WHITE PAPER

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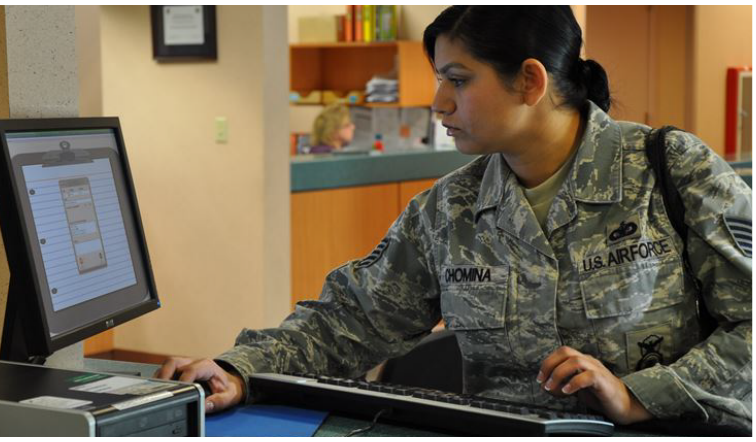

A Roadmap for Rapidly Scaling Continuous Improvement – U.S. Air Force

May 27th 2020

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Abstract

Problem solving and process improvement skillsets and mindsets, for most, are viewed as mission-critical competencies that must be spread and instilled, organization-wide. Employees armed with this knowledge do their jobs well today, and perform better tomorrow. For them, problems are to be solved, processes have inherent waste that must be eliminated, and seemingly insurmountable challenges are met using data. Further, such employees have high work self-esteem, embrace change, ask "why" repeatedly, value standard work, solve root-causes, believe in collaborative teamwork, and viscerally grasp the transformative power of a continuous improvement culture.

Lean Six Sigma deployment leaders, in every industry, are driven by the vision of operational excellence unleashing their entire organization, and their people, to achieve their collective and individual potential. They are passionate about the opportunities, improvements, and innovations made possible within a transformed organization. And yet, despite their intense bias for action, these same leaders struggle because the path to get there, quickly, effectively, and economically, has heretofore remained elusive.

The US Air Force shares this vision, and ultimately aims for every airman to be a trained and capable problem solver. Joe Crady, USAF-wide CPI leader, and his team were tasked with making this high-flying vision a reality. The then current state of the Air Force CPI training and implementation program weighed heavily upon their minds. Expanding the existing training process, with its known constraints, predictable bottlenecks, and excessive variation, was simply a non-starter. Knowing that a complete process overhaul was in the offing, the team contemplated the many obstacles before them. The team wanted to be particularly sensitive to the change resistance they anticipated from their own practitioner community. It was imperative that the right plan be architected. Determination and discipline to stay-the-course would be needed, so resisters would become believers and adopters. Any missteps along the way would have severe consequences. It would be the improvement project of a lifetime and the team knew they needed a willing and capable partner if an overhaul of this magnitude would have any chance of success.

Problem Statement:

As Joe and his team surveyed the landscape of the Air Force's Continuous Improvement initiative, they saw a non-scalable, waste-filled training approach and a haphazard, anecdotal project tracking process. Prospective Green Belt practitioners left their job site for a week (40 hours) of classroom instruction led by one of the 500+ process managers scattered across the globe. The quality of the training experience varied wildly from one class to another. Many key principles were either left out or taught incorrectly. The standard class materials were often reworked to fit the whims of an individual instructor. Scheduled classes were frequently cancelled due to high last-minute drop rates. Green Belt graduates lacked a common vocabulary, consistent depth of understanding, and reliable project proficiency. The overall initiative was being undermined by too much training variation. Project teams were being hampered by team member confusion while the entire organization flew blindly, for lack of meaningful data.

Background:

Founded nearly 30 years ago, OpusWorks (originally named The Quality Group), launched from its base within the IBM corporation, to quickly become a leader in what is today known as Blended Learning. Blended learning, in short, is a training process that combines self-paced e-Learning for knowledge transfer with instructor-led training for knowledge application. Blended learning, done well, enables students to become competent, faster, with instructors more productively and effectively coaching and mentoring them.

Over the years, Joe had become somewhat familiar with the OpusWorks blended learning system for CPI. He shared his sense that OpusWorks had been battle-tested, and had continuously improved, for many years. The Air Force team decided to investigate. They explored the company's experience training hundreds of thousands of American Express, Seagate, Bank of America, Southwest Airlines, and AT&T employees, which led to their billions in savings. They probed about the company's openness to VOC (Voice of Customer), agility at responding to customer needs, and commitment to developing a fully integrated CPI deployment suite. And they commended OpusWorks as a pioneer in cloud delivery and an expert in all-virtual blended learning for Green Belts and Black Belts. With OpusWorks, the team concluded that USAF students would thrive as much or more than they did under the old paradigm.

Perhaps just as important, Joe, as the team leader, was learning a lot from the OpusWorks team, especially its MBB from the GE tradition, and former deployment executives, one from AT&T and the other from Seagate. Blue sky brainstorming discussions began and over time they morphed into a cohesive strategy that, if properly executed, would be transformational for the Air Force. It was time for a pilot.

