this new paradigm for theory and practice of OD is far and broad. For example universities and other institutions of higher learning and training will have to take a new look at their training curricula. The practice within universities and colleges where students are insisted upon to provide problem statements in the beginning of research proposals, thesis and

dissertations are all embedded in the linear epistemological approach to problem solving. This is not to say problem statements are not necessary, but should not be definitional in every instance. Some of the problems are wicked and cannot be defined.

The emphasis on nonlinear epistemology and the concept of the WPC, however, should not be interpreted as advocating the total demise of linear epistemology. The usefulness of linear epistemology in addressing tame problems is not in contention. The contention is that linear epistemology cannot be the dominant epistemology of practice and that dynamic complexity of wicked problems, which requires a nonlinear epistemology of practice, rather than reductive or linear thinking or processes of normal science, is a reality in many 21st century organisations. Wicked problems require, a deliberate leader with the pattern recognition skill of an artist as well as the empirical gift of our 20th Century managerial inheritance.

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