

USING ESSENTIAL SAFE TO MODERNIZE A U.S. DoD CYBERSECURITY DATA CENTER FAMILY

Executive Summary

After several months of negotiation, initial training, and engagement scoping, a U.S. DoD acquisition program decided to undertake a full-up transformation to manage a family of distributed cybersecurity data centers using the Scaled Agile Framework (SAFe). This was only one of hundreds of acquisition programs belonging to the cybersecurity portfolio of a Top 5 U.S. DoD contractor, the organization was 10 years into a corporate lean and agile transformation, and it was decided to implement lean-agile principles on as many programs as possible from the bottoms up. This target program was in the last year of a decade long sole-source acquisition cycle, it was being recompeted, and the program management team took the initiative to ask for assistance to undertake a lean-agile transformation in order to improve its posture for gaining the follow-on contract. That is, “Crisis is a Catalyst for Change,” and the threat of losing this decade long cash cow was worth a transformation to a new set of acquisition principles in the eleventh hour.

While the parent corporation itself set out to train over 100,000 of its personnel in a variety of lean-agile topics from the top-down, the cybersecurity portfolio sought to literally transform its acquisition programs from the bottoms up. It therefore sought the services of a third-party lean-agile boutique with a track record of successful lean-agile transformations to augment the corporate staff with pointed bottoms up management consulting services. The lean-agile boutique had a standard practice of assigning a triumvirate of lean-agile coaches to each target program depending upon its size. That is, for small to medium programs, three lean-agile coaches would suffice, but larger acquisitions were assigned more. Two external lean-agile coaches were teamed with a corporate coach to support the cybersecurity data center acquisition program. The program itself was an operations and maintenance contract that amounted to day-to-day Linux systems administration for nationally distributed brick-n-mortar data centers.

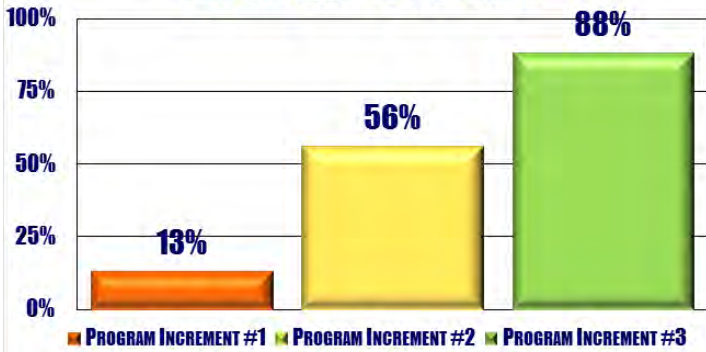
The program was valued at around \$80 million and consisted of 80 Linux systems administration managers and engineers from a variety of firms. The coaches followed the SAFe Implementation Roadmap that consisted of training program personnel in a variety of topics including Scrummastery, Product Ownership, and SAFe implementation. Once the program personnel were trained in SAFe concepts, then a detailed execution plan was formed to begin using SAFe on this acquisition program. Initial open-ended assessments were conducted in order to gain the business intelligence necessary to understand the customer’s needs in greater detail. The program itself augmented itself with an internal agile coach, scrummasters and product owners were appointed for each of 12 teams, and the agile teams themselves were formed. This alone constituted a major transformation or reorganization of this 10-year-old program. From there, final plans were made to identify the start date, iteration length, cadence, and SAFe planning event.

The 80 Linux systems administrators and managers had been in daily firefighting mode for 10 years on, so the notion that they would plan an 8-to-12-week period-of-time called a SAFe program increment of activities was also a major change. They were in reaction mode for so long, it was awkward to actually plan Linux systems administration tasks well in advance for the 80 engineers. Of course, the notion of organizing or thinking about their work in lean-agile terms such as Epics, Features, and User Stories was also a major paradigm shift. Since they were fundamentally an IT services contract, the program managed multiple IT incidence or ticket tracking systems including JIRA, which is considered a lean-agile lifecycle management (ALM) system (or tool). That is, the program’s personnel would capture their SAFe planning and execution data in JIRA without having to learn a new ALM system. Once the initial SAFe planning was conducted, the next hurdle was to get the teams up-to-speed on executing Scrum ceremonies.

SAFe ceremonies were also executed such as a weekly program synch, multiple team and program assessments were conducted for process improvement purposes, and agile coaches helped agile teams get started as well. The first program increment was a bit of a wash as it was merely the dry-run, the second program increment exhibited routine lean-agile ceremonies “with” customers, and the third program increment focused on delivering valuable features. As a result of the increased transparency, pace, and customer involvement experienced during the first two program increments, the U.S. DoD civilians said this program made a “Quantum Leap Forward” in performance. After the third program increment, both the civilians and program management team said, “This was the first time we’ve delivered features in 10 years and we’ve made tremendous progress, which is proof that SAFe works.” This was precisely the outcome the prime contract sought to achieve when it decided to undergo a lean-agile transformation.

Key success factors were numerous, such as leadership buy-in at all levels, including the parent firm, cybersecurity portfolio, lean-agile boutique, transformation team (which isn’t always a given), program managers, customer (which cannot be understated), and program personnel (Linux systems administrators). While this was an unusually successful SAFe transformation, there is still a long way to go, especially improving Agile Product Management (APM) which is its Achilles heel, ceremony consistency, and, of course, metrics use and reporting. But, let’s remember this program succeeded with SAFe in spite of a direct strike by COVID-19, a hurricane, corporate divesture, and high attrition due to lack of contract renewal by fiscal year’s end (although it was extended by a year). This program embraced the bare minimum SAFe and Scrum essential practices to deliver 90% of core features really well!

FEATURE COMPLETION RATE



DIRECT CUSTOMER FEEDBACK

TRANSPARENCY, COMMUNICATION, AND MOTIVATION INCREASED WITH SAFe

WE TURNED THE CORNER AND MADE A QUANTUM LEAP FORWARD WITH SAFe

WE DEMONSTRATED THE ABILITY TO SATISFY COMMITMENTS WITH SAFe

RETROSPECTIVE—OVERALL SAFe TRANSFORMATION

| ACCOMPLISHMENTS | CHALLENGES | RECOMMENDATIONS |
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| <ul style="list-style-type: none"> Quickstart. Lean-agile consultants kickstarted SAFe transformation immediately upon joining client. Training. Delivered five (5) official SAFe certification courses within one month to 80 participants. Workshops. Designed seven (7) custom lean-agile workshops to address specific program challenges. Assessments. Administered five (5) lean-agile assessments eight times to measure adoption maturity. SAFe. Facilitated successful execution of four (4) program increment planning events and three (3) PIs. Scrum. Deployed routine Scrum ceremonies across ten (10) teams (planning, standups, demos, retros, etc.). Lean. Administered value stream mapping (VSM) workshops with customer and developed lean canvases. Program. Established customer-led product management team and routine program-level sync meetings. Performance. Dramatically improved customer satisfaction, alignment, execution, productivity, and trust. | <ul style="list-style-type: none"> Remote. SAFe coaches had to facilitate a cold-start transformation sight-unseen from 1,000 miles away. Traditional. This was a decade-long U.S. DoD traditional acquisition with little to no lean-agile maturity. Staffing. Acquisition program was understaffed, over scoped, and most personnel served in multiple roles. Natural Disasters. Acquisition program had to operate 24 hours a day through COVID-19 and hurricanes. Non-Software. This was a lift-n-shift brick-n-mortar data center operations and maintenance contract. Classified. This was a classified U.S. DoD acquisition program operating over unclassified communications. Infrastructure. Program operated on an antiquated, unreliable, and outdated U.S. government network. Staffing. The program lost in excess of 33% of its staff due to the uncertainty of its contract extension. Tools. The program was forced to use an outdated agile lifecycle management system unsuited for SAFe. | <ul style="list-style-type: none"> Metrics. Establish a simple set of baseline lean, agile, and SAFe metrics, models, and measurements. Tools. Better use of agile application lifecycle management (ALM) tool for planning, tracking, and metrics. Ceremonies. Consistent use of program and team level ceremonies (especially capacity planning metrics). Planning. Streamlined program increment (PI) planning ceremonies, practices, tools, length, and duration. Transparency. More transparency between program managers and engineers (include lean-agile coaches). Product Management. Improve the maturity of its fledgling lean-agile product management function/team. Team Structure. Streamline its team structure for overall optimization, flow, efficiency, and dependencies. Personnel. Better tailoring of SAFe and Scrum roles and responsibilities to optimize use of fewer resources. Tailoring. Better tailoring of SAFe and Scrum ceremonies for nationally distributed teams on multiple shifts. |

LEAN-AGILE TEAM MATURITY



OVERALL LEAN-AGILE MATURITY



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Abstract

As lean and agile thinking are entering their golden age, more and more public and private sector enterprises are implementing broad sweeping organizational transformations to move away from traditional thinking practices. While lean and agile thinking dates back to the 1950s, or earlier, their application to high technology and other knowledge intensive industries is just getting started. That is, lean and agile thinking emerged in the much slower moving brick-n-mortar manufacturing sectors of the pre-electronic computer era. Modern enterprises were faced with mastering, adapting, and even innovating lean and agile manufacturing principles to much faster moving 21st century scenarios. We now live in the Internet of Things (IoT) era with billions of Web-enabled devices interacting and exchanging trillions of transactions with one another in real-time at fractions of a second. Lean and agile thinking is much better suited to living on Internet time, but had to be streamlined, updated, and modernized to transact with billions of global devices tens of thousands of times a day. The creators of lean thinking, like the Toyota Manufacturing System (TMS) are now faced with adapting to modern lean and agile thinking innovations from the Internet Age in order to survive.

Post-modern enterprises themselves—Those not already steeped in 20th century lean manufacturing practices—are now adapting lean and agile thinking principles and practices as well. Not so much so at the team, project, or program level anymore, as was popular from 1990 to 2010, but at the portfolio and the enterprise itself—In the form of Business Agility. That is, public and private sector enterprises steeped in traditional thinking are now adding lean and agile thinking principles at all layers of their organizations. More progressive ones—Although few and far between—are replacing traditional thinking lock, stock, and barrel with lean and agile practices instead of just adding them to their pantheon of traditional practices. In other words, many public and private sector enterprises are now beginning organizational-wide lean and agile transformation initiatives among all of their functions including leadership, strategic planning, middle management, manufacturing, hardware design, software development, and even administration. That is, lean and agile thinking is not just for automobile manufacturing nor computer programming anymore. Many models of lean and agile thinking are emerging to help with these enterprise transformations for all organizational functions.

This is the story of a Top 5 U.S. DoD firm undergoing an enterprise-wide lean and agile transformation initiative using the Scaled Agile Framework (SAFe)—Which has recently been outfitted with Business Agility principles. That is, this firm resolved to apply SAFe to its entire portfolio of DoD acquisition contract programs, which numbered around 1,000. Some of these DoD acquisitions are quite large, ranging from \$5 billion to \$10 billion per year. Its CEO and other executives established corporate goals that each of its programs would be outfitted with lean and agile frameworks by 2021. In order to help achieve these goals, a lean and agile budget was set aside for this purpose, the services of lean and agile consulting boutiques were acquired, and small tiger teams of highly experienced lean and agile experts were assigned to each one in the prioritized backlog of programs. One of these DoD programs was a \$100 million family of distributed national-level network cybersecurity datacenters. The program was completing its current funding cycle, so both the buyers and suppliers rushed to apply SAFe practices for one final lift-n-shift initiative to lay the architectural runway for completely modernizing them with DoD cloud and data center services in the near future.

Introduction

The U.S. DoD budget for fiscal year 2020 was a whopping \$738 billion—Its highest peak in history. The DoD agency to which this \$100 million program belonged had an annual budget of \$10 billion. Cybersecurity operations of DoD networks was one of the many vital functions performed by this agency. The program managed about half a dozen national cybersecurity data centers, it was decommissioning some, relocating a few, and modernizing others. Furthermore, there were suites of cybersecurity applications that managed traffic between DoD networks that had to be consolidated and modernized as well in order to streamline DoD network traffic. The U.S. DoD as a whole is moving towards a software defined network (SDN) fabric in the form of modern cloud computing services, which is sort of stuck in first gear with its \$10 billion JEDI contract locked up in courts. Therefore, this agency was stuck with an aging brick-n-mortar nationally distributed network infrastructure and fabric suffering from frequent reliability failures and security vulnerabilities. This agency wished to adopt lean and agile program management practices while waiting for SDN technologies to become available to satisfy corporate goals, improve its delivery, and modernize its systems.

