AI & THE BUILT ENVIRONMENT

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CONTENT

FOREWORD

The growing field of AI has been compared to the beginnings of the internet and the Industrial Revolution, and just like these periods of innovation, AI will change how we live and how we work. The Mayor of London is committed to supporting the AI revolution, and for the AI revolution to support Londoners.

Commissioned by the CPA & WPA NextGen committees for the London Property Alliance, the report seeks to answer the important question – how will AI shape the future of central London's built environment and jobs in this sector.

The paper has been underpinned by findings from an industry survey completed by 300 industry professionals from across the Alliance's network. The results showed that 64% of those surveyed were worried by the increased reliance on technology and automation, but they also revealed that 90% of respondents saw the potential of AI to increase efficiency and productivity.

In some way, these figures mirror the results of the in-depth interviews undertaken with professionals across the sector on how AI is being deployed in their organisations and specialisms. Just like the beginning of the age of computers, the interviews uncovered that 'human touch' and specialist expertise, professional responsibility and human discernment cannot be replaced.

The potential of AI to dramatically enhance how we work is transformative and as you will see in the research, the opportunity lies not in replacing people with AI but instead reallocating time and human expertise from repetitive and resource intensive tasks, towards creative problem solving.

London and the built environment have much to gain from AI, supporting the capital in its acceleration

and growth. Planning in particular has the potential to see the most opportunity from AI; empowering local authorities in the critical analysis of planning applications, releasing public sector resource and assisting in the delivery of the workspaces and the homes of the future. However, a coordinated approach between the public and private sectors at this nascent stage is critical in realising this potential over the coming years.

There is still far to go in the development of this technology but as AI continues to flourish, steps need to be taken to innovate, learn and manage our relationship with it if we are to truly take advantage of all it has to offer.

Theo Blackwell MBE
Chief Digital Officer
for London, Greater
London Authority

Image: Created by Arka Works using Midjourney

EXECUTIVE SUMMARY

With the acceleration of AI innovation, the London real estate sector is facing profound and unprecedented shifts. Whilst mainstream, open-source AI has infiltrated much of society, AI-powered design and delivery tools are still in their infancy, and built environment professionals are just starting to grapple with how the technology can best serve the industry.

It is anticipated that 37% of architecture and engineering tasks could be automated by AI[1]. More broadly, the UK Government estimates that 7% of all UK jobs might be replaced in the next five years, 18% in 10 years and 30% in 20 years, which would equate to 2.2 million jobs[2]. Whilst this sounds alarm bells for some, others see opportunities for progress.

Automation will change job roles and take over certain tasks, however, skilled professionals are required to train and operate AI systems . Specialist expertise, professional responsibility and human discernment are needed to define the development concept, provide quality assurance and leverage the AI generated output. In this "bookending" approach, where the human initiates and concludes the process, AI is used for creative augmentation rather than creative replacement.

With the capacity to generate endless options quickly, a greater emphasis should be placed on the quality of the original idea, professional judgement, and care for the end user – aspects that AI tools are not yet equipped to factor in but that are essential to successful and sustainable growth in the capital. Some organisations might see AI as an invitation to streamline their workforce, but the real opportunity lies in re-applying people to tasks that add

significantly more value to companies, allowing professionals to focus on their core skills and not on tedious and repetitive tasks that lend themselves to automation.

London has much to gain from AI:

- With intense pressures on land in the capital, AI has **the potential to facilitate workstreams** and **deliver new development more efficiently**;

- An **AI-enabled planning system could work faster** to support London's growth;

- An accelerated optioneering process can reduce the uncertainty of land speculation and **ensure appropriate development densities** for urban sites;

- AI-generated feedback can inform rational decision-making throughout the design and development process to **prevent late-stage issues, redesigns and post-rationalisations**;

- Real-time insights can steer building management systems towards more sustainable operations to help **decarbonise the London property sector**, which currently accounts for 78% of the capital's emissions[3].

Whilst the opportunities for innovation and progress are seemingly endless, there are a number of challenges that London's real estate sector needs to address to prepare for an AI-powered future:

AI INTEGRATION

Different organisations will opt for different routes to AI integration depending on resources, finances and priorities. An alternative to risky in-house development is to customise and rebrand off-the-shelf products, which can be quick, cheap and without a need for maintenance or worrying about back-ends. Pre-trained models that are available on the market can be trained further with bespoke data which will generate a differentiated output and create an advantage in London's competitive real estate market.

EDUCATION AND RESKILLING

AI is not a shortcut and students of built environment subjects will still be required to learn the basics of their trade. It is therefore important that young professionals don't miss out on essential knowledge but that they are provided with a sound foundational understanding of their subject matter. AI generated outcomes can easily be misinterpreted as 'the right solution' and therefore the inability to make good judgements and question outputs is critical. Continuous training in the workplace will be essential to keep up with the pace of technological advancements, and to that end, several London built environment companies have set up internal AI groups that trial new products and provide in-house education.

COPYRIGHT

Copyright is a key concern amongst practitioners and extreme caution is exercised to prevent original designs and data from migrating onto the cloud where it can be used to further train AI models and become available to third parties. As a result, many companies choose AI tools and software depending on how they treat data. In-house policies and continuous audits will be crucial to govern the use of AI tools and protect intellectual property; it is good practice to clearly signpost copyright material and prevent search engines from sifting through sensitive data. UK businesses will need to stay vigilant and flexible in response to new AI case law, as it emerges.

ETHICS

Any AI system carries a risk of misinformation and bias, which often stems from training data. AI models don't necessarily rely on qualitative data but will gather all available data, and they have been known to replicate or amplify discriminatory practices that society is consciously veering away from. The choices that are made when training AI systems matter, and it is critical to ensure models are context appropriate, representative of society at large, and tailored to local norms, values and ways of working. Assigning responsibility to developers and in some cases users of AI throughout the system's life cycle is paramount. There are no simple metrics to measure ethics and fairness, and some decisions should not be left to the machine – the human perspective should prevail.

LEGISLATION

As the development of AI technology is pacing ahead, legislation is lagging behind. Regulatory frameworks for AI are being developed by countries and supra-natural bodies, including the European Union and the OECD, to ensure that AI evolves in a way that underpins democracy, equality, inclusivity and fairness. The EU is ahead of the game with the Artificial Intelligence Act which is the first of its kind to regulate how AI is used. In the UK, there is no current law governing AI, instead the technology is regulated under existing law. A Government White Paper has proposed a set of principles to guide regulators as they implement new AI rules, however, their adoption will be determined by the outcome of the next UK General Election.

This research report was commissioned and published by the City Property Association (CPA) and Westminster Property Association (WPA) NextGen committees for the London Property Alliance (LPA).

The LPA is the joint name for the CPA and WPA: two not-for-profit membership bodies representing the leading owners, investors, professional advisors and developers of real estate in the City of London and Westminster.

Our NextGen programme is an initiative designed to support and engage younger people working in the industry and is comprised of young people from the CPA and WPA membership. This initiative is supported by NextGen champions Gardiner & Theobald.

This report was written and produced by Future Places Studio.

Future Places Studio is an independent research, insight and content studio based in London, working across the built environment sector to deliver projects that prioritise inclusive growth, placemaking, sustainability and innovation.

They use a qualitative approach to research that engages with a broad range of stakeholders to learn about them and hear their perspectives.

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GT GARDINER &THEOBALD

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DEFINING AI

AI is an umbrella term that covers a range of technologies. The thermostat on your heating system is AI in its simplest form, and these basic types of AI technologies have already been infiltrating our lives for many years. What we tend to refer to when we talk about AI are advanced algorithms and machine learning technologies that can help us predict or generate content, such as large language models or image generation.

These systems might appear intelligent, but currently they are just statistics machines trained to solve specific mathematical tasks, not apply logical reasoning. The quality of the output is therefore only as good as the data and the algorithm itself.

The AI systems that exist today are not entirely autonomous and they lack a general understanding of the world, relying on human resources for its design, deployment and operations[4]. However, further in the future, we might live in a different AI reality that includes autonomous AI systems. What that future might look like is impossible to predict at this time.

Machine Learning
Based on algorithms that allow systems to make predictions based on training data. Machine learning technologies analyse data to find patterns and make predictions.

Generative AI
Like machine learning technologies, generative AI uses algorithms to make predictions based on training data, but can learns from existing data to create new data.

Deep Learning
A subset of machine learning technologies, defined by the system's ability to make decisions based on artificial neural networks, which is a computational model based on the structure and functioning of the human brain.

Artificial Generative AI
AI technologies that in theory matches or exceed human-level intelligence.

Image: Samuel Regan Asante, Unsplash

INTRODUCTION

With the emergence of open-source AI, it has become clear that we are standing on the cusp of a technological revolution akin to the dawn of the internet. Most of us have used AI in our everyday life for some time, perhaps unknowingly, but the recent surge in mainstream AI tools has unlocked our ability to reach new levels of productivity and creativity, offering a glimpse of what the future might hold for the London property sector.

Kevin Kelly, founding executive editor of Wired magazine, speaks about AI as a process of "cognification", whereby we gain artificial smartness; during the Industrial Revolution we amplified our muscle power to create bigger things, now we will "cognify"[5] and multiply our brainpower to process more data and create smarter solutions. Commissioned by the CPA and WPA NextGen committees for the London Property Alliance (the LPA), this report provides a temperature check on the London property sector as it faces a major technological breakthrough. It explores how London's real estate sector can best prepare for change and highlights the key considerations that we must address to make sure we are empowered by AI and not subjected to it.

To research this report, we have spoken to experts and practitioners in the London real estate sector – from architects and planners, to property experts and developers, digital technology consultants and policy makers – to understand how they work with AI today and what their view on the future is. A focus group conversation with the Westminster Property Association (WPA) and the City Property Association (CPA) NextGen committees, comprising of the next

generation of built environment leaders, shed light on the challenges and opportunities of working with AI, and how it might shape the future. A public survey provided additional insights into the perspectives on AI from people working in property related fields in the capital.

The AI debate is polarising and perspectives vary from optimistic to fearful. How will we live and work with AI? How will it impact the capital's property sector – will jobs be replaced, or will AI augment our capabilities, products and services? Might we create an artificial intelligence that ascends beyond our comprehension? Google's AI division DeepMinds forecasts that artificial general intelligence (AGI) – a system that in theory matches or exceeds human-level intelligence – could be less than a decade away. 59% of Brits have expressed a concern about the use of AI, the top five being: the dependence on AI and loss of human skills; autonomous systems making decisions without human intervention; job displacement and impact on employment; privacy and data security; and ethical implications and potential misuse of AI[6]. The WPA and CPA NextGen committees mirror these concerns.

Image: Unsplash

59%

of Brits have expressed a concern about the use of AI

07%

of UK jobs might be replaced in the next five years

18%

of UK jobs might be replaced in 10 years

30%

of UK jobs might be replaced in the next 20 years

Other uncertainties pertain to our roles and responsibilities as we integrate AI into the workplace. How will the multi-disciplinary teams that deliver change in the capital collaborate, and where will human creativity and artificial intelligence meet? How will we redirect our attention as automation speeds up production and takes over certain work processes? As original work migrates outside of the confines of the workplace and onto the cloud, how can we ensure that intellectual property is protected?

Profound shifts are predicted for everyone in the property sector. It is anticipated that real estate professionals will be highly affected; a recent report by Goldman Sachs estimates that 37% of architecture and engineering tasks could be automated by AI[7]. The UK Government estimates that 7% of UK jobs might be replaced in the next five years, 18% in 10 years and 30% in 20 years, which would equal 2.2 million jobs[8]. This sounds alarms bells for some, whilst others see opportunities for innovation.

London has much to gain from AI integration. With intense pressures on land in the capital, AI has the potential to facilitate workstreams and deliver new development more efficiently: an AI-enabled planning system can work faster to support London's growth; an accelerated optioneering process can reduce the uncertainty of land speculation and ensure appropriate development densities for urban sites; and real-time feedback can steer decision-making towards more sustainable outcomes to help decarbonise the London property sector, which currently accounts for 78% of the capital's emissions[9].

Historically, technological advancements have prompted us to become more productive, not less. It happened when we went from paper to digital, and into the internet era. In the context of change, it is easy to imagine the jobs that could be lost, but harder to imagine the jobs that will be created in a future that is unknown to us; all kinds of jobs exist today that didn't exist 10 years ago.

The questions surrounding AI are many, and the answers not necessarily straightforward. It's fair to say that we are in uncharted territory, and as professionals, we are best placed to assume a collective responsibility for how the property sector in London develops in the context of AI. The road ahead is likely to be turbulent and riddled with challenges but the rewards for the sector could be beyond our imagination.

In the fast-paced AI evolution, our gaze forward is somewhat blurred, and whilst we can project a few years into the future, the decade ahead is hard to predict even for experts in the field. Our outlook for this research report therefore extends a few years into the future, after which we are hard pressed to forecast how the London property sector might be impacted by AI.

"My interpretation of technological advancement is we almost never use it to do less, we always do more with it. We could have looked at the modern office in the 1970s that is about to fundamentally change with the invention of personal computing and say, we should go down to a three or four day week. But we didn't do that, we just did more. And with the internet, we did more. I don't think AI will be any different."

