Research Report: Building Awesome
Turning Concept into Reality in the Face of Adversity
A Superintendent's Journey

by Sean Van Tyne

August 2018

Why Read This Report

The Construction industry is "ripe for disruption" is both an overused term and an understatement. The McKinsey Global Institute (MGI) conducted a study that shows the construction industry is going to be disrupted by evolving technology at an ever increasing pace. MGI stated in their report that if the construction industry had followed a similar productivity curve as manufacturing, the world would be $1.6 trillion dollars richer.

The Van Tyne Group and Thinking Engines conducted a study with several commercial construction companies looking for opportunities for unprecedented improvement. They learned that the Superintendents are the key to disrupting this industry.

Discover why removing the barriers to success and properly empowering Superintendents are key to disrupting this industry.

Key Takeaways

Superintendents are helping to build amazing structural legacies which require complex interactions while speaking many different languages on top of constant firefighting, critical decision making and acting as a peace maker to make sure everything stays on track.

One of the most important jobs of a Superintendent is coaching and mentoring but their time to do so is being decimated. In fact, Superintendents spend 6 to 8 hours per day on paperwork which is a travesty.

Superintendents are best utilized when they are able to empower their teams to increase efficiency, improve quality and safety, thus allowing them to shine. They are doing this best when they get out of the trailer and into the field. Something needs to be done in order to get them back to building.

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by Sean Van Tyne
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Overview

Working with several commercial construction companies ranging from $10 million to $4 billion, Thinking Engines, Inc. and The Van Tyne Group conducted a study looking at opportunities for innovation in the construction industry. This study shows that the Superintendents are the key to success for construction quality, production efficiency, safety, risk management, employee retention and growth that ultimately builds the brand of each construction company. They are the glue that holds everything together.

Background

For this study, Thinking Engines interviewed 44 construction professionals from 10 construction organizations. The Van Tyne Group was brought in to facilitate a superintendent journey mapping workshop with superintendents and key stakeholders to better understand the daily activities of superintendents to identify issues and opportunities. The goal of the workshop was to map the journey of the superintendent to understand each activity he/she does to determine how to improve their current experience and ultimately quality of the job and their lives.

A journey map is a visualization of a process. It is a map of the phases and steps that a person (in this case, a Superintendent) goes through to complete a particular goal or multiple goals. It is a map of what they are doing, thinking, and feeling at each interaction or "touchpoint." For this map, we were interested in better understanding the Superintendent's daily journey. We wanted to understand the Superintendents' challenges at their touchpoints – what frustrates them, what the barriers are - and what delights them. These insights reveal opportunities to best improve their experience.
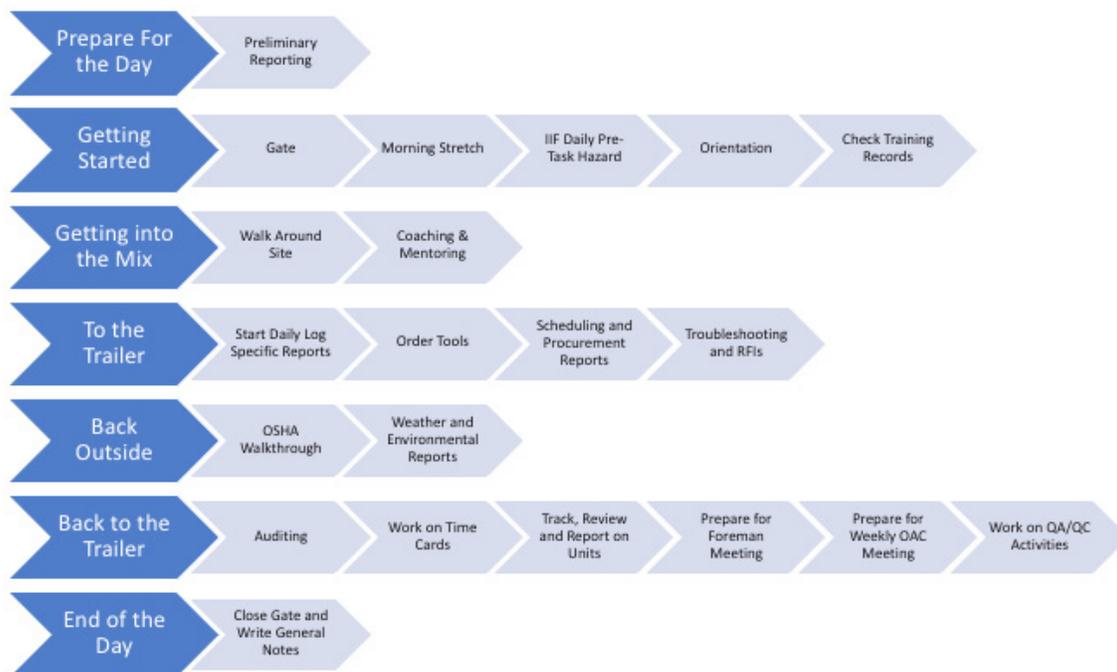
FIGURE 1 The Superintendents' Journey

