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Don't Throw Away Your Shot: Rise Up to Change the Narrative for Construction Management

An Operational Practice prepared for SCTE by

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1. Introduction

It was the summer of 2017, Hamilton was the hottest show on Broadway. Data hungry consumers were straining the network and there was one looming question the Broadband provider couldn't answer: How can I build my existing network to be bigger, better, faster?

In a company built by acquisitions, network construction knowhow was managed by local knowledge, teams and antiquated systems running DOS. The organization was anxious for change. The company had to prepare and scale the next generation of construction to accelerate growth.

Enter a young(ish), scrappy and hungry crew that never spliced cable but needed a job. Management gave them 5 months and bowls of cashews to fuel their mission. Look three years into the future, assess how the birth of a workflow management platform became the center of the construction universe and, in the words of the C level execs resulted in "not too many complaints."

This paper will test a basic hypothesis of organizational change management: do people, process and technology have to move together in the same direction to drive change? It will argue that technology can drive organizational change and it will outline the inputs necessary to do so. It will further demonstrate that a group does not need to "own" the work to transform the work. It will articulate a bold approach to the routines and rituals required for agile technology development to translate into incremental organizational changes. Most importantly, it will challenge its readers to re-think their methods of driving change with construction and design resources in an ever-evolving race to construct the fastest data delivery network.

2. Building a National Tool Started With a Pivot

The first attempt to build a tool was called Polaris, referring to the North Star sailors would use to set their course. Polaris was conceived to set the course for how capital expenditures would be managed to build out network infrastructure. This tool was intended to help standardize the way the enterprise works with 3rd party Business Partners, and to become the source of truth for all construction activity, capital dollars spent, duration and quality of work completed. But after some time and substantial software investment, Polaris was still just an idea – or rather, a conglomeration of ideas collected over time, without any unifying vision or purpose.

While the Organization developed a nationwide infrastructure strategy, its 15 regions had uniquely different ways of managing the day-to-day of it, from walkout surveys to permitting and plant construction. Every region agreed that a national tool could be helpful, but none wanted to change the way they were operating. Regions would commit to getting their teams to use Polaris only if their specific, ever-growing list of features were delivered. In an effort to gain user adoption, the Polaris team had implemented somewhat arbitrary capabilities, based on disparate requests, from the most vocal regional users. The irony is that while trying to build a tool that would work for everyone, they built something that didn't quite work for anyone. The pressure to on-board Regions into Polaris was mounting, but the tool had only a handful of test users and the executive team couldn't get a clear answer on what was needed to launch.

In the summer of 2017, Polaris was handed off to a new software development team, with instructions to "fix it, fast." A technical deep dive yielded the brutal truth: it was not usable. Not even the technical foundation was salvageable. Neither the development team nor potential users seemed to know the answer to the question: what problem are we trying to solve? Without any reusable code, clearly documented requirements in place, or shared vision, the new leadership team recognized that "fixing" Polaris was an impossible task.

Lesson 1: Know When to Pivot

In August, Polaris was shut down. In September, P2 was born. By January 2018, P2 would need to support a Pilot market with an actual workflow. The bold decision to shut down a 3-year effort and task a new team to build a working tool in 4 months' time was the catalyst to *fan this spark into a flame*.

P2 (short for Polaris 2) began with a clear mission in mind: build a national tool that would help manage the flow of construction, with a common set of goals and language.

> Mission Statement: P2 is an enterprise-wide integrated workflow orchestration tool that tracks the progress of all construction job types – providing visibility into status of milestones, accurate cost of each project, the data to build forecasts, and the ability to roll up those metrics to a national view.

