DIGITAL BY DEFAULT

Construction after COVID-19

Ulrik Branner
Thomas Goubau

How a crisis is becoming a catalyst for change and how successful construction companies are preparing for the future with new, digital ways of working in the wake of the Coronavirus

》LETSBUILD

About the authors

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Executive & Board, LetsBuild

Originally an air traffic controller, Ulrik has had a long commercial career in banking and telecommunications. Ulrik has experience from several startups and is a seasoned speaker at events all over the world. Prior to the merger, Ulrik was the CEO of GenieBelt.

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With a background in telecommunications and consulting, Thomas topped up his commercial profile with an MBA in 2009. He co-founded APROPLAN in 2012 and was the company's CEO until the merger that created LetsBuild.

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A word from the authors

In the early months of 2020, our world was hit with a "black swan moment", when what turned into a pandemic started in Asia and rapidly spread across the globe. In a matter of months COVID-19 – or the Corona Virus – radically changed the dynamic of most of our lives, forcing us to change most of our normal routines, both privately and at work. Remote working has become standard for millions of people, literally overnight, and the rules of social distancing left shopping malls, stores, cinemas, and streets empty.

Construction was no exception although as an industry, construction globally is battling fiercely to keep the wheels turning while upholding safe work measures. And with these contradictory priorities, new ways of working are emerging and changing the way we operate.

In these unusual times no one has complete directions - it's uncharted territory for all. As a consequence, we initiated the Virtual Town Hall sessions to create a venue for the industry to meet, listen and ask questions. By taking advantage of each other's knowledge and skills, the Town Hall has been a place to seek and hopefully find answers to a number of urgent questions across the industry and across countries. As one of the panelists in the very first Town Hall stated: *In construction, we do not know what we do not know. The crisis has already shown us the implications if we continue with that!"*

What is a black swan?

A black swan is an unpredictable event that is beyond what is normally expected of a situation and has potentially severe consequences. Black swan events are characterised by their extreme rarity, their severe impact, and the widespread insistence they were obvious in hindsight.

The term originates from the belief that all swans are white because these were the only ones accounted for. However, in 1697 the Dutch explorer Willem de Vlamingh discovered black swans in Australia. This was an unexpected event in history and profoundly changed zoology.

On a global scale, the pandemic is now forcing hundreds of thousands of companies in our industry to fast-track technologies that will help keep the wheels turning and, as a phoenix bird, this unprecedented adoption rate of digital technologies actually shines like a light in an otherwise dark moment.

At LetsBuild, we know that this rush into new ways of working has its drawbacks - Increased efficiency but reduced human depth is just one example. Companies will rapidly adapt technologies and worry about return of investment later and in some cases, it might not even solve their problems

But in many cases, stories are emerging that confirm that COVID-19 might be the catalyst that ushered in a new era for an industry otherwise haunted by very low digital adoption, massive waste contribution, low efficiency and high fault rates.

This is the compelling reason why we decided to write this book – together with contributors from all parts of the value chain and from all around the world. It is because, if we are to find good in bad - which is human nature – then it is right here: Many experts believe that the current crisis will prove to be a catalyst for change, when it comes to digital usage and it will fundamentally tip us towards more innovative ways of building and operating.

This book is about how smarter ways of working are establishing themselves – and about the companies that discovered them. But it is also a book written to mitigate a risk! To quote Mark Farmer of Cast Consultancy, the risk is that we emerge from the crisis with a clear A-team and B-team and that the B-team is left too far behind - unable to catch up, which will slow the whole industry down. So the more we can share knowledge, lessons learned and best practice, the better we stand together.

As an industry, we are only as strong as the weakest link.

Ulrik Branner
Executive & Board, LetsBuild

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1. Why you should read this book

2020 will always be remembered as the year when our world was hit by a pandemic that forced us all to change the way we live and work. COVID-19 will significantly impact the industry for decades to come. Not only because it will take quite some time to get things back to "normal" but also because **"normal" has not been a desirable state for a long time.**

In this book, we will introduce you to some successful construction professionals who are living proof that digital transformation provides lasting benefits. Using their stories, we will show you a new way forward; towards a modern construction industry that uses the occasion of COVID-19 to digitally transform the business. We will also lend voice to several experts from different parts of the world to hear what they have seen and learned during COVID-19, because through shared information and insight comes a higher degree of learning. The time is now!

"In this unique moment, companies can learn and progress more quickly than ever before. The ways they learn from and adjust to today's crisis will deeply influence their performance in tomorrow's changed world, providing the opportunity to retain greater agility as well as closer ties with customers, employees, and suppliers. Those that are successfully able to make gains "stick" will likely be more successful during recovery and beyond."

McKinsey & Company - Digital strategy in a time of crisis, April 2020

2. COVID-19 and digital - When digital becomes the New Normal
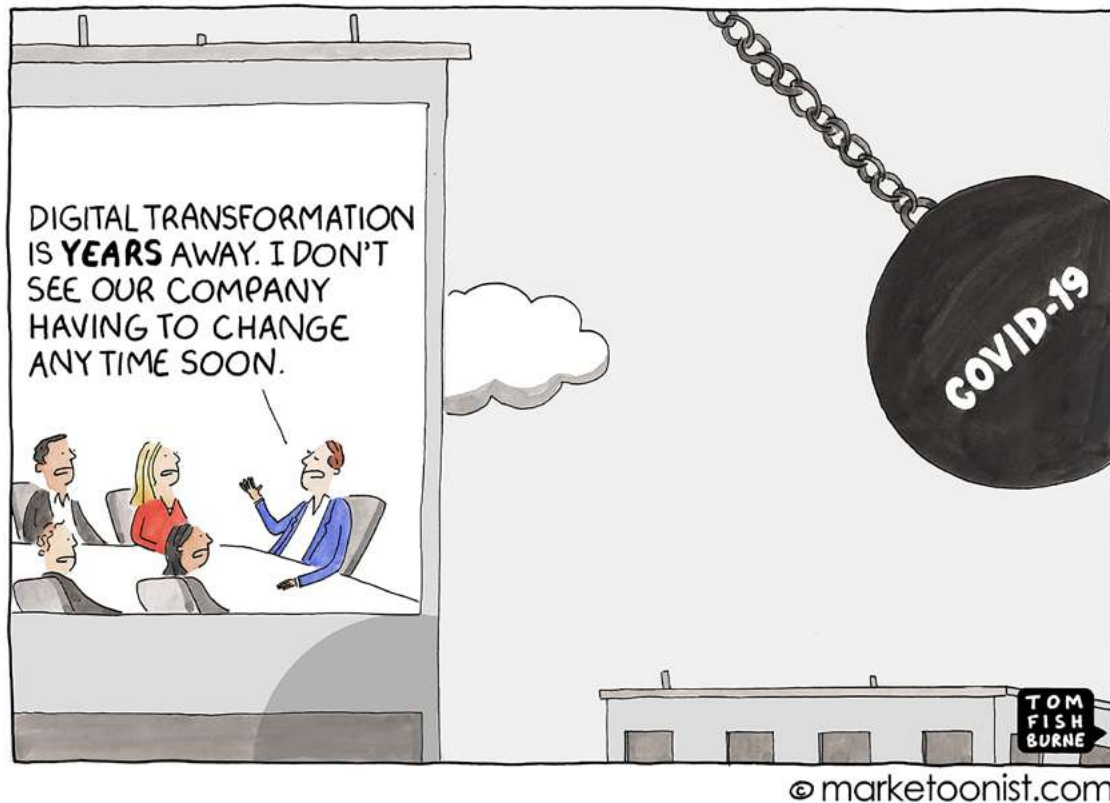
Most people within this industry would not associate change with the construction industry. Especially not rapid change. But nevertheless change is an inherent part of any crisis. And rapid change is the reality of the current COVID-19 crisis - especially for the construction industry. With an unprecedented impact on the global industry, companies have been forced to rapidly adapt innovative solutions to keep the wheels turning on construction sites.

"I'm seeing much more collaboration in the industry. I think this might be collaboration in the face of existential threat rather than collaboration because people believe it's necessarily a long-term strategy. But at the moment, we are seeing tremendous work being done by all sorts of people and organisations for the benefit of the whole industry. And to me that shows what we can do when we really have to.

I see uncertainty. Will a lack of work lead to another race to the bottom when it turns out that this collaboration was actually just a coalition? And will that coalition fall to pieces once we all start fighting again for work? I hope that isn't the case. Because the final thing I do see is optimism. I see construction coming through as a powerful economic lever both in its own rights because of the amount of economy we contribute to but also a vehicle to deliver change elsewhere.

Ultimately, I feel during this crisis construction has shown how good we can be and we should be optimistic that we are going to play a significant part in the upturn when it comes."

Ann Bentley - Global Board Director, Rider Levett Bucknall

COVID-19 has been sweeping across construction sites all over the world, making construction work decline with rates not seen since 2008. In the UK, the industry has experienced rapid falls in output and new work after COVID-19 landed on the British Isles. The Activity Index compiled by IHS Markit shows the fastest downturn in UK construction for almost eleven years.

The situation in the UK is reflected across the world and the severity of COVID-19 is also captured by Trackunit's Downtime Index. The Downtime Index compiles weekly harmonized engine utilization changes (defined as voltage activity on a machine) - basically measuring activity in the construction industry across countries.

The impact of COVID-19 varies across the measured regions in the index. Suffering the most, Southern Europe including Italy, Spain and France continue their downward trend followed by Western Europe and North America. However, Eastern Europe keeps performing better than expected with index numbers pushing above 100, which also serves as an indicator of the impact of different governmental strategies affecting the industries differently.

It's worth noting that only 42 percent of all the available machines were active during week 15, underlining the magnitude of the impact on the industry.

Activity Index by construction category
Housing / Commercial / Civil Engineering

sa, >50 = growth since previous month
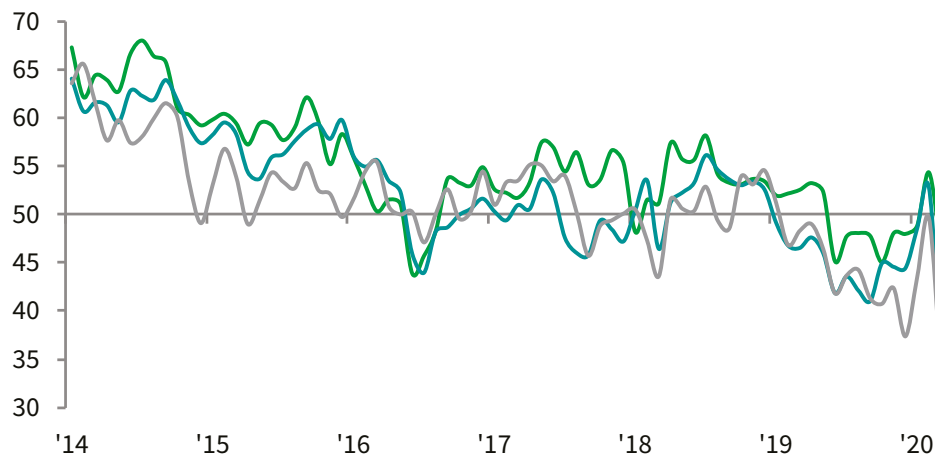
In Germany, almost 90 percent of construction companies noticed the impact of COVID-19 on their business. And in Japan the number of companies experiencing no effect at all from COVID-19 dropped from 63 percent to 5 percent within a month.

Data revealing the impact of COVID-19 tells us a horror story, but it might still be difficult to comprehend the sheer size of the wrecking ball that actually hit the construction industry. What might be easier to comprehend is the change following the initial impact.

Within a few days, the effects of COVID-19 have forced the industry to increase the use of technology and software to allow individuals and teams to communicate and collaborate remotely.

The Danish Construction Information Centre Molio has carried out a survey, uncovering the use of digital tools within the construction industry during the COVID-19 crisis. More than 350 companies across the value chain in Denmark have participated in the survey running from late March to early april 2020.

Trackunit's Downtime Utilization Index by Sub-regions
Eastern Europe · Northern America · Northern Europe · Southern Europe · Western Europe
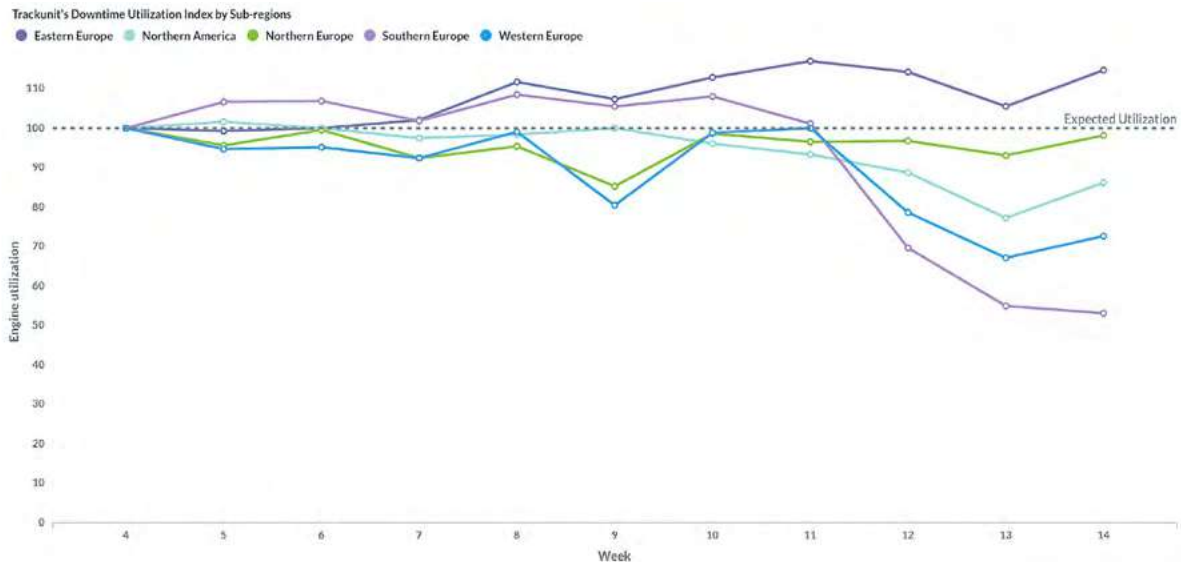
The results are straightforward. The COVID-19 crisis has led to a significant increase in the use of digital tools across the value chain. Not surprisingly, most tools rising in popularity are linked to remote meetings and communication. 95 percent of all respondents experience a significant increase in the use of digital tools in relation to meetings and almost 70 percent have significantly increased the use of document and file sharing tools. And this includes everyone from the carpenter on site to the client working remotely at home.

Also, the use of industry-specific digital tools in the form of online solutions and apps have seen a change in behaviour. 25 percent of all companies have to some or great extent experienced a notable increase during the COVID-19 crisis.

Impact of Coronavirus (COVID-19) outbreak on business operations experienced in construction industry in Japan as of April 2020
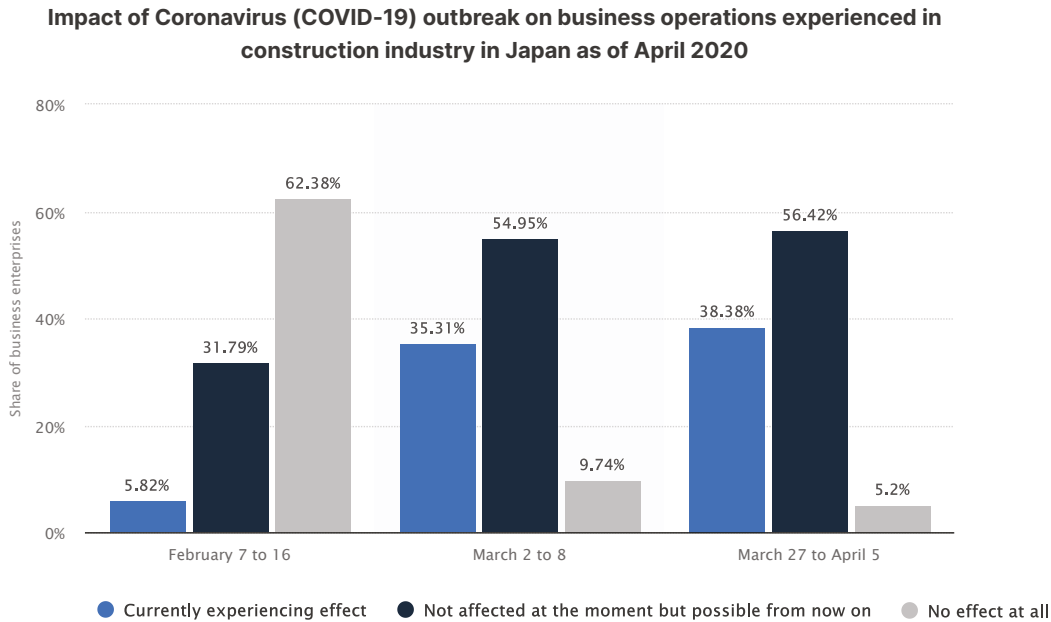
Source
TSR │ @Statista 2020

Additional Information:
Japan: March 27 to April 5, 2020: 2,212 business enterprises; Online survey

Complicated decisions on investments in new technologies that usually take months or even years to mature within construction have been expedited in days during the COVID-19 crisis. Overnight, these technologies have become an integrated part of the industry, building up new routines and ways of working in a digital framework.

