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Robert MILDER
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# ARTIFICIAL INTELLIGENCE ARCHITECTURE

David WHITEHEAD
Jacobs

**Definition of "architect" and AI...**

The potential for AI to impact architecture is huge.

At the moment the industry is in a proof of concept stage. Many specialist firms are developing their own solutions even though the odds are against them; then again companies that succeed will have a transformational impact on the way buildings are designed, procured and delivered.

As always, the areas with the biggest budgets are having the most investment. We're seeing developers acquiring software firms that allow them to rapid assess the potential of sites without the need to commission professional services. At the other end of the spectrum, software firms are developing tools to optimise the design of workplaces and interiors.

We're looking at this at multiple levels, our approach is to develop some aspects internally and to collaborate with partners on other initiatives. This is a great way to learn from each other.

The architect of the future still has the ability to add huge value to our clients but we need to focus on using the support of AI to deliver projects that meet their organisational objectives: financial, environmental and social.

AI in Architecture

## Potential impacts of AI to the architecture...

Depending on your source, the percentage of building projects delivered without using an architect varies but all sources note this is already very significant. It's easy to argue that these clients miss out on the skills an architect brings but we are not convincing the clients.

Most clients don't want architects, engineers or project managers; they want efficient delivery of effective building. Procurement mechanisms, traditionally used, have a backward-looking approach, and are focused on professional silos. As more organisations come to be aware of AI potential, procurement models will shift and start to procure the products as opposed to the services.

In Susskind and Susskind's The Future of the Professions, they predict the decline of aspects of traditional professional skill as AI effectively replicates the complex assessment the professionals do. We might argue that architects' creativity can't be replicated but we should reflect on whether this creativity is for clients and users, or whether it is a creativity that only fellow architects admire.

There will remain a demand for architects who produce unique buildings with rammed concrete walls and hand-cut floor tiles taking months to lay because the client wants something different, but this will be increasingly niche and irrelevant to the vast majority of buildings procured.

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## Keeping up the new era...

We need to open our eyes and look at other sectors. AI is being used by rail, and highways engineers to rapidly optimise routes; other than scale, are the problems that these tools are being used to solve any different from the routing of services with a building?

We need to really consider the building as an outcome, AI doesn't align with the traditional professional silos. The design team needs to work together, seeking the opportunities to make use of the emerging technologies in our delivery process.

Good architects are imaginative and collaborative. If we use these skills and tune in to what is happening, we have the ability to benefit and shape the new era.

### Innovations & opportunities that come with AI...

Architects are divergent thinkers. If you combine this with AI tools that rapidly assess and develop a single solution, you have a good counterpoint.

There is a significant opportunity to look at how the buildings we create can be optimised during use. A building should evolve over time. An architect working with AI has the potential to help the building owner and user optimise the facility. This means not just energy and facilities management optimisation but also the organisation's use of the building, analysis of how people collaborate, how they interact and how they deliver the tasks they set out to do. Analysing and shaping the completed buildings has the potential of providing clients with real benefits which will be highly valued.

### Changes in the production of architecture...

2D and 3D modular timber framed construction is often cited as a Modern Method of Construction, yet the timber framed construction is one of the oldest methods of building. The solutions provided by most of the construction firms are inflexible and unique to the provider; locking the client to the supplier if they want to adapt it in the future.
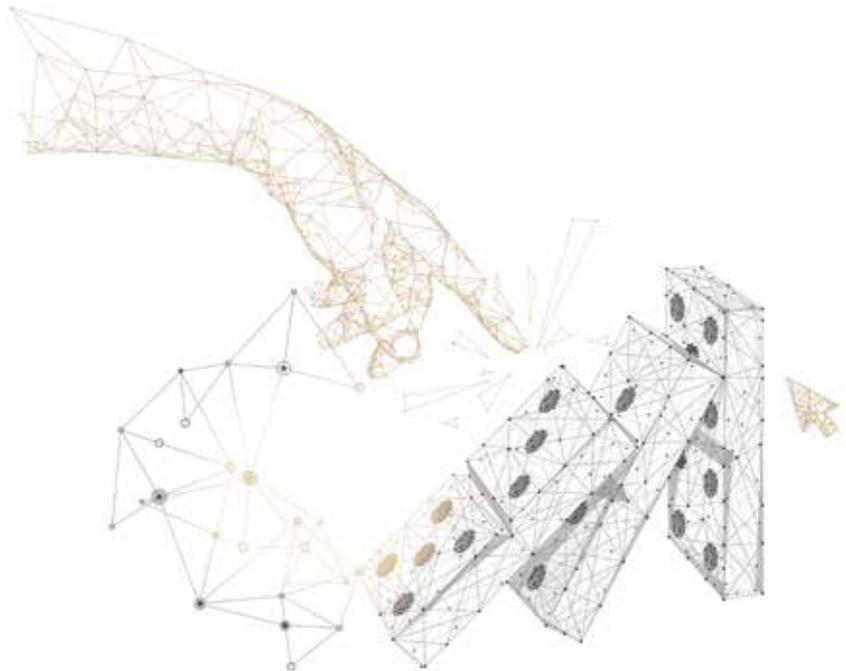
Most architects look with distain at the buildings produced preferring the "commodity, firmness, and delight" that traditional methods deliver. This is not without justification as many of these buildings are disappointing and do not achieve the benefits that modern methods of construction should deliver.

It is the approach not the systems that will have the ability to transform the production of architecture.

The UK government's approach to developing platforms has real potential in this area. It's not reliant on a system builder to come up with a solution, it requires: clients to think about and change their briefs; good designers to work with the constraints and to develop effective designs with manufacturers and addressing this at an enterprise level.

What it is not, is the architect's trick of taking something simple like a shipping container, adapting, and spending more than a tractional project and then branding it as a simple solution. We need to go back to the principles, understand these and use AI to help us refine our solutions.

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## AI & sustainability...

By sustainability, we must consider financial and social as well as environmental factors.

The ability to model multi-dimensional scenarios has real potential, allowing us to help clients optimise the project that we deliver against the criteria that is right for them in a way that traditional trial and error design cannot. For example, we have entered into a partnership with Simetrica who use advanced techniques to help clients plan socially sustainability projects. This is something that will have increasing importance for all clients as they make future investment decisions.

The other area we should be really focusing on is the long-term operation of the buildings we design for our clients. Handing over a building and leaving to the owner to manage on their own is unlikely to get the best environmental performance out of the building.

Again, look at other sectors. In the logistics world, the smart lorry manufacturers don't just sell the vehicle, they support the operators by: monitoring systems, locations and driver inputs and then interacting with the vehicle by providing feedback, limiting gear selection based to improve the fuel consumption.

Why wouldn't a client want to have the same help and benefits in a building? ■