DiGiTAL Construction Skills

DIGITAL CONSTRUCTION

CASE STUDIES

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INTRODUCTION

Welcome to Digital Construction Skills' case studies e-book

The aim of this e-book is to offer brief, yet insightful examples of the ways in which a range of contractors and other organisations, from small to large, have digitalised their businesses, and to showcase a number of digital tools and services.

Whether you are interested in digitalisation and not sure where to start, or your business is taking the next step in its transformation, we encourage you to read on and discover:

- how real businesses like yours have explored and implemented digital tools in response to external policy and internal business needs
- how digitalisation can support business improvement, increase innovation and expand expertise
- the potential challenges that lie ahead and how to navigate them
- the 'why', 'what' and 'how' of a range of digital tools and services

Click on the orange company names in the Contents sections to jump to the corresponding case study. And use the hyperlinks in the orange box of each case study to visit the relevant websites and explore whether a particular digital tool might be right for your business.

Many thanks to all our contributors who made this e-book project possible!

Digital Construction Skills: Visit www.digitalconstructionskills.com to get in touch or to access our podcasts, blog posts and free e-learning modules.

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CONTRACTOR

ELECTRICAL INFRASTRUCTURE SERVICES

Digital tool

Simpro

Electrical Infrastructure Services (EIS)

Design, installation and maintenance of high voltage electrical equipment. Approx. 10 employees.

Simpro

Software for service, project and maintenance workflows.

Background

After researching and trialling different, disparate software options that didn't talk to each other and ended up causing numerous data mistakes, EIS subscribed to a software it thought was the answer. Although EIS thought the software would streamline operations, the business continued to suffer the same problems. That's when EIS found Simpro. EIS realised Simpro fit most of its requirements and the company decided it was time to implement the software.

Benefits

Once EIS implemented Simpro, they saw improvements to every aspect of job management including equipment ordering, invoicing and quoting. EIS was able to track data from every moving part of the business, improving overall efficiency and processes.

In addition, Simpro's supplier catalogue transformed the way EIS quoted its jobs. "In Simpro, because our catalogue is well populated and up-to-date, the correct materials and prices are used when quoting," says Nigel Bird, Managing Director at EIS. "Simpro allows us to produce complex quotes in a very short time. It gives us excellent job management tools, especially for materials control."

Simpro also enabled EIS to have more control over ordering materials and equipment. Previously, purchase orders could be placed with any supplier. Now staff can only purchase from suppliers that are on Simpro and, as such, have been vetted and approved.

Invoicing processes were also improved with Simpro, and EIS now easily keeps track of invoices with reports such as the uninvoiced jobs report.

Challenges

The main challenge EIS faced was preparing their existing supplier, customer and materials databases to be imported into Simpro. Despite the work, this was recognised as vital to successful implementation. "Moving on nearly three years, we have eliminated all the mistakes that used to plague us and quoting and cost tracking of jobs is just so much easier," says Nigel.

The EIS team were also challenged to accommodate and learn a new software. However, there was a clear willingness to improve on their old systems. By having group learning sessions and helping each other, this was soon overcome. All staff members are now fully engaged and supportive of Simpro, and continuing to develop.

Support

Simpro's experienced implementation team helped EIS through their onboarding step by step. Nigel adds, "The process was good, well-structured and well delivered; the initial online sessions were particularly good in getting us started along with the online learning tools. We were initially sceptical of the relatively high costs, but quickly realised that without the implementation training, we would have floundered, not got the best from the software and possibly rejected it."

"Simpro allows us to capture any lead that comes in, make notes, attach information and carry that right through to the job, without duplication or loss of information"

Nigel Bird, Managing Director at EIS

If you suffer from using multiple non-linked systems, don't delay, you won't regret it. Simpro allows us to have everything in one place, without interface errors, and the customer support response and knowledge is first class. It has been excellent and Simpro has delivered everything we hoped it would.

CONTRACTOR

DANSK BOLIGBYG

Digital tool

Tactplan

Dansk Boligbyg (DBB)

Contractor specialising in new housing and renovation, based in Denmark. Approx. 120 employees.

Tactplan

Location-based scheduling software solution, developed by Exigo, project and risk management specialists for complex construction projects.

Why DBB uses Tactplan

“One of the most important tools in our digital tool belt is location-based scheduling. We use Tactplan to minimize time schedule risks and optimize the schedule to create the best possible prerequisites for a successful construction phase,” says DBB’s Digitalisation Manager, Bjarke Apollo-Andreasen.

Background

The story behind this is that in 2020, DBB management decided to speed up digitalisation to reduce project risks, increase productivity and earnings, and ultimately, through this transformation, to ensure a better work environment for all staff on site. They hired Bjarke Apollo-Andreasen to be at the forefront of this transformation process. His job is to teach employees to use digital tools and ensure a boost of digital skills across the organization.

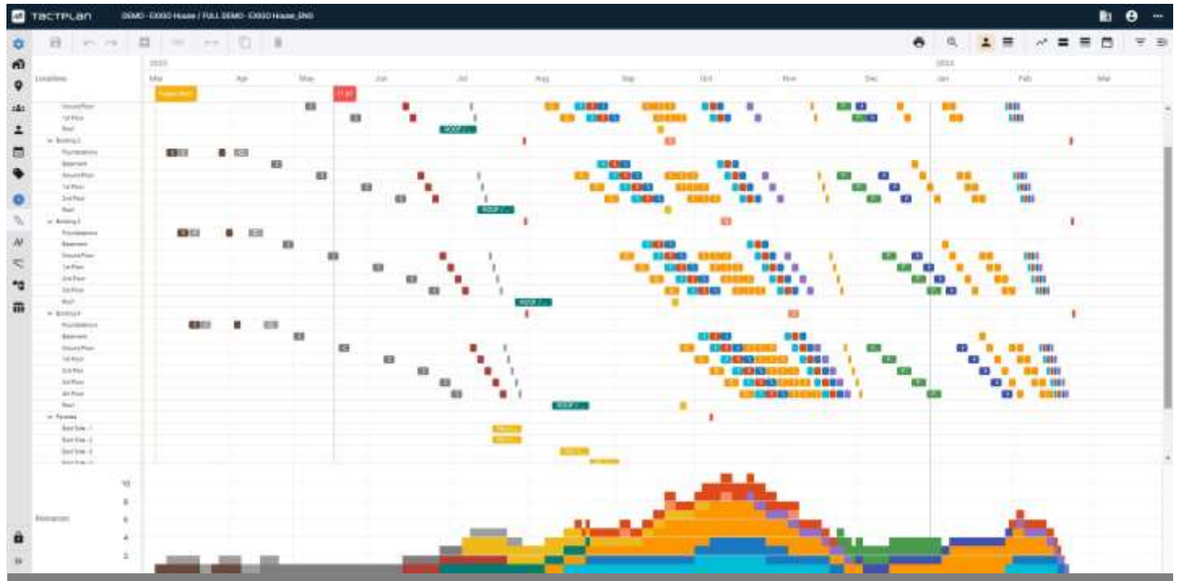
Before Bjarke started, DBB had already implemented location-based scheduling on several projects, but at that time, the user interface of the available software was complex and difficult to learn and use. Because of this, several subcontractors had issues accessing the schedules. Despite these obstacles, more and more project managers at DBB (and in the construction industry in general) understood the great advantages of this method and wanted to leave Gantt behind in favour of location-based scheduling.

While planning a large multi-story residential building project in Odense, Denmark, DBB teamed up with the University of Southern Denmark to go all in with ‘lean’. The subcontractors were involved in the scheduling process right from the beginning, using the methods of ‘last planner system’ and placing sticky notes on a whiteboard. From the early phases and during the entire construction process, the subcontractors were an important part of planning activity. The project was a great success, and an important learning experience for both DBB and the future project managers from the University.