As one major Danish contractor explained, his project managers are experiencing having more time on their hands. When they face a problem on site, they instantly call the advisor on video, show the problem and get instant feedback and a solution to continue working. There has been a shift in perspective and now the project has been put at the centre with a shared focus across the value chain.

> **"During COVID-19 we have ensured that each trade works in solitude on-site...THIS is what we have used digitalisation for."**
>
> **Morten Chrone** - Group COO, HusCompagniet

> **"The COVID-19 crisis seemingly provides a sudden glimpse into a future world, one in which digital has become central to every interaction, forcing both organizations and individuals further up the adoption curve almost overnight."**
>
> **McKinsey & Company** - Digital strategy in a time of crisis , April 2020

However, the big question remains: will the effects of the COVID-19 crisis have a long-lasting impact on the construction industry? Will the increased use of digital technologies incite the adoption of digital construction across the industry?

> **"The current crisis will prove to be a catalyst for change, when it comes to digital usage - the numbers of the survey speak a very clear language."**
>
> **Christina Hvid** - CEO, Molio

The use of digital tools in construction during the Corona crisis

To which extent has the Corona crisis caused an increase in...

Question	To a very high/high extent	To some extent	To a low/very low extent	Not at all
- the use of digital tools in connection with meeting activity? (N = 355)	85%	10%	3%	3%
- online sharing of/or online collaboration around documents, presentations, spreadsheets, etc? (n = 345)	35%	32%	22%	11%
- written internal communication? (N = 351)	30%	38%	22%	9%
- the exchange of documents via email? (N = 349)	18%	31%	34%	17%
- the use of industry specific digital tools in the form of online solutions and apps? (N = 321)	10%	14%	36%	40%
- the use of industry specific digital tools in the form of software installed on PCs (N = 320)	5%	13%	35%	47%

Referring once more to the survey carried out by Molio, the feedback from Danish companies is quite noteworthy. 92 percent of all companies expect to some or great extent to continue with the use of digital tools after the COVID-19-crisis. The numbers appear to support a substantial change in the behaviour of companies across the value chain.

No one can predict the future or how things will be at the end of the COVID-19 crisis, but the numbers indicate that we definitely will not be working the same way we did before. If the numbers hold, **digital seems to have become the New Normal** in construction - and this within a period of a few weeks. Not only because it's a necessity to communicate to continue working remotely. But most importantly, because it is good business. A few cases will underline that point.

To which extent so you expect that your company will continue to use the digital tools when the COVID-19 restrictions cease? (N = 350)

- To a very high/high extent — 57%
- To some extent — 35%
- To a low/very low extent — 7%
- Not at all — 1%
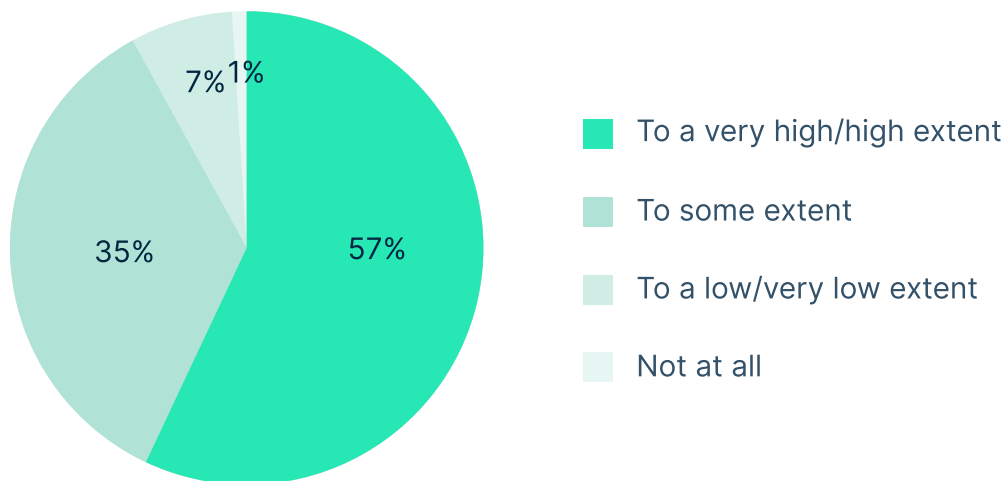
Mark Farmer, Cast Consultancy, writes:

The construction industry continues to struggle in embracing modernisation, especially the adoption of technology solutions. The vast array of options available to businesses of all sizes can be overwhelming and is often couched in technical and complex language without a clear benefits case being definable. However, the resulting confusion, is not an excuse to bury your head in the sand and simply believe what worked and was appropriate in the past is still right today. My belief is that is now more than ever a recipe for disaster.

It is critical for construction businesses, whether they be consultants, main contractors or specialists and whether they be large or small to be open to change and to be inquisitive. In an industry that seems so fixated with lowest cost rather than creating value it is no longer sustainable to just cut prices without productivity being improved and waste reduced. Margins need to be protected and technology can both automate and augment processes to deliver bottom line financial benefit for businesses and greater assurance of outcome for clients.

I have no doubt that the Covid 19 crisis will now accelerate some of the modernisation trends that the construction industry has been seeing in recent years. This market shock is unlike previous economic cycles which have dictated more flexibility and short term thinking in business models that have inherently led to greater loss of control and weaker structural resiliency. The parallel need to decarbonise our society will add further regulatory pressure which will render many current approaches and behaviours obsolete.

In a world ahead where C-19 recurrences and other possible future pandemics will now have to be routinely planned for, a new breed of contractor, specialist and consultant will need to appear using technology more effectively and increasing project level pre-manufactured value using new, more robust and vertically integrated supply chains.

The industry's continued reliance on high site labour intensity and its dependence on ad hoc procured, fragmented value chains have been exposed like never before and are no longer sustainable.

If companies are brave and digitally transform for the new world, I am optimistic there can be a bright new world for construction.

Mark Farmer
CEO, Cast Consultancy

3. Digital activity on construction sites during COVID-19

The LetsBuild Tracking Index measures the daily activity on construction sites across the world. In March 2020, usually one of the busiest months in the construction industry, the activity takes a significant decline due to the COVID-19 crisis. It echoes the pattern of other data points in the same period. However, one thing stands out compared to other data sources and that's the ability of the LetsBuild Tracking Index to measure activity on an individual company level. And while the general picture shows a decrease, zooming in on individual companies reveals some interesting details.

While activity dropped on average 15 percent across the industry during March and several companies were forced to put construction sites on hold, some companies like HHM and EBK Huse in Denmark and VolkerWessels in the UK increased their activity significantly.

Adoption (DAU) Aproplan
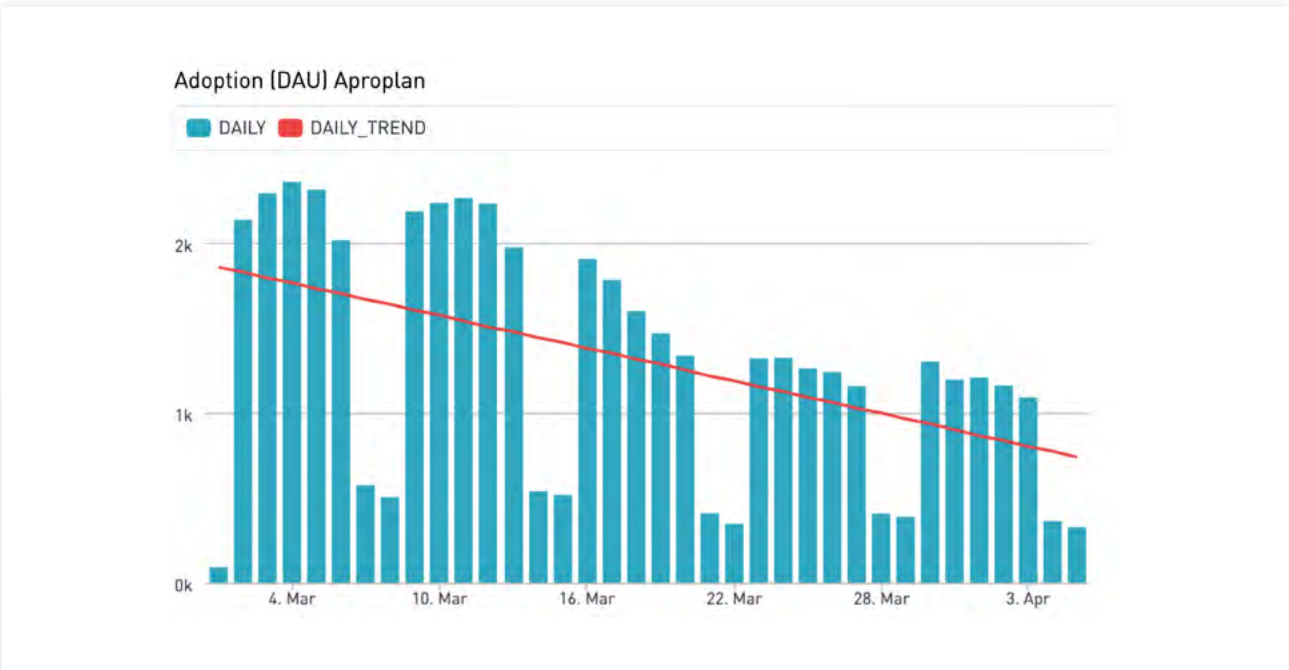
HHM experienced an increase in activities of almost 30 percent during March, while EBK Huse and VolkerWessels UK increased this activities by 57 and 75 percent.

EBK Huse - a Danish housebuilder - experienced an unexpected return on their investment in a digital infrastructure, when COVID-19 put restraints and regulations on the offices and construction sites in Denmark, in the beginning of March. Instead of stalling work and projects to make room for adjusting to new ways of working remotely, EBK Huse increased digital activity by more than 50 percent in the first weeks.

% change in user activity

-100%   0%   100%

VolkerWessels UK   75,02%

EBK   56,69%

HHM   27,72%

Average   -14,5%

CEO Jesper Keinicke could reap the benefit of his previous investments: *"Our investments made in recent years have enabled us to move our employees from all our different departments to each of their own living rooms, continuing the same effective communication without any interruptions".*

This also proved to be the case for another Danish housebuilder, HHM.

Project manager Patrick Salomon Timmner and his colleagues in HHM had already implemented several digital processes across the company. However, when COVID-19 hit the Danish construction industry, HHM experienced an increase in digital activity of almost 30 percent. Part of the increase could be explained by the fact that Salomon and his colleagues were now working from home and they were spending more hours in front of the computer. However, the main part of the explanation was related to the contractors working with HHM on their projects. In many cases, the contractors were using a combination of digital tools and printouts of the floor plans to be used on site.
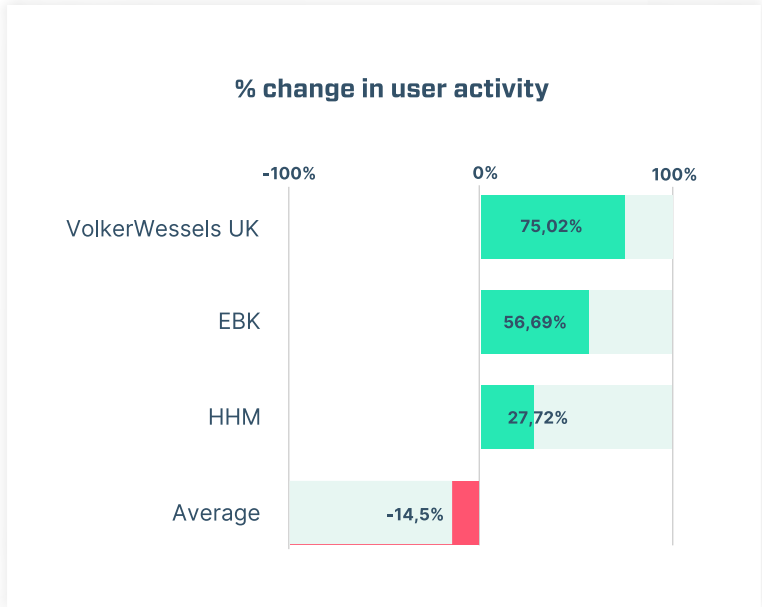
The COVID-19 changed this radically as Patrick explains: "Because of COVID-19 we were no longer able to deliver printed plans on site, so we had to force everyone to use the digital tools 100 percent of the time. For us, the COVID-crisis has actually helped us complete our digital transformation."

So from having struggled with contractors unwilling to convert to new digital tools, transformation came overnight, when COVID-19 entered the construction sites and eliminated the alternative of printed copies. Curiously, the newly enforced digital processes have been running smoothly from the outset: "I have not had one single complaint from anyone after converting printouts to digital tools", Patrick states.

Henrik Mielke, the CEO of a large contractor in Denmark, recognises this picture from his own company. When Henrik took part as a panelist in the LetsBuild Town Hall meeting in March, he described how the COVID-19 had changed the attitude towards digital tools: *We tried to gain traction on our internal app for* **three years** *without any luck - as we converted to a virtual office, it took only* **three days** *before 95 percent of our employees were using it every day!"*

The COVID-19 crisis has significantly changed priorities within construction, creating a very powerful catalyst for digital transformation. Usually it will take years to implement new digital processes and tools and now this has been cut down to days as demonstrated in the above examples.

One company actually used that catalyst to substantially increase their efforts towards the adoption of digital tools and processes. VolkerWessels UK increased their digital activity by 75 percent when the COVID-19 hit the UK in March. The constraints and restrictions on construction sites resulting from the pandemic increased the demand for timely reporting of progress and issues from site. To fill this immediate need within the company, it was rapidly decided to adopt the necessary digital solutions across all projects in order to enable project and senior management teams to make informed decisions and enable work prioritisation.

"**On the upside, every crisis is also an opportunity.** There is a case that we actually see an unprecedented acceleration of innovation. And we already see that in a number of sectors; we hear clients tell us that they are essentially compressing five-year investment plans into 3 months. So that is the order of magnitude of acceleration that some players are doing.

When we think through what that might mean in construction specifically, a few things stand out. It's essentially an industry that hasn't been innovating at the rate and scale it could for a long time and for many good reasons that have held the industry back.

Our research has shown that there is a 60% productivity opportunity looming in the sector waiting to be reaped. 60%."

Jan Mischke - Partner, McKinsey Global Institute

> **"Let's not underestimate the potential here. The construction plan is the focal point around which everything revolves in our industry. Digitising the plan opens up, not only for efficient, Corona-safe coordination, but a wealth of other quality and productivity boosters."**
>
> **Hugo Dorph** - Group Commercial Director, Solar A/S

At the beginning of April, VolkerWessels UK launched a company-wide release plan to get the digital tools to all the projects as quickly as possible. With three iterations, the plan was to have the roll-out finished within 1 ½ months.

> **"As a business, we feel fortunate that we had already accelerated our people-focussed digital construction strategy during 2018. As we move into a 'new normal', we understand now, more than ever, the value that ConTech can offer our sector, as we move to become an industry which is 'powered by data and driven by people.'"**
>
> **Simon White** - Chief Digital Officer, VolkerWessels UK
> *The above quote is an extract - for more, please refer to the appendix*

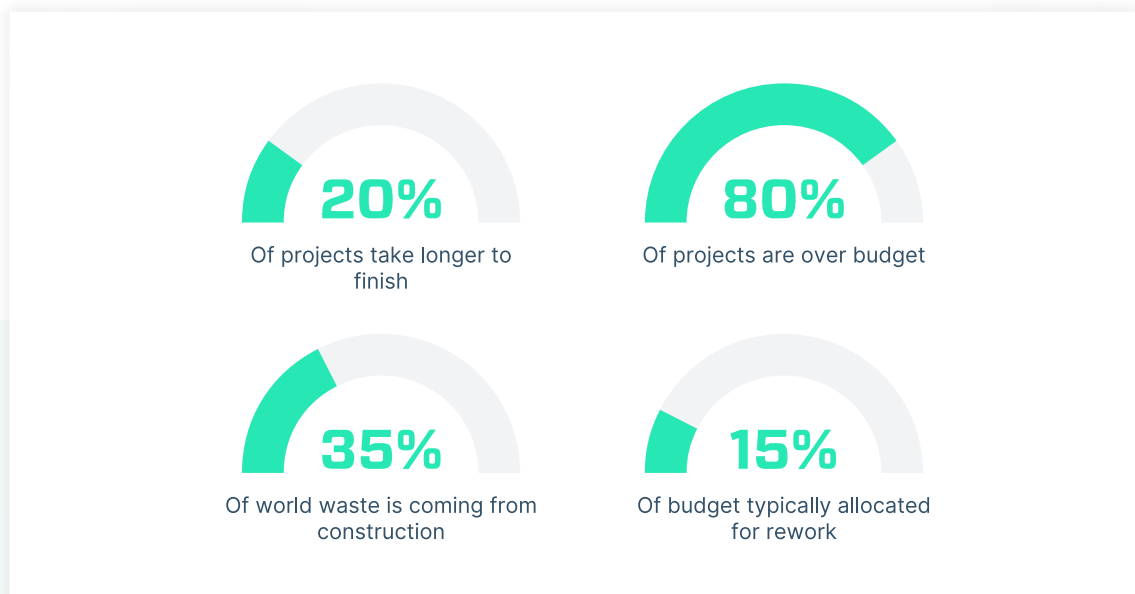A lot of companies took a serious hit on their activity levels due to the constraints of COVID-19 related regulations. However, the three companies highlighted above chose another route and increased their activities significantly. For EBK Huse and HHM, it was a natural extension of their current operations. They already had the infrastructure in place and could easily adapt to another setting within the industry.

