



DIGITALIZING CONSTRUCTION TO **ELIMINATE DOWNTIME**

Insights, stories and questions, for people in construction who want to eliminate downtime.



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A movement was
born to eliminate
downtime by 2025.

Welcome to the Whitebook

In June 2016, McKinsey published an article “Imagining Construction’s Digital Future,” stating that the industry is “ripe for disruption.” Less digitalized than almost any sector except hunting and fishing, construction had not only been a laggard in technology adoption, but was also struggling to get the basics right.

When we asked ourselves what happened – we used to be the cool guys – a movement was born to Eliminate Downtime by 2025. I pinch myself when I realize that at Trackunit we signed up to it nearly four years ago. Even in that brief time, we’ve discovered a willingness across the industry to be proactive and shape changes that are desperately needed.

Downtime. It’s the mother of all our problems

We call it the mother of our problems. In fact, downtime has a large litter of offspring with many different names including everything from machine breakdowns, construction deviations and worker breaks, to lost tools, machine idling, and a lack of informed planning. Each sibling brings with it knock-on effects, just to add to the chaos.

Downtime is a challenge that pervades every single corner of the construction industry leaving almost no stone unturned. It is for this reason alone that the response to downtime has to be an industry-wide movement. I’m happy to say that many companies and individuals from across the sector are already in. We’re seeing the evidence.

The purpose of this Whitebook is to curate the stories we’ve collected at major events such as ARA and Bauma, smaller conferences such as our own Predict Summit and Downtime X gatherings, and corner offices and site meetings. We’ve mapped them against the Downtime Model so you may reference them easily.

The Whitebook comprises 100 ideas to help eliminate downtime and increase productivity. Some of these may resonate with the downtime challenges you’re facing now; others may be more long term projects. This piece has no real beginning, middle or end - you do not need to start on page one and read through to the end. It’s there to stimulate your thinking, so just jump straight to content which interests you and use the overview as an orientation.

Use the Whitebook to formulate your own story

In documenting how others are tackling their downtime challenges, what stands out are ideas like collaboration, openness, and transparency. I've personally had a lot of conversations with people leading organizations as well as those at grassroots level. I have a strong impression that not only are the problem areas being identified, but solutions to them are becoming more visible.

Things are evolving. We want this document to be dynamic and ever-evolving. If you haven't already done so, sign up to the Eliminate Downtime movement. Connect with us, share your story and your experiences. It's important this happens because in all business decision-making there are always three questions – what's the problem, what's the solution, who else has done it?

Read on!

When we called downtime the mother of all our problems, we didn't realize that she had a big sister waiting in the wings. Nevertheless, coronavirus will run its course and the construction industry will bounce back. Trackunit launched the Downtime Utilization Index as a way for the industry to identify leading indicators that markets are picking up again. We've decided to put our data to use for the benefit of the entire construction community and invite others to do the same. Our hope is that we will all have extracted something positive from this period of enforced downtime – and even taken advantage of it.

Without the pressure of business as usual, companies seem to be taking this strange period to see how technology and new processes can be implemented in a way that augments raw talent to deliver a stronger, more creative, efficient, productive and – importantly – profitable thing of beauty.

No doubt, the next edition of this white book may include some even more adventurous stories as we continue our journey back to becoming the cool guys again.



Søren Brogaard, CCO Trackunit, April 2020

STORIES ON **HOW HUMANS DEAL WITH DOWNTIME**

Even the best technology won't solve the problems that we currently face. We need great ideas from bright minds to solve them - we need a human perspective. On the following pages, you'll meet ten inspirational humans from our industry and learn about how they are eliminating downtime.

What's your story?

YWIN

Reduce repairs to reduce your downtime

If you work at Boels Rental and start talking about improving uptime or reducing downtime, it won't be long before you run into a gentleman with the name of John Smeets. He is responsible for all systems and processes that keep equipment running.

Repairs and maintenance of equipment are one of John's biggest headaches, so he recently reviewed each step of this repair process and made some interesting findings.

