

Complexity and Self-directed Teams

Abstract

This paper examines the relevance of complexity theory in understanding how self-directed teams (SDTs) form, transform and operate. It examines current literature on the fundamentals of complexity paying particular attention to the work of Ralph Stacey and also available literature/research about self-directed teams. The phenomenon of self-directed teams is not new, indeed in 1995 it was estimated that 20% of all companies in the USA were experimenting with some form of self-direction (*Coates & Miller*), but a search of the literature has revealed that there is very little that links contemporary thinking on complexity theory with the creation, operation, life-expectancy and experience of self-directed teams.

To assist the reader, this paper commences with a distillation of the ideas in the literature on complex responsive processes particularly applied to learning and knowledge management in organisations (*Stacey*) and the resultant ‘paradox of control’ (*Streatfield*), then explores different ‘real life’ examples of self-directed teams, including an examination of the theory of distributed-leadership within such teams (*Barry*). Examples of current thinking on how these different elements are related to each other are then discussed and critiqued. The author has also included a small section of ‘self reflection’ as part of the critical process before drawing final conclusions. No attempt is made to argue the benefits of SDTs compared to other more traditional organisational models. A list of references and a bibliography are appended.

(Authors note: in the course of developing this paper and in particular recognition of the abstract nature of complexity theory, certain phrases and words have been italicized to add emphasis and to assist the reader to make connections between the different theories and concepts discussed.)

1 Complexity Theory & Organisations

‘Though this be madness, yet there is method in it.’

William Shakespeare; Hamlet

1.1 Stacey: Complex responsive processes in Organisations - Learning & Knowledge Creation

The main argument from Stacey in this book debunks current mainstream thinking about established models of interactions between individuals and groups / organisations. Effective learning and knowledge creation requires a sharing of ‘values’ that have to be established through a process requiring leadership. Leadership, with its political implications can become difficult as leaders apply what Argyris called ‘defence routine’s such that some issues become impossible to discuss between the leader and ‘the led’.

There is one overall frame of reference in this current thinking – ‘systems thinking’ underpinned by rationalist and formative teleology. Systems thinking

assumes it is possible for people to transmit their mental contents to each other for sharing within the context of an organisation or group but Stacey poses the questions:-

- i. How do individuals and the social world around them connect and which comes first in that interaction?
- ii. What is it that individuals actually share and how differently, if at all, is this perceived by them?
- iii. What theories of causality are assumed?
- iv. How do enduring social collectives and individuals change as a consequence of interacting and what are the impacts of those changes?
- v. How do changes and/or novelty arise in the minds of individuals and/or the social collective?

Although these questions are framed in the context of 'learning and knowledge creation', they are also resonant of the issues confronting SDTs and their parent organisations. The conclusions Stacey draws are as follows:-

- 1) The meaning of communications does not reside in words but in the response words call forth in the receiver/listener; this is analogous to symbolism. However the common tendency in considering words is to prescribe them with a reality that is not real – this is effectively creating 'folklore'. A way of thinking about this is to consider the rules of mathematics, logic, science and professions where the language used is abstract and uses systematic frameworks constructed in reified symbols (i.e. tools that are stored for use in the interaction between people and/or collective groups).
- 2) This communication via symbols is equivalent to bodily actions of relating. Knowledge is therefore a process of action / interaction not an 'it' in itself. This process is a 'patterning of symbols' takes place only in the living present and cannot be stored or shared....

Thus this way of thinking about interaction between individuals and social collectives is moving away from the notion that there is a system of rules causing coherence in human communication towards the ordering properties of the communication actions themselves. This concept of self-ordering is analogous with 'fractals' and the simple equations that give rise to these patterns. An example of this self ordering can be recognized in the negotiated way in which turn taking and turn making takes place in communication to give coherence. There is also novelty that arises inevitably in the variations that occur during communication and the passing on of information; so the coherence of communication is centred on the self-organising themes and variations that occur around a pattern of shared experience.

