ARTIFICIAL INTELLIGENCE

Photo: Franki Chamaki, Unsplash

The energy manager — me, myself and AI

The increasing impact of AI in property will have significant impacts for energy managers, argues *Christian Albrecht*.

Recent research by PwC estimates that a staggering 20% of jobs will become automated in the next 20 years. Artificial Intelligence (AI) will be the main driving force of this revolution and is expected to create 7.2mn jobs within the UK, achieving a marginal net gain as around 7mn jobs will be displaced by the technology.

Of course, many of these will not be like-for-like jobs, and what of those disenfranchised? Will government take responsibility for up-skilling supermarket tellers, for example, so they can join the legions of programmers and engineers designing automated checkout systems? PwC also states that 'no industry will be unaffected' and there is little indication that any prohibitive legislation is around the corner.

With this in mind, how will AI's unrestricted impact be felt by the property industry and by tomorrow's energy managers?

A growing interest

The findings from *Property Week's* Power of PropTech survey in July are an insight into the rising potential and precedence of AI in the property sector. When asked: 'What technologies will have the greatest effect on the property industry in the next five years?' 30.6% of respondents replied 'AI and machine learning' (a 3.6% rise from 2017 and 8% more than the runner up, blockchain – see **Figure 1**).

According to results from the same survey, there is growing intent to invest in disruptive technologies, with a majority of companies (68%) willing to become early adopters and trial new tools or systems in order to gain a competitive advantage.

Some may initially question how AI can be deployed in the property industry, but so far the applications have been diverse and we expect to see continued innovation from technology providers. We exist in a commercial marketplace, operating on a global scale and driven by the margins on services provided; digitising information and powering processes with AI can boost efficiency, lower costs, and improve customer service.

AI-powered chatbots have been used in property for a few years now, facilitating anytime online conversation between customers and the business which satisfy online customer queries and aid the sales process outside of normal business hours. Continued development of these systems has meant that they've become indistinguishable from real humans. In 2016 the Inman 'Broker vs Bot' test showed AI can actually exceed human expertise, increasing the relevance of recommendations and streamlining customer searches more than a professional real estate broker.

Automated valuation models (AVMs) have transformed the property pricing model, using regression analysis and sales data from previously sold properties to predict market values. Over time the complexity of these algorithms will increase, with additional variables and larger datasets to reference. At some point in the near future it will become bad business to market a property without assessing its value through an AVM.

How is AI disrupting energy management?

Unfortunately, the uptake of AI in energy management has not been significant enough for wide-scale change. Companies are often inactive, have one energy manager for numerous sites conducting an audit once a year, or are relying on a range of capital projects to reduce energy consumption.

However, whilst that new boiler or pump may be 25% more efficient than your current plant, using data and AI to drive the efficiency of your existing assets can yield the same savings with far less capital expenditure. Furthermore, it's important to remember that even new equipment can be run badly, especially if resources are precious and those who know how to operate the plant are focused elsewhere. The opportunity for AI within energy management is monumental, and the early adopters are enjoying the benefits of this.

There are many ways to reduce energy consumption and, in keeping with this, divergent approaches on building optimisation itself, with many choosing to optimise through the building management system (BMS) as an easy way of accessing savings via set-point optimisation and equipment staging. However, there are limitations with this

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approach as it relies on the accuracy of BMS information, rather than true energy data.

In a recent example, a contractor at one of our client sites had boarded over a temperature sensor during a shop refit. As a result, the heating, ventilation and air conditioning (HVAC) system was relying on incorrect data and running full time, although the BMS showed the equipment still operating within its set points.

A recent audit of EP&T's initiatives showed that 48% of the savings opportunities identified are due to faulty BMS readings, confirming that the technology is only as good as the data that powers it.

A key benefit of AI in energy efficiency is that it can continuously reference current performance against previous energy data, every 15 minutes, 24 hours a day, 7 days a week. If it's 27°C outside and the building consumption profile shows a certain cooling load, an intelligent system will compare this to a previous day with similar weather conditions and identify that there is or isn't an inefficiency.

Within a more advanced system, disaggregation algorithms will then be able to identify the specific piece of equipment causing an increased load. For the progressive energy manager, this is a tool to allow a precise knowledge of how their equipment performs under certain conditions. Ideally the system will automatically establish new performance benchmarks based on the consumption profile in each specific day, leading to increasingly optimised buildings (see **Figure 2**).

Risks and drawbacks?

Like any energy project, implementing an AI-based optimisation system will incur upfront commitment and expense from the business, although some providers will offer a savings guarantee or creative financing solutions. Some organisations will choose to leverage their existing capabilities before exploring a technology-led approach although, in these instances, it's important to consider the cost of inaction, which can easily be projected by comparing consumption trends with tariff forecasts.

