

The Evolution of Managed Change in a Complex IT Enterprise

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We are members of a contract team charged with performing all aspects of the operations and maintenance of a complex and diverse enterprise network at a Department of Defense customer site. After years of rapid reaction to mission updates, management changes, and varying requirements for governance of technical change in the environment, we found ourselves managing an enterprise that was not well understood and becoming prone to unexpected failures. Over the past two years, our team developed a managed service transition process for change implementation, navigating technological complexities and influencing workplace culture to create a mature process that has delivered positive and predictable results for effective change.

Our contract team operated the enterprise for several years without strong and consistent processes for managing and implementing changes across the operational environment. Our top priorities were always to support the mission first, which sometimes resulted in IT process discipline becoming a secondary priority. Although proposed enterprise changes received formal approval, they were sometimes executed with inadequate planning and were frequently implemented suddenly and without understanding of the second- and third-order effects. This led to situations in which technicians were sometimes working without coordination, resulting in technical problems that couldn't be traced definitively and successes that could not be quantified easily.

This inconsistent change process created a working culture for our team of reacting to uncertainty as our "normal." Although we never had a catastrophic, sustained failure, we spent considerable resources in damage control after deploying changes. A second-order effect of this was that we frequently increased overall complexity by adding technology tools to "fix" our problems rather than directly focusing on our root problem of change control.

These challenges became highly visible when technicians began making preventable mistakes during change deployment, sometimes resulting in a reduction of enterprise services to key user groups for the time it took for problem isolation and resolution. Even though these events usually only lasted minutes, they gained enough negative attention from senior leadership that disciplinary actions were taken for some contract team members. Often, we were forced to stop all change to the environment and review and report any proposed change meticulously, resulting in even more instability to the network as planned critical patches and improvements became backlogged.

To address increasing leadership pressures and head off a perception of growing instability in the environment, we started having a daily change review meeting. Approvals were granted based on well-informed, technical discussion. The culture at this time placed considerable burden on a small group of select, trusted experts on our team and largely sidelined others, resulting in staff frustrations and growing attrition rates. These daily meetings didn't significantly reduce the number of failures or increase overall stability, but they did raise awareness of the number of changes happening, and they helped us gain control over awareness of change success rates and resulted in fewer surprises. This first step helped us to realize the importance of cross-discipline communication and coordination.

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Understanding What's Important, and What Is Critical

As we continued to struggle through change implementation, winning small battles and making incremental improvements, pressure to dedicate resources to managing and controlling change began mounting. To address this need, the operations manager for our contract designated one technician to take on an additional duty to start a change management cycle that would start with a regular “Subject Matter Expert (SME) meeting,” with the necessary and relevant technicians from each IT section required to attend and discuss change details. SMEs began to help collaborate to develop the process and meetings by staying engaged and taking the process and its purpose seriously. This was not without challenge given the fluidity of operational requirements and changes in personnel and responsibilities that slowed any real cultural change. After about four months, the instability of the group and the early process started to gel; after six months, we were starting to receive change requests from across the team and even other organizations, leading toward our process becoming the focal point for all IT change implementation across the site. Because the process introduced independent rigor, which resulted in a slowed pace of change, we received initial resistance from internal stakeholders. This required us to instill more formality into the process and to develop stronger management commitment for process deadlines, and we started focusing on building customer buy-in for the importance of process discipline.

During this evolution of building, strengthening, and enforcing process requirements, more pressure was applied to implement change with even greater reliability. This pressure resulted in a more formalized meeting structure for change review and more scrutiny on implementation procedures. Our early and loose “SME meetings” became more formal cross-divisional “Technical Review Meetings” that mandated attendance from all IT sections, including Engineering, Cyber Security, and the implementing sections. One Technical Review Meeting became two, an Initial Technical Review and a Final Technical Review meeting to provide “check and balance.” Simple PowerPoint slides explaining the details of the changes evolved into Remedy ticket reports with detailed documentation showing execution plans, validation steps, and back-out plans. We developed, documented, and disseminated formal, program-level procedures clearly defining the terms, roles, responsibilities, workflows, and much more of how change is processed for implementation. As this progressive evolution was occurring, our changes were becoming more organized, predictable, and more visible. Our change implementation success rate rose steadily and dramatically.