Pilot:

During the fall of 2018, a pilot class was launched using the standard OpusWorks Virtual Blended Learning Green Belt 12-week design. The goal was one curriculum for all. Five pilot participants were carefully selected from various commands and geographies: a previously trained student, a new student, an experienced instructor, a practitioner, and Joe himself. Each week, the students completed 3-5 hours of e-Learning, on their own, as preparation for a several-hour facilitated online session with the OpusWorks instructor (See Figure 1). The results were energizing. With the e-Learning, students affirmed content rigor, appreciated visual appeal, highlighted course interactivity, and shared their enjoyment of the experience, especially in contrast to their other e-Learnings. The team keyed on the efficiency of the OpusWorks course structure with learning points concisely stated, creatively exemplified, and effectively paced. Through the pilot, blended learning designs that would work well for USAF could now be constructed. The pilot process, following a PDCA mindset, had passed the "Check" with flying colors. Now it was time to "Act."

Launch:

Formal kick-off came in early fall 2019. The project team shifted into high gear. Weekly checkpoint calls were held. Objectives were defined; timelines developed; actions completed; data analyzed; and solutions were crafted. The USAF clearly expressed its requirements, and the OpusWorks crew pedaled profusely to stay ahead. As the implementation plan took shape, the team kept the overarching goals in sharp focus. They would be the guiding North Star of the team's direction and effort.

Overarching Goals:

1. **Meet the DoD mandate that 5% of the workforce, over 30,000 airmen, be trained to Green Belt level.**

2. **Give all Airmen enrolled in the program a common CPI training experience and a standardized Body of Knowledge (BOK).**

3. **Automate and integrate learning processes, project tracking, and leveraged gains in order to exponentially increase the pace and results of the deployment.**

4. **See training effort translate to actual improvement efforts while having visibility into CPI progress within each Air Force command.**

5. **Automatically identify high achieving talent across the Air Force.**

All knew that the path forward was fraught with roadblocks and resistance of all kinds, some known and in the open with others lurking in the shadows of the unknown. Each challenge would require special attention and flexibility while some needed military style brute force.

Challenges:

1. **Non-Standard training.** Getting every Air Force Airman on the same page, delivering complex training via a consistent process, drawing from an agreed-to book of knowledge, having consensus on necessary training breadth and depth, and being of one mind on how to execute projects would be difficult, to put it mildly.

2. **Instructors reluctant to change.** Many instructors like the allure of training full-time, in a physical classroom. Due to the complexity of the material, many Lean Six Sigma instructors feel that it is important to see, in-person, the eyeballs of understanding and be present for those ah-ha moments of clarity and insight. Deep down though, even the best CPI instructor knows they add more value as a hands-on problem solver. They also realize that to train thousands of people, quickly and cost effectively, the all-instructor led process – even when propelled by the cascading train-the-trainer model – is totally incapable. Regardless, the team needed to recognize that many would not embrace handing-off basic training to the e-Learning.

3. **Students resistant to change.** For many students, the blended learning form of training would be radically different from the traditional training that they were accustomed to. Some carried the unpleasant memory of previous experiences with poorly constructed e-Learning. Others imagined their boredom with online PowerPoint presentations, lots of e-reading, and mind-numbing viewing of video after video. The OpusWorks e-Learning would have to grab e-Learners right away, and quickly remove any lingering bad tastes for the new medium.

4. **USAF Network bandwidth limitations.** Airmen know that the Air Force prioritizes network access and bandwidth for mission critical military tasks. They expect frequent reductions in internet speeds and intermittent access for non-mission critical tasks. Launching a 100% online learning and deployment initiative across the USAF network could be a bumpy ride.

5. **Lack of dedicated support staff.** Who would register, support, train, track, and report the performance of thousands upon thousands of students? A labor-intensive administrative nightmare seemed to loom on the horizon. Even normal online practices would have to be reconstructed if the Air Force were to have a reasonable chance of achieving its goals.

6. **Communication constraints.** The U.S. Air Force is a huge organization with people spread throughout the world. Advanced communication techniques would be required to recruit students. Creating pull for the program would be a top priority. In addition, regular communications with various stakeholders, informing them of progress, and providing them with custom but actionable information, would be another logistical challenge.

With the goals defined and the challenges understood, the team dug in and began the real work.

Learning Design:

The mandate was clear. Design a single system featuring high-quality training, accessible to all, and deploy it the same way, everywhere, every time. Further, integrate that training with one end-to-end project execution and tracking tool that would be additive for teams and actionable for executives. Finally, assure that the system could produce the real-time data necessary to measure progress and enable informed decision-making about adjustments and improvements.

The pieces were coming together and every detail would be important. With guidance and assistance from his OpusWorks advisors, Joe and his team converged on a 9-week course design consisting of 45 e-Learning modules, organized into three, 8-12 hour chunks, with a one-hour virtual class session inserted after each chunk (See figure 2). To earn their certification, students would have to score at least an 80 on module quizzes, pass a 60 question, open-book final exam, participate in the virtual class sessions, and successfully complete a project. Every airman was a potential student.