In other words, there are big differences between companies and the degree to which they turn to digital tools to help them manage a difficult situation, whether it is a pandemic or not. Some of those differences relate to varying levels of digital maturity (more about that towards the end of this book), but with the industry facing as many challenges as it is, there could also be other reasons:

- Projects take 20% longer to finish than expected
- 80% of large projects are over budget
- We contribute >35% of the world's waste
- Construction productivity has declined in some countries since 1990
- Rework typically costs 7% - 15% of your budget

Maybe that is why construction is still the world's second least digitised industry? Looking ahead when wading through a bog of troubled waters can seem near impossible.

We often hear construction professionals complain about the fact that they are having a hard time getting an overview of their projects and feel like they are spending a lot of time and effort sitting

20%
Of projects take longer to finish

80%
Of projects are over budget

35%
Of world waste is coming from construction

15%
Of budget typically allocated for rework

in endless meetings and fighting with disconnected processes and teams. But that is just the way construction works, right?

Actually, it doesn't have to be that way. In this book, we will share the experience and stories we have gathered from construction professionals around the world to help you on your digital way. But first, let us take a look at the starting point; how the situation is on projects now.

"**The pandemic is creating an unprecedented impact on our built environment, not just here in the UK but globally as well.** But I think there's positive things, as well. It's also forcing us to strive for more innovation and much more rapid solutions. One of the things we see again, not just in the UK, is the contribution the construction gives to our economy.

I think it's fair to say Construction is a major backer of success for our economy. **If we don't get this recovery right, it's going to be a major break and slow down.** I think how the sector responds to the pandemic is going to be a crucial element to the world economic reset."

David Philp - Global BIM/IM Consultancy Director, AECOM

4. The project management nightmare

The success of any construction business is contingent on delivering projects successfully and profitably. And the successful delivery of construction projects relies heavily on the work of the project management or director, who oversees the planning, design and construction processes throughout the project lifecycle. This is particularly important to larger projects, where there is more complexity and more potential for encountering problems that can cause delays and cost money. But let us look at the reality facing project managers every day.

As any project manager would testify, the increased complexity of construction projects with **multiple stakeholders**, ever stricter environmental and technical regulations and now even COVID-19 related **rules and guidelines** can be quite the headache. Trying to coordinate and communicate across many teams whilst simultaneously sticking to the project programme and budget is stressful, particularly when following the traditional ways of the industry.

Because it is the role of the project manager to oversee the project across teams and activities, it is also down to the project manager to try to reconcile all information sources to get the real picture. We have asked hundreds of project managers what this means for them and they tell us they spend up to **40% of their time** in endless meetings or compiling reports for their bosses and clients.

This is time that could have been spent on resolving issues and keeping the project moving forward. In fact, if companies want to succeed, project teams need to be looking forward and anticipating what comes next in order to avoid problems down the line. And that is impossible if they are bogged down in admin work and dealing with daily interruptions.

So, many project managers complain about working long hours and spending a lot of their time on admin work and coordination. But, as many project managers have told us, "this is just the way things are. It is part of the job." Meanwhile, most of the time in meetings is spent trying to figure out how the project is doing, where the problems are, and discussing who is to blame for interruptions and delays.

As we know, construction projects are quite the **battlefield**, with more than 30% of projects ending up in courts, and construction companies spending an average of 17 months resolving each dispute. In fact, the fear of litigation or exposing one's weaknesses to others is causing teams that should be collaborating to keep information from each other and focusing on covering their own ... behinds.

But if everyone is focusing on what others are doing wrong and not freely sharing available information, a **culture of blame** emerges.

If people are spending time looking backwards instead of forwards and protecting themselves instead of working together efficiently and without distrust, it also makes it more difficult to introduce **shared and standardised processes**. This is what we hear from many project managers and directors; getting

teams to use a common set of processes is close to impossible because they are working separately and in their own ways. As a result, productivity can vary a lot between teams and sites. In fact, research shows that there can be up to a 50% gap in productivity between two field teams performing the exact same tasks, on the same site at the same time. When comparing teams from different sites to each other, the gap is up to 500%.

New technologies and smart devices are everywhere, even in the hands of most construction workers. And yet, people on site and people at the office are disconnected, with 80% of the technology used residing at the office, while 80% of the work is done on site. Even with COVID-19, close to 100% of site teams are allowed to work on site as long as they observe social distancing guidelines, whereas as few as 10% of office staff are allowed to work normally. Even more than before, this shows how important it is to **get technology into the hands of people doing the actual construction work**.

Today, even when workers are using technology, each team is using a multitude of tools to communicate with each other - MS Teams, email, **Whatsapp**, sms, etc. And because of the inherent culture of blame and the traditional desire to keep information from others, communication flows in isolated 'strings' with no real coordination happening across the project, except at meetings, which are largely spent updating each other - and quite often yelling at each other, too. No wonder a lot of project managers complain that they never get home in time for dinner!

80%
of technology
is in the office

80%
of work is on site
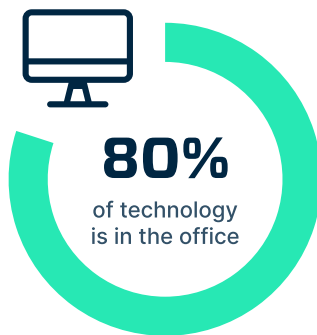
The thing is, the emergence of a new world, characterised by new regulations on social distancing and hygiene, will only make these problems worse unless construction companies find new ways of working more efficiently, even from a distance. Already, we have seen a surge in online meetings being held but it doesn't stop there because a simple copy-paste of the old ways of doing things will only make project teams less successful. The traditional meetings, which rely on a lot of face-to-face information sharing, do not become more effective with Zoom or Google Hangouts - on the contrary.

In fact, one of the consequences of COVID-19 is that construction professionals are starting to re-evaluate the way they work, simply because it is necessary when face-to-face meetings and crowded construction sites are not allowed. Is there a better way moving forward? Can we in fact address some of the problems in the industry by re-thinking the way we work together? And can that make us more competitive and successful in the future, even when the COVID-19 crisis is over?

Let's turn to some real-life examples. In the following chapters, we will relay the stories of three construction professionals who changed the way their companies communicate and collaborate and reaped the benefits.

LetsBuild Zoom meeting

"The act of building is not an isolated act. It is carried out by taking into account these new constraints, partnerships formed between all stakeholders, in a respectful local environment. The new technologies associated with the digitalisation of construction must, as a matter of priority, set themselves societal and public health objectives. The development of a modular construction industry should also be able to meet these new challenges. The design of our buildings must be reflected as places for living, working, education and leisure. Builders must integrate new services into their service offer throughout the life cycle of buildings. We no longer have a choice. Nature chooses what is best for us, even in the event of a natural disaster."

Prof. Dr. Zoubeir Lafhaj - Full Professor, Chair holder, Centrale Lille

5. How a major rail contractor increased productivity overnight

When project participants use different communication channels, it takes time to channel feedback and enquiries to the right people so that downtime and unnecessary costs can be avoided.

This was an everyday problem for Matt Ghinn, Project Director at VolkerFitzpatrick. He was responsible for the West Anglia Main Line capacity improvement project, which required a lot of coordination as work could only be carried out on weekends and any delays were penalised heavily by the client.

Matt was finding it difficult to maintain an overview of the project. There was a lot of pressure on him to deliver and he needed to execute on an hour-by-hour project plan without full insight into what was happening on site. Formal reports were made every 4-12 hours only and that meant that impacted schedule problems were not always known until the end of the 12-hour shift, resulting in project delays.

Matt Ghinn
Project Director,
VolkerFitzpatrick

When critical problem solving is delayed, it inevitably disrupts site activities, which in most cases causes project delays. For Matt and his company, this could potentially mean €100,000s in penalties.

VolkerFitzpatrick are heavy Primavera P6 users and quite happy with its overall functionalities but on-site teams don't have access to the system because it is quite complex, difficult to use and not made for people on site. So instead, the different teams would use a combination of WhatsApp, emails and Excel to keep track of activities.

Not only did this mean that Matt and his project managers had to spend time reconciling information from different channels; important WhatsApp messages with impact on the project schedule would be missed because of the sheer volume of messages going back and forth, causing project delays.

Matt realised that WhatsApp and Excel, good as they are, are not made for construction. The different digital tools he and his colleagues were using simply weren't suitable for the purpose of managing such a time-critical project. So Matt set out to find what he calls "**The WhatsApp for construction**".

Based on a recommendation from a friend, Matt decided to test out the real-time progress reporting and communication platform offered by LetsBuild. In spite of his management's concerns with introducing a new digital tool to rail workers when their existing tools were "good enough", the site teams were trained in just one day and kicked off already the next day on site.

> **"We are not phoning out, we are not using WhatsApp groups, we are not sending emails. The programme is just live, it is there and all data from the site is captured."**
>
> **Matt Ghinn** - Project Director, VolkerFitzpatrick

60% tasks on schedule → **85%** tasks on schedule

5 days behind → ✓ **on schedule**

0 savings → + **€5,000/ month**

Matt quickly saw the benefits when he received a notification in the app during a meeting that part of the project was not progressing. Thanks to the overview he had gained with the new tool, he was able to immediately cancel a €10,000 concrete order that would otherwise have been wasted.

Fast forward two weeks and Matt had already seen an increase **from 60% to 85%** in the percentage of scheduled activities completed on time. Over the next three months, the project went from being 5 weeks behind schedule to being on time. And Matt has calculated that he is saving on average €5,000 / month because materials are delivered at the right time, decisions are made faster and he has fewer disputes with his subcontractors because everyone is working on the same platform.

> **"Our programme is updated at site level. That means that the operative supervisor provides us the information from the site. So we get photos; we get updates. This allows the team to take more ownership and provides us with visibility across the whole site team."**
>
> **Matt Ghinn** - Project Director, VolkerFitzpatrick

"It's really important to maintain good lines of communication and to collaborate with each other and try to find solutions out of the COVID-19 situation rather than to try and gain any kind of commercial advantage. **Coming out of the COVID 19 crisis, we might start to see disruption coming from technology giants (eg. Amazon).** There may be an opportunity for some of the biggest companies to enter the industry. And I think it's something that certainly the contractors need to keep an eye on really closely.

This crisis will change society. I just hope it changes construction, as well."

Chris Hallam - Partner, CMS, UK

6. Increasing output at a major home provider

Meanwhile, in Denmark, Group COO at HusCompagniet Morten Chrone was frustrated that his project managers couldn't manage more than 6-7 projects each at a time because they had to collect all data on site and then go back to the office to do their reports. This meant that they became bottlenecks and also increased overhead.

HusCompagniet is Scandinavia's biggest home provider, building 1,500-2,000 houses per year. The company does not employ blue-collar workers but uses external subcontractors to carry out the work.

Morten's project managers were **buried in admin work** and he and his management team didn't have a good overview of how projects were going and how well the project managers were doing. Also, subcontractors would often **travel to site in vain** because schedules weren't up-to-date.

Morten Chrone
Group COO
HusCompagniet

With project managers using 40% of their time on admin work, Morten was essentially paying €2,500 per month per person, just to produce reports. Also, subcontractors would invoice for lost time whenever sent to the site in vain.

When reporting is slow and project managers are buried in a workload that doesn't allow them to focus their attention where it moves the needle, interruptions happen on site. Subcontractor teams are stopped while waiting for others to finish, work is stopped because materials haven't arrived, and questions from workers remain unanswered. Morten could see that this was costing him 5-10% extra production cost.

HusCompagniet has 8 regional offices, each of which builds approx 800 houses per year, so sites are remote. Also, the company does not receive any money from their customers until handover, so delivering on time is essential to cash flow.

Morten realised that if all project data was kept up-to-date and centralised, the project managers would no longer be **bottlenecks**. If he could free up some of their time, they would also be able to handle more projects.

Did you know

Project managers spend on average 40% of their time in meetings and doing various repetitive admin work.

> **"We are estimating we will save between 5 and 10 percent of the cost. So it's substantial. "**
>
> **Morten Chrone** - Group COO, HusCompagniet

He engaged with LetsBuild and standardised processes across the board. His project managers were initially worried that management was looking over their shoulders but when they realised that single-platform communication and automated reporting and dashboards meant that they were getting rid of most of their admin work, they soon embraced the new "system".

> **"Getting the right contractors on site is huge, because whenever the carpenter doesn't show up, the next in line is going to be delayed as well. So there's a lot of downtime. There's a lot of waste in that industry. So by connecting them, which we have done with LetsBuild… they're notifying each other: "Yes I'm done" or "No, I'm not done". So at least I don't need to drive to the building site and waste my time on it."**
>
> **Morten Chrone** - Group COO, HusCompagniet

The reduction in admin work allowed Morten's project managers to manage **50% more house projects** with no added stress. Even more importantly, the project managers are no longer bottlenecks. Problems can be solved or escalated in real time and data is shared freely so everyone has access, even if a project manager is sick or leaves the company. This type of flexibility is vital when facing a pandemic as agility becomes even more important and decisions may have to be made quickly in order to avoid interruptions and delays. And that's extremely valuable considering that on average 35% of all projects in construction will at some point experience a major change that could have a direct effect on their development.

What if, at any given time, you could have this much insight into what was happening on site?

What if your organisation could save hundreds, even thousands, of hours normally spent collecting and reporting on project information? What if you could avoid a lot of the uncertainties and problems that characterise most construction projects?

What would that mean for your business? For your team? For you personally?

Let us take a look at some facts.

7. Why do projects get delayed?

We know that projects can get delayed for a variety of reasons. Poor weather, delays in material deliveries, changes in specifications are but some of them. As reported by McKinsey and Company, **an average project in construction is expected to experience a minimum 20-month delay and an 80% budget overrun.**

As a matter of fact, only one out of four projects will eventually manage to stay within 10% of its original deadlines. Unfortunately, that comes as no surprise considering that 98% of megaprojects experience 30+% cost overruns and that 77% of them are running 40% late. So, it quickly becomes clear that there is plenty of room for improvement in the way the sector designs, communicates and eventually builds.

> **"The minute you start a project you're late... There's no doubt about it, if you overrun, it costs money, it costs money for every day you're on site. And your budget never allows for you to be there an extra 6 weeks, 7 weeks, 10 weeks, whatever."**
>
> **Project manager** - quote from survey, 2020

We thoroughly researched 150+ projects in Europe and concluded that 39% of project delays are caused by poor planning at the outset. Insufficiently detailed tenders leaving bidding contractors to "gues-stimate" time and budget, overambitious project programmes, etc. Other 17% are caused by other external factors, but **44% of delays are caused by interruptions happening during the construction phase**.

What's more, those 44% actually account for 68% of the extra cost associated with delays. **This means that interruptions on site accounts for ⅔ of your cost overruns!** The remaining 32% of budget overruns are related to poor planning before execution or other external causes.

When we dig into these 44% - the interruptions, it turns out that the majority of those relate to errors, late replies and changes that happen during construction but which are not communicated properly to those affected.
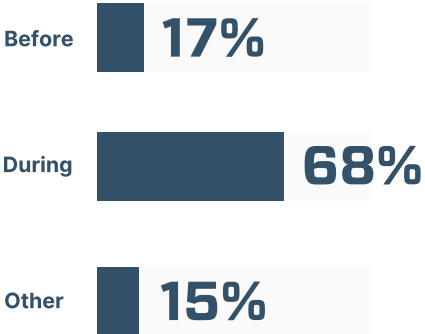
In other words, if we could eliminate or at least reduce interruptions during project execution, we would be much more likely to deliver projects on time and budget.

When researching projects all over Europe, the average €10 million project experiences no less than 600 interruptions per year.

A lot of these interruptions have to do with questions being asked, be it RFI's or other requests. With the traditional way, information and communication flows between parties on a busy project, it takes an average 7 days to respond to requests.

