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Foresight to navigate the turbulent construction market
Unlocking more value from data

In today's challenging construction sector, contractors are looking for new ways of doing more for less. With foresight at a premium, making the most of the data available – 'data analytics' – becomes a critical component in the fight for survival.

The use of data analytics has grown exponentially in many other industries, such as oil and gas, mining and retail, as businesses seek to better understand their operations, suppliers, customers and risks. And while the use of analytics to identify exceptions in transaction processing and contract costs is well established in construction, there remains **huge potential in applying the same techniques to improve cost control, logistics and health and safety on site, as well as reducing the incidence of loss-making projects and fraud**.

Data analytics defined

Rather than some esoteric and futuristic technology, data analytics is simply the process of using the data available to make better, faster decisions, thereby helping to direct strategy and operational improvements.

As the volume of data available has exploded in recent years, so too has our processing power – enabling organisations to generate predictive insights which were previously out of reach.

> Just as weather forecasting has evolved from looking for "a red sky at night" to exploiting powerful computer simulations and huge volumes of historical data to predict rain fall to the nearest minute, so too has business analytics reached similar levels of sophistication and predictive power.

And to continue the weather analogy, those who make use of this data can avoid getting caught in the rain, or having to buy an emergency umbrella when there's a perfectly good one sitting at home.

The organisations that put analytics at the heart of their operations have the potential to create significant value. Those that master the use of analytics to become truly predictive will stay one step ahead and become market leaders. Faced with unprecedented market challenges, can contractors afford not to make the most of their data?

Seven ways to unlock greater value from data

One of the toughest analytics challenges is determining where to focus first. Does it make sense to start in a business domain where there are already some basic analytics capabilities in place, such as finance or risk? Or is it better to start fresh in another area, where expectations are low and opportunities are considerable? Knowing where and when to focus is an art in itself, however, here we consider the areas of considerable potential for contractors.

1. Improving health and safety

Zero Harm is a challenging objective, but one towards which all contractors are working. Good health and safety practices are embedded in many organisations, yet accidents still occur. Analytical techniques are increasingly used to understand the factors which are most likely to be associated with an incident, and to focus investment on high risk areas. By highlighting the most statistically significant factors relating to incidents, analytics can often challenge received wisdoms and shed new light on health and safety practices.

Parental supervision
Recent analysis demonstrated to one client that well trained, young, motivated staff were frequently involved in health and safety incidents – a segment of the population not normally considered at risk. However, when census data was incorporated into the analysis of factors driving incidents, it became apparent that these individuals invariably had small children and partners who were also working. Analytics thus revealed that employees' lifestyles were causing them to be tired, and it was this, and not just their level of training, that significantly increased the risk of incidents. This insight has allowed the client to develop new policies to protect this vulnerable group of employees.

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2. Enhanced cost control

When it comes to making a difference to the bottom line, robust analysis of the detail can make a significant impact on eliminating cost and wastage. Using simple analytical and visualisation tools, contractors can very quickly unearth patterns which identify individuals who are submitting inappropriate expense and mileage claims, phone bills and purchase card costs. Often, taken on their own merits, these may not seem excessive, but when analysed in their entirety they can reveal individuals who are working just below 'trigger' thresholds but nonetheless significantly over-claiming. **With minimal effort, companies have identified £5,000 - £10,000 a month of excess cost buried in the detail through identification of petty fraud or inefficient working practices.**

3. Early identification of contracts with profitability challenges

Maintaining a robust view of contract profitability is fundamental to contractors, but how do you know that sites are really on top of their numbers? The experience of those within the business goes a long way to making this assessment, yet people often take an optimistic view of contingencies, unforeseen events still occur, contracts fail, money is lost.

Data analytics can help to improve contract control and reduce this risk of failure. Through historical analysis of all the factors relating to contracts which have succeeded or failed, contractors can identify the early warning signs which might indicate that a contract is likely to deviate from schedule and incur a significant monetary loss. Myriad data points, from the blend of suppliers and shape of the project plan, to the volume of change requests and frequency of manual adjustments to the ledger, can all be analysed to provide early warning of contracts that may be heading for trouble – allowing proactive and preventative actions to be taken when those conditions re-occur. The same techniques can also be applied to inform the risk analysis undertaken when tendering for new projects.

Seeing things clearly

Organisations with which Deloitte has worked have been able to reduce logistics costs by as much as 25%, when integrated and visualised logistics data made it apparent that goods were being unnecessarily transported between distribution centres, only to be sent to customers within a short distance of the point of manufacture. In the context of construction, the same techniques could equally be applied to the efficient movement of materials to site.
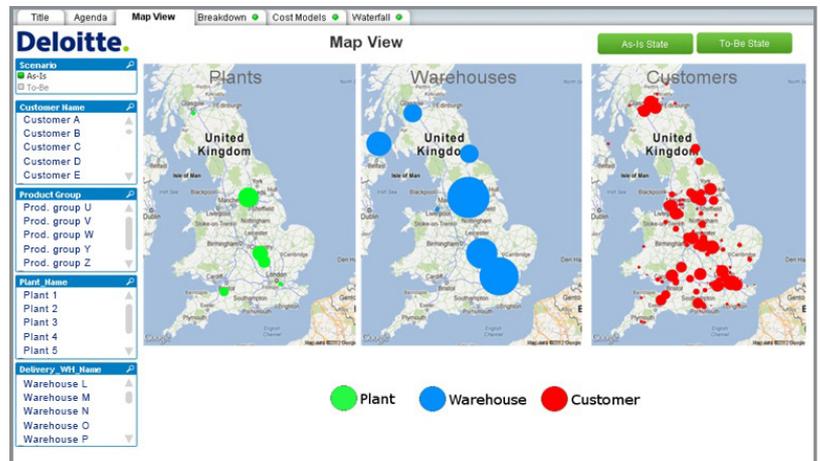
4. Delivering greater efficiencies in logistics

Moving goods and materials between suppliers, distribution hubs and sites can become complex on the largest infrastructure projects. Analytics, and specifically data visualisation, can often highlight inefficiencies in operations which, when the details are hidden deep within spreadsheets or across multiple systems, are often difficult to spot; as demonstrated by the example above.