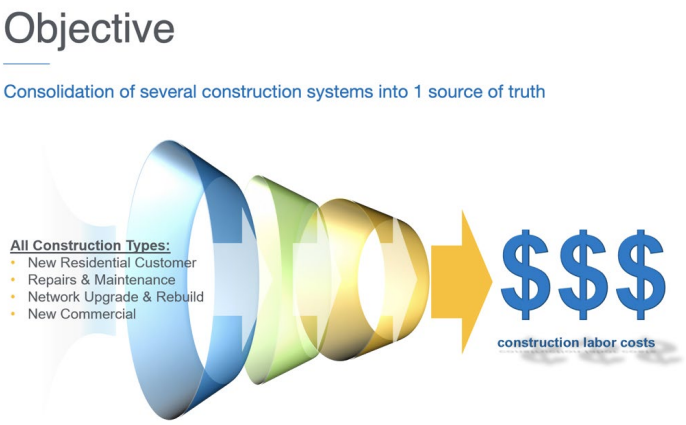

Figure 1: P2 Platform Objective

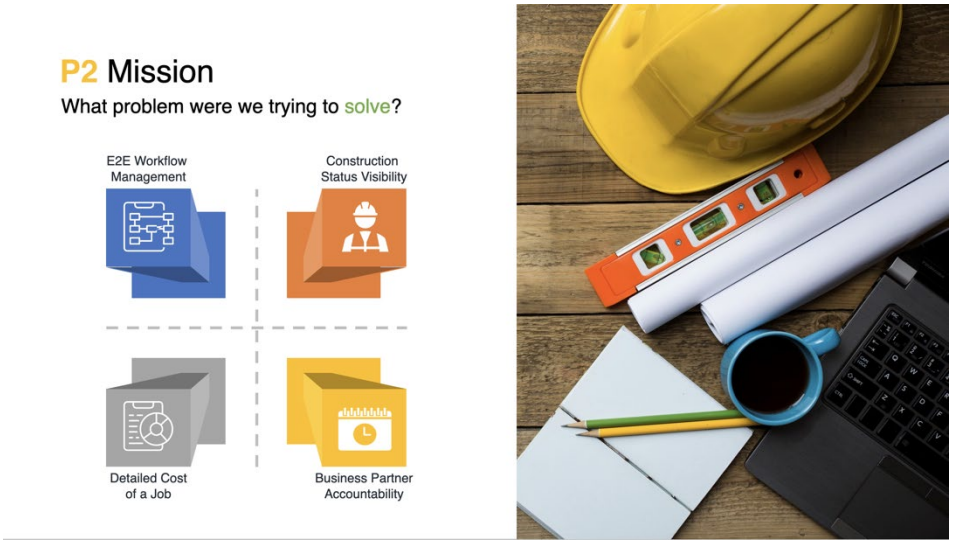

Figure 2: P2 Problem Statement

The plan was to build on that belief shared by all 15 regions that a single tool, that provides a national view of all construction builds, would be useful. But, moving 5,000+ users onto a new standard platform meant that many of the teams across those regions would need to change certain processes and ways of doing things. And change is hard.

Comcast's construction teams had been building out the network for years, which meant they had well established ways of managing phone calls, marked-up paper maps, post-it notes, spreadsheets, and local databases to keep the flow of production moving. In their minds, this insider know-how, sometimes collected over decades, had been optimized for their circumstances. Aerial coax construction to replace a span? Who else could more efficiently complete this build than the guys who pull cable in their towns every day? The original Polaris team struggled to find a meaningful benefit for end users to transition to a new platform; what incentive existed to drive change? With a pivot to P2, there was an opportunity to clearly identify and communicate "the why" and benefits of change.

The "why" was a parallel initiative called Fiber Deep. Comcast was about to deepen its investment in constructing a proactive network upgrade architecture that would increase capacity in the short term and pave a way for growth in the long term. The challenge was that this was a new kind of cable construction that was unfamiliar to many. It was massive in scale, impacted entire geographic areas, and the volume of this type of work was expected to grow with time. As work was increasing, it was clear that phone calls and post-it notes wouldn't be enough to keep these large-scale projects moving on time and budget, and the existing databases couldn't be refactored quickly enough to support this use case. Visibility of related work and automation to speed up data entry or help with calculations were identified as critical needs. The development team realized that building an intuitive way of managing these types of projects in a set of workflows would be compelling enough to persuade users to adopt the tool.