And a whopping 25% of requests are never answered, leaving the subcontractors to invent their own solutions!
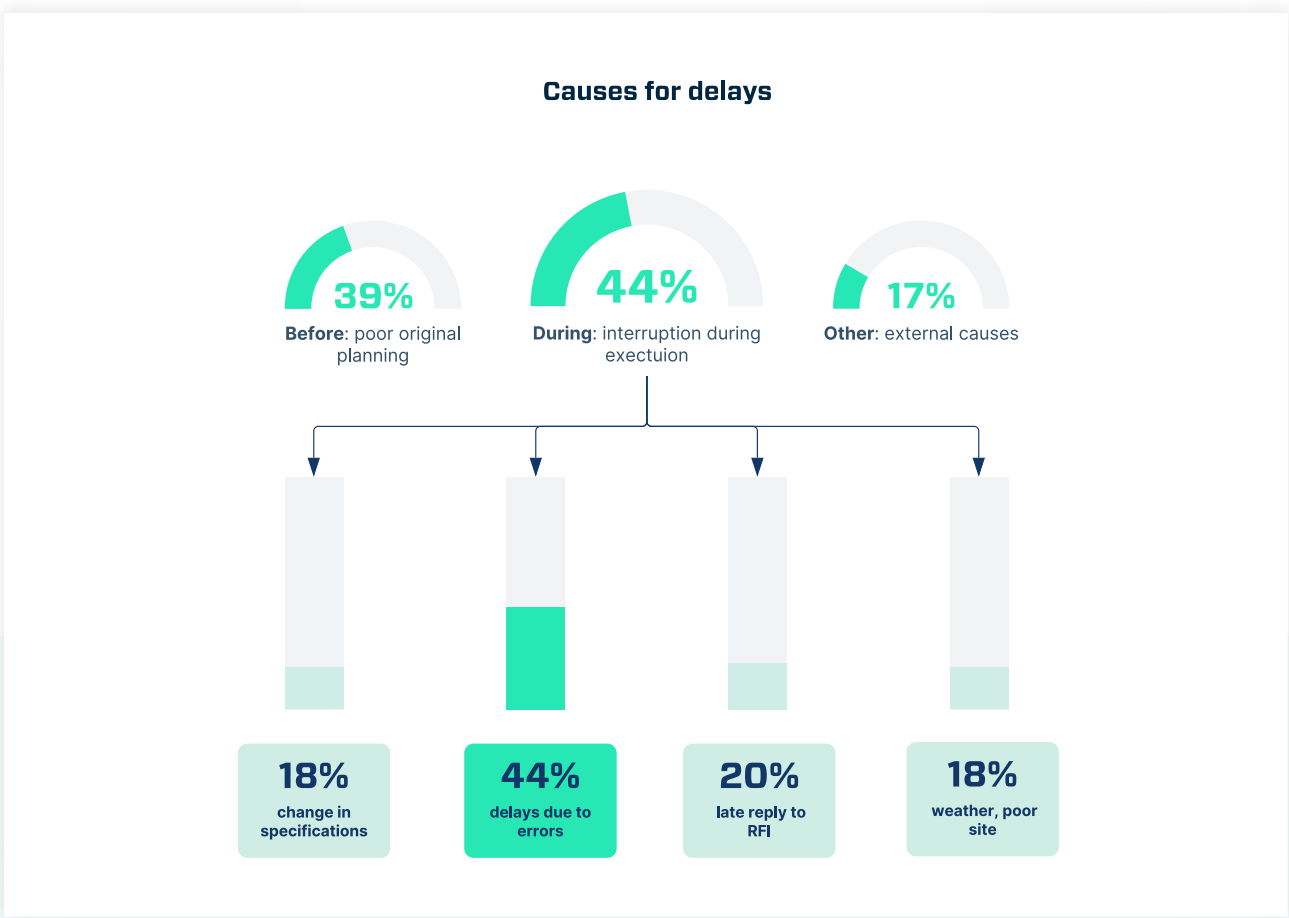
Cost associated

Before **17%**

During **68%**

Other **15%**

Unplanned interruptions during execution

600
interruptions
per year per 10m€ value

7
average days to reply

25%
requests without response

That's extremely problematic considering the complete **l**ack of standardisation in projects that follow such an approach. In many cases, people in construction perceive pre-designed and standardised processes as too difficult or useless and everyone wants to do things their way. That comes from the common, but false, belief that every project is 100% unique, although 80% of the process is always the same.

Allowing interruptions to stop progress on a construction site can be detrimental to successful project completion - and to careers.

Causes for delays

39%
Before: poor original planning

44%
During: interruption during exectuion

17%
Other: external causes

18%
change in specifications

44%
delays due to errors

20%
late reply to RFI

18%
weather, poor site

8. Why interruptions can kill your project's health - and your own

Imagine this situation - everyone is busy at the building site, it looks as if things are going to plan but then suddenly, a subcontractor calls and says that their materials haven't been delivered as planned.

Obviously, the supplier needs to be contacted to figure out what happened and when they can deliver (or an alternative source must be found) but apart from that, what are the consequences? What about the subcontractor team responsible for the following task? Will it have a knock-on effect on their planning? Does that mean the whole project will be delayed? What will that mean for your relationship with the customer? Your profitability? And what are the consequences in terms of admin and reporting time?
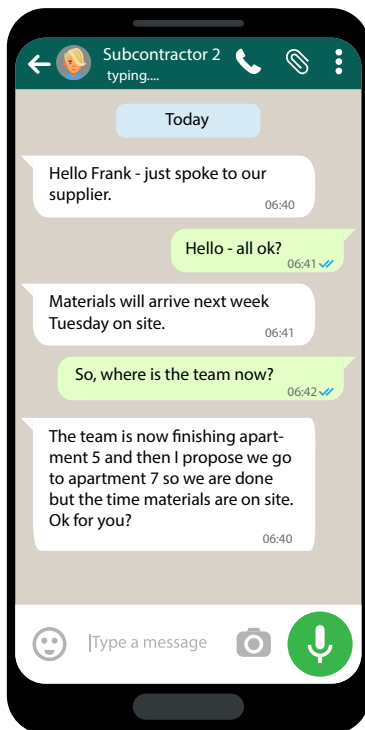
You know that solving critical problems quickly is what helps you deliver on time and without spending extra money. Take the example above. If it takes 7 days to ensure that the relevant people learn about the problem and react, this could become a critical issue with great consequences, depending on the project. It could most definitely mean extra costs. **Only in the United States, the cost of reworks that resulted from inefficient communication and low quality data in 2018 was estimated at $31.3 billion.**

With 600 interruptions a year, it should be no surprise that 82% of project owners openly admit that they should collaborate better with their contractors. This number shows the big need for the construction industry to take a step forward towards a new, more collaborative approach. But more about that in the next chapter.

When information is typically scattered across many different data sources - some even analogue - the decision-making process with both internal and external stakeholders becomes exceptionally difficult. Meetings are needed more frequently and take much longer than they should because half the time is spent trying

to update each other on project status and on discussing problems or arguing over whose fault it is. Such an approach goes hand in hand with excessive micromanaging and constant requests for countless emails, calls or WhatsApp messages.

Under these circumstances, people start to feel overwhelmed and stressed out. They feel out of control since they don't have a precise overview of what's happening on site and there is no clarity on who's accountable for what. As a consequence, making smart decisions fast becomes very difficult and project and site managers end up being the bottlenecks in their teams.

To make things worse, overtime becomes the rule as project agents constantly need to work extra hours in order to get the project delivered and to successfully deal with the immense administrative workload.

The final outcome is physical and mental exhaustion and it demotivates construction stakeholders as this is not what they signed up for when they decided to work in the industry. They joined construction because they wanted to make a difference, build something for the future, not to spend a lot of their time copy-pasting information from one source to another or being dragged into disputes.

When talking to people in the industry, it quickly becomes apparent that project progress can be severely hindered by different types of interruptions. Here are some examples:

- Missing information (drawings, technical specifications, etc.)
- RFI's and clarification questions
- Missing or misplaced materials
- Delays in preceding activities
- Subcontractor team not on site on time
- Missing paperwork/approvals
- Adverse weather conditions

Some interruptions are unavoidable. But it is the speed and efficiency with which you handle them that makes the difference.

It is not a question of whether there are 100 or 1,000 snags to resolve, it is how quickly you close them out.

But how do you solve problems more effectively if you don't know they exist? You may have invested time and money in establishing what you consider the right communication flows and systems to enable project management to stay on top of such interruptions but unless you work on the culture as well, it won't work.

Why not?

This is where the **culture of blame** comes in.

"Corona is a global crisis that is spreading death and destruction. But as with any crisis, something better can grow from the ashes, and as it becomes very clear that the digital leaders have an advantage in the remote working regime of Corona, we can hope that the whole industry learns and we can see an acceleration in digitalisation. This will tie the value chains better together, and it will mean more projects delivered on time, on budget and with lower environmental waste."

Klaus Nyengaard - CEO, LetsBuild

9. **Kill the culture of blame**

On any medium-sized to large project, there are hundreds and hundreds of variations and design changes, information flows, lack of information sharing between stakeholders, misunderstandings, information clashes and so on. All this leads to conflicts - between contractor and design team, between contractor and subcontractors or suppliers, or even internally between the contractor's teams.

The fact that 30% of construction projects end up in court proves how conflict-ridden this industry is. And that doesn't even include the hundreds of hours spent on writing explanatory reports or yelling at each other in meetings. That being said, reading that the global average value of legal conflicts in construction is calculated to $33 million is no surprise at all.

Five steps to a collaborative model

McKinsey & Company recently released an insightful report on how construction could embrace a new collaborative model in order to escape from the blame culture and rebuild trust in the sector. In short, here are five steps that project owners and other stakeholders in construction can take to move the industry towards a more collaborative ecosystem:

McKinsey & Company

STEP 1: Assess the collaboration readiness of your organisation

Knowing the strong and weak points of your organisation is of paramount importance for the successful outcome of this process. Here are the main parameters you should consider:

- Solid organisational framework to allow a new collaborative approach
- Flexible project culture
- Strong portfolio of projects to support your long-term strategy
- Agile approach to tender processes
- Openness to take on risk and a forward-thinking risk-management philosophy

STEP 2: Find the right partners

Having the right partners by your side can make a big difference. Initiate alliances with organisations and stakeholders who share the same working culture but have a different set of capabilities so that you can complement each other.

As the McKinsey report states, "Relationships are what moves the needle." A good relationship between project teams across partner organisations can open the path to strong and proactive decision making.

STEP 3: Define your projects in detail

Project owners need at an early stage to thoroughly define the scope of the project , come up with a solid plan of execution and an accurate cost estimate. By doing that, they increase their chances of a timely project delivery with higher returns.

STEP 4: Keep all partners on the same page

Keeping all stakeholders aligned on responsibilities, goals and reward is of critical importance. Do not allow any distractions to come between your teams and the end goal.

The owner of the project should be able to provide all sides with incentives that will keep them proactive and valued. That is one of the safest ways to ensure that all project stakeholders will work together towards the successful completion of this collaboration.

STEP 5: Make trust your priority

Introducing and maintaining a collaborative approach only happens through continuous effort. It is important that project owners continue to measure the progress of their projects against the goals that have been set.

Knowledge sharing, problem solving, creativity and curiosity are deemed as fundamental. Consequently, training throughout the project is a crucial component of change. Lastly, contractual enforcement can be a key element as well.

So where does it go wrong? Well, for one, stakeholders may not share all the necessary information at once, fearing that they will be held accountable for any setbacks to the original plan. Needless to say, this creates confusion and makes life even harder for project managers and foremen who are trying to ensure the successful delivery of the project on time and on budget.

It is understandable that the different project stakeholders are keen to protect themselves against being blamed for costly mistakes. But it kills communication if parties are holding information close to their chests instead of sharing so that issues can be dealt with quickly and effectively.

Your teams are smart. If you enable and empower them to work together to find solutions to problems that don't need to be sent up the chain of command, they will. If they have the right information at their fingertips, they will make the necessary day-to-day decisions and only escalate problems they can't solve themselves.

That is why focus needs to be made on reporting issues and accurate project progress so that they can adapt and make the right decisions quickly. **Solving the right problems fast is what helps teams deliver on time.**
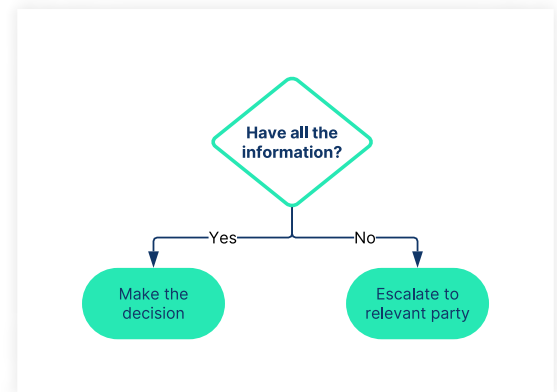
"Yes, I have yet to work on a project that has finished on time. Reason: communication is the main thing. Some issues are out of everyone's control such as the weather, but the communication following on from that is often very fragmented and that's the main reason for delays."

Project manager - survey April 2020
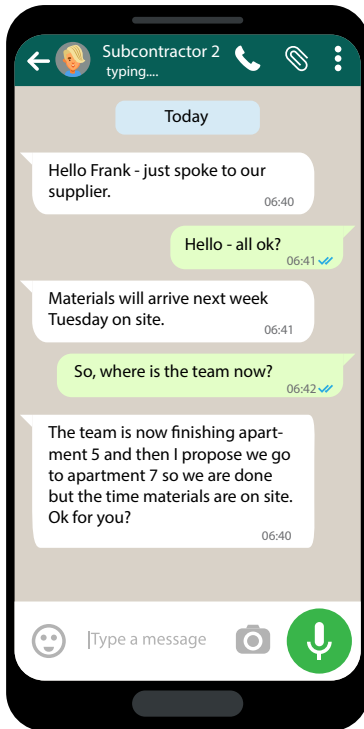
It is not important that there is a non-conformity during an inspection. What is important is that the team has managed to resolve it before the next activity starts.

It is not the fact that the subcontractor is asking for approval of a technical specification, it is the fact that the project team doesn't realise that taking 7 days to provide feedback is a problem because the related task is on the critical path.

Battling the culture of blame is fundamental to having a real picture of where the project is at and prioritising correctly. If issues are not communicated transparently because of a fear of blame, it will not be possible to achieve reliable progress reporting, and it will remain impossible to prioritise correctly.

So you need to kill the culture of blame and give the teams the right tools to collaborate efficiently.

10. Good habits trigger success

We now know that a €10 million project experiences an average of 600 interruptions per year. We also know that it takes project teams on average 7 days to reply when teams request clarification or confirmation, or report a problem from the site. These lag times often cause temporary delays because the activity is stopped while workers are waiting for a decision.

An interruption can be as simple as this:

Mark is busy and has to finish a meeting, probably several, before he can react to the WhatsApp message. After that, it will take him time to get hold of the architect, who in turn will take time to locate the right drawing, revert to Mark to find out where to send it, and then send it, after which the contractor will receive it, presumably by email or maybe even in print. So, an innocent request for a new drawing can stop work for days, depending on how busy the involved parties are and how they prioritise.

Let's have a look at what that pattern does to your project timeline.
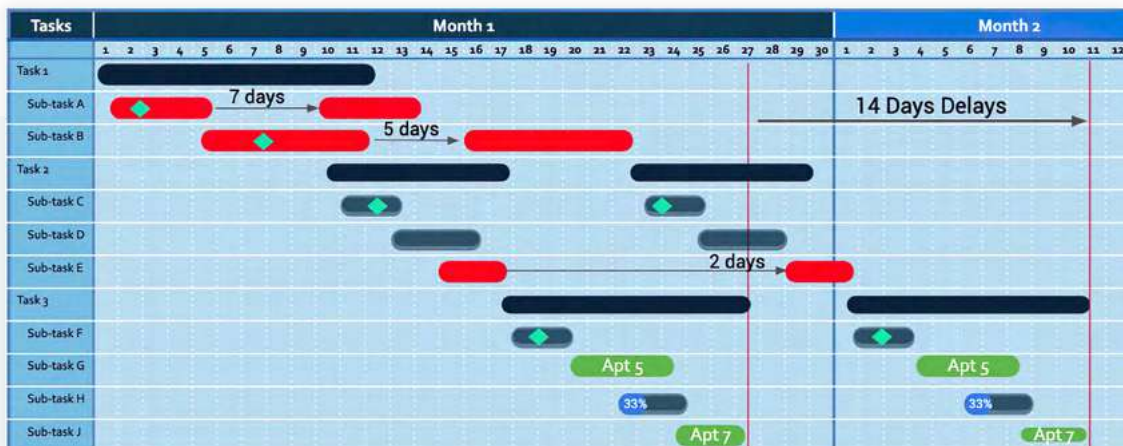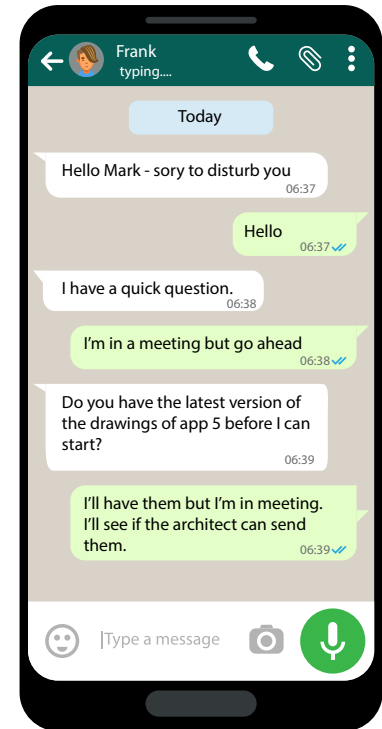
If an interruption relates to an activity that is on the project's **critical path**, a 7-day delay in responding to even the simplest request - a request for an updated drawing, for instance - can have big consequences. In the above example, sub-task A can't be finished on time, and while the request or question is outstanding, it also delays sub-task B. This in turn affects sub-task E, which can't be started until sub-tasks B, then C, then D have been completed. As a result, the project is delayed by 14 days because of one interruption.

If this happens 600 times per year, or roughly twice a day, you can imagine the ramifications it will have on your project delivery and profitability.

In fact, research shows that **66% of general contractors are carrying added costs from overtime/ second shifts on at least three quarters of their projects due to schedule slippage, with 50% of them needing to extend the project end date**. That is a damning statistic when you consider the profit margins of most general contractors. Basically, it highlights the need to reconfigure the way the industry collaborates to deliver results.

