Tangible Strategies for Aligning Your Processes with Agile

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ABSTRACT

This paper describes a victory: how a highly functioning project team adapted a traditional software development methodology while staying true to the Manifesto for Agile Software Development, converging the two to meet both process maturity requirements and the project's needs. The project has been an overwhelming success. The resulting software has aided customers in not only meeting but exceeding their mission goals, and the project team has remained cohesive, happy, and productive.

Introduction

In the software development world, “process” is a dirty word. Process implies stale unnecessary rigor that bogs down creativity and the swiftness with which products can be delivered, potentially impairing momentum. Mention process to a software development team and watch the resulting eye rolling. Using an Agile approach seems so much better – the antithesis of following a cumbersome process.

Here’s something you may already know. “The Agile Manifesto” includes 12 principles, one of which is *At regular intervals, the team reflects on how to become more effective, then tunes and adjusts its behavior accordingly* (Agile Alliance, 2001). The trick, in terms of processes, is determining how the secret synergy of processes can work best; how a project team can employ necessary rigor while letting team members stay in the flow.

G2

Victory over the process conundrum came by way of a project funded by the US Department of Energy’s (DOE) National Nuclear Security Administration (NNSA). Its name is a mouthful: the NNSA Program Management Information System Generation 2, called simply, “G2.”

In February 2007, G2 was the brain child of a meeting wherein the G2 system’s initial functions, design assumptions, budget, and schedule were agreed upon by a federal NNSA sponsor in Washington, DC, and an IT project manager based at Oak Ridge National Laboratory (ORNL) in Tennessee. The goal was to have a functioning G2 system by September 2007. At the time, G2 was a program information and performance management system that integrated DOE headquarters and national laboratory scope, schedule, and budget information at the project level, creating a single repository of data. It also integrated financial data for budgeting and cost reporting in addition to providing geographic information systems (GIS) visualization to monitor work progress worldwide. One of the fundamental requirements of the system was to provide DOE with a “common truth” for reporting at a time when the program office was experiencing budget increases at a 70–80% rate. The visibility and expectation of the program to achieve its mission, “to reduce and protect vulnerable nuclear and radiological materials located at civilian sites worldwide,” (National Nuclear Security Administration) was increasing, and the G2 system was integral to the process, both for planning and progress reporting. To have data integrity issues was unthinkable. To miss the September deadline was also unthinkable. Imagine the pressure.

The G2 project was then, and still is today, a project that moves at breakneck speed. Don’t be fooled though. G2 is also all about excellence. The expectation for every member of the project from the executive sponsor through the ranks of team leads and down through the entire project team can be put into one word: Excellence. A desire for excellence drives the team. Retaining that excellence and staying on deadline is tough.

Rooted in Agile
So G2, conceptualized and rooted in excellence, was kicked off using the Agile development methodology. A team of developers sunk everything they had into daily scrum meetings, working religiously with the customer to hone in on what was to become the G2 system. Many, many, many hours of concentrated effort later (including one particularly long and frenetic July 3rd evening prior to a July 4th deadline), G2 v1.0 was deployed. On time. And was excellent.

The executive sponsor was happy, which meant so was the project team. Because of the constant desire to do more and improve, the G2 project kept rolling, the focus now turning to how to enhance G2. Make it better. Improve upon its excellence.

Nurtured by Process
As time passed and the project team had a chance to try and catch its collective breath, little pockets of concern arose. How do you sustain momentum on a project with back-to-back intense sprints? How do you remember what you did or why? Someone suggests an improvement. Who? Why? When? Where is that information kept? Does the sponsor concur? What about all those findings from testing that might be really great enhancements? When and how would those be addressed? The G2 project team used effective but rudimentary tools for tracking: a spreadsheet for the backlog; a project portal for defect tracking and resolution; a development tool for decomposed requirements and sprint definition. And a lot of past history resided in people's heads.