Before, the Air Force's training was instructor centric. Instructors were measured by how well their students – regardless of aptitude – became capable, competent, and motivated. In short, instructors were accountable for the performance of their students. Not so in the USAF's new design. Students would now own their own performance. It would be their responsibility to complete the learning modules on time, attend the virtual sessions and pass the tests. It would be

their choice whether to respond to posted questions, engage in chat discussions, do their homework, and complete all the activities. Some students would shine, others would get by, and a few would fail. Based upon the individual student performance data, instructors would fluctuate between cheerleading, cajoling, counseling, and mentoring. With students being fully accountable and instructor expertise only involved as needed, class sizes could be quite large, more people could be trained, and the best and brightest could be identified more quickly.

The final Air Force design was set up in the OpusWorks portal. The team familiarized themselves with the portal functionality. It became apparent that, at long last, the Air Force's CPI leadership team would have access to real-time data about student performance – scores, time in course, number of test retakes, pace, etc. – and roll-up data about project accomplishments – value, progress, deliverables, status and more. Armed with data, sliceable and ready to be stratified as needed, Joe and USAF management would, for the first time, have a fact-based way to evaluate the training process and its effectiveness. Joe was especially eager for the system to identify high-potential practitioners and enable the mobilization of early adopters.

Training Begins:

With the learning design finalized, classes constructed, e-Learning modules, surveys, exams, and virtual classroom sessions ready-to-go in the Air Force branded portal (See Figure 3), the team turned to student registration. At the time, OpusWorks offered six registration options. None would work perfectly for the Air Force. OpusWorks envisioned, designed, and quickly programmed a custom, entirely self-service registration system. The system was also coded to control access to the portal, and capture, up front, important student information: command structure, location, process manager, supervisor, etc. In hindsight, the team did a great job anticipating the future needs for reporting, communications, and information sharing. As for registration, the new system indeed automated the entire process: verify student identity, confirm USAF status, enable class selection, enroll, and start training … all without any human intervention.

The CPI leadership team pressed the button, and distributed the registration URL to process managers. Many would be students in the first wave. Registrations immediately appeared. The first two training waves, each restricted to 100 students, filled up fast and soon their nine-week journey began. Additional classes, with every other week start dates, were released. They too filled up quickly. The deployment was finally underway.

A class size of 100 is enormous by traditional standards, but only a drop in the bucket for what was to come. Next, the team veered to reporting. The needs coalesced around what would be programmed and named the "Class at a Glance" report (See Figure 4). This highly detailed report displays every student in a class on one axis, and every activity contained within the class along the other. In one glance, the stakeholder sees what modules have been completed, by whom, and with what final score. It also shows whether students have taken the surveys, attended the virtual sessions, and their final exam score.

Changing Roles:

From the beginning, it was agreed that OpusWorks would model the way. The early waves were taught by OpusWorks instructors and supported by OpusWorks administrators. The CPI team recognized that training from OpusWorks would be required for their instructors to become effective virtually. The old techniques just wouldn't work with digitally connected students, and instructors would fail if they didn't master the delivery technology. OpusWorks proffered a four-step methodology: Model, Assist, Watch, and Release. The first Air Force instructors-in-training began by shadowing the OpusWorks expert. When ready, they assisted, and then took over under OpusWorks' watchful eye. The process worked well. Within a few months, the Air Force had sufficiently built its own competent and capable instructor team, so the hand-off could be completed.

Early in the rollout, many instructors stayed on the sidelines. A few, no doubt, believed it would fail. But as momentum accelerated, and data from surveys and tests started rolling in, there was no going back. It also became apparent that fewer instructors would be needed over time. Astute instructors embraced the new learning model, committed to supporting the students as future change agents, and welcomed their expanded role as mentor and coach. Others would seek another opportunity. Some requested flexibility, and possibilities were brainstormed with them. The only non-negotiable was that everyone used the OpusWorks e-Learning. Though designed for self-paced learning, a green light was given to those who wanted to deliver the e-Learning in a group setting so that questions and knowledge application could happen immediately. The days of inconsistent training material and rampant variation, however, were over.

Early Pushback:

Every week, the team carefully evaluated survey results. It wasn't long before the data pointed to a bandwidth problem with the USAF network. Though the obvious solution was to increase USAF network performance, that seemed to be well beyond the team's sphere of influence. Other options were considered. Dumb down the content, so it would be less media rich, and less taxing? Strip the e-Learning down to simple pictures and reading? Remove all the interactions? The team intuitively understood that if they did any of these, satisfaction scores with the e-Learning would plummet. And yet, the VOC data was clear that the problem needed to be solved.

Stuck teams are keen for that new insight that puts everything into perspective. Suddenly, the daunting network problem was reinterpreted as an unanticipated opportunity for students to shine. "We're teaching people to become problem solvers, right? Let's see if students can solve their network problems!" Sure enough, most students did figure it out. Stories abounded about airmen taking their training via smart phone, the library, coffee shops, McDonalds, home WIFIs, and other internet connected places! Perhaps the Air Force was indeed on the right path of every airman becoming a capable problem solver.