For the journey mapping session, there were representations from the Field, Operations, Project Management, Safety, Warehouse Operations, Human Resources, and Estimation. The facilitator led the discussion with the group as they walked in the footsteps of the day in the life of a Superintendent from early morning to late evening – from preparing for the day, first entering the site, orientation and training,

paperwork, reports, schedules, troubleshooting, meetings, emails, phone calls, texts and more. Note-takers captured what the participants shared as insights on the journey map at the appropriate phase activity and interaction. Interactions included behaviors, attitudes, needs, wants, expectations, barriers, opportunities and more.

After the session, the 365 insights were analyzed and initial findings were validated and revised appropriately with key stakeholders including subject matter experts. When the findings were finalized, recommendations were determined and action steps were created with the Team and Senior Leadership.

Findings

Superintendents wake up at 2am thinking about critical activities. They get onsite early, check to see what happened the night before and address issues. Sometimes they can't get a hold of the warehouse or the warehouse doesn't have the tools they need or the warehouse sends the wrong tools… either way, work will be delayed.

Walking around the site, Superintendents look for safety items, work progresses and quality. When Superintendents don't spend enough time walking around, many things can go wrong… There is barely enough time to give critical feedback for safety let alone provide positive feedback to develop career growth. Superintendents would love to have a solution that tracks good behavior and job performance so they can easily reward good workers.

The average amount of time spent on electronic and physical paperwork ranges between 6 to 8 hours per day. Additionally, if there is a poor internet connection, it takes longer. In many cases, Superintendents are dealing with multiple systems, manual entry, human error, bad data, and they don't know who to ask for help. Because of this, Superintendents do much of this after work at home.

Tracking materials, job completions, injury reports, time cards, and a multitude of other reports are not done on time or accurately due to poor communication, people moving around, inaccurate information and many other factors. Even the owner, architect and design team are not always timely. Some people intentionally don't come to the planning and status meetings to avoid confrontation which makes it challenging to keep everyone up to speed. All of this delayed and inaccurate information has a cost…
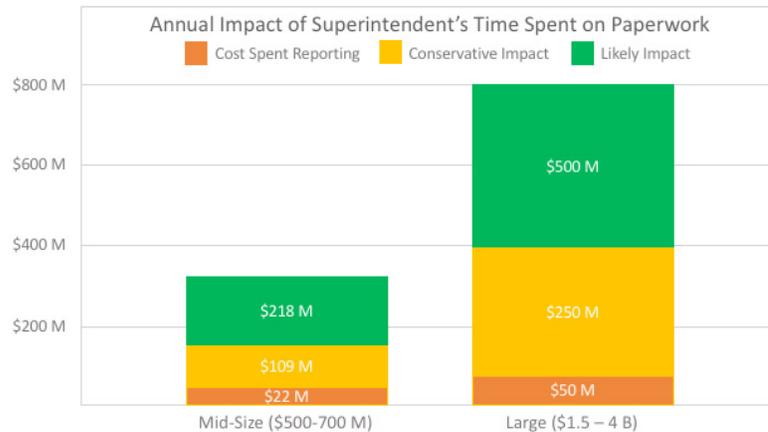
Superintendents are helping to build amazing structural legacies which require long days of constant firefighting, critical decision making while acting as a peace makers to make sure everything stays on task and on budget. They are doing all of this while their most valuable time walking around, coaching and developing the team is getting squeezed less and less by the day. In fact, the Superintendent spends an average of 6 to 8 hours per day filling out paperwork, completing electronic forms, working in the trailer in various applications and there are often days they never even get the chance to get out in the field where they shine. Something needs to be done in order to get them back to building.

