Joining the dots. Linkages between Sustainable cities, Action Research, Complexity and an emerging role for Technical Professionals.

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A recent letter writer to the Guardian Weekly (March 2010) expressed a vision for the future that many of it's readers (educated, technically proficient, inquisitive) would probably be happy enough to adopt. "There's general agreement on the destination: a planet where all sentient beings can grow, work, play, create, eat, shit and sleep in perpetuity and safety". The writer then stated that the big problem is that we don't know how to get there. As we live in an age where if you don't have a plan - you plan to fail, this is not a good situation. A significant problem is that the vision lies externally to any specific product or service, and our dominant level of consciousness can only conceptualise planning to achieve sophisticated products and services. To achieve the desired vision requires a different level of problem solving to that which we are used to. To both explain this and illustrate what this might mean in reality, I will use the contemporary city that we live in (as imagined as that great jumble of products from shacks to railways to high rise offices) as a focus. This focus will be as both illustration of the kind of change required, and a platform to explore how built form itself can more effectively be used to achieve the desired vision.

I will first outline what I see as some of the inhibiting factors to achieving the vision. I will then look at the issue of complexity and how that links with Spiral Dynamics and Action Research. Finally I will provide some strategies to achieve the desired outcomes with some practical examples I have used or am aware of.

Inhibiting factors

When thinking about a possible direction to reach this vision, I feel that amongst all the multitude of barriers, there are four significant ones:

- To date, the process of modernity has in fact delivered (and continues to deliver) a higher standard of living for many more than at any other point in history.
- We limit our vision of the city by the parameters of what currently exists.
- It is in the nature of change that it is those who have the most to lose from a change in the status quo that most resist change.
- Most inhibitors to achieving the desired vision are within the system itself, and not resolvable by traditional means.

Up until recently modern culture has actually worked extremely well. There are more people living on the planet today than have ever lived before, and those that are alive are living longer and healthier lives (Smithsonian Institute 2004). Thus modern cities comprise a huge paradox. On the one hand they have been at the centre in achieving the current state and on the other are, in their current form, absurdly inefficient and completely unsustainable. Not to mention often ugly and uncomfortable. At the same time contemporary cities truly reflect and accommodate complexity. For cities are not just a collection of things like rapid transit systems, ipods, factories and suburban houses but also comprise of individual people with networks and relationships.

In his 1966 Domus article, The City is Not a Tree (Alexander 1965), Christopher Alexander explained why it is not possible to purposefully create a city. His thesis is that the human mind can only manage to conceptualise complicated projects (like a tree, with roots and branches), not complexity itself. This is a similar concept to Rittell and Webbers article (Rittell and Webber 1973), Dilemmas in a General Theory of Planning. Rittell and Webber observed that problems in outputs (products) are essentially 'tame' and solvable, whilst many of the problems confronting us today (depression, domestic violence, angry police, disengaged teenagers) are 'wicked'. Wicked meaning that there is no one answer, no eureka moment when the problem can be deemed 'mission accomplished' for they exist within the people part of the city, not the product part. Their thesis is that these problems are not solvable by using the practices used to solve 'tame' problems, and in fact are often exacerbated through the use of the same processes.

Fig 1. Modern cities don't look like a giant building because we are not ants.

Wicked problems are the undesirable outcomes (or results) of real tangible events and products, not tangible products and services themselves. Due to the linkage between creating improved products and services and the positive outcomes that have historically been achieved, it is understandable that there is considerable reason to support a strategy of more of the same. There is also considerable evidence to suggest that this might be erroneous, just because something worked in the past doesn't mean that it is valid for today. If the horse is dead, get off it.

Levels of consciousness

In a recent presentation to the Melbourne complex processes research group, John Stewart presented a paper proposing that the people part of the city are currently going through an evolutionary shift something akin to which occurred at the age of enlightenment. This was a time when there was a shift in general consciousness from being in 'Association' with the landscape to one where Abstract Rational Thought gained dominance. This time though it is a consciousness shift from Abstract Rational Thought to what he terms Systemic Cognition. Key characteristics of Abstract Rational Thought are the capacity to visualise an improved state, plan to achieve that state, take risks and learn from mistakes. These characteristics are, to varying degrees, shared by three attributes of modernity; action research, entrepreneurialism and the concept of design as a process. Systemic cognition though is a conceptual understanding of complexity, the reality of multiple correct answers and the interconnectivity between actions and their effect on the broader system.