- 3) It follows that organisations rely heavily on local communication and local knowledge which is created by local ‘languages’ (jargon?), communication processes and practice. Therefore it is foolish to consider that there can be explicit rules for managing knowledge as knowledge lies in themes that are being reproduced continuously.
Ideological themes organize people’s experiences of being together as ‘power relations’ and these are an essential feature of the communication and interaction processes. Hence to propose that it is possible to manage knowledge is to imply that it is necessary to manage ideologies and power. Yet an essential feature of communicating and interacting is imagination which can be in the more easily understood in the form of fantasy or gossip.
- 4) Organisations are processes of complex responsive relations between bodies in both a human and non-human context. These processes are enacted in the medium of symbols and are patterned into organising themes.
- 5) Change is evolutionary – thematic patterns organising the experience of being together. But this is only possible when the dynamics of communication and interaction are fluid enough i.e. there is sufficient diversity, tension and conflict in the thematic patterning of the interaction; this could be considered as being near to or at the edge of chaos!
- 6) Knowledge therefore is meaning and only emerges in communications between people; it is evolutionary and transformed by reproduction and variation. It can be proposed that learning is much the same – in fact is there any point in distinguishing between the two?
- 7) Knowledge is neither designed nor exists in a common pool, rather it is emergent. The use of tools (symbols) requires, perhaps generates variations in the living present and so it would be impossible for someone outside of a local situation to stay in control although that person may paradoxically remain responsible and ‘in charge’.

Taking all this into account renders the idea of being able to manage knowledge more and more implausible.

1.2 Philip J Streatfield: The Paradox of Control in Organisations

Streatfield primarily uses Stacey’s concept of an organisation evolving as a ‘series of complex responses’ to explain and understand his experiences and observations as a manager in a pharmaceutical company that undergoes a merger. The driver for this line of enquiry was his need to rationalize what he describes as ‘the piecemeal nature of management practice’ and ‘the messiness of management’ set against a traditionalist view that managers are people who must be (tenuously) ‘in control’. This control is limited by the access a manager has to the *conversations* going on at grass roots level amongst those who are the subject of this ‘control’. Furthermore these *conversations* are in a language from which a manager can be excluded and may not even be aware of. It is *pre-existing patterns of behaviour*

that prevent managers from engaging in or even being aware of these conversations. Hence the paradox of control referred to in the title to his book.

The manager's role may be written down formally in a job description but this definition only loosely relates to the actuality of the role. Streatfield's personal experience was that only by distancing himself from the formal role of manager and engaging in dialogue with those who were supposedly under his control, could he make sense of what was happening in his sphere of responsibility. This 'making sense' emerged in *conversations and patterns of behaviour* and control emerged in the relationships between people, (not always including himself).

Of course 'being in control' can mean different things to different people. Streatfield's definition is: 'producing consistent results that are in line with expectations and equal to or better than similar companies in the same sector' and he makes the distinction between being in control and 'experiencing a sense of coherence'. Yet Streatfield recognizes that management processes very often include 'intuitive guesses and actions' intertwined with logical, planned and analytical approaches. Consistency of results therefore were critically dependent upon management (and other) processes that were inherently uncontrollable. The idea of managers combining both intuitive and deductive thinking to determine their actions/decisions is analogous to being at '*the edge of chaos*' described by Stacey. From this emerges the idea that the futures of organisations are under perpetual construction / deconstruction caused by the interactions of people in those organisations and by the interactions between organisations themselves. These interactions, do themselves, have a capacity for spontaneous transformation (*Stacey*) and attention is therefore focused away from the choices of individual managers or organisations towards the nature of their relationships with each other and the impact that intentional action has in its coexistence with the transformative evolutionary process that results from interaction.

