The Foundations of Agile Teaming in Special Systems Theory

Synopsis
Chapter 0

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Abstract

Introduction

Many agile practices are dependent on teaming for their implementation. For instance, we speak of the self-organization of the team being a basic resource that is indicated by the agile principles. It is well known that Complex Adaptive Systems was one of the inspirations for Scrum. However, there is not a rigorous definition of the teaming based on a specific Complex Adaptive System Model. Therefore, in this paper we will use a specific Complex Adaptive Systems meta-theory called Special Systems Theory to develop a deep theory of teaming to be the basis for agile and lean practices. This paper is a synopsis of a book on the Foundations of Agile Teaming by the author. As such it presents a thumb nail sketch of the foundations of High Performance Agile Teaming in a specific Complex Adaptive Systems Theory that was developed in the early 1990s and was used as the basis of an alternative to the CMMI presented at the National SEPG conference which was a precursor to Agile Scrum based on the theory called Advanced Process Architecture. A paper on the model that was then developed called the Future of Process was also written at that time and published online in Wild Software Meta-systems. Since that time quite a bit of development work has been done to refine Special Systems theory which has been presented and published at various Systems Engineering conferences. Recently the author was introduced to Agile and Scrum after leaving Aerospace and realized that the original theory could be applied favorably to what had been developed in the meantime in commercial industry now known as Agile and Lean and also Scrum process practices in order to give them a theoretical foundation. That foundation was laid out in a book called Agile Theory recently written. But it became clear that because teaming was so crucial to agile that special attention needed to be given to

the relation of the Reflexive Social Special System and the ideas of High Performance Teaming as a precursor to the use of Agile and Lean approaches so a second book was written on the Foundations of Agile Teaming in Special Systems theory which is described briefly here.

Basis for a theory of Normal and High Performance Teaming

There is a literature on high performance teaming which is separable from the literature on agile, but there is an assumption that high performance teaming is an intrinsic possibility inherent in the application of Agile using approaches like Scrum. This paper explores this possibility based on a specific Complex Adaptive Systems meta-theory called Special Systems Theory, and particularly a specific level of the various special systems called the Reflexive Social Special Systems Theory. Special Systems Theory was presented recently at the ISSS conference. This theory has a long history starting in the early 1990s of being presented at various conferences in Systems Science and Systems Engineering. It formed an integral part of the authors recent dissertation on Emergent Design. The key point is that the theory is mathematically based and has analogs in anomalous physical processes and thus the theory claims to be scientific in the rigorous sense of the word and claims to be a robust theory in the sense defined by Stephen Wallis. Fundamentally it describes three special systems with extraordinary properties between the Systems and Meta-systems Schemas as defined in General Schemas Theory. Once it is realized that systems have an inverse dual called a meta-system that describes an organized environment that produces niches for systems, then it is possible to identify thresholds between the System and its Niche in the Meta-system called the special Systems with special properties. These special properties include hyper effectiveness (Agile) and hyper efficiency (lean) and produce an interval which is known as ultra-efficacy. Such systems are negatively entropic and the lowest level special system is equal to the dissipative structures defined by Prigogine. But via mathematical models like hyper-complex algebras it is possible to conjunct dissipative structures to create higher forms of the special systems called the Autopoietic Symbiotic Special System which is analogous to the theory of Matuana and Varela and also Reflexive Social Special Systems that is reflected in the reflexive social theories of O'Malley, Sandywell, and Blum as well as other reflexive sociological theorists. What is known of these systems is that each level is associated with a particular mirror configuration as defined by the hyper-complex algebras. And thus systems have one mirror, dissipative structures have two facing mirrors, autopoietic systems have three facing mirrors, and Reflexive Social systems have four facing mirrors. It is mathematically impossible to have any higher regular set of mirrors and thus the series comes to an end at the Reflexive Social Level. These various levels are associated also with non-orientable surfaces so the System is associated with the lemniscate, and the dissipative structure is associated with the Mobius strip, the autopoietic symbiotic system is associated with the Klienian Bottle, and the reflexive social system is associated with the hyper-kleinian bottle. These various mathematical analogies and physical analogies are used to define the nature of these various levels of Special Systems, and the interesting thing is that the

various mathematical representations fit together to give further information about the various kinds of special systems, such that the theory becomes extremely precise. And that precision helps to bring the theory into the range of what is testable. One test of the theory is to apply it to the trial and error discovered approaches to Agile which appear in the literature. And that is what has been done in the Agile Theory book. That book starts at the Dissipative Structural Level and works up toward the reflexive social level to explain the canonical features of Scrum within an Agile context. However, the work on the foundations of Agile Teaming works downward from the Reflexive Social level to explain the teaming component of Agile as implemented in Scrum and especially the possibility of high performance teaming.

The book starts with the Drexler / Sibert model of high performance teaming and the ideas of culture hacking presented by the McCarthy's in Software for your Head. What we know from the Reflexive Social Special Systems Model is that there are four mirrors at that level that form an inwardly mirrored tetrahedron. Thus the theory developed in Foundations of Agile Teaming goes on to name the mirrors based on hints taken from Aristotle's ethics concerning friendship. Those mirrors are named Respect, Trust, Authenticity and Virtue. Drexler / Sibert only develop one foundation for teaming which is the mirror of Trust, thus a similar type of model is developed for the other four dimensions of teaming. Then this expanded model of teaming is mapped to the McCarthy protocols and found to be nearly isomorphic. This means that there is a fuller theory of High Performance that has four different modes of laminar flow as its basis instead of just one. The theory of Adrian Bijan of the Construtal Law is used as the model for understanding high performance flow at the team level rather than the level of individual consciousness which was already developed by Csikszentmihalyi. Bijan's constructal theory says that any flow architecture may remain viable so long as it is striving toward laminar flow. In this new model of High performance teaming there are posited to be four different strands of laminarity that can be approximated by a high performance team based on the four different social mirrors that exist in the Reflexive Social Special System. Understanding the relations of these mirrors to each other and how they support different laminar strands provides the foundation for Agile Teaming that explains how high performance in agile teams is possible and how that resource within teaming is taken advantage of when we undergo the paradigm shift into Agile approaches such as those that appear in the Scrum team management process.