Benefits

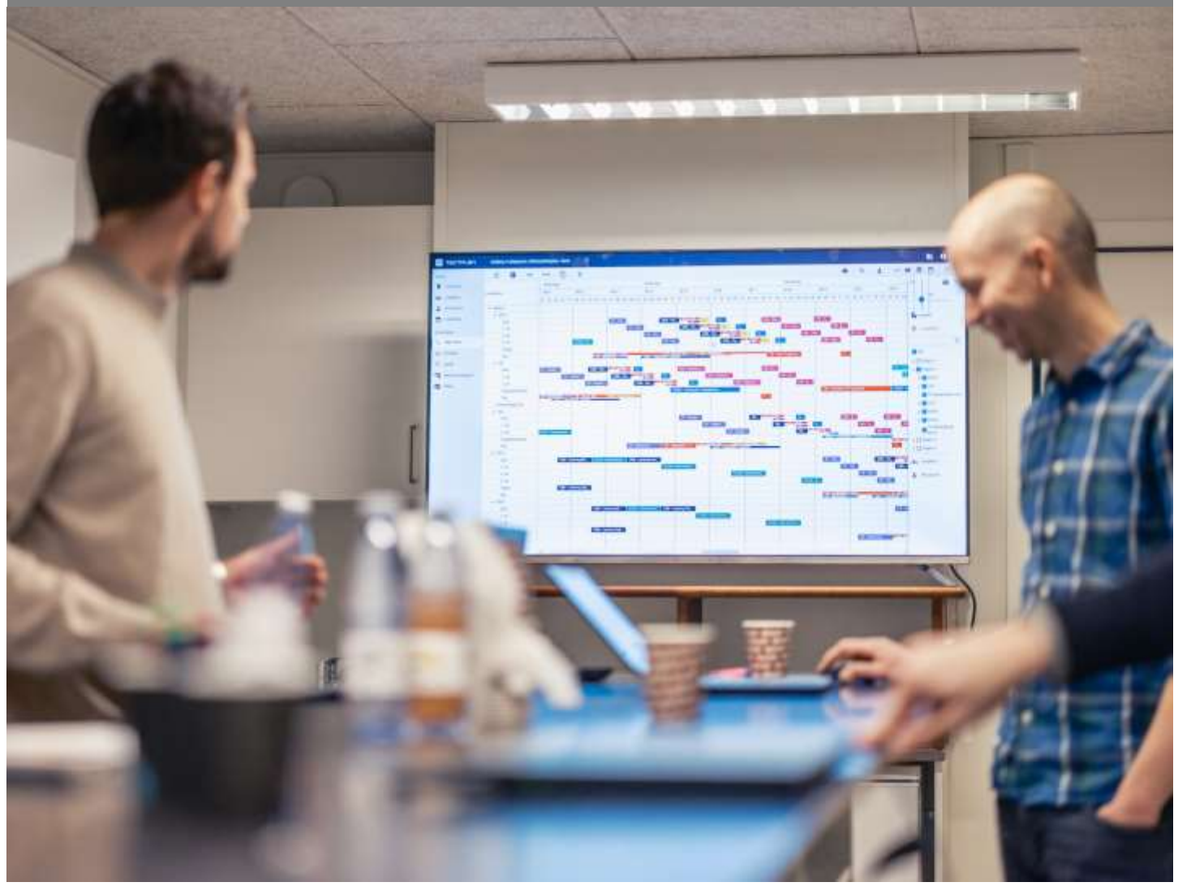
Bjarke notes, “Feedback from our project managers who are using location-based scheduling

Case study continues on next page



Above: Close up of the Tactplan Takt Time view. Below: Tactplan schedule shows on the screen.

From the overall project plan and down to the specific sub-contractor - Being able to plan visually with locations helps with a general project overview and with communicating issues and potentials.



Using location based planning and intuitive tools to make changes, makes the planning process more detailed and easier to communicate on site.

is that the method saves them at least 2 weeks in their schedule, and many experience even larger reductions. Collisions are discovered and corrected early, and we can react to and handle issues much faster than by using Gantt charts. Our construction managers use their time much more efficiently by planning ahead and making good decisions, instead of endlessly putting out fires. Importantly, we see an improvement in the collaboration and working environment on the construction site."

Challenges

"Using location-based scheduling requires a culture change, in the sense that everybody needs to accept that more details and more decisions need to be dealt with early on. The existing culture is that the people around the planner in the beginning of the construction phase expect planning to be dealt with in a few days.

"By using location-based scheduling, you need to be more thorough and address more issues in the early stages of planning. However, the time spent in these stages will come back tenfold later in a smooth, consistent, and healthy construction phase.

"We also need to be realistic. Too many user-interface issues and software bugs can cause some project managers to discard the method. Construction is going fast today. There is simply no time and surplus of mental resources to get acquainted with new complex software," says Bjarke. That is why Exigo's straightforward, simple to use location-based scheduling software, called Tactplan, has been introduced into the Danish construction industry with such success. The gains are experienced immediately.

Lessons learned

"Even though the beginning of every construction project is busy, it is important to reserve good time to plan. We tend to think that the one day spent planning is one day missing in the end, but it is not the case. One day invested in planning might end up giving you four more days in the end. We need to steady our nerves and trust the process.

"There needs to be an improvement in the collaboration and communication with the different parties. The owner, the constructor, the sub-contractors, and the advisors - everybody needs to accept these culture changes. If they don't, and instead they put pressure on the planner to use old methods, then the planning process, the issues, the delays, the toxic environment on site, all of that will be business as usual."

Support

"Exigo assist us in training and ongoing support, mainly in the early stages." Internally, Bjarke supports the different teams. He says, "I cannot force the teams to use this method, but I can inspire and try to give a sense of purpose. We have tons of business cases proving this method – and we have the tool."

"Finally, a solid product is being developed, with a solid platform, based on Nordic management methods. Tactplan is intuitive, with a simple user interface that makes implementation much easier. Everyone who uses the location-based scheduling method experiences a clear improvement in the collaboration and working environment on site. My ambition is to implement location-based planning on all our projects over a short number of years, and I can easily see that Tactplan can be the tool that makes this possible."

Bjarke Apollo-Andreasen,
Digitalisation Manager at DBB

Digital tool

TimeKeeper

TimeKeeper

Simple employee timesheet app.

Why choose TimeKeeper?

Many contractors currently rely on paper timesheets, which can be easily falsified or left incomplete. Manually entering this data into a payroll system also introduces further human error, costing both time and money for businesses. Relying on employees to track their time retrospectively also means employers have no insight into who is on site in real time, and have to rely on back-and-forth communication with site managers and team leaders.

Paper based processes make it difficult to track time against jobs, which leads to inaccurate job costing and lack of insight over the true labour cost for a business.

Managing employee leave manually also causes issues for both HR staff and employees, as staff struggle to calculate their remaining leave entitlement manually and managers have no visual oversight of their team's holiday plans, often leading to clashes and short staffing.

Benefits

Contractors using TimeKeeper to replace paper timesheets and other outdated processes find they immediately save money, due to reduced payroll costs from more accurate hours. The GPS stamping of clock-ins ensures staff arrive on site on time, improving punctuality.

Managers also see a reduced administrative burden on their payroll and bookkeeping staff, as there is no need for manual entry or manual calculations of overtime and leave. Errors in payroll are also significantly reduced, owing to less human error.

Many businesses find that the live reporting in TimeKeeper gives them greater insight and saves back-and-forth messages to team managers about their employees' whereabouts. The ability to track time against jobs allows for more efficient project management and resource planning, with accurate labour costing per job that highlights projects which are unprofitable.

An unexpected benefit many contractors see is greater insight for their clients - the ability to run off reports detailing all the hours worked on a clients' project provides reassurance on where their client's budget was spent, and can be used to back up invoices.

Challenges

As with all digital tools, initially implementing TimeKeeper does require some time and attention, particularly when loading all employees into the system, assigning their usual working patterns and configuring each job's details.

Some contractors do face challenges with regards to employee attitude - however, these are usually overcome by explaining the benefits of the system and addressing any privacy concerns employees may have about their data. Ensuring employees download the app and actively use it as intended can also present a challenge, and contractors may need to introduce training sessions to ensure their team are on board.

Another key aspect of integration of any digital tool is an internal champion. A member within the business must be the "champion" of the product to drive adoption and realise the benefits of the software. Without this, stakeholders in the business will naturally revert to 'the way they have always done it'.

Lessons learned

Many contractors have found themselves stuck in contracts with providers or required to invest large amounts of money in physical infrastructure. TimeKeeper is completely cloud based, and recommends low-cost hardware solutions which contractors can purchase to get started with minimal set-up expense.

One common mistake we also see with contractors is investing in a long-term contract with a digital vendor before they are sure that the product fits their needs. Only commit to annual and longer contracts once you know that the product is solving the need for the business. Digital vendors can help here by providing free trials, monthly rolling contracts and no penalties for cancellations.

"Many clients have found that implementing an off the shelf digital solution improves adoption and requires less time investment than bespoke software, so TimeKeeper has developed a system which can be quickly adopted with minimal time investment."

Sean Quinn, Founder at TimeKeeper

Support

Founder, Sean Quinn says, "TimeKeeper is first of all designed to be user friendly and easy to onboard. In the event that a customer needs help, we offer many resources including a helpdesk, online live chat and specialised concierge services such as onboarding and training. Given we are a UK business, we can offer support during UK business hours, which means we are working when you are working. Typically with USA vendors, you will see a longer feedback cycle given the time zone differences."

CONTRACTOR

RED SYSTEMS

DIGITAL CONSULTANT

RED JAM

Digital tool

Field View & Power BI

RED Systems

Commercial glazing systems. Approx. 35 employees.

Red Jam

Process transformation specialists.