— Keir Regan-Alexander, Principal at Arka Works

SECTION 01: AI & THE BUILT ENVIRONMENT PROFESSIONAL

The London real estate sector covers a range of professions that collectively produce the buildings and neighbourhoods that make up our cities. AI will undoubtedly change how we all work, with different types of AI tools and systems affecting the sector differently. In this chapter, we will delve into how AI is and might affect the many stages of development:

THE DESIGN PROCESS
From early ideation and concept design to detailed design stages undertaken by the architect, urban designer and masterplanner in collaboration with developers, planners and specialist consultants.

SITE ASSESSMENT
Covering site acquisition, optioneering and capacity testing driven by the developer or planner.

PLANNING SYSTEM
Relating to the planning application process and land assessment performed by local authority planning departments.

ONSITE
Focusing on demolition, retrofit and construction stages of buildings, including site management and management of supply chains.
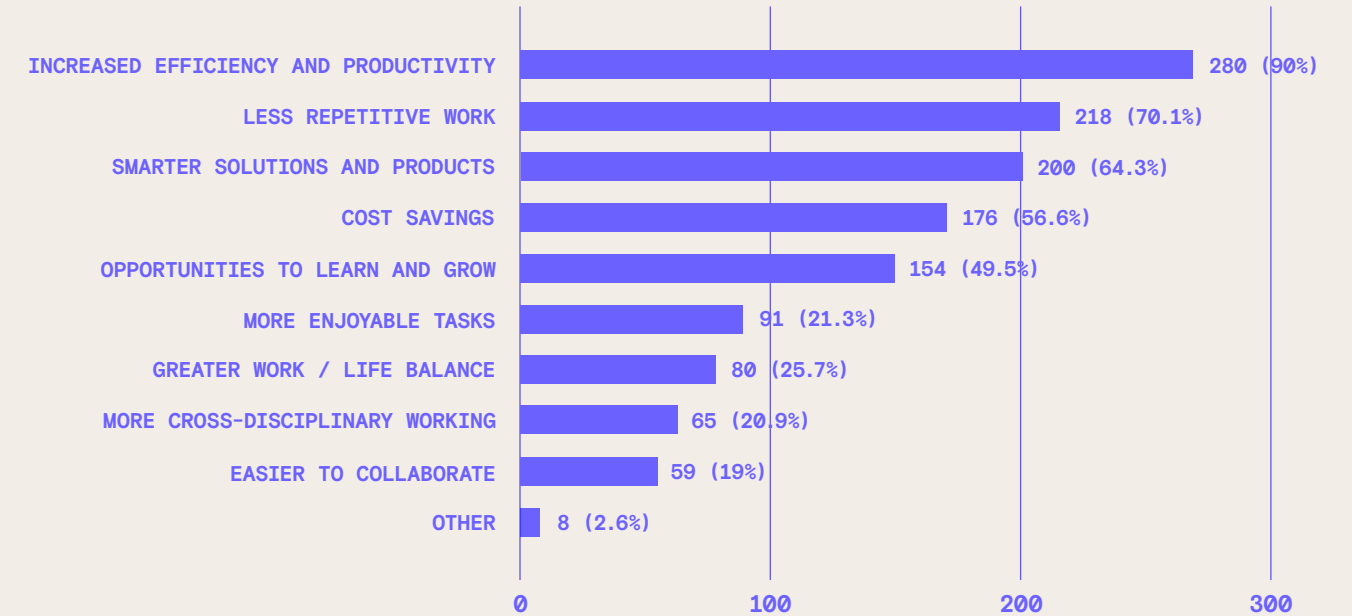
SMART MANAGEMENT
Involves building management systems such as cooling, heating and ventilation, smart tech used to optimise city functions, and digital twin technology – virtual models used to operate buildings and predict future needs.

The general consensus from the participants of this research project is that AI will function as a digital assistant that works alongside the professional to produce better outcomes faster and with more analysis. As such, it is expected to open up rather than close down opportunities. 90% of our survey respondents expect AI to lead to increased efficiency and productivity in their work whilst nearly 70% have already had some involvement with AI in their work.

WHAT DO YOU THINK THE OPPORTUNITIES OF AI ARE WITHIN YOUR SECTOR?

INCREASED EFFICIENCY AND PRODUCTIVITY	280 (90%)
LESS REPETITIVE WORK	218 (70.1%)
SMARTER SOLUTIONS AND PRODUCTS	200 (64.3%)
COST SAVINGS	176 (56.6%)
OPPORTUNITIES TO LEARN AND GROW	154 (49.5%)
MORE ENJOYABLE TASKS	91 (21.3%)
GREATER WORK / LIFE BALANCE	80 (25.7%)
MORE CROSS-DISCIPLINARY WORKING	65 (20.9%)
EASIER TO COLLABORATE	59 (19%)
OTHER	8 (2.6%)

HOW OFTEN DO YOU COME ACROSS AI IN YOUR WORK?
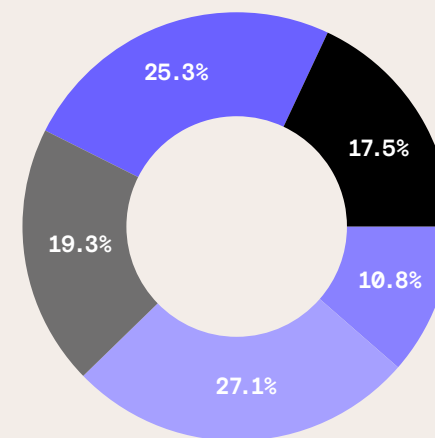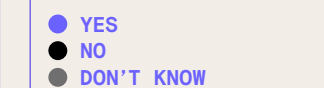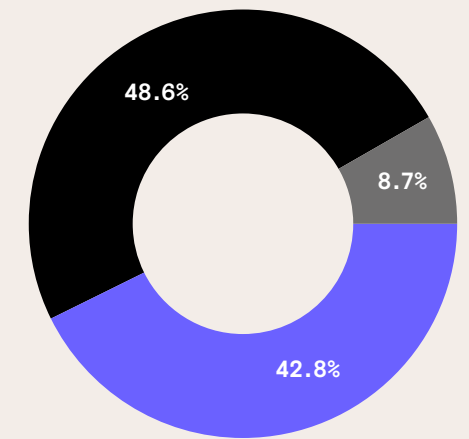
25.3%
17.5%
19.3%
10.8%
27.1%

- DAILY
- WEEKLY
- MONTHLY
- A FEW TIMES PER YEAR
- DON'T KNOW

ARE YOU WORRIED ABOUT HOW AI MIGHT CHANGE YOUR PROFESSION?

48.6%
8.7%
42.8%

- YES
- NO
- DON'T KNOW

IF YOU ARE WORRIED ABOUT HOW AI MIGHT CHANGE YOUR PROFESSION, WHAT ARE YOUR CONCERNS?

Category	Value
INCREASED RELIANCE ON TECHNOLOGY & AUTOMATION	115 (64.6%)
A LACK OF ACCOUNTABILITY ON DECISION MAKING	94 (52.8%)
ETHICAL CONCERNS	91 (51.1%)
COPYRIGHT AND LEGAL ISSUES	84 (47.2%)
LOSS OF JOBS/ JOB INSECURITY	82 (46.1%)
NEEDING TO RE-TRAIN OR RE-SKILL	80 (44.9%)
CHANGE TO JOB TASKS & ROUTINES	58 (32.6%)
RISK OF LEAVING SOME BUSINESSES BEHIND	39 (21.9%)
DISRUPTION TO MY WORK ENVIRONMENT	24 (13.5%)
CHANGES TO YOUR SALARY	22 (12.4%)
OTHER	12 (6.7%)
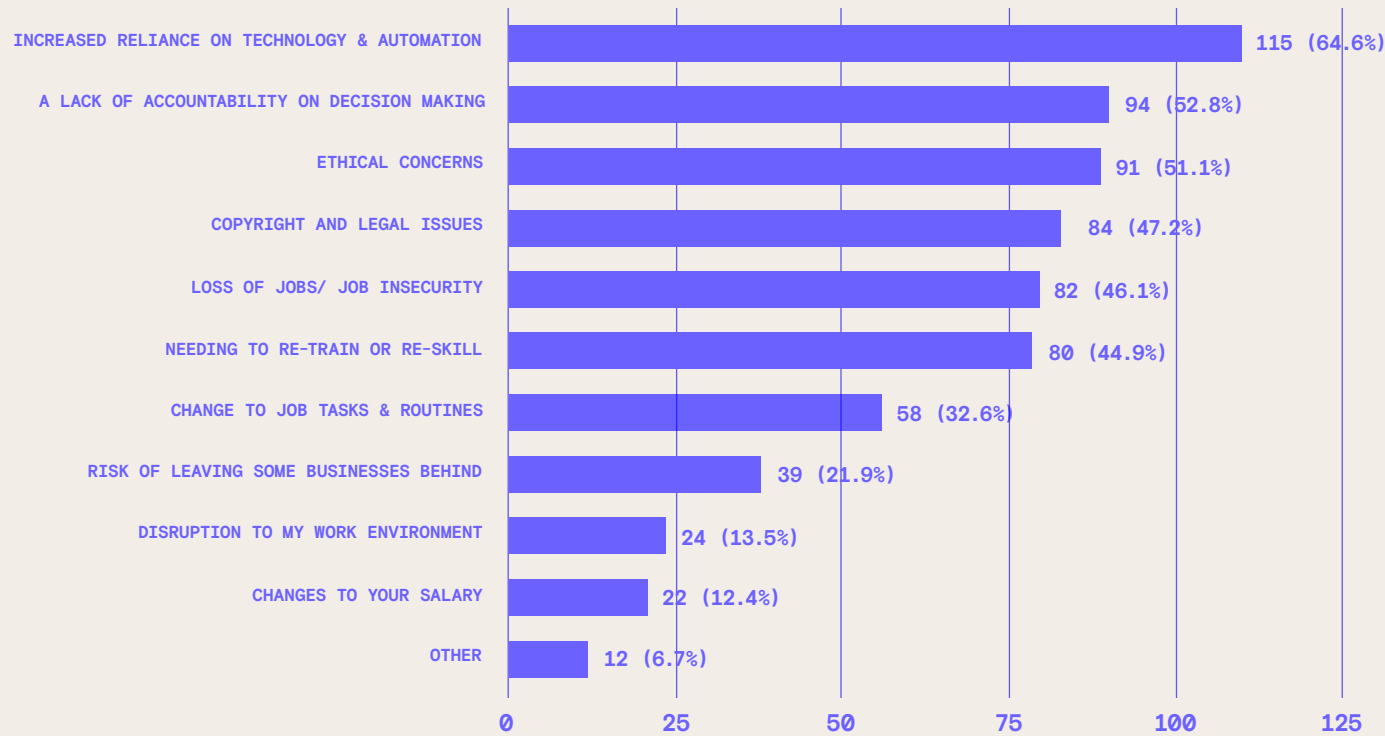
Architects report that it is getting harder to perform all these additional job functions and be very good at it, which could signify a turning point for how architects work – 43% of survey respondents are worried that AI will change their profession. However, automation allows companies to reapply staff to make better use of their skills and intelligence, redirecting their time towards higher value activities instead of performing the repetitive and tedious work that lends itself to automation.

> "We are yet to see if AI will lead to the job losses people fear, but certainly it will cause widespread changes in scope of roles. If you're in the middle of the market and the projects you work on are very prototypical and standardised, I think that business model is pretty vulnerable if you don't move with the times."
>
> – Keir Regan-Alexander, Principal at Arka Works

Drew Waller, Data Science Lead at AECOM, highlights that "there is a large risk of organisations just seeing efficiencies coming from AI. Those organisations will quickly lose out to those that will keep the people with all their understanding and expertise and apply them to tasks that add significantly more value." This analysis is similar to feedback received in our survey, with 65% of respondents who are worried about AI sighting a fear that companies will become over-reliant on technology and automation.

Generative AI and machine learning will make certain processes quicker and more efficient, such as creating a myriad of development options for a site. The way this technology works today, it relies on being fed a specific task that is set by a professional, and the output will require the skill and human discernment of a trained professional for quality assurance and to leverage the output.

Skilled professionals will also be needed to train and operate AI systems, requiring both technical skills and specialist expertise. If we don't fully understand our models and what they are capable of, we risk generating unreliable outcomes. Equally, we cannot assume that the AI generated outputs are true and correct – thorough checks by a subject matter expert will be required to confirm that the outputs are consistent and in line with our understanding.

The prevailing perspective is that with AI on the shoulder, functioning as a digital assistant, we will be able to make more informed and rational decisions earlier on in the process. Critical to the success of any process that involves AI will be the quality of the original idea, good judgment, efficient collaboration, and the creation of new London developments that care for the end user. This should be the focus of the built environment professional in the capital, and clients will likely choose to work with skilled teams using AI over teams that just use AI.