Streatfield makes much of the paradoxical way in which the *conversations* between very senior executives who espoused the need for an absence of emotion, had an influence on the behaviours and emotional responses of people in two culturally different organisations that merged to form one large international company. Analysis, logic and rationalism all became *reified 'tools'* used as rhetorical devices/challenges to underscore the emotional and consequently political responses of managers to the changes imposed upon them by the CEOs and the merger itself. These *spontaneous* responses became a discernable *pattern* along side the 'top down' prescribed control framework for the merger and were aimed at retaining control or power over what had previously (i.e. prior to the merger) been the status-quo, particularly in terms of one's own destiny. As the responses were unplanned, spontaneous and at times ambiguous, it follows that their meanings were different and individual to each person i.e. a 'messy' experience. The resultant informal power patterns that emerged were both self-organising and highly individualized but nevertheless gave form to the emergent organisation.

The key management skill or attribute for dealing with this paradox is to have the courage to continue to participate creatively in *conversations* from which new

meaning either knowingly or unknowingly emerges. In turn this requires an understanding of organisational qualities and patterns rather than traditional hierarchical relationships whilst being able to live with the anxiety this paradox creates.

2 Self-directed teams

2.1 David Barry: Managing the ‘Bossless’ team: lessons in distributed leadership

Self-directed teams or as Barry calls them, ‘Self Managed Teams’ (SMTs), can appear in many different forms for example: quality circles, task forces, *communication teams* etc. and are widely used by major corporations to solve what are viewed as *complex* problems. Drivers for this include:

The IT explosion where people (workers) become more self-directed and specialist by having increasingly easier access to information with all the connotations this has for the manager/employee relationship where power was previously rooted in ‘knowledge’.

Expensive and sophisticated systems requiring worker operators to make real time decisions on their own or without supervision in order to prevent disruption to these systems.

The need to reduce the costs of middle-management and speed up decision making – *also cited by Coates & Miller in their paper on self-directed teams in local government (see below).*

But the demand for leadership still exists even when the boss has gone or is removed and arguably the demand for leadership is more complex in self directed teams...as the need for task based leadership is supplemented by the need for leadership around the group development processes as well.

Barry proposes that without the presence of formal leaders and authority, there are power struggles about the task and process issues. He states that as SMTs never (rarely?) receive formal training in group process skills the teams are frequently unstable, but perhaps this is just a manifestation of the ideas that Stacey proposes regarding the nature of communication between individuals and the social collective?

Barry does however agree with Stacey that the existing (leadership) models for organisations are inadequate where perhaps leadership is seen as a ‘quality’ that exists in one person within a group and where theories about universal traits, situational leadership, functionalism and ‘learned leaders’ apply. Barry states that; ‘these theories ignore leadership *dynamics* within a group’. The group centred leadership model of Tannenbaum-Warren Schmidt in which the importance of focusing on a group’s decision making processes (rather than the individuals within a group) is critiqued by Barry as being inadequate as they tend to ignore the impact of a group’s evolution on its leadership requirements. This model also

ignores the need (as Barry sees it), for ‘social leadership’ roles that help to manage participation and conflicts.

Barry is more complimentary about Blanchard and Hershey’s extension on group development to situational leadership theory which identifies the need for socially centred support functions to vary during the life of a group; in the earliest stages of group formation directive leadership can make up for a lack of task competence whilst enthusiasm and commitment are high. Conversely when a group has matured and is most effective / high in morale, there is a greater need for external supportiveness and less direction.

Nevertheless, Barry argues that both the Tannenbaum-Warren Schmidt and Blanchard-Hershey models ignore the situations that exist in SMTs when the traditional leader role is absent. He proposes that a third model, the ‘substitute’s school of thought’ has more relevance for the functioning of SMTs. This school of thought from the early 1980’s argues that individual, task and organizational variables can reduce a group’s need for traditional leadership particularly when the team members are knowledgeable, when tasks are routine, results driven and satisfying to accomplish. But the model also recognizes that the surrounding organisation needs to have certain critical attributes such as: being highly formal, highly inflexible yet cohesive with independent reward structures for managers and spatial distance between workers and managers.