Viewpoint Field View

A cloud-based software solution for snagging, forms and permits, project delivery and handover.

Microsoft Power BI

A business intelligence (BI) platform for data visualisation and analysis.

Background

We were already capturing data using Field View when we met Andy Almey at Red Jam, who recommended adding Power BI to our digital capability. Working with Andy and implementing the two technologies in conjunction has had powerful results. We now use Power BI to extract and analyse the Field View data for a variety of purposes, such as calculating a cost of error within the business, reporting on purchase order spend and tracking additional spend over budget.

Data analysis is facilitated by a suite of visual, digital dashboards which Andy tailored for our needs. The dashboards update automatically every 15 minutes with Field View data from all our projects, allowing near-live viewing and analysis of a huge range of data flowing from all sites. Analysing trends in data has enabled the business to have far greater control of key finance and production factors.

Benefits

RED Systems had been collecting data for years, but using Field View and Power BI has added value to the business by reducing risk. We now meet regularly to identify repeated errors and implement interventions, feeding into a continual improvement strategy.

Additionally, as we capture all the design and installation data required for handover to the building owner, we can efficiently and confidently fulfil our duties as part of the Building Safety Act.

Challenges

As an SME, the biggest challenge in our digital transformation journey has been limited resources. With limited budgets, investing in Red Jam's support was potentially a risk, but has more than paid off.

Andy Almey,
Managing Director at Red Jam

Another challenge has been the differing positions of clients. Some are keen to progress and invest in digital innovation, while others seem solely focussed on profitability, limiting the potential of data-driven improvements.

"One of the challenges we faced was engaging site managers in the digital journey. We overcame this by making it as easy as possible for them to collect data, then feeding it back to them in a visible and meaningful way so that they knew they weren't doing it for no reason."

Lessons learned

Before investing in a technology based on the promises of its sales team, we would recommend initially mapping out your business aims, then

"Using Field View and Power BI has not only enabled us to increase profit margins through reducing wastages, but importantly also gives clients confidence that we are in control and continually aiming for excellence."

Mike Green,
Managing Director at RED Systems

investing in expertise like Red Jam who can advise on the right technology for your business and help develop your digital processes.

Another valuable lesson learnt is that implementation needs to be a continual process rather than a one-off event. After noticing negative trends in the data, we realised that our new employees and clients were unfamiliar with the digital aspirations of the business. To address the problem, every project now holds a 'data kick-off' meeting to review which digital technologies will be used and why, and identify any training required.

CONTRACTOR

GLOBAL TECHNICAL SERVICES

Digital tool

PlanRadar

Global Technical Services (GTS)

Fire safety solutions consultancy. Approx. 23 employees.

PlanRadar

PlanRadar is an award-winning digital platform that creates time and cost savings in construction and real estate projects by digitising task management, documentation and communication.

The challenge

Global Technical Services (GTS) deliver scrutineering services, fire risk assessments, fire risk management and surveying. As Head of GTS, Ross O'Loughlin, seeks to both improve the client's experience of services while making those services more transparent, efficient and enjoyable for his team to deliver. When O'Loughlin joined the business, he was keen to ensure his team had the tools they needed to deliver their work successfully. He also needed to be able to predict the scope and time needed for work in order to generate accurate quotes for clients.

Another central challenge for the business is being able to recruit enough highly trained professionals to fill the roles required. As a result, it's important that each person at GTS is able to work efficiently to deliver the projects the division takes on without compromising their work-life balance.

O'Loughlin says, "My main concern was how we could speed up our surveys without losing the value within the survey. I wanted to improve the working life of my staff. Reporting, writing, and collating information around a survey has always been a laborious task. If we can streamline that in any way, that allows us to focus our energy on delivering our expertise."

The test: usability on a large-scale surveying project

Following a demonstration of PlanRadar, O'Loughlin saw PlanRadar's potential to be a one-stop shop for delivering surveys and inspection results. The ability to record video and integrate BIM were also key to GTS's requirements around the Building Safety Act and increased expectations for data collection in line with the Golden Thread of Information.

After further conversations, the team decided to trial the software on one project from start to end. The test project was based in a university in Northern England, where the surveying team were delivering a damper inspection survey. There were thousands of dampers to inspect, making this a task that required meticulous record-keeping.

The team's feedback was unanimous: "The guys on the test project said that PlanRadar was fantastic. It really sped up their reporting and it was very usable."

Benefits

Following the successful test project, GTS rolled out PlanRadar to their full inspection and surveying teams. It provides the team with effortless ways to record fire inspections and survey results, walking through a building and recording voice notes rather than having to stop to make notes on paper or do lengthy follow-up work in the office. Today, around 20 team members work with PlanRadar every day.

While the division currently uses several pieces of technology to deliver different services, they are already exploring how PlanRadar could be used in other areas of the business. "From a business perspective, uploading as many documents, photos or jpegs at no extra cost is a massive win in comparison to competitors in this space," says O'Loughlin. He is confident that there is much potential still waiting to be unlocked.

"We wanted to improve the working life of my staff. Reporting, writing, and collating information around a survey has always been a laborious task. If we can speed that up in any way, that allows us to focus our energy on delivering our expertise."

Ross O'Loughlin , Head Of GTS

PlanRadar is really useful, and the opportunities we can gain from getting to grips with and using all its functions would improve our business.

SUPPLIER

SURVEYTECH

Digital tool

Leica RTC360

Surveytech

Suppliers of surveying and construction instrumentation.

Leica RTC360

3D laser scanner and reality capture solution.

Why use the Leica RTC360 scanner?

The laser scanner allows the rapid measurement of millions of points in a matter of minutes to create an accurate digital model. This can then be brought into AutoCAD to easily create schematic drawings or a variety of other modelling software.

Benefits

The time on site is dramatically reduced as every dimension is captured quickly and accurately. The unexpected benefit is that because it captures everything it sees, you can get dimensions from some things that you needed to measure but didn't realise when you first visited site.

Challenges

There's no doubt that although time on site is dramatically reduced, there is more desktop skill required in using point clouds rather than manual measurement information. There are also ongoing software expenses through Leica Cyclone Register360, Autodesk and the Leica Cloudworx plugin.

Recommendations

Training and support are essential so it's important to buy from a survey equipment company that will help you adopt the new technology. Site visits and YouTube walkthroughs from the technology vendor are also useful.

Financial Support

A hire-purchase agreement can allow you to spread payments over a time period and interest payments can be offset against tax.

The Leica RTC360 scanner in use

Working with the digital model following data capture using the Leica RTC360 scanner

Digital tool

LSBUD (LinesearchbeforeUdig)

LSBUD

A free, online search service providing utility plans to users to aid protection of buried assets, by promoting safe digging for all.

Why does LSBUD exist?

LSBUD's main driver is to keep people safe. Our underground utility infrastructure is hard to imagine for most. Think of it like the human body's venous system. We know it's there, but we don't know exactly where the main arteries and veins are located. If we damage a main artery or blood vessel, the outcome is unthinkable. This is the seriousness of hitting a buried utility asset – imagine puncturing a high-pressure fuel pipe because its location wasn't known. Therein lies the problem that was addressed by the minds of our founders 20 years ago: to offer an online search platform to 'show what's below' the ground, protecting the integrity of buried assets.

Background

Since LSBUD started, we continue to benefit from the 'snowball effect' – more users (individuals or businesses) and more members (utility asset owners).

Our members are our advocates, which we are really proud of. "In making our data more widely available, we are dramatically reducing the likelihood of asset strikes" says Mary Horsted at Portsmouth Water. We see this more and more with our new and existing members. This supports our main ethos, which is to keep people safe.

Benefits

LSBUD wasn't originally set up to provide alerts to members with regards to 'risky' activity taking place around their networks. However, as the service has progressed, so has the amount of data, enabling us to provide predictions to our members with regards to upcoming activity in the area they operate - an unexpected benefit, providing invaluable information.

Challenges

Our main challenge is data security. We host data that details the location of critical national infrastructure. The storage and use of this data is of the utmost importance, and we have strict security measures in place to provide the necessary reassurance to our members that we can manage their data on their behalf.

Another challenge we plan for is 'quality of data'. We are aware that no data is perfect. Therefore we designed a solution that can accommodate all data, in many formats, thus removing the barriers, so that asset protection isn't compromised and every asset owner can benefit.

Lessons learned

LSBUD was created for the right reasons, and we still exist today because of the way we work. Safety first, not profit first is what we are all about. We want to have a system with purpose, and we do. We keep people safe, every day. We currently have over 250,000 registered users and receive more than 15,500 searches every day. That's one every 6 seconds – all day, every day.

If our system worked the other way around, and we put profit before safety, it simply wouldn't work. Our advice to others is to work with real conviction and do the right thing - even when no one is looking!