Nonetheless, the team remained fearful that the fledgling initiative was at risk without a solution to the network problem. Network performance had to be

fixed, not just for CPI training but also because it was strategically important for the Air Force-wide emphasis upon digitization, technology, and automation. Unlike other at-risk initiatives, however, Joe's team had data. The team pushed on. They drilled into survey results (See Figure 5), test scores, and satisfaction metrics. Soon they were able to correlate those reporting network problems with those least satisfied. Though the analysis appeared to be statistically sound and defensible, OpusWorks statisticians nonetheless reached out to other experts for confirmation. Joe presented his case confidently, and was taken seriously. Today, student complaints about network performance have diminished considerably. Whether the team's analysis made an appreciable difference is unknown. Regardless, the team had relied upon data to successfully navigate treacherous waters. And the OpusWorks system proved up for the challenge.

Emboldened, the team made final plans to open the floodgates, which meant pressure testing all the components of the new training process.

Growing Pains:

From Waves 3-7, class sizes expanded to over 700 students each. With such a large and sudden influx of students, processes became less capable and the fire hose of data, once so helpful, turned to noise. Additional automation was essential. While the OpusWorks support specialist worked tirelessly to keep up, the OpusWorks development team used the 5 Whys and other quality tools to design and program sustainable solutions that addressed root causes. For example, with thousands of students going at their own pace and expected to keep up with the cadence of their class, change requests were inevitable. Before the requests became too overwhelming, OpusWorks was able to add another self-serve portal function so students could make the change on their own. Because student accountability was and still is a core value, the team needed to know the reasons behind the transfer request. A mandatory survey was built so that data would help the team assure a proper balance between student needs and the integrity of the overall initiative.

Data is the compass for an initiative. Leaders need to have the right data, at the right time. For a rapidly scaling initiative, data that was actionable before might no longer be relevant. Reports that were a snap to produce yesterday might be a resource hog tomorrow. The "Class at a Glance" report, mentioned above and so informative early on, was increasingly less useful. Seeing everything for every student meant nothing with hundreds of students in a class. The team contemplated such changes to the report as making exception information stand out and be more visible, but the writing on the wall became clear. This single report was now bogged down mining a database in order to display over 42,000 individual datapoints. What started as a good idea was now unsustainable.

The team stepped back and engaged in heated debate about the purpose of the data. What does the data need to tell us, what will we do with the data, and what decisions are we trying to make based upon the data? Suddenly, Joe Crady, the career practitioner, exclaimed: "Yes! This is what I wish would happen across ALL our processes! We need to be digging into the

data, asking the 'why' questions, and allowing it to lead us to better conclusions!" The team did just that, and they asked questions. Why does an instructor (or process manager) look at this report in the first place? What insights are they seeking? What report layout will properly inform stakeholders without introducing unnecessary subjectivity? Deep reflection about these questions led the team to investigate solutions powered by Artificial Intelligence. It was apparent that the process of class management needed to be automated to an even greater extent.

Roadblocks Removed:

For blended learning to succeed, students must complete their e-Learning on-time. Do it on your own time, do it in small chunks, do it when convenient, but meet due dates. So, of utmost importance was identifying students falling behind, so they could receive an email or phone call of encouragement, to catch up. The dialogue continued. But shouldn't those right on schedule be acknowledged, and those ahead be recognized? Yes, and yes. The team began to visualize a continuum with every student somewhere between where they are, and the standard for where they should be. Five "Status" levels were identified: Far Ahead, On Track, Falling Behind, Behind, and Far Behind.

Pivot Tables, directly from the OpusWorks Portal, became the latest innovation. In addition to reducing the system's burden by 90%, it also became a systems approach that greatly improved:

Communications with Stakeholders. Every Monday morning, the Pivot Table is emailed, by the OpusWorks system, to every stakeholder. Before, stakeholders had to derive the information they wanted, from a static report. Now, without any assistance, they can manipulate the data to get what is most important to them. Process Managers were delighted with how quickly and easily they could see only those students within their area of responsibility by location, class, status, and more.

Communications with Students. Traditionally, the greater the instructor involvement, the more motivated the student. With virtual blended learning and very large class sizes, new ways, preferably automated ones, are needed to connect with students. Building upon the Pivot Table structure, an AI-like function was added so the OpusWorks system could take action based upon specific business rules. Going forward, students would receive individual attention without any human intervention. On Monday morning, every student receives an email message tailored to their status. Those far ahead are congratulated, given perks, and challenged to go even faster. Those far behind may be given options if they just can't grasp the material or are unable to keep up. The team noticed an immediate spike in course completions. A few students even replied to share their enthusiasm for the course or express their gratitude for having such open access to the training. The team chuckled as they imagined student reaction when they realized they were not anonymous participants.

Inspire High-Achieving Students. In the old way of training, the pace delights only one student. For everyone else, the pace is either frustratingly fast or monotonously slow. Remember the team's goal and Joe's enthusiasm

about identifying high achievers? The real intent was for them to become process improvement superstars, as fast as possible, with nothing in the way of their progress and advancement. The team aligned on the priority, took a fresh look at the process, identified a few roadblocks, and automated some improvements.

In the original design, checkpoint classes occurred every 3 weeks. Because participating in these virtual classes was a requirement for certification, students couldn't access the next chunk of e-Learning modules until after class. Anecdotal feedback indicated that some students – presumably the high-achievers -- were annoyed by being held back. The team changed the process so that a student could either take the live class or view a recorded video of the same session from an earlier wave. Ever mindful of eliminating administrative waste, the OpusWorks system was programmed to automatically check-off attendance regardless of which virtual checkpoint session class was chosen by the student.