The frailties that Barry perceives in these three models and the results of his own researches into SMTs led him to propose a different model of leadership – distributed leadership which has at its heart the notion that leadership is a collection of roles and behaviours that are split, shared, rotated and used sequentially or concomitantly. The result is the idea that there can be simultaneous leaders existing at the same time within a group assuming complimentary leadership roles.

The distributed leadership model assumes that each group member has certain leadership qualities that will be needed by the group at some point and that the *dynamic pattern of distributed leadership is emergent*. It is worth remembering that ‘patterning’ and ‘emergence’ are two key elements identified by Stacey. However in the author’s opinion this assumption is not necessarily true – there is no explanation of what drives individuals to display their supposed inherent leadership qualities nor is there any recognition of any more recent theories regarding ‘followership’ and the complex relationships that exist between followers and leaders e.g. that leadership is ‘bestowed’ by followers.

Barry goes on to explain that there are four primary and different leadership roles that are required at different times within successful SMTs; Envisioning leadership, Organising leadership, Spanning leadership and Social leadership. In summary these different roles encompass the following:-

- i. Envisioning leadership: facilitating ideas, defining goals, finding conceptual links *between systems* and fostering framework breaking thinking.

- ii. Organising leadership: bringing order to disparate group tasks by making things predictable and clear, providing focus on details, deadlines and structure.
- iii. Spanning leadership: facilitating the links between the SMT and outside groups and/or individuals.
- iv. Social leadership: externalizing members' needs and concerns, ensuring that all group members have an equal voice, interpretation of others' views, injecting humour, mediating conflicts and generally being alert to the different and evolving energy levels / emotions within the SMT group. The social leader has the greatest responsibility for ensuring that the group members learn about the personal qualities of each other and develop a working knowledge of the different orientations, beliefs, and skills within the group. Only in this way can distributed leadership be established.

Barry further states that it is not enough for the different types of leadership role to be just present, but that for optimum SMT performance the roles must be differentially emphasized during the different phases of the life of the SMT group. Within each of these phases of group life at least one, (and probably more), of the leadership roles identified above need to be present and effective. In terms of the dynamics of leadership, the most important factor initially is to establish an acceptable leadership *pattern*.

2.2 Bebee, Rubenson and Smith: Using Self-directed teams in a Business School Structure

In response to changes to the requirements of accreditation standards introduced by the 'Association To Advance Collegiate Schools Of Business' (AACSB), in the USA, the Franklin P Perdue School of Business at Salisbury University in Maryland decided to restructure the School's organisation to make it more effective in meeting these revised standards. In particular the restructured organisation needed to overcome gaps in the co-ordination of instruction (teaching) and to co-ordinate better the activities of the 30 or more different faculty members.

The school introduced a new team-based matrix organisation that has successfully operated since 1994. This development of this new matrix organisation was undertaken by the dean, the associate dean and several faculty members. The teams created were to take responsibility for decision making, adaptation to environmental changes and monitoring their own performance. Seven 'service' teams were created, patterned after the AACSB's standards and mapped onto the existing functional structure in an atypical 'matrix' style organisation. Each team was empowered to elect its own leader and has a three year rolling compliment of members.

The perceived benefits of the team structure were that those involved could bring to bear their own different synergies to perform major organisational tasks, the barriers between departments and functions would be broken down, there would be better access and utilisation of resources and the teams would be empowered to make decisions. Of the seven teams within the structure, only two – The International Council and The Applied Business Learning Experience Team, were mandated to be ‘self-directed’. It is not clear from the paper what criteria were used to determine if a team should be self-directed or not nor what the precise benefits from self-direction have been.

The general consensus within the school is that the matrix team structure has fulfilled the requirements of the AACSB’s standards and removed decision making bottlenecks without (apparently) adding to bureaucracy. In addition, programmes and activities have been introduced in a more timely fashion by a broader cross-section of junior and senior staff. Students are perceived to have benefited from advances in instructional delivery, the (improved?) use of technology, greater international opportunities, and increased faculty diversity.