Ordering parts takes 100,000 hours every year

To keep their many thousands of machines running, Boels currently makes 100,000 purchase orders for parts per year, adding up to about 823,000 parts ordered every year. The complete process from looking up parts, to ordering them, to completing the payment took nearly one hour each in the past, resulting in more than 100,000 hours lost!

But ordering the part is just one aspect. If a machine needs to be repaired, the complete downtime is 12 days in average.

Maintenance-related downtime reduced by 48%

It was key to understand and evaluate how different systems integrate and to align processes around the goal of delivering better customer value. One year after reviewing these processes and implementing fixes for the most apparent problems, results started to show. Repair and maintenance-related downtime were reduced by 48%. Time spent on ordering parts went from one hour to 13 minutes on average, saving them at least 80,000 hours per year!

Getting better at understanding data from our machines will fundamentally change how Boels operate if you ask John: "We need to learn more from the data in order to plan better and react faster."



John Smeets
Technical Manager
Boels Rental

We need to learn more from the data in order to plan better and react faster.



EVN



Ryan Pike
Operations Manager
Plantforce Rentals

The construction industry is catching up - we're not in the Stone Age anymore.

Use VR and AR for training

Ryan Pike is the Operations Manager at Plantforce Rentals, and he's a man on a mission! He believes AR (Augmented reality) and VR (Virtual reality) will change how we train and learn in construction.

Downtime in plant hire is typically the result of a breakdown of equipment, insufficient training, or a lack of industry understanding. In almost all of these cases, even some basic on the job education could make a substantial positive difference.

Learn to control heavy equipment in a virtual space first

It's tough to properly learn how to use heavy lifting equipment from reading a manual; in most cases, you'd have to steer it yourself, which can be quite a challenge for inexperienced individuals. An active construction site is probably not the best classroom in which to learn.

Ryan has started experimenting with using VR and AR for training before letting individuals control actual equipment. His goal is to provide training experiences just like the real world but within safe and managed confines.

Simulation training for all machines

Today, simulation training programs are available for practically any machine, with operators being trained in everything from safe working zones to equipment start-up routines and service. The results speak for themselves, with the additional benefit that technology enables performance, risks, and skills to be thoroughly analyzed.

Simulation training can be carried out away from the distractions of the site so that trainees can fully immerse themselves in the tasks at hand in a gamified atmosphere. Ryan got inspired by how other industries, from Formula One racing cars to space exploration, have been using AR/VR to boost their training efforts.

Charge your batteries every single night

Simon from Nationwide Platforms has got a simple, but important message: Charge those batteries!

He has analyzed a major construction project with his colleagues at Nationwide and found that 29% of all service calls were due to operations conditions resulting in flat batteries.

Flat batteries can cascade into many hours of downtime

You might not think that's such a big deal, but then consider that in the London area, the average response time to a potential breakdown for plant hire companies is between 3 to 6 hours. On top, you then need to add the recharging time, and you can see how this cascades into a great deal of downtime.

Most of the cases Simon has seen would have been solved by always charging batteries overnight (as they are supposed to), but it might not always be so simple.

Make sure your staff is authorized to use your equipment

Often you have unauthorized operators using equipment they do not have the relevant training or skills for. They might not know how or where to recharge the machine. They may leave it in places where it shouldn't be left, and if the equipment is not in the appropriate overnight position, it might be challenging to find it the next working day, resulting in increased downtime.

So keep those batteries charged and make sure your staff is authorized to use your equipment. But remember that operators, even authorized ones, are only humans and can forget procedures. In these cases, we need help from technology, so that our equipment automatically “rings the office” when the battery needs recharging.



Simon Beckett
Strategic Accounts Director
Nationwide Platforms

Deliberate use of technology and increased feeling of ownership eliminate downtime.



Key Findings About Downtime

How to with downtime in construction? To find an answer to this we launched the Eliminate Downtime Benchmark where respondents had the opportunity to get their reports on how they compare to their peers. From the survey, key findings were identified giving an insight into the state of the industry.