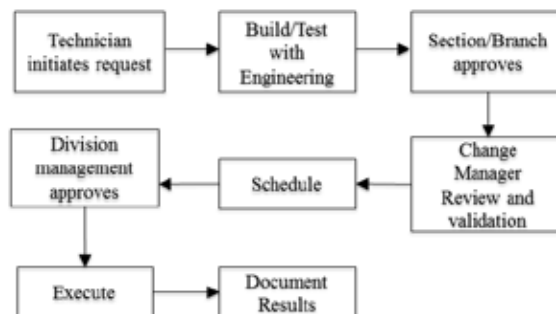


Figure 1: The initial workflow we developed for our change management process

A Formal Training Program Emerges

Although the process at this point had been documented and was becoming established, we still lacked a formal training program. Technicians were still sometimes applying changes outside of formal change control procedures. The process and procedures were there, but unless the technician understood them, the process was all but useless. Several examples became apparent where technicians applied uncoordinated changes, thinking that corrective actions and routine tasks would not require change control. These kinds of events led to increased pressure and scrutiny on changes and the processes governing them.

After another thorough review, we concluded that the process was sound but that there was no programmatic way for new employees to learn it, so it was time for formalized training and communication. Over a period of a couple of weeks, we developed a comprehensive and detailed training program, complete with workflows as shown in Figure 1, terms and definitions, requirements, roles and responsibilities, and timelines. This solidified the process and provided a road map and reference for people to use to submit change requests and to understand the timeline they should expect for planning purposes. After formal documents were disseminated and mandatory formal training provided, our change management workload increased dramatically. Over time, with an improved understanding of how the process worked, people began to better manage expectations, better plan their changes, and slow the overall rate of change. This led the different work sections to become more organized and to decrease the number of “emergency” changes that would circumvent process.

A Formal Process Is Finalized, with Room for Growth

The next phase in our implementation plan included developing a post-review process to identify, document, and disseminate lessons learned when planned change did not complete as expected. We had developed a strong process that worked well for producing success and rolling back from failure, but the process had no provision for anything other than success. This resulted in a lack

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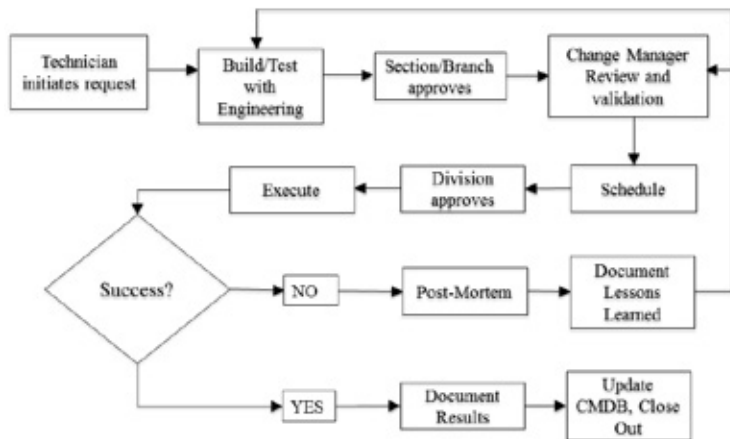