2.3 Coates and Miller: Self-directed teams – Lessons From Local Government in the USA

In 1985, Bob O’Neill the new City Manager of Hampton, Virginia made it clear that creativity, flexibility and empowerment were needed to provide more efficient local government on behalf of the city’s citizens. The Director of Human Resources responded to this new climate of change by deciding that her staff should become a self directed team even though this had not been a specific requirement laid down by Manager Bob O’Neill.

The three major lessons that were learned from this change in direction within the Human Resources Department were:-

- a/ Not all local government departments may be suited to self direction and it is the nature of the work they do that primarily determines this. Five factors were identified that prohibit or pose significant risk to self directed teams; these were:-
 - i. Dangerous, unpleasant, arduous, fast paced work involving high levels of risk that ‘unexpected’ things can happen which may cause harm, loss or disaster. Examples being police, fire service and other emergency units where it is considered essential to have traditional direction / supervision.
 - ii. Where there is little or no team interaction, for example vehicle drivers, accountants and building inspectors.
 - iii. A lack of ‘professional maturity’ amongst team members leading to an inability to co-ordinate work schedules, run meetings and represent the team to external interested parties

including senior management.

- iv. An cultural unwillingness to make the effort i.e. where there is a preference for the supervisor to continue in a traditional role.
- v. Difficulties and/or an inability to meet as a team; this could be where there are high concentrations of part-time or temporary employees or where shift working is common place.

b/ Self directed teams cannot be implemented as isolated programmes and for such teams to be successful, requires major changes in nearly every aspect of an organisation from the top down.

c/ Management need to understand from the outset, that there will be a sizeable investment in making self directed teams work involving significant costs and challenges.

Coates & Miller stipulate the importance of all-round change in organisations seeking to move away from traditional hierarchical structures and to introduce self direction. Leadership practices, incentive systems, communications and career development policies are all cited as areas that may require adjustment to support self directed teams. Taking each of these in turn:-

- a) Leadership practice: senior management need to commit to an organisation wide culture change, provision the necessary training and empower / rigorously support empowerment to ensure that decision making does not atrophy and that the necessary levels of customer service are not prejudiced. There also needs to be careful forethought on what to do with former supervisors whilst recognising that there will be a need to treat each case on its own individual merits. The matter of how to apply disciplinary policies will need very clear and different direction from that within a traditional hierarchical organisation.
- b) Incentive systems: Self directed teams should have 'elevated' goals and when the results are 'excellent' the team members should be rewarded and recognized collectively.
- c) Communications: the systems should enable self directed teams to interconnect with each other effectively and so help to significantly increase *organisational learning* and reduce the extended time inexperienced self directed teams inevitably need to make decisions.
- d) Career development policies: the removal of layers of management makes the existing paradigm for career development obsolete. New 'lateral' career development processes need to be therefore enabled and understood so that team members advance their careers by

achieving a recognised higher professional status based on experience, education and achievement.

2.4 George & Wellins: The key to self-directed teams from Training & Development Journal

This 1991 article is based around a broad industry survey in the USA carried out by Industry Week Magazine, Development Dimensions International (DDI) and the Association for Quality and Participation (AQP). The number of self-directed teams had been growing in acceptance from the mid 1980s onwards. They were originally viewed as a radical concept and the 1991 survey identified that 26% of the Executives were ‘using’ SDTs and that half the workforce would be in SDTs within five years i.e. by 1996.

The key message in the article is to reinforce the importance of planned and structured training in the initiation, development and running of SDTs. This is seen by senior management and training specialists alike as a vital and key way of combating the problems that would otherwise occur when new members of SDTs confront the reality that they are required to adapt to very different working practices / responsibilities requiring them to learn / continuously learn very different skills. The emphasis here is on new social and leadership skills being practiced with increasing levels of sophistication in an emergent and different cultural context. The responsibility for training fell primarily to company Human Resource Specialists with line managers and team members also taking part. However it was discovered that team members most frequently learned best from each other, echoing Stacey’s views that local conditions are best understood by those who are local.

