

# Are We Ready to be Unleashed? A Comparative Analysis between Agile Software Development and War Fighting.

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## **Abstract**

Agile is for people, but are people prepared for agile? This paper compares the Agile Principles and our agile practices to an organization that may have 2,500 years experience practicing agility, the military. This paper suggests there are sufficient similarities between the nature of war fighting and the nature of software development to warrant a comparison between military war fighting philosophy and the principles of agile software development. While there are obvious limitations to this comparison, the comparison is enlightening because it both reveals potential deficiencies in our practice of agility and helps legitimize agility as a valid time tested approach to achieving success.

## **Keywords**

Agile software development, harmonious initiative, maneuver warfare, training, trust, leadership, doctrine

## **Introduction**

Agile is for People, but What About the People? “Agile is for people”<sup>1</sup> “Individuals and interactions over process and tools” declares the agile manifesto. No matter how you say it, agile software development is about delivering value and responding to change by unleashing talented people’s creativity. But are we ready to be unleashed?

Success through agility is a military doctrine which may date back 2,500 years to when Sun Tzu wrote in *The Art of War* “*Speed is the essence of war*” One hundred and seventy years ago, the Prussian strategist General Karl von Clausewitz rejected prescriptive approaches to war

fighting and advocated agile like principles. Military strategists coined the term maneuver warfare to describe techniques that enable a force to win battles with minimal bloodshed by rapidly and opportunistically responding to change. The German Blitzkrieg (lightning war) is a famous application of maneuver warfare.

With the software industry embracing agility we want to ask the question if the military has such a long history developing and practicing agile war fighting principles, are there lessons we can learn from their experience and training? Can military knowledge and experience help us discover deficiencies in our approach to agility and therefore improve our development and execution of Agile Principles? Can this knowledge help us develop a stronger validation of the Agile Principles?

This paper argues the affirmative and despite the thankfully wide chasm between the nature of war fighting and the nature of software development there are lessons we can learn from military war fighting philosophy. This paper draws on the military’s experience with agility and identifies opportunities for improving our pursuit of agility. We are always reminded agility is for people<sup>2 3</sup>, and this paper examines how the military prepares people for agility.

This paper is a comparative analysis between the nature of war fighting and software development. We will first turn to the writings of the famous Prussian strategist Karl von Clausewitz and compare his model of the battlefield environment with the software development environment. Von Clausewitz shows us the inappropriate nature of prescriptive approaches to rapidly changing environments such as the battlefield. We will then present how modern militaries such as the United States Marine Corps (USMC) and the United States Army apply von Clausewitz’s ideas and effectively manage an

agile force through the concept of harmonious initiative. We develop a model for supporting harmonious initiative and compare it to our Agile Principles and practices. This comparison reveals both strengths and weaknesses in our approach to agility. Finally we make recommendations for how we can overcome the weaknesses.

An noteworthy side affect of this comparison between the Agile Principles and war fighting philosophy is the demonstration to skeptics that agility is not an off the wall, self serving concept developed by tree hugging socially conscious software developers. Rather it is conservative time tested philosophy practiced by successful war machines throughout history.

### **Software Development and War Fighting**

There is nothing new in comparisons between military and business practices. Numerous books and papers make this comparison. Tom Demarco of the Cutter Consortium employed this comparison in his armor versus mobility metaphor to characterize the changing balance between process and agility. The military metaphor is frequently used because it is dramatic, highly visible to the general population, and evokes strong metaphors and images. Unfortunately, it is the more violent metaphors that have often been employed as management clichés, “price wars”, “navigating the minefield”, “death march”, “seizing market share”, and “defeating the competitor”. Worse, military metaphors have often been misinterpreted as justification for a harsh, rigid command and control management style.