As a theory, there are similarities in John Stewarts to Spiral Dynamics (Cowan and Beck 1996), which outlines nine levels of consciousness in two tiers (Fig 2). Of significance is that both Stewart and

Cowan and Beck maintain that it is not possible to 'leap frog' from one level of consciousness to another, but must work through each level. It is also significant that it is estimated that 70% of the US currently exists at the level of Association. Key characteristics of a person operating with a level of consciousness that is 'In Association' with the environment are being only able to react to the situation in which one is, often fearful and at edge with the situation and potentially with a low 'locus of control'. In other words, the model of progress and development epitomised by the idea of carrying out complicated projects in a spirit of entrepreneurialism is actually only realised by a minority of the population, the majority of the worlds most developed nation being bit players dominated by the exigencies of their particular situation.

Spiral Dynamics		John Stewart
Coral	Tier two	Systemic Cognition
Turquoise		
Yellow		
Green	Tier one	Abstract Rational Thought
Orange		
Blue		
Red		In Association' with surroundings
Purple		
Beige		

Fig 2: Linkages between Spiral Dynamics 'memes' and John Stewart's levels of consciousness.

Excepting those that have become rich and powerful through inheritance or luck, the primary (legal) beneficiaries of contemporary cities are those that have the greatest capacity to undertake Abstract Rational Thought (ART). Those that have the capacity to carry out complicated tasks such as designing or constructing rapid transport systems, high rise buildings, complicated pieces of policy and intricate financial products by and large find the city not a bad place to be. But it is not just having access to reasonable schools, the ability to own a nice enough house with a smart enough car and the occasional overseas holiday and ski trip that makes the modern city a relatively pleasant place for the members of this group. It is also the work itself and the relationships developed in creating these complicated projects that provides personal challenge and growth. A recent definition of 'prosperity' being 'the capacity to flourish'.

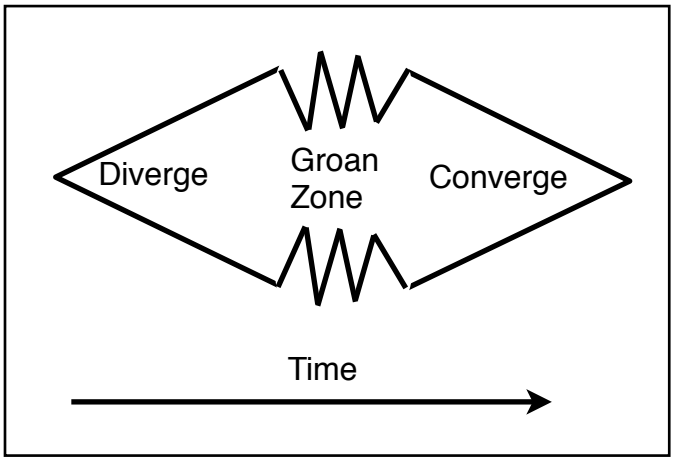

Fig 3: The 'Diverge/Converge concept. This diagram describes the problem solving process, with the 'groan zone' in the middle.

The psychologist and facilitator Sam Kaner (Kaner 1996) uses the diverge/converge model to describe the problem solving process for creating products. At one level the model describes the technical process of doing wide ranging research (diverge) followed by a process to develop a conclusion or decision (converge). Of more importance is the 'groan zone' that occurs in the middle. Irvine Stone titled his biographical novel of Michaelangelo 'The Agony and the Ecstasy' which as a title describes this difficult part in the middle that a creative person goes through to

synthesise a wide variety of criteria into a product that is both 'good enough' and transcendental. Whilst uncomfortable and challenging, it is going through this part of the decision making process that creates transformation and learning, which in turn effects the level of awareness of the individual. When carried out by an individual this is a process of 'self-talk', but is the same effect when the competing and various criteria are expressed by different individuals working in a collaborative environment.