Three years later, in 2010, the project team had grown, and G2's IT project manager decided to investigate incorporating some additional process rigor, with the caveat that anything considered for inclusion had to be meaningful and relevant. By virtue of being a government agency, DOE had a documented software development lifecycle guide (DOE G 200.1-1A) known as the *DOE Systems Engineering Methodology (SEM)*. Since G2 is DOE-sponsored, a choice was made to adhere to SEM and make it work. But, SEM has a reputation of being old and clumsy. It's built for waterfall development. Its level of rigor is high. A business analyst was brought onto the G2 project to determine a workable approach for incorporating SEM-based practices into the project's Agile-based processes, bearing in mind that G2 had a highly functioning project team. The "if it ain't broke, don't fix it" axiom applied. The pressure was on to see how a seemingly outdated methodology could be used to improve upon something working pretty well. But remember, one of Agile Manifesto's 12 principles is *At regular intervals, the team reflects on how to become more effective, then tunes and adjusts its behavior accordingly* (Agile Alliance, 2001). It was time. Let the challenge begin.

Instituting Change
There's a trick to determining how the synergy of processes can work best; how a project team can employ necessary rigor while letting team members stay in the flow and it comes in the form of a question. The most important question that can be asked when making decisions about a project's process is, "Does this make sense for us?"

SEM, like any methodology, is prescriptive and attempts to serve multiple masters. It requires 43 separate artifacts plus in-stage assessments and defined stage exits (or gates) to move on to the next phase of development. What was the goal? Exhaustive plans that cover everything from make/buy decisions to training? No. One overarching project plan that has staffing, budget, risks, technical approach, and contingency planning? Yes. Comprehensive detailed procedures? No. Key procedures for development and deployment? Yes. The easy way out would have been to create 43 artifacts and call it done; the proverbial boxes would have been checked. But, that wasn't the challenge. The challenge was to find that optimal juxtaposition between SEM and Agile.

Making It Worth It

To get the most value out of the effort, everyone had to know what was being done and have a chance to participate. The team learned that what was critical to successful change was ensuring team members' concerns were not only heard but considered. Over the course of about a year, a series of meetings were held so that the way the project already worked could be understood and documented. What followed was a natural upshot of each of those discussions, the keen awareness that there was room for improvement. As the team became more self-aware that improvements were coming from within and weren't for the sake of "instituting a process," so came the affinity and solidarity for invoking change.

Defining a Process

Ironically, defining the team's process became a process. By implementing the six steps shown in in Figure 1, the team instituted necessary change.

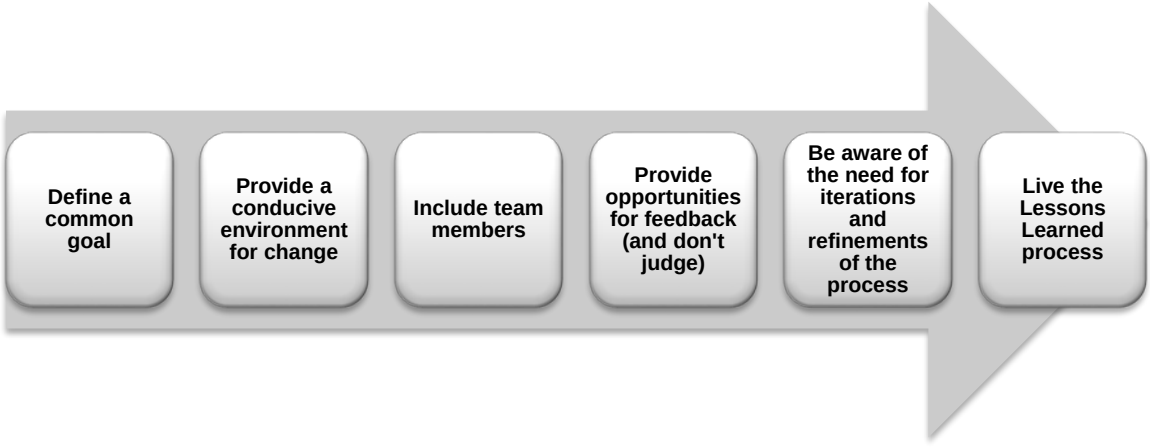

Figure 1 – Defining a Change Process

Table 1 lists, in practical terms, how each step was implemented on the G2 project.