The main topic that has dominated discussions and agendas of Eliminate Downtime events revolves around partnerships. The findings from the recent survey only underline the importance and urgency of that matter as 100% of top performers in eliminating downtime have entered new partnerships in the past year. Collaboration is at the heart of success in a complex ecosystem like construction. Nobody can know everything and more than half (57%) of low performers in eliminating downtime have lost business in the past year because they did not possess the necessary resources within their own organization. It shows that breaking down knowledge silos and daring to share across organizations will move us forward.

Exploit data to reduce downtime

Gathering at Predict Summit in 2020 showed the sheer amount and choice of possibilities that Artificial Intelligence opens up. But 55% of construction companies do not exploit the full potential of the data they gather. One of the reasons that so much potential goes unused is that 83% of these companies simply lack the knowledge of how to use the data. While the industry is dealing with a talent gap for experts in data science, it needs to prioritize attractive working conditions for these experts. Top performers in eliminating downtime are 2.5 times better than low performers at exploiting data to support their business operations. Being able to make sense of data is not a nice-to-have anymore, it is a necessity to stay ahead of the game.

What does caring for the environment have to do with downtime in construction? A lot more than you might think. It is a perspective that has not been discussed much during the last year of the Eliminate Downtime Journey, despite

the increased public interest. When it comes to environmental protection, idle time is a key concern. The average idle time for machines in construction is 36%. However, the study shows that 22% of the respondents underestimate this number.

Caring about the environment pays off

Further, the survey found that environmental responsibility is increasingly important in our industry, as 15% have experienced losing business in the past year due to non-compliance with environmental standards. Top performers in eliminating downtime distinguish themselves by caring deeply for the environment. In Construction eliminating downtime and protecting our environment go hand in hand.

But it is not only the environment that is in need of better protection - it is also the people that do their work on the construction sites every day. However, only 1 of 3 enterprise rental companies (Fleet size: 10,000 - 100,000) can document that a customer knows the security procedures of machines. The industry needs to leverage technology that is available to facilitate the communication not only within their own organization but across the entire ecosystem. Another aspect for which this is true is training. While 100% of enterprise rental companies agree that training programs for operators are not a waste of money, 33% of them state that operators do not receive sufficient training.

Connecting your assets can lead to a 51% higher financial performance

One of the hot topics in construction certainly is connectivity of equipment and machines. The survey data shows that companies with more than 50% of their fleet connected enjoy 23% higher financial performance than the rest, and companies with more than 75% of their fleet connected enjoy 51% higher financial performance than the rest. With the right strategy and knowledge on how to use the data collected, connectivity is an excellent and important tool to increase productivity.



WE NEED AI TO ELIMINATE DOWNTIME

Quite possibly the most hyped expression of the last decade, Artificial Intelligence has become the magical go-to-solution for almost any type of problem society faces today.

Unsurprisingly the hype has resulted in expectations that are impossible to meet and frustrated management teams waiting impatiently for the actual results to become reality. AI is over-hyped, and in many cases, not the solution you'd need. Still, regarding eliminating downtime in the construction industry – AI might be an essential piece of the solutions we need to approach.

AI can help us get much better at identifying not only where downtime occurs but also be a driver in eliminating it. We don't expect AI to develop into a Terminator-like robot that'll replace all of our employees. Actually, we believe it never will. What AI can do is give our colleagues the powers they need to fulfill their jobs even better. AI can sense, comprehend, act, and learn faster than humans and thereby augment our current abilities to almost incomprehensible new levels.

And the time is now. Partly because of the hype driving massive investments in AI startups, thus increasing innovation, partly because data is becoming much more available. Also, what just a few years back would have

required a super-computer in the basement, can now be computed on the cloud for mere pennies. One could say these three factors have created a sort of Golden Age of AI, with significant breakthroughs happening weekly.

Unfortunately, it seems the construction industry has not been as prone to picking up new advances within AI, unlike other industries. It has not made things better that a global talent war has emerged for attracting data scientists and other crucial roles. More than half of everyone working in Data Science now works in either the technology or financial sector, less than one percent in the construction industry.

There are massive gains in productivity waiting to be unlocked for construction. It will, however, require a more creative and daring approach to AI than just jumping on the bandwagon and hiring a few data scientists. We have gathered real-life cases on applying AI to your business and how that can ultimately lower downtime.