> "AI is an enabler, a tool, but at the end of the day, the human has the final say."
>
> – Tom Heath, Global Director of Data Science and AI at Arup

THE DESIGN PROCESS

The design process starts with the initial idea or concept, and evolves through the design stages towards producing tender drawings that are used onsite for construction. This work takes place primarily in the architectural practice, and in close collaboration with the developer client, the planning authority and specialist consultants, including structural engineers, mechanical & electric engineers, fire engineers, sustainability and environmental consultants, ecologists, acoustic consultant, cost consultants and many others.

Our research shows that this group of London's built environment professionals have started using AI, but that it is primarily limited to large language models, image generation, benchmarking and analytical tools. Some more advanced users are developing machine learning algorithms and customising off-the-shelf products. As new AI tools are being evolved by different software developers, such as Forma by Autodesk, they will become more prevalent in the design process.

> "We want to use AI technologies to enhance our workflows and to allow our designers to focus on their ability to design, not on repetitive tasks. Nobody went through university and joined an architectural practice to colour in plans. They joined to do design work and these technologies can help us get into a position where these designers can focus on that aspect of their career and begin to enjoy the design process more."
>
> – Lee Bennett, Partner at Sheppard Robson

For the designer, AI tools have the ability to conjure up new solutions and more options, quickly. It could take an architect weeks to generate a handful of different design options for a complex urban site, whilst AI can produce hundreds of options in minutes. With the prospects of endless variations and outputs, it will become increasingly important for the architect to set clear objectives and design parameters to guide the AI systems towards an appropriate outcome that is aware of site specifics and context, socioeconomics, heritage and local culture.

Image: Scott Brownrigg model visualisation created in Autodesk Revit and rendered in Enscape. The image is enhanced using Magnific AI to add definition and context detail.

> **"I think that because of the complex math that's behind the way that machines work and the output that we can get from them, we can probably design and build far more complicated and interesting structures with AI than we would be able to otherwise. I think that is very positive."**
>
> **— Jonathan Holt, Founder of Holt Architects**

Ana Matic, Director of Digital Development at Scott Brownrigg, says that: "when working with AI, Architects still need to use their professional skills, design knowledge and responsibility to train AI systems to help them come up with the original ideas. I call this 'AI book-ending' – create an idea, then let the AI work (whether it's generating stories, forms or beautiful images) and then apply yourself at the end".

The general consensus of the NextGen focus group that was held as part of this research was that the architecture profession will inevitably change over the coming years. A more niche idea was that production will transfer to those who develop the software, and that workflows that used to take months will be completed in a day. The more prevalent thought was that whilst this might be where we end up in a more distant future, the work of architects will be far more complex with AI. Whilst AI can optimise processes and outcomes, there is no such thing as an optimum design – the best design will depend on what the developer, planners and community agree on jointly.

Martha Tsigkari, Senior Partner, Head of Applied R+D at Foster + Partners, says that "we're trying to shape whatever input machine learning may have in our processes to fit our design aspirations. We need to integrate these applications in the way that we work and feel that they're empowering the designers rather than replacing them. We hope that people start using the tools exactly as they're supposed to be used, as design assist models, that become a helper and an augmenter during the creative process. It is creative augmentation rather than creative replacement."

Architects are already generalists, but with AI it will become possible to gain better insights into the key aspects of a development that would normally be calculated by a specialist consultant, such as daylight/sunlight, wind, carbon, noise and cost. AI generated insights should not be interpreted as final and they need to be verified by an expert, but they will enable the designer to make rational decisions and analyse solutions within an acceptable margin of error as the scheme evolves. This can prevent issues from emerging late in the design process, which is a common issue that often leads to post-rationalisation or redesign.

Clients will benefit from these types of real-time assessments as they can assess and evaluate many more live development options and create business plans earlier on. Keir Regan-Alexander, Principal at Arka Works thinks that as a result, clients might keep their design briefs open and flexible for longer, fixing the final design later than we are accustomed to.

More analytical ways of working come with new responsibilities and an increased risk for the designer. The AI system is ultimately not responsible for any failings, the professional is, and it is unlikely that we will ever arrive at a place where everything is automated and the designer doesn't have to verify results and apply themselves.

Architects report that it is getting harder to do all of that work and be very good at it, which could signify a turning point for how architects work. Traditionally a multi-tasker, the architect will likely need to become more specialised – some will become digital architects, others technical architects – to keep up with expectations and the rapid technological progress.

One concern relates to innovation in the property sector. Megan Greig, Associate at Elliott Wood says that "we are in a climate emergency and the way that we design and build isn't good enough, particularly from a carbon and biodiversity standpoint. If we're designing new buildings based on previous data, how can we move the industry forward?"

Certain AI tools will make the design process easier. Sketch-to-render tools transform simple hand sketches into photorealistic 3D renders, allowing the architect to quickly convey a design idea. Previously, architects have translated images in their head into a form that a computer can absorb, but with sketch-to-render there is a more direct translation between idea and image. Martha Tsigkari, Foster + Partners, says that in a few years' time, we will have applications that can create entire building designs in 3D.
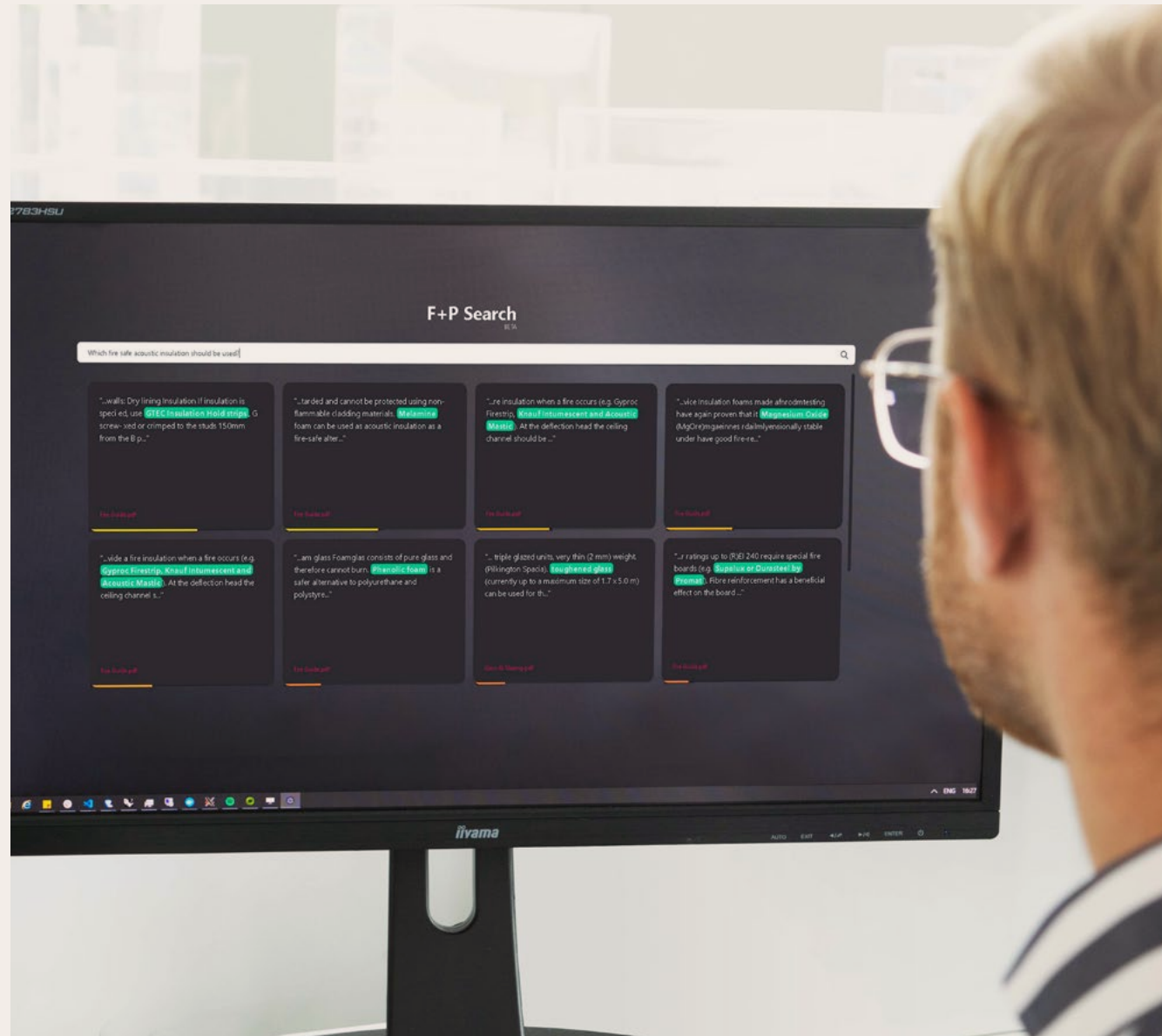

Image: Foster + Partners Semantic Question Answering system, allowing designers easy access to information in up-to-date design.

AI image generation is widely used in the London design industry, however, its tendency towards a particular aesthetic comes with concerns around superficiality and lack of realism. The designers that we spoke to as part of this research use image generation tools mainly to produce inspirational reference images during early ideation and they are embraced with caution as they sample pre-existing work, and the originality of the outcome is debatable.

Sherif Tarabishy, Associate Partner, Design Systems Analyst at Foster + Partners, says that "there are a lot of inefficiencies that are not related to design and I think that the most useful applications or tools will be those that focus on those inefficiencies, not the ones that are focusing on image making".

Some larger London design practices with in-house R&D departments are training their own bespoke AI systems. For smaller practices with limited resources, more off-the-shelf products that can be customised will become available in the next couple of years. Both futures will likely run in parallel, with the chosen trajectory dictated by funds, resources and investment priorities.

70% of respondents to our survey look forward to AI reducing the amount of repetitive work undertaken in the built environment sector. For architects there seems to be a growing consensus that AI may liberate the architect to be creative problem solvers and idea generators as the burden of more mundane work is passed over to technology.

"I think people are mesmerised by the ability of AI to solve things, generate amazing visuals from prompts and produce 150 options instead of three. That will not go away, but the novelty will wear off and the ability will get integrated into our tools. But the actual problem solving that humans do, I don't think AI will ever take over that. AI will not replace architect roles, the architects will have to evolve to embrace AI and use it – just like with any other tool."

– Ana Matic, Director of Digital Development at Scott Brownrigg

SITE ASSESSMENT

Site assessments are undertaken by developers to understand a site's capacity for development. It could be part of the land acquisition process to determine the value of land or the initial feasibility process to establish the brief to the architect/urban designer.

Site assessments are also essential for the planning authority to estimate development capacity in their borough or district, which underpins local planning policy and land allocation strategies.

Euan Mills, Co-Founder of Blocktype, estimates that there are approximately 50,000 property developers in the UK, each producing on average 20 site appraisals every week. By automating this time consuming and tedious process, the developer can perform high-level feasibility studies in-house, quicker and cheaper, without appointing a design team.

Mills developed Blocktype, an AI powered masterplanning tool, to reduce the uncertainty of land speculation and prevent overdevelopment stemming from inflated land costs based on unrealistic site appraisals. This is particularly relevant to sites in the capital, where land prices are soaring. The goal is to achieve more appropriate development densities and designs for sites across London and the UK.