As a psychologist, Kaner maintains that real personal transformation occurs when individuals have to work together, express their own values and listen to others and truly collaborate to develop a mutually agreeable synthesis to a problem. Robert Putnam (Putnam 2000) describes the social value in the sort of linkages that occur when people work together to solve common problems as 'social capital'. An effective and resilient community that comprises of effective and productive individuals is one that has high levels of social capital. As individuals within a group, professionals display high levels of social capital; social capital being the 'glue' that maintains the broader system as a whole. This is both through their experiences of the city as an environment (the shops, the cafes, the museums) but also in their everyday work in creating and maintaining the city as a collection of products (shops, cafes, museums).

Currently it is the technical professionals with considerable capacity to create the outputs (products) that form the elements of a modern developed city who are also the ones with considerable stake in the city comprising these products. At a simplistic level it is the road engineer who has a relatively good life in the city, but is dependent for every day work on the city having the kinds of roads that he/she is highly capable of designing and building. More removed, but within the same paradigm is the public servant who needs the road, the car, the train to commute every day to a highly sophisticated, complicated built structure to work with other professional staff on a new policy for an ageing society. For all these professionals it is personally rewarding to be part of a team or organisation that is required to make a product that each time can be a little more sophisticated, a little more complicated, more perfect than it's predecessor. This is the nature of action research/learning and this group of people are best able to experience it.

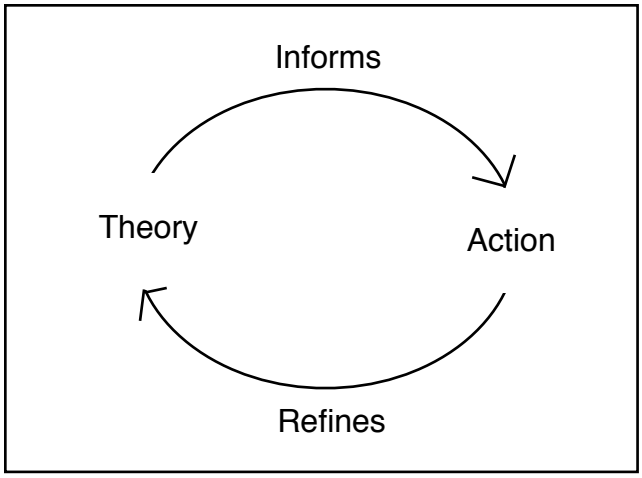

Fig 4: Praxis; the process of developing theoretical understanding through purposeful action.

Action learning/action research is essentially the idea of 'praxis' (fig 4). For a technical professional it is the process of specialising in a particular product or service that provides the basis on which to both practice, and learn from that practice. The logical progression for a technical specialist is towards creating (or being part of a team that creates) ever more sophisticated and technically proficient products and services in which ones area of specialisation is valued. Thus through a process of incremental change, the individual components of the city have become more technically

sophisticated, more complicated, more dependent on high order skills to successfully fund, design and construct (fig 5).

Fig 5: The development of professional and technical expertise can be seen within the objects of the city.

Unfortunately the value of each of the incremental advances in the individual products made by the professionals are providing diminishing returns to the system as a whole, both environmentally and socially (Fig 6). New, more efficient cars might travel on safer roads (complying with a new more sophisticated construction policy) to travel to a smarter office to service houses with higher energy ratings - but real change is being inhibited because the focus is to create these projects and programs in isolation to the system as a whole. To take a complex systems approach to transforming the city into something that supports and enhances the system itself requires not envisaging a different city, but a different understanding of the value of the city, and that this in turn will result in a different city. For it is the nature of cities to be a reflection of complexity, not a finite product in itself.

Fig 6: Though nothing wrong with the products themselves, Pruitt Igoe was demolished because of its effect on the broader system. This was a learning experience for housing professionals who changed the product, but the idea of social housing still remains.

What is required to achieve the desired vision is a different level of thinking to the problem, one in which those with the skills at creating complicated projects and programs use their capacity in abstract rational thinking to enable a broader strengthening of the system itself. Paradoxically the strategy to achieve the kind of results for which we are looking could potentially be found in the processes that have served the technical professionals so well, that is, learning through doing.