As software developers, we are not interested in forcing our will on our enemies. Rather, we are interested in discovering ways to operate successfully in challenging, rapidly changing environments. Warfighting <sup>4</sup>, the United States Marine Corps war fighting manual describes the battlefield environment as one where

*“plans will go awry, instructions and information will be unclear and misinterpreted, communications will fail, and mistakes and unforeseen events will be commonplace.”* Warfighting pg 10

This is the environment soldiers must not only operate in but must also succeed in. According to the USMC:

*“We must therefore be prepared to cope—even better, to thrive—in an environment of chaos, uncertainty, constant change, and friction.”* Warfighting pg 80

Jim Highsmith described our work environment as a “Agile Software Development Ecosystem”<sup>5</sup> The question this paper asks is are people prepared to work harmoniously in this ecosystem where mistakes and unforeseen events are commonplace?

Even in this limited context, we must use caution with this metaphor because there is a significant difference between the intensity of the battlefield and the software development environment. Simply, we do not ask software developers to face physical danger and potentially lay down their lives for the sake of their country. We only ask them to give up their personal time, their families and friends for the sake of the project.

### **Is War Fighting Agile?**

When we think of war fighting we may think of heavy tanks rumbling across a battlefield, naval taskforces cutting across the oceans, the military bureaucracy, the incompetence and scandals so generously highlighted by our media we may want to answer a resounding no. It is certainly true that the administration of the military is a hidebound, non-agile bureaucracy. However, war fighting is another matter. What is perhaps surprising is that it is not just the elite services such as the U.S. Navy Seals or British Special Air Service (SAS) that consider themselves agile, *all* the military considers itself agile when it comes to war fighting. Scrum Master and retired US Army Colonel, Dan Rawsthorne, says that everything he *really* needs to know about agility he learned in the Army.<sup>6</sup>

### **Karl von Clausewitz**

Much of western military theory is based on the writings of Karl von Clausewitz (1780-1831) a Prussian officer whose war fighting advice for the Kaiser was collected and published in his famous book “On War”<sup>7</sup>. While von Clausewitz provides an analytical study of war, his recognition of the difference between war on paper and war in practice should resonate strongly with us

*“Everything is very simple in war, but the simplest thing is difficult.”* On War, Book 1, Chapter 7

Von Clausewitz used the metaphors friction and fog to describe these countless factors that make the simple difficult. He described friction as

*“.....the influence of an infinity of petty circumstances, which cannot properly be described on paper, things disappoint us, and we fall short of the mark...Friction, as we refer to it here, is what makes the seemingly easy so difficult.”* On War, Book 1, Chapter 7

Fog became a metaphor\* to describe uncertainty's affect on decision-making and the execution of a battle plan:

*"the great uncertainty of all data in war is a peculiar difficulty, because all action must, to a certain extent, be planned in a mere twilight, which in addition not unfrequently—like the effect of a fog or moonshine—gives to things exaggerated dimensions and an unnatural appearance"* On War, Book 2, Chapter 2

Like a fog, uncertainty hides information and makes decisions hard. Von Clausewitz further observed how the non-linear nature of uncertainty intensifies this fog:

*"issues can be decided by chance and incidents so minute as to figure in histories simply as anecdotes"* On War, Book 8 Chapter 4.

How does von Clausewitz recommend we operate in an environment of friction and fog? Certainly not using rigid inflexible strategies or finely detailed plans. Von Clausewitz rejected such prescriptive approaches:

*"Given the nature of the subject, we must remind ourselves that it is simply not possible to construct a model for the art of war that can serve as a scaffolding on which the commander can rely for support at any time."* On War, Book 2 Chapter 2.

Former GE CEO Jack Welch sums up Von Clausewitz's attraction for agilists:

*"Von Clausewitz summed up what it had all been about in his classic On War. Men could not reduce strategy to a formula. Detailed planning necessarily failed, due to the inevitable frictions encountered: chance events, imperfections in execution, and the independent will of the opposition. Instead, the human elements were paramount: leadership, morale, and the almost instinctive savvy of the best generals".<sup>8</sup>*

Von Clausewitz theories are essentially descriptive and intended to help us develop our own judgment for coping and succeeding in friction and fog. Given that most western military theory is built on von Clausewitz's theories, it is instructive for us to study war fighting to discover practices for succeeding in an environment immersed in friction and fog that defies prescriptive solutions.