Table 1 – The Cultural Change Process for G2

Step	As put into practice on G2
Define a common goal	Sensible adherence to SEM while maintaining Agile roots
Provide a conducive environment for change	Ensure the leadership team is not only onboard but advocating change
Include team members	Engage the full team
Provide opportunities for feedback	Provide every opportunity for feedback
Be aware of the need for iterations and refinements of the process	Refine the process as needed
Live the lessons learned process	Hold retrospectives while still listening at all times

So what ultimately happened? You can safely assume the requisite SEM artifacts were not created. Instead, a significant amount of time was spent understanding the intent of all those documents and working to create a set of artifacts that would ring true to the G2 team as well as live up to "the spirit of the law." Seven documents were authored that undergo an annual review, and nine others were instituted that are maintained on an ongoing basis (see Figure 2).

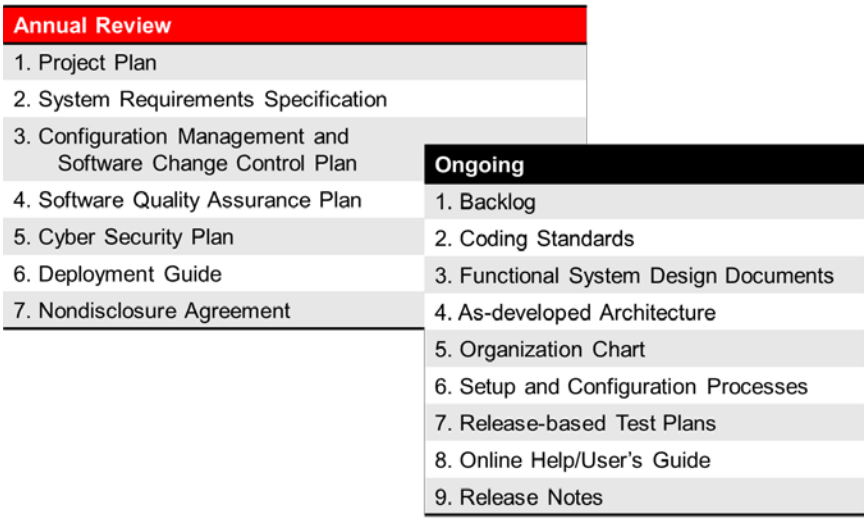

Figure 2 – G2 Artifacts

Progressing through Time

The following year, in 2010, the team embarked on what it thought was the final step of the initial process journey, this time focusing on project management, attempting to understand the connection between the PMBOK® and SEM's lifecycle stage requirements as well as Agile practices. Process mappings were created to understand compliance and address gaps. It was imperative to find a straightforward way to document what was done and why. On G2, it is called the Process Mapping Table (shown in Figure 3).

PMI Knowledge Areas	PMI Project Management Process Groups				
	Initiating	Planning	Executing	Monitoring and Controlling	Closing
Project Integration Management	• *G2 Project Charter*	• *G2 Project Plan* • Product Roadmap	• Daily Scrum • Weekly Team Meetings • G2 Project's SharePoint Site • User Training Materials • *G2 User Guide* and Online Help	• Daily Scrum • Weekly Team Meetings • Retrospectives	• Release Notes • User Acceptance Verification • User Training
Project Scope Management		• *G2 SRS* • *G2 CM and Software Change Control Plan* • Backlog (and Backlog grooming) • Release Planning Meetings	• Design Documents • RTM • Source Code and Deployed Code • Customer Demos • Deployment Guide	• Meetings with Executive Sponsor • QA Testing • UAT	
Project Time Management		• Backlog (and Backlog grooming) • Release Planning Meetings		• Backlog (and Backlog grooming)	
Project Cost Management		• EAC		• EAC Reviews • Monthly Cost Reporting	
Project Quality Management		• *G2 SQA Plan*	• Application Test Plans and Reports • QA Testing • Code Reviews • Peer Review	• Defect Reporting • Process Audits	
Project Human Resource Management		• *G2 Project Plan* • G2 Organization Chart • G2 Project, Nondisclosure Agreement	• *G2 Project Plan* • Daily Scrum • Backlog (and Backlog grooming)		
Project Communications Management		• *G2 Project Plan* • *G2 SRS*	• Daily Scrum • Weekly Team Meetings • G2 Project's SharePoint Site	• Daily Scrum • Weekly Team Meetings • G2 Project's SharePoint Site	
Project Risk Management		• *G2 Project Plan* • *G2 Failover Plan* • *ORNL Cyber Security Program Plan Supplement: Nonproliferation Systems Hosted Applications* • Product Roadmap • Backlog (and Backlog grooming) • Release Planning • Daily Scrum • Weekly Team Meetings • Retrospectives • Task Board • Interconnection Security Agreement between G2 and the National Security Alarm Training (NSAT) system		• Daily Scrum • Weekly Team Meetings	
Project Procurement Management		• *G2 Project Plan* • SOWs • Source Selection Criteria	• Subcontracting Agreements • Internal agreements with ORNL IT Services Division	• Contract Compliance • Receipt of Deliverables	• Contract Termination • De-obligation of Funds
Project Stakeholder Management	• *G2 Project Charter*	The Agile development method (used on this project) is based on routine and continuous stakeholder engagement spanning the Planning, Executing, and Monitoring and Controlling Project Management Process Groups			