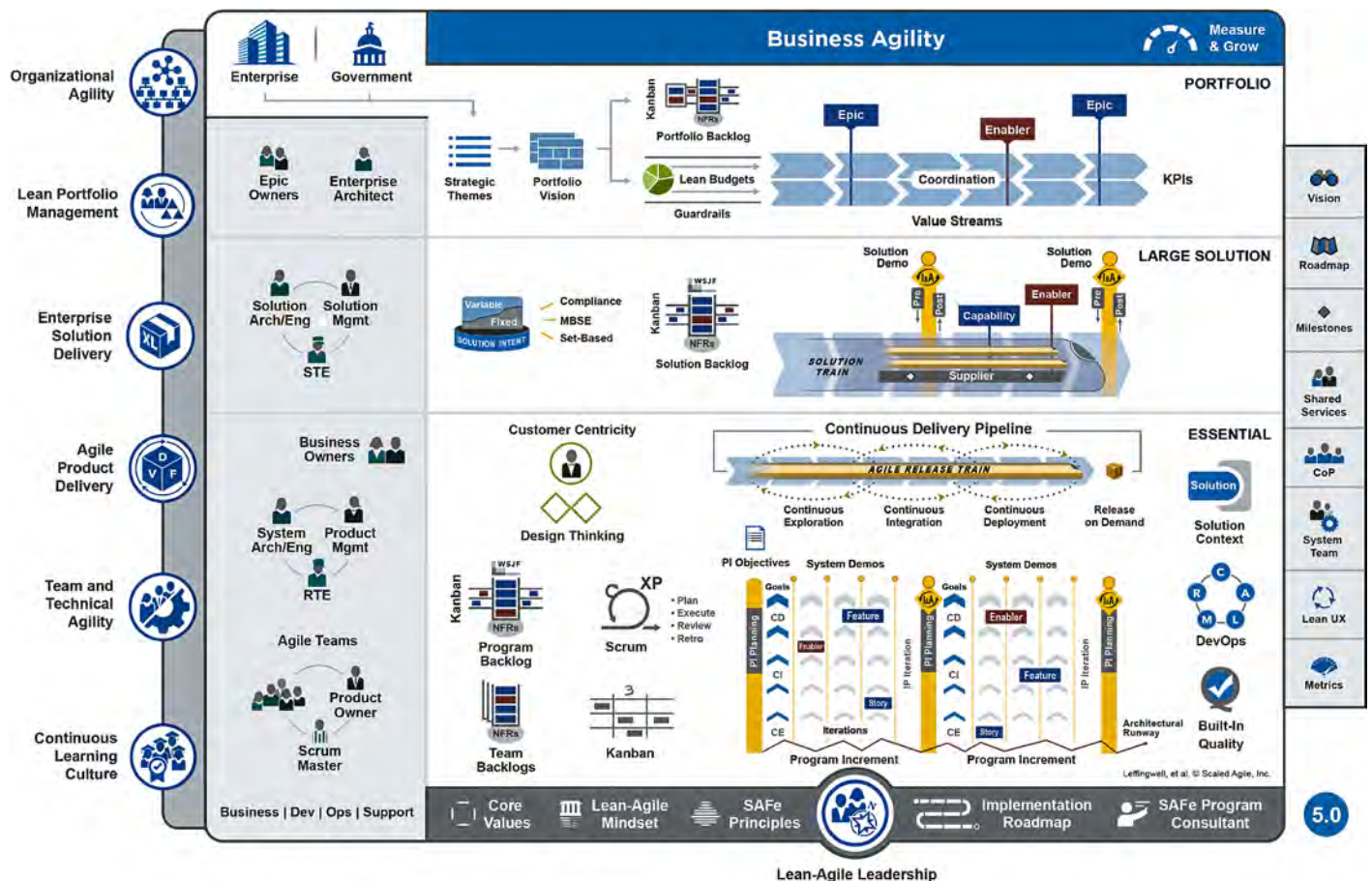
This agency was not new to modern information technologies and has been one of the thought-leaders in the application of lean and agile thinking for DoD acquisition programs for over 10 years. However, this thought leadership was slow to reach the lower, innerworkings of its bureaucracy, and many of its personnel were hearing of lean and agile thinking practices for the very first time. It was sort of a greenfield for the application of lean and agile practices, and its staff were very enthusiastic to try a new management approach for data center operations (Hawthorne Effect).

The program's personnel were getting tugged back and forth between two larger forces—Lean and agile corporate initiatives and U.S. DoD lean and agile initiatives too. There was just no where to hide at this point and the SAFe boogey man was coming to getcha in whichever brick-n-mortar datacenter you resided. Between near term top-down corporate and government agency-level lean and agile objectives, this program was compelled to reach out and request corporate assistance with their SAFe initiative from its Lean and Agile Center of Excellence (LACE). Since it was a medium-sized to large program, the Essential SAFe lean-agile framework was selected for transformation.

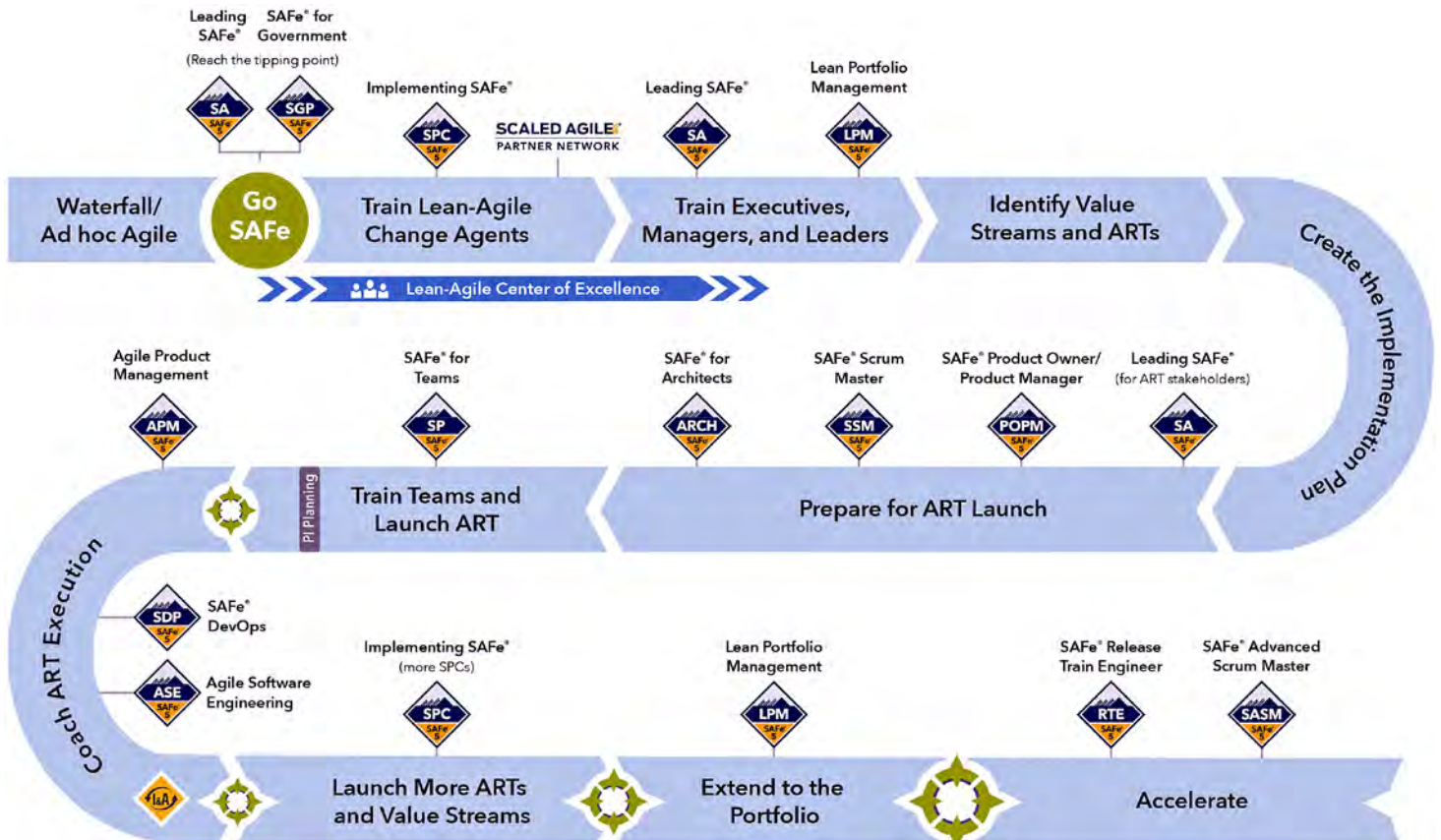
The U.S. DoD contractor retained the services of a lean-agile consulting boutique, hired SAFe Program Consultants (SPCs), and farmed them out to top priority U.S. DoD acquisition programs. The corporation usually sent in a discovery team to scope the requirements for each SAFe initiative, and then later sent in a coaching team to follow the heavy-lift training substages of the SAFe Implementation Roadmap. In this case, two external coaches were hired and sent in right away to jump into a moving freight train. The program was in the final stages of following the SAFe roadmap, and three back-to-back SAFe certification training courses were needed ASAP—SAFe for Scrummasters (SSM), SAFe Product Owner/Product Manager (POPM), SAFe for Teams or SAFe Practitioner (SP). In the meantime, the COVID-19 pandemic hit the fan and all of the client's coaches were immediately sent home for teleworking purposes, all of which introduced sudden uncertainty into this SAFe rollout. Additionally, the external lean-agile boutique was placed in-charge of our client's lean-agile coaches, so all were faced with managing up and down as well. Again, it was a moving freight-train, time was running out, and SAFe was new for the program—Kobayashi Maru.

Transformation Context

The U.S. DoD has been on the bleeding-edge of many management phenomenon for at least five decades, although many people in the commercial and other international sectors have not experienced this firsthand. This isn't to say that the U.S. DoD community does not have strong proponents of traditional thinking—even today! In fact, many of today's middle managers were raised in an era where traditional thinking practices were bleeding edge and hold dearly to this outdated paradigm in both the private and public sectors. However, the U.S. DoD was an early adopter of iterative and incremental thinking from the 1970s, rapid prototyping and spiral development from the 1980s, and Six Sigma and Lean Six Sigma from the 1990s. Furthermore, early U.S. DoD projects quickly adopted Extreme Programming (XP) in the early 2000s and Scrum was a mainstay in up to 60% to 70% of U.S. DoD agencies by the late 2000s. Early multi-billion-dollar U.S. DoD programs even experimented with Continuous Integration (CI) practices by the mid-2000s. In the early 2010s, U.S. DoD programs ventured into lean-agile program and project management, and by the mid to late 2010s, SAFe had found its way into U.S. DoD programs and many public sector agencies.



Lean-agile strategists reached out to the program early in fiscal year 2020 to help determine the scope of the lean-agile transformation. It was a medium-sized U.S. DoD program operating a family of national cybersecurity data centers. It was largely an operations and maintenance (O&M) contract but involved significant reengineering and modernization of the data centers, as well as their cybersecurity applications. More importantly, the program was winding down, the contractor's leadership team was under pressure to satisfy lean-agile corporate objectives, and the contract was up for re-compete. That is, successfully implementing SAFe offered a significant market differentiator for re-winning this \$100 million program. Lean-agile strategists drew up high level roadmap, trained buyer and supplier leaders, and performed some initial value stream mapping. Once that was done, the lean-agile strategists acquired a hands-on coaching team for the battery of SAFe certification courses required by its roadmap. As mentioned earlier, these included the SAFe SSM, POPM, and SP certification training courses. The coaches had to upgrade their SPCs to version 5.0, acquire the requisite training enablements, and deliver the first courses in a week or two.