Projects:

With training in high gear, the team has shifted focus to bringing online the OpusWorks project tracking system. The Air Force follows an 8-step improvement process based on an A3. The system facilitates practitioners through each step and streamlines access to a mentor for tollgate reviews and extra help. Shortcuts enable mentors to quickly evaluate practitioner deliverables. An alert system points out roadblocks and helps speed up project progress. Stakeholders and Process Managers have dashboard visibility into their project portfolio. Each project must have a job classification code and be aligned to one or more of the Air Force's strategic priorities. Data from the OpusWorks system can be stratified by job type and organized strategically to report progress up the chain of command.

The team insists that OpusWorks' project tracking software be simple and productive to use for project team members. If too complex or heavy with non-value added work, the software won't be used and the much needed data flow will dry up. Flexibility for the practitioner is a priority. Present the options at critical junctures but leave the final decision to the practitioner and mentor. So far so good, but as with the OpusWorks training system, challenges will emerge and real-time improvements will become essential as the OpusWorks project tracking system also rapidly scales.

Closing Perspectives:

Culture Change:

Changing culture in an organization the size of the U.S. Air Force, with its vast expanse of commands, is a mammoth undertaking. And yet, rather than wasting the energy trying to cajole, bribe, or entice consensus and participation in the new direction, the team forged ahead, slowly and purposefully. They embraced the early adopters and prioritized creating gravitational pull. As the pace quickened and the results spoke for themselves, entrenched CPI leaders, process owners, and practitioners began climbing aboard. While the complete transformation is just beginning, the team knows that the system is now in place for the Air Force to have a big win, but as with all things, only time will tell.

Pandemic:

In late 2019, an unknown threat to the deployment was developing in China. The Coronavirus caught the world completely by surprise, both in the speed of its spread and the severity of its impact. Traditional brick and mortar training across the U.S. ground to a halt. K-12 school systems and colleges sent their students home. The plug was pulled on all corporate training. Travel was shut down. And, gathering in a classroom ceased altogether.

Meanwhile, in the midst of the chaos, the Air Force deployment hardly skipped a beat. Process improvement knowledge was now more important than ever. People wanted tools that would prepare them for the new-normal. The all virtual blended learning model accelerated and was succeeding beyond all expectation. Student enrollments at the height of the pandemic soared by over 450% while the support team workload continued to lessen due to all the automation built into the OpusWorks system. By luck, providence, or timely planning, the CPI training solution was in high demand and performing superbly. The CPI team was perfectly positioned to meet the challenge presented by the pandemic.

The Future:

To its credit, the U.S. Air Force has been hugely supportive of the CPI team's efforts. New opportunities are emerging almost daily and with the process so automated, the ease of adding other class types to the training mix is well understood. A Foundational Skills class has been created and launched so new airmen can learn the basics of process improvement over a three-week period. Virtual blended learning black belt classes are being contemplated for release in the summer. The Air Force Academy wants to adapt the OpusWorks solution to their year program, so cadets can graduate as U. S. Air Force trained Green Belts. Additionally, other Air Force schools want to learn more about, and perhaps emulate, the virtual blended learning model for their curriculums.

With the integrated project tracking system, the possibilities are endless. E-Learning content can now be accessed directly from within the tracking system for a JIT refresher. An integrated project suggestion, vetting, and approval system is in the early planning stages. Talk of an HR system to track practitioners and their capabilities is on the drawing board. With the U.S. Air Force, it is indeed true that continuous improvement never ends.

Figure 1: Pilot GB Learning Design

Virtual Sessions & e-Learning Modules:	Time (minutes)
Kickoff	**60**
Virtual Session 1: Introduction	**120**
Self-paced Prerequisites	
Introduction to Six Sigma	60
Introduction to Lean Principles	60
Introduction to Lean Office and Service	45
Introduction to Theory of Constraints	60
Homework	30
Virtual Session 2: Defining the Project	**120**
Self-paced Prerequisites	
Voice of the Customer	75
Managing the Project	55
Kaizen Event	30
SIPOC	15
Mapping the Process	30
Homework	30
Virtual Session 3: Leadership Skills	**120**
Self-paced Prerequisites	
Understanding Change	40
Facilitation Skills	40
Effective Communication	60
Active Listening	25
Intro to Conflict Management	40
Conflict Management Tools	40
Virtual Capstone Event 1: Define Phase	**180**
Virtual Session 4: Measuring the Process	**120**
Self-paced Prerequisites	
Eight Wastes	25
A3 or 8D Problem Solving	30
Current State Value Stream Mapping	60
Future State Value Stream Mapping	45
Process-Based Costs	30
What is Statistics?	35
Organizing and Presenting Data	45
Homework	30
Virtual Session 5: Process Analysis	**120**
Self-paced Prerequisites	
Pareto Analysis	40
Scatter Diagrams	30
Measures of Central Tendency	40
Measures of Dispersion	60
Measurement System Analysis	45
Homework	60
Virtual Session 6: Baseline & Root Cause	**120**
Self-paced Prerequisites	
Introduction to Process Capability	45
Process Capability Assessments	60
Cause and Effect Diagrams	40
Failure Mode and Effects Analysis	40
Homework	60
Virtual Capstone Event 2: Measure Phase	**180**
Virtual Session 7: Making Improvements	**120**
Self-paced Prerequisites	
5S	25
Visual Management	20
Standard Work	20
Error Proofing	20
Changeover Reduction	60
Workplace Design and Layout	20
Flow and Pull Systems	30
Total Productive Maintenance	25
Virtual Capstone Event 3: Analyze Phase	**180**
Virtual Session 8: Controlling the Process	**120**
Self-paced Prerequisites	
Selecting the Solution	30
Control Charts	45
Controlling the Process	45
Virtual Capstone Event 4: Improve & Control Phase	**180**

