



5 Differences between complexity & systems thinking

📅 October 28, 2013 👤 sonjablignaut 📄

Complexity and adaptive leadership



Over the last 10 days I've had the privilege of accompanying Prof Dave Snowden to various workshops and client meetings in Johannesburg & Cape Town. It's been almost 5 years since his last visit, so it was really great to catch up on some of his new thinking. We also connected with other people who've been involved in Cynefin since the early IBM days, so that was fun!

I've learnt so much, it's enough to fill several posts! But one of the learnings I find very useful is clarity Dave brings around the differences

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between Complexity thinking & Systems thinking.

Often people see Complexity as a subset or slight variation on Systems thinking, but Dave has drawn some clear distinctions that I find very useful. These aren't the only differences, but they're the ones that remained top of mind:

1. Ideal future vs evolutionary potential of the present

Systems thinking seeks to define an ideal future (e.g culture) and then define strategies to "close the gap". Complexity works with the evolutionary potential of the present i.e. it seeks to understand the "now", find out what can be changed (in a measurable way) and then take small evolutionary steps in a more positive direction without any assumption of the end destination. I really like this, because I've yet to experience a project where the "ideal future" was actually realised. Most companies end up with cynical staff who become more and more disengaged with each new set of "mission, vision & values".

2. Complex systems are modulated, not driven

This partly explains no 1: A driver assumes single causality i.e. if A drives B, changing A should have a predictable effect on B. I've been part of several facilitated sessions where people try to figure out what is a "driver" and what is being "driven". In complex adaptive systems, this simplistic approach adds very little value, as complex systems are modulated, not driven. The following metaphor is useful to understand what this means: Imagine a metal table with several powerful magnets spaced

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around underneath. On top of the table are iron ball bearings. While the strength and polarity of the magnets remain constant, the bearings form a stable pattern on top of the table. If one magnet changes polarity and the others remain constant, the pattern formed by the bearings will change in a predictable way. That would be an example of a driver in systems thinking terms. In a complex adaptive system however, when one magnet changes, the others change as well in ways that don't repeat. The patterns formed by the bearings therefore become unpredictable, depending on which of the magnets have changed and in what way. The magnets are examples of modulators, factors or forces that influence the system at the same time and in unpredictable ways.

In light of this uncertainty, defining an ideal future becomes pointless. But movement and direction is important.

3. Complex systems are dispositional, not causal

The way I understand this (which may be wrong!) is that whereas one cannot accurately predict the behavior of a complex adaptive system (i.e. A -> B), one can observe tendency or propensity for the system to move in a general direction. As we move in any given direction by making choices (and per definition closing off opportunities as we make these choices), there will always be a certain fluidity, not a direct path as in a causal system. (if Dave reads this post, he may want to elaborate in the comments)

4. Extrinsic rewards destroy intrinsic motivation

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Setting explicit outcome-based targets with associated incentives destroy intrinsic motivation i.e. people start chasing the target without considering potential consequences. Another way to put it: Anything explicit will be gamed. Several years ago I saw a perfect example of this in one of the culture projects we did for a large bank. They had issues with their Customer Information File, which wasn't being updated correctly by frontline staff. They had duplicate entries; incorrect contact details, in short are was causing nightmares for them from a CRM perspective. We conducted a narrative enquiry, and found an interesting pattern. Customer facing staff members in the branches were being measured on among other things;

- how many customers they saw in an hour
- how many of a specific product they sold in a day/week

This led to a decrease in customer satisfaction, as it caused staff members to focus on either selling that week's product or getting you out of the door as quickly as possible. It also led to them not completing the customer information on the system, as that was seen as a waste of time. In an effort to increase customer satisfaction by decreasing waiting time, the bank achieved the exact opposite. There are many more examples, some of them from healthcare and mine safety that are pretty scary.

Setting explicit targets (ideal behavior) and attempting to "close the gap" simply leads to gaming behavior and unintended consequences. In complex systems we try to measure outcome. An example would be to set a target of changing the type of stories that cus-

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tomers tell and how they interpret them. This cannot be gamed, as the only way to change the stories is to change your interaction with them.

5. People are not widgets, not are they ants

Systems thinking often seeks to “engineer” an ideal culture, which in essence means “engineering” people and their interactions. A symptom of this is how consultants and leaders seem to disregard the impact the constant re-structuring – moving people around as if they really are interchangeable widgets. Another is the popularity of personality assessments like Myers Briggs, which puts people in boxes. I’ve worked in environments where people were unable to relate to me because they had no idea which box I fit into. Complexity acknowledges that people have agency; that we have multiple identities that we switch between seamlessly (e.g. I can be wife, daughter, entrepreneur, friend and different identities may have different thinking patterns based on priorities). Bottom line, people aren’t cogs in a machine, nor are they ants, or birds ... although we do sometimes drive like birds flock 😊



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Marcus Jenal

October 29, 2013 at 3:17 pm

Dear Sonja. This is a brilliant post. Although I have heard Dave talking about this difference some times, your interpretation gave me some additional nuances to think about. I also liked it a lot that you added your real life experiences to illustrate the points.