Support

Initial support came from several fuel companies. With incredibly high-risk assets that criss-cross

"Our service is entirely funded by the asset owning Members. They pay us to help keep their assets, and the people who work near them, safe. With this model we can ensure that LSBUD remains free to use for all our Users."

Laura Knight,
Head of Marketing at LSBUD

Britain, they have established a mature and robust set of asset protection techniques which include controlled sharing of their asset data for anyone who is planning to work nearby.

We have followed their lead and rolled out the same and similar approaches for asset owners in all utility sectors. This means that electricity cables, gas pipes, water and sewerage pipes, fibre and telecoms plus all manner of disparate networks are all protected as well as they possibly can be from third party damage.

CONTRACTOR

HERON BROS

Digital tool

SustainIQ

Heron Bros

Construction and property development company. Over 200 employees.

SustainIQ

All-in-one ESG (environment, social and governance) and sustainability data reporting software.

Background

Sustainability information is utilised by multiple departments across our business, and to continually improve, we must ensure we have access to the latest and most accurate performance data. Prior to SustainIQ, the majority of our ESG and sustainability information was captured in spreadsheets and siloed across the business. To improve efficiency and the process of monitoring and measuring our responsible business practices, we identified we needed a digital system that would automate data capture across the business, regardless of location and benefit us with easily interpreted reporting dashboards.

Benefits

SustainIQ user friendly workflows facilitate straightforward ESG and Sustainability data input from all departments within our organisation. Key information is available in visual graphs, providing the data rich information required for real time, accurate reporting.

Using the dashboard, we have established our baseline data, and can easily benchmark our performance across all projects and on progress towards targets. This valuable information has enhanced and supported our ESG and Sustainability credentials, and ensures we remain competitive through quick and easy access to current data, while building trust with our Clients through fully transparent reporting.

SustainIQ has benefitted our business through streamlining our responsible business data capture, reduction in risk to the business such as noncompliance with legislation or contract requirement, and enables us to fully demonstrate our ongoing commitment to ESG and sustainability targets within the construction industry.

Challenges

Sustainability and ESG continues to evolve with a greater requirement for reporting on all aspects of our activities. One of the main challenges for the business has been the growth in departments and different roles that are now required to input, and equally extract, ESG and Sustainability performance data to fulfil reporting requirements, such as Scope 1, 2 & 3 GHG Emissions required for our Finance Teams. We have made an investment in training to ensure SustainIQ is utilised to its full potential, with identified ESG champions to roll-out dedicated training/upskilling to our teams across the business.

"Communication is key if the software is to be a success once implemented."

Noel Mullan,
Commercial Director at Heron Bros

Recommendations

Fresh from our Digital Transformation, we are experienced in implementing new software products into the business, and the need for full 'buy-in' from the outset. We would recommend that any business undertaking a similar process/ software implementation, ensure all staff understand why the business has made the investment and communicate regularly with everyone during the onboarding and implementation process. We nominated dedicated ESG Champions who continue to work closely with the project teams to report on performance.

Support

The SustainIQ team worked closely with us during onboarding and implementation and continue to provide invaluable support when required.

Interested in SustainIQ?

SustainIQ is on a mission to change the world for good. If you are interested in learning more about SustainIQ, this particular case, or perhaps want to read more case studies like this one, get in touch at hello@sustainiq.com, or visit www.sustainiq.com/case-studies

CONTRACTOR

BETONMAST

Digital tool

Imerso & Leica BLK360

Betonmast Buskerud-Vestfold AS

General contractor based in Norway. Approx. 56 employees.

Imerso

A smart construction monitoring platform including 3D capture, automatic BIM inspection, performance metrics and more.

Leica BLK360

An advanced precision imaging laser scanner.

Background

Failure to detect deviations early leads to several complications for us at Betonmast Buskerud-Vestfold, including project delays and additional costs to rectify mistakes. We were searching for better ways to carry out more frequent inspections for monitoring fieldwork quality proactively.

From testing several solutions, we selected Imerso's platform in combination with a Leica BLK360 laser scanner. Imerso's scanning app simplifies the on-site data capture process by enabling our own team to document the as-built status in high-precision 3D, right as subcontractors are finishing their work. Imerso's platform then automatically compares the as-built status on-site against the specifications of the building plans in BIM. Deviations that can lead to costly consequences are quickly discovered early in the process. We can thus require that subcontractors correct such deviations immediately, before these create problems for the next phase, or charge for added expenses in the final settlement.

Benefits

Imerso's solution made it possible for us to detect early any elements built outside tolerance, without spending extra time on quality control procedures. Our company now verifies and documents 100% of the relevant areas within the same time that was previously used to cover about 15% by random sampling, which corresponds to a productivity increase of over 500%. In addition, this proactive approach prevents unplanned downtime, daily fines (which can easily exceed one per mille of the contract value), or the need for replanning work later in the project.

Challenges

Applying new technology always comes with challenges. For us, we have spent some time to perfect the process of scanning on a dynamic worksite with many obstacles and moving objects. We encountered challenges beyond our control

Christopher Carlsen, Head of Innovation at Betonmast, on site with the Leica BLK360
Photo credit: Mikkel Moxness and AF Gruppen

like the scanner having some limitations in its capturing capabilities, especially shiny surfaces like water and glass, and also some ducts. So in this case, as long as you know about the technical limitations, it's manageable.

Recommendations

When using 3D scanning and Imerso for the verification process we have had great response from our shareholders and subcontractors by sharing the results. It's a very visual tool and easy to understand. When including as many as possible into the platform the adaptation increases, as does the interest to have more scanning done on the worksite.

The process is leading to the creation of best practices for enabling even smoother workflows in future projects. Through better documentation and real-time compliance verification, subcontractors recognize that they are themselves exposed to lower risk and can thus give us better prices, further reducing Betonmast Buskerud-Vestfold's costs and increasing the company's competitive advantage. Additional costs caused by disputes and extra work to be performed by other subcontractors can now also be avoided.

Support

We have support from the Norwegian research council (Forskningsrådet) with a specific project where we are aiming to develop "best practice for 3D scanning and the evolution of the site-manager 2.0".

Digital tool

Tenstar Simulation

Tenstar Simulation

Simulation-based operator training.

What do Tenstar Simulation offer?

We provide training simulators to help entrant learners experience many types of heavy plant, such as excavators and dozers. This helps to engage young people into the industry. We also work with experienced operators who want to learn how to use the GPS 3D systems (Topcon, Trimble, Leica) that are now commonplace on most earthworks sites.

Benefits

Benefits of simulator training include more training time on the machine and engaging with a wider, younger (even pre-school-leaver age) audience to increase the number of new operators entering the industry.

Challenges

The challenge faced within the industry is gaining acceptance from what is still a very traditional practice, within both public and private sector training organisations, and also training standards authorities. Understandably, there is resistance to change and moving on from more traditional training methods and techniques.

Industry support has been a challenge. Industry sector awarding bodies need to provide more incentivisation and guidance on how and when to use this training technology. It is particularly interesting when we look within Europe how they have an entirely different approach to training on construction machinery. The training is based over longer periods of time, for example taking the form of a full year or more vocation at further education colleges. They are also more focused on the quality of the training rather than simply getting a ticket to operate a machine with no guarantee of the competency or skill levels.

Recommendations

Don't only focus on the existing work force, but instead be prepared to engage with the younger, student community before they leave school. We help customers gain a better understanding on how to get the most out of their investment, even when this means employing and creating new digital trainer roles within their organisation.

CONTRACTOR

NG BAILEY

Digital tool

Internal web-based e-catalogue

NG Bailey

Building services. More than 2500 employees.

Why NG Bailey developed an internal web-based e-catalogue

Our e-catalogue is an aggregation of all manufacturer part codes required by the engineering business, as defined by our technical and commercial agreements. It was created to restrict unwanted items and focus the efforts on our preferred products and agreements. This helps solve issues with poor product selection, incorrect deliveries and Goods Received Note (GRN) / invoice mismatch issues.

Benefits

One unexpected benefit of using the e-catalogue is that it acts as a single source of truth. The data is provided and maintained by a third party, with syndication to merchants and other contractors, effectively supporting the Golden Thread.

Challenges

Data, data, data! The industry still wants to take a siloed approach to providing information. In the case of manufacturer part codes, this means multiple sources resulting in mass ambiguity. Despite our pedigree and commercial leverage, some manufacturers still resist our calls for change.

Having a data strategy is only the start. The long-term management of data used across all business platforms is key. Serious consideration needs to be given to the time investment required to bring about cultural change. There is no quick fix.

CONTRACTOR

VINCI

Digital tool

OpenSpace

VINCI Building

General contractor. Approx. 2000 employees.

OpenSpace

360° photo reality capture for construction sites.