Student Time Commitment	Hours
Self Paced Prerequisite	28
Virtual Sessions	17
Virtual Capstone Events	12
Homework	3.5
Total Hours	***60.5***

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Figure 2: Green Belt Learning Design

USAF Green Belt Trained Course Flow	Time (minutes)	Time (hours)
Kickoff Call	60	1.0
Introduction to Six Sigma	60	1.0
Introduction to Lean Principles	60	1.0
Introduction to Lean Office and Services	45	0.8
Introduction to Theory of Constraints	60	1.0
Voice of the Customer	75	1.3
Managing the Project	45	0.9
Kaizen Event	30	0.5
Plan Do Check Act	30	0.5
SIPOC	15	0.3
Mapping the Process	30	0.5
Understanding Change	40	0.7
Meeting Facilitation Basics	15	0.7
Facilitation Skills	40	0.3
Effective Communications	60	1.0
Active Listening	25	0.4
Intro to Conflict Management	35	0.6
Conflict Management Tools	40	0.7
Prerequisite e-Learning for Checkpoint Call 1	715	1.0
Checkpoint 1	60	1.0
Eight Wastes	25	0.4
A3 (and/or) 8D Problem Solving	30	0.5
Current State Value Stream Mapping	60	1.0
Future State Value Stream Mapping	45	0.8
Process Based Costs	30	0.5
What Is Statistics?	35	0.6
Organizing and Presenting Data	45	0.8
Pareto Analysis	40	0.7
Scatter Diagrams	30	0.5
Measures of Central Tendency	40	0.7
Measures of Dispersion	60	1.0
Measurement System Analysis	45	0.8
Introduction to Process Capapbility	45	0.8
Process Capapbility Assesssments	60	1.0
Prerequisite Learning for Checkpoint Call 2	590	9.8
Checkpoint 2	60	1.0
Cause and Effect Diagrams	40	0.7
Introduction to Hypothesis Testing	40	0.7
Failure Mode and Effects Analysis	25	0.4
5S	20	0.3
Visual Management	20	0.3
Standard Work	20	0.3
Error Proofing	60	1.0
Changeover Reduction	20	0.3
Workplace Design and Layout	30	0.5
Flow and Pull Systems	25	0.4
Total Productive Maintenance	20	0.5
Selecting the Solution	45	0.8
Control Charts	45	0.8
Controlling the Process	30	0.5
Prerequisite e-Learning for Completion Call	450	7.5
Completion Call	60	1.0
e-Learning Hours	1755	29.3
Virtual Sessions (Kickoff Checkpoint, Completion) Hours	240	4.0
Total Time Commitment	1995	33.3

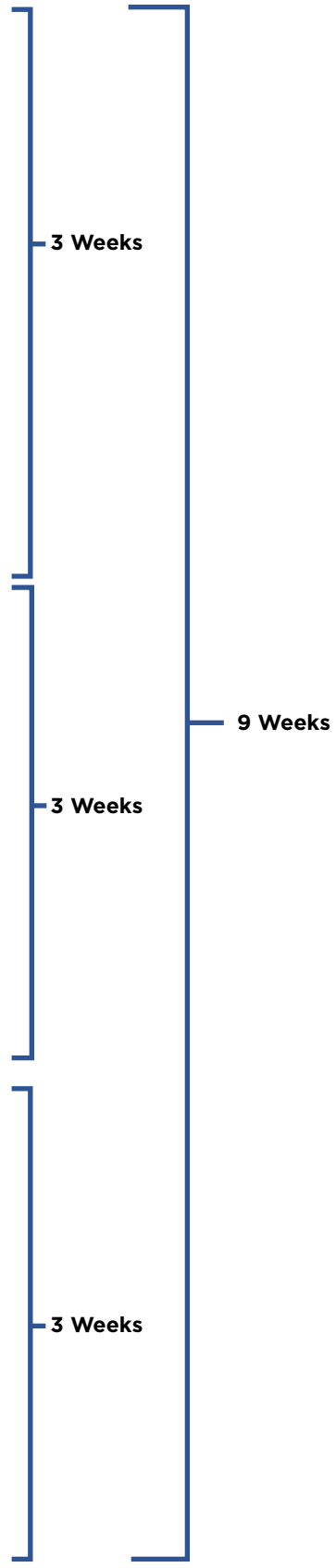

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Figure 3: Air Force Branded Portal