Lesson 2: Talk Less, Smile More… Ask Many Questions

The P2 team set out to build this new tool, that would support a new process, managed by new teams. Given the specific scope (Fiber Deep), but with many unknowns and open questions, it was a perfect situation to apply a *Design Thinking* framework. In Design Thinking, the goal is to use the following process to design a solution:

1. Empathize – to think about the community of people needed to be served, the roles they play, the challenges they'll have and what they'll care about
2. Define – based on their challenges, identify what will that community need, what is a problem that needs to be solved?
3. Ideate – brainstorm to come up with a wide range of ideas to tackle the problem identified
4. Prototype – build a small proof of concept that can be demoed, and that allows user interaction
5. Test – run experiments to test the hypothesis, allow users to engage with the prototypes to validate if the idea really solves the problem

In the months that followed, the P2 Team spent hours, days, weeks with the Construction experts. This was a small team of software developers who didn't know the first thing about construction, but knew how to really listen to people in order to *Empathize, Define,* and *Ideate.* These rich discussions gave the team enough direction to start iterating on a prototype of a single Fiber Deep workflow. During this time together, the P2 Team continuously strove to do two things – 1) show incremental progress, no matter how small, and 2) build trust by always delivering on a commitment and being transparent about the process and any mistakes or missteps. These frequent discussions, small feature demos and iterative development based on their feedback, gave the Regional Construction teams a sense of ownership in the workflow that was being built. By December, the P2 Team had built enough of a workflow framework, and enough advocates, to bring key Regional team members together in Philadelphia to demo the *Prototype* to prep for a January trial.

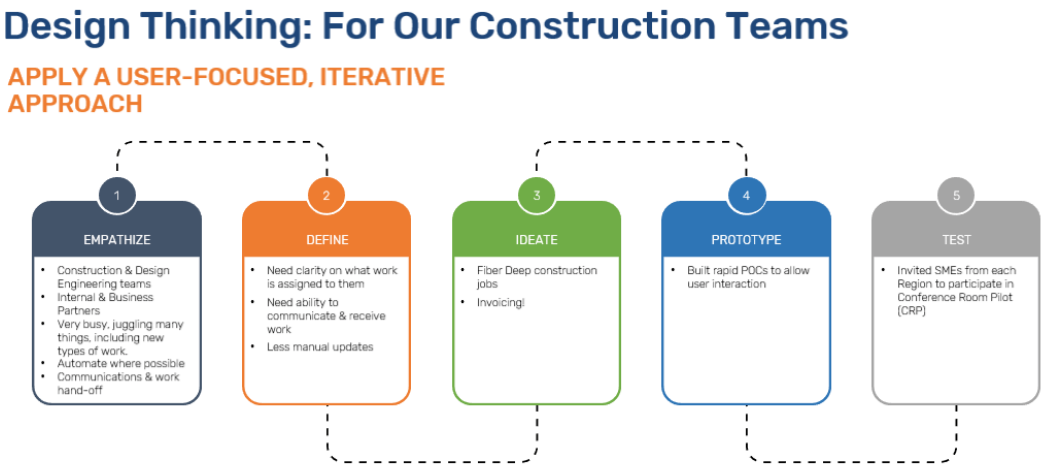

Figure 3: Design Thinking Applied to Construction Workflow

Lesson 3: Build Advocates… *in the Room Where It Happens*

Although constructing Fiber Deep builds involved a new process, a few Regional teams had already begun their projects and had strong opinions about how to implement these outside plant changes. The P2 Team knew that in order for a National tool to succeed, these Regional teams would have to develop a common language and come to an agreement on what really matters when managing these projects. The purpose of this large meeting was not only to demo the prototype, but to have the local experts and decision makers from each Region sit in the same room, debate the controversial topics, but leave with a shared commitment to live with whatever compromise they made. These sessions, which were called *Conference Room Pilots (CRPs)* allowed stakeholders to have a seat at the table, to voice their point of view on construction nomenclature, or the kind of specific attachments a vendor should load when submitting an invoice, and everything else. But, no matter what was debated, a decision was required at the end.