Blocktype allows the user to quickly assess site capacity before a design is commissioned and development takes place by generating compliant development options quickly, drawing on embedded planning data and site constraints. The user plugs in basic development criteria in a user-friendly interface, such as typologies, building height, number of units and unit mix, whereby a floorplan is generated that complies with local planning policy. The internal layout adjusts to changes in the building footprint and the software generates live information about number of homes, density, gross development value, overall mix, gross internal area, build cost, parking requirements, population and child yield, sale price and Community Infrastructure Levy (CIL). Whilst Blocktype focuses on housing, commercial, industrial and other mixed-use development are being added to the pattern book.
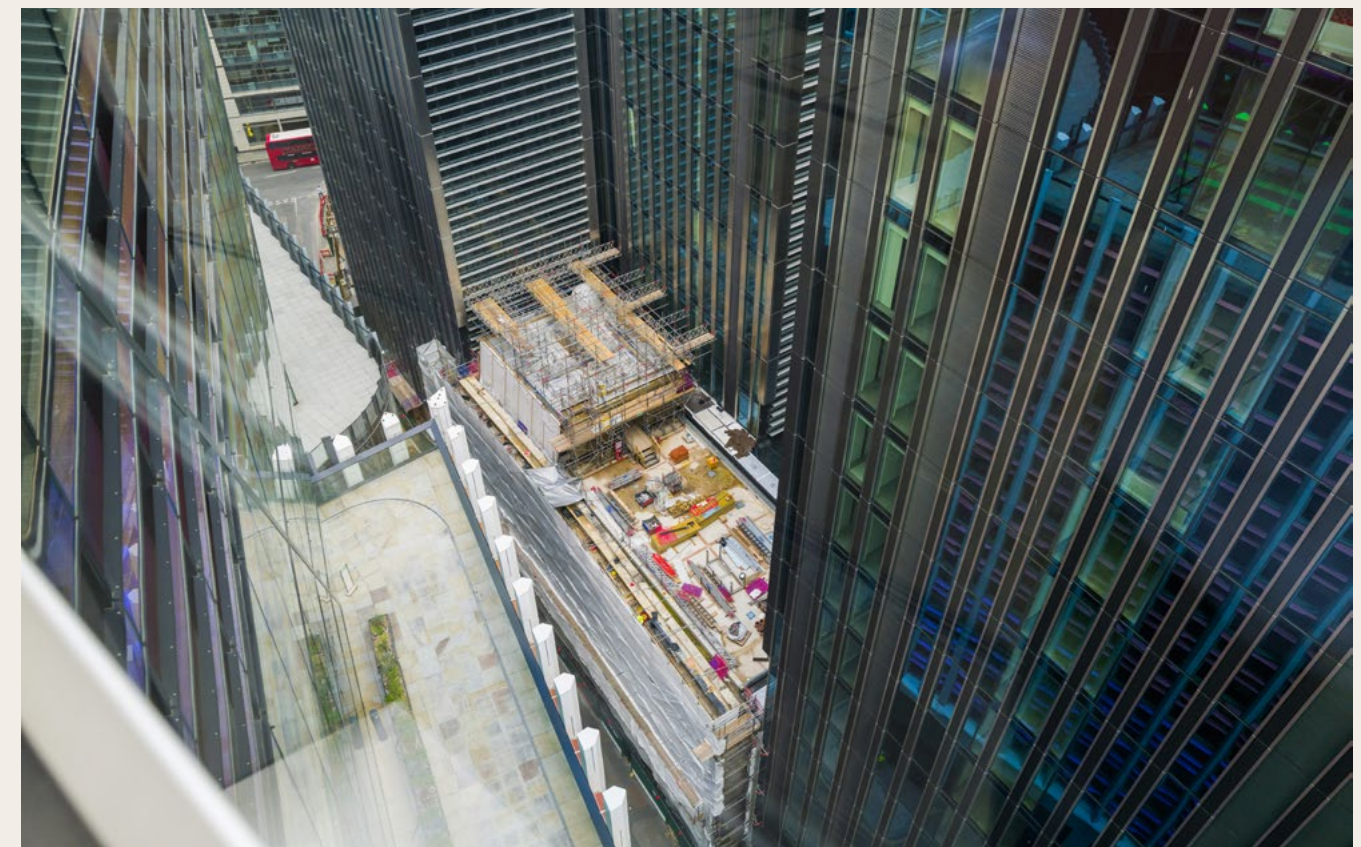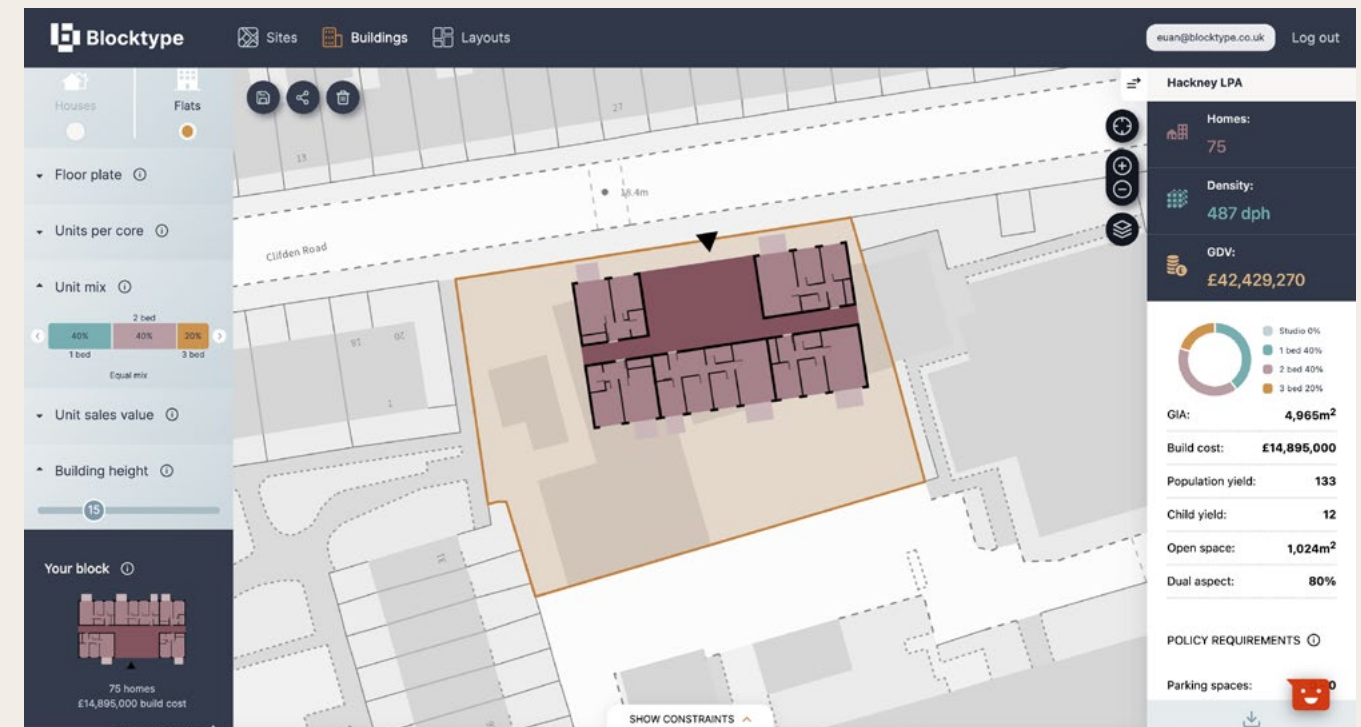

Image opposite top: Blocktype
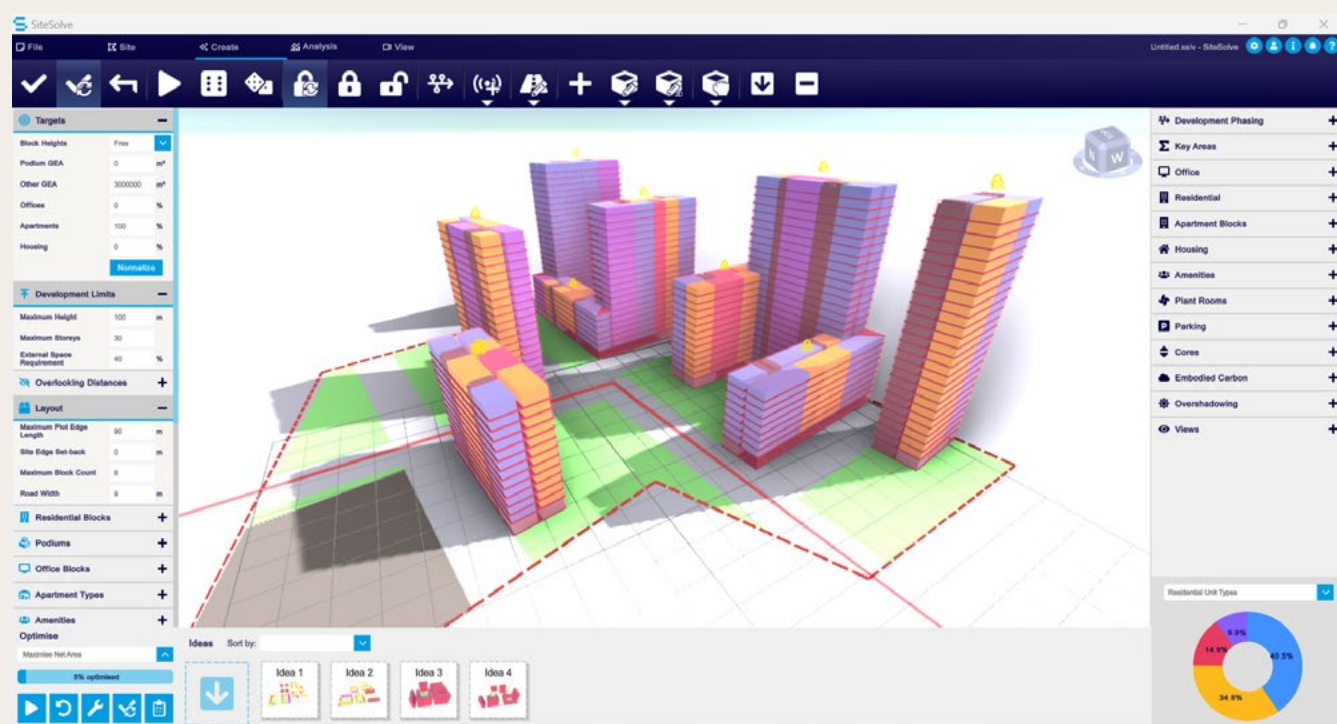Image opposite bottom: Georg Eiermann, Unsplash

SiteSolve by VuCity functions in a similar way. Opting for a 3D interface that works with building volumes instead of floorplans, the software quickly generates a myriad of options based on key development criteria, such as typologies and uses, and a user defined building envelope. Calculations that the designer and consultants would usually perform manually, including accommodation schedules and embodied carbon, are done in real time[10].

Both tools can explore endless policy compliant configurations in London's complex urban environments that are subject to various local, regional and national planning policies whilst providing instant technical feedback to allow the user to respond to any issues more effectively. The output is a simplistic development envelope that can be handed over to an architect/urban designer to be designed up in greater detail. Questions may arise over the generic output of AI powered site assessment tools, and this highlights the importance of qualitative considerations, such as environmental context, local communities and what constitutes a good neighbourhood – perspectives that AI tools are not yet equipped to factor in but that are essential to sustainable and inclusive growth in the capital.

For London's Local Planning Authorities, AI masterplanning tools can predict housing capacity in their borough or district to facilitate land allocations proceedings and build a preparedness for growth. Today, the assumptions underpinning Strategic Housing Land Allocation Assessments (SHLAAs) are calculated manually, often based on quick feasibility studies, and they come with a high margin of error. This has repercussions for housing delivery, transport planning and social infrastructure across Greater London.

> **"A large number of emerging AI tools are primarily focused on the early design stages, such as feasibilities and optimisation, which is quantitative. The ability to generate lots of iterations and filter out what will and won't work, that process needs to be governed by someone experienced who can make a qualitative judgement."**
>
> **– Thomas Bartram, Project Director at Darling Associates Architects**

THE PLANNING SYSTEM

The UK planning system is overseen and managed by 337 different local planning authorities that process more than 3.5 million planning applications every year[11], from small scale housing extensions and façade upgrades to large scale masterplans.

Greater London's 35 planning authorities received 16,000 planning applications in the first quarter of 2023 alone[12]. Planning officers handle applications manually, which is hugely time consuming and puts a serious strain on planning departments. As a result, the planning system is slow and a major blocker of new development.

Peter Kemp, Head of Change and Delivery at the Greater London Authority, says that the planning system hasn't yet come to terms with the concept of data and digitalisation, let alone the opportunity of AI: "As an industry, we are so bad at data and so far behind other industries in the UK, so under-invested in and so under-resourced that we have the opportunity to ask what we want AI to do for us, and focus our energy to get data to support those use cases. Planning is the start of the golden thread of data, so we need to start thinking carefully about it. The risks to us are quite small, but the opportunities are quite big."

Today, the cost of the drawn-out planning approval process is prohibitive to many landowners and developers who cannot afford to hold on to costly inner-city land for long periods of time as they await a decision from authorities. If AI could automate part of the planning system and speed up the application approval process, the market could be opened up to a diversified group that can contribute towards delivering much needed homes, workspaces and infrastructure across the capital.

Planning applications are currently submitted as PDF documents and then sifted through by planners to find valuable data. Could applications instead be submitted in a different format, allowing councils to understand critical information about, and impact of, developments? This would open up the opportunity to have critical conversations with development teams sooner, and reduce the amount of time taken to manually find critical information.

Image: Scott Blake, Unsplash

Keir Regan-Alexander, Arka Works, is convinced that AI tools could empower local authorities by aiding the critical analysis of proposals and impacts of development without the need for much in-house specialist expertise: "A local authority might hire one architect and one engineer and with access to the right tools they could interrogate information more accurately and effectively, such as whole life carbon assessments which are otherwise technically difficult and time-consuming to digest."

Peter Kemp, Greater London Authority, emphasises that AI systems rely on access to centralised and open data, which currently exists as dispersed datasets: "We're some way away from relevant data accumulating nationally, let alone into a central model which will make these types of tools more beneficial to us. There needs to be a conversation about collective ownership and curation of data, and how we can create a system that allows everyone to benefit from it as a shared resource. The validation elements of AI, we're technically not there yet (albeit there are some great examples of early tools doing some of this work, they are still in their early stages), but it has potential in terms of checking site history and constraints and identifying obvious non-compliances. We likely need to change how we receive planning applications to make it happen, and that's a big system change that will need a shared commitment to data in the built environment."

Euan Mills, Blocktype, believes that a deluge of data will happen, it is just a question of how: "The question is whether the private sector will drive it and then charge everyone to access the data, or whether the public sector will do it and make it open to everyone."

For London's local authorities, AI integration will hinge on access to resources and funding. The central Government will have an important role to play to ensure that planning authorities are keeping pace with AI development to prevent a two-tiered system from emerging between authorities, where some can and some can't, or the public sector falling behind the private market. The planning community also needs to learn from and support each other on this journey.