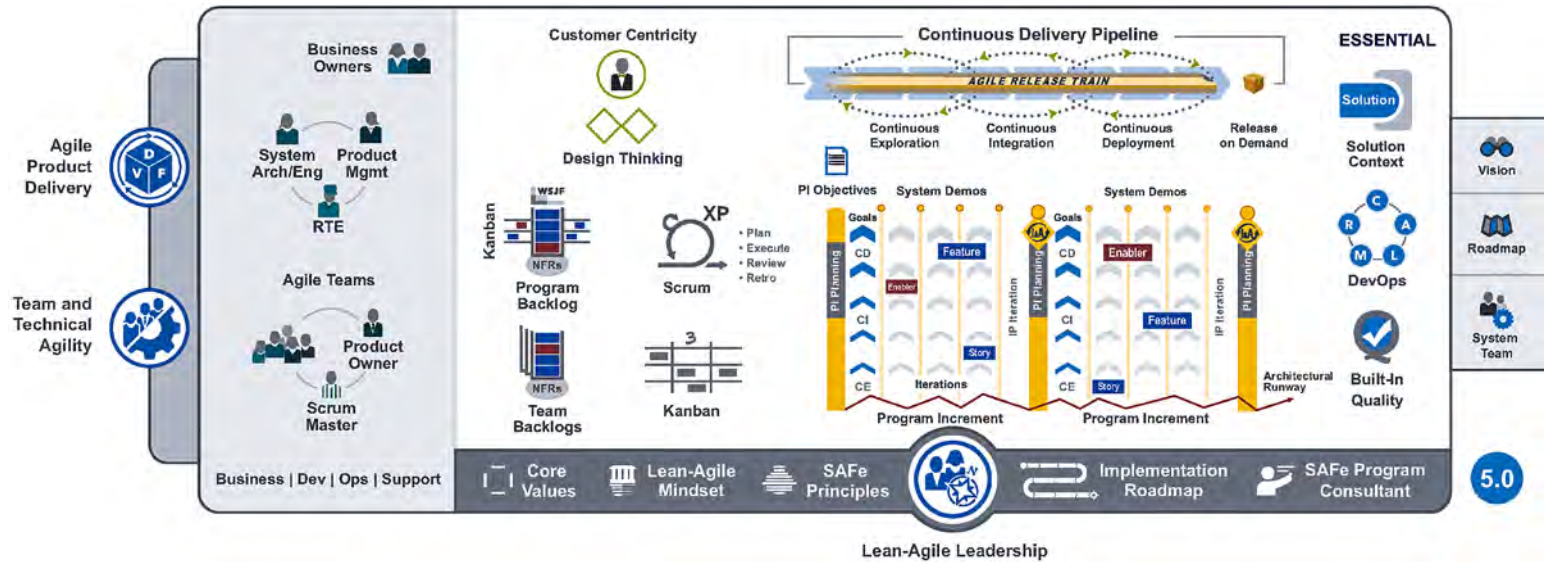
The new coaches had a number of obstacles to overcome. They had to be processed into the client's firm, find their office, and get oriented to one another as well as the client's staff. They had to meet with the lead coach to ascertain the coaching needs. The coaches also had to begin scoping the transformation, although the lead coach placed a great deal of emphasis on delivering SAFe certification courses. The coaches also had to acquire their corporate information technology equipment, such as laptops, smartphones, and corporate network login credentials, which took two or three days. All the while, the COVID-19 kicked into high gear sending 90,000 employees scrambling for the hills leaving the coaches in a veritable ghost town. They felt a little like Will Smith in "I Am Legend!" Once, the new coaches received their laptops and corporate access credentials, they were all sent home to begin their coaching engagement by Skype and Zoom. Using Zoom as a training delivery vehicle was also new to the client, as most lean-agile courses had been conducted in a face-to-face manner for the prior decade. So, Zoom accounts had to be acquired for the entire coaching staff and all had to learn how to facilitate remote training classes while the courses were delivered.

Initial Engagement

One of the coaches was burdened with getting SPC 5.0 upgraded, POPM enabled, mastering zoom, dissecting the POPM course into 2 to 3-hour chunks, and figuring out how to deliver its face-to-face training exercises using Zoom. The other coaches focused on the immediate needs the program might have, like ensuring the ART checklist was being used, meeting with the program's leadership team, and preparing a Program Backlog with prioritized features. All of the coaches looked into the portfolio of corporate lean-agile training, selected an Agile Product Owner training module, tailored and shortened it for Zoom delivery, and immediately trained its Product Owners in Feature writing. They placed special emphasis on the SAFe requirements model or hierarchy instead of generic agile terminology. The

agile coaches ran the first feature writing workshop, which was a completely new concept to the program's staff. The POPM-enabled coach immediately ran a weeklong POPM certification training course using only Zoom with its primitive whiteboarding capabilities, which was extremely exhausting and difficult. Meanwhile, the other agile coach acquired an SSM enablement and still another took a remote SPC certification training course to teach the SP course.

An SSM course for the Scrummasters was delivered after the POPM course, while the third coach completed a remote SPC 5.0 course and SP enablement in eight days. The program asked to delay the SP course to address pressing matters. The coaches took a deep breath, giant step backwards, and analyzed the scope of the program's needs. An open-ended assessment was designed and implemented, regular meetings were held with the client, teaming agreements and backlogs were assembled, daily standups were scheduled and held, and the coaches went into a needed forming, storming, norming, and performing phase. The program manager decided to delay SAFe PI planning for another month, which gave ample time to run two one-week SP classes with 40+ participants, which they did. The initial three-week reprieve gave the coaches time to find and download the SAFe remote training toolkits, better utilize Zoom, streamline the courses for smoother delivery, setup SharePoint sites, and interact with many other coaches and their engagements. The program also requested to use their features and user stories as well as speak to them in their language of DoD datacenters vs. the hypothetical SAFe software development language and terms.



The program wanted an internal or local agile subject matter expert (SME) for assistance. Hence, the agile coaches helped interview an SPC 5.0 who was a former U.S. military officer with strong leadership skills. As an aside, GE hired many former U.S. military officers to drive their corporate-wide Six Sigma initiative the 1990s. SAFe for Teams (SP) training finished just as the local agile SME was onboarded and the program decided to rollout out its first two-day SAFe Program Increment (PI) Planning event. Again, the program wanted a sharp market differentiator to secure the re-award of the \$100 million national cybersecurity datacenter acquisition contract. This didn't leave much breathing room, so the SME configured its ALM tool for SAFe, while the program's local Release Train Engineer (RTE) prepared its U.S. DoD facilities for PI Planning and Program Backlog. The agile coaches finished the ART Canvas for the U.S. DoD civilians—Business Owners (BOs) and delivered a one-hour SAFe PI Planning overview for the entire ART. The agile coaches also prepared individual groups with Teaming Agreements, Definitions of Ready (DoR), Definitions of Done (DoD), iteration checklists, backlog grooming guidelines, and SAFe-oriented iteration execution materials.

Program Increment (PI) Planning Event

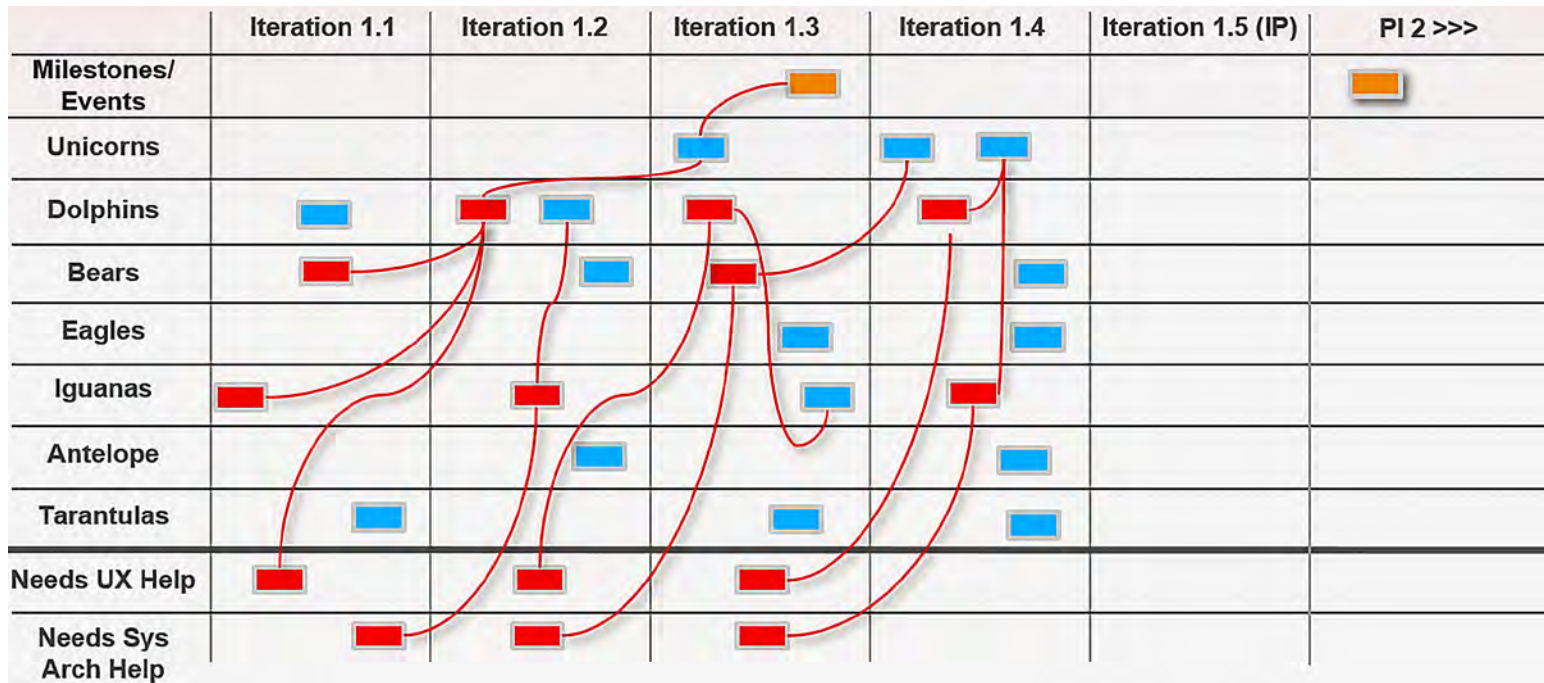
While initially considering a two-and-a-half-day distributed PI planning agenda, the local agile SME and RTE made a unilateral decision to hold a two-day "by-the-book" agenda. The U.S. DoD civilian BOs assembled a kickoff briefing describing the business context, product/solution vision, and architecture vision for transforming the nationally distributed cybersecurity data centers. The ART was composed of 12 teams with highly specialized functions and Product Owners (POs) and Scrummasters (SMs) were assigned to each one. All of the POs and SMs were trained, analyzed their assigned features from the Program Backlog in advance, and even prepared and sized some user stories in advance. To some degree, POs and SMs even drafted some PI objectives and risks associated with their features and user stories. Although the program had been in existence and most people had been working on this program for several years, the ART's 12-team design was brand new. That is, it constituted a complete reorganization of the program's personnel, the teams were briefed about one month in advance of their new assignments and roles, and they had "some" time to form, norm, storm, and perform to some degree during hands-on training exercises.

After months of preparation—12 weeks for the new agile coaches, PI Planning was off to the races. A dry run of the U.S. DoD video conferencing system was tested that technically went well but did raise the ire of the BOs a bit, because they were uncertain of attending in-person or not. However, on the actual day of the PI planning event, the U.S. DoD network experienced intermittent failures and the remote coaches were not able to login. The coaches tried four different Internet browsers to no avail but were able to dial-in by telephone and listen to the kickoff briefings, which were very professionally done. It was clear that the BOs took their role seriously and delivered a rather detailed, world class business context, product/solution vision, and architecture vision. They seemed to really understand the importance of what was going on with respect to the SAFe transformation of this U.S. DoD program. The local agile SME and RTE gave a brief overview of the PI planning context and quickly dismissed the 12 teams into long breakout sessions to develop their PI plans for an eight-week PI (three technical iterations plus one innovation and planning or IP iteration). The DoD facility, however, was rather confined, was not conducive to large collaboration events, the breakout rooms did not have computers, and most teams did not open teleconference bridges for the coaches.



The agile coaches were flying blind, which may have been intentional to protect the sensitivity of the U.S. DoD data. Only two agile teams had an open phone line and one of the teams struggled a bit. This was the first time they had come together for a face-to-face event, although some dialed in remotely, and there was a ton of forming, norming, storming, and performing to do. They weren't prepared due to their daily workload and PI-preplanning activities. They were also fiercely individualistic and wanted to document each individual's work ad nauseam. They struggled to understand how to divide their work into two-week iterations which is the norm for U.S. DoD engineers who are accustomed to year-long delivery cycles to prepare stacks of engineering documentation. The local agile SME and RTE did not perform a Scrum of Scrums, so most of the agile teams received little guidance during breakout sessions. An agile coach moved the team into the performing stage of their team breakout, by urging them to develop a high-level plan of user stories, document some draft PI objectives, and identify risks and dependencies before the Draft Plan Review. The coach also emailed other teams to check on their progress to which all responded things were fine.