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Annual Impact of Superintendent's Time Spent on Paperwork

| | Cost Spent Reporting | Conservative Impact | Likely Impact |

*Companies in the annual revenue range of $10m to $100m spend $936,000 on reporting
with a conservative impact of $4,680,000 and a likely impact of $9,360,000.

FIGURE 2 Annual Impact of Superintendent's Time Spent on Paperwork by mid-size and large companies

"You must look at both direct costs and indirect costs, or hidden costs...
at five to seven times the cost." -AGC's Supervisory Training Program

Preparing for the day. Superintendents wake up at 2am thinking about critical activities like yesterday's issues and the warehouse orders. They call/text/email the warehouse, foreman and subs. It's a bad start when they can't get ahold of someone and it's a good one when everyone responds on time. They hope that everyone will be there - and with a good attitude.

Getting Started. As they drive up to the gate, the Superintendent looks to see who is there and if the material delivery is there. They check to see what happened the night before and if there were issues. They are delighted when the foremen are there and other folks (forklift operators, subs, etc.) have already opened the gate.

Morning Stretch and Daily Planning. The first thing they do is gather everyone for the Morning Stretch, play catch with a football and do pre-test planning. The Superintendent is looking for engagement and feedback. It is a successful morning when everyone is in a good mood and engaged. They gather in groups and go over the work activities - discuss possible encounters, safety, risks and tools needed. They go over critical activities like what are the events which could come up and what risks each group may have. It is expected that everyone understands what needs to happen. It is a pain point if someone doesn't show up. It is especially bad if there is no HR paperwork or lack of necessary forms. They will adjust crews as needed by activities and skills if someone doesn't show up. If permits aren't there, it is a pain. They need to post the permit information in an area easily visible. They would love to go electronic (some subcontractors do already).

Orientation. All employees participate in orientation. They sign up new employees and owners every day. The orientation is specific by jobs. Everyone needs to sit in orientation (i.e. owners, city officials, etc.). It is expected that everyone pays attention to the training. They use videos for general orientation and oral presentations for specific projects. It is a challenge if the video doesn't work. If the video is not specific enough then the workers do not pay attention. Videos alone are not enough. Superintendents use the orientation talks to assess the skill level of the workers. If someone is "green" they will make sure a more senior worker will keep an eye on them. If someone is a "rock star" then they give them more autonomy. Supts' are looking for workers who are proactively helping (next generation of leaders) and looking for enthusiasm. It is also a time to assess if a worker shows up impaired and needs to be sent home or if there are language barriers outside English and Spanish that need to be addressed.

> *"Superintendents are interacting with a large number of people with various degrees of experience from different departments (or other responsibilities within the project) such as estimating, legal, human resources, safety, governmental organizations and project ownership. It's this complex interaction that requires them to speak many different languages in order to be really successful."*
> -Josh, Field Coordinator-Ryan Companies US, INC.

Check Training Records. Check union card with barcode reader – looking for certified training. The Asset Protection Team is thinking about spreadsheets, photo copies of certificates. It is expected that training is current and valid. Workers cannot work if training is not valid and/or current. It is hard to capture all the sources of training records. There is human error when entering of training records. Ideally, they would like to collect data from unions and store it electronically (scanning) and to work with the unions to get training certificates.