When decisions were needed on topics that reached an impasse, the only way to move forward was to vote. The vote was a sacred ritual, each of the three divisions got two votes, representing their Finance and Construction organization, as well as the voice of their regions. Once a vote was cast, and a decision was made, it was prioritized. Some change requests, like field labels, were quick to change and if a decision was reached in the room, an engineer made the change on the spot. Some requests, like standardizing construction quality audits, were agreed to be important but could be addressed outside of P2 in the short term and added later. Finally, a handful of decisions would require Executive Leadership input prior to implementation.

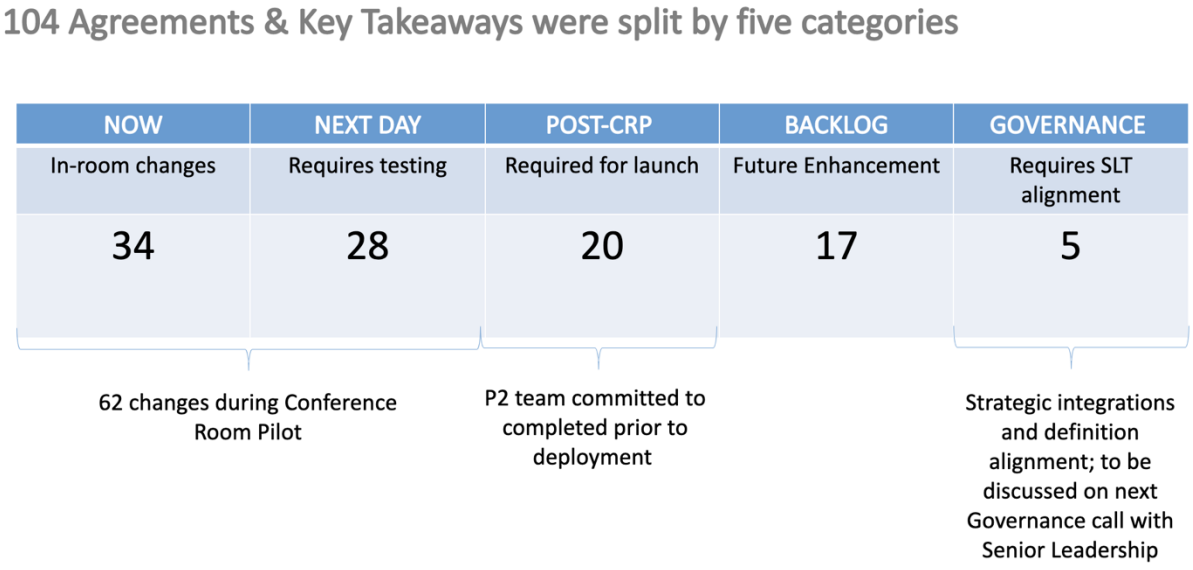

Figure 4: Conference Room Pilot Agreements Output

The Conference Room Pilots gave an opportunity for the people *in the room where it happened* to own the process that was being built into the tool. Debating the topics made their ideas and concerns feel heard, and voting gave them agency, even if the outcome wasn't exactly what they had proposed. As the team closed out on its first of many CRPs to come, they got the commitment from one of the Fiber Deep Project Leads to run a Pilot of the tool in their Region. A Pilot would allow the team to take their prototype and *Test* whether they got the solution right. What many folks did not know is that that in those early days, the P2 Tool only supported one Workflow, in one Region, for one Design Business Partner, and one Construction Business Partner. Yet, it was enough to run a Pilot. In software product development, there is a concept called "MVP," which stands for Minimum Viable Product. Building an MVP workflow, with continuous demos of small incremental progress, and by building trust in local advocates, was enough to prove out the value and benefit of managing Fiber Deep in a single tool. At the launch of the Pilot, the tool still had many gaps in functionality and many unanswered questions about process, but it didn't matter. The development team continued to iterate, develop and deploy new functionality each week, closing these feature gaps in both small and meaningful ways.