The theory goes on to use the work of Charles Whitehead on Social Mirrors and the work of William Van Dusen who has a theory of higher dimensional social psychology of the social mind to elaborate the theory of the nature of the mirrors and how they interact within higher dimensional timespace in which the team does its work together. It explains why it is that conversation and actual presence of team mates to each other is more effective than communication through written documents that are the basis of the traditional process and planning centered approach based on command and control organizational styles. Agile organizational styles use the inherent resources of teams interacting together closely and at a

sustained pace over time to bring the foundational aspects of teaming together to make a difference on the effectivity and efficiency of agile and lean projects. Also the ideas of Chillers about non-representability are used in order to ground the effectiveness of representations that are used in the group setting which are inherently higher dimensional and must be brought down into representational products such as working code or documentation that are delivered as the product of the team. Teams naturally work with higher dimensional concepts, essences, designs, and perspectives that cannot be represented in lower dimensional artifacts without substantial loss of information content. This fact that teams operate with eventities that are higher dimensional, being composed of seven plus or minus two INDEPENDENT elements. Thus higher dimensionality of group thought is established as another resource that groups can bring when interacting directly with each other that is not possible for individuals communicating though documents. It was P. Nauer that said that if you wanted to know how a design worked no amount of documentation would tell you and that you had to talk to the designer to get a significant clue as to how it worked. The same is true of all aspects of the product development. The team has access not just to higher dimensional eventities that may be described as concepts, essences, designs and perspectives but they can also manipulate these in a quadralectical fashion that surpasses either the dialectics or trialectics described by Hegel as described the recent dissertation of the author on Emergent Design. But the team also has access to a little researched resource called conversational memory. That is the memory that exists only in the pair or team together in dialogue where one can remember where a particular subject thread left off and take it up again from the point where it was left to continue it sometimes years later. We know what others known and do not know and are thus mindsighted, and we use that knowledge in order to make sure our communications are information rich, and not needlessly and unnecessarily repetitive. Thus the knowledge base of the group from dialogue together is deep and rich and goes beyond the individual's short term and long term memory which is what is mostly studied in psychology. When we begin to realize all the resources that are brought to software development and other activities that use teaming, and especially that strive for high performance teaming, then we realize that Agile and Lean are layers built on top of the emergent properties of the Reflexive Autopoietic Special Systems theory and its implications for teaming rather than the other way around. We need first a good theory of high performance teaming based on Complex Adaptive Systems Theory and then we need a theory of the special properties of Agile which are contributed mostly by the lower levels of the Special Systems model.

It is Paul Dupuy who alerted me to this important point which I have been developing within the book on the Foundations of Agile Teaming by going to the literature and finding the resources that are needed to flesh out the model of the Reflexive Social Special System within the context of the rest of the Special Systems and also in the context of the Emergent Meta-system that is the umbrella theory that combines the normal system with the special systems to produce the transformation into the meta-system that provides the niches for the systems within the meta-system. We also use the theories of Boyd who was a military tactician who

developed the doctrine of maneuverability in order to operationalize this theory and make it so that it can be used in a practical way. Boyd turns out to have developed a theory similar to that of the social mirrors as his way of defining Moral Strength in warfare. And of course we also use the theory of the meta-levels of Being or Knowledge developed previously in the author's first dissertation "On The Structure of Theoretical Systems in Relation to Emergence" (LSE UK 1982) to define the different modes of being-in-the-world-within-the-team that are possible. It turns out that the meta-levels of Being or Knowledge are the basis for the differentiation of the Special Systems. Thus there are five kinds of Teaming which are called Pure, Process, Hyper, Wild, and Ultra which have different existential characteristics, and it turns out that Agile Teaming makes use of Hyper Teams for the most part, but high performance teaming makes use of Wild Teams, while the extreme of the Ultra Team in which all the various laminar threads are fused becomes a limit that appears to be only worth while using in warfare and other crisis situations. In this way we not only show how the various characteristics of normal and high performance teaming derives from the special systems but we also define the different types of being in the world of the team that can exist within the Western Worldview with its current ontological basis.

It turns out that this theory of special systems derives from a study of the imaginary cities of Plato that appears in the book The Fragmentation of Being and the Path Beyond the Void. In those cities which were Atlantis, Megara, and the Republic/Ancient Athens there are odd properties that are difficult to explain. Plato was however the first sociologist and the first systems theorist because he created these odd imaginary cities. Studying the oddities of these cities in the context of other dialogues such as the Symposium engendered the thought that perhaps these same structures might exist in modern mathematics, and this hypothesis turned out to be true. There are many different mathematical structures that have the same mathematical structure as the three cities of Plato, and not only that if we combine these mathematical anomalies together we get a very precise image of the nature of these special systems. When in the course of this study, which is summarized in "Reflexive Autopoietic Dissipative Special Systems Theory", and given in the various studies under the title of "Reflexive Autopoietic Systems Theory" that were done in the process of the exploration of the possibility of these systems, it was discovered that there are also physical anomalies that correspond to these special systems as well. This connection by analogy between the mathematical and the physical embodiments of these anomalies allows us to have a very precise meta-theory that explains the emergent qualities of consciousness, life and the social via the sub-theories that make it up which are those of Prigogine, Maturana and Varella, as well as O'Malley and Sandywell.