The City of London Corporation has received funding from the Digital Planning Government Improvement Fund to improve digital capabilities, and considering how, if, and when AI has a role to play allows for

interesting blue sky thinking. The funding will support the development of a public facing 3D web app, a visualisation tool that will explain some of the more complex policies and make them more accessible to a wider audience. Visualisation tools can help improve communications with stakeholders and the public during consultations; AI could in theory also be used to analyse feedback and highlight key comments that require responses, which could save valuable time. The hope is that data hosted by the web app can integrate with native software packages, such as GIS and CAD systems, and make more data open access for built environment professionals. The project is currently in the early stages of development, and focus group sessions are planned to learn from different user groups how they would prefer to interact with the app.

AI has the capability to transform complex technical documents into plain, easy to understand and jargon free language, which would open the door to supporting broader understanding of policy, and facilitate greater engagement.

"AI reduces the need for experience with local planning policy because we can scrape all relevant data from the planning portal and the local authority website, and then ask questions to a bot that will give us the answers we need. We then just need to verify the results ourselves."
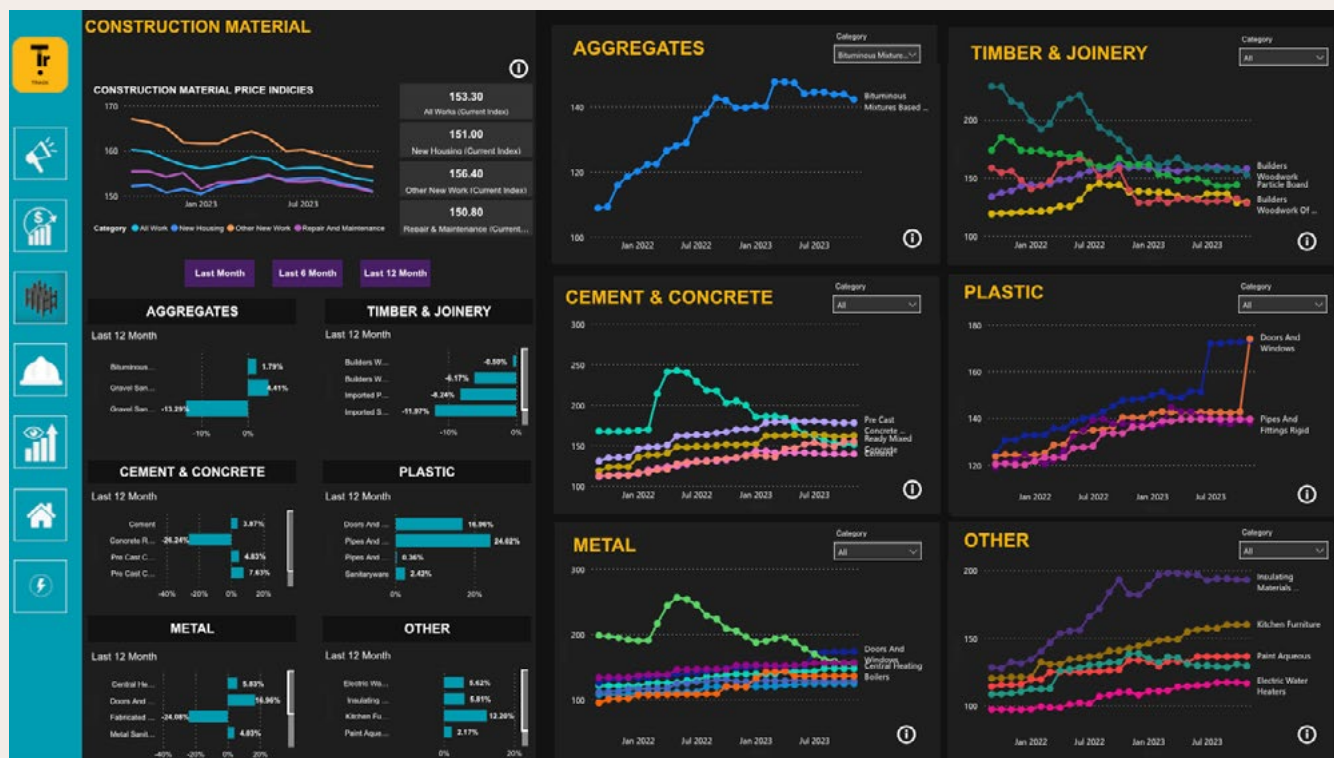
-Jonathan Holt, Founder of Holt Architecture

Image: This is Engineering, Pexels

Image top: Clem Onojeghuo, Unsplash
Image above: Track software interface, Gleeds

ONSITE

From demolition of existing buildings to the construction of new, contractors working onsite already use a range of AI applications that assist with day-to-day tasks such as 3D scans of buildings and construction sites, ensuring compliance, streamlining project and budget management, and automating construction work[13].

AI tools are used to automate data capture onsite; workers can simply upload a photo of goods received notes and waste transfer notes to track products and materials that are delivered to and from site, which eliminates time spent on paperwork. The data can be updated in real-time and made available to construction teams to inform cost-control, supply chain management and sustainability matrices, simplifying the management of sites and providing an overview of environmental impacts[14].

New research has revealed that industry-wide adoption of key AI tools could assist with cutting real estate greenhouse gas emissions by up to 6.46 gigatonnes by 2030[15]. The analysis covered the entire value chain with key areas being: reducing the amount of raw material required through generative design and 3D AI analytics; preventing construction rework; reducing waste with AI-assisted waste material analysis; and reduced energy consumption through smart building technology.

Gleeds has developed an AI-powered Track tool that tracks material prices and labour prices in real-time, feeding into cost plans and feasibility studies, and enabling data-driven decision-making. Onsite, the Visualise tool allows surveyors to walk around the construction site with a camera on their hard hat to monitor progress and scan buildings using a digital twin technology, creating a live virtual replica of the physical environment.

AI-powered computer vision can also help create a safer job site by analysing accidents, flagging safety hazards and identifying non-compliance practices. The tool can identify discrepancies between the architects' plans and job sites to aid project management. Internet of Things (IoT) devices can log incidents and machine learning tools can help identify risks and anticipate problems before they happen[16].

The challenge for the construction industry in the capital is that skills development is grounded in traditional know-how, and changes to working practices could disrupt established methods of training and transmitting craftsmanship. To add to the challenge, construction sites are complex environments and there are significant differences between sites and projects which remains a barrier to the adoption of AI in construction[17].

THE INTERNET OF THINGS

The Internet of Things (IoT) is a network of devices with embedded sensors, processors and communication hardware to collect, send and respond to data in their environment. The IoT devices connect and exchange data over the internet or other communications networks to enable seamless communication between people and things. IoT devices can include everyday objects, such as kitchen appliances, cars and thermostats, as well as more sophisticated tools, to facilitate our day-to-day and improve our lives. For example, when arriving home, your thermostat can adjust to a pre-set temperature. IoT is also essential to provide businesses and organisations with real-time data on their systems and performance, allowing machines to undertake tasks without human intervention.

SMART MANAGEMENT

AI can be used to manage our environment from the scale of the city to the individual building, optimising operations to improve performance and enhance the experience for users. AI technology could also prove instrumental in our quest to decarbonise the city centre.

Landsec is trialling an AI-operated building management system in their London Victoria headquarters, aimed at optimising cooling, heating and ventilation to reduce energy demands and costs whilst regulating the internal conditions of the building.

Landsec are hoping that the AI solution, provided by Canadian company BrainboxAI, can be instrumental to achieving their goals. By continuously learning the operating patterns of the building and analysing external factors, the system autonomously implements every potential to save energy whilst maintaining optimal comfort conditions through cloud-based algorithms. The trial has shown encouraging initial results, and the ambition is to implement AI-operated building management systems across the company's commercial portfolio. Data analysis and management that would normally be done manually is now powered by AI, lowering energy use as much as 20%, with significant cost savings.

Andy Mazzucchelli, Senior Energy Manager at Landsec, says that "the beauty of the system is that it is quickly learning and adapting to changes in weather conditions and use patterns to ensure that the operating systems are functioning in the most efficient way, and that they are not competing with each other, for example heating and cooling running simultaneously, which is terribly inefficient. The fundamental goal is to cut down carbon emissions."

Scott Brownrigg is using digital twin technology to understand how their Client's projects and estates are working and to view and control their performance and energy usage. Digital twins use IoT and can employ AI to accelerate data processing to gain real-time insights into energy consumption, occupancy, temperature, light levels, and air quality of buildings[18]. This enables building managers to reduce carbon emissions to improve environmental performance.

Image: Landsec headquarters in London Victoria.

Ana Matic, Scott Brownrigg, says that the technology that allows buildings to be fully operated by a digital twin is still in development but she estimates that in the next two to three years, it will become customary to hand over a building with a digital twin. The AI component of the digital twin can use algorithms and machine learning to automate data collection and processing to ensure that the virtual model is accurate and reflects the current state of the building. Ana explains that this technology is already well embedded in the London transport sector: "You can look up bus times on an app and see that your bus is 10 minutes away. Similarly, our understanding of design and cities will soon be half in our brain and half in reality."

Transport for London (TfL) is using digital twin technology with AI to collect data on its network, such as noise, heat and carbon emissions. This data used to be collected manually during the nighttime when the system was out of use, but with the digital twin, data can be collected in real-time to detect faults, overheating and noise hotspots.

Cities are becoming smarter with AI technology. Because most cities currently lack access to real-time information, much of their infrastructure is underused, overused, or used inefficiently. AI-powered systems can process vast amounts of real-time data gathered from sensors in the urban environment, and learn from citizen interactions to improve planning and management, as well as predicting future needs. For example, in a city like London, AI-operated traffic signalling and sensor systems can be used to alleviate traffic congestion, crime can be monitored to enhance public safety, and carbon emissions can be tracked to promote sustainable solutions.

Image: The London Underground. Edward Howell, Unsplash

SECTION 02: KEY CONSIDERATIONS FOR AN AI-POWERED FUTURE

Whilst mainstream AI has infiltrated much of society, AI-powered design and delivery tools are still in their infancy, and professionals are just starting to grapple with how the technology can best serve the London real estate sector. In this chapter, we delve into the challenges around AI copyright, data, education, ethics, integration and legislation to understand how we can prepare for change.

AI INTEGRATION

The adoption of AI can be through off-the-shelf products, with option for customisation, or development of bespoke systems. Resources, funds and priorities will dictate what route companies choose to embark upon.

Large organisations with in-house research and development departments will have the capacity to build their own systems while this will likely be too onerous and time-consuming for small to medium organisations. The middle way is to opt for off-the-shelf products that can be customised and rebranded to suit business needs, which will be

quick, cheap and without the need for maintenance or worrying about back-ends.

Martha Tsigkari, Foster + Partners, explains that they are using pre-trained models that are available on the market, and training them further with their own data. Many of the general AI tools available on the market, such as the GPT models from OpenAI, allow companies to deploy their own instance of those models and fine-tune them with training on their own data. The benefit of this approach is that any engine working off a company's unique template or library can generate a differentiated output, which is an advantage in the competitive London real estate market.

"We have developed a lot of applications, but that doesn't mean that everybody is embracing them in the office. There is a level of mistrust against AI, and I would say rightly so. That's why a lot of the work that we do is to build trust."

– Martha Tsigkari, Head of Applied R+D at Foster + Partners

The reality is that most built environment consultants don't want to be software developers because that's not their expertise. James Garner, Global Head of Data, Insights & Analytics at Gleeds, points out that consultancy embraces a very different commercial approach than software development which works on a high risk/high reward model where a lot of it fails but the returns are often great if successful and that doesn't appeal to the built environment sector who tend to have lower but steadier returns. He says that "In an ideal world, AI tools would be democratised and the industry would own it. If we were really clever as an industry, we could come together and jointly develop a built environment suite of tools that we can all use, rather than everyone creating their own."

There is a lot of risk involved in AI research and development, and companies need to be careful about how they spend their money and time. The tech giants are so far ahead and the progress is so fast paced that individual companies developing their own systems will struggle to keep up. Large sums could be spent on designing bespoke algorithms and systems that can quickly become redundant with the release of new OpenAI or Google tools.

Tom Heath, Global Director of Data Science and AI at Arup, explains that AI integration in the property sector is some way behind other sectors such as life sciences and retail, because the cycles are so long – a regeneration scheme in London can take decades, so there is limited opportunity to iterate and learn. In comparison, for digital products and services, the barriers to entry are low and the timescales fast.

Hattie Walker-Arnott, Founder of AI-RE, says that "in the past year I was training ChatGPT 3.5 on my own information with very basic Python [programming language]. Then custom GPTs came out, and all the time I had spent was wasted. It is so much easier now for people to make basic edits to AI programmes and shape them to suit their own needs. Software companies can and should make their products more editable, or I think they will lose customers."