The Pilot began with a handful of Users in the production tool and the P2 team talked with them every single day. Users would join each day to let them know which buttons they clicked, which ones they couldn't find, which headers were confusing, and about a plethora of missed requirements. Each Pilot User had the personal cell phone numbers of the product development team. The development team ate feedback from this pilot community for breakfast, lunch and dinner. The P2 team continued to build on the trust and transparency established during the initial engagements. They always fully embraced and encouraged criticism and feedback about the tool, the process, the interactions with the Users. Both internal Construction team members and Business partners trusted the team enough to immediately inform them if a feature wasn't working. They all knew that sharing that feedback, however rough, was the only way to get better.

Lesson 4: ***When You Got Skin in the Game, You Stay in the Game***

As the Pilot continued, additional Regions agreed to come on-board. New requirements were identified with each new project, but decisions were always brought back into weekly calls where all Regional experts had a chance to weigh in and vote. The development team continued to work closely with each new Regional team to understand their challenges and needs, and fix things that weren't working for them. By November of 2018, the P2 Tool had become the national workflow tool for all teams that had Fiber Deep projects to manage. It had grown from 10 Users to about 150 Users across the country, all executing the same construction workflow in in P2.

With the Pilot, and incremental, iterative changes, P2 had managed to drive standardization across 15 Regions using technology to pave the way. Change was starting to happen. But the majority of new build construction workflows still needed to be accounted for. The number of Regional teams, decision makers, feature gaps, process changes needed to support all construction, increased exponentially. The development team continued to leverage the CRP format to quickly *Empathize, Define, Ideate, Prototype,* and *Test* workflow changes needed to support the variety of workflows needed. They spent the final few months of 2018 in a full-blown marathon to develop and deploy all the capabilities needed to manage all construction in P2. Local advocates built over the course of the Pilot evangelized the benefits of the Tool and helped strengthen the call for everyone to transition over to the new way of working.

By 2019, all three Divisions agreed to launch P2 across all their Regions in the first quarter of the year. The transition to National deployment, where all 5000+ Users across every Region and Business Partner were on-boarded to this new platform was not easy. For one Division in particular, adopting P2 meant migrating away from an existing legacy tool that had been in use for over 10 years. But the Construction

teams that had helped to build this tool could see the value of a single platform, and made the commitment to push through the challenges and adapt to the process changes that came along with it.

Lesson 5: "Aim" for "Not Too Many Complaints"

Immediately following the full adoption of the P2 Tool, the development team met with the Cable Division Finance Executives for a progress briefing. As the team gave a demo of the tool and an update about the launches, an Executive remarked – "based on where you are in this process, I haven't received too many complaints." In this meeting, it became clear that one indicator of success was not how many praises P2 received, but that it didn't draw, "too many complaints...." The motto became an anthem.

3. Piloting is Easy, Scaling is Harder

Lesson 6: When You need to Operate at Scale, Process Must Also Be a Product

The successful launch and adoption of the P2 Tool had much to do with the trust that was built between the Users and the development team. Thanks to the frequent touchpoints through the CRPs, daily chats and regular meetings, the Users felt like their needs and requests were always being heard. This feedback loop gave the Users and the development team comfort in knowing there was clarity on the list of problems that needed to be solved, and the path to ideate and validate different approaches. However, as P2 was adopted as the National Construction Tool, the User community grew from 150 to 5,000 users in a matter of weeks. At that scale, personal phone numbers and chat messages to the development team would not work; the product development process needed to maintain that trust and User engagement also needed to evolve.

To that end, the P2 Team added a Product Operations group, whose objective was to build the processes and communications channels needed to support a User community at scale. Rather than have people pick up a phone or send an email, the Product Operations team built out a self-service ecosystem that gave every User a path to look up release notes, FAQs, read documentation, watch training videos, and submit enhancement ideas. CRPs evolved into Product Trials, where the *Test* part of the product development lifecycle now included more structure around how to collect feedback, measure success, and how to troubleshoot issues when something didn't work as expected.

Product operations is critical to ensuring the platform can build with empathy at scale – supporting all Users where they are and giving them an equal voice, even if they don't have the phone number for a member of the product development team.