It is worth noting that the survey found that problem solving skills were identified as the most popular and most required training in 72% of cases, followed by team building (61%) and improving quality (58%). The benefits quoted were not quantified in terms of their impact on business performance but ranged from improved productivity in 77% of cases, better quality (72%), improved job satisfaction (65%), improved customer service (57%) and reduced waste (55%). It is worth noting that there is an absence of *elevated goals* as referred to above by Coates & Miller.

The major barriers to successful SDTs were seen as:-

Insufficient training	(54% of survey respondents)
Resistance from pre-existing Supervisors	(47%)
Incompatible Systems	(47%)
Lack of prior planning	(40%)
Lack of (middle) management support	(31%)
Lack of union support	(24%)

Not surprisingly given the age of the article, the proposed model process for introducing SDTs includes having a senior management ‘Steering Committee’

and a ‘Design Team’ that reports into the Steering Committee and which is made up of team members, middle managers or supervisors, other functional representatives and union officials. It is also proposed that best practice dictated both the Steering Committee and Design Team undertook all the same training members of SDTs would themselves undertake.

2.5 M Zasloff: Starting Self Directed Teams - an article from Supervisory Management July 1994

In order to nurture SDTs Mindy Zasloff a management consultant proposed starting teams off with decisions they can handle to avoid ‘crushing disappointment’ leading to team control being revoked. Her prescription for success was:-

- Determine the team’s degree of authority in advance
- Identify the support such authority will require
- Limit initial authority to areas the team can handle with confidence
- Ensure the team knows what it can and cannot do
- Work with team members to determine what training or other resources are required to expand the team’s authority successfully
- Set key result targets for the team limited by the team’s capability

3 Critical Discussion

From Stacey we can gather that the conscious and unconscious themes that organise experience are inseparable in any normal individual and it is therefore meaningless to ask how tacit knowledge is transformed into explicit knowledge which is something that has profound implications for organisations, particularly in terms of power and control! Of more importance however, is the conversational life of employees and other ‘interested’ people but the recognition and acceptance of this by senior management may be very difficult in traditional hierarchical organisations as it challenges the traditional concepts (‘nose to the grindstone’), of working roles.

It is not unreasonable to assume that the majority of SDTs are populated by people from non-managerial backgrounds. The author would assert that if managers at all levels struggle to come to terms with the paradoxes of control identified by both Stacey and Streatfield then the members of SDTs, (where arguably more traditionalist views of hierarchy flourish), will also struggle to cope. Building on this theme, Barry’s paper openly discusses another paradox for leadership in teams, namely: a team can benefit from heterogeneous leadership yet the differences that emerge can threaten team stability and performance if the need for different leadership roles to co-exist is not understood by team members. In the author’s opinion, problems such as this would be further amplified by the potential reluctance of Management exterior to the SMT to encourage potential instability through the use of multiple leaders.

Barry focuses mainly on justifying his ‘distributed leadership’ model which does not account for SDTs that may have a long term or continuous life. The model he proposes does not infer how changes in team membership, (simultaneous, gradual or otherwise), could affect team dynamics. The distributed leadership model assumes that each group

member has certain leadership qualities that will be needed by the group at some point and that the *dynamic pattern of distributed leadership is emergent*. It is worth remembering that ‘patterning’ and ‘emergence’ are two key elements identified by Stacey. However in the author’s opinion this assumption is not necessarily true – there is no explanation of what drives individuals to display their supposed inherent leadership qualities nor is there any recognition of any more recent theories regarding ‘followership’ and the complex relationships that exist between followers and leaders e.g. that leadership is ‘bestowed’ by followers. His paper is now fourteen years old which may explain this deficiency as the concepts of SDTs and followership were still in development at that time. Is it a failure to recognize the requirement for the different leadership roles proposed in Barry’s model that explains why perhaps some SDTs underperform or are not as prevalent within organisations as was forecast originally in the late 1980s and early 1990s? Barry’s concept of simultaneous leadership roles has echoes of Stacey’s complex responsive processes within organisations in the self-ordering properties of communication (turn taking & turn making)..