## Harmonious Initiative

We often regard military command and control as the poster child for rigid, hierarchical decision-making. The phrase "command and control culture" has become a cliché in the agile community for describing rigorous process centric organizations with centralized authority. However, the reality is the military views rigid control as highly undesirable. An officer summed up this attitude towards rigid control:

*"I want to unleash my marines, not control them"*<sup>9</sup>

The UMSC war fighting manual clearly states that rigid hierarchical decision making is not part of the US Marine's operating philosophy:

*"Efforts to fully centralize military operations and to exert complete control by a single decision maker are inconsistent with the intrinsically complex and distributed nature of war."* – Warfighting pg 13

Rather than centralized control, the USMC favours a decentralized control structure:

*"In order to generate the tempo of operations we desire and to best cope with the uncertainty, disorder, and fluidity of combat, command and control must be decentralized"* Warfighting pg 77.

How can command and control be decentralized and how can we free people to adapt without our development project deteriorating into randomness? The USMC command philosophy is based on the principle of harmonious initiative:

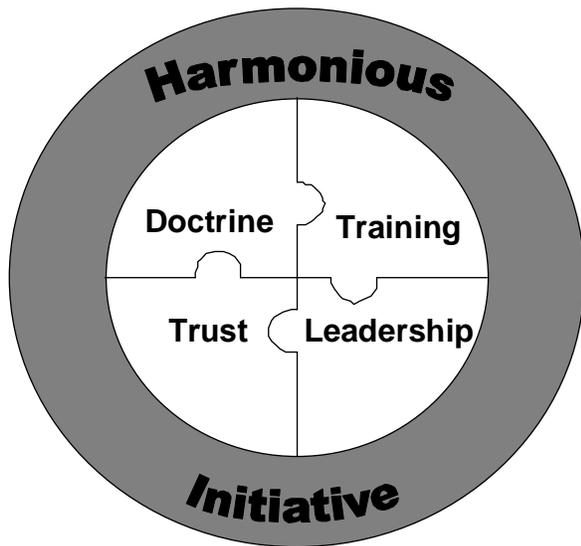
*"we cannot allow decentralized initiative without some means of providing unity, or focus, to the various efforts. To do so would be to dissipate our strength. We seek unity not principally through imposed control, but through harmonious initiative and lateral coordination within the context provided by guidance from above."* Warfighting pg 88.

We may think of harmonious initiative as empowered people acting together as a team towards a shared common goal. This is the essence of agility. An analysis of military field manuals suggests four synergistic elements support harmonious initiative:

1. Doctrine
2. Training
3. Leadership
4. Trust

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\* While fog became a popular metaphor for uncertainty, von Clausewitz never used the expression "fog of war"



**Figure 1 Four Element Model of Harmonious Initiative.**

These four synergistic elements form an environment that supports harmonious initiative and hence an agile team. Using this model, we will describe each element and then compare that element to relevant Agile Principles and practices.

#### Doctrine

An effective team requires a shared common philosophy to practice their profession. This requires a shared knowledge of methods and tools, and a common vocabulary, otherwise the team risks becoming like a dysfunctional tower of Babel working at cross purposes. The USMC refers to this basic shared core knowledge as their doctrine.

*“Doctrine is a teaching of the fundamental beliefs of the Marine Corps on the subject of war, from its nature and theory to its preparation and conduct. Doctrine establishes a particular way of thinking about war and a way of fighting. It also provides a philosophy for leading Marines in combat, a mandate for professionalism, and a common language. In short, it establishes the way we practice our profession.”* Warfighting pg 55

Methodology is a part of our software development doctrine, whether we follow XP, Scrum, Crystal, or

something else from the panoply of agile methodologies. The intent behind these methodologies is to establish a particular way of thinking about the conduct of developing software. An established doctrine helps facilitate trust because we each speak the same methodological language, we understand what our obligations to each other are, and we share a common professional philosophy.