Lesson 7: *Every Action's an Act of Creation* – The Criticality of Process, Post-Launch

By using software to identify the work being performed, P2 became the center of the construction ecosystem. Technology had fanned the flame of change by bringing all regions together to loosely follow a high-level set of processes. Furthermore, having everyone work in a single tool provided an opportunity to use consistent language to talk about construction activity. The P2 platform provided the foundation to align around one national strategy to deploy a proactive network upgrade architecture. While P2 could provide data on how construction was progressing, it became clear that a governing body was needed to determine how to measure if the enterprise was successful in its implementation and create a forum to adjust policies around process and compliance collectively.

In early 2019, just as P2 was getting deployed nationally, Construction 2.0 (C2.0) was born. Just like P2, Construction 2.0 had a clear mission statement:

> "Construction 2.0 is a construction business operations ecosystem that compliments the strategy of fast, efficient growth through standardization and alignment of roles and responsibilities, processes and procedures, tools and reporting, and performance management."

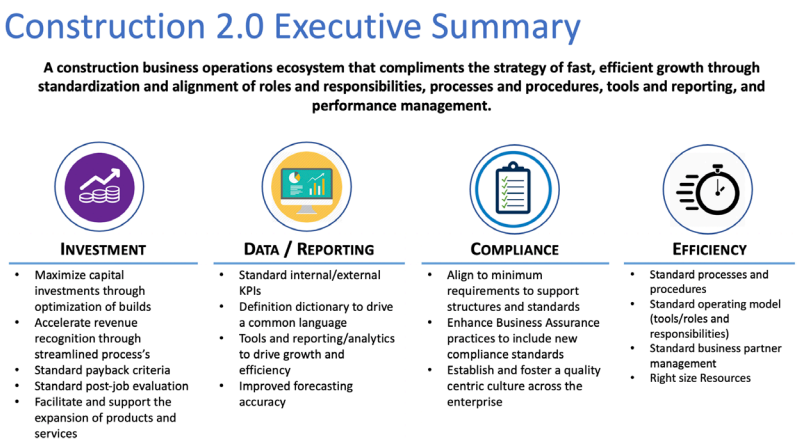

Figure 5: Construction 2.0 Charter

The inaugural C2.0 summit was the first time in the enterprise's history when Regional and Divisional representation came together to prioritize a construction process improvement roadmap and establish and agree on an approach to execution. The summit was the first deliberate step towards organizational sameness.

After the initial summit, the C2.0 team quickly discovered that gaining alignment to process, policies and standards would take a different level of effort to achieve sameness across the enterprise. Rather than starting with a focus on Roles and Title alignment, C 2.0 rationalized that by prioritizing the standardization of processes most critical to the business, those politically stickier issues would naturally follow.

Working teams were established with key Divisional and Regional representation, and facilitated by a member of C2.0. The working sessions were bucketed into four main categories to work through the prioritized list of national process changes and included:

1. Business Partner Process Standards
2. Sales Interaction Process Standards
3. Construction Standards
4. Strategic Software Integrations Standards with other National tools that impact Construction

The P2 Team was brought in if an organizational process change necessitated changes in the tool. This integrated approach allowed C2.0 to marry process and policy decisions back into the existing P2

workflows. For example, in the early development stages of P2, there was general consensus that quality audits were critical to construction workflow but it would require a process change. That process change was managed in the Construction Standards workstream discussions and the P2 team was present to collect requirements for development.

In addition to the working meetings where all the "sausage making" was occurring, governance and update forums were stood up. The Governance meeting facilitated fast alignment, and brought the most important decisions to leadership coming out of the working teams. The update meetings consisted of monthly program calls to keep the broader stakeholders informed and quarterly updates to keep senior leadership in the loop.

The governance structure was critical. Each Division had a voter and a proxy voter for both Construction Ops and Finance to ensure the organization was making well-rounded decisions and created more meaningful meetings; it was consensus driven decision making.