Figure 2: Our workflow after adding in feedback to deal with failed changes

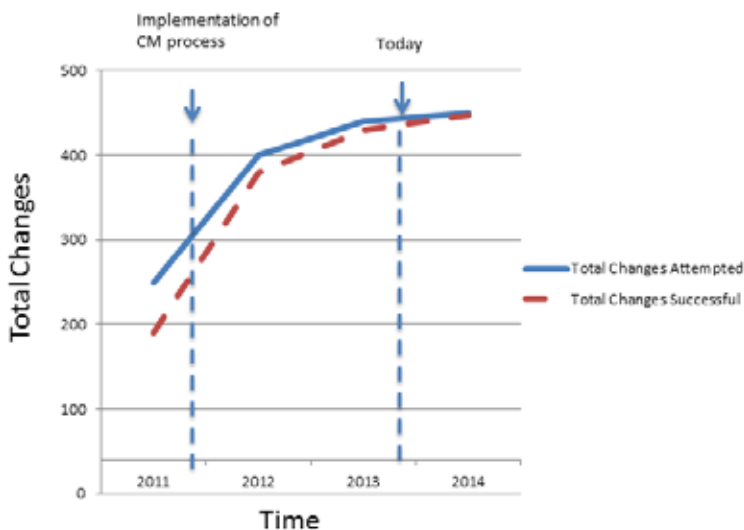


Figure 3: During the three years of this process, we have reduced the rate-of-change for new changes, while increasing our success rate.

of real understanding of failures and loss of opportunity to revise techniques and procedures based on lessons learned. We added an after-action review “post-mortem” branch to our formal process, as shown in Figure 2. When a planned change has any result besides full success, we call a post-mortem meeting with all the people who were part of planning and executing the change, as well as people responsible for system monitoring, service desk, storage, and other relevant technology families. This post-mortem meeting is organized and facilitated by the change implementation manager with senior operations and engineering leadership support, resulting in a collective approach to understanding the problem. The overall environment is explored, frequently with whiteboard diagrams. These reviews explore the need for process or procedural adjustments, the specific plan for the failed change is examined, and a play-by-play of the actual change event is discussed. This is all reviewed with a focus on discovering failure points where wrong decisions

were made or where a test plan didn’t reflect the operational environment. The culture of the post-mortem discussion is non-retributive: technicians are encouraged to “own your failure” so all can learn from the event.

Our Managed Change Process Today

Over the years, this natural growth of a process benefitted from some good decisions, and a little luck. The decision by senior leaders to encourage the development of the process, to prove it, formalize it, and then get it sanctioned from the bottom up rather than the top down led to broad buy-in from our contract technical staff. The early decision to keep meaningful records of change over time was essential for “proving” the value; we learned that results matter.

Over the past three years, we have made approximately 1,000 changes to our enterprise. Of those, we have had 4% completed unsuccessfully. Figure 3 shows the three-year trend of changes and failures. Noting that the presence of a strong process was an influence on reducing the rate of changes made is important. Although our actual change numbers continue to increase over time, the number of changes relative to the consistently growing complexity of the enterprise is actually decreasing. Things that would have been casually done three years ago are now scrutinized and planned meticulously. If these “casual” changes are no longer being done and the environment is more stable, concluding that we’re avoiding unnecessary change, reducing the opportunity for change failure, and preserving stable systems in stable states is easy. By ensuring all change follows a rigorous review process, we gain much deeper understanding of the overall environment and better knowledge of what actually needs to change.