Military doctrine is authoritative and not prescriptive. The USMC War Fighting Manual builds on von Clausewitz’s rejection of prescriptive doctrine:

*“Our doctrine does not consist of procedures to be applied in specific situations so much as it sets forth general guidance that requires judgment in application. Therefore, while authoritative, doctrine is not prescriptive.”* Warfighting pg 56

The delight we should take here is that agile software methodologies are authoritative, giving us what Jim Highsmith describes as “a barely sufficient methodology” that unshackles people’s creativity while providing sufficient guidance to prevent randomness. Neil Harrison referred to this as a “Liberating Form”<sup>10</sup> a minimal set of rules that liberate our creativity. Therefore agile software methodologies contribute to this supporting element for harmonious initiative.

However, while methodology is a necessary part of the doctrinal element, it is not sufficient because methodology is limited to the process for creating software. An effective software organization possesses a collection of local patterns, solutions to common, locally occurring problems. These patterns are a key element of a common domain language. Whether these patterns are explicitly written down or simply retained in the heads of developers, these patterns give an organization its competitive advantage. While such patterns are outside the scope of an agile methodology, they are an essential part of an agile organization’s doctrine and essential to supporting harmonious initiative.

#### Training

While we are fortunate in the software development world that we do not face the same penalties for lack of training as soldiers, we should take strong interest in the importance that military services place on training:

*“All commanders should consider the professional development of their subordinates a principal responsibility of command.”* Warfighting pg 63.

While there is general agreement within our industry about the importance of training, the actual support for, and the provision of training varies dramatically between organizations: Some organizations enthusiastically embrace and pursue training while in others employees are fortunate if they are reimbursed for their tuition. Commitment to training is one measure of an organization's desire to embrace agility.

Training though is more than hours spent in a classroom or performing canned exercises because this type of training does not expose the participant to the effects of fog and friction. This is why military training consists mostly of drills and exercises to practice skills under realistic conditions where the participants experience the effects of fog and friction.

*"Exercises should approximate the conditions of war as much as possible; that is, they should introduce friction in the form of uncertainty, stress, disorder, and opposing wills."* Warfighting pg 60

The Agile Principle of regular reflection supports this approach to on-the-job training. Of course it is not usually necessary to set up a drill project for training team members but we should consider taking advantage of the very real opportunities for fostering on-the-job training. This may be as simple as a developer presenting to her colleagues a work product she created and explaining the reasoning behind it. While the term "live fire exercise" may be an all too appropriate military metaphor, the value of this kind of training should not be underrated.

*"Critiques are an important part of training because critical self-analysis, even after success, is essential to improvement"* Warfighting pg 61.

However, even the organizations that embrace training may not experience the full benefits of training if training is seen only as a way for instilling basic doctrine. Training is also a key element for creating common experiences and familiarity, which are the basis of trust:

*"All officers and enlisted Marines undergo similar entry-level training which is, in effect, a socialization process. This training provides all Marines a common experience, a proud heritage, a set of values, and a common bond of comradeship. It is the essential first step in the making of a Marine."* Warfighting pg 59.

In most companies it is not practical, nor desirable to have the equivalent of boot camp where new recruits are sent for weeks of indoctrination and training to become

good corporate soldiers. However, there is a synergistic relationship between training, doctrine, and trust because trust develops with shared experiences between colleagues.

Much of the training delivered within companies is often delivered with a narrow focus; just-in-time training with specific employees learning the specific skills required for a specific project. For training to be truly effective in support of harmonious initiative it must be broadened such that members of closely related groups receive common training to develop a common experience and mutual respect. Imagine for a moment developers training with project managers to learn basic project management, project managers training with testers to learn basic test theory. Even developers training with marketing to learn what it is the company sells, and who the customers are. Southwest Airlines' created the "Walk in Your Shoes"<sup>11</sup> program which encourages employees to swap jobs. While this program is not regarded as a training program by Southwest Airlines, it is still an interesting high profile example of using cross functional learning to prepare people with different backgrounds to work collaboratively, one of our dearest Agile Principles.