In the AI race, the tech giants will likely absorb many of the successful startups and incorporate their models, which is a common trend in the tech world. That will create a monopoly but it will also democratise products and make them more widely available. Hattie Walker-Arnott, founder of AI-RE highlights that "Autodesk App Store [a marketplace for third party plugins] is indicative of the fear that the big tech firms can't keep up with production of specialised products. It is smart to bring them all together as add-ons instead of trying to develop it all in-house."

Keir Regan-Alexander, Arka Works, explains that in the last year, research and development expenditure has become increasingly outsourced to startups that are developing tools that can be accessed and used by small businesses. "There is an interesting levelling happening where powerful open-source or low costs tools are coming forward that would have been the preserve of big practices with larger R&D budgets before now, but can be accessed by small practices. This allows small practices to operate more like big practices and have a bit more leverage, which is an exciting prospect."

"In an ideal world, AI tools would be democratised and the industry would own it. If we were really clever as an industry, we could come together and jointly develop a built environment suite of tools that we can all use, rather than everyone creating their own."

– James Garner, Global Head of Data, Insights & Analytics at Gleeds

Image: Created by Sheppard Robson using word-to-image testing in Midjourney to stimulate design dialogue.

EDUCATION & RESKILLING

AI is quickly evolving and it is anticipated that with time it will permeate all levels of organisations, not just affecting junior positions. A UK Government report highlights that the professional group most exposed to AI is early-career employees with high levels of qualification[19]. However, recent technological advancements in the property sector have taught us that graduates are often more tech savvy than experienced professionals and they will likely spearhead the AI revolution.

Thomas Bartram, Project Director at Darling Associates Architects, emphasises the opportunity to benefit from the skills of the diverse, young and tech savvy talent pool in central London's built environment industry: "A lot of the graduates will have more experience than people who've been working in architecture for a number of years and we need to be ready to foster them and make sure that we're utilising all of that new knowledge that's coming in."

AI experts emphasise that AI is not a shortcut and students of built environment subjects will still be required to learn the basics of the profession; the need for professional control and scrutiny around AI systems will require skills, critical thinking and good judgement. It is therefore important that young professionals don't miss out on essential knowledge but that they are provided with a sound foundational understanding of the subject matter.

AI tools should be used to enhance the professional knowledge and design intuition when working with the technology. AI generated outcomes can easily be misinterpreted as 'the right solution' and therefore the ability to make good judgements and question outputs is critical.

Martha Tsigkari, Foster + Partners, says that "a lot of the people that are delivering courses on AI are trying to turn people from designers and architects to prompt engineers. I teach my students that you're only as good a professional as the domain knowledge that you have. AI systems are trained with a particular domain knowledge, but they still need a human in the loop that can interact with the tool and evaluate the output. What will become important is how we develop design intuition when using these tools."

In the workplace, new AI tools are continuously emerging and evolving. To stay ahead, organisations will need to provide ongoing training for staff, and the Government should be proactive in facilitating training and upskilling. Gleeds has launched an Upskill data literacy programme, providing internal training and working in partnership with Projecting Success and Multiverse to offer courses to the market. The courses are delivered by a built environment professional rather than a data provider to tailor the curriculum to the participants' needs and to promote skills that are specific to the sector.

93% of survey respondents want to learn more about AI technology. Several of the focus group participants work for organisations that have set up internal AI groups that trial new products and provide education for teams.

> "I hope that we will allow Digital Twin and AI technologies to open our minds rather than narrow us down. I am sure that new generations of architects will be able to apply themselves to both and use them creatively – both to reduce our energy use and waste but also to create exciting new urban landscapes."
>
> – Ana Matic, Director of Digital Development at Scott Brownrigg

COPYRIGHT

Copyright is a key concern amongst designers and extreme caution is practiced to prevent original designs and data from migrating onto the cloud where it can be used to further train AI models. This has an impact on what type of tools are being used, and how these tools treat data.

ChatGPT has announced that the model will no longer be trained on business data, which removes one of the main deterrents for corporate use. The future will tell if other AI systems follow suit to give their users some comfort that their data is protected.

Foster + Partners is developing their own in-house AI policies to govern how users within the firm are interacting with any third party providers. The development of bespoke tools offers safe and authorised ways of working, with continuous auditing by IT and legal teams in terms of intellectual property and security.

Sheppard Robson ensures that its input into AI systems is anonymised, whether staff are working with text prompts or image generation, before there is a clearer understanding of the data protection legislation attached to these tools.

There are a whole suite of intellectual property issues surrounding AI tools. Ashley Winton, Data, AI and FinTech Partner at the law firm Mishcon de Reya, advises designers and content creators to use controls that stop search engines from sifting through their data and clearly signpost copyright material, which will assist in case of a lawsuit.

Just like people are inspired by and borrow from others, AI is no different. It can be near impossible to separate AI-generated material from human-created material, or work out what portion originates where. Keir Regan-Alexander, Arka Works says: "It is not possible to copyright something that has been produced by an AI tool because it is not human-made, but if it has been sufficiently transformed, it could probably be argued as an original design in court. Businesses need to be flexible enough to adapt when new case law around IP and Copyright comes forward, because at the moment there's scant case law in the field of AI. Some tech companies are positioning to defend their users and themselves against intellectual property infringement and copyright cases. There's a whole ethical and moral framework that needs to be turned into policy within businesses adopting these tools."

Scott Brownrigg does not allow team members to issue any material that has been directly produced by AI – all AI outputs need to be reviewed and turned into a drawing or visualisation by a professional. AI produced material is used for reference only, for example to exemplify what a design could look like.
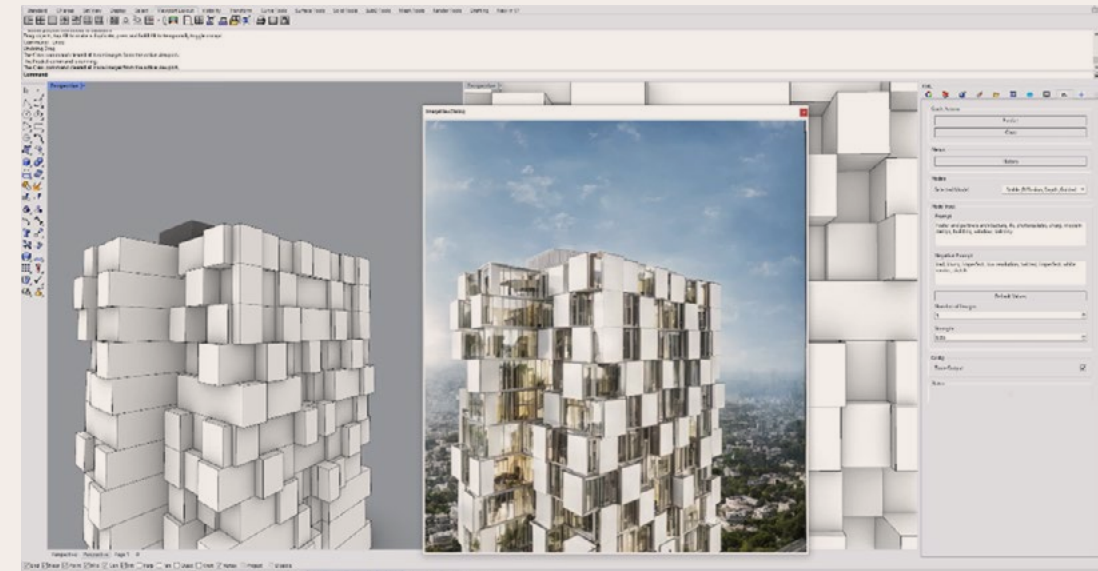

Image: Foster + Partners stable diffusion depth-guided model being used within Rhino. Using in-house inference Application Programming Interface (API), latest machine learning models are deployed directly to digital content creation tools.

ETHICS

52% of survey respondents concerned about the impact of AI have ethical concerns. Any AI system carries a risk of misinformation and bias which often stems from training data. Therefore, the choices that are made when training AI systems matter. AI models use large quantities of data to make inferences; when using historic data to predict the future, AI systems have been known to replicate or amplify discriminatory practices that society is consciously veering away from[20]. It is therefore critical to ensure models are context appropriate, representative of society at large, and tailored to local norms, values and ways of working.

There are no simple metrics to measure ethics and fairness, and in an algorithm-driven society, could we risk losing the human perspective? This is a common fear surrounding AI, and an indicator that some decisions should not be left to the machine. The use of AI in law enforcement, for example, has been met with objections due to a fear of discrimination.

Suzan Ucmaklioglu, Associate, Inclusive Design Specialist at Foster + Partners, is concerned that image generation tools don't have a proportionate representation of disabled people: "If you use 'people in a building' as a prompt, the resulting AI images contain no people with visible disabilities. Additionally, using 'disabled people in a building'
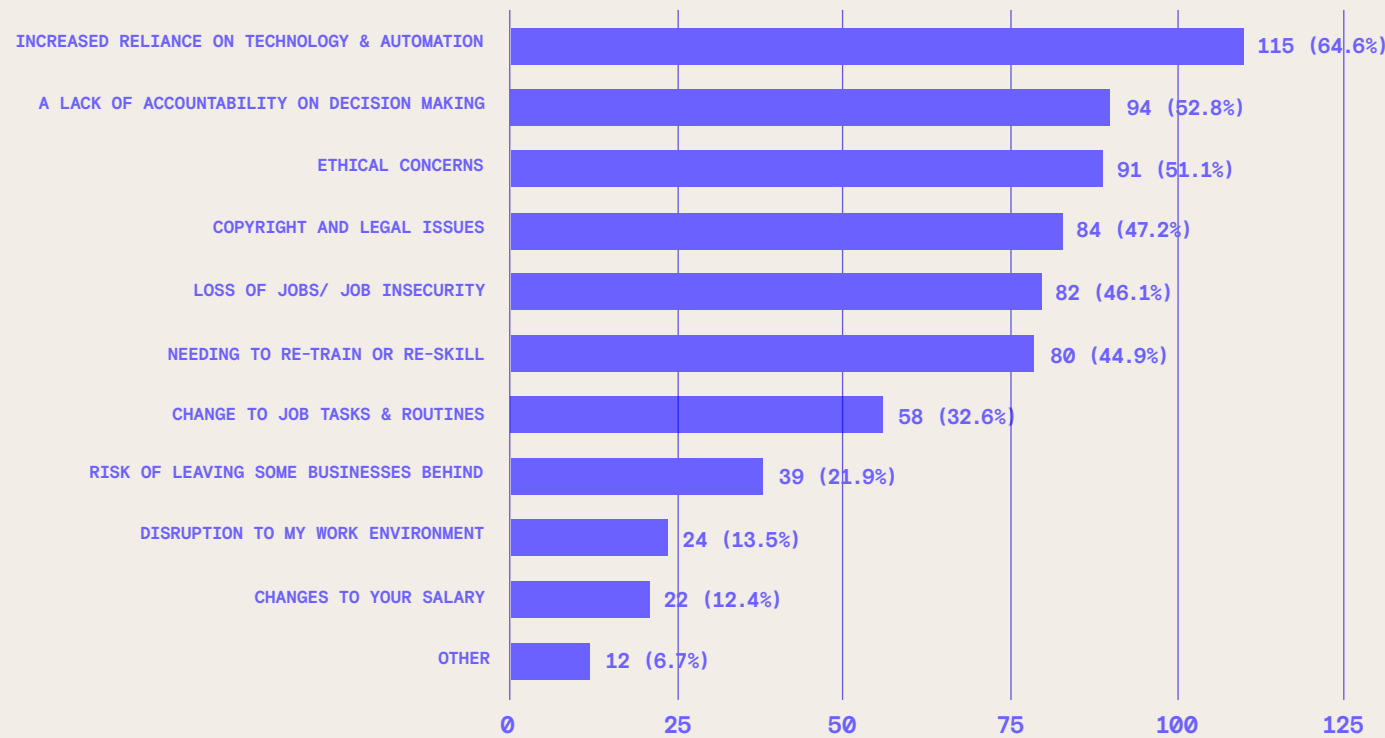
as a prompt often generates images with people who are wheelchair users, but to a disproportionate percentage. It is estimated that approximately 1-5% of people with disabilities are wheelchair users. I find this to be an interesting representation of how our societal biases of disability have been programmed into our computers and is something we should be cognisant of moving forward."

Martha Tsigkari, Foster + Partners, says that the problem is that the datasets that we use to train our models are not solid, and we don't know how good the data is, particularly when it comes to architecture: "Most of the time we have zero visibility on datasets, their validity, how biased or unbiased they are, it is impossible to identify. There are no universal standards around how we can define good or bad architecture, and I don't mean design, but how sustainable a building is, how well it complies with code, how structurally viable it is, how culturally adjustable it is or inclusive in terms of disability. We may design with these performance indicators in mind, but architecture's collective datasets are not tagged to expose how well we perform against these objectives."

> "If we don't have good data, we will generate bad results. AI models don't necessarily rely on qualitative data, they will be trained in any data fed to them, regardless. This is a huge issue that is grossly underestimated at this stage."
>
> – Martha Tsigkari, Head of Applied R+D at Foster + Partners

A research paper published by The Brookings Institute has called for a framework for 'algorithmic hygiene' for operators and creators of AI systems alongside public policy for the "fair and ethical deployment of AI and machine learning technologies"[21]. To ensure socially responsible AI, developers will need to take accountability to deploy trustworthy AI and mitigate risks.