Superintendents don't spend enough time supervising. Walking around the site is the best part of the day for the Superintendents. Checking progress and seeing if everyone is doing what they said they would do. Looking for safety items like PPE, work progresses and quality. It's a good day when everyone is doing their job well – giving the owners what they're paying for and it is frustrating when someone is not spending as much time as they should (craft – quality). While walking around, Superintendents become aware what they forgot to order. Everyone comes up to them and lines begin to form. RFI's are electronic forms and a painful broken system with design issues. The time for the walk is getting shorter and they need more time to supervise. When Superintendents don't spend enough time walking around, many things can go wrong, like re-work and lack of ability to improve quality. Can't catch issues the first time and have to wait until the 59th time. Some days they don't get to walk at all which is a major pain point. It is a successful day when the main focus of the day is to walk around, and Superintendents get to talk to everyone.

Provide Coaching & Mentoring. In addition to walking around the site, coaching and mentoring is one of the best parts of being a Superintendent. Supts' became Supts' because they are top performers. When the Supt' has a bad day, they sometimes want to go back to "bending nails" because of the pressure. But coaching and mentoring gets them excited about bringing up the next generation of leaders. There is not enough time to provide coaching and mentoring. There is barely enough time to give critical feedback for safety let alone provide positive feedback to develop career growth. The work ethic is changing with millennials. Millennials are leaving after 8 hours whether the work is done or not. There needs to more and better leadership and management training in order to keep them motivated.

Back at the trailer there is a mountain of work. Supts' write RFIs, text field staff, email architects, etc. and there are constant interruptions preventing the work from being completed. In fact, the average amount of time spent on electronic and physical paperwork ranges between 6 to 8 hours per day. If you have a poor internet connection, the mountain of work takes longer to complete. Some days they just want to bang their head.

There is not enough time in the day to do the daily log. When Supts do the daily log, they think through issues, weather and schedule, etc. They may take notes on paper throughout the day and do the daily log after work at home which is a problem.

> *"Superintendents take a lot of pride and responsibility in their work which means they often times put in a lot of extra hours to make sure the job is done right."* -Justin, Kalcon LLC

The foremen call the warehouse and schedules orders. The warehouse would ideally like 72-hour notice to track down the tools and get them to the site to do the job. But in reality, foremen and Supts call when they are on the way to the job and need the tools now. The warehouse gets about 30 calls per day. They scratch orders on paper then transfer to sheets. Order slips are then scanned in. They only have limited drivers delivering tools. Sometimes you can't get a hold of the warehouse or they don't have the tool you need or the tool they send you doesn't work.

There is not enough time to do scheduling and procurement reports at work. It takes uninterrupted mental time and often the Supts do this at home. They sometimes use more than one system which don't talk to one another. They want basic duration per square feet. Each Supt' has his own schedule estimating information in their heads and they need data for all of it - for estimating and for others to know how long the Supt' needs and who they need to complete the job. They need more training on how to create a baseline for scheduling because a lot of the Supts knowledge base is siloed by Supt. They also need the data onsite to sync with other applications. The system standards are ideally driven by cost code. The goal for many construction organizations is to move from individually tracked estimates to a systematic approach to compare the previous schedules with their own knowledge base. In many cases, they are dealing with multiple systems needed to transfer to one estimate. The data is bad, and they don't know who to ask for help. All the data is currently stuck in reporting. It is not consolidated which can create future problems. There's a lot of manual data entry which creates a lot of errors.

Troubleshooting and RFI's are typically done from processing information from the Walk Around. The Supts research information from the activities observed. There are times when the Supts do RFIs themselves and send it to make sure it's done right. There are a number of resources the Supts interact with when doing the RFIs, including the Architects, Foreman, contractors, Engineers, owners, PM and, Building Officers. Typically, the submittals are drawings on paper or electronically, blueprints and various systems. Sometimes owners are not timely with the responses (decisions) required to keep the projects on time. The owner, architect and design team are not always timely with tasks and can delay up to 5 days depending on the agreement. Sometimes the delegate does not do the job or subcontractor drops the ball which can create additional delays and require additional troubleshooting. And if permits are required, it can take a long time.