### Leadership

Leadership is a term that is at best difficult to define. Leadership is certainly not the acts of giving orders and directing tasks. Rather, leadership is about inspiration and encouraging people to achieve. Good leaders are like coaches who inspire athletes to achieve accomplishments the coach themselves will never obtain.

Decentralized command requires effective leadership because decentralized decision making risks dissipation of a force's strength if the members of that force do not share the same vision. Unity in harmonious initiative is sought through what is called "commander's intent". According to the US Army's Operations Manual,

*"US Army doctrine stresses rapid, agile operations based on exercising disciplined initiative within the commander's intent,"*<sup>12</sup>

The foundation for commander's intent is drawn from the philosophy of a student of Von Clausewitz's, Field Marshall Helmuth von Moltke's who is best known for the phrase "no plan ever survives first contact with the enemy". Von Moltke believed commanders should issue only the most essential orders providing only general instructions outlining the principal objective of a mission. Tactical details were left to subordinates. The

USMC war fighting manual describes how the use of commander's intent supports harmonious initiative:

*"The purpose of providing intent is to allow subordinates to exercise judgment and initiative—to depart from the original plan when the unforeseen occurs—in a way that is consistent with higher commanders' aims...."* Warfighting pg 88

The philosophy of commander's intent seems consistent with the Agile Principle of self-organizing teams. The Agile Principles encourages self-organizing teams as the most effective ways for coping with complexity and rapid change. The team collectively organizes and re-organizes itself to the task at hand and in response to change rather than by management direction. However, self-organizing teams are not leaderless teams<sup>13</sup>. For just as an armed force without leadership is nothing more than an ineffective armed mob, so is a leaderless development team nothing more than a well-intentioned group of hackers.

The implicit message in both von Moltke's philosophy and the USMC war fighting manual is the importance of the leader's vision, the ability of the leader to communicate that vision, to inspire others – and not necessarily just subordinates - to rise to the challenge of the vision, and to foster trust among others such that they may quickly develop and carryout their function in the support of that vision. These are not talents or skills we can assume everyone possess, or expect a person to develop on their own.

While some people are gifted with the talent and charisma to become good leaders, potentially even great leaders, leadership skills still must be learned and the value of a leader must be recognized by the organization. This value is recognized in the USMC War Fighting manual, which states the goal of a professional military education is to develop creative thinking leaders. Approximately a third of a military career will be spent in formal training, with much of this training focused on leadership, and creative thinking in battlefield situations.

A leader is not just a good developer with expert knowledge of Java, XML, and Junit. A good leader is also conversant in the matters of the problem domain and the business itself. Good leaders must possess some skill in managing inter-personal relationships. Von Clausewitz expressed the need for diversity in the training and professional development of leaders:

*"The commander need not be a learned statesman, or historian, or political commentator, however, he must be quite conversant in the higher matters of state and customary practices"* Book 1, Chapter 3

Training is only part of the development of an effective leader. Von Clausewitz challenged the idea effective leaders may simply be trained, and believed experience is a necessary ingredient for successful leadership, for as von Clausewitz wrote about war

*"without personal knowledge of war we cannot perceive where the difficulties lie."* On War, Book 1, Chapter 7

Experience is therefore a significant component of an effective leader. To believe that we can simply train a leader falls into the MBA malaise of believing that intense analytical training prepares a person to become a corporate leader. According to Henry Mintzberg, the Cleghorn Professor of management studies at McGill University "Leaders cannot be created in the classroom. They arise in context".<sup>14</sup>

The development of leadership skills is an area of concern because leadership development within software organizations is often ad hoc if it exists at all. Agile methodologies unshackle gifted and creative people and open the opportunity for them to lead and inspire a team of creative individuals. Unfortunately, in many cases we are simply hoping people possess natural talent to exploit the opportunity and work together as a team. Militaries do not rely on hope and place a very high value on leadership at all levels

*"Our philosophy requires competent leadership at all levels"* Warfighting pg 81.