Figure 3 – G2 Process Mapping Table

The G2 Process Mapping Table correlates recommended activities in the PMBOK with G2's verifiable objective evidence of compliance with them. In the black column are the PMI Knowledge Areas, and in the red header are the PMI process groups. When a cell is shaded gray, it indicates that the PMBOK contains recommended activities for the process group/knowledge area combination. The Process Mapping Table lists not only plans but Agile activities, as these interactions are as much a part of the team's overall integrated project process as the documented plans.

Good News Bad News

In early 2011, the G2 team was flying high. NNSA received notification that the G2 team won the 2010 PMI Distinguished Project Award. The entire project team flew to Washington, DC, and joyfully partook in the recognition ceremony and life was great, until a monkey wrench appeared. In 2013, two things happened that would have a significant impact on G2: (1) the G2 sponsor, the one who'd envisioned it all in 2007, got a promotion, and (2) DOE retired SEM. The team was in shock on both counts.

First, the promotion – The G2 sponsor would be leaving his post and heading to the NNSA executive offices…and taking the G2 project with him, meaning lots of new project scope. Good thing the team had documented its process as there was a lot of knowledge to impart on the newbies.

Second, SEM – DOE decided to replace SEM with DOE Order 415.1, which, as it turned out, had as part of its guidance the option to follow practices in, of all things, the PMBOK! Remember the Process Mapping Table? Thankfully the decision to understand the connection between the PMBOK® and the project's practices was a good one.

Success – By Accident or Design

Today (March 2016), the G2 team stands at roughly 50 people (including both the development team and product owners) and has had some growing pains. Staffing up has been a challenge, one that the team still struggles with in areas such as onboarding, knowledge transfer, and reinforcement of the axiom that simply adding staff does not mean more functionality will be delivered faster (aka nine women can't make a baby in a month).

It took about a year to cycle through the team's artifacts and not only remove the references to SEM but ensure, in conjunction with that effort, that the team documented and implemented current guidance in a meaningful way, still asking (and answering), "does this make sense for us?"

Finally, the one constant that the team has had through the years is great people. When working to invoke cultural change, to improve a highly functioning Agile team: Listen, gather necessary data, and proceed with intention. Typically, highly functioning Agile teams include subject matter experts who have unified to meet a common goal. And they are in a battle with time. Given that, to invoke change, listen to what the team is saying. Does it sound like "same song, different day?" How many

days have you heard the song? Is it just a person or two who's voicing a concern or is there a theme? Are people going outside the process? And if so, why? Highly functioning Agile teams thrive on communication and trust. Listening, gathering data, and proceeding with intention takes out that unspoken element of mistrust. For a highly functioning Agile team to change, they have to see and accept the benefit of the change and have a level of trust in it.

The original G2 sponsor had a saying about hard work versus luck – you need a bit of both. By all accounts, the G2 project has been a success. The team's hard work (and luck) has paid off in terms of deploying and maintaining a wildly successful system and receiving not only the PMI award but other internal and industry awards as well.

Seven years after our process journey began, we claim momentary victory. Momentary because just as systems continue to improve, so do processes. Victory because our *esprit de corps* and our commitment to Agile (and each other) are as strong as ever.

References

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