One thing that I had never really understood till very recently is the notion of a complex system being dispositional, not causal. For me it means that there cannot be one cause that leads to one effect if the system does not have a particular disposition. So is the cause really the cause? Because the eventual shape of the outcome is not due to the shape of the cause but due to the disposition of the system (or maybe both to a certain extent). We can only connect the cause with the effect in the aftermath. But often you cannot say what it really was that lead to the change, because many things change at the same time (see the point about

modulators). So it is futile to talk about cause and effect. Does this make sense?

Your interpretation of dispositional is adding to this by saying that the specific disposition a system defines to some extent the direction it can take. This disposition is given by the constraints and the attractors that emerge from within the system. So if we have an idea of these constraints and attractors (for example through listening to stories) then we can have a feeling of where the system is going to. But then again we need to be aware of the possibility of tipping points or phase changes, when new attractors come into play.



sonjablignaut

October 29, 2013 at 4:08 pm

Hi Marcus, I'm glad you enjoyed the post! I must say, I found the concept of dispositional systems challenging too. I have a good idea what it means, but writing about it and clearly articulating it was difficult!

I like what you say about the boundaries and attractors being helpful in determining what the disposition is. In uncertainty the boundaries and attractors are some of the few things we can identify and potentially use influence. It begs the question, in transformation projects, are we trying to fundamentally influence the disposition of the system?



Marcus Jenal

October 29, 2013 at 4:46 pm

I guess we are somehow trying to change the disposition of the system. We can play

with setting new boundaries or by introducing new attractors (of course in the form of safe-to-fail experiments). Dave exemplifies this nicely in his story about organizing a children's party.

Pingback: Linking: 5 Differences between complexity & systems thinking | Shawn Cunningham's Weblog



Dr Shawn Cunningham

October 29, 2013 at 3:32 pm

Dear Sonja,

I've been wondering what your summary of the Dave visit would be. Thank you for sharing this. I wish I could add comments below each point, as I have been grappling with many of these.

I think perhaps the most important addition from our conversation with Dave upon his arrival in Pretoria is that not all things are complex. Perhaps that is why Cynefin remains so popular and relevant.



sonjablignaut

October 29, 2013 at 3:35 pm

Hi Shawn, I'd love to hear your comments ... Maybe just use the numbers as reference? One of the reasons I find the Cynefin framework so useful is the idea of multi-ontology sense-making and things being valid within

boundaries.



Dave Evans

October 30, 2013 at 3:10 pm

Thanks for this, Sonja – it captures what I understood of Dave's views in the talk well. A key point about the complex domain is that all understanding is retrospective – whether it is cause/effect, coherence, disposition, or anything else. How much of that can be used predictively is very questionable; disposition may have more value in that respect, for future interventions, than cause/effect or coherence, which are probably more transitory.



Dave Snowden

October 30, 2013 at 5:10 pm

Its worth remembering that I generally say "I am technically talking about systems dynamics, but in popular thinking those practices now define systems thinking in other than cognoscenti circles



LineUp Software

August 10, 2014 at 3:58 am

Reblogged this on Engage, participate, collaborate and innovate with LineUp™ and commented:

Often people see complexity as a subset or slight variation on systems thinking, but the author of this article draws some clear distinctions between the two concepts.

Pingback: Complexity In Context | Duncan Nisbet



Patrick Verdonk

April 22, 2015 at 11:31 am

Hi Sonja, likely a little late... Great writing. I got interested more deeply on Complexity, Systems Thinking and Adaptive Cycles (Panarchy) over the past year or so. I can't claim I'm in any way an expert like you or Dave. I found "Often people see Complexity as a subset or slight variation on Systems thinking" a little curious. I -personally- see systems thinking as one way (for sure there are many others) to describe/visualize complexity in systems within given boundaries (set by the person making the visualization). Additionally I understand that systems thinking assumes -parts of- a system seeks equilibrium, though recognizes other behaviors -including Complex and Chaotic- are

possible. I use systems thinking to visualize some of my thinking on complex issues (issues I think many people see as complex, though following the official theories maybe are not complex at all).

Ok – I need to stop writing here, because otherwise my reply may turn into a blog post itself (maybe I'll try that in stead)

Thanks Sonja, great work – will be reading more here soon!



sonjablignaut

April 22, 2015 at 4:04 pm

Hi Patrick,

I won't really call myself an "expert" – I find that to be a dangerous word! I also realise that the world of Systems thinking is very broad! You'll see in a comment on this post by Dave that he mostly refers to Systems Dynamics. What I have seen though is that (in general) Systems Thinking still assumes causality and design; in interactions with people who are heavily influenced by Systems thinking I've seen a greater resistance to the idea that complex systems evolve and you therefore cannot design towards an ideal end state (or find "drivers" or levers you can leverage. Also, in human systems the "only valid model of the system is the system itself" – so we need to always remain aware of the boundaries/limits we are putting on the system. I can see how it could be a valuable thinking aid though.



cbouyio

April 23, 2015 at 11:56 am

Dear Sonja,

Thank you for this very interesting post!

I would be particularly interested to know which more examples from healthcare as well as mine safety (that really sounds scary) you have in mind.

Thanks again.



Steven Walden

August 25, 2015 at 1:51 pm

Thanks. Just posted on linkedin. Having worked with Cog Edge I concur this is important thinking especially for those looking at systems such as customer experience and subjective customer perception.

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