Why Vinci uses OpenSpace

We decided to use this tool to perform site data capture and keep the construction record on a week-by-week basis. There have been four main benefits:

- First, we can save up to 700 working days using OpenSpace as we don't need to take photos manually as before.
- We also increase client engagement from being able to provide current building status.
- On top of this, remote site visits become available.
- Finally, we have connection with the construction program with the use of AI.

Challenges

The main challenge was our teams changing their current way of working. The introduction of new tools is not always understood by project teams and cultural change is the biggest barrier.

We focus first on digital training and on the technology after.

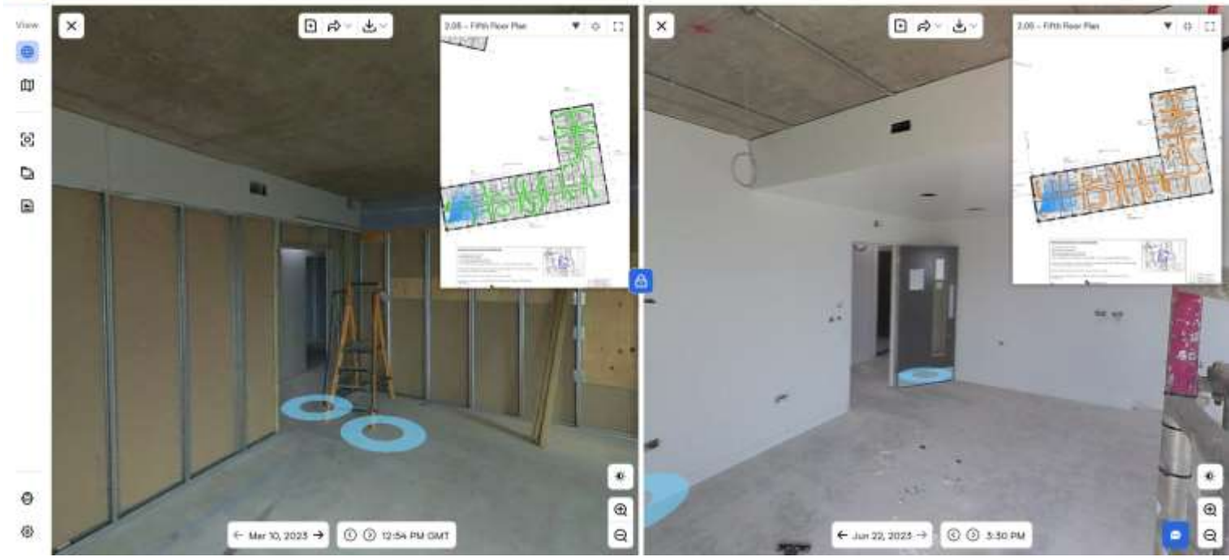
Support

We were supported by the vendor and a technology enabler company, which has enabled us to introduce the technology quickly.

Top right: An operative using a tablet, camera mounted on a selfie stick and OpenSpace 360 software to perform a site scan. A helmet attachment can be used for the camera instead of the selfie stick.

Centre right: The OpenSpace 'Capture Comparison' tool.

Bottom right: The OpenSpace 'BIM Comparison' tool.



SUPPLIER

LORD TECHNICAL

Digital tool

Leica iCON range

Lord Technical Ltd

Supplier of construction and civil engineering machinery and equipment for sale and hire.

Leica iCON range

Hardware and software solutions, including robotic total stations.

Benefits

As an authorised Leica Geosystems distribution partner and service centre, we were introduced to the iCON brand on its first release. We recognised its potential to improve efficiency and accuracy for our customers, and to open up new sales and hire opportunities for our business. As the field software was developed and became far less locked down, we started to present iCON to customers more often, which led to some early sales and the introduction of some units to our hire fleet. Following early software improvements, we found many of our earthworks and civils customers keen to adopt iCON as their preferred solution with many now saying they wouldn't use anything else.

Above: Leica iCON build software, with views of digital design data
Below: Leica iCON applications on site (images by Leica Geosystems)

Challenges

We have taken the iCON concept to many companies who were still using string lines, plumb bobs and tails for setting out foundations and holding down bolts. As well as the lengthy process involved in setting up string lines, they also often obstruct the path of plant on site and may need moving to allow access for concrete deliveries. By using the iCON robotic total station instead, the foundation layout can be uploaded or sketched in and positioned in a fraction of the time, and the need to reset string lines is eliminated.

Recommendations

The ease of use, sketching app, simplicity of the as-built function and ongoing improvements in the layout interface are now opening up opportunities in the agricultural and small builder market sectors that we would not have seen with other available systems. Additionally, the introduction of GPS/GNSS receivers to the iCON range has opened up more possibilities for use in the earthworks sectors. I would suggest anyone with an interest in digitalising their construction business arranges a one-hour demo of iCON on a live job and take it from there.

CONTRACTOR

MWH TREATMENT

Digital tool

Terrestrial 3D laser scanning

MWH Treatment Ltd.

Integrated design and build non-infrastructure solution provider in the UK water sector. Approx. 900 FTE + 200 Agency/ Contractor employees.

Background

We identified early the requirement to embrace the opportunities which could be derived from delivering our projects in a digitally enabled manner. The provision of accurate and reliable data to enable the making of informed decisions is critical. As the leading company for the delivery of process infrastructure in the UK water sector, we led the development of adopting digital tools and technologies. The use of digital surveying through the deployment of terrestrial 3D laser scanning technology was one of the early key technologies deployed to attain an accurate 'one version of the truth' prior to our works commencing.

Benefits

MWH Treatment has grown over the past 10 years, enabling the business to deliver its Digital Delivery strategy. The ability to accurately provide and review visual data representation of our projects remotely, as well as reduce risk and design out construction clashes, has been a valuable outcome of the use of terrestrial 3D laser scanning technology.

Two years of Covid restrictions have really shown the benefits of using this technology to provide visual context to sites. It allows virtual world access and understanding, reducing the requirements for engineers to travel to the site. This also delivers reduction benefits for our Carbon Reduction targets. We have many schemes in remote locations, such as the Highlands and Islands of Scotland, the Lake District, and the High Peak areas in the Peak District.

Challenges

The adoption of new technology within a traditional industry sector was the biggest challenge we faced in driving the utilisation within our business. Due to the nature of our project locations and the complexities of the risk profiles, surveying can be expensive and resources hard to recruit. We have overcome significant barriers in the utilisation by driving the understanding that whilst the initial survey cost may be higher than traditional surveying techniques, the project lifecycle benefits are multiple, and the programme efficiencies derived are significant.

Lessons learned

It is important to remember when adopting digital change that it is not going to be easy. There will be early adopters and laggards in any business, thus capturing and demonstrating benefits in the early stages of implementation is difficult, but critical. The challenge for us was that the digital surveying we undertake is done early in the programme. However, many of the benefits are not realised until later stages. Establishing the use case for those earlier schemes was more challenging. Setting achievable goals and developing in stages, increased complexity and size of projects showing proof of concept, significantly benefitted us in driving adoption.

Support

We have had a significant amount of support from Faro and from Sunbelt Survey to help us to obtain equipment, training in its use and improve our efficiencies.

"We work closely with our engineers and design teams to ensure we are providing accurate and reliable data. Also supplying an invaluable visualisation tool results in a large reduction of travel per year in site visits. The data we provide is essential for the production of precise 3D models, forming the basis of our design work ."

Marc Green, Digital Survey Manager at MWH Treatment

Within the industry, there are a wide variety of platforms where additional learning and support can be obtained, whether that be through industry exhibitions, supplier events or online forums. There is a plethora of knowledge and information available and an excellent community where someone will invariably have the answer.

CONTRACTOR

WILLS BROS

Digital tool

Autodesk BIM 360

Wills Bros

Civil Engineering for Roads, Earthworks, Bridges, Pavement, etc. Approx. 500 employees.

Autodesk BIM 360

A construction management platform connecting project teams and data.

Background

BIM 360 is an Autodesk cloud-based solution that allows project teams to effectively work in a collaborative environment. In the AEC industry, it connects all project stakeholders to execute projects from conceptual design through construction and ultimately project turnover.

Benefits

First, the Common Data Environment (CDE) - a single platform for sharing of design, construction, handover and maintenance information. It is used by everyone working on the project, from client to designer to contractor.

Second, Digital Field Inspections – a paperless method to carry out quality inspections for site works. This eliminated the previous requirement of paper use, individual signatures, scanning, sorting and storing completed checklists.

Challenges

We have recognised six main challenges in using BIM 360:

1) Implementation of the new platform at the start of the project.

2) Ensuring all project users understood how the system would work and were ready to use it.

3) Adopting the new digital solution took some time, including the need for group and individual trainings.

4) Investment in purchase of hardware required such as iPads for use across site.