What would happen, for instance, if the cause of the above interruption was resolved faster? Let's take the previous example again.
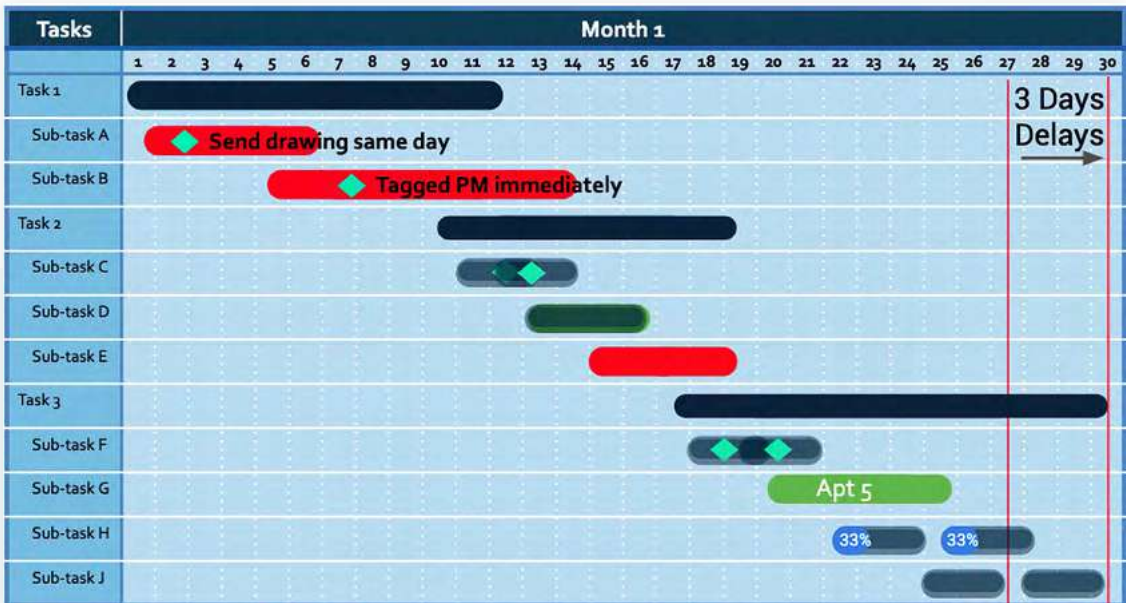
Now, the requested drawing is sent the same day and the project manager is advised of the short delay. In this example, this means that the project schedule is only delayed by three days.

Research of construction projects across Europe shows that there is a **77% correlation between delivering on time and delivering on budget**. In other words, when you focus everyone on the project on delivering on time, you will likely also deliver the project on budget.

Deliver on time

↓

Deliver on budget

- 77% correlation across 150 projects in Europe
- projects take on average 20% longer than expected

When everyone focuses on delivering on time from the beginning of the project, all processes get tuned to progressing the project as fast as possible, even when problems occur. It's kind of an "All hands on deck" approach.

If questions, reported problems and requests from the site are communicated in real time to the right people, issues can be handled quickly without getting stuck in traditional holding patterns like weekly meetings, inflexible reporting structures and information overload.

Delivering on time is a **keystone habit**. By focusing on eliminating wasteful processes and communication lag, you vastly increase your ability to deliver projects successfully and profitably.

"We need to know better what is actually happening on site that impacts the planning so that we can avoid issues and interruption and therefore also costly delays."

Rudy de Kock - Technical Director, Pellikaan

How one keystone habit changed everything - Alcoa

When the late Paul O'Neill became CEO of aluminium manufacturer Alcoa in 1987, the company was starting to flounder. Investors of course expected that Paul O'Neill would announce the usual "new CEO measures": Cutting costs, reorganising and/or establishing new markets. Instead, at the very first investor meeting, he announced that his vision was "zero injuries".

Alcoa had suffered its share of work accidents but to O'Neill, worker safety was a **keystone habit** - the type of habit that leads to a cascade of other actions that, over time, change everything.

Paul O'Neill
CEO, Alcoa

Tim Ferriss, the author of "The 4-Hour workweek", was once asked how he could achieve so much in such little time. His answer was, "Instead of looking at all the tasks that I could do, I try to identify the one Big Domino - the one thing that if I could knock THAT down, all the other dominos would either fall down or become irrelevant."

Tim Ferriss
Author, The 4-Hour workweek

THE BIG DOMINO

THE ONE THING
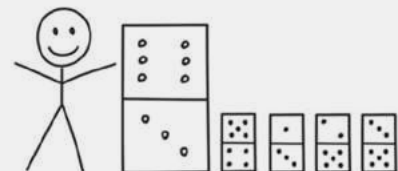
As O'Neill said, "I decided I was going to start by focusing on one thing. If I could start disrupting the habits around one thing, it would spread throughout the entire company". And as his safety plan was implemented, it started a snowball of change rolling in the organisation.

In order to avoid accidents, they had to understand why accidents happen, and in order to do that, they had to understand where manufacturing processes had gone wrong. They then had to bring people in to educate workers on quality control and efficient work processes because work performed correctly is also performed safely. In other words, focusing on safety resulted in better processes and a culture of continuous improvement, causing costs to go down, quality to improve, and productivity to skyrocket.

Why accidents?

Where did we go wrong?

Better quality control

Educate workers

Foster a culture of continuous improvement
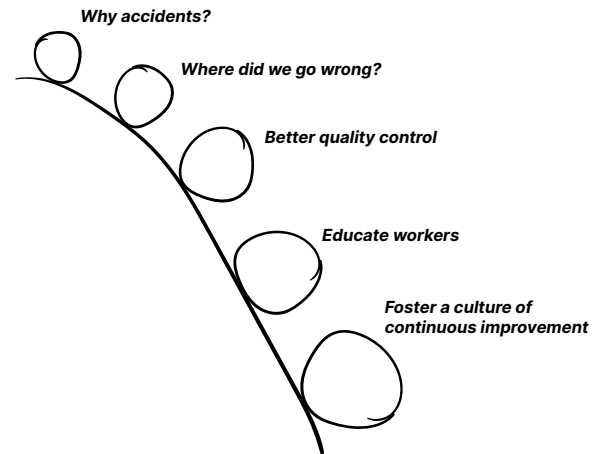
In one anecdote, O'Neill told the story of a machine that would spill molten aluminium on workers. The machine was immediately replaced, which increased safety while at the same time preventing further spillage and waste, which then in turn saved production cost. Another machine that kept breaking down was replaced to avoid worker injuries. As a result, the machine posed less of a risk of injuring someone but it also increased quality as the equipment malfunctions were a chief cause of quality issues. **These small wins are part of how keystone habits create widespread changes in a company.**

When O'Neill encouraged workers to contact him directly with any safety related issues, they started sharing their ideas with each other and him on how to improve processes and workflows in the company. Opening up communication and focusing on safety fostered greater employee engagement and helped management identify where improvements could be made.

And it worked. Within one year, Alcoa had reached record results and by the time O'Neill retired in 2000, the company's value had increased by $27 bn.

The company achieved this because the keystone habit of worker safety forced the organisation to be less rigid, to establish open communication and react quickly. That permeated throughout the organisation, paving the way for a more efficient way of working and better results.

O'Neill was able to start a cascade of change in his company. What would happen if you decided to focus everyone on delivering on time?

- Would your project schedules become more detailed and actionable?
- Would people start sharing more information in order to work towards a shared goal?
- Would interruptions be dealt with faster and more efficiently?
- Would quality assurance become more effective?
- Would meetings become collaborative instead of confrontational?

This industry also needs to change. Now, more than ever, with COVID-19 forcing us to rethink the ways we go about executing projects, we have a chance to make some lasting changes that will impact the industry positively for many years to come. But we will need to examine existing processes and team structures carefully to do that. One of the things that everyone will need to identify is where there are bottlenecks in the "production line".

11. From bottlenecks to empowered teams

If you let key functions in your organisation be bottlenecks instead of enabling and empowering the different project execution teams to make the right decisions faster, project progress will be slower as teams wait for days to receive critical information or a decision.

This is what the management team of Provivienda, a large housebuilder in Panama, realised. About a year ago, the company was struggling with long project delivery times. Provivienda was in trouble. Land prices and worker salaries were on the rise and they were seeing more and more competition, which meant that they couldn't charge more for their houses. As the CEO, Federico Salazar, said, they knew they had to change, otherwise they would have to close the business in the next five years.

Federico Salazar
CEO
Provivienda

But how could they be successful when it took them 330 days to build each house?

Federico sat down with his management team to identify why it was taking them so long. Obviously it was not a matter of actual building time. The team worked out that without an efficient flow of communication from their sites to the correct decision makers, it took them a long time to solve problems or answer questions from workers. That caused a lot of downtime while people were waiting for decisions or answers. Also, because they couldn't see exactly what was happening at the remote sites, they had to add buffers to the project schedules to make sure that one team of workers was finished before another one started.

All this meant that it took the company on average 330 days to complete a house that their MS Project programme said should take 75 days. And it also meant a huge drain on their finances, as they had to carry a building materials inventory of $2 million, to cover for any eventualities in a longer build period.

Federico knew that they would not succeed in improving this unless they found a leaner, more agile way of working. They started working with Lean consultants to improve processes but they were still missing a way to communicate and see progress on site, from the office, without delays. Essentially bringing the office to site, virtually.

As Federico says, "It would take the inspector, say, a week to identify and send a problem up the chain of command, and that compounded over the levels of authority and the number of houses - all with the same problems." The result: delays of up to 1 month, during which time houses were not finished and delivered to the waiting customers..

The problem with using tools like WhatsApp for project communication, which Provivienda's staff were doing, is that people end up making critical mistakes as they might be led to rushed decisions without having the full picture. And the more channels they participate in, the higher the possibility that they become the bottleneck for their projects.

When communication and decision making is that inefficient, all problems turn into big problems, even the ones that would have been easy to solve by people on or close to the site, quickly and simply. That puts a lot of inertia into an organisation, making the company less competitive.

So, Provivienda really wanted to eliminate this slow decision making process, of course without losing control or insight at management level. The secret lay in making sure progress, questions and problems could be reported directly from the inspectors on site, and automatically connected to

the tasks in the project schedule. This ensured that people at the office were kept in the loop whilst securing that projects progressed with a minimum of interruptions.

In fact, Provivienda now has a rule: All problems have to be solved in 72 hours, otherwise the CEO is alerted and will take action personally. Basically, as Federico says it, "the inspector gets 24 hours to solve it, then it is escalated to the site manager and then - after another 24 hours - to the project manager. If the problem has not been solved by then, it needs management attention."

Federico realised that his site inspectors and site managers were becoming bottlenecks in an inefficient system. Now, they are no longer bottlenecks and projects are running much more smoothly. Why? Because they are now receiving progress reporting and communication directly from site and problems are escalated quickly and easily. In an industry where the dependence of subcontractors on spreadsheets was reduced only by 1% from 2018 to 2019, that's a game changer.

In these COVID-19 days, and in the future, successful construction companies will ensure that they

1. avoid that individuals become **bottlenecks** by inadvertently "sitting on" critical information so long that it causes unnecessary delays, and

2. **enable their teams** on and off site to make the decision they should be making and just get on with it instead of being forced to sit back and wait if it isn't necessary.

Federico and Provivienda found a way to enable their teams and get rid of bottlenecks.. So far they have achieved a reduction in average project delivery time **from 330 days to 60 days,** a reduction in inventory **from $2 million to $100,000**, and a production cost reduction of **10-15%**.

330 days	→	**60 days**
$2 million	→	**$100,000**
0%	→	**10-15%**

> **"The thing that changed was a live programme that helped us avoid downtime between activities. If your programme is not updated frequently, problems on site get worse, because they may not have been communicated to the right person quickly."**
>
> **Federico Salazar** - CEO, Provivienda

What Federico saw is that you need to connect your teams with the right tools and processes - but make them keep you in the loop. That is the sweet spot that will help you deliver projects on time and budget.

> **"During this pandemic, the challenges are there with the medium and smaller players. There, we see huge cash flow issues. That is a major concern. We also see concerns of the unknown. How long will this continue? That could create a huge impact in the Middle Eastern region. And we believe the smaller players will have to do something drastically different or get absorbed by the bigger players in the industry."**
>
> **Arun Khehar** - Senior Vice President, Oracle Middle East Africa and India

12. A new way forward

When talking to Matt, Morten, Federico and all the other successful construction professionals we have interviewed, a few things emerge that they all have in common.

For one, they were all looking to make a critically important transformation to the way they were operating. Whether brought on by the threat of penalties or even bankruptcy or the need to standardise or optimise processes, they were all facing a critical event that necessitated taking a fresh look at their operations.

Much like a pandemic shutting down or restricting millions of construction teams around the world, our four heroes were in a situation where, in order to be successful, they had to question their own and their colleagues' assumptions and habits.

Matt took a hard look at the way his teams were collaborating and getting information from the site and realised that the digital tools they were using were not suited for construction. They were not "good enough".

Morten needed to relieve his project managers of unnecessary admin work and time-consuming routines. He realised that project managers in fact don't need to spend almost half their time on gathering information and compiling reports.

Federico turned around his company by getting rid of bottlenecks in the chain of command and by enabling efficient decision making and materials management.

You could look at any of their projects like this:

During the construction phase, there are three major areas in play.

- **QHSE:** Quality control, non-conformities, inspections, audits and handover
- **Documents & drawings:** Management and sharing of drawings and documents related to quality, planning and technical specifications
- **Cost & planning:** Master plan and 3-6 week look-aheads, materials management and quality control planning
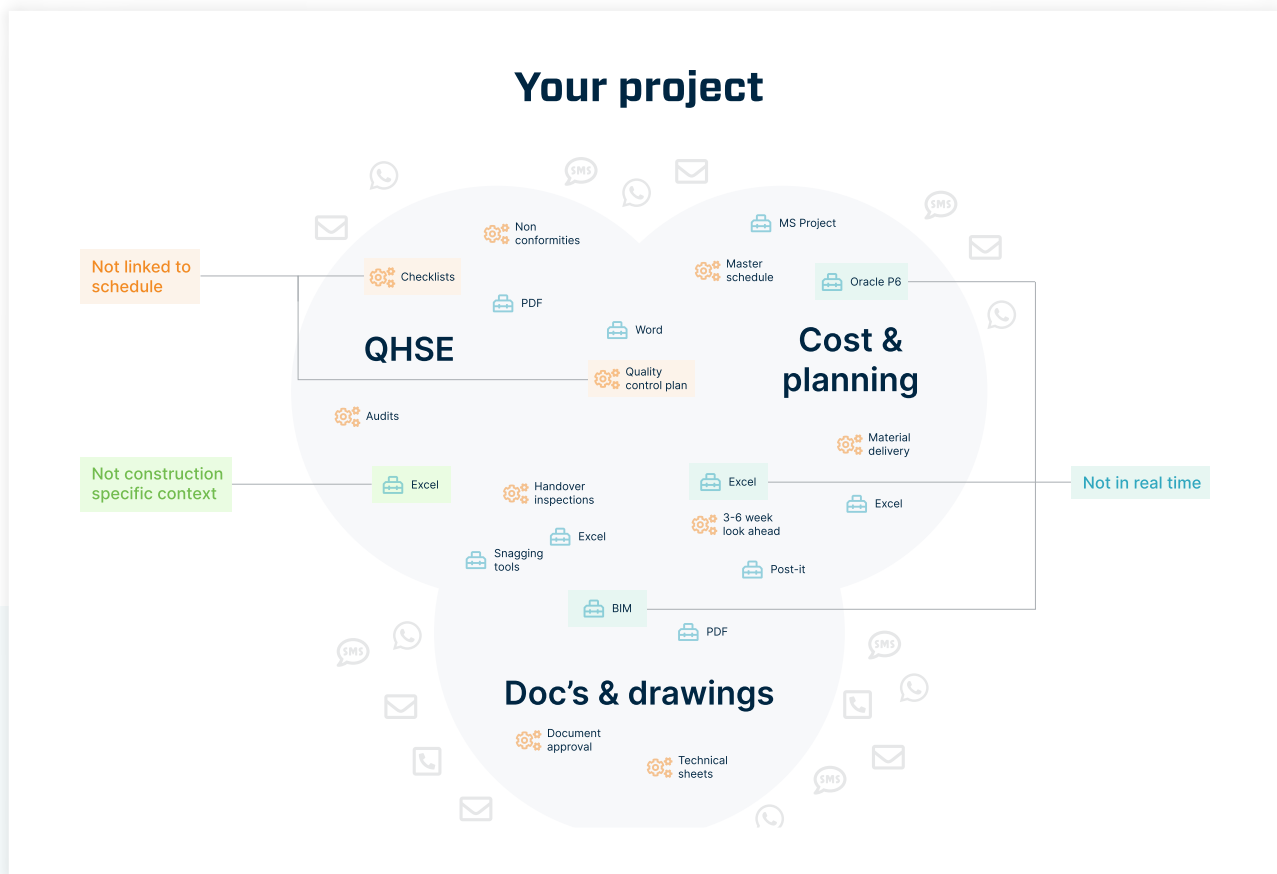
Companies are using different combinations of digital and analogue tools to manage these processes but, as our heroes found out, all too often they are not designed for constr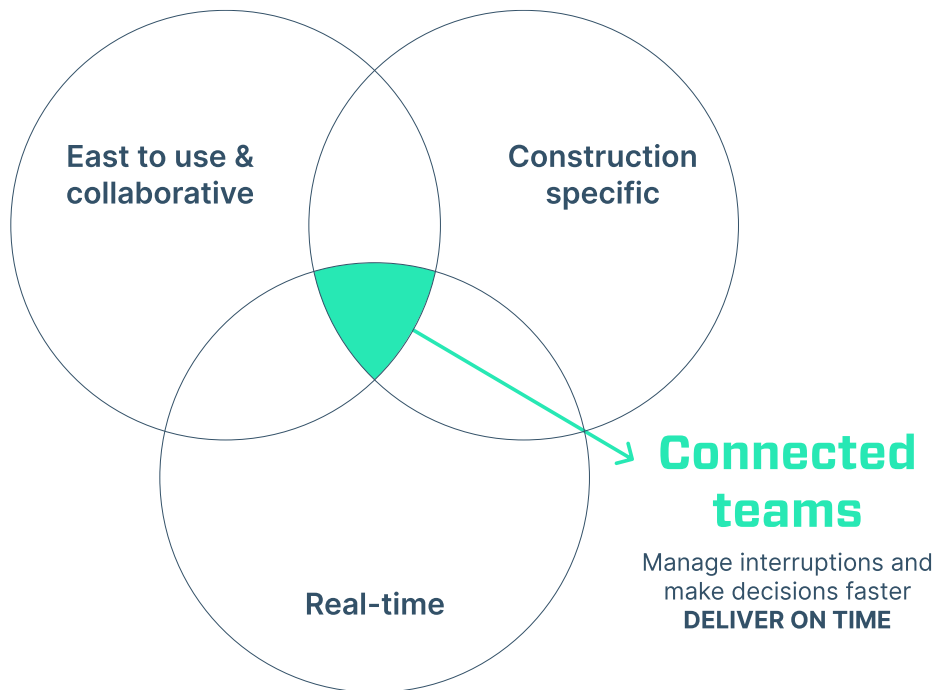uction, not linked to the schedule of work, and not real-time. As a result, teams are disconnected from each other and from the plan, and a lot of manual work has to be done in order to coordinate and progress the project activities.