Another reality to be aware of is that algorithmic systems are designed to learn and will therefore change over time, sometimes in unpredictable ways. Drew Waller, AECOM, explains that "we have to be aware of our training data and whether there are any inherent biases within it. A lot of cloud based tools can identify sensitive fields in the data, for example if it contains gender or race demographics, however this is not something we often deal with in the built environment sector. If a model is deployed in the correct way and using the correct tools, it will warn of data drift [unexpected or undocumented changes to data that can affect the performance of the AI system] to prevent bias."

The AI systems of today are not designed to operate independently and without transparent human governance. Assigning responsibility to developers and in some cases users of AI throughout the system's life cycle is therefore paramount[22].

Developers of AI solutions should ensure transparency around their objectives, extending to disclosure of information, algorithmic transparency, explainability, interpretability and trust[23]. To that end, the Organisation for Economic Co-operation and Development (OECD) asks that municipalities make available information about application of AI technology, data collection method, use and sharing of data[24].

A number of independent organisations are working diligently to highlight concerns related to AI: The AI Now Institute provide actional policy research related to algorithmic accountability, antitrust, climate, biometrics and global digital trade; The Centre for Humane Technology are dedicated to leading a shift towards a technology that strengthens wellbeing, democracy and shared information; The UK based voluntary organisation The Institute for Ethical AI & Machine Learning produces frameworks for responsible machine learning systems.

WHAT CONCERNS DO YOU HAVE ABOUT HOW AI MIGHT CHANGE YOUR PROFESSION?

Concern	Value
INCREASED RELIANCE ON TECHNOLOGY & AUTOMATION	115 (64.6%)
A LACK OF ACCOUNTABILITY ON DECISION MAKING	94 (52.8%)
ETHICAL CONCERNS	91 (51.1%)
COPYRIGHT AND LEGAL ISSUES	84 (47.2%)
LOSS OF JOBS/ JOB INSECURITY	82 (46.1%)
NEEDING TO RE-TRAIN OR RE-SKILL	80 (44.9%)
CHANGE TO JOB TASKS & ROUTINES	58 (32.6%)
RISK OF LEAVING SOME BUSINESSES BEHIND	39 (21.9%)
DISRUPTION TO MY WORK ENVIRONMENT	24 (13.5%)
CHANGES TO YOUR SALARY	22 (12.4%)
OTHER	12 (6.7%)

LEGISLATION

As the development of AI technology is pacing ahead, the legislation is lagging behind. An open letter from the Future of Life Institute, which is working to reduce extreme risk from transformative technologies, has called for a pause in AI development until we can understand, predict or reliably control it, and that powerful AI systems should be developed only when we are confident that their effects will be positive and their risks will be manageable.

Regulatory frameworks for AI are being developed by countries and supra-natural bodies, including the European Union and the OECD, to ensure that AI evolves in a way that underpins democracy, equality, inclusivity and fairness.

The EU is ahead of the game with the Artificial Intelligence Act, which was approved in March 2024. It is the first of its kind to regulate how AI is used. The Act classifies AI systems according to their level of risk and mandate different use requirements for high risk systems with steep fines for incompliance. Rules apply to training data, human oversight and accountability, with potential for rightsholders to opt out. The purpose of the Act is to respect democratic values and rules and "make AI systems fit for the future we as humans want"[25]. European companies have expressed concerns, however, that the framework could jeopardise Europe's competitiveness, productivity and technological sovereignty[26].

The OECD principles of ethical AI were adopted in 2019 and includes recommendations for public policy and strategy. It aims to assist policy makers, regulators and legislators to assess risks and ensure policy consistency across national borders.

In the UK, there is no current law governing AI, instead the technology is regulated under existing law. The General Data Protection Regulation (GDPR) and the Data Protection Act 2018 apply to the use of personal data, whilst the Equality Act 2010 prohibits discrimination, harassment and victimisation based on age, disability, gender, race, sexual orientation, religion, marital status, pregnancy and maternity[27].

The 2023 UK Government White Paper 'Establishing a pro-innovation approach to AI regulation' does not propose a specific AI law like the EU's Artificial Intelligence Act, but sets out a series of principles that regulators are asked to implement, including five cross-sector principles related to: safety, security and robustness; appropriate transparency and explainability; fairness; accountability and governance; contestability and redress[28]. The intent is to address issues such as social scoring, biometric identification and use of AI technology in law enforcement, education and employment[29].

Ashley Winton, Mishcon de Reya, explains that "the UK's attempt to regulate AI will be sidetracked by the General Election and it will be interesting to see how the Labour and Conservative manifestos address AI, as this will indicate what might come into law".

Image: Zac Wolff, Unsplash.

KEY FINDINGS

IMPACT ON JOBS

Automation will change job roles and some jobs will likely disappear, but new jobs will also be created. Skilled professionals are required to train and operate the AI systems of today; specialist expertise, professional responsibility and human discernment are needed to define the development concept, provide quality assurance and leverage the AI generated output. In this "bookending" approach, where the human initiates and concludes the process, AI is used for creative augmentation rather than creative replacement. Some organisation might see AI as an invitation to streamline their workforce, but the real opportunity lies in re-applying people to tasks that add significantly more value to companies, allowing professionals to focus on their core skills and not on tedious and repetitive tasks that lend themselves to automation.

DATA ACCESS

Centralised and open-access data will be critical to speed up the planning system and allow London's real estate sector to fully benefit from AI. Data is currently dispersed across many institutions and planning departments, and there needs to be a conversation about who drives the process of centralising this data and making it available. More user friendly tools that help visualise planning policies and developments can help improve communications with stakeholders and the public during consultations, as well as generating more meaningful dialogues. AI tools could also assist members of the public who want to submit planning applications, for example for home extensions, to consolidate relevant local planning policies, site constraints and design guidelines, making planning documentation more accessible and digestible.

AI INTEGRATION

Different organisations will opt for different routes to AI integration depending on resources, finances and priorities. An alternative to risky in-house development is to customise and rebrand off-the-shelf products, which can be quick, cheap and without a need for maintenance or worrying about back-ends. Pre-trained models that are available on the market can be trained further with bespoke data which will generate a differentiated output and create an advantage in London's competitive real estate market.

EDUCATION & RESKILLING

AI is not a shortcut and students of built environment subjects will still be required to learn the basics of their trade. It is therefore important that young professionals don't miss out on essential knowledge but that they are provided with a sound foundational understanding of their subject matter. AI generated outcomes can easily be misinterpreted as 'the right solution' and therefore the inability to make good judgements and question outputs is critical. Continuous training in the workplace will be essential to keep up with the pace of technological advancements, and to that end, several London built environment companies have set up internal AI groups that trial new products and provide in-house education.

COPYRIGHT

Copyright is a key concern amongst practitioners and extreme caution is exercised to prevent original designs and data from migrating onto the cloud where it can be used to further train AI models and become available to third parties. As a result, many companies choose AI tools and software depending on how they treat data. In-house policies and continuous audits will be crucial to govern the use of AI tools and protect intellectual property; it is good practice to clearly signpost copyright material and prevent search engines from sifting through sensitive data. UK businesses will need to stay vigilant and flexible in response to new AI case law, as it emerges.

ETHICS

Any AI system carries a risk of misinformation and bias, which often stems from training data. AI models don't necessarily rely on qualitative data but will gather all available data and they have been known to replicate or amplify discriminatory practices that society is consciously veering away from. The choices that are made when training AI systems matter, and it is critical to ensure models are context appropriate, representative of society at large, and tailored to local norms, values and ways of working. Assigning responsibility to developers and in some cases users of AI throughout the system's life cycle is paramount. There are no simple metrics to measure ethics and fairness and some decisions should not be left to the machine – the human perspective should prevail.
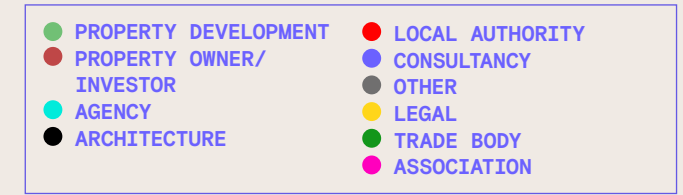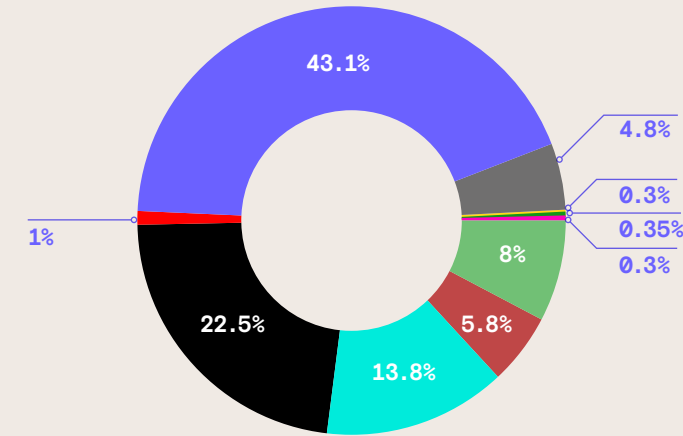
LEGISLATION

As the development of AI technology is pacing ahead, legislation is lagging behind. Regulatory frameworks for AI are being developed by countries and supra-natural bodies, including the European Union and the OECD, to ensure that AI evolves in a way that underpins democracy, equality, inclusivity and fairness. The EU is ahead of the game with the Artificial Intelligence Act which is the first of its kind to regulate how AI is used. In the UK, there is no current law governing AI, instead the technology is regulated under existing law. A set of principles have been proposed to guide regulators as they implement new AI rules, however, their adoption will be determined by the outcome of the UK General Election.
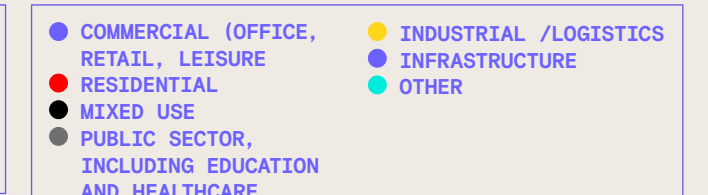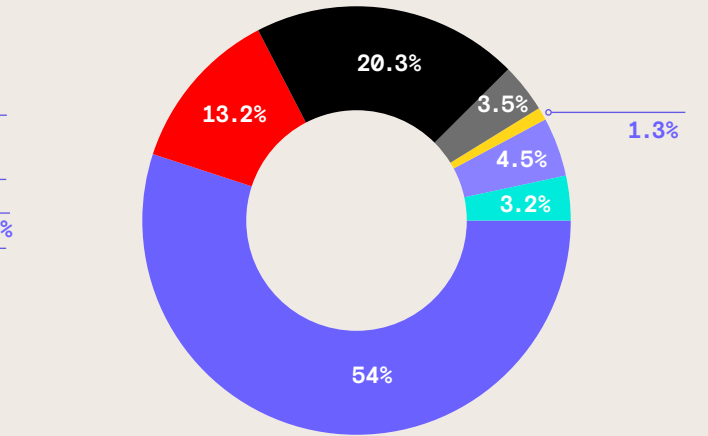
SURVEY RESULTS

As part of this research project we conducted a public survey, calling professionals from the London real estate market to share their perspectives on AI. 311 responses were received – a summary is presented in this section.
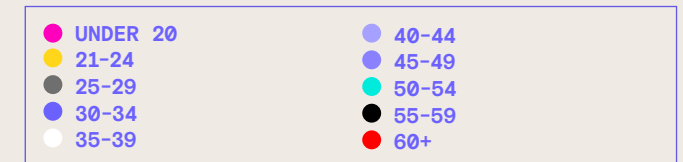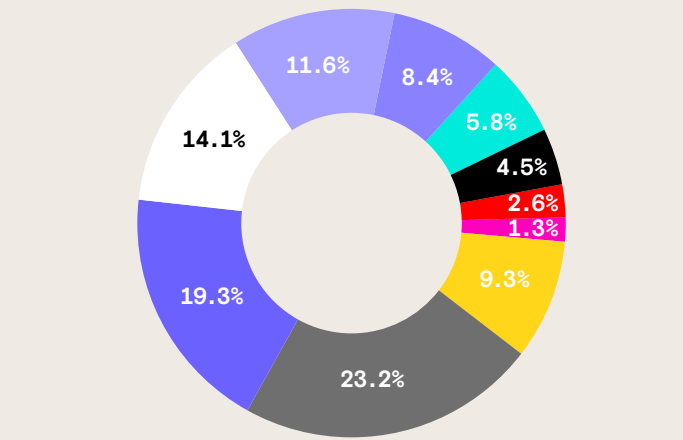
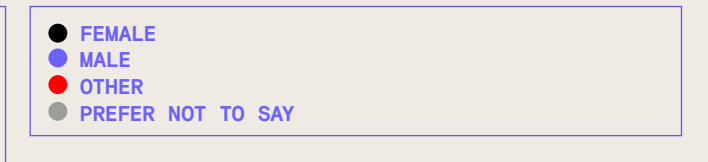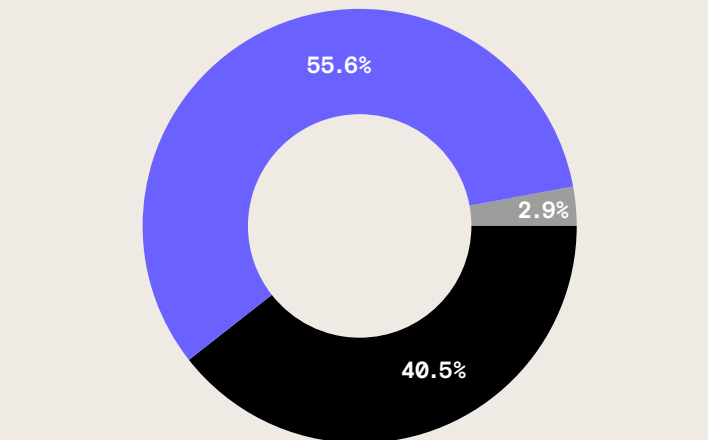## WHAT TYPE OF ORGANISATION IN THE REAL ESTATE SECTOR DO YOU WORK IN?