It is the development of leaders where we see the widest gulf between Agile Principles and military philosophy. While Agile Principles enable people to lead, they do not set down the importance of developing leadership skills as is done in military war fighting philosophy. If we truly believe that agile software development is about people, then the development of leadership and team skills must made explicit in the Agile Principles.

### Trust

The flexibility to quickly respond to change depends on quick decision making. Doctrine and training provide rules and guidelines for making decisions. Leadership provides vision and inspiration. But it is trust that enables us to take the initiative and make decisions quickly in an environment of friction and fog. Trust is often referred to as the "lubricant" that reduces Clausewitzian friction. The sociologist/economist Fukuyama wrote regarding trust

*"If people who have to work together in an enterprise trust one another because they are all operating according to a common set of ethical norms, doing business will cost less. Such a society will be better able to innovate organizationally, since the high degree of trust will permit a wide variety of social relationships to emerge...."*

*"By contrast, people who do not trust one another will end up cooperating only under a system of formal rules and regulations, which have to be negotiated, agreed to, litigated, and enforced, sometimes by coercive means. This legal apparatus, serving as a substitute for trust, entails what economists call "transaction costs." Widespread distrust in a society, in other words, imposes a kind of tax on all forms of economic activity, a tax that high-trust societies do not have to pay."*<sup>15</sup>

It is stating the obvious that trust is a key element supporting harmonious initiative and therefore a key success factor of an agile team. Several Agile Principles directly support the development of trust within an agile team and its stake holders by building confidence and familiarity with early and continuous delivery of valuable software, by requiring business people and developers working together and by face to face conversations.

Unfortunately it seems that organizations treat trust as either a nice to have, or as some mysterious property that they cannot really control and may or may not emerge. Furthermore, organizations often have policies that discourage putting the team above the individual frequently in the form of incentive programs or consequences for violating rules. Trust is not a mysterious property that may or may not emerge within a team. Neither is it something that simply decreed. According to the USMC:

*"Trust is a product of confidence and familiarity. Confidence among comrades results from demonstrated professional skill. Familiarity results from shared experience and a common professional philosophy".* Warfighting pg 58

Psychiatrist, Jonathan Shay wrote

*"We know a great deal about how to create trust among people who start out as strangers: cohesion, leadership, training. We know how to do this! It is not mysterious."*<sup>16</sup>

This should be another area of concern for us because trust or the lack thereof is a key determinant to the

success or failure of a project. To paraphrase Cockburn and Highsmith, people trump process, but politics trumps people<sup>17</sup>. We seem to be assuming trust will automatically emerge with the introduction of an agile process. While agile processes are a good expression of trust in a team they do not on their own create an atmosphere of trust.

## **Conclusion**

Agile methodologies enable us to clear away the cluttering impediments imposed by rote prescriptive methodologies and unleash our creativity. However, when we compare ourselves to military war fighting philosophy we have to ask are we ready to be unleashed? Are we ready to take advantage of agility? Unfortunately, after comparing the four synergistic elements of harmonious initiative to Agile Principles and practices, the answer is an unsatisfying "it depends". It depends on the organization's training policies, leadership and the development of leaders within organization and whether corporate policies encourage or inhibit the emergence of trust.

At an abstract level, there is similarity between the nature of war fighting and the nature of software development. Friction and fog are good metaphors for describing the software development environment and agility becomes a necessary philosophy for succeeding in this Clausewitzian environment. The military approach to agility is based on a decentralized command structure where unity of purpose is achieved through harmonious initiative. This paper presented a four element model of harmonious initiative to which we compared our agile practices.