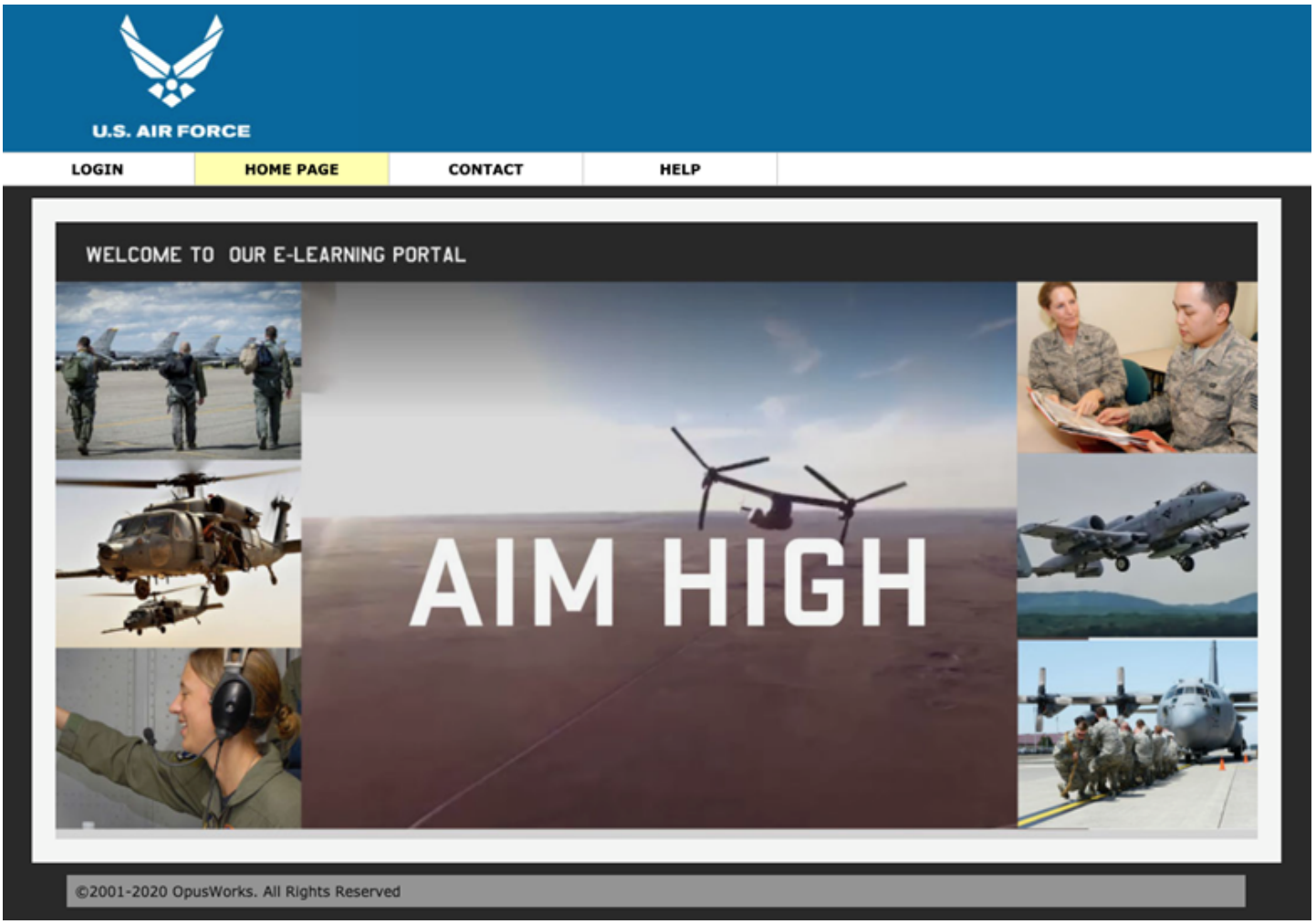


Figure 4: "Class-at-a-Glance" Report

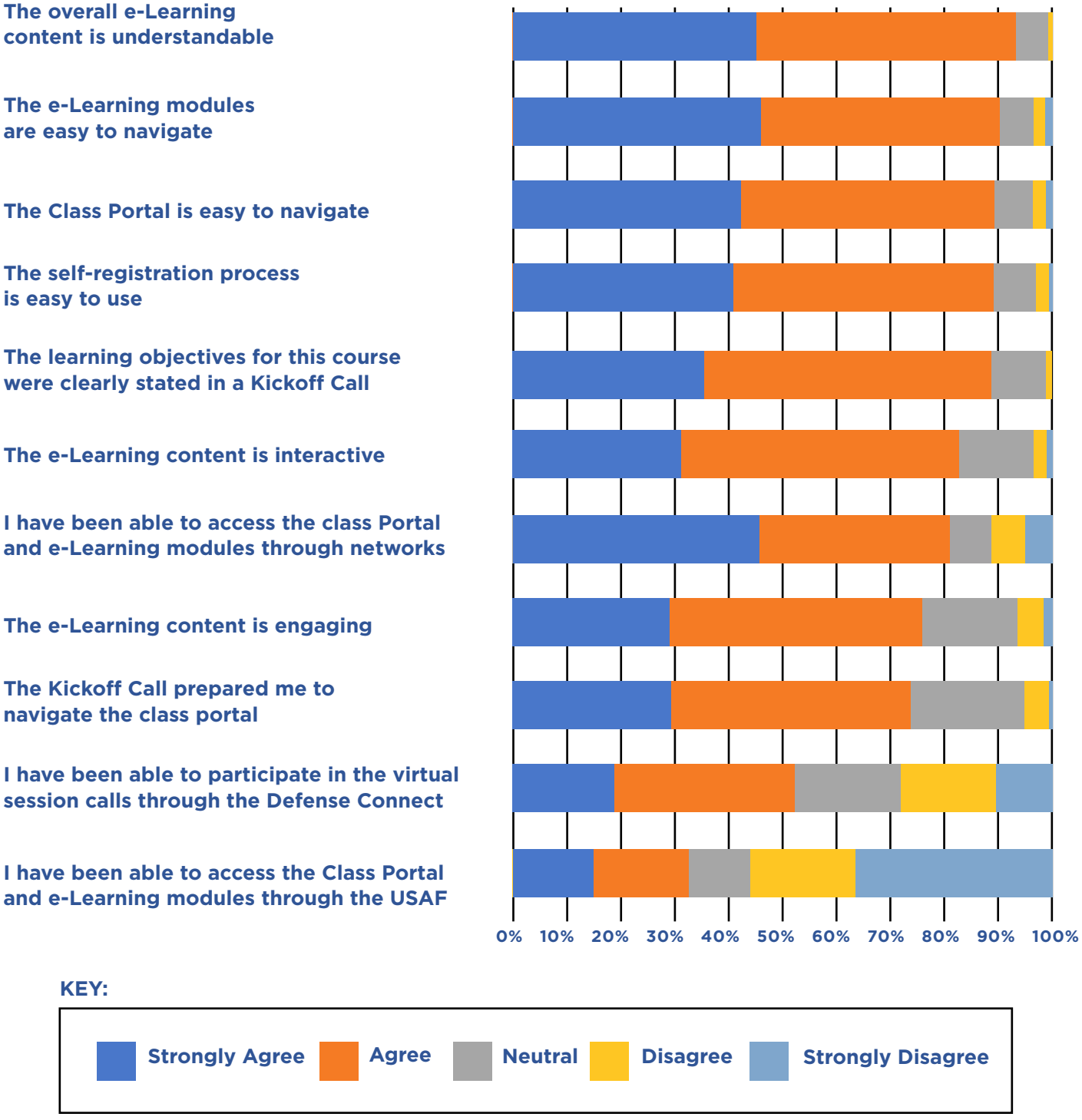
AVERAGE CLASS MODULE TIMES | CLASS EVENTS | CLASS ACTIVITY GRID | CLASS EXAM GRID | **CLASS AT A GLANCE (Download)** | CLASS SURVEYS

Save Attendance

Display Scores | Display Completion Symbols

	10/16/2018					10/24/2018						10/31/2018		11/7/2018									11/14/2018						
Student	Session 1 Attendance	Introduction to Six Sigma	Introduction to Lean Principles	Introduction to Lean Office and Service	Introduction to the Theory of Constraints	Session 2 Attendance	Voice of the Customer	Managing the Project	Kaizen Event	SIPOC	Mapping the Process	Session 3 Attendance	Green Belt Capstone Event: Define	Session 4 Attendance	Eight Wastes	A3 Problem Solving	Current State Value Stream Mapping	Future State Value Stream Mapping	Process-Based Costs	What is Statistics?	Organizing and Presenting Data	Session 5 Attendance	Pareto Analysis	Scatter Diagrams	Measures of Central Tendency	Measures of Dispersion	Descriptive Statistics: Self Assessment	Measurement System Analysis
[redacted]	☐	90	90	80	90	☐	100	90	100	100	100	☐		☐	100	100	100	80	80	90	100	☐	100	100	90			
[redacted]	☐	90	90	100	100	☐	100	100	100	100	100	☐	C	☐	100	100	100	100	100	90	100	☐	90	100	100	100	85	80