5) Developing a whole new intellectual property (IP) for BIM in the company's Integrated Management System (IMS).

6) Coordination with Autodesk developers for feedback on the system's shortcomings and further features required.

Marcin Sokołowski, Company BIM Manager at Wills Bros holding our Kitemark BSI certificate

"When the Covid 19 pandemic hit, we realised just how beneficial it was to have digital and contactless processes. This eliminated the risk of disease spread through paper versions as well as time savings when people could work remotely."

Muhammad Ziyad Rasheed, Civil Engineer at Wills Bros

Recommendations

A dedicated implementation team headed by an experienced manager is an absolute necessity. Also, testing before formal launch of the digital tool is essential when working with high profile clients and projects of national importance.

Support

Primarily, we were supported by Autodesk's Customer Success Team and a dedicated manager.

We were also supported through:

- Online support from CITB funded programmes such as the Gloucestershire Training Group
- The Construction Scotland Innovation Centre (now Built Environment - Smarter Transformation (BE-ST))
- Collaboration with Autodesk to present at Digital Construction Week 2021 and the opportunity to engage with technology experts and like-minded industry professionals
- Collaboration with Digital Construction Skills (DCS) in Glasgow
- and 'ICE BIM for Infrastructure' training certification.

CONTRACTOR

GEORGE LESLIE

Digital tool

Engineer Visualise Explore (EVE)

George Leslie Ltd

A Scotland based civil engineering contractor based on the outskirts of Glasgow. Working across Scotland and beyond, George Leslie undertake projects ranging from Water, Power, Marine to Renewables. Approx. 300 employees.

Engineer Visualise Explore (EVE)

Immersive 3D visualisation platform for temporary works, developed by temporary works specialist, Mabey Hire.

Why George Leslie uses EVE

We wanted to explore and utilise the capability of our supply chain to deliver a solution that was suitable to install around existing infrastructure, permit the construction of new permanent works in alignment with a complex programme sequence to meet the Client's operational requirements, and also provide additional risk mitigation and health and safety benefits.

Benefits

Benefits include the ability to identify potential clashes between the temporary works, the existing infrastructure and the new permanent works being installed, via a desktop review. We can also use EVE as a communication tool to brief the site team and demonstrate how the temporary works will look once installed.

Challenges

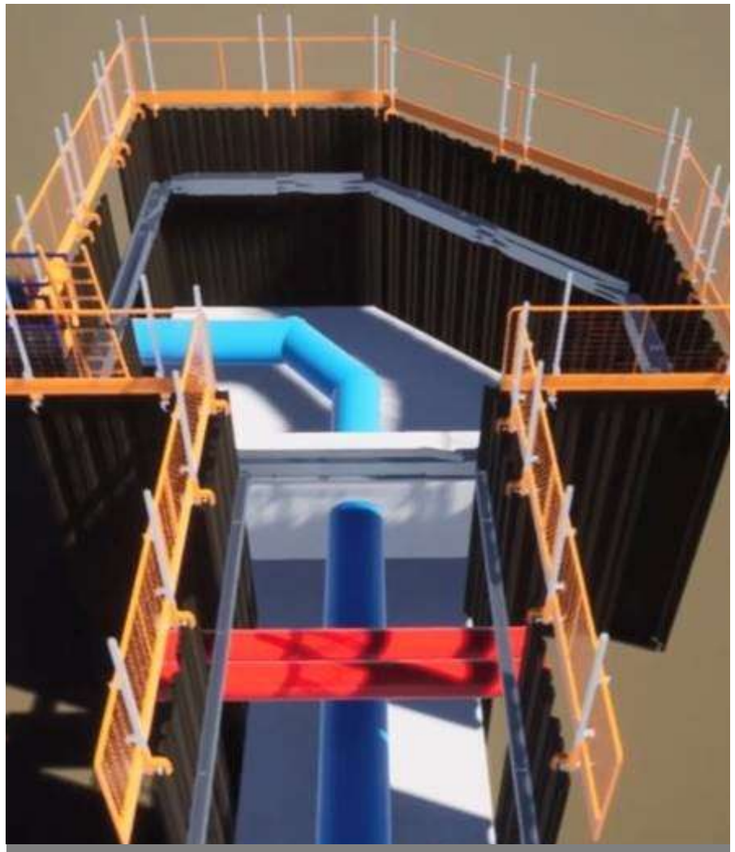
During the initial stages, there were challenges involved in the transfer of the permanent works design information to the temporary works designer. We had to ensure that the data was interpreted correctly and that file types could be read from both sides.

Support

Mabey Hire, our temporary works subcontractor, supported the process by developing the digital model, importing it into EVE, and presenting it to the project team. They also provided the model in a format suitable for communicating to the rest of the site team.

"It's important to engage with the digital tool early, to allow sufficient time to capture as much information and site specific circumstances as possible. Including this data within the model assisted with overcoming potential issues on site before reaching the construction phase."

Scott McCaw,
BIM Coordinator at George Leslie



Above: Aerial view photograph of temporary works area.

Below: The digital model of the same temporary works.

CONTRACTOR

KIER

Digital tool

Depotnet, Totalmobile & Power BI

Kier

Kier are a leading provider of infrastructure services, construction and property developments in the UK. Approx. 10,000 employees.

Depotnet

A database-driven depot and workflow management system for civil engineering.

Totalmobile (formerly GeoPal)

A customisable mobile workforce management solution for the utility and infrastructure sectors.

Microsoft Power BI

A business intelligence (BI) platform for data visualisation and analysis.

Background

We started using both Depotnet and GeoPal within the Kier Networks business during 2020-2021 as part of the digitisation strategy to remove paperwork on site and to significantly improve operational processes.

Benefits

These tools have enhanced the works order process, making it digital from start to finish.

All works are processed using the built-in works scheduler, which automatically pushes out works notifications to the specific team's tablets. Site personnel then capture and upload data such as photographs and risk assessments directly using the systems. This means that we can partly complete quality checks digitally through the digital system, although a portion of works will always need to be viewed in person. Reporting to the client is also made easier and quicker through the automation that these solutions offer.

There is less chance of data error in the digital workflow. We set 'drop down' style parameters for the majority of questions that site personnel run through in both systems. The answer selected determines the next question that appears, saving site personnel from working through unrelated questions and therefore saving them a lot of time.

Finally, internal reporting is also enhanced through using PowerBI to visualise the data captured through both Depotnet and Totalmobile. This is a live process, meaning that the office team can view up-to-date data at any stage of the job.

Challenges

Updating processes and testing were the main challenges. To cope with on-site procedural changes required for working digitally, we compiled user manuals containing answers to the questions we thought might arise, and nominated certain people on site as 'superusers' to help the implementation process all the way through.

"To end up with a good solution, ensure that your digital transformation is well designed, supported and implemented from start to finish. When operatives can clearly see the benefits and understand why the change is important, they will buy into it."

Declan McParland, Engineering Manager (above left) and Greg Price, Contract Manager (above right) at Kier Networks

We also had to ensure that data coming from our clients was in the right format, and that every step of the process was tested before being rolled out. The process of upgrading to the GeoPal and Power BI system specifically took approximately nine months before rolling it out.

Fortunately, most of our people on site were already used to using tablets because we had previously gone through a comprehensive training programme. Effective training must be provided if your workforce doesn't already have the necessary IT skills.

Recommendations

Our biggest recommendation would be to ensure the right support is available for people using the system, from local superusers to your company's IT support where available.

All sorts of IT challenges arise so we meet with our IT department on a weekly basis to ensure that problems are raised and resolved as swiftly as possible. Our software suppliers also partner with Kier IT so they are full developers and owners of the software.

DESIGNER

BUJU ARCHITECTS

Digital tool

Prin-D

BUJU Architects

Specialising in design and development of bespoke residential projects of varying scales. Approx. 7 employees.

Prin-D

Digital Compliance Platform for CDM.

Why BUJU uses Prin-D

As an architectural service provider, we are often appointed as the Principal Designer (PD), particularly where we are also the lead designer of a multi-disciplinary team. Preconstruction management and coordinating matters relating to Health and Safety is not our core offering, so at times we have outsourced and subcontracted the PD role to various providers.

As part of our ongoing digital transformation, we choose to use Prin-D to increase control over, quality of, and revenue from our Principal Designer offering. The Prin-D platform makes CDM compliance appear simple and supports collaboration with other duty holders, all through one platform.

Benefits

As clarity developed around the new Building Safety Bill, it became clearer that we needed a digital solution, particularly with reference to digitally recording information and the 'Golden Thread'. Prin-D differed from other systems, with its focus and standardisation of Principal Designer workflow.

Using Prin-D has improved our confidence to accept PD commissions, which is a positive and growing revenue stream. The signing function means information is verified, and Prin-D is a reliable 'source of truth' for compliance records which can be accessed, uploaded, reviewed and audited all through one simple platform.