OSHA walkthroughs are every six months. Since it is an infrequent task, it can be set up while on the job or at random.

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Environmental Reports. Silica dust, CO and/or CO_2 requirement reports vary depending on seasonality and the number of small spaces, etc. There are some concerns about people passing out from CO. If it happens, it must be reported. These activities are generally delegated to the Foreman. It is expected that the environment will be checked and monitored a couple times per day depending on the site and level of dust. The need to monitor the environment is more frequent for medical projects. The information is gathered with a wearable Carbon Monoxide device, manually documented in a notebook, and stuffed into a physical file folder. Cement trucks and concrete slabs generate CO_2. Silica statistics are site specific which are electronically stored and reviewed. The future of silica requirements is unknown.

It is expected that Superintendents document events every day and write the report once per week. Data is gathered and put into the safety log report per regulations. The policy is once per month for others. Many times, the systems that are provided to the Superintendents to do this work are perceived as "broken" and "bad software". Daily injury reporting is another report with way too much manual entry. They would love the ability (and the time) to have a solution where good behavior is tracked and reported so they could easily recognize good workers and reward good behavior. It's a good day when there is time for reflection of what happened with the ability to communicate action and findings.

Foremen should be doing time cards on a daily basis and also keeping track of production. The reality is it is "one flipping headache" with so many codes that they want to give up. Entering a person who's on vacation is a pain point. It's a challenge to verify who is entitled to benefits as some of the Supt's believe it takes from other jobs. The challenges with the current processes stem from inaccurate communication, people moving around, tracking issues, guessing what people have worked on, trying to estimate if the information is accurate, and reaching out to HR to enter a person into the system. It can take 3 to 5 people spending 1 to 4 hours working on identifying the information and entering it into the system. This can be exasperated by homegrown "free systems". If the reports are not done daily, then they there is a high likelihood of having inaccurate data. The delay in time cards can add up. Another challenge is its manually entry. The manager can't see information about PTO. Trying to remember everything can create issues like wrong or missing cost codes and trying to fix wrong cost codes is a pain.

Tracking materials and job completions should be done daily for accuracy, but it's not always done every day due to not enough time to complete them. With some organizations Supts can't enter units without hours on a job which requires additional work. When they are done accurately, it helps with cost projections which are eventually shared with the Estimating team. Due to the system limitations the sometimes create a false record of time because they may have forgot to enter information and they have to get the report done. Often times there are deadlines associated with the reports which must be done on Mondays regardless if it is a holiday.

Testing Quality Assurance/ Quality Checking (QA/ QC) is often be done by a 3rd party. It includes resources from the design team. Quality requirements need to be in agreement with the Supts and Safety. QA/ QC activities are conducted using design documents and mock ups including physical mock ups (building mock ups in a warehouse, testing labs, etc.). The documentations and processes are done on paper, by calling resources and walking around the site. The Supts are looking for deficiencies to help ensure quality standards are adhered to. The consistent feedback is they could use more people to add documentation for QA/ QC and they would love an all-in-one solution which could be used for estimating and communicating activities. A challenge would be another set of reports with the new process for QA/QC for the Supts. The goal for the QA/QC activities are a trouble-free building and giving the owners what they paid for.

Planning reviews are usually done once per week. The Foreman needs to be prepared for the meeting. They help put together the Meeting Minutes for the discussion. Some of the tools being used are a TV, Ignite, PowerPoint and other supporting documentation. A barrier to success is when there is a lack of attendance.