Dashboards are a common display mechanism for these systems, but crucially dashboards alone don't generate savings and having a collaborative relationship with your technology provider is key. Ideally, your system will generate targeted actions and the team works in partnership to deliver them.
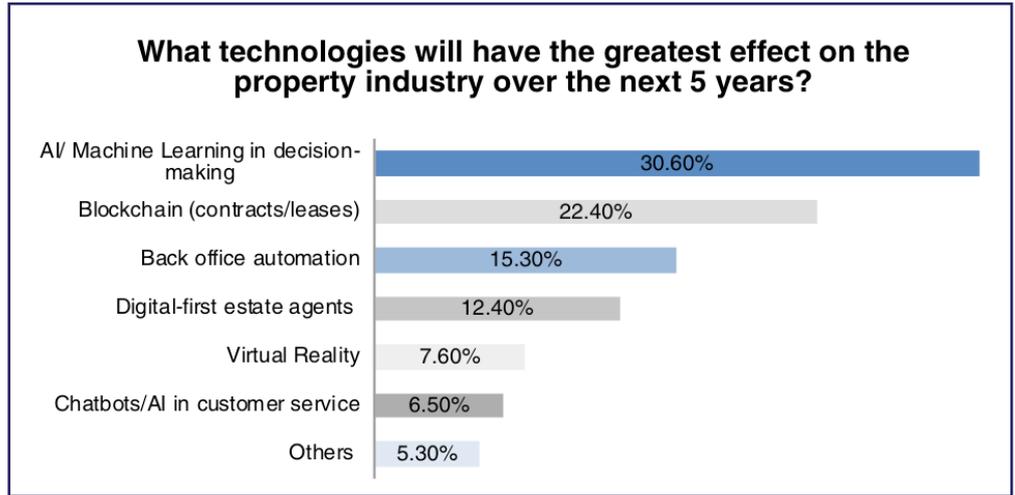
There is an argument regarding AI's inability to fully replicate human emotion, judgement and action. Without the combination of human expertise technology can become disengaging and yield unsubstantial results. A screen flashing alerts which nobody looks at is beyond useless.

The most commonly referred to disadvantage of any automated system is the impact on job loss, a real fear in certain industries, predominantly manufacturing. So how does this affect the energy manager?

As is often the case, some individuals embrace technological change while others reject it. One of the biggest challenges faced in on-boarding an AI-based energy solution is the disruption caused amongst estates, engineering and building management teams. How would you react if someone plugged in a computer and it said you were 25% inefficient in your work?

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The resistance is no surprise; research undertaken by *Harvard Business Review* shows that, although seen by top-level managers as an opportunity to strengthen, mid-level managers view change as disruptive. The message from upper management in this instance should be clear: if a building is inefficient and costs are higher than they should be, we should avoid apportioning blame and focus on making progress.

A rapidly changing environment

With the economic benefits well documented, reports suggest that 68% of businesses are willing to become early adopters of new technologies and it is highly apparent that the market is marching towards AI integration.

A proactive approach from energy managers is therefore necessary and there are many reasons to be positive — adoption of this technology makes a day-to-day task easier, faster and less complex. The progressive energy manager uses this technology as a tool to aid decision making, acting confidently and quickly in prioritising and implementing changes which drive positive outcomes.

The energy manager of the future will embrace technology and use it to advance their objectives, achieving market-leading results to encourage internal engagement and prioritisation of the energy agenda.

Adopting new technology is also an opportunity to shift the perception of the energy manager, moving from the individual who diagnoses technical issues to the individual who champions new solutions, elevating the conversation on energy efficiency and asset optimisation. Simply put, AI can achieve results beyond the capabilities of a human and future leaders in the field will be those who leverage its capabilities, expanding their influence from the boiler room to the board room. ●

Christian Albrecht is Commercial Manager at EP&T Global, a company specialising in energy savings through advanced technology and AI **eptglobal.com**

What technologies will have the greatest effect on the property industry over the next 5 years?

AI/ Machine Learning in decision-making	30.60%
Blockchain (contracts/leases)	22.40%
Back office automation	15.30%
Digital-first estate agents	12.40%
Virtual Reality	7.60%
Chatbots/AI in customer service	6.50%
Others	5.30%

Figure 1. How those in the property industry rate the importance of new technologies

Figure 2. How an artificial neural network works

COOLING LOAD

ASSET SPECIFIC DATA   DATABASE INFO

RECOMMENDATION