Most profound is the introduction to digital compliance, immutable record keeping and the efficiencies that are created. We can use fewer people and less time to manage more projects – fantastic!

Challenges

The main barrier to adopting Prin-D was considering operational and business change.

There is an apparently endless amount of information relating to digital transformation. This can have a counter-effect where, as a result of information overload, we might remain in our realm of comfort and continue with 'business as usual'. However, we also took time considering the risks in reducing the amount of PD work we outsourced and doing it in-house instead. Ultimately, competence and ability to deliver are major aspects of CDM compliance, so it was fundamental that we were doing things right.

Support

The Prin-D team were keen to support us. They provided simple yet informative training about Digital CDM and demystified CDM2015 compliance, all of which boosted our confidence in accepting and delivering the PD role to our clients. We can't put a price on that but will be able to quantify the growth in revenue from PD appointments.

We are one of the early adopters of the Prin-D technology and in exchange for openly reporting what were minor issues, we had access to dedicated tech support, who were happy to do more than ask us to 'restart our computers'. The team demonstrated that they listen and respond professionally and quickly.

In addition to Tech support, Prin-D provided CDM related training and at times consultancy to our projects which has been really helpful and appreciated by our clients.

"Adopting Prin-D was an internal business development decision. The training of our staff and use of the platform provides a saving when compared with outsourcing and sub-contracting Principal Designers on a project-by-project basis."

Andy Wilde, Director at BUJU Architects

CONTRACTOR

ROSS-SHIRE ENGINEERING

Digital tool

3D digital designs

Ross-shire Engineering (RSE)

M&E and process engineering company delivering modular projects. Over 900 employees.

Background

We are proud to be at the forefront of digital transformation in the municipal water sector. Since 2017, we have used 3D digital designs for all projects because doing so:

- Supports our drive to maximise modular, off-site construction.
- Improves engagement of Client/End-User stakeholders through design development.
- Underpins co-ordination of M&E and process plant with each other and with the civil and building works.
- Enables efficient conversion of designs for fabrication (e.g. CNC, machining).
- Reduces the chance of clashes or the risk of one bit of plant impairing access to another - supporting our right-first-time approach.
- Helps planning the fabrication and site installation process.
- Results in streamlined project execution.

Benefits

3D designs provide digital models that look just like the finished project. These digital visualisations enable the multidisciplinary engineering team, specialist suppliers, and clients / end-users to visualise and understand the engineering plant that is being designed for them. 3D designs also allow sharing of dimensionally accurate models from across the supply chain to ensure components fit, that clashes are avoided, and that the completed project is safe to operate and maintain. Furthermore, since 2021, the 3D design database of parts has been populated to enable swift, accurate assessment of embodied carbon to support development of low carbon solutions.

Challenges

Initially the challenge was mastering 3D design and using the models to create nesting, toolpath, and machining files for the automated manufacturing (e.g. the CNC machines). The challenge then shifted to how we share 3D designs within RSE, with specialists, and with clients / end-users. There was an associated challenge of having equitable commercial control of collaborative design development. The current challenge is how to maximise the opportunities and efficiencies of being able to integrate data within the 3D designs, that can be used and accessed by clients / end-users.

Recommendations

There are different types of licences for 3D design software. Our preferred choice, 'subscription' licences, involve a recurring subscription fee. You lose access if you stop paying the subscription, but software updates are included. There are also 'perpetual' licences whereby you hold the license and access the product indefinitely, but you will not receive product updates.

Most 3D design software offers 3D viewers that can be downloaded for free, meaning that team members who only need to view the model can do so without having to download the full software. It is best to share this information as soon as a project commences.

For software packages used for creating machining files, as well as 3D design, you need sufficient critical mass, or redundancy (i.e. duplication), in terms of user numbers to be resilient.

Support

The 3D design software vendors provided valuable support that helped us ensure that our IT infrastructure was adequate, which included configuring the network and firewall settings, and ensuring that the designer's PCs met the necessary specifications. Additionally, they conducted compatibility assessments between the 3D design software and the software used in our automated manufacturing facilities, enabling us to seamlessly integrate the two systems.

"The adoption of 3D design technology since 2017 has been instrumental in enabling RSE to increase the delivery of projects using modular and off-site construction methods, which is a core aspect of our business strategy. By leveraging this technology, we have been able to reduce waste and embodied carbon, improve the quality of our projects, and provide our clients with greater programme and cost certainty.

"In addition to these benefits, the implementation of 3D design technology has also resulted in increased accuracy, efficiency, and standardisation, while simultaneously enhancing our internal governance processes and project management capabilities. This has enabled us to streamline our workflows and enhance our overall performance, further reinforcing our commitment to delivering exceptional results for our clients."

Fraser Darling,
Group Proposals Manager at RSE

CONTRACTOR

EPS WATER

Digital tool

Augmented reality roll-out

EPS Water

End-to-end solutions provider operating in the water sector. Approx. 600 employees.

Augmented Reality (AR)

An interactive experience that integrates digital information with the user's real-world environment in real time.

Background

There was a significant acceleration in changes to traditional methods of work due to the impact of the COVID-19 Pandemic and as a result, organisations have rapidly tried to adapt to this change with the expedited introduction of digital processes.

The use of Augmented Reality was proposed to EPS in 2020 as an innovative digital solution for a major Waste Water Treatment Plant which EPS were working on in Scotland and we adopted and invested into this approach for a number of reasons.

In the past, a project for a UK site would have seen a large amount of travel back and forth from our head office in Cork for the project team. The introduction of a Microsoft HoloLens headset integrated with Microsoft Dynamics 365 Remote Assist has allowed the user of the headset to collaborate with one or more Microsoft Teams users. Therefore, the Site Manager now has the ability to wear the headset and collaborate with the design team based in Ireland while providing a real-time view of their surroundings on site. This process allows the Site Manager to provide real-time updates to the Design Team, while also troubleshooting with the team with a high degree of confidence, speed and safety.

Similarly, the use of Augmented Reality allows the site team to accurately visualise how the finished product will look by overlaying the detailed 3D Model onto its fixed real-world position on site. This allows the teams to envisage the bespoke DfMA assemblies, detailed pipe runs and cable containment, while also allowing the team to track assembly progress and to take corrective action where required. The software integrates with tablets and allows the user to visualise the 3D Model in its real-world position without the use of the headset. This opens up connectivity to a larger team of users on site, or where site safety requirements may preclude the use of a headset.

Challenges

A major challenge faced with the integration of this software has been training and acclimatisation, as the end users need to be comfortable not only using it but also in troubleshooting any issues which may arise.

Certain infrastructure requirements also need to be met, for example, connecting with the headset during a Teams meeting requires solid internet connectivity at the operator's end, which can be difficult on remote sites.

Case study continues on next page with Recommendations, Support and Benefits.

Using augmented reality on a tablet to visualise the 3D model in its real-world position on site

Recommendations

One key point is to ensure there is a solid benefits case, not only in terms of outlay for the technology but also to secure buy-in and support from employees and business leaders. There will often be some resistance to change when it comes to digital transformation, so it is important to roll out a change management initiative when implementing the technology.

Try to empathise with end users and reassure them that the technology exists to make their work easier by streamlining processes.

Support

EPS engaged with a researcher from the Nimbus Research Centre which forms part of Munster Technological University in Cork. The Research Centre suggested various different headsets but, ultimately, they outlined that the Microsoft HoloLens would be best-suited to meet our initial requirements. This was recommended as they had tried and tested the use of the headset with Microsoft Dynamics 365 Remote Assist, and they were able to transmit live video feed while integrating 3D Models, documents, videos and annotations to the remote meetings.

Benefits

The digital transformation of an industry can dramatically change how an organisation value adds for the benefit of their customers.

The implementation and general use of Augmented Reality has particularly benefitted EPS by enabling us to open more connections and remain competitive within the UK market. EPS have a large hybrid working policy and the continuous investment and implementation of digital processes and procedures allows the workforce to stay connected across a vast array of projects.

Inspecting an overhead pipe rack using a Microsoft HoloLens headset

SOLUTIONS PROVIDER

LEICA GEOSYSTEMS

Digital tool

Digital Reality Capture Solutions

Leica Geosystems

Leica Geosystems creates complete solutions for professionals around the world.

‘Leica Geosystems On Demand’

YouTube channel

YouTube case studies playlist

Why use Leica Geosystems products?

We work with companies of all sizes who have a range of different needs. As a recent example, we worked with Castle Surveys, a young and growing geomatic surveying firm who invested in the Leica RTC360 3D reality capture scanner after a demo with the team. With pre-registration and visualisation functionality, the RTC360 was used to map highly accurate building interiors and exteriors for BIM models on a very tight turnaround through point cloud and photogrammetry scanning. A 4-minute video with more details can be viewed here.