5. Identifying procurement fraud

With high numbers of suppliers comes complexity, and with complexity comes a greater risk of fraud. Data analytics can cut through this to shine a light on fraudulent behaviours. Analytics can help in identifying collusion between particular suppliers and an employee, anomalous payments or contracts repeatedly awarded, duplicates or a series of unusual payments. There have been very high profile examples in the banking industry, which highlight the dangers that can occur when there is inadequate segregation of duties and an individual is able to manipulate controls. On a smaller scale, even if an individual is taking care to hide their fraud just beneath the radar of controls, monitoring patterns of behaviour using analytics can still detect malevolent activity.

6. Demand planning

Being able to forecast demand and organise resources accordingly, be they suppliers, people, machinery or finance, is a major factor in both improving the efficiency of operations and developing realistic business plans.

Deloitte has experience of tackling some of the largest demand forecasting challenges, most notably helping the NHS (which manages the UK's largest workforce) predict where and when specialist skills, doctors, nurses, beds and medicines will be required – based on myriad factors and projections.

The same demand planning techniques are equally applicable to the world of a contractor, where predictive models can be exploited to improve the scheduling of both internal and sub-contracted resources. Better understanding future demand can also enable contractors to improve their negotiating position by procuring goods or services in bulk or in advance.

7. Predictive maintenance

Planned maintenance of fleet vehicles, as well as plant for those contractors with plant hire agreements, is an important component of well managed operations. However machine failure can both lead to costly unplanned maintenance, and even worse, health and safety incidents.

"Big Data" technologies now make it possible to ingest huge volumes of real time telemetry data from equipment, and analyse the historical patterns which have pre-empted failure in the past. As such, it is now possible to see machine failures before they occur, undertake preventative maintenance in real time, and avoid the costly implications of breakages and downtime.

Realising the potential

- **You're already ready**

  Most organisations are already using basic analytics in some form and evolving this further does not need to take up significant time and resource. A small analytics project may be a great way to tackle a particular business problem in a different way, using existing infrastructure.

- **Good is good enough**

  The level of data integrity required for analytics varies according to the task performed. Investigative analysis seeking to set a broad direction can often be conducted on data with lower integrity, but where absolute accuracy is required – for example in regulatory reporting – data must be clean. In many instances, it will therefore be possible to initiate analytics and derive value without the need for a transformation of data integrity. Start the analysis quickly, iterate the approach based on what you find, and evolve your insights accordingly.

- **No adoption, no value**

  Analytics is of little use if locked away inside the IT department, and it is now easier than ever to extend analytics capabilities throughout an organisation. However, simply pushing new data and insights to different audiences doesn't necessarily mean they will know what to do with them. The most effective analytics tools are intuitive and easy to use, but do not underestimate the amount of training and change management required for them to be adopted successfully.

- **Do you already have the technology you need?**

  Most organisations already have many of the tools required – at least enough to get started. An inventory of your existing analytics technology – including solutions that aren't currently used for analytics purposes – may surprise. If you need to boost your capabilities, today's commercially available tools are loaded with analytics, and open source solutions offer an inexpensive alternative or complementary approach.

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Why wait?

The case for analytics is undeniable.

> The best analytics investments are self-funding, most organisations already have some analytics capabilities in place, even if they're underused, and at such a turbulent time in the construction industry, foresight is at a premium.

While contractors have historically relied on brand, clients and staff, data could become a valuable fourth asset.

In the short term, actionable insights can be generated within just a few weeks. Deloitte frequently advises clients who require a rapid analysis of data in a six to eight week timeframe.

Once the relevant data is extracted from the client's systems, insights can be generated almost immediately, and our team of data scientists work closely with clients to refine and re-focus analysis based on the findings throughout a project.

To maximise the effectiveness of analytics over the longer term, organisations need to ensure they proactively manage their data quality. Even if an organisation chooses not to bring analytics capability "in-house", rigour in capturing and managing data is required in order to give analytics the best chance of success. Whilst modern analytical techniques are able to cope with flaws in information, establishing organisational ownership for data and implementing a data quality testing regime will go a long way to ensuring that analytics generates actionable results.

Deloitte Analytics

Our specialists support clients in both conducting forensic analysis of their data, using leading edge tools and third party data sets in our dedicated analytics lab, and in building and running their own in-house analytics capability.

> **What does this really mean for your organisation?**
> We would be delighted to demonstrate how analytics can apply to your organisation in a bespoke workshop in the Deloitte Analytics lab. To register for a session or to find out more, please contact us **at infrastructure@deloitte.com**.

Deloitte works with many of the world's leading building contractors. We offer a truly comprehensive range of business advisory services, from strategic and financial advisory to PPP bid support and operations consulting, as well as specialist contract and commercial risk management expertise. With a deep understanding of the sector and extensive industry experience, our dedicated Contractors network brings together the best of Deloitte's leading expertise into practical, integrated solutions to the key challenges of the flat construction market.

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