[redacted]	☐	100	90	90	80	☐	90	90	100	100	100	☐	C	☐	100	100	100	100	100	100	80	☐	90	100	100	80	80	80
[redacted]	☐					☐						☐		☐								☐						
[redacted]	☐	100	90	100	100	☐	90	80	100	100	100	☐	C	☐	100	100	100	80	100	80	80	☐	100	100	100	90	90	80
[redacted]	☐	80	80	80	100	☐	100	100	80	80	100	☐	C	☐	100	80	80	100	80	100	100	☐	90	100	100	90	95	80
[redacted]	☐	100	100	100	80	☐	90	90	80	100	100	☐	C	☐	100	100	100	100	80	100	80	☐	90	100	80	100	80	100

Figure 5:


The overall e-Learning content is understandable
The e-Learning modules are easy to navigate
The Class Portal is easy to navigate
The self-registration process is easy to use
The learning objectives for this course were clearly stated in a Kickoff Call
The e-Learning content is interactive
I have been able to access the class Portal and e-Learning modules through networks
The e-Learning content is engaging
The Kickoff Call prepared me to navigate the class portal
I have been able to participate in the virtual session calls through the Defense Connect
I have been able to access the Class Portal and e-Learning modules through the USAF
0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
KEY:
Strongly Agree
Agree
Neutral
Disagree
Strongly Disagree