What Matt, Morten and Federico worked out, was that they had to create a new reality; one where their **teams were connected** to each other and to the office.

If we take a look across the stories we have told, the secret sauce for all our heroes was connecting their teams by getting them working together using a tool that is easy to use, collaborative, and made for construction and which works in real time.

East to use & collaborative

Construction specific

Real-time

Connected teams

Manage interruptions and make decisions faster
DELIVER ON TIME

Connected teams

↓

Manage interruptions

↓

Deliver on time

↓

Deliver on budget
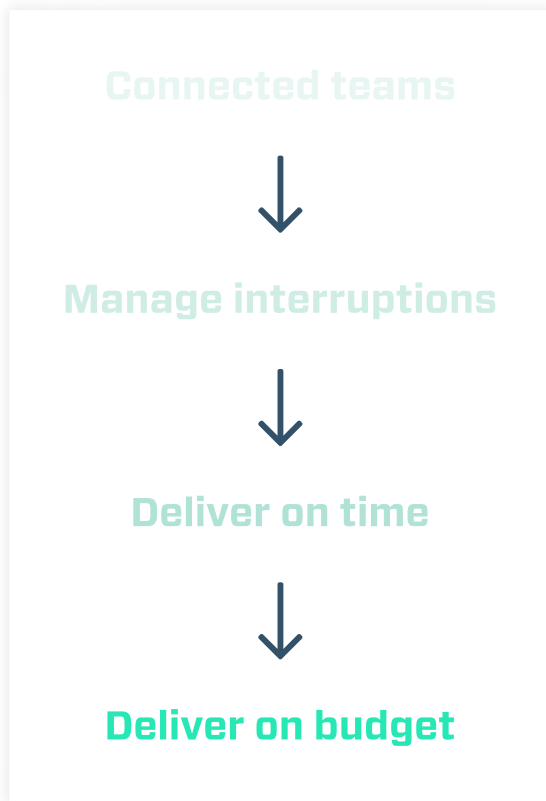
This finding is echoed by a lot of others we have talked to. **Basically, if you connect your teams in real time and get rid of the old processes and bad habits that are causing bottlenecks in your organisation, you will be able to manage interruptions and make decisions faster. As we know, this directly correlates to delivering on time - and budget**.

Let's take a step back and look at the concept of a keystone habit again. We said earlier that a keystone habit like Alcoa's "zero injuries" is the type of habit that leads to a cascade of other actions that, over time, change everything.

As part of his safety focus, Paul O'Neill insisted on being informed of any injury within 24 hours and being presented with a plan of how to avoid it in the future. To be able to do that, the whole organisation had to improve their communication and work processes. This changed a previously rigid hierarchy to a dynamic, collaborative organisation, all focused on optimising processes to achieve the shared end goal: A safe working environment.

In other words, to achieve his end goal, O'Neill enabled his workers and teams to communicate directly with management and with each other, and enabled them to find solutions to problems themselves. After all, they were closer to the problems on the floor. Essentially, he connected the teams and made them collaborate towards a shared goal. Exactly as our construction heroes did.

13. Getting you on the way forward

CDML™ - A catalyst for change

So where to begin? It's a lot easier to decide where you want the journey to end.

The global construction industry is approaching a crucial point in time, when it comes to the understanding and application of digital technologies.

Hundreds of thousands of companies struggle to find cases, best practice and models to learn from and lean on. No public Best Practice nor global models exist, where companies can look to and draw confidence and insight from. We all need a baseline - a place to begin. The CDML™ (Construction Digital Maturity Ladder) has been developed to give companies within construction a necessary starting point.

The Construction Digital Maturity Ladder (CDML™) is a free-to-use online assessment of your company's digital maturity. It has been designed to give companies in construction a needed digital benchmark against thousands of companies in the industry globally. By filling out the assessment you will receive instant feedback and gain exact insight into where your company stands.

There are seven steps on the ladder: From Business As Usual to Guiding Star.

If you want to go all the way to the top of the ladder, becoming a Guiding Star in construction, you will need to balance People, Processes, Data and Technology - the four dimensions of a successful digital transformation.
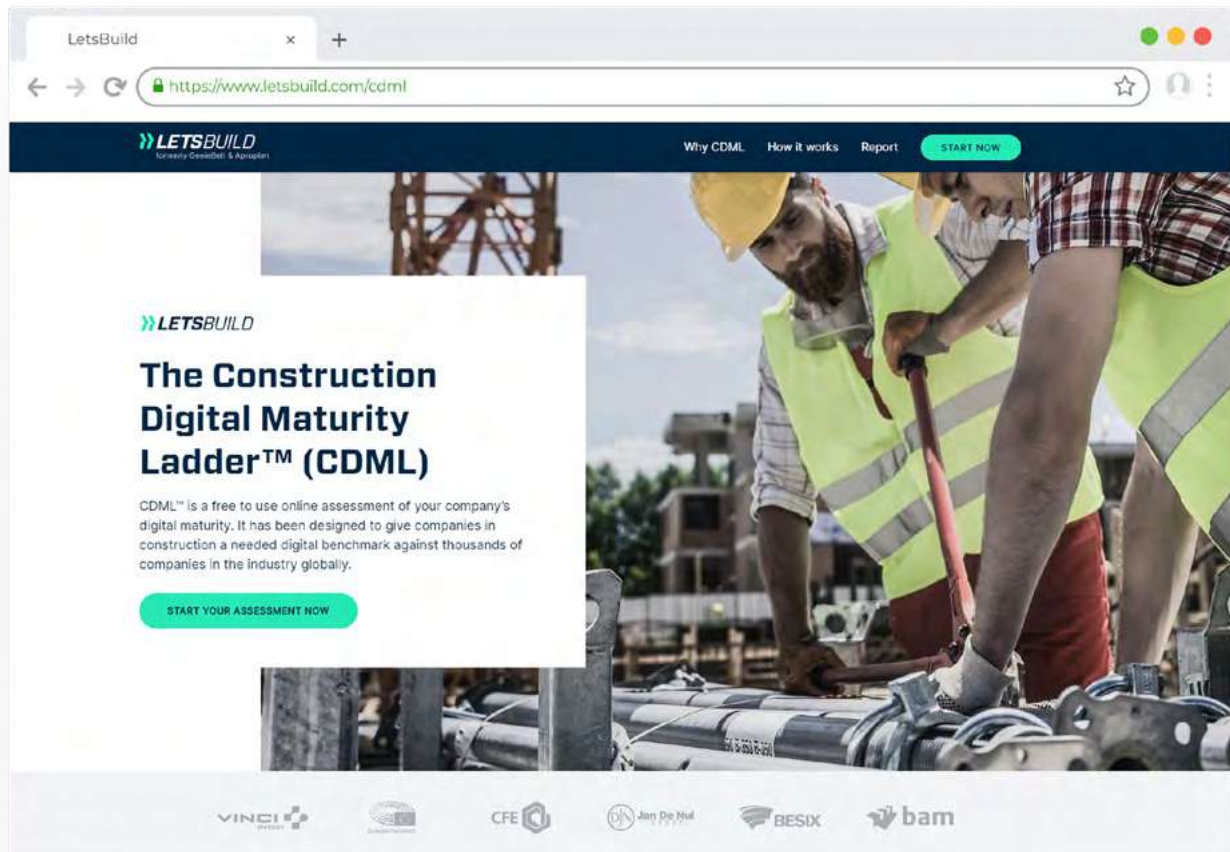
It's like having a chair - if one leg is out of balance or even missing, the chair wobbles or perhaps even falls over. That's why it is important to keep focus on all four dimensions if you want to strengthen your digital maturity.

The CDML™ emerged from a strong vision to change the way the construction industry collaborates and communicates. To achieve this, we must all move towards a common language and a mutual understanding of the project at hand. In this journey, a universal digital model can be the catalyst for a groundbreaking change.

The CDML™ cannot give you all the answers. No one can. But it can give you a starting point. It gives you an external perspective on your company and the contours of the road ahead. Whether or not you decide to use the CDML™, one thing is certain. The road to digital transformation begins and ends with you. The next step is yours.

To do this free online assessment, visit **www.letsbuild.com/cdml.**

"**The pandemic is a perfect opportunity for us to rethink again and actually use this time for enlightened thinking as we speed up the modernisation process.**

We can't afford to take our eyes off the longer term. We still have to think about the longer term. The route of how we get there might be different but we shouldn't be changing these key objectives."

David Philp - Global BIM/IM Consultancy Director, AECOM

14. Construction after COVID-19 - closing thoughts from the authors

The topic of digitalisation in construction has been much discussed over the past few years but there is no doubt the COVID-19 pandemic is adding fuel to the fire. The need to change the way we operate in this, one of the world's oldest industries, is only being highlighted by the Coronavirus.

We have summarised a lot of research, collected opinions from experts in the industry and studied the way some of the industry frontrunners are doing things and the reasons for their success and shared our findings with you. We hope it has been worth your time.

Bold, tightly integrated digital strategies are the most effective approach to digital transformations.

Rate of organic revenue growth, % share of (past 3-year CAGR,[1] actual)

	Traditional incumbents	Incumbent competing in new digital ways
<0%	19	16
0% to 4%	23	14
		22
5% to 9%	27	37
10% to 25%	25	
>25%	5	10
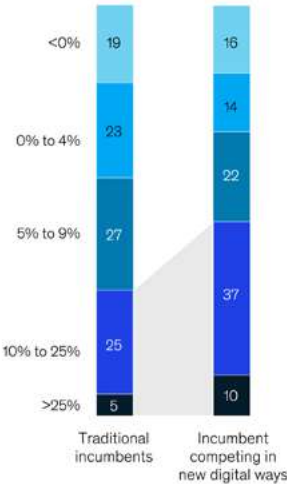
Rate of EBIT[2] growth, % share of (past 3-year CAGR, actual)

	Traditional incumbents	Incumbent competing in new digital ways
<0%	18	13
0% to 4%	22	16
5% to 9%	25	23
	31	38
10% to 25%		
>25%	3	11
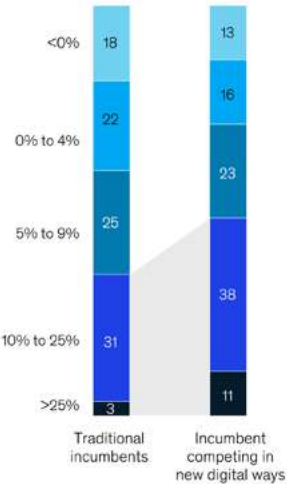
Note: Numbers may not sum to 100, because of rounding.
[1]Compound annual growth rate.
[2]Earnings before interest and taxes.
Source: 2017 Digital Strategy Survey

McKinsey & Company

We would like to leave you on this note:

Accelerating your digital transformation in order to deal with a pandemic can be daunting as companies are forced to pilot new digital initiatives at a scale and speed hitherto unknown. But, as McKinsey & Company put it in their recent report "Digital strategy in a time of crisis":

Despite the horrible ramifications of a global virus threatening our societies and economies, COVID-19 might be the catalyst for change in an industry that is characterised by low productivity and high waste. If there was ever a time to question old ways and think of new solutions, now is it.

"Now is the time to reassess digital initiatives—those that provide near-term help to employees, customers, and the broad set of stakeholders to which businesses are increasingly responsible and those that position you for a postcrisis world. In this world, some things will snap back to previous form, while others will be forever changed. Playing it safe now, understandable as it might feel to do so, is often the worst option."

McKinsey & Company - Digital strategy in a time of crisis

REFERENCES

- **Digital strategy in a time of crisis** - McKinsey & Company, April 2020

- **Imagining construction's digital future** - McKinsey & Company June 2016

- **Shaping the future of Construction: A Breakthrough in Mindset and Technology** - May '16 World Economic Forum and The Boston Consulting Group

- **Molio - Construction Information Centre** - The Use of Digital Tools in Construction during the Corona Crisis, April 2020

- **IHS MARKIT / CIPS UK CONSTRUCTION PMI®** - April 2020

- **Global Construction Outlook to 2024 (COVID-19 Impact)** - GlobalData, March 2020

- **Imagining construction's digital future** - McKinsey& Company, June 2016

- **Global Construction Survey 2015** - Climbing the Curve by KPMG

- **The construction productivity imperative** - McKinsey & Company, July 2015

- **Shaping the Future of Construction** - A Breakthrough in Mindset and Technology by Boston Consulting Group, May 2015

- **Global Construction Disputes Report 2019: Laying the Foundation for Success** - Arcadis

- **Statista survey of construction companies on COVID-19** - 2020

- **Construction Disconnected** - Plangrid & FMI Corporation, 2019

- **Subcontractors speak out on productivity** - Martin Loosemore, May 2016

- **Factors Affecting Construction Labor Productivity** - Intergraph, 2012

- **The KPI's of construction - Survey** - Autodesk & Dodge Data, November 2019

- **Causes of delays in construction projects in Turkey** - Journal of Civil Engineering & Management, March 2011

- **Causes of Delay in Road Construction Projects** - Researchgate, July 2012

- **Project Schedule Risk is Key to Understanding Cost Risk** - Hulett & Associates, 2011

- **Time-cost relationship for residential construction in Texas** - Texas A&M University

- **Time–cost relationship for predicting construction duration** - Elsevier, March 2013

- **Analysis of Relationship between Time and Cost Overruns in some Infrastructure Projects** - Nicmar, Journal of Construction Management, 2012

- **Time-Cost Relationship in Road and Highway Construction** - Texas A&M University, June 2016

- **2019 ConTech Report** - JB Knowledge

APPENDIX

Extract from presentation given by Jan Mischke, Partner, McKinsey Global Institute at

Virtual Town Hall meeting: How does UK construction learn and move forward during this unprecedented time of Covid-19, April 2020

What we are collectively trying to achieve is to rapidly and quite effectively control the virus spread by locking down for a period of two months with a view to starting to re-open and normalise the economy stage-wise as of summer.

Executive expectations about the shape of coronavirus crisis in the World and the United Kingdom
Survey of 2,079 global executives (136 in the United Kingdom); % of respondents

	Most likely scenario		World / United Kingdom %	
Virus spread and public health response	Rapid and effective control of virus spread	B1 — 15/18%	A3 — 16/16%	A4 — 6/3%
	Effective response, but (regional) virus resurgence	B2 — 11/7%	A1 — 31/36%	A2 — 6/4%
	Broad failure of public health interventions	B3 — 3/3%	B4 — 9/10%	B5 — 2/2%
		Ineffective interventions	Partially effective interventions	Highly effective interventions

Knock-on effects and economic policy response

In this scenario, assuming that also the economic policy response is effective in terms of the support given to companies and to households, we would expect a v-shaped recovery where the economy in Europe tanks by about 10%. That is the biggest drop since WWII but then it actually comes back to where we left off from early next year already. In the construction sector we would in this scenario expect to develop even slightly more positively or slightly less shocking than the overall economy because of public stimulus measures and because it is hard-hit but less hit than some sectors like retail or travel and so on.