The case of the Business School reported by Bebee, Rubenson and Smith is in the author’s opinion just a ‘nod towards’ the then fashionable emerging concept of SDTs. There is no clarity in what criteria determined which of the teams in the matrix structure should be ‘self-directed’ nor how the success of these teams compared to those that were not self-directed.

The HR SDT described by Coates & Miller unfortunately does not make clear how the role of the Director of Human Resources changed as a consequence of the teams formation. This would have been enlightening in view of Coates & Miller’s stated need for total organisational change / adaptation in support of successful SDTs. There is another weakness in this paper, namely that not all self directed teams will transform at the same rate and there may be issues arising from the fact that teams/team members within the same peer group are being rewarded for different levels of success or failure. Whilst it is without doubt that modern IT communications systems should enable self-directed teams to interconnect with each other effectively to significantly increase *organisational learning* and reduce the extended time to make decisions, these do in turn require careful consideration and planning to prevent isolationism and parochialism.

The top down perspective in the survey quoted by George & Wellins, revealed that senior management believed the control of SDTs was very much within their scope and that the leadership of teams is both internal and external. This is at odds with the later paradoxical ‘in charge’ view proposed by Stacey, Barry and Streatfield. The key message in this article is to reinforce the importance (as seen by senior management) of planned and structured training in the initiation, development and running of SDTs. This was perceived as the biggest barrier to successful SDTs, but perhaps this is just a euphemism for a lack of understanding of the complex dynamic responses that take place in SDTs and between SDTs / Parent Organisations...

4 Critical Self-reflection

In preparing and writing this paper, the author found that gaining a true grasp of complexity theory and its relevance to organisations was the most demanding element of the entire process. Nevertheless, the ‘scientific’ basis for these theories have a resonance

that was very appealing and which may lead to further study & research in the forthcoming thesis.

The age of some of the articles on self-directed teams (more than ten years old) is perhaps a weakness of the paper but this is answered to a degree in the views that the author expresses in section three. Further research for more current thinking would certainly have added a more contemporary view on how the concept of self-directed teams has developed / is developing. Another weakness is the lack of any quantified data on the success and number of SDTs in more recent times to back up the author's assertion, (based on his own experience in industry), that the number of SDTs has failed to match original expectations.

Although the list of references is not very large, the author felt that there was sufficient material on which to draw both a basic understanding of complexity theory and to apply this to self-directed teams.

5 Conclusions

There is real value in understanding how the application of complexity theory can shape and mould the understanding of self-directed teams, their successful operation, their internal interactions and their interaction with parent organisations.

The author asserts that the number of true self directed teams has not increased significantly since the mid 1990s and the reasons for this may lie in why such teams fail to live up to the expectations of parent organisations. Complexity theory explains that only localized control is possible and the paradox for organisations, managers and the self directed teams themselves, of 'who is in control', 'who is accountable' and who is 'in charge' is almost certainly the reason why such teams are perceived to 'fail'.

SDTs or managers have the responsibility to make commitments on deliverables, (for example products or services etc.) but these deliverables are themselves the results of unstable, complex processes within organisations. It is perhaps therefore not surprising that whilst the concept and application of self-directed teams has failed to develop to the degree originally foreseen, there is an increasing credibility ascribed to the quality management ethos that has built up in recent years around six-sigma process control. Perhaps in the future, the next 'step change' will be in the use of the very scientifically grounded six sigma approach by locally focused, locally controlled self-directed teams?

Appendix 1: References and Bibliography

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