The Owners Architect Contractor (OAC) meeting is held once a week or once in two weeks. It is a face-to-face status update meeting led by the Project Managers (PM). The PM is expected to share the agenda before the meeting and bring the schedule along with the required updates. It is a different elevation from Foreman's meeting. Some people don't come to the OAC meeting to avoid confrontation which makes it challenging to keep everyone up to speed if they don't show up. A good meeting ends with grabbing lunch after.

End of the day. Unexpected things can happen at the end of the day, including OSHA showing up, the Owners, Architects and late deliveries. If there wasn't time during the day, some of the Supts use voice to text on drive home and/ or write their general notes. Most Supts do more work when they get home for another 30 to 90 minutes... before waking up again in the middle of the night thinking about critical activities.

"*Superintendents must be honored for the work they do, they have earned it!*"
-Perry, Lean Executive Director Parsons Electric

Recommendations

Superintendents need an online system where they can check the status of issues whenever they want with updates and alerts that they can manage, pre-filled out forms with drop-downs of standard responses and easy search and look up with pre-saved searches. The solution needs to be mobile and tablet-friendly for the Supt to use onsite to manage schedules, training certificates, timecards, etc. Logs to manages safety, quality and progress and sync with other apps easily. A solution that integrates with the warehouse, environmental report and training programs.

Superintendents need an online system where they can check the status of issues whenever they want (to alleviate the stress that is waking them up in the middle of the night). The system should provide text with updates and alerts to the Supt that he can manage (for his or her piece of mind). There should be a surveillance system to track who comes onsite. This could be checked online and have texts and emails with alerts.

Troubleshooting and RFI. An online system or module that a Supt can log onto anytime with tablet and mobile app. Pre-filled out forms with drop-downs of standard responses. Pulls in necessary data to fill-in needed data. Easy search and look up with pre-saved searches. Address book to easily contact Foremen, contractors, Architects, etc. Easily scan/import drawings, blueprints and other files needed. Workflow and rules engine to track who needs to respond to requests with alerts.

Worker Knowledge Base. There should be an app to manage workers that is mobile and tablet-friendly for the Supt to use onsite. If workers don't show up, then the Supt should be able to easily reassign crews by that day's needs and skill sets. Less skilled workers should be 'tagged' and assigned a "buddy" to ensure that they get extra supervision and seasoned workers can be 'tagged' to have autonomy.

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The system should track who has completed the appropriate orientations, scan union cards and training certificates, and pull the latest data from the union and other related resources. The system should track and assign 'awards' or 'badges' to reinforce positive behavior and manage 'warnings' and 'process improvement plans'. Auto updates timecard – has benefit data, PTO and cost codes

Logs. The system should have easy to use apps for the Supt to enter data and manage safety, quality and progress. There should be auto-log real-time data, including who is there and count the subs onsite, weather data and other project-based information with the ability to sync with other apps. Voice to text should be available to help augment the auto-logged data to help with ease of use and the quality of the information. Scheduling management system that are cost-code-driven along with procurement system with data comparison for estimating with and API to integrate with multiple systems. Daily injury reporting system should be included along with Easily track materials and job completions and QA/QC management.

Warehouse System. The warehouse needs an easy (potentially tablet accessible) system to enter orders including an electronic order slip. The Supt and Foremen need an easy system for requesting tools – online (office, home), tablet (in the field) and mobile (on the go). And it needs to easily send back the wrong tool if it doesn't work. The system should track driver routes and the location of the tools both when in the warehouse and on the project site, so the warehouse and the requester can see ETA and ensure it is not lost, stolen or strayed so the project can continue to progress on time.

Environmental Reports. The System should track Silica dust, CO and/or CO2. Accessed online via desktop, laptop, tablet and mobile. It should provide status and alerts management (send alerts texts/emails). Integrates with wearable and other remote Carbon Monoxide and other sensory devices.

Training Programs. A leadership training program is needed to groom the next generation of leaders. Includes how to run an efficient project, meetings, conflict resolution techniques with tools and applications. Workers should be recommended by a supervisor for this special training. Supts need training to create a baseline for schedules