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Nous Contributor Series #1 Letter

Data could turn the laggard construction industry into a leader

All our readers who are real estate developers will agree with us when we say that one of the most complicated components of the development process is construction. Frustratingly, industry methods have not changed in over 50 years. You know the drill. We still assemble raw materials onsite, build a completely bespoke product every time whilst simultaneously training our teams . . . and then start over from scratch on the next project. But, hey, construction is just inherently inefficient, right? **We disagree. Efficiency can be improved**, and no, we are not talking about off-site construction in this instance (though that has its merits). **It is all about data**.

Data is the most precious asset in today's world. The fabled FAANG companies have a cumulative market cap of several trillion dollars, much of which hinges on their enormous access to data, and clever use of it. Amazon, Google and Facebook specifically have built their businesses on data aggregation, running sophisticated analytics off the back of this data, and monetization every step of the way. We see examples of this in every waking moment of our lives: from the constant retargeting ads that chase us around the Internet, through recommendations on who to be friends with, what to buy and where to go based on our preferences and behaviours, to the Al-driven assistants that many of us can no longer live without. **These features function on data that we all willingly share, every single day.**

Now, consider construction. The global construction market is huge, with forecasts indicating that it will exceed \$24 trillion in 2021. Despite its enormous size, it is also inefficient and technologically underserved

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The result is that **98% of large projects suffer average cost overruns of 80% and delays of 20 months.** According to the McKinsey Global Institute, **less than 1% of revenue is spent on technology**, making it the second least digitised industry behind agriculture. Data is one of the construction industry's weakest spots. This can be attributed to the fact that the ecosystem is largely made up of firms that cannot afford the time and money to invest in data and digitization. This dearth of data has resulted in deep inefficiencies within the sector, with **construction waste amounting to 35% of a project on average and global industry productivity growing a meagre 1% over the past two decades, compared to 3.6% in manufacturing.**

There are two sides to the data equation in construction. On the one hand, data capture is becoming increasingly feasible in construction with the growing use on site of smartphones, wearables, drones, GPS systems and other mobile solutions.



However, the true "game changer" is not the data per se – it is the analytics that is built on this data and the actions they engender. Better data analytics will result in a clearer understanding of costs and timelines, leading to improved budgeting, greater certainty of expected margins, effective management of time to avoid delays, and an increase in accuracy of predicted project outcomes.

Innovative startups such as the following are tackling the issue and improving data analytics for the construction industry

Versatile Natures believes that a large construction project can only progress as fast as the cranes move. It has developed a sensor installed on construction crane hooks to monitor movements, loads, and downtime, among other things; this is used to determine efficiency and, through AI, make recommendations to improve productivity.

nPlan has digested hundreds of millions of scheduled tasks from its partners and utilised machine learning to understand their context and detect patterns in performance. Through these algorithms, it predicts the outcomes of construction projects based on individual schedules.

BuildSafe leverages data to make construction projects safe. Its cloud-based service allows for mobile reporting, documenting, and monitoring of risks. Owners and contractors are able to maintain high levels of safety, reduce paperwork, and understand which areas, companies, or individuals may be most at risk.

Disperse captures 360-degree images throughout a construction project, uses computer vision to detect changes week-on-week, detect anomalies, and measure progress in order to optimise workflow and provide early warning signs.

Briq claims to be the modern data platform for construction. Through a range of products using Al and machine learning, Briq captures data from disparate sources, standardises the data, and then provides solutions to specific problems.

If tech and data analytics are so important and so beneficial, why haven't more construction industry players embraced them yet? Consider the typical construction life cycle. Owners, whether private or public, will spend months or even years planning their project down to the smallest detail. Once that part is done, they will tender out to a contractor who is pressed for time to price the project and then deliver it.

The contractor will make changes to save time and money and will likely hand it back loaded with change orders and defects. This is largely because the owner-contractor relationship is historically adversarial, with owners looking to pay the lowest price and contractors scrambling to make it work, often willing to work at near cost just to keep their employees busy.

Margins (both in terms of money and in terms of time) are so low that contractors are scared of trying new things, despite the fact that good tech can save them money. In light of the recent real estate forays by some of the FAANG companies, such as Amazon's recent purchase of a prefab homebuilder, and Google's Sidewalk Labs building a smart city in Toronto, there is a strong risk that if incumbents don't change their current approach, others will enter the market and force this change onto them.

"We believe that, in order for tech and data to become winning elements of the construction life cycle, owners must take control of the process. They pay the bills, so it is in their power to dictate how things are done. With the right kind of contractual terms which are not just driven by price, tech and data could become the status quo, resulting in a win-win whereby the owner gets the outcome they desire every time and the contractor works better and makes more money."

We have already touched upon some of the benefits that data analytics can bring to the construction site. The benefits to owners are even greater. With data, owners can future proof their plans by using historical data to predict future behaviors both when designing and when planning the construction for their upcoming projects. Imagine if, as an owner, you knew exactly how long it took to install certain materials in specific locations and under certain conditions. You would be able to design a project with the full knowledge of factors that otherwise would be estimated at best. Imagine you could pinpoint delays and errors to specific teams of subcontractors working under specific conditions – you would be able to design your workflow to avoid any conditions causing delays. Further to this and looking at the lifetime of the asset, sensors deployed and data captured in construction can be used for effective management of the asset throughout its lifecycle, not just for its maintenance but also to ensure it conforms to its design goals in the long term (such as energy efficiency).

There are several challenges to implementing data collection and analytics in a construction project. The first, which is cost, can be surpassed if the owner is willing to recognize its value and drive the process, as well as pay for it. The actual collection itself is difficult but, as we have discussed, this is increasingly being solved using sensors, wearables, smartphones, drones and more. Analytics are historically expensive, as they would usually require a data scientist to be kept on staff to run the more complicated programmes, but this is now being supplanted by the emergence of SaaS models for the construction industry. Finally, probably the greatest challenge is data sharing between the projects' stakeholders. How can architects, engineers, contractors, consultants and subcontractors be made to collaborate in data sharing to the degree that is needed for all we discussed above to be a success? Once again, only the owner can drive this collaboration, by establishing its principles in each stakeholder's contractual terms from the get-go.

Each of the stakeholders in this process must be willing to embrace change in order to leverage tech and data to successfully increase their and the whole sector's profitability. If you are an owner about to embark on a construction project, be sure not to simply "hand over" the project to your contractor and forego collecting the data. Rather take control of the process, demand data collection and its utilisation, be prepared to act the outcomes from that data, be willing to pay for it, and include data terms in your legal agreements. If you are a contractor, you would be well advised to recognise the value that data and analysis can play in your projects, collaborate with owners, and trial start-ups claiming to solve these problems. If you are a start-up, focus on developing a product that solves a real need: listen carefully to the end user and collaborate closely with owners, contractors, and other start-ups in your ecosystem.

ABOUT THE AUTHORS



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