The agile SME and RTE improvised a bit at this point and visited each of the 12 teams individually with the U.S. DoD BOs to review their Draft PI Plans, Objectives, Risks, and Dependencies. The BOs also gave each team PI planning adjustments at this point which was a nice improvised touch (innovation). The team that was struggling seemed very deflated as the BOs were not very happy with their Draft PI Plan. Although the BOs seemed to grasp SAFe-based lean-agile thinking, the 12 teams were asked to continue performing their daily operations and maintenance (O&M) tasks, while planning for and decomposing the new Program Backlog's Features into User Stories. Furthermore, the local RTE gave some impromptu estimating advice that was out of context for the SAFe concepts the agile coaches advocated for the last 12 weeks. It was clear that the BOs wanted to apply SAFe to reengineer significant portions of the nationally distributed cybersecurity data centers while maintaining continuity of operations of the traditional brick-n-mortar footprints. At the end of the first day, the management team got together to discuss any necessary PI planning adjustments to which there was very little discussion due to the earlier team-by-team Draft PI Plan review.



The second day went a little smoother, the U.S. DoD network suddenly stabilized a bit, and the agile coaches were able to see some of the second day planning adjustments. However, each of the breakout rooms did not have computers and most of the teams did not open phone lines for the agile coaches. The team that was struggling settled down a bit, decomposed their features into user stories, and developed PI Objectives, Risks, and Dependencies. Its agile coach also urged them to place their Features on the Program Board with Dependencies. The Final Plan Review ensued and each of the teams presented their Team Boards to the entire ART, one-by-one, illustrated PI Objectives, Features, User Stories, Risks, and Dependencies for each of the four major iterations (including the IP iteration). Although a Program Board was populated with Features and (many) Dependencies (red strings), it was not illustrated for all to see. It may have been photographed for distribution and analysis, but it would take days if not weeks to have a classification officer review its sensitivity for distribution to a wider audience. An ART level confidence vote was held using the U.S. DoD video conferencing system and no one voted below a three. A retrospective was not held.

SAFe Kickoff Outcomes

The SAFe kickoff for this U.S. DoD family of nationally distributed cybersecurity data centers went remarkably well. However, this didn't occur without a long list of actors throughout the years. The corporation applied lean-agile frameworks at scale since the mid-2000s. This grew into a corporate-wide lean-agile transformation that involved training over 10% of its entire global workforce in lean-agile practices. Now, its top-level executives baked lean-agile thinking into its corporate goals and charged the entire corporation to achieve lean-agile thinking by 2021. As profiled earlier, the U.S. DoD had also been a thought leader in bleeding edge acquisition practices since at least the 1970s, if not the 1960s, exhibited up to 70% lean-agile penetration by 2010, and was boldly moving out into SAFe. The U.S. Digital Services (USDS) agency blazed a trail for baking lean-agile thinking and practices into the acquisition contracts themselves and labored to undo traditional thinking across the entire U.S. government. Last but not least, the program manager of this U.S. DoD program asked for lean-agile assistance, agile strategists responded and provided leadership training, and agile coaches were hired to support the middle stages of the SAFe Implementation Roadmap.

The U.S. DoD BOs were happy to have a lightweight near-term adaptive PI Plan to reengineer the cybersecurity data centers before contract end. The supplier was happy they were applying contemporary practices that satisfied corporate goals and near-term business value to help justify earning the re-award of this \$100 million contract. The local agile SME and RTE were relieved that their hard work finally paid off as they did much of the heavy lifting during the final two weeks leading to SAFe PI Planning since they were onsite. The members of the ART were reasonably satisfied to participate in their first PI Planning event. The remote agile coaches were also happy to see the fruits of their labor during this SAFe transformation and help this program with its first PI planning event. There was such a big sigh of relief on everyone's behalf and quite frankly everyone was exhausted. The local leadership team was so satisfied, they wanted to completely empower each of the 12 teams to execute their team's plans, hold their iteration ceremonies, and build out their user stories. That is, they didn't seem too interested in what happened between PI planning events, while the agile coaches were eager to coach each of the individual agile teams through the entire PI.

RETROSPECTIVE—SAFE PROGRAM INCREMENT (PI) PLANNING

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| GOOD | <ul style="list-style-type: none"> • Got-R-Done. The client executed its first SAFe Program Increment (PI) planning event. • Participation. All of the program's teams and its personnel participated in PI event. • Success. Client's Agile Release Train (ART) applied most SAFe PI planning ceremonies. • Leaders. Client's business owners participated in its PI events from start to finish. • Detail. Teams constructed detailed iteration-by-iteration plans with goals and risks. • Norming. Each team had ample time to form, storm, norm, and perform and gel together. • Ownership. Supplier leader's team took ownership of PI planning from start to finish. • Customer. The customer was enthusiastic and appreciative supplier applied SAFe event. • Morale. The agile teams had very high degree of motivation and buy-in to PI planning. • Preparation. Coaches did very good job of preparing agile teams for SAFe PI planning. • Feedback. Business owners gave teams very detailed feedback in draft PI plan reviews. • Pre-briefs. Business owners delivered world class pre-briefing PI planning beginning. • Effort. Local SAFe RTE teams provided a Herculean effort to overcome impossible odds. • Dependencies. Agile Release Train (ART) gained insights in to interteam dependencies. • Transparency. Agile Release Train (ART) gained insights into the total scope of work. |
| BAD | <ul style="list-style-type: none"> • Network. Client's network and telecommunications are very unstable and malfunctioned. • Conferences. Few teams had online conference or telephone lines open for PI planning. • Insights. Coaches had very little insight into what was happening during PI planning. • Coaches. Coaches couldn't provide real time guidance to all teams during PI planning. • Draft PI Plans. Client didn't perform an open draft plan review for all teams to see. • Risks. Client program didn't perform a detailed risk ROAMing ceremony for all to see. • Opaque. Client withheld a lot of SAFe PI planning data from coaches that was helpful. • Board. Client did not display an overall SAFe PI planning program board for everyone. • Long. It's first SAFe PI planning day was an unnecessarily long and drawn out period. • Legacy. Client did not give a lot of thought into integrating legacy and future work. • Execution. Client did not think about the SAFe ceremonies between PI planning events. • Alignment. Business owners didn't align PI planning pre-briefing to feature backlogs. • Involvement. Local SAFe RTE coaches could've involved the remote SAFe coaches better. • Detail. Agile teams put too many details in draft and final PI plans and team boards. • Estimation. The local RTE implemented poor agile estimation practices at last minute. |
| BETTER | <ul style="list-style-type: none"> • Features. Client could've prepared comprehensive list of features before PI planning. • Grooming. Agile teams should've refined their team backlogs before PI planning began. • Training. Coaches could've trained entire Agile Release Train (ART) before PI events. • Bridges. Client could've established phone and conference bridges for all SAFe teams. • Draft Plans. Client should've held both detailed and open draft SAFe PI plan reviews. • Checkpoint. Client could've held hourly Scrum of Scrum checkpoints with Scrummasters. • Coaches. Client should've assembled small local team of agile coaches for assistance. • Whiteboard. Client could've bought a virtual collaboration workspace for PI planning. • Integrate. Client could've integrated PI plan reviews, ROAMing, and confidence votes. • Loosen Up. Client could've loosened up scope and detail for shortened SAFe PI cycles. • Schema. Client could've invested in communicating SAFe requirement model much better. • Workflow. Client should've put more thought into balancing overall workflow and load. • Early. Business owners should've been more involved in PI planning earlier vs. later. • Trust. Client could've cleared coaches into program and shared detailed project data. • Workflow. Client should've put more thought into balancing overall workflow and load. • Iterations. Invest much more time in planning, coaching and executing its iterations. |

As true with most SAFe rollouts, building the Program Backlog well in advance, or lack thereof, was the long pole in the tent. Although the agile coaches provided feature writing workshops, user story writing workshops, and even PI planning simulations with most of the teams, the Program Backlog simply did not get constructed until the last minute. Given the compressed nature of the SAFe transformation, it may have been best to have agile coaches dedicated to PI Preplanning and others for SAFe training associated with the SAFe Implementation Roadmap. It was simply too much for the agile coaches to do both major sets of transformation activities. Given most of the 12 teams were completely new to lean-agile and SAFe principles and practices, it may have been better if the teams had performed some iteration ceremony simulations in advance. Of course, the major challenge throughout the last 12 weeks was lack of a virtual whiteboard like Mural, where the teams could collaborate on SAFe training as well as PI planning. Both the U.S. DoD and supplier's corporation should have invested in one long ago for processing sensitive U.S. DoD data. Basic SAFe estimation practices should have also been followed during PI Planning which is problematic.

Next Steps with SAFe

This is a good point to take a step back and identify some of the success factors for this SAFe transformation. The U.S. DoD is in the midst of its largest lean-agile transformation in its history. Of course, the executives of the supplier's organization are driving all of its public sector programs, both DoD and non-DoD towards achieving near-term corporate lean-agile goals. The supplier established multiple Lean Agile Centers of Excellence (LACE) corresponding to the plateaus of its organizational hierarchy to help drive lean-agile thinking through its enterprise. Both the U.S. DoD and the supplier's corporation recognize SAFe as the lean-agile scaling framework of choice which is a smart move given its maturity, industry adoption, and body of trained and certified practitioners. Rigorously applying the SAFe Implementation Roadmap was also a smart move as many public and private sector organizations try to short circuit the SAFe transformation process which stalls many fledgling SAFe initiatives. The ground level agile coaching homeroom and its external lean-agile consulting boutique wisely assigned teams of agile strategists and coaches to assist each U.S. DoD program. And, of course, the program itself recognized the need for local agile SMEs.

- **Leadership.** Any transformation, be it traditional or agile, simply cannot succeed without leadership buy in, participation, and oversight of SAFe transformations. In this case, this transformation had lean-agile leadership oozing out of every corner. This included the U.S. DoD civilians, corporate executives, corporate LACEs, agile strategists and coaches, program management team, and of course, the local RTE and agile SME.
- **Burning Platform.** Beyond the necessity of strong leadership, a burning platform or urgency is needed to help motivate and drive the success of a SAFe transformation. In the organization change vernacular this is called "crisis is a catalyst for change" or "necessity is the mother of invention." That is, people will be willing to participate in an arduous SAFe transformation journey if there is an urgent or compelling need to do so which was true in this case.
- **Lean-Agile Thinking.** However, leadership and urgency will simply drive an organization down the wrong path if they don't have an understanding and mastery of lean-agile thinking. Lean-agile thinking shortens lead and cycle times, improves quality, and strengthens trust among stakeholders. So, it's a plus when your strong leadership and sense of urgency takes you down a path of success with a paradigm that delivers—lean-agile thinking.
- **Lean-Agile Framework.** Part and parcel to lean-agile thinking, is having the insight and wisdom to apply a lean-agile thinking framework that scales to complex enterprises and agile release trains. The U.S. DoD is one such complex domain with nearly 200,000 projects, and its suppliers are equally complex in scale, scope, size, and complexity. SAFe is designed for just a context, is a proven model, and embodies many emerging techniques.
- **SAFe Implementation Roadmap.** The behavior that embodies true maturity, commitment, and leadership is the audacity to follow the SAFe Implementation Roadmap. That's because, the roadmap involves commitments of time, money, skills, and other resources. Most importantly, it establishes a foundation, entry, and runway for success. Our people are our greatest assets and the SAFe roadmap is geared towards preparing them for lean-agile success.
- **Transformation as a Team.** True to the spirit of lean-agile thinking was the wisdom and experience to assign small teams of agile strategists and coaches to each U.S. DoD program. It doesn't take an army to do great things, but successful SAFe transformations are well beyond the capability of a single person. Some lean-agile boutiques take this one step further to treat each SAFe transformation as an Agile Release Train (ART) in of itself.
- **Embedded Lean-Agile Coaches.** Of course, the secret sauce to a successful SAFe transformation is to have boots on the ground with embedded lean-agile coaches, Release Train Engineers (RTEs), Product Managers, Product Owners, Scrummasters, and many other SAFe related roles and experts. Agile strategists and coaches exist to gently guide programs, but the programs themselves must invest in people who must do the work every day.

RETROSPECTIVE—OVERALL SAFe TRANSFORMATION

GOOD

- **Change.** Crisis was a catalyst for change and supplier needed a market differentiator.
- **Motivation.** Hawthorne Effect motivated traditional engineers to try newer approaches.
- **Leadership.** Buyer and supplier leaders "asked for and advocated" SAFe transformation.
- **Coaches.** SAFe coaching team with deep industry experience hired to help drive change.
- **Teamwork.** "SAFe transformation as a team" model used to pull the heavy load together.
- **Experience.** All agile coaching team members were certified and experienced SAFe SPCs.
- **Values.** SAFe coaches used lean-agile values, principles and practices for their work.
- **Roadmap.** Coach's firm, coaches, buyer, and supplier used SAFe Implementation Roadmap.
- **Remote.** Coaches quickly adapted remote tooling to deliver SAFe coaching and training.
- **Training.** Official SAFe training provided to Product Owners, Scrummasters, and Teams.
- **Planning.** Buyers and suppliers set a fixed SAFe PI planning date as forcing function.
- **Value.** Supplier team wanted to implement SAFe to demonstrate mission value to buyers.
- **Suppliers.** The supplier firm established lean, agile, and SAFe corporate-level goals.
- **SME.** Program hired a local, full-time SAFe subject matter expert (SME) to drive SAFe.
- **Ownership.** Program took ownership to finalize and facilitate SAFe PI planning events.
- **Value.** Supplier and coaching leaders asked coaches for near-term value and fast wins.