Current educational philosophy places high credence on the capacity for ‘on the job learning’ to enable individual development. Princeton University bases all it’s learning program on the 70/20/10 principle (Michael M. Lombardo), in which it is said that seventy percent of learning occurs ‘on the job’, twenty percent through coaching or mentoring, and a mere ten percent through traditional teaching. This correlates with investigations on how professionals learn (Schön 1995). What this presumes though is that the person is in a job that allows learning opportunities. For every designer/ manager/entrepreneur that has the capacity to make meaningful change, there are many others who ‘have to do a job’. As my student son laments ‘Do you realise how boring it is to have to stack the same supermarket shelves, with the same products, every shift?’ The other side to this quandary are the many technical professionals who express frustration that when they do attempt to engage others in their project or program they are met with lacklustre interest.

It is something of a truism that architecture is a mirror image of the contemporary conditions of society (Oliver 1969). Many of the contemporary city's components (parks, suburban houses, factories, shopping centres, railways) came about during the C17th and C18C as a reflection of the emergence of abstract rational thinking. Previous to this the urban environment was a medieval hotch-potch of unself-conscious construction. Since these early times, the administrative processes required to create these components of the contemporary city have also evolved, becoming ever more sophisticated and institutionalised (Fig 7). Perhaps the multitude of meaningless jobs and at the same time reluctance to be involved in the creation of the modern city are two sides of the same coin.

Fig 7. In 1749, there was a 'huge crowd' of 12,000 (causing a 3hr traffic jam) that watched the celebrations to mark the Treaty of Aix-la-Chapelle. Lady Grey wrote: "The illumination too, which should have been done all at Once was performed Bits at a Time which quite spoiled the effect, and when lighted it was not at last so pretty as an Opera-Scene...the whole Diversion was....an Irregular Incompleat Whole consisting of several very Beautiful parts". New Year celebrations at Sydney harbour regularly attract between 1M - 1.5M spectators.

In both instances a component of these limitations is our perception of the city and it's institutions. As the products (outputs) of the city and contemporary culture have become more sophisticated, the opportunities that these components provide for control and choice, taking risks and making decisions in collaboration with others have become the province of only a few. For many it is a process that has become ritualised almost to the point of being an administrative procedure. We have become very good at making the individual bits. On the other, to have meaningful input into such complicated projects requires a level of conceptual understanding that is beyond many. When a majority of the population are looking for explicit direction and absolute truth (the 70% of the population that have limited capacities in abstract rational thought), they are unlikely to be interested in the intricacies of (say) planning regulation. We have so successfully institutionalised (Fig 8) the concept of the city into specific components requiring high levels of technical capacity that this conception inhibits real change. This requires a different strategy to achieve the desired vision. It requires re-imagining the city from being a single entity that comprises a series of sophisticated products, such as great freeways (road engineers), inspiring buildings (architects), beautiful parklands (landscape architects), great urban spaces (urban designers), opportunities for capital investment (urban planners), superb public transport (transport engineers), wonderful hospitals (medical specialists), the biggest firework display (firework designers) into a vehicle to enable growth and change within the system itself. This will though require those same technical specialists to approach their work

Fig 8. Whilst the technology has changed, the organisational structures required to create the city have been maintained. Technological development has merely enabled greater efficiencies to undertake the same tasks. True change will only occur when we use the new technologies to achieve a different purpose.

differently. For the built environment to operate effectively as an action research/action learning opportunity that will create change within the system itself, it will require more people to have the opportunity to meaningfully participate in the decision making process. A pre-requisite for the learning process being for people to be part of the decision that results in something happening and means something to them. Any less than this is merely opinion. However this will require those who currently create sophisticated products such as policy documents and rapid transport systems to re-conceptualise their role. This can be done at all levels of endeavour, from the large scale to the small.