Conclusions and Future Work

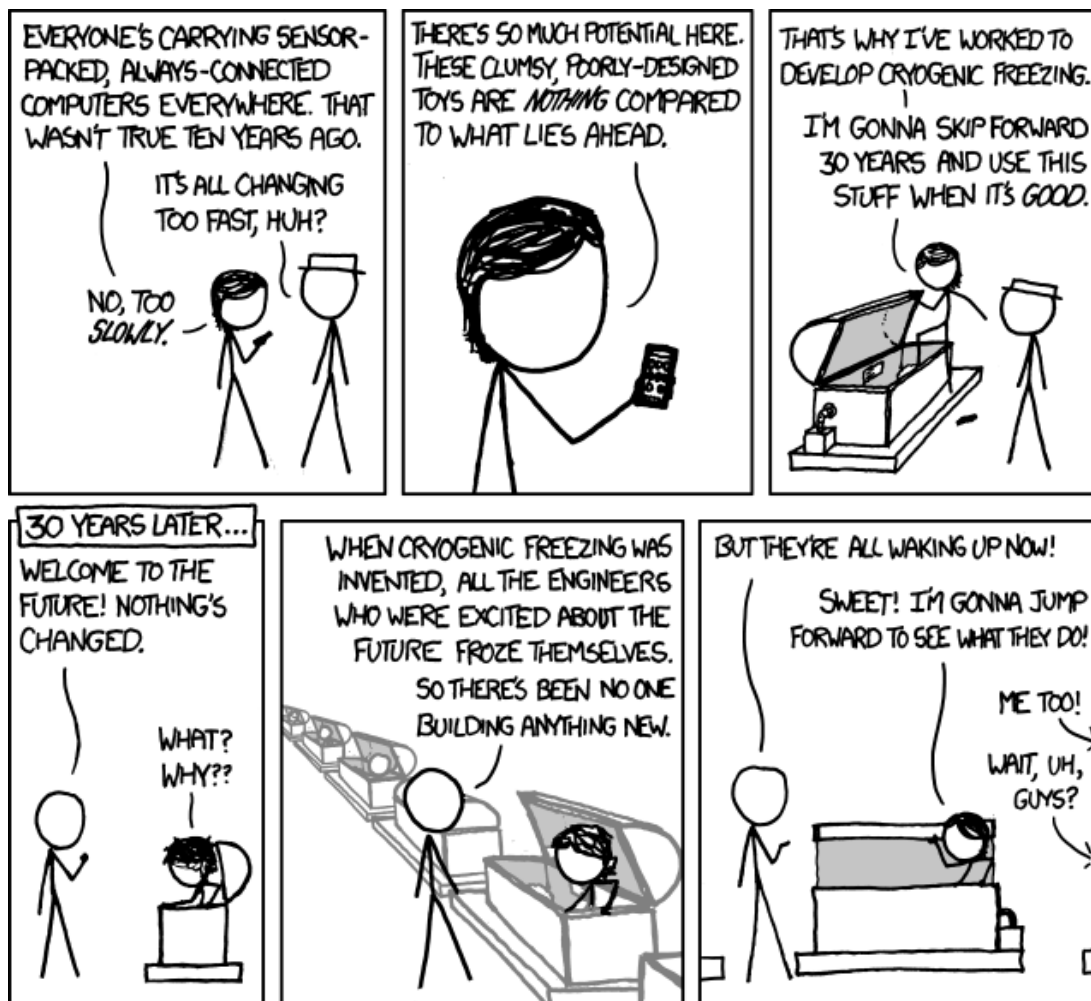
Our enterprise was grown organically, driven by reactive, operational imperatives. Leadership changes over time resulted in different focus areas and new tools layered one on top of the other, creating a complex, poorly understood environment. Concepts such as the Information Technology Infrastructure Library (ITIL) were known, but over the years there was little time to formalize process. The change implementation process grew the way the enterprise did, by necessity and in reaction to challenges. Once we slowed the pace of attempted change, and after we had an opportunity to reset the technology baseline with a major overhaul of the datacenter, we were able to apply real rigor to a process that guides change implementation rather than just focusing on the change itself. Although ITIL informed and influenced our new change process, ours is not specifically an ITIL process. In the coming year, we will be growing our change process to encompass other key ITIL areas, such as release management

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and configuration management, and we will tune existing steps to ensure ITIL alignment.

The future of IT change in our enterprise is becoming such that the environment is always understood, changes are always tested where possible, and change failures are always embraced as learning opportunities. Our goal is 100% change success through a living process that is embraced by all levels of our team and is easier to follow than to bypass. With improvements in the speed of change approvals and increases in overall throughput, such a process would allow an increased rate of successful IT change.

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