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| BAD | <ul style="list-style-type: none"> • Pressure. SAFe coaches were brought in very late during the heavy lift training phase. • Pandemic. COVID quarantine interrupted face-to-face (F2F) SAFe coaching and training. • Delay. Customer delayed SAFe PI pre-planning until last minute due to COVID pandemic. • Sensitive. This was a public sector program and had issues of sharing sensitive data. • Remote. There were limited tools available for remote work on public sector networks. • Distrust. There was not very much trust between the program leaders and SAFe coaches. • Distance. SAFe coaches had to project rich high-context communications from distance. • Cat-n-Mouse. SAFe coaches had to connect many hidden dots in fabrics of missing data. • Bandwidth. Program leader had little bandwidth and knowledge for SAFe PI preplanning. • Software. SAFe training materials were geared towards software development audiences. • Domain. Customer's domain was a traditional brick-n-mortar public sector data center. • Hardware. Customer's workers were often involved in administrative lift-n-shift work. • Tuckman. Coach's firm and coaches had to form, storm, norm, and perform very quickly. • Distributed. Program nationally distributed with unaligned self-motivated stragglers. • Value. SAFe coaches had to constantly justify their value to employers and customers. • Connected. Coaches had to consistently stay connected to program's leaders and staff. • Let Go. Coaches had to let go for program to plan and execute SAFe PI planning alone. |
| BETTER | <ul style="list-style-type: none"> • Tools. Client corporation should've invested in stronger remote tools suite long ago. • Tool Kits. Client should have had a repository of SAFe toolkits ready for deployment. • Sharing. Client should have been more open to sharing program's sensitive data early. • Engagement. Client should have engaged earlier in the transformation vs. last minute. • Resources. Client should've allocated more coaching personnel due to short deadlines. • Attention. Client program should have met frequently with coaches for PI preplanning. • Involvement. Client could have involved coaches in designing SAFe PI planning agenda. • Simulations. SAFe PI planning simulations should have been used with new agile teams. • PI Planning. Program should've balanced innovation with basic PI planning ceremonies. • Execution. Client should've involved coaches a little better during SAFe PI planning. • Backlog. Client should have set up product management teams to groom backlog earlier. • Alignment. Client could have better aligned legacy work into program backlog earlier. • Standups. Client should have participated in coaching standups much earlier in cycle. • Radiators. Client could've utilized essential SAFe information radiators much better. • Estimating. Client could've asked coaches to establish standard estimating practices. • Ceremonies. Client should've invested in basic SAFe ceremonies following PI planning. • ALM Tool. Client could've setup application life cycle management (ALM) tool earlier. |

At the heart of lean-agile thinking, and especially SAFe, is the pillar of continuous improvement. That is, programs should strive to get better and better every day until they reach the point of complete mastery (if at all possible). With that being said, it would have been helpful if the supplier would have assigned a small team for PI Pre-planning, SAFe certification training, Product Management, and coaching in the various SAFe ceremonies. It was great that the program used a hard date for SAFe PI planning as a forcing function to get this 75-ton boulder moving. However, you don't want to skimp on your SAFe transformation team when you're on a short deadline, because things will get messy very quickly. The COVID-19 pandemic forced the supplier to apply remote lean-agile coaching services, which sped up delivery, reduced costs, and eased the stress and pain of this rather large SAFe transformation (for the agile coaches). Therefore, the buyer and supplier should have invested in a stronger remote delivery platform long ago, especially as it applies to U.S. DoD projects with highly sensitive data. The commercial world was able to flip to a smorgasbord of Internet services for remote collaboration, a luxury that U.S. DoD programs simply do not possess.

Summary

This case study should be entitled, "Successfully Applying the SAFe Implementation Roadmap to Highly-Sensitive U.S. DoD Projects During a Global Pandemic." This is the scenario that lean-agile thinking frameworks like SAFe are designed to address. That is, the notion that the world is an extremely complex system, uncertainty abounds, and market conditions instantly change on a dime. Therefore, leaders, managers, and engineers must be tooled with models like SAFe to dynamically adapt to new market conditions and constraints and still succeed with the same allocation of resources. In this case, the U.S. DoD, supplier corporation, lean-agile consulting boutique, agile coaches, and the program's personnel instantly adapted, didn't change too many of the delivery dates beyond reason, and set fixed deadlines for the SAFe transformation. Because, SAFe includes such a thoughtful implementation roadmap, the supplier hired trained and certified SAFe coaches, and everyone performed Herculean feats, this SAFe transformation continued moving forward. It wasn't without its hiccups, warts, and significant areas for improvement and the internal and external SAFe coaches continue to apply lean-agile thinking principles to identify and improve high priority issues.

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SOME OF THE MAIN OBSERVATIONS, EMERGING CHALLENGES, PATTERNS, AND HIGHLIGHTS

- **Changing Leadership.** The importance of leadership to successful organizational change has always been important for the last 75 years and it will never cease to be so. That is, the buyer, supplier, and operational delivery leadership (middle managers) must demand and support lean, agile, and SAFe transformation. You don't need a ton of leaders, but you definitely need small, effective, proficient, and powerful coalitions of key leaders driving, supporting, and demanding lean and agile change. More and more leaders at all levels of the organization are starting to see the lean, agile, and SAFe light, which is a GREAT thing! However, the deeper understanding of lean thinking—dangers of too much WIP—hasn't fully penetrated organizational psychology yet, which is kind of sad! There also has to be a balance of some empowerment and self-selection when it comes to bottoms up organizational change implementation. Too many organizations want to hire a lean, agile, SAFe, or DevOps subject matter expert (SME), add them to their pantheon of traditional managers, and declare victory—That simply doesn't work!
- **Changing Demographics.** This is probably the biggest unplanned, unmanaged, and unmitigated risk in starting a new lean, agile, or SAFe organizational transformation. Managers and engineers have known for decades that the keys to productivity and success were to minimize, limit, and even eliminate the source of geographical and ethnographic diversity. It sounds Draconian, Machiavellian, and narrow minded, but it was true. Far Eastern nations such as Japan attribute their high productivity and quality to the simple fact that their nation, culture, firms, and engineering teams were simply one race, language, and gender. This limited a lot of variables when it came to forming, storming, norming, and performing (but NOT all of them)! Eastern nations even attribute low productivity and quality to ethnographically diverse nations like the U.S., while the West attributes frequent innovation cycles to ethnographic diversity. For many decades, top executive teams were 6'5" White Males, and sadly that hasn't changed much if you look at most organizational charts, top 25 U.S. universities, Silicon Valley startups, or Fortune 500 firms even in 2020. We're simply NOT advocating going back in time to the 1950s nor all becoming Japanese. What we're saying is that today's organizational landscapes are dramatically changing in terms of demographics (at least at the lower and middle levels, and sometimes at the top). We truly live in the midst of realized globalization and today's organizations and projects are chock full of the most ethnically diversified personnel mix in the history of humankind. This includes the rise and dominance of females into middle management and executive positions in all industries. When you have such a mix of races, languages, religions, creeds, genders, beliefs, cultural norms, and hormonal intensity, some of which are taken very seriously, then it creates a host of challenges for successful, near-term lean, agile, and SAFe transformation. Many non-Western cultures have high power-distance structures—1 % of the rich have all of the power, while 99% are peasant servant slaves. Even the West is not immune to this as public sector employees act like Far Eastern (wealthy) elites, and, of course, buyer-supplier contracts are treated like 19th century master-slave agreements. These elements have been known about for decades but are simply at the forefront today and largely being ignored. It simply means, lean, agile, and SAFe teams must proactively manage cultural diversity as a form of conflict management on steroids and viciously focus on social skills, emotional intelligence, teamwork, collaboration, communications, inclusion, and prevention of all too common ethnocentric cliques, clans, factions, silos, and dangerously degenerative and debilitating high-tech white collar hooligan gangs.
- **Changing Expectations.** We definitely live in a far different era of expectations. The workforce is getting younger, more educated, and more motivated, and our expectations upon today's educational system, workforce, and organizational performance are at all time levels. Basically, people are working two to three times harder and faster, with vastly higher quality levels for two or three times less salary. Worse yet, many of today's newly minted college graduates are more than happy to work as interns for FREE! Today's generation of Millennials is more than happy to oblige, perform at these historically high 19th century slave era performance levels, take it on the cheek, and say, "thank you sir, may I have another!" Quite frankly, it's simultaneously sad and admirable! It's sad because today's workforce has dramatically lowered its standard of dignity and respect, but it's admirable, because they are working at unprecedented levels of productivity, velocity, and workweeks which we haven't seen since the 1800s. However, today's global problems are extremely great, and we need a workforce of Avengers or metahumans to tackle large problems people from the last century would have simply ignored or allowed to continue. Lean, agile, and SAFe are all about "Adapt or Die!" It's Darwinism at its finest and the fittest will be the survivors! Of course, this places a great deal of pressure for those of us who live on the threshold of the last century and the current one— Sometimes, it's hard to keep up with someone willing to work 80 hours a week on a problem for one-third of your salary by next Monday, when that simply would have been a one year or 90 day task or project in the last century. Lean, agile, and SAFe methodologies were designed based on the cultural norms of the 20th century, so getting a Millennial to plan for 90 days or two weeks and attend a dozen highly structured ceremonies is a bit of a stretch, when they'll simply stay up for 72 hours to complete a task, take a good beating for missing the mark, and rinse and repeat until the customer is thoroughly satisfied for one-third of the pay, for free, or for paper stock shares! Either lean, agile, and SAFe strategists and coaches have to slow down the organizational and workforce pace or we have to speed up to living on Internet time! Many emerging paradigms are designed for just this era like (5-Day) Design Sprints, (Lean) Startup Way, 5x5 (5-Day) Business Experiments, DevOps, Cloud Computing, Software Defined Networks, etc. Let me tell you, most executives simply do not have time for a 5-day process, they want a FREE no-BS result in 24 hours or less no matter how you do it (AND, they reserve the exclusive right to change their minds as often as they want for any whim, itch, or reason without committing a 90 day, 180 day, 365 day, or 5 year plan)!