The phrase 'Think globally act locally' might be a bit dated, but the digital network provides a new meaning to the practicalities of the expression. It is now technically possible for anybody with an internet connection to be involved in the big discussions, the high level policy agendas, the large scale conceptual thinking (Butcher 2009). This means more than just thinking globally, but being involved in the discussions that will make the decisions. The fear of every technical specialist (whether in architecture, planning or finance or ethics) is that poor decisions will be made when there is greater input into the deliberative process. The expressed fear is that non-specialists will either not have the technical capacity to make a good decision, or the process will be 'hi-jacked' by a power group with an agenda different to the technical specialist. With regard to the former the evidence is that given sufficiently good information on which to base a decision, the reality is that people make as good a decision as any other group (Carson 2010). The critical part is providing good quality information for people to make decisions in a supportive environment. Concerning the latter, there is an emerging practical body of knowledge to allow multiple views be expressed whilst providing a 'level playing field' for people to be heard and decisions made. In this new reality, it is the work of the psychologists that provide the theoretical underpinnings to action.

Psychologists have developed a large body of knowledge around how individuals wield power to have their values imposed on others. The methods used include organisational rank, financial power, elected power, linguistic, artistic, technical, professional expertise and even power through being a victim and power through rescuing others by advocacy. Group facilitation is an emerging skill set that brings to the system skills and processes designed to provide the space in which ideas and world views can be expressed, and conversations held, around common hopes, dreams, issues and concerns. These techniques can be used to enable groups of people engage with each other on the built environment issues.

Fig 9. 1300 people developing the Perth structural plan

At the 'big picture' end, an example of how group facilitation skills can be used within the built environment is the America Speaks process (AmericaSpeaks 2010). This process enabled 5000 people in NY generate the brief for the rebuilding of the World Trade Centre . The same process was used for 1300 people to create the 2005 Perth structural plan (Fig 9). However far smaller processes can be used for more local issues. A group of residents in an outback country town with in interest in improving sporting facilities were taken through a Participatory Action Research process that enabled them to consider and compare all the existing

facilities, the users, their fitness for purpose and rate of use (Fig 10). This process provided the program logic to develop a funding proposal to upgrade the touch-footie ground. Through having the opportunities to participate in small 'non-contraversial' projects, it allows people to practice participating on an everyday basis.

Fig 10. Through participating in a Participatory Action Research process, the residents of an outback town developed the rational for seeking funding to upgrade sporting facilities in the town.

In another example, residents on a NSW public housing estate were requesting front fences to the houses. The responsible Department decided to provide funds over a three year period. The question remained, how was the program to be prioritised, and what types of fence should be built? The first years budget was divided by three, and all residents were invited to attend a facilitated workshop to determine the work program. In the first round, those that attended the workshop decided that priority should be given to those that were 'community minded' ie. Those that attended the meeting. By the third round, there were 30 households attending the workshop, with all residents providing useful and considered thoughts on priorities. It was a learning process for residents to realise that the workshops gave the participants real control on how funds were to be expended, it was not just an 'advisory committee' with power retained by the Department.

Fig 11. Signing up to paint a fence for an agreed amount allowed this public housing resident the opportunity to not just earn some money in a flexible way, but take the responsibility of determining when and how she was going to complete the contract.

Whilst most Government Departments make 'good enough' decisions that most are happy enough to live with, it will only be through consciously engaging stakeholders in the decision making process on the 'easy' projects that skills will be developed by all to cope with the harder ones (such as who will pay for damage caused by climate change) when they arise. Thus the fencing project helped residents become more willing to be involved in a larger upgrading project at a later date, and subsequently participate in the Neighbourhood Job Access Centre (Butcher 2000; Butcher 2000). This project was consciously designed to enable public housing residents be responsible for completing small projects for an agreed amount (Fig 11). The process developed was akin to a standard sub-contract process that involved breaking 'larger' elements into small sub-contracts. In this case it was breaking up the construction of a front fence into mini-subcontracts (digging holes, construction, painting). The work was carried out in a supportive environment, but responsibility was still with the residents to complete the work. The difference between this approach and the idea of 'labour based projects' (Fig 12) or other work

Fig 12. Labour based construction and work creation projects have their place in a complex world, but will not provide the kind of learning opportunities required to strengthen the system as a whole.

creation projects is that it provided opportunities for people to make decisions, and in that process learning occurs. Labour based, and broad based work (or volunteer) generating projects have their place in a complex environment, but can not be as effective in strengthening the system as a whole in the longer term.