**Doctrine:** The agile methodologies establish excellent methodological practices that enable people to work collaboratively to deliver value and rapidly respond to change. However doctrine is not just methodology because there are numerous local patterns that contribute to an organization's core competency. These patterns must be recognized as part of an organization's doctrine.

**Training,** Within the agile community there is strong support for training, and an excellent repertoire of agile development courses. However, training must be seen as more than a tool for instilling doctrine within individuals but also for

developing a shared common experience (e.g. cross discipline training). Furthermore it is unclear if we are taking advantage of drill training and regularly reflecting on the lessons learned.

**Leadership** The concept of commander’s intent is consistent with the Agile Principle of self-organizing team. However, the Agile Principles do not highlight the need for developing leadership skills and the importance of experienced leaders.

**Trust** Trust is essential for agility and the act of adopting agile development practices serves as an excellent demonstration of good faith in the people of that organization. However, we are usually hoping that trust will somehow emerge. Worse, organizations may have policies that inhibit the development of trust. We need to acknowledge that trust is a key element for supporting harmonious initiative and can be developed and encourage with policies that foster trust.

The deficiency in the Agile Principles and practice is the implicit assumption that people are ready for agile software development, that they possess the needed inter personal and leadership skills. The military, and especially the US Marines go to great lengths to emphasize the importance of these elements for creating an agile organization. While our Agile Principles are built on collaboration, face to face conversations, and trust, we do not explicitly state the importance of developing the skills which support these principles. Two lessons we should take from this comparison between the military’s practice of agility and our own are:

1. use training not only as a tool for instilling skills/doctrine, but also to provide a common shared experience, as a builder of trust.
2. recognize the importance of developing experienced leaders,

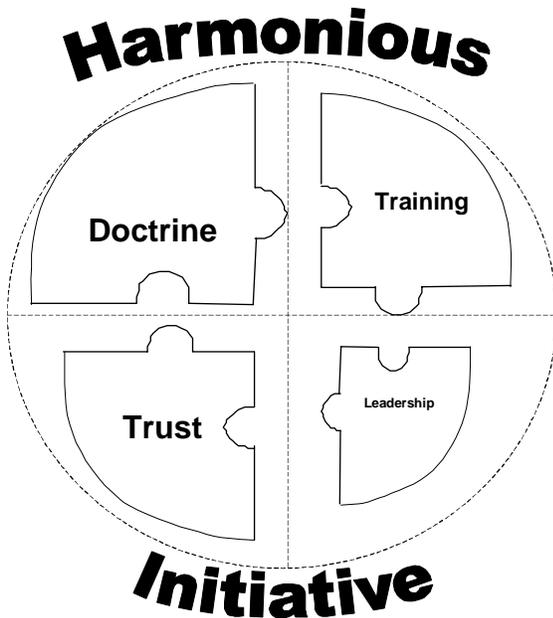
The concern is that while the Agile Principles put people first, there is a bias towards technical excellence within our Agile Principles that may cause some to undervalue the development of inter personal skills. The development of inter personal skills is sufficiently important to the military that they have explicitly incorporated them into their basic war fighting philosophy.

This comparison is not intended to suggest agile software development is an inadequate philosophy, rather it should be seen as a strong validation by demonstrating how agility is a philosophy for operating in difficult environments and is embraced by some of the largest and complex war machines. The potential deficiencies identified in this paper may be the result an incomplete appreciation of the elements that create harmonious initiative by management and ourselves. Furthermore, there may even be those who are suspicious of the motives of those who advocate agile software development. However, if agility is good enough for the military then perhaps it is good enough for us too.

**Acknowledgement**

The author wishes to thank Jennitta Andrea, Dr. Dan Rawthorne, Dr. Alistair Cockburn, Shannon McMahan, and Carsten Hiena for reviewing the early drafts of this paper. The author further wishes to thank the referees for their suggested improvements.

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**Figure 2 Comparison of the Agile Principles Support for Harmonious Initiative to Military Warfighting Philosophy in Figure 1.**

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