- **Changing Economics.** Of course, who can ignore the dramatic change in global economics over the last 20 to 30 years! Slow, painful, and capital-intensive manufacturing dominated the scene for at least two to three centuries. Lead and cycle times were measured in decades, capital infrastructures cost billions of dollars, new product development projects also cost billions and sometimes trillions of dollars, and unit output could be counted on your fingers (one jet, one plant, one new product, one new customer, etc.). This gave rise to hyper-traditional paradigms such as program and project management, integrated master schedules (IMSs) and manufacturing resource planning (MRP) with thousands of meticulously planned data entries, stacks of business requirements and enterprise architectures, systems and software engineering standards, quality standards, process improvement models, etc. The theory was that if you spent 90% your new product development cycle predicting the future like a soothsayer and 10% of your cycle manufacturing physical units, then you could produce a final product or service with no defects or failures and customers would be infinitely satisfied for decades. The only problem (fallacy) with this paradigm is that it is simply alchemy (black magic)—Mind reading was disproved decades ago—One simply cannot predict a customer's needs years or decades in advance at cost of billions of dollars, and, by the way, the customer hated your solutions and the entire development investment was wasted. Today's currency is no longer a manufacturing plant, 50,000 black Ford Model Ts, nor a billion-dollar soft drink everyone will consume for 100 years. You must strip down infinitely complex product designs to their absolute bare essentials—Minimum Viable Products (MVPs)—and rapidly produce a working unit and measure its market (customer) performance in a day. Chances are, you will miss the mark on the first few go arounds, until the real hidden market need emerges, and then you can home in on this market if it yields results. Value is no longer measured in terms of tangible dollars and cents (revenues and profits), but rather in intangible terms such as millions of end users, referrals, likes, downloads, and advertisements displayed or clicked upon. The new product or service is just a medium to measure market share and deliver advertising payloads, capture and resell analytical customer data, and find the potential sweet spot for targeting further MVP experiments. Of course, all of this no longer requires a \$10 billion, decade long new product development cycle, with 1,000 engineers, but can be done in 24-hour cycles with highly motivated employees working for stock shares vs. salaries. While the Toyota Production System (TPS) was designed for century long manufacturing cycles, TPS in all of its glory is obsolete now for all intents and purposes. Top dot coms produce hundreds and sometimes tens of thousands of business experiments per day and their stock market performance is 10 times better than traditional brick-n-mortar manufacturing firms which wait decades to yield revenues while gobbling up low interest financial loans to bankroll capital infrastructures—Be careful how you repurpose TPS!
- **Changing Delivery Speeds.** Changing economics is part and parcel to changing delivery speeds. The cost of launching 10,000 business experiments a day by a top 5 dot com is less than \$5,000 per experiment. How prophetic, as Michael Schrage predicted businesses could launch five \$5,000 business experiments in five days (5x5[x5] X-Teams)—I guess Amazon listened! Contrast this to a major North American food manufacturer that spends \$10 billion to launch ONE new product every 10 years to a market (customer) that never wanted that stupid idea in the first place (New Coke, Pepsi Max, etc.)! Or, consider Team New Zealand that reduced its lead and cycle times for full scale physical prototypes from 90 days to 24 hours to tweak its waterline multi-hull yachts to win the much-coveted America's Cup on several occasions. By, speeding up its lead and cycle time to a single 24 hour experiment, they discovered that tweaking a design characteristic yielded no further speed benefits, so they shifted or pivoted to another design characteristic, and then tweaked that to the point of winning races by a full 30 seconds. That's a lot of seconds in the America's cup—A second might as well be decades to a North American food manufacturer. Without 24-hour business experiments, Team New Zealand would have tweaked the wrong characteristics, ignored the correct characteristics, and lost races by minutes. 10-year, 5-year, or 90-day cycle times are simply a concept from the last century. Even GE is building jet turbofan MVPs in weeks and months vs. decades using lean startup techniques. Bing (Microsoft) yields \$18 million in new revenues for every millisecond they shave off of their search engine's speed. They can only discover the search engine design characteristics by conducting hundreds of business experiments each month to find the right combination of source code necessary to accurately yield search results in the shortest period of time to maximize advertising revenues. Remember, the intangibles such as millions of end users, referrals, likes, downloads, and advertisements displayed or clicked upon generate the revenues—Bing is simply the delivery platform for the advertisement payloads and capture and resale of market analytics. Today's workforce, must be willing to conduct hundreds of business experiments per day for the price of a stock share and certainly not a decade long integrated master schedule, enterprise architecture, business requirements document, test plan, nor bureaucratic lean and agile process framework modeled after the Toyota Production System (TPS).
- **Changing Alignment.** Now, back to the subject of lean and agile frameworks more specifically. The first generation of modern lean and agile frameworks from the 1990s were focused on small teams of new product and service developers. And, in 90% of the cases that was just fine, even today. Maybe these first generation lean-agile frameworks are more relevant than ever (maybe)? Second generation lean and agile frameworks focused on the program or project level—That is, groups of teams building larger products or services (we called that lean and agile project management). However, this was quickly overtaken by third generation lean and agile frameworks that focused upon the portfolio level—That is, groups of programs or projects for an entire business, business unit, or even complex systems of systems. Subsequently, fourth generation lean and agile frameworks focus on the organization, enterprise, or business level itself (portfolio of portfolios). The gist of these latter generation frameworks is that every bottom level task should be traceable to a higher level strategic objective—That is, a C-

level executive establishes an enterprise objective, it is flowed down to a single daily operating task, and then an army of middle managers wants to meet with you 8 hours a day to check on your alignment (and micromanage your every move). It's great from a middle management perspective, as these latter generation frameworks created a cottage industry of lean and agile middle managers whose job it is to take your temperature every day, make course corrections for you, and report back to the C-level executive how much progress you made that day (and, of course, how much value the middle managers are adding in this manual reporting process). However, it's a little hard on the front-line worker, who not only has to scope, plan, and execute the work, interact with the market or customer to ascertain the needs and deliver the new product and service payloads, but now develop reports and attend meetings to answer daily C-level executive data calls. Keep in mind, that basic lean and agile frameworks were designed to focus 90% of the team's activity on delivering new product and service payloads. Traditional thinking from 1900s said 90% of the worker's time should be on planning and reporting. However, now lean and agile frameworks and practices have robbed front line workers of their daylight hours from 9 to 5. That's okay, I guess they can do the work from 5:00 pm until 8:55 am each day for the price of a stock share? The problem is that you now have THREE customer constituencies instead of one or two—Lean and agile middle managers, your teammates, and your customers (and I can assure you that the most difficult to satisfy are tyrannical lean and agile middle managers)!

- **Changing Tools.** Firms have been developing sophisticated developer, team, project, program, portfolio, and even enterprise-level toolsets for decades (dating back to the much-ballyhooed software factories and computer aided drafting or CAD tools of the 1970s). These became computer aided software engineering (CASE) and computer aided engineering (CAE) tools in the 1980s, integrated development environments (IDEs) in the 1990s, and lean and agile application lifecycle management (ALM) systems in the 2000s. It's hard to say how much the globe invested in developing, selling, buying, learning, and discarding these toolsets (probably trillions). For all of this investment, we simply haven't learned how to apply them and many of them have extremely poor user experience (UX). Lean and agile frameworks, especially Scrum and SAFe rely on a ratio of 80% conversations to 20% processes, tools, and documentation. Many lean and agile middle managers want to reverse this ratio back to 90% processes, tools, and documentation and 10% conversations just like in the 1900s. This now means that teams must now spend 90% of their productive workday on the processes, tools, and documentation necessary for lean and agile middle managers to assure C-level executives that their strategic objectives are being met (in the name of portfolio alignment). And, quite frankly, between demanding middle managers and jet setting millennials, there is very little time for lean, agile, and SAFe ceremonies nor conversations demanded by the Agile Manifesto. Again, much of this is due to poor investment choices in tooling, bad UX, fragmented tool value chains, little training and knowledge of lean-agile-SAFe tools and the frameworks themselves, little investment in tooling subject matter experts (SMEs), poor tool configuration, and use of the wrong tools, reports, metrics, and dashboards to tell the stories C-level executives and middle managers want to hear every 24 hours without rich high-context high-value conversations. A chart, metric, or report is simply dead without a conversation to tell a story, which is what user stories are for (what a concept)! More focus on the lean-agile mindset is needed at all levels—That is, the values and principles of lean and agile thinking. This last dilemma created a cottage industry of tools to integrate other tools—TaskTop, etc.!

Although lean, agile, and SAFe coaches behave like middle managers from the last century, perhaps these are just growing pains associated with the successful spread of lean and agile thinking in the early 21st century ...

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OBSERVATIONS, EMERGING CHALLENGES, PATTERNS, AND HIGHLIGHTS—FROM PI #1 AND PI PLANNING #2

As described throughout this case study, it was the first time this DoD acquisition applied lean, agile, or SAFe values, principles, frameworks, methods, practices, metrics, and tools. As such, this was a lean, agile, and SAFe greenfield program so to speak. However, the government customer (agency) had some background in SAFe, and combined with the contractor's defense business unit, customer willingness, and the energy of the engineering team that operated, maintained, and modernized the defense systems, there was a great deal of motivation to succeed with SAFe. So much so, that this was one of the more successful SAFe transformations in all three domains—Government agency, corporate enterprise, and lean-agile consulting boutique. COVID-19 stepped in to spoil the transformation, but the three stakeholder groups managed to get SAFe going anyway, with some degree of success. In some regards, COVID-19 accelerated the transformation, because the SAFe coaches remotely advised the leadership teams with some degree of urgency, expediency, and success, without the typical face-to-face personality-driven politics that ruin transformations in a microsecond or blink of an eye with all-to-common amygdala hijacking-based decision making!

Initially, COVID-19 only prevented the agile coaches from traveling to the remote client site, but eventually affected the entire program, preventing the operations and maintenance team from working onsite. While the coaches were more adept and adaptable to working remotely, the defense program was much less so, leading to a significant disruption or discontinuity of service. This is true with most U.S. DoD programs, who are prisoners of face-to-face program operations. A few visionaries realize the limitations of U.S. DoD face-to-face acquisitions, knowing that it must catch up to the teleworking culture of its non-military counterparts—including the commercial world. Perhaps, COVID-19 will help usher the U.S. DoD into the 20th and 21st century and illustrate to the necessity operating U.S. defense acquisition programs with remote teleworking workforces. Until that happens, of course, teleworking will continue to be a major impediment of U.S. DoD acquisitions. In spite of these challenges, the contractor's leadership team quickly replanned its operating posture, and kept both the program and SAFe transformation moving forward. Again, this is a testimony to the degree of high motivation that was especially unique to this acquisition program!

Other challenges, of course, were that this was a nationally distributed program working on three shifts. This of course, made it difficult to run routine SAFe and Scrum ceremonies for the 12 teams constituting the SAFe Agile Release Train (ART). Oftentimes, all Scrum ceremonies were combined into one large ceremony for iteration planning, demos, and retrospectives. Daily standup meetings of course suffered, along with backlog refinement meetings. Product owners and scrummasters were often on the day shift at one site, which led to a lot of management driven planning and reporting on behalf of the ART instead of including the whole agile team in these ceremonies. Although they did use an agile lifecycle management (ALM) tool to some degree, there were no common agile metrics nor dashboards, which is also a common malady in lean, agile, and SAFe transformations. The scope of the day-to-day work consisted of contractual terms and conditions, SAFe and Scrum backlogs, out-of-scope tasking from customers, frequent data calls from contract leaders, and directly from highly motivated individuals empowered to do what they thought was best on any given day, shift, or moment, which seemed to have its strengths and weaknesses.

Since there were multiple channels of daily tasking—Contracts, customers, managers, team leads, and individual engineers working in multiple states and shifts—This made it a bit challenging to capture these in SAFe and Scrum backlogs (plans), track this work, adhere to agile principles like bottoms-up team planning, adhere to lean principles like limiting and visualizing work in progress (WIP), adhere to SAFe principles like alignment, and measure progress and value. This was a data center operations and maintenance contract with significant reengineering (development) as is common on most U.S. DoD maintenance programs. Therefore, much of the tasking was emergent in nature as antiquated equipment, networks, and legacy systems frequently failed, requiring the immediate unplanned attention of the ART. Of course, there were also daily maintenance tasks that were often in the eye of the beholder, and the customer wanted significant new reengineering too. There was disagreement about whether new work or emergent work should be captured in SAFe and Scrum backlogs (plans)? Although some coaches advocated planning for all work, there was widespread disagreement, inconsistency, and perturbation about how to do so in SAFe and Scrum?

It was the perfect storm—Traditional U.S. DoD operations and maintenance program, SAFe transformation, global pandemic, and inconsistent messaging among local and remote lean, agile, and SAFe coaches—As well as hardheaded, but highly-motivated product owners, scrummasters, and DoD engineers. In spite of these challenges, the ART made a controlled crash landing by the end of Program Increment (PI) #1 much like Captain Chesley "Sully" Sullenberger landing his Airbus A320 in New York's freezing Hudson River following a bird strike-induced loss of both engines! Again, this was due to the quick thinking of the contractor's program manager, his crew, U.S. DoD engineers, local lean-agile coaches, and the remote SAFe coaches! The teams used their first SAFe Innovation & Planning (IP) iteration to catch up—Buffer the shock of COVID's direct hit on their staff—And, close out their iterations and first PI with some degree of success! There was some question as whether to extend PI#1, continue with SAFe, or begin PI#2 planning and execution, but the everyone agreed to keep on charging forward instead of retreating into the past traditional approach and begin PI#2 planning in earnest while the teams closed out PI#1.

The local coaches organized the SAFe system demo, retrospective, inspect and adapt (I&A) and PI#2 planning events, while the remote coaches assisted, organized, and aligned their own reporting structure with the parent

corporation, and delivered a third-round of SAFe for Teams (SP) training to new ART teams, such as administration, facilities, data center strategists, and other shiftworkers who were missed the first two times. Some of the new trainees were happy with the SAFe training and hands-on PI planning simulations and exercises, because they said they had no idea what was happening during PI#1 planning. This was welcome news to the SAFe coaches. Shiftworkers were annoyed to be training instead of sleeping and didn't get much out of the third round of SAFe training, which was disappointing. The lean, agile, and SAFe coaches—Along with the rest of the ART—Slammed into PI#2 planning without skipping a beat—That is, without a minute to spare. For lack of a formal SAFe product management team, the local lean-agile coaches organized a smaller list of top features for PI planning purposes, as well as better team-level PI planning aids, which dramatically improved the efficiency and effectiveness of PI#2 planning!