Benefits

The main benefit of using Leica Geosystems’ solutions is efficiency over traditional methods. In simple terms, this means time savings for surveyors on the ground, and cost effectiveness for management.

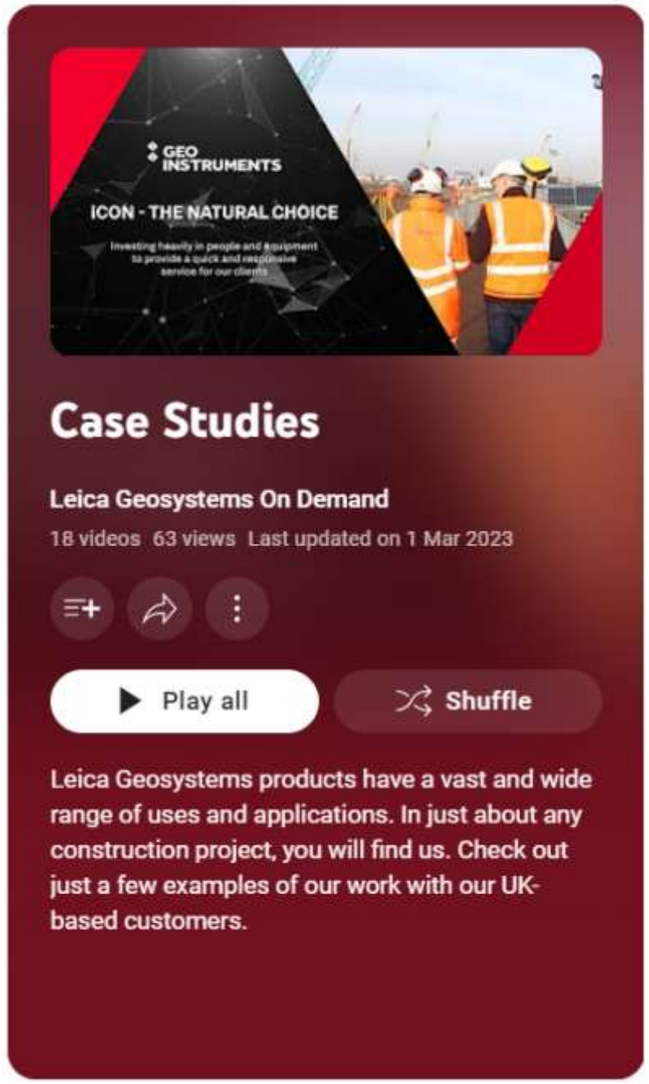
Challenges

For many of our clients, one of the biggest challenges they face is the site environment, for example working in confined spaces or very busy areas such as highways and train stations. Our digital equipment can be used in tight areas and can help mitigate risk.

Lessons learned

We receive a lot of helpful feedback from people on the ground, and constantly develop our solutions to make their lives easier. For example, we developed the Leica BLK360 laser scanner as an ultra-fast, small and lightweight offering which includes a companion mobile app, meaning that a single person can easily control, monitor and complete scans by themselves. We also developed the Leica AP20 AutoPole which can be used without height or tilt adjustment, therefore removing analogue processes to increase data reliability and efficiency. Insight from users is crucial to improving our products so we always encourage our customers to get in touch with feedback and suggestions.

Our YouTube channel is updated regularly and includes a playlist of current UK-based case studies.



Support

The relationship Leica Geosystems enjoys with its customers can be defined in one word: Partnership. And that is our commitment to our customers, true partnership that includes a full circle of Active Customer Care support and services, anytime and anywhere. Many people have experience in surveying, detection and machine control but do not have a full understanding of how it all connects. The Leica Training School helps complete that workflow and a full overview of the connected worksite environment, from data capture through to an as-built. Comprehensive training courses with hands-on experience provide a better understanding of measuring, surveying, detection and machine control, empowering people and assets to be smarter, safer and more productive.

CONTRACTOR

INNOVARÉ SYSTEMS

Digital tool

PlanRadar

Innovaré Systems

Offsite modular construction specialists for the education, residential & healthcare sectors. Approx. 150 employees.

PlanRadar

PlanRadar is an award-winning digital platform that creates time and cost savings in construction and real estate projects by digitising task management, documentation and communication.

Background

As Innovaré have historically worked as subcontractors, they have found themselves using a wide range of software solutions for different tasks, including snagging. Over time, they found that this continuous movement between systems was inefficient and led to their data being scattered. The challenge was therefore to find a single system that could consolidate or replace existing software that was being used for snagging, defect resolution and quality assurance.

As a company specialising in modular construction, with much of the work happening in a factory prior to installation on site, any software solution had to work across teams in several locations. Snags and defects needed to be spotted and resolved as early as possible in the process so that installation and construction could go ahead as quickly and efficiently as possible. After considerable experience with other solutions, the team at Innovaré settled on PlanRadar after seeing the product demonstrated and testing it extensively on a single project over 4 - 5 months.

Testing

Innovaré's Head of Project Delivery, Alex Banks, first introduced PlanRadar to a project that had already completed the design and manufacturing phase and was just about to begin on site. Collaborating with the site manager, he established which forms would initially be most useful for snagging, defect management and quality assurance. They also set up their own custom reports. Throughout this process, they involved the rest of the site team and engineers to see how they would respond to the software.

The results were extremely promising, with the team quickly realising that PlanRadar could be used for far more than snagging. After the success of the test project, PlanRadar was rolled out to several different teams, each of which uses the flexible software completely differently. The list of total uses is now a long one that includes: deadline management, site diaries, reporting non-conformance to production, variation instructions, collecting evidence of building to the design, planning and pre-allocating all tasks in advance and health and safety management. Alex and the rest of the Innovaré team also continue to push the limits of what the software can do and find new uses that suit their team's structure.

Benefits

In terms of Innovaré's initial goal, to consolidate their snagging, defect management and QA systems into a single software, PlanRadar has been a resounding success. The software has enabled them to move beyond snagging to the next level of quality assurance. According to Banks, one of the key functions of PlanRadar for the team is that they can now prove that each element is correct and matches the design, from its manufacturing to its installation on site. Prior to using the system, they were able to prove where something went wrong or was repaired, but now each individual element can be photographed and signed off.

Another major benefit is the openness of communication. PlanRadar's tickets allow the team to share information across all of their teams instantly and they have found that when people have the information they need, they're empowered to make the right decisions. The flexibility of the tickets also works well for people who work and learn differently, with the ability to add photos, text and audio helping everyone to understand their tasks.

"PlanRadar allows us to share information across all of our teams instantly, and when people have the information they need, they're empowered to make the right decisions."

Alex Banks,
Head of Project Delivery at Innovaré

As a company offering modular construction, Innovaré have always claimed that their way of building is more efficient. With complete documentation using PlanRadar, running from the design phase to project handover, they now have the audit trails and statistics that prove that this claim is true.

SOLUTIONS PROVIDER

COMHARRA SOLUTIONS

Digital tool

Digital twins

Comharra Solutions

Photogrammetry drone mapping and virtual 3D space creation including 3D digital twins.

Background

Previously while flying drones, the photos and videos only offered visual data, where our clients would have benefited from more survey-grade data. In response we invested time and resources into developing an aerial survey service which is also backed up and complimented by our ground-based systems.

Benefits

The main benefits that our clients have found with our services is the ability to have a highly accurate and measurable digital twin of an asset. This can be captured in a fraction of the time of normal survey methods, whether this be a century old castle or a modern infrastructure project. Also with being aerial based, this reduces H&S concerns and reduces costs for gathering data. The data we capture enables clients to better plan a project, reducing unnecessary costs and also enabling them to lower their carbon footprint.

One unexpected beneficial outcome is that having scanned an area before work begins, our clients are better able to respond to concerns regarding leaving the area in the condition that it was when they started. Also the introduction of more working from home during COVID-19 meant that full teams were able to look around, measure and plan projects in 3D space, all from home.

Left: Take off and landing from boat to carry out coastline and cliff surveying.

Above: Colourised point cloud of lock gate with volumetric calculation.

Right: Comharra on site carrying out 3D data surveys of lock gate replacement.

Challenges

We offer a relatively new service that is massively advancing at a rapid pace, so we must always carry out research and look at new technology to ensure we stay up to date and within regulation with bodies like the Civil Aviation Authority.

Lessons learned

It is very easy to capture data using drones and lidar camera but exactly how to process and deliver that data for different clients really matters. Some are happy with the cloud based viewing system whereas others want only the data to then take into their own BIM software.

Support

A lot of what we learned came through very many hours of research and calls to manufacturers to better understand the systems. What we do is so new that it involves a massive amount of trial and error and practice.

DIGITAL CONSTRUCTION CASE STUDIES E-BOOK

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