Lesson 8: Make Progress to *Get a Lot Farther by Working a lot Smarter*

At first, the governance decision making process was clunky, and the conversations were spent trying to understand the problem and the solution being solved for, versus making a decision to implement a new national process or standard. To address agility, C2.0 had to change the way it presented recommendations during governance.

To address quicker decisions making monthly Governance forums were limited to one hour and only included two topics: Decisions and Ideation items. For quicker decision making, a "pre-voting" process was implemented. The process involved all governance decisions and supporting documentation to be sent to leadership one week in advance of the meeting. Each division workstream lead was instructed to meet with their leadership on upcoming topics to inform the vote. Each voter would respond to the template via e-mail with their verdict. Anything aligned to pre-governance no longer required discussion, which saved time for topics where alignment was more challenging to garner. The ideation section consisted of strawman proposals to ensure the workstreams were solving the highest priority items with a general identification of the problem that required solving. Once prioritized and ideated, most all of the heavy lifting and debate on process change happened within the workstream teams.

Once decisions were made, several ways to communicate the change were implemented. To support the change management process more locally, a core group of division leads received launch documents. Each document provided pertinent information to support the communication of the change such as background of what is being launched, intended audience and FAQs. Internal stakeholders had access to a standards portal housing national standards and The Construction Hub portal that housed national policies. A Business Partner Portal providing standards and policies for design and construction business partners was also created. Where process changes impacted P2, the Product Operations team would build Job Aids or Awareness documents to summarize impact to P2 Users.

These structures enabled C2.0 to solution quickly, garner the appropriate approval from leadership to implement, disperse information to stakeholders and partner with P2 team as the solution unfolded. This cross-pollination of process and technology allowed C2.0 to care for the most important items in a manner that would yield quick wins in terms of user functionality, tool compliance and overall standardization sameness. It created a formalized way to share best practices and either adopt or augment those practices to fit the enterprise. It pushed the organization towards the sameness in a way that was agile and manageable for the ecosystem to consume.

4. You fought in this war, what was it all for?

Once the entire construction community is in one system, it created fractal changes within the organization. The C2.0 governance forum created a place to assess priority of new system integrations to trigger an action or provide status to other orgs that had interaction with the outside plant design and construction community. Within the 18 months of launch, P2 integrated with other national applications to process:

- Sales orders that required construction plant extension to new customers
- Capacity augmentation work that required outside plant design/construction activities
- Survey requests to determine total cost of construction prior to a customer sales commitment
- Procurement warehouse data to cost out materials required for a construction build
- Purchase order balances ensuring fund availability to complete a build
- Visibility of construction status to all construction activity to anyone in the enterprise
- Maintenance requests requiring outside plant construction resources to address

Three years post the initial pilot, the C2.0 governance process is continuously prioritizing additional integrations to ease communications across the organization.

5. Conclusion

Change is often difficult to accept. When a large organization is facing the need for meaningful change across the enterprise, it can be a challenge to get existing teams on-board to implement them effectively. In more traditional approaches to change management, the people, process and technology need to be fully defined in order to execute the asks. With P2, the team proved that Technology can be used to drive organizational change, even if the organization wasn't ready to answer every process and people related question. By allowing Technology solutions to remain agile, to flex and change to prioritize the highest impact needs of the organization first, you can get people to join the movement. With time, the incremental changes in behavior and process, driven by small, iterative changes in the Technology, will build up to the meaningful change you were striving for.

Using an agile approach, local knowledge can be leveled up and turned into enterprise best practices. This can, in turn, be used to propel the organization towards sameness, and drive compliance of tool usage and standards application. Facilitation of a collaborative approach, fostering a growth mindset, making it safe to fail fast and course correct while in flight can drive consensus and alignment needed to manage change effectively.

As your organization and solutions scale, process becomes more critical to the success of its growth. At a certain inflection point, a more formal process will begin to drive the change, with Technology supporting both. The results of weekly incremental change over a period of three years for the enterprise resulted in an ability to scale the network nationally, in a standard way for years to come.

6. Acknowledgements

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Abbreviations

NGAN	Next Generation Access Network
SCTE	Society of Cable Telecommunications Engineers

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