It's important to note that the government customers initially pushed back on a PI#2 planning event, arguing that one PI planning event was sufficient for the remainder of the program's period of performance (PoP), which was only a couple of months away. After a brief but effective PI#2 planning kickoff ceremony, the 12 ART teams went into their first breakout sessions much more quickly, knocked out draft PI plans, and didn't get stuck in the mud like they did in PI#1 planning. That being said, not all team members were present during PI#2 planning due to shiftwork and other misunderstandings, like believing product owners and scrummasters could construct PI plans for their teams. Other teams had full participation and used their time to continue to form, norm, storm, and perform, but completed their draft and final PI plans on-time anyway due to the motivation, skill, and proficiency of product owners and scrummasters. In other words, it wasn't clear whether the teams understood why they were present, what their role was, nor how to participate efficiently and effectively. Some teams did little PI#2 planning (winged it as engineers are proficient at doing), prepared lightweight plans, or prepared detailed PI plans with dozens or hundreds of stories.

This was a distributed PI planning event, only local coaches, product owners, and scrummasters were present onsite, social distancing was enforced, and ART teams called in using conference lines. This made dependency management, close and continuing collaboration, and interaction with coaches, customers, program managers, and business owners a bit challenging, but they managed to muddle through. This also made constructing a live information radiator (SAFe Program Board) a bit challenging, which was done after the event, and led to some misunderstanding about the scope and capacity among underworked and overworked teams. That is, overworked teams reported 200% capacity overallocation, while underworked teams reported 40% to 60% capacity allocation. Of course, this looked bad to everyone, customers complained, and local coaches were a bit disturbed about these stark differences. Much of this disparity was due to inconsistent estimating and metrics practices and differences in personality, philosophy, and opinions of the agile coaches themselves—Some advocated lightweight SAFe plans with plenty of capacity margin, while others advocated detailed plans with hundreds of story points to report overallocation to customers.

In spite of the challenges, the overall SAFe transformation continues to be an exemplar, PI#1 execution and PI#2 planning were highly successful, and the teams continue to maintain a high-level of enthusiasm for using SAFe on this U.S. DoD operations, maintenance, and reengineering program. Local coaches constructed their first makeshift digital SAFe Program Board, ALM tool proficiency continues to grow, and product owners and scrummasters have a renewed sense of urgency about executing agile ceremonies more consistently. That being said, this SAFe transformation still has a few major obstacles to overcome—Better customer involvement, product management, measurement and reporting, ceremony consistency, involvement of distributed shiftworkers, and, of course, focusing on delivering enhanced mission value in the form of successful new reengineering features. Communication between local and remote coaches and program leadership personnel continues to strengthen and improve—Along with cooperation between product owners and scrummasters—And, government customers are getting better transparency and insight in to the total scope, status, progress, risks, issues, impediments, and mission value of the program.

| STRENGTHS | WEAKNESSES |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> ● Strong customer and contractor leadership buy-in. ● Highly motivated government and contractor teams. ● Highly motivated local and remote agile coaches. ● Highly motivated U.S. DoD engineering teams. ● Effective SAFe PI planning and execution. ● Quick leadership response to COVID-19. ● Steadfast decision to continue using SAFe. | <ul style="list-style-type: none"> ● Nationally distributed agile release train on 3 shifts. ● Shifting mindset from emergent to planned work. ● Use of light, medium, and heavyweight planning. ● Inconsistent metrics and measures in PI planning. ● Teams are still forming, norming, and storming. ● Vastly differing lean-agile coaching paradigms. ● Insufficient government customer involvement. |

RECOMMENDATIONS

- Product owners and scrummasters should stay in their lanes—Instead of dynamically reversing roles.
- Greater emphasis on emotional intelligence among product owners and scrummasters towards their teams.
- Consistent program increment (PI) planning reference models to capture static and dynamic priorities.
- Establishment of a simple set of baseline lean, agile, and SAFe metrics, models, and measurements.
- More emphasis upon lean thinking at all levels including customers, managers, team leads, and engineers.
- Resist temptation to construct detailed plans and reports to look busier than the teams actually are to customers.
- Focus more on delivering more value-added reengineering features vs. detailed planning and SAFe consistency.

OBSERVATIONS, EMERGING CHALLENGES, PATTERNS, AND HIGHLIGHTS—FROM PI #2 AND PI PLANNING #3

The U.S. DoD acquisition settled down a little bit throughout Program Increment (PI) #2, which was especially visible during the PI#3 planning event that was the smoothest of the three PI planning events. More than 75% of the hands-on engineering personnel had been through SAFe for Teams (SP) certification training, which focuses on basic lean, agile, and SAFe concepts, especially PI planning. Many of the latter participants felt lost during PI#1 planning who had not been to SP training prior to our PI#2 planning event. Nearly all of the participants, including the DoD government personnel had been to at least one or more SAFe certification classes, especially the Leading SAFe (SA) course. However, there was some distance, or a long period of time, between the first round of SA courses and the final rounds of SAFe for Scrum Master (SSM), SAFe Product Owner Product Manager (POPMP), and SAFe for Teams (SP) courses. Additionally, the instructors for the latter SSM, POPMP, and SP courses were different than the initial SA courses, leading to some conceptual misalignment between the former and latter groups of trainees. The DoD government leaders, program managers, product owners (POs), and scrummasters (SMs) settled down, fell into a routine, and most basic Scrum and SAFe ceremonies were followed throughout PI#2. There was a routine weekly combined Agile Release Train (ART) and Product Owner (PO) Sync called an ART Synch that also helped to stabilize the overall cadence of the 10 teams constituting this ART, especially as it pertains to these constituencies.

As mentioned throughout this case study, the engineering personnel were not on three, but six shifts distributed at multiple geographical locations. This was a DoD data center operations contract, so personnel had to work around the clock to keep the mission critical DoD networks operating properly. Therefore, most of the personnel constituting the POs and SMs were at the main site on the day shift and did the heavy lifting of PI and Sprint or Iteration planning throughout the first two PI planning events as well as the PIs themselves. Occasionally, teams were all present during planning events and routine ceremonies, but attendance was hit and miss throughout the ART due to mission critical shiftwork. With some cajoling by the remote coaches, communication, collaboration, and cooperation between the remote and local coaches, including DoD government customers and program leaders substantially improved throughout PI#2. The local coaches felt it was their duty to make ART level strategic decisions while relegating the remote coaches to day-to-day team-level coaching. The remote coaches were able to build more trust and credibility throughout PI#2 in order to get involved in “some” ART level strategic decision-making. However, this was often hit-and-miss, as the DoD culture favored unilateral decision making and other local coaches were too comfortable also making unilateral decisions in a vacuum. Fragmented communications continued throughout PI#1 and PI#2, but the gaps closed quickly. The coaches collaborated to conduct assessments and performance improvement workshops.

Practical day-to-day SAFe operations were relatively new to both the local and remote coaches, so lack of experience seemed to be a major roadblock. That is, most coaches were in the business of training and basic agile or Scrum coaching, and were a little weaker on more sophisticated SAFe practices like Product Management (PM). It’s pretty typical for SAFe coaches to wing PM a little bit, place more emphasis on the RTE role, and just get SAFe PIs rolling on a wing and a prayer, which was certainly true in this case. That’s when schism between SAFe and Scrum began. Most coaches felt individual POs were responsible for PM among their individual teams vs. a centralized PM function. One coach in particular began in earnest to come up to speed on traditional, lean, and agile PM practices in order to convince all of the coaches, including the DoD customer, to establish a SAFe PM team. The coach even became SAFe APM-Enabled and took the lead on designing a SAFe-centric PM workshop that was administered to the entire ART, including the DoD government customers. While this didn’t convince all of the coaches centralized SAFe PM was necessary, it was enough to convince the government to refer to themselves as the PM team. This was symptomatic of the deeper problems beneath the hidden fabric of communications (i.e., the lead local coach, although a SAFe SPC, was a bigger fan of a competing framework that although looked different from SAFe was actually very similar). In other words, his favorite competing framework had a centralized PM, which was called a PO.

There were other more basic problems than establishing a sophisticated SAFe PM function, such as the coaches failed to establish uniform capacity and velocity estimating practices. Basic SAFe story points were in person days, while basic Scrum story points were in something closer to hours. This caused a basic mismatch, miscalibration, and impedance between SAFe PI planning and day to day Scrum Sprint or Iteration planning practices. Basically, there were fewer SAFe story points available, while Sprint or Iteration Planning resulted in an abundance of user stories and associated story points beyond the SAFe staff day points. For instance, a small SAFe team may have 30-or-40-days-worth of SAFe staff day points per Sprint or Iteration, but a seasoned Scrummaster may plan for 100 to 200 Scrum story points of work per Sprint or Iteration. The coaches did not foresee this estimating issue or mismatch between SAFe and Scrum estimating practices, so this also resulted in the development and delivery of a capacity planning workshop. Unfortunately, this did NOT resolve the basic impedance between SAFe and Scrum story points and disparities continued throughout PI#2 and PI#3 planning. A deeper issue, other than inconsistent SAFe and Scrum estimating practices and differences of opinion on SAFe and its competing frameworks, was the nature of the data center work itself. As described throughout this case study, this was a traditional brick-and-mortar U.S. DoD data center that was a bit behind the times in terms of cloud-based infrastructure as a service (IaaS) technologies!

Basically, this was referred to as a U.S. DoD Operations and Maintenance (O&M) contract, and indeed, it most certainly was. However, when it came down to it, this was a team of 80 Linux System Admins working six shifts to

keep a dilapidated family of U.S. DoD data centers operating by fat fingering operating system commands one at a time using 800 human digits around the clock. Some of these were planned or routine systems administration tasks, but at least one-third to one-half of the time it was unplanned emergency tasks to unfreeze networks, networking equipment, operating systems, and other networking applications. In many cases, Linux administrators on any one of the six shifts and multiple geographic locations are left to their own devices to do whatever they think is best for the functional area assigned to them. For the remote SAFe coaches, much of this domain knowledge didn't begin crystalizing until the end of PI#2. Part of this was due to the lack of transparency by the target program itself (i.e., it was a U.S. DoD program that was keeping a lot of the day-to-day operating knowledge hidden from the remote coaches, while pretending to be a much more glamorous development program—Also known as a Research, Design, Development, Test, and Evaluation or RDT&E contract in DoD-speak). This led to a little pushback from the teams themselves—Why are we using Scrum or Sprint planning for day-to-day firefighting?—As well as pushback from the local agile coaches who were predisposed to believe SAFe was a heavyweight prescriptive development framework.

While SAFe originated as an agile program management framework for lightly pushing medium to large batches of user stories in 90-day cycles called PIs, SAFe has evolved to a much more sophisticated Lean and Kanban pull-driven system. In other words, SAFe has evolved to a full pull-driven lean-thinking framework, although even lean frameworks are considered old-fashioned now. Therefore, any thought that SAFe was inappropriate for this ART of firefighting Linux system administrators was argumentative at best. Even the field of maintenance in all industries transformed from firefighting to routine maintenance planning since the 1960s. As such, the number of POs and SMs who believed SAFe-based Scrum or Sprint and PI planning was appropriate or inappropriate for this Linux O&M contract was split down the middle. Once again, had the program been more transparent, the remote coaches would have focused more upon Kanban and Scrumban practices instead of Scrum. There were other systemic issues, such as the fact that the Linux contract was thinly staffed, there was too much Linux system administration work at any given time for the number of Linux administrators largely due to the failure to adopt modern IaaS practices, or as a senior SM said, Parkinson's Law was in full effect (work expanded to fill the amount of time available). As alluded to earlier in this case study, the U.S. DoD agency itself was committed to modern IaaS practices at the highest levels, but IaaS practices had not matriculated to daily operating U.S. DoD networks like this one due to the failure of DoD's JEDI.