The slightly more negative scenario is that in summer we find out that the virus has not been sufficiently contained, that the measures taken are not sufficient; there will be a resurgence of the virus and a renewed lockdown or a series of renewed lockdowns until we find a vaccine. In this case, one must assume that significant and lasting damage to the economic fabric with lots of bankruptcies, corporate debt fall-outs and so on will have happened. We expect a contraction of the European economy of about 14%, peak to trough, and then an even stronger contraction of the construction sector of about 16% peak to trough, and then recovery only by late 2024. So essentially five lost years.

You can see here, the three coloured shapes is what executives in our survey think is the most likely option.

On the upside, every crisis is also an opportunity. There is a case that we actually see an unprecedented acceleration of innovation. And we already see that in a number of sectors; we hear clients tell us that they are essentially compressing five-year investment plans into 3 months. So that is the order of magnitude of acceleration that some players are doing.

When we think through what that might mean in construction specifically, a few things stand out. It's essentially an industry that hasn't been innovating at the rate and scale it could for a long time and for many good reasons that have held the industry back.

Our research has shown that there is a 60% productivity opportunity looming in the sector waiting to be reaped. 60%.

Let's look at the effects look set to accelerate industry disruption:

Effects look set to accelerate industry disruption

i — Increased digitalization and investments into technology

ii — Increase in offsite construction

iii — Increased vertical integration

iv — Accelerated consolidation

v — Acceleration in demand for sustainability?
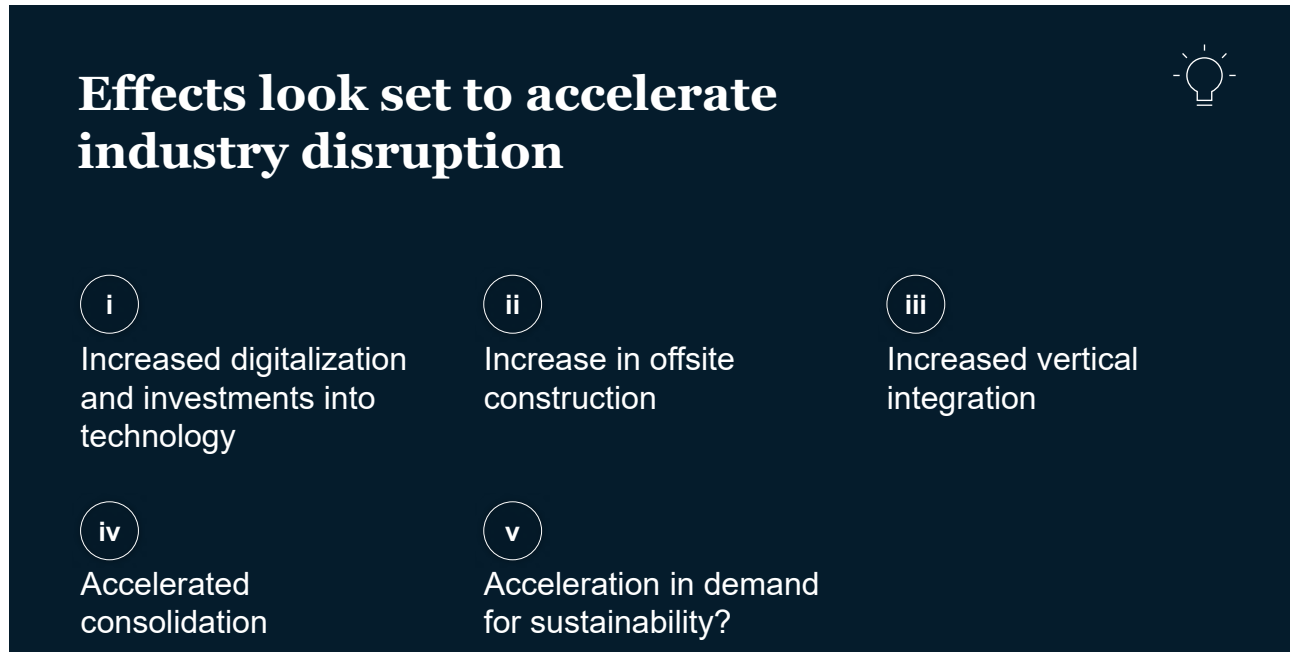
Of course a lot of this has to do with digitalisation. For the broader ecosystem, beyond BIM and all the site technologies, it is also a lot about digitalisation of channels and logistics chains or supply chains turning into fully industrialised supply chains with delivery just in time, sequence of installation and so on. So there is a huge bucket of digitalisation that is about to go on steroids with the epidemic.

Secondly, for offsite construction, our research shows a 20-40% cost savings opportunity. Those have not really materialised at scale yet because most suppliers are waiting to make the big investments and to gain scale while the big developers are waiting to find the large suppliers that can guarantee them a no-risk and cost-saving outcome.

Thirdly, the industry has been slow to move because of its fragmented set up. And that's why we expect for a sustained period of time an increase in vertical integration for players to actually overcome that and control what they want to improve.

Fourth, lots of companies go bankrupt but also other companies try to get the scale they need to make the required investments.

And last but not least, an acceleration in the demand for sustainability. There is a question mark because unfortunately there are some discussions again on whether we want to live through a brown recovery where we prioritise jobs over the environment.

We believe that these shifts will radically accelerate due to the crisis.

How COVID-19 could accelerate the adoption of ConTech in 2020

By Simon White, Chief Digital Officer, VolkerWessels UK

In recent years, organisations across the world have been developing and implementing their own digital transformation strategies, and many in the construction sector have struggled to implement them successfully. With ever increasing advances in automation, generative design, photogrammetry, IoT, machine vision learning and artificial intelligence, and the emergence of a plethora of digital software platforms, the construction sector has had all the necessary tools to make major advances. However, it has proved difficult to change some ingrained habits and ways of working built up over decades, to enable acceleration at the pace needed. Although there are challenges, the current situation could provide the opportunity to move our industry further forward more quickly than ever before.

VolkerWessels UK made a strategic decision in 2018 to accelerate its approach to digital construction and innovation - and looking back now, we are very grateful that we did so.

Our goal was not to give people specific technologies and expect them to be implemented but rather, to give our people the awareness, culture and ability to adopt any technology, to have time to think, innovate and create a better work life balance.

We have now successfully applied this approach on numerous occasions – for example, with the voluntary adoption of Microsoft Teams across our businesses. In under 12 months, we had achieved almost 90% active users which has helped accelerate our adoption of a range of cloud-based

platforms. These include most notably, our Common Data Environment Enterprise solution ASite, and LetsBuild - our enterprise solution for construction management. These solutions help us connect our sites and offices, whilst giving us the ability to collect live information about construction progress, to track issues and to plan our projects with transparency for our clients and supply chain using high quality, real time data.

As the UK moved into a lockdown period, our digital construction strategy – called 'Tomorrow Now' – had already empowered most of the business to work remotely on our sites, in our offices or from home. This has allowed us to continue focusing on a variety of innovations, and in the last few weeks, we have received more than 70 requests for our central digital team to support pilot projects across the business.

In response to the COVID-19 crisis, we have accelerated our LetsBuild rollout, both in terms of the number of projects and also additional functionality. We have worked with LetsBuild to flex its solution to provide us with construction management data, which will inform our project and business level decision making.

Alongside our strategic solutions, we have built a series of fast track applications and dashboards, to enable us to monitor the health of our business as closely as possible to real time. We have monitored our COVID isolation statistics, the operational status of our construction sites, and of our design management. We track remote working, monitor business continuity and have developed a stock distribution PPE application, as well as developing a solution to carry out COVID financial scenario modelling.

As a business, we feel fortunate that we had already accelerated our people-focussed digital construction strategy during 2018. As we move into a 'new normal', we understand now, more than ever, the value that ConTech can offer our sector, as we move to become an industry which is 'powered by data and driven by people'.

Towards post-COVID-19 construction industry sector

By Prof. Dr. Zoubeir LAFHAJ

The first important thing to clarify is that COVID -19 is not a crisis. It is a disaster. And the hallmark of a disaster is that it happens quickly, by surprise, on an uncertain issue. The disaster happens because no one has anticipated it or invested to avoid it. The mechanism of a disaster follows a well-identified process: (i) it must be clearly named, (ii) it must be informed with honesty and transparency, (iii) good examples of resolution must be sought. In the case of the construction sector, it is therefore necessary to ask what role it should play in anticipating disasters and investing in appropriate solutions based on international examples of this global COVID-19 disaster.

The environment around construction has undergone significant changes in recent years, both technically and strategically. With digitalisation, the business model, based on generating income by selling built units, is changing. Even if the opportunities offered are almost infinite, the COVID-19 disaster will allow companies to make appropriate choices, especially if humanities wants to survive. The post-COVID-19 period will allow priorities to be set in terms of health, use of natural resources, proximity and servicing. All industrial sectors, including construction, must therefore show resilience and make integrated proposals for servitization to people, to humans.

To reach the next level of servitization after COVID -19, manufacturers need to rethink their service offering (if any) and not focus solely on the delivery of works (products). By relying on its capacity to integrate the construction phases and align the supply chain, construction can transition to a service offer focused on the comfort, health and safety of users, the maintenance of its assets over a period of years, even decades, and integrate the circular economy in which it will be fully integrated.

The following figure represents the model for the adoption of the Act of Construction in the post-COVID-19 for the built environment. The Figure represents the three contexts that act synergistically on the construction sector:

- **The basic needs of humanity with** respect for **cultures** and **societies**. Priorities, with the help of technology, must be directed towards food, water, energy, land and the environment.
- A rethought economic context. It is about designing and building in a **resilient economic context**. Construction is part of a rethought vision of our economy, integrating the **local**

economy (materials, transport, manufacturing, sustainable supply chain), **the circular economy** (respecting the life cycle of buildings and their recycling) and following what K. RAWORTH calls the *Donuts theory* in which society is built by respecting available resources and the basic needs of all humans.

- **Social integration and leisure**: this phase concerns the **end user and** is intended for his comfort and safety. It concerns the social and cultural aspects of people, their happiness, sharing, volunteering, trust, communication.
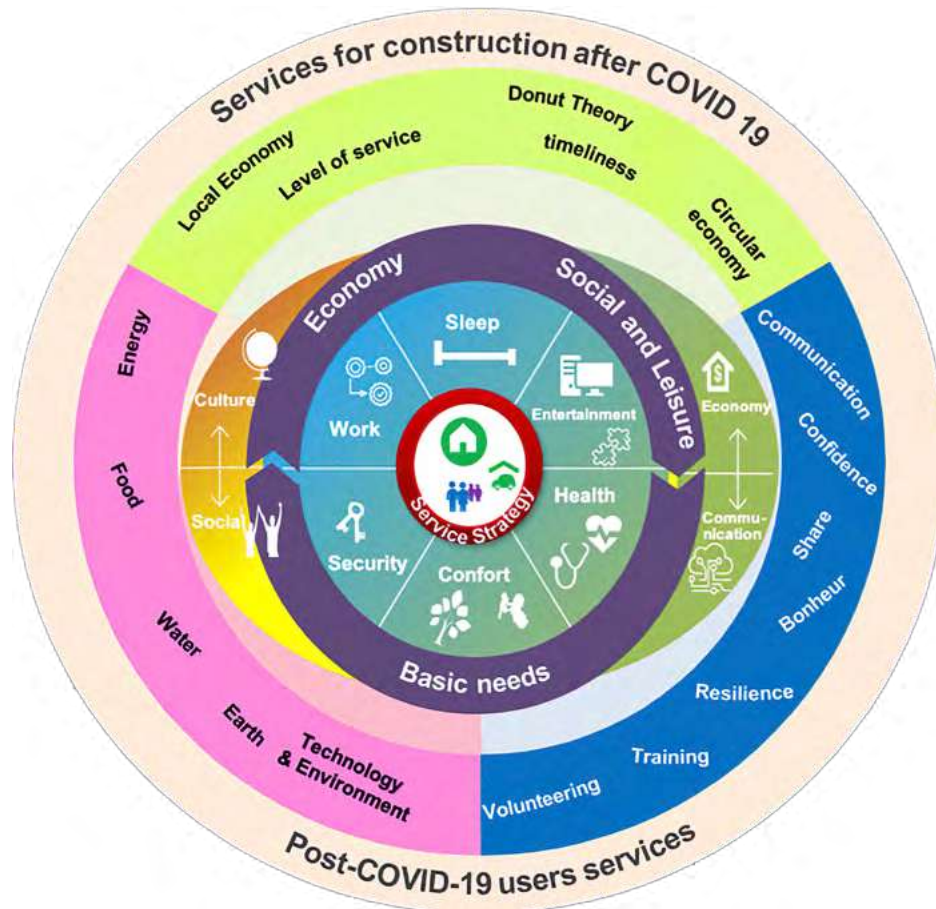

Figure 1 : Strategic vision for the construction industry post COVID-19

The act of building is not an isolated act. It is carried out by taking into account these new constraints, partnerships formed between all stakeholders, in a respectful local environment. The new technologies associated with the digitalisation of construction must, as a matter of priority, set themselves societal and public health objectives. The development of a modular construction industry should also be able to meet these new challenges. The design of our buildings must be reflected as places for living, working, education and leisure. Builders must integrate new services into their service offer throughout the life cycle of buildings. We no longer have a choice. Nature chooses what is best for us, even in the event of a natural disaster.

Prof. Dr. Zoubeir LAFHAJ is Professor of Civil Engineering at Centrale de Lille (France). He holds the Industrial Research Chair "Construction 4.0".

Extract from:

Oracle's commitment to our customers and partners during the COVID-19 crisis

Background

Much has been written about how Covid-19 will reshape travel, tourism and retail. Less has been said about what it will mean for construction & real estate. However, this sector plays a far greater role in the global economy than the former two. The value of global real estate is more than all the world's stocks and bonds combined. It's also a key growth driver. Construction in all areas of real estate in the US, for example, accounted for 18.1 per cent of gross domestic product in 2019.

Unfortunately, in the wake of Covid-19; what we are seeing in many parts of the global real estate market right now is an explosive combination of oversupply, under-demand, and the very worst aspects of financialisation.

I however believe that digital technology will be a strong force in redefining the foundations of construction & real estate value – whether it is the meaning of location and accessibility, employee health & safety, the power of regulation and zoning laws, the flow of capital and information, and even the notion of scarcity itself.

With the young discovering old ways to connect and the old connecting with the new, the Covid-19 outbreak has turned some assumptions about technology and the demographics of the Internet on its head.

Construction Industry – Road to Modernization Using Technology

While modernization and embracing a digital strategy are priorities, they're challenging for many companies. And with modernization comes the need for investment. To meet cash flow goals and improve cycle times, those in the finance function will need to carefully understand how investments can generate the best returns while also meeting business objectives.

- Installation and upgrades in enterprise resource planning (ERP) software and financial systems are fundamental requirements to enable competitiveness.
- From a Supply Chain perspective modernization will bring the necessary focus on autonomous materials movement (e.g., autonomous forklifts and cranes and high-payload drones) and the automation of repetitive tasks. It will also be important to evaluate the use of automation solutions to reduce the number of workers on sites.

Final Thoughts | Visit Your Construction Tomorrow, Today

According to a recent EY survey of construction industry executives, most of them (98%), believe a digital strategy is critical to their ongoing success. At the same time, however, only 28% noted they actually have a strategy in place, and a mere 9% defined themselves as having digital readiness.

The construction industry is an extremely competitive sector where the stakes are high and operational efficiencies mean bigger profits. The process of modernizing their business operations with digital transformation will make construction companies more efficient and more profitable.

Arun Khehar, Senior Vice President, Oracle Middle East Africa & India

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Keeping supply chains open while cutting off the chain of infection

Contribution from Solar

Solar is a digital sourcing and services company supplying technical building materials and know-how to construction, installation and industry customers in Northern Europe.

COVID-19 challenged us all on our processes, our digital maturity and our agility in ways we had not anticipated in our otherwise extensive risk management efforts. We had a wealth of other scenarios prepared, trained and ready to roll with…but not this one. We tend to think of "Black Swan" events in very generic terms, like "X% negative GDP impact", but when they actually do swoop in, it's a precision strike deep into our business operations.

That being said the construction bust following the 2009 Financial Crisis was still in "muscle memory" of our executive team, so our response was swift and thorough, setting up a COVID-19 Task Force meeting daily and communicating to 1st line management twice weekly followed by broader Intranet bulletins. We were determined not to underestimate the consequences: hope for the best but plan for the worst.

The first order was to protect our core : our ability to deliver products to customers in a safe way. Over 60% of daily orders are digital and more than 90% of deliveries are either overnight shipments or 1-hour "Fastbox" digital courier service, which are already a perfect match with social distancing restrictions. In Solar we have long questioned why, in 2020, do we still need physical stores for professional construction materials when digital tools and direct deliveries are so much more productive for everyone?

On the inbound side of our distribution business we have trucks arriving from all around Europe on a daily basis, including early COVID-19 hotspots like Northern Italy and France. We required chauffeurs to stay in their trucks, or, if they had to unload themselves, do so at a specific dock, where we could decontaminate.

Our central warehouse operations were replanned into zones, with small shift teams that could back-fill if a team member became symptomatic. Practically all staff transitioned to work from home, including top management. The lunch buffet - a central tenet of Danish work life - was canceled and instead our kitchen delivers the food directly to each active work zone.

