# FUTURE OF CONSTRUCTION

INTRODUCTION

With the construction market estimated to hit $10 trn in 2020, construction is a very crucial sector of any economy. Spending less than 1% of revenue on research and development has proven to be a huge set back with productivity only growing by 1% per year. This is alarming as it would be adding $1.6trn to the global economy annually.

Construction sector in the UK, 2017

		% of UK
Economic output (£ billion)	113	6%
Jobs (million)	2.4	7%
Businesses (million)	1.0	17%

Sources: Output: ONS, GDP estimates, Low Level Aggregates table
Jobs: ONS Nomis Database, Workforce Jobs (Q3 2018)
Businesses: BEIS, Business population estimates, Table 5

PROBLEMS IN CONSTRUCTION

The most prominent problems in construction include the waste produced, the lengthy process as well as the cost! The investment that goes into building infrastructure is shocking. In fact, the High Speed 2 rail project has been reported that is unlikely to stay within the budget of £56bn, and now will possibly surpass to £30bn. Wastage of construction material is increasing in large cities. *According to Udeaja, CE, Ekundayo, D, Zhou, L and Perera, S. (2013). Material waste in the construction industry*, annually poor design and site management amounts to approximately 13% of the delivered materials going unused.
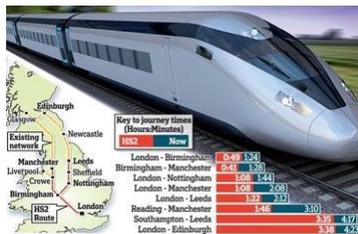
SOLUTIONS

Construction is arguably the least digitised sector in the world thus investment in technology used in construction is the way forward. 3D printing is the most prudent solution. The environment has been a growing issue and just getting worse. The 3D printing process minimises waste of value materials. Moreover, the possibility of creating large-scale building at relatively low prices can be plausible with 3D printing. Other technological advancements can be also used to counteract the problems faced in construction such as AI Technology or AR, which can monitor behaviour of workers or work alongside the engineers and architects.

ARTIFICIAL INTELLIGENCE

Some investments in AI has opened doors to limitless possibilities working parallel to the advancements in AI technology itself. In construction, image classification can access data video data collection on work sites which then can be utilised to identify unsafe worker behaviour. Such programme can reduce worker casualty rates and could be used for future training purposes. Furthermore, enhanced analytics paves way for data to be analysed from sensors and thus act accordingly deploy real time solutions based on one's patterns of movements or signals recognised. *The statistics illustrate that the construction sector is behind in AI adoption. Despite the fact that AI technology can be revolutionary, it is still lagging behind amongst the other sectors.*

Future AI demand trajectory[1]
Average estimated % change in AI spending, next 3 years, weighted by firm size[2]

1 Based on the midpoint of the range selected by the survey respondent.
2 Results are weighted by firm size. See Appendix for an explanation of the weighting methodology.
Source: Michael Chui, James Manyika, and Mehdi Miremadi, "What AI can and can't (yet) do for your business,"
McKinsey Quarterly, January 2018, McKinsey.com

3D PRINTING

This method is already being implemented. The figure is of a prototype home made in Texas, Austin by ICON, a technological construction company. The 3D printed houses will be constructed in El Salvador, tackling the housing shortages. The minimal waste and labour cost are significantly reduced, and the process takes less than 24 hours!

AUGMENTED REALITY

This concept involves superimposing computerised image onto the real-life surroundings. AR trial had undertaken at Custom House Station for the Crossrail project. Through the implementation of AR, it will increase levels of precision and will provide analytics that will determine progress in the production process. Although, it many challenges came to light after the trial, without a doubt it is the future of construction with the ongoing rapid advancements in the AR industry, there is immense potential.

CONCLUSION

There is a very strong relationship between the construction sector and the economic growth. Investment is essential for the modernisation in construction which then in turn positivity affects the country as it not only generates income but also serves as a multiplier effect, creating jobs.