Use of AI to predict machine maintenance

"Predictive Maintenance" has been a hot topic for a few decades: Applying advanced analytics to assess the current condition of an asset or perhaps an entire fleet, with the goal of trying to guess exactly when a specific asset needs maintenance.



We see a lot of experiments within this field, but very few results. Way too often, initiatives grow too big and ambitious, before even validating their founding principles, thus failing to accomplish anything worthwhile for business. If we steer away from the bold headlines and fancy conferences, we do however see a trove of opportunities to change how we run our businesses in our current time.

Today it's not hard to ask AI to predict the current condition of a piece of construction machinery, and it will do so reasonably accurately. Then if we connect that to a completely different AI skill, one constantly scanning auctions to figure out what our machine is currently worth, we then finally tell the algorithm about our service costs and revenue targets. Suddenly we have invented a way to figure out exactly when we should offload the machine and buy a new one. This is just one practical example of how connecting complex data streams and using AI to make sense of it has become reality. This is something we all need to act on.

In other industries, they are already far ahead. One could visit Deutsche Bahn in Germany to investigate how they have lowered downtime dramatically by placing sensors on railway tracks, every second collecting information

about moisture, temperature, and many other factors. All of this data is analyzed by a shared "brain", that figures out the current condition of the exact piece of railway, but also automatically lowers the speed of trains running over it, to reduce the load.

AI can also learn a great deal about how we operate our equipment and thus teach itself to recognize machines that are not adequately maintained. Not correctly maintaining equipment can result in massive increases in emissions. For example, a recent study of forklifts found that roughly half of all forklifts are not properly maintained. Improper maintenance can result in a rise of up to 2.3 tons CO2 per forklift per year.

Use AI to speed up compliance

A surprisingly high number of man-hours are spent on compliance in construction every year. Whether it is reporting to authorities or looking through details in contracts, humans spent a great deal of time trying to fill out the blank spots.

AI comes with a great promise to hopefully fill out many of these blank spots for us, and for those where it cannot, it can alert us to spend our time more wisely.

Our industry should be inspired by how financial services, in most cases, primarily large banks, already use AI to capture, analyze, and filter large chunks of compliance data. An area dubbed "regtech" with a vast number of case stories reported online and believed to be saving financial institutions millions in annual compliance costs.

Today it's not very hard to ask AI to predict the current condition of a piece of construction machinery, and it will do so reasonably accurately.

AI is not only handy for understanding data sets, simple human conversations can also be improved. A product called Conduct Surveillance from Digital Reasoning uses Natural Language Processing to analyze conversations recorded in text or voice to determine whether or not a bank's employees are

acting within compliance when they interact with clients. Companies can use this to make sure their employees are compliant.

**TOGETHER, WE WILL
ELIMINATE DOWNTIME**

#eliminatedowntime



We want to hear your story!

Share your thoughts, ideas and personal downtime stories with us. Simply write an email and we will get in touch and find a way to feature it in the Eliminate Downtime ecosystem. Your story makes a difference.
insights@trackunit.com

The Journey continues.

If you liked the paper, sign up for our newsletter and receive three selected articles and updates of the movement in your inbox once a month.

Learn more about the Eliminate Downtime journey and sign up for the Inside Eliminate Downtime newsletter.

Stay up to date.

Follow us on social media for the latest updates on the journey.



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About Trackunit

Trackunit is specialized in fleet management solutions connecting and tracking machines and operators across a wide range of industries. Trackunit's IoT services collect and analyze machine data in real-time to deliver actionable, proactive and predictive information, empowering customers with data-driven foresight.

Trackunit promises to eliminate downtime by 2025. The ambition of this mission is not only to recover from budget and schedule overruns, but also to re-establish the reputation of the industry for innovation and leadership.

From operator safety and machine health to business optimization, Trackunit's industry-leading telematics software, hardware and services benefit the everyday operations of customers worldwide. Trackunit services its customers directly from its headquarters in Denmark and Chicago, IL and through subsidiaries in Sweden, Norway, France, Holland, Germany and England. Visit Trackunit.com for more information.

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