We re-focused work on daily operations, close coordination with both customers and partners to keep supply chains open and pushed major new product launches out. Sales reps found that, instead of meeting 2-3 customers in person and spending hours in their car, they now spoke to more than 15 customers on the phone or in digital sales calls every day. Our management team found similar efficiencies interacting with their teams and conducting business.

As our markets went into lock-down, construction was one of the sectors tapped to stay open by most Northern European governments. However, initial missteps happened in the early confusion. Some were down to old habits: how can we coordinate a project without cramming into a damp trailer to argue over a stack of Gantt charts and drawings? Others were just stupid mistakes: schools sent their students home, but also any contractors doing refurbishments, site permits got stuck in limbo between town halls and home offices, etc.

Some of our affected customers vented their frustration to journalists eager to publish local impact stories...and a good politician know not to become a visible part of the problem, so they quickly found solutions.

However, a sector slowdown was unavoidable. Less so on construction sites than in the daily installation service business. Keeping companies on a strong footing, for employees and owners, as well as for customers and partners, required both hands on the wheel and attention to detail in the engine room. Flexible, temporary government programs designed to salvage employment came on-line in all our markets and helped soften the initial blow - also for Solar.

Then came the mobilisation: from state authorities lifting local construction caps all the way down to council workers determined to get a "green upgrade" project slated for fall out of the door by Friday (and they succeeded!). A flow of constructive proposals were funneled through our Industry associations to parliament with some turned into law in a matter of weeks.

And we are seeing customers accelerate adoption of our digital tools and Fastbox deliveries, even from a very high level. We are seeing contractors pick up digital coordination - what was discussed for years became integral to their operations in a matter of weeks. And lets not underestimate the potential here. The construction plan is the focal point around which everything revolves in our industry. Digitizing the plan opens up, not only for efficient, Corona-safe coordination, but a wealth of other quality and productivity boosters. From a Solar perspective we can make construction

site logistics much more productive by coordinating material deliveries with a digital, real-time construction plan. And it doesn't stop there, our value-chain is sitting on a heap of opportunity in closer, more digital collaboration.

As we all plan our return from lock-down we know we're still a long way from "normal", and it will likely be a "new normal", so let's use this crisis to create new and better habits for our sector for the future.

Hugo Dorph, Group Commercial Director, Solar A/S

Corona hitting construction – a paradoxical boost for digitalisation

By Christina Hvid, CEO, Molio

Molio is an industrial foundation with the aim of strengthening the construction industry through digitalisation and innovation. Molio offers digital tools and services supporting all links of the value chain. Molio also runs the Danish chapter of buildingSMART.

In Q1 2020 the construction industry in Denmark was flying. We had a high demand as well as a record high number of more than 180.000 Danes working in the industry. The highest in 12 years. But then the world changed. The country was locked down, and workers sent home. Throughout the crisis, Danes have been working from home, shops are closed and social activities and gatherings of more than 10 people are not allowed.

The Corona crisis started as a health crisis, but has since evolved into a world-wide economic crisis.

There is no doubt that the Corona crisis is serious and is going to leave a lasting mark on everyone, big and small, regardless of industry or trade. However, though the Corona crisis has proven to be a storm hitting several layers of our society, the construction industry has to some extent been able to weather the worst of it so far. This is in large part due to an unprecedented increase in the use of digital tools.
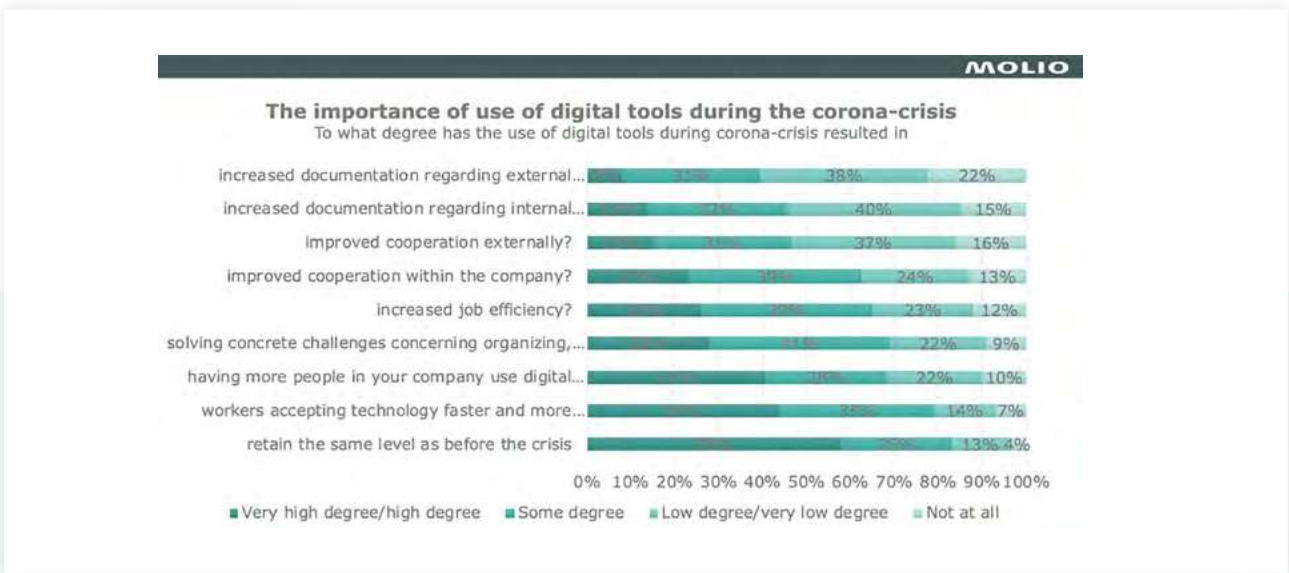
When Corona hit Denmark, Molio did a survey on how Danish companies in the construction industry were handling the crisis in their day-to-day work and how they were affected by it. And the findings

turned out to be quite interesting. The large majority – more than 9 out of 10 – have increased their use of digital tools during Corona, and more than 8 out 10 respond that this increase has helped them sustain the same level of activity as before the crisis. Two thirds of companies even respond that they actually have become more effective due to the use of digital tools.

This development is in itself a positive trend. But what is more important is that the increase has taken place across both architects, engineers, developers and craftsmen, as well as company size. It is not a case of the big getting bigger or the "most digital becoming more digital", but a trend playing out among every link in the construction value chain.

Necessity is the mother of invention

In our biennial survey on the state of digitalisation in the construction industry made before the Corona crisis, we could see a near-standstill of the state of digitalisation. Though everyone agreed on the positive effects of increased digitalisation, the transformation just was not taking place. The main barriers across the construction sector were lack of digital skills, a lack of digital culture, and cooperation – a gordic knot that the current crisis seems to have started to loosen.

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The importance of use of digital tools during the corona-crisis
To what degree has the use of digital tools during corona-crisis resulted in

	Very high degree/high degree	Some degree	Low degree/very low degree	Not at all
increased documentation regarding external...			38%	22%
increased documentation regarding internal...			40%	15%
improved cooperation externally?			37%	16%
improved cooperation within the company?			24%	13%
increased job efficiency?			23%	12%
solving concrete challenges concerning organizing,...			22%	9%
having more people in your company use digital...			22%	10%
workers accepting technology faster and more...			14%	7%
retain the same level as before the crisis			13%	4%

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

We are now during Corona seeing a massive increase in the number of companies and people using the digital tools and services. This not only concerns the use of communication-tools like emails or Skype, Zoom, Teams and the like, but even industry specific tools such as Revit, Dalux or LetsBuild. In fact, among contractors and craftsmen, the latter being one of the least digitalised professions, 1 out of 5 have now increased their use of industry specific tools considerably. Furthermore, companies report that more and more of their employees have begun to use digital tools in their day-to-day work – and are doing so willingly! For instance, a plumbing-company recently reached out to Molio asking for help using a digital tool. They reached out because the architects on one of their projects had insisted on using it. It was completely new and unfamiliar practice to them, but they embraced it and started using it. With conviction and without reluctance.

A lasting effect or a breeze?

All the current data show us that the Corona crisis has pushed the construction industry onto a path to increased digitalisation. Though we cannot say for certain, I am convinced the digital momentum we are currently experiencing is much more than a momentary breeze.

When we asked the 450 participants in our survey during the height of the Corona lockdown in Denmark, more than 9 out of 10 responded that they would continue their use of digital tools and services after the government lifting the imposed restrictions. I am seing similar trends in other industries as well, and it implies a perception of "no going back", which can have enormous effect. It will help create a more effective construction industry with a higher level of productivity. This will not only benefit the construction industry, but society as a whole.
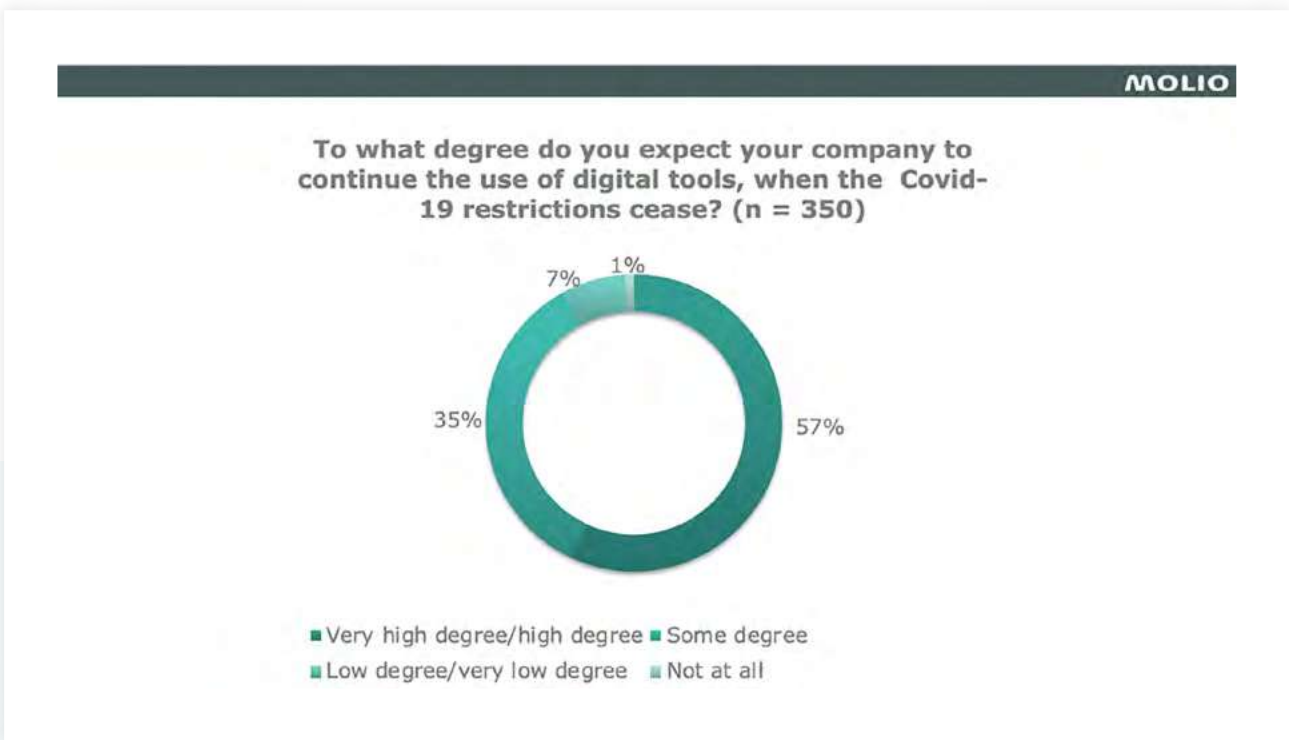
First of all, the unprecedented increase in the use of digital tools and services coupled with a commitment of continuing this use can lead to an increased demand of more advanced tools. Having been forced to take the first hard step and experiencing the results firsthand, digitalisation has become demystified and more people are encouraged to take on further tools and services, and to adopt a more digital way of working.

The way I see the future outlook

I believe we are going to see a vast increase in the use of construction technology in the coming years which will give rise to an increased demand for standardisation. Here, I believe buildingSMART

will become the new normal, offering the open standards and tools necessary to support a digitalised workflow across the value chain, which will have major impact on our efficiency. We will travel less across country to inspect a site, because everyone will be using digital tools and virtual meetings. We can create better solutions faster, because more advanced tools are becoming commonly used, and we can reduce costs and better document our work. We are already starting to see the effects here in Denmark, with an increased trust between different professions due to the use of these tools.

This in turn will also impact society more broadly. Our biennial survey on the state of digitalisation in the construction industry highlighted the fact that digitalisation is an essential part of transitioning to *sustainable* construction. It is through the use IoT, AI and data-driven tools and services we can find out where and how to optimise our efforts and document our results.

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To what degree do you expect your company to continue the use of digital tools, when the Covid-19 restrictions cease? (n = 350)

1%
7%
35%
57%

■ Very high degree/high degree ■ Some degree
■ Low degree/very low degree ■ Not at all

With all links in the value chain becoming more digital, and with the developers setting higher demands for the use of digital tools, we are making crucial gains on an issue that has broad awareness. The issue of our footprint on the world has become even more present during the current crisis, where we have experienced rapid changes with cleaner air and clearer water in our cities. Digitalisation is the foundation of a sustainable construction industry, and it is my hope that we in the industry will act on the current momentum and accelerate this process even further. We need to *work digitally to build sustainably.*

Finally, going forward I believe that Corona will mark a turning point for the decade. We will see massive changes to the way we build, how we want our buildings to be and what we want them to do. We will see a broader use of property technology in our real estate business, we will see smart cities popping up, and even our common urban spaces will become digitalised.

A Molio we are working on creating a hub for experimenting with construction technology, a ConTech Lab. Here, I hope we will be able to test new ways of working together, designing, developing, and constructing, and to explore how we can think differently when it comes to digitalisation for creating the buildings of the future. The importance of creating such a hub has only been confirmed with the current crisis.

Paradoxically, it seems the storm hitting society has turned out to be the much-needed wind in the sails of making a digital transformation of the construction industry.

What the 1980's restructuring of the car industry means for construction

By Klaus Nyengaard, CEO, LetsBuild

During the 1980's, the car industry in the USA and Europe, which for decades had been ruling supreme, met a new breed of competitor: the Japanese car manufacturer! Toyota, Honda, Nissan and other Japanese companies managed to get big market shares globally by producing cars that were cheaper and often also better quality than the products from the old, well-known brands. Customers raved about how the Japanese managed to offer not only small cars, but increasingly also mid-sized family cars that were better, more reliable and lower priced than the usual brands from Europe and the US. The old car industry was suffering. How could the Japanese systematically across their car manufacturers out-compete the establishment?

Many resources went into understanding the Japanese production model, books were written, delegations shipped to Japan, academics made reports, etc. The Japanese tactics became clear, and there were many small elements that came together to shape a more effective and ever improving organization with tight focus on quality and efficiency. Today, we all know about the methods used, because they are now used globally, not only in car manufacturing, but across industries, e.g. Kanban, Just-In-Time, continuous improvement, etc.

Why is this relevant for the construction industry today? Because what happened in the 1990's in the manufacturing industry will be reflected now in the construction industry. One of the key enabling factors for the car companies was that they had to optimise the entire value chain, and they had to collaborate closely on R&D as well as logistics and manufacturing. It all had to be glued together, so all the thousand small parts moving back and forth were coordinated, even though it was managed by independent companies. In order to make that happen, you need IT systems to collaborate. It is essential for collaboration, that information is shared, and that communication can run smoothly both within companies as well as between companies in the value chain. The manufacturing industries benefited hugely from the digitalisation of data & communication in the last part of the 20th century. Without those tools, the advancement that has seen manufacturing improve productivity by 2% every year for decades would not have materialised.

In the car industry, it was the big car brands that took a lead in gluing the value chain together. They built the IT systems that everybody could use, and they invited the parts suppliers and others to collaborate from the beginning on car projects. The big car brands took the initiative to orchestrate the value chain to the common benefit of everybody in it.

This is now gradually happening in the construction industry. Much more agile and user friendly IT systems are needed to reach out to the on-site activities, before they also become part of the shared data environment - but it is happening. Technology in a very user friendly format is now available. The first pioneers in construction are now reaping the benefits of collecting data from the field, making it available in a structured format and sharing it with the relevant parties, so issues are detected faster and on-time delivery is enabled better than before.

But it is still only the early adopters that are reaping these benefits, and trying to orchestrate the construction value chain. Many more are needed before any big productivity gains are seen. And this is where the unfortunate Corona crisis might mean a difference: those that already had started their digitalisation are reaping benefits not available to the majority who have not gone far enough. The Corona crisis will accelerate the differences in performance between those who are far on the digitalisation journey and those that are not.

Corona is a global crisis that is spreading death and destruction. But as with any crisis, something better can grow from the ashes, and as it becomes very clear that the digital leaders have an advantage in the remote working regime of Corona, we can hope that the whole industry learns and we can see an acceleration in digitalisation. This will tie the value chains better together, and it will mean more projects delivered on time, on budget and with lower environmental waste.

About LetsBuild

LetsBuild's missions is to change the old pen and paper ways of the construction industry. We are working to bring modern technologies to construction in a no-nonsense, simple and easy-to-use way.

From end to end, LetsBuild supports the construction phase. Site teams collaborate efficiently with clear communication and clear processes and real-time information is shared seamlessly between site and office.

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