The concept of breaking down large projects into smaller entities can be undertaken in a variety of ways, but has to be done in a manner that results in greater control and choice to promote the opportunity for positive learning. A large project to construct fifty Government houses[1] was split into five contracts, each contract enabling a smaller contractor the opportunity to learn and be challenged. However whilst this approach provided greater opportunity to five smaller contractors, the real value of housing as a learning opportunity lies in its multi dimensional relationship between householder and built form.

When viewed within a traditional architectural frame, it is easy to dismiss the suburban environment as reflecting little in the way of rigorous Abstract Rational Thought (Fig 13). However what the suburban framework has done, and continues to do, is provide many people the opportunity for personal expression and learning through doing. It is rare for even an internationally respected architect to not have cut their teeth working on suburban houses. If we reframe how we look at the city, from something akin to a grand palace with impressive boulevards, piazzas and urban squares, to an opportunity for experimentation and individual growth and change, the suburban environment has contributed significantly to human learning and endeavour. The issue with the suburbs as they are now conceived, financed and constructed is that they are merely a component within a single large urban conglomerate. It is this that makes them unsustainable in their current form, not that people have access to land that they can afford within a social fabric that enables growth and change.

Fig 13. Never before in human history have so many people had so much control and choice in their built environment. World Bank funded housing programs emphasise people gaining land ownership and access to loans to construct housing that they can afford. This provides not just good quality affordable housing, but the opportunity for people to make decisions and learn.

We know from historical evidence that the contemporary city is considerably different to those of the past; concepts of normal have changed over the years. We also know that it is only when those with the power to effect change see it in their own interests to change, that change occurs. It was only in the 18th Century that there came a general understanding of the links between cholera and contaminated water (Fig 14). Before that, it was commonly thought to be the smell that caused disease, so those with the money would keep a posy of fresh flowers. It was not until the C19 that those with the power to effect change came to fund the great water and sewage systems that have dramatically increased life expectancies in developed countries. For as long as it was viable to believe that the plague and cholera could be warded off with posies, why change? Spend the money on another statue and find some stronger perfume. The kind of shift required in our current transition towards a greater awareness of complexity and the need to strengthen the system as a whole for long

[1] Police Houses, Matsapha Swaziland 1994

term survival is as great as the emergence of abstract rational thought had, in it's time, on the city environment. The difference is that the decision making processes require a shift from technical expertise to social and psychological expertise and greater understanding of the human condition.

Fig 14 : It was the cholera and plague epidemics that effected all classes that drove modern public health improvements. These developments also changed what we see as 'normal'.

Whilst the nature of complexity is that there is no one right answer, the proposal is to more appropriately use the opportunities provided by the human requirement for shelter to actively promote a strengthening of the broader system. That is, the social capital developed when people work collaboratively on common complicated projects and the increased personal capacity developed through the action learning process. The proposal is that those with a high level of abstract rational thinking and who currently underpin the current concept of a city, consciously design and implement techniques and processes based on social and psychological understanding to promote opportunities for active engagement and collaboration in the creation of the products that comprise the city. This is compared with actually designing and implementing the products themselves. Ultimately this would effect the image of the city, and in ways that might surprise. The technicalities for executing this kind of change are emerging, and are far from being institutionalised which also makes it an exciting arena. Current practice in these early efforts to use the city for the strengthening of the system as a whole is often much like a 1750's firework display '..an irregular Incompleat Whole consisting of several very Beautiful parts'.

Thus rather than to imagine a specific conception of what a city based on an action learning model might look like, it would be better to raise questions in the hear and now that could be deliberated and considered using emerging community engagement tools. Such questions should be linked to real policies, projects and programs being developed by public servants and building professionals such as planners and architects who have an interest in strengthening the system. These decisions could be as varied as a complex policy document such as city (or country wide) subsidies for food production, to more local issues such as how to modify a traffic intersection or how much to spend on maintenance in the local park. To achieve the desired goal requires a different approach by those that have a high capacity for abstract rational thinking in how they approach their problem solving process.

I wonder which will be the first city to decide rather than holding a giant firework display at it's iconic centre, to design and implement an engagement plan to determine how many, where and by who this years New Years Eve fire work displays will be held?

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