As a result of the program's Linux system administration firefighting culture, lack of transparency, geographic distribution, six-shift workforce, tendency to exaggerate overutilization due to Parkinson's Law, PO and SM push-driven planning, and, of course, difference of opinion on SAFe adequacy for this domain, metrics were slow to get started. On a sidenote, some teams were using Kanban boards to track their Scrum teams (Scrumban), but not consistently. Some coaches wanted to institute basic Scrum metrics, others wanted a pantheon of lean and agile metrics, and others wanted to track and report individual hours on a daily basis especially if they pushed back on SAFe or Scrum in order to measure whether they were telling the truth. The remote coaches encouraged the local coaches to stay-the-course and stick with SAFe before considering switching to a competing framework. In general, most people on the 80-person ART were very enthusiastic about the use of SAFe for this U.S. DoD data center Linux system administration contract, especially the POs and SMs. The U.S. DoD government customers made multiple enthusiastic statements by the end of PI#2 and during PI#3 planning such as: "We are very happy that SAFe is helping us achieve our PI planning objectives on delivering DoD mission value, we have turned the corner since we began pondering the use of SAFe over a year ago, and we've made a quantum leap forward in acquisition program performance in the last two PIs!" In general, this SAFe program made substantial progress throughout PI#1 and 2!

| STRENGTHS | WEAKNESSES |
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| <ul style="list-style-type: none"> • Good to moderate government support and buy-in. • Good to strong support from program leadership. • Good to strong SAFe and Scrum PO and SM buy-in. • Growing buy-in and participation from agile teams. • Better coaching communication and collaboration. • Maturing use of agile lifecycle management tool. • Growing trust between coaches and program leaders. • Individual team member flexibility and motivation. | <ul style="list-style-type: none"> • Lack of SAFe product management team function. • Disagreement on product management vs. owners. • Lack of full-team participation in SAFe ceremonies. • Inconsistent use of agile life cycle management tool. • Lack of basic standardized agile and Scrum metrics. • Lack of program transparency with remote coaches. • Not relying on remote coaches for strategic decisions. • Inconsistent capacity planning metrics framework. |

RECOMMENDATIONS

- Establishment of a simple set of baseline lean, agile, and SAFe metrics, models, and measurements.
- Consistent of use of agile application lifecycle management (ALM) tool for planning, tracking, and metrics.
- Establishment of a consistent capacity planning and management framework for PI planning and tracking.
- Streamlined program increment (PI) planning ceremonies, practices, tools, and overall length and duration.
- Consensus based decision-making between local and remote coaches concerning ART-level decision-making.
- Tactical transparency between remote agile coaches, program leaders, and day-to-day agile operating teams.
- Emphasis upon Lean, Kanban, and Scrumban principles, practices, and tools offered by SAFe out-of-the-box.
- Establishment of basic SAFe Agile Product Management (APM) function or team—Starting with SAFe training.

OBSERVATIONS, EMERGING CHALLENGES, PATTERNS, AND HIGHLIGHTS—FROM PI #3 AND PI PLANNING #4

The U.S. DoD acquisition continued to settle down throughout Program Increment (PI) #3. By this time, the Agile Release Train (ART) of 80 engineers and managers had now experienced three PI Planning events and began to understand the purpose and value of SAFe and its PI planning model. Remember, this was a 10-year-old traditional IMS-driven U.S. DoD acquisition program that measured its performance in years, if not decades. So, the notion of 90-day replanning cycles was a little bit antithetical to their mode of operation, there was a little bit of resistance from both the buyer (government) and supplier (prime contractor) sides at first, but then people started to slowly acclimate to the SAFe lean and agile framework. The customer in particular began to appreciate the value of not only frequent feature planning cycles, but seeing features delivered every few iterations and certainly by the end of a 90-day PI period. That is, for the first time in 10 years, this U.S. DoD acquisition was now delivering finished mission critical features in frequent increments. Not only was the pace of execution substantially faster, but transparency was even greater with daily, weekly, bi-weekly, monthly, and quarterly cycles. Therefore, the first benefit of using SAFe on this U.S. DoD acquisition was increased transparency. The second major benefit was frequent re-planning cycles to deliver valuable mission features in at least 90-day cycles as opposed to 10-year cycles governed by IMSs and EVM. New lean-agile teams often make the mistake of overplanning and overscoping their PI plans, and this team was no different in that regard. So, the combination of overscoped PIs and increased delivery pace was a little bit worrisome to the SAFe coaching team. However, due in part to the Hawthorne effect and true to the nature of intrinsic motivation built into lean-agile frameworks like SAFe, the newness of lean-agile thinking and the increased delivery pace actually peaked the motivation of the teams and helped them feel more fully engaged than a 10-year IMS cycle.

By the end of PI#3 planning, the U.S. DoD customer felt this U.S. DoD acquisition program made a “Quantum Leap Forward,” which again was primarily attributed to increased transparency. By this point, most of the benefits were qualitative as the program struggled to get their agile life cycle management (ALM) tool going, establish basic metrics and reporting, and, of course, consistent team and tool ceremonies and practices. By the end of PI#4 planning, the U.S. DoD customer as well as the prime contractor program management team said the team now had the ability to specify, solution, deliver, and certify 90% of new mission critical features well within the boundaries of a PI using SAFe which they were not able to do in the previous decade. Although metrics, dashboards, and team level ceremonies and practices were still a bit inconsistent at this point, the rudimentary Agile Product Management (APM) team established in PI#3 was able to begin using the crude ALM tool to help track the delivery of mission critical features. The Agile Teams themselves stopped complaining about SAFe, Scrum, Lean, Agile, and its ceremonies, practices, and measures, although not completely, and began acclimating to framework a little bit more. More importantly, the prime contractor’s program management team became more acclimated to the remote SAFe coaching team, trust and cooperation expanded exponentially, and more openness, transparency, and cooperation ensued sharply. The same is true between the remote coaches and the Agile Teams themselves. However, the program manager continued to make centralized, top-down unilateral decisions for the entire ART as well as the remote coaches. The program management team enforced a strong division of labor between managers, engineers, and coaches that was compatible with a U.S. DoD government cultural, psychological, and mental mindset, but is definitely antithetical to lean and agile thinking, and the engineers and remote agile coaches felt this on a daily basis.

As transparency, communication, trust, and comfort dramatically increased in PI#3 between all political constituencies including the government, program managers, engineers, and remote agile coaches, more and more insight came to the surface every day. The SAFe coaches were accustomed to supporting traditional U.S. DoD acquisition programs where trust and transparency took years and sometimes decades to achieve. However, the SAFe coaches were now experiencing dramatically increased trust and transparency after only two PIs. Some of this was just the nature of fast-feedback lean-agile frameworks like SAFe, which foster a “Constant Sense of Danger,” “Tyranny of the Urgent,” and “Forming Norming Storming and Performing” that seem antithetical to trust, safety, sustainable pace, and psychological safety. Some of this was planned by the SAFe coaches that impatiently risked demanding greater transparency with the program management team. And some of the increased trust and transparency was accidental or incidental rather than intentional, as turnover among the program’s staff at all levels demanded greater dependency upon the SAFe coaches. Of course, the SAFe coaches, as seasoned management consultants, seized the opportunity afforded by the old maxim, “Crisis is a Catalyst for Change,” to step up and assume more program-level lean-agile coaching duties, responsibility, and ownership. Basically, this U.S. DoD acquisition program was end-of-life, it was being recompeted, the prime contractor’s parent corporation was divesting this line-of-business, and management and engineering staff were dropping off like flies (leaving quickly). At this point, the turnover reached 33% and the SAFe coaches sensed a possible transformation implosion. However, in-the-end, retrospect that is, the SAFe framework actually helped the U.S. DoD acquisition keep its head above water during this latest storm. You know what they say, “Hindsight is 20-20,” and that was certainly the case here.

One of the epiphanies, of course, was increased understanding of the U.S. DoD acquisition program’s basic purpose by the SAFe coaches. Again, this was a U.S. DoD program, the coaches were remote (1,000 miles away), and there was little incentive by the ART to share any day-to-day operating data with the SAFe coaching team. That is, by program management direction, the entire ART was directed to share as little data with the SAFe coaches, save that

of asking basic lean, agile, and SAFe coaching advice mostly at the team level. To add insult to injury, the program management team then set out to use a “Divide and Conquer” approach to managing the ART—That is, any day to day administrative information like contracting, staffing, and budgeting was the purview of the program management team and any day-to-day technical information was the purview of the engineers, but not necessarily the SAFe coaches. Of course, this “Divide and Conquer” approach was completely antithetical to the basic SAFe core value of total transparency, lean and agile concepts like Value Stream Mapping, and the SAFe operating model itself. Nonetheless, it became apparent to the SAFe coaches that this was a basic, low-level operations and maintenance contract to provide daily Linux systems administration services for managing a small family of traditional, rapidly aging, brick-n-mortar U.S. DoD networks. Much of the work involved managing multiple trouble ticketing queues, performing recurring systems administration tasks, tracking U.S. DoD physical network hardware and software assets in multiple states, patching numerous security vulnerabilities in the antiquated U.S. DoD network, and, of course, daily firefighting that consumed more than 50% of most people’s time. SAFe was primarily designed as an engineering model for New Product Development (NPD) that required a modicum of advanced planning vs. a model for routine day-to-day recurring operational work. This is not to say that maintenance does not need planning too.

Even more important was the pace at which the work was performed. This program was in firefighting mode for 10 years when it began its SAFe journey. System administrators woke up, put on their firefighting gear, reported to their posts, received the location of the most recent fire, rushed into burning building often one at a time, put out the fires, went home for a beer, and then rinsed and repeated every day (365 days a year, 24 hours a day). That is, this program was better suited for a faster pace than the basic out-of-the-box cadence of 90-day PI planning cycles. In other words, a day was like an iteration, an iteration was like a PI, and a PI was like a year to this U.S. DoD acquisition. More importantly, everyone was an Army of one-person, which is often true in the U.S. DoD culture, paradigm, culture, psychology, and DNA. The notion that the SAFe coaches would ask firefighting Linux system administrators to sit down and plan a 90-day program increment AS A TEAM, execute two-week iterations and its bi-weekly Scrum ceremonies, and then rinse-and-repeat every 90 days was a bit ludicrous, laughable, and downright insane at first. More importantly, firefighters respond to unplanned calls, they don’t have situational awareness, know where the fires will be in advance, and construct a 90-day plan to extinguish them. Of course, since its inception in the mid-2000s, SAFe incorporated ever-increasing amounts of lean thinking values, principles, and practices to adapt to a mildly reactive pull-driven vs. overly proactive push-driven operating model. In spite of the fact that the SAFe coaches initiated the ART with Scrum vs. Kanban practices, this is not to say basic SAFe lean-agile framework elements like Scrumban were not useful and the ART did not benefit from them. In fact, both SAFe PI and Scrum planning practices were a forcing function to help them conduct planned maintenance. Furthermore, lean practices like capacity planning helped the teams moderate their pace to reduce burnout and increase delivery success.

There were many systemic challenges throughout PI#3 such as inconsistent ceremonies, capacity planning, tool use, metrics, and team participation in ceremonies. Some rudimentary lean and agile program and team assessments were used as a proxy for measuring ART performance (including some corporate SAFe metrics instruments). The program has yet to apply SAFe Program Predictability or Business Value Measurement, and its rudimentary Agile Product Management (APM) team continues to delegate too much of its own responsibilities to the Agile Teams themselves. PI Planning #4 was pretty mature, with most teams performing rather detailed planning well into the IP iteration, but the program managers are elongating team breakout sessions much greater than necessary, altering and skipping key PI planning events, and skirting essential Inspect & Adapt (I&A) events like retrospectives and problem solving.

| STRENGTHS | WEAKNESSES |
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| <ul style="list-style-type: none"> • Good buyer and supplier buy-in to SAFe at all levels. • Strong management SAFe leadership/coordination. • Above average product owners/scrum masters. • Growing team participation in Scrum ceremonies. • Routine lean-agile program and team assessments. • Stronger trust between coaches and program leaders. • More transparency/involvement of SAFe coaches. • Improving product/feature management abilities. | <ul style="list-style-type: none"> • Inconsistent Scrum ceremonies and agile tool usage. • Lack of standard/basic tool-based agile metrics. • Lack of uniform program/team metrics dashboard. • Disagreement over product owner/management roles. • Teams starting to develop overly detailed sprint plans. • Inconsistent capacity planning and measurements. • SAFe PI planning breakout sessions are too long. • Autocratic, divide-and-conquer management model. |

| RECOMMENDATIONS (have not changed since PI#3 planning event) |
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| <ul style="list-style-type: none"> • Establishment of a simple set of baseline lean, agile, and SAFe metrics, models, and measurements. • Consistent of use of agile application lifecycle management (ALM) tool for planning, tracking, and metrics. • Establishment of a consistent capacity planning and management framework for PI planning and tracking. • Streamlined program increment (PI) planning ceremonies, practices, tools, and overall length and duration. • Consensus based decision-making between local and remote coaches concerning ART-level decision-making. • Tactical transparency between remote agile coaches, program leaders, and day-to-day agile operating teams. • Emphasis upon Lean, Kanban, and Scrumban principles, practices, and tools offered by SAFe out-of-the-box. • Establishment of basic SAFe Agile Product Management (APM) function or team—Starting with SAFe training. |