- 43.1%
- 4.8%
- 0.3%
- 0.35%
- 0.3%
- 8%
- 5.8%
- 13.8%
- 22.5%
- 1%

● PROPERTY DEVELOPMENT
● PROPERTY OWNER/ INVESTOR
● AGENCY
● ARCHITECTURE
● LOCAL AUTHORITY
● CONSULTANCY
● OTHER
● LEGAL
● TRADE BODY
● ASSOCIATION

WHICH AREA OF THE REAL ESTATE SECTOR DOES THE ORGANISATION THAT YOU WORK FOR OPERATE IN?

- 20.3%
- 3.5%
- 1.3%
- 4.5%
- 3.2%
- 54%
- 13.2%

● COMMERCIAL (OFFICE, RETAIL, LEISURE
● RESIDENTIAL
● MIXED USE
● PUBLIC SECTOR, INCLUDING EDUCATION AND HEALTHCARE
● INDUSTRIAL /LOGISTICS
● INFRASTRUCTURE
● OTHER

WHAT IS YOUR AGE?

- 11.6%
- 8.4%
- 5.8%
- 4.5%
- 2.6%
- 1.3%
- 9.3%
- 23.2%
- 19.3%
- 14.1%

● UNDER 20
● 21-24
● 25-29
● 30-34
● 35-39
● 40-44
● 45-49
● 50-54
● 55-59
● 60+

WHAT GENDER DO YOU IDENTIFY AS?

- 55.6%
- 2.9%
- 40.5%

● FEMALE
● MALE
● OTHER
● PREFER NOT TO SAY

HOW WOULD YOU DESCRIBE YOUR ETHNICITY?

0.3%
0.3%
0.3%
1%
2.3%
0.3%
1.9
0.3%
0.3%
2.3%
0.3%
0.3%
16.1%
3.5%
70.7%

- ● WHITE BRITISH
- ● BLACK BRITISH
- ● ASIAN BRITISH
- ● CARIBBEAN
- ● WHITE & BLACK CARIBBEAN
- ● AFRICAN
- ● WHITE & BLACK AFRICAN
- ● WHITE & ASIAN
- ● INDIAN
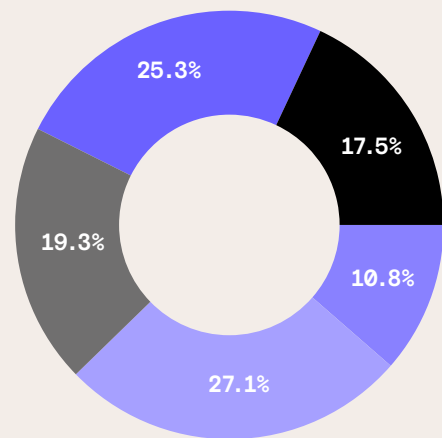- ● PAKISTANI
- ● CHINESE
- ● BANGLADESHI
- ● ARAB
- ● GYPSY OR IRISH TRAVELLER
- ● WHITE OTHER
- ● OTHER
- ● PREFER NOT TO SAY
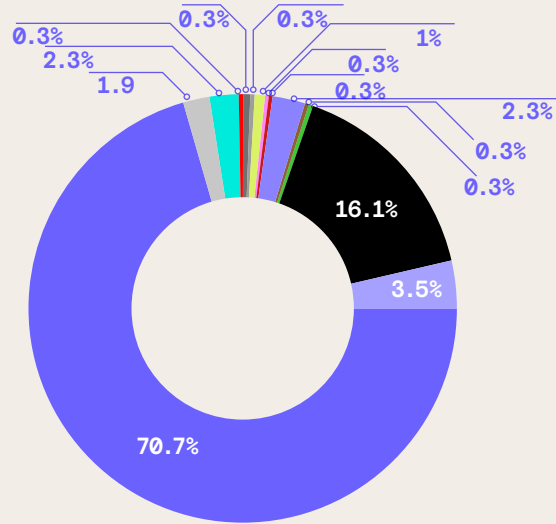
HOW WOULD YOU DESCRIBE YOUR UNDERSTANDING AND KNOWLEDGE OF AI?

151 (48.6%)	
74 (23.8%)	57 (18.3%)
18 (5.5%)	11 (3.5%)

1 = POOR
5= EXCELLENT

HAVE YOU EVER COME ACROSS AI IN YOUR WORK?

25.4%
5.5%
69.1%
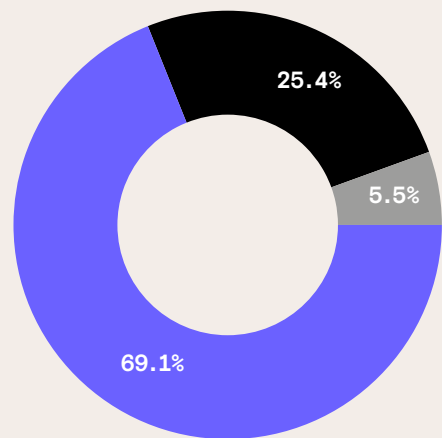
- ● YES
- ● NO
- ● DON'T KNOW

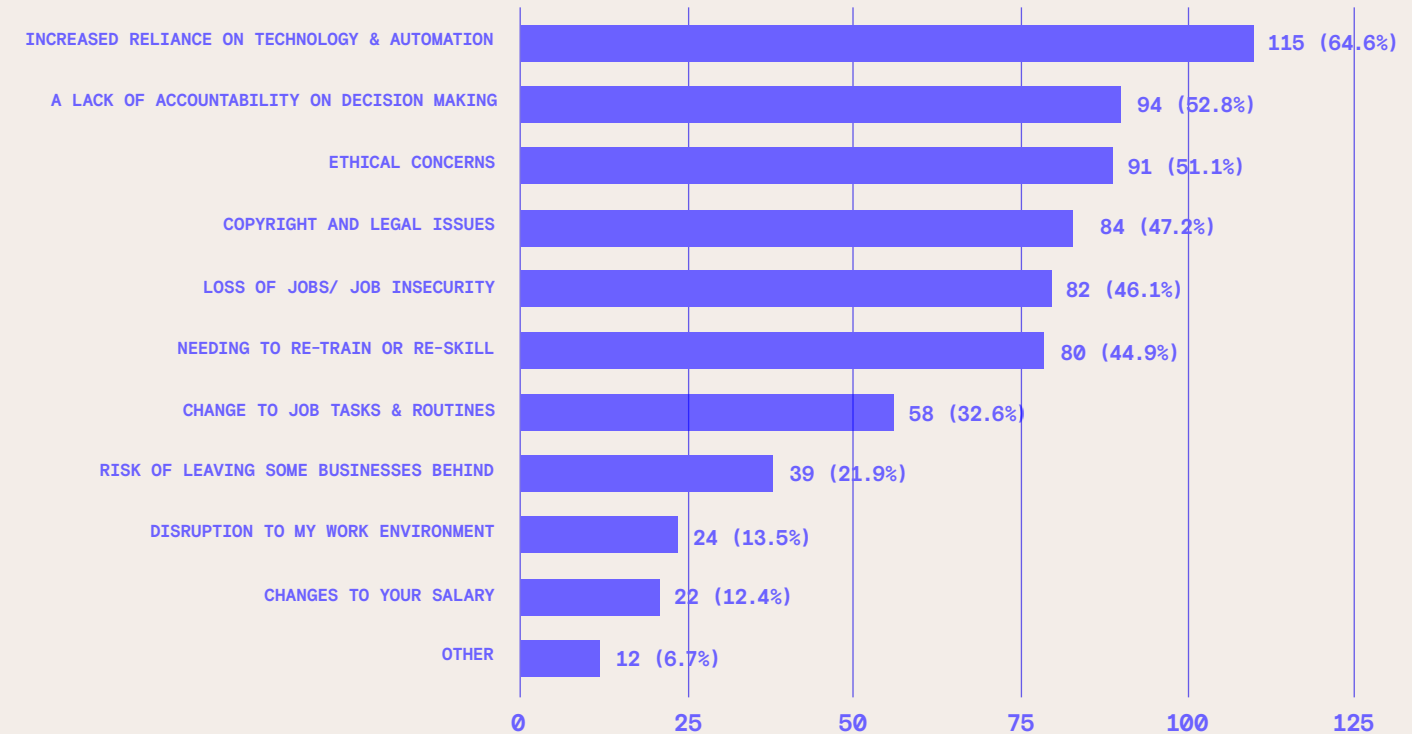## IF YOU HAVE COME ACROSS AI IN YOUR WORK, HOW OFTEN DOES THIS HAPPEN?

25.3%
17.5%
19.3%
10.8%
27.1%

- ● DAILY
- ● WEEKLY
- ● MONTHLY
- ● A FEW TIMES PER YEAR
- ● DON'T KNOW

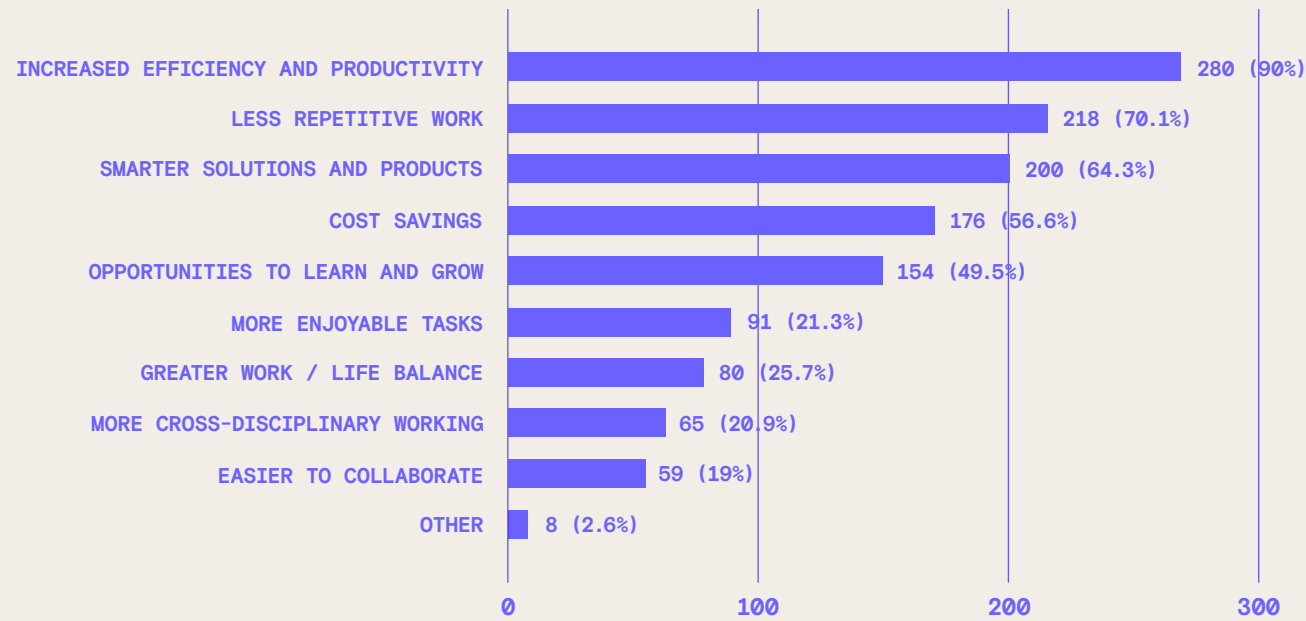## ARE YOU WORRIED ABOUT HOW AI MIGHT CHANGE YOUR PROFESSION?

48.6%
8.7%
42.8%

- ● YES
- ● NO
- ● DON'T KNOW

IF YOU ARE WORRIED ABOUT HOW AI MIGHT CHANGE YOUR PROFESSION, WHAT ARE YOUR CONCERNS?

INCREASED RELIANCE ON TECHNOLOGY & AUTOMATION	115 (64.6%)
A LACK OF ACCOUNTABILITY ON DECISION MAKING	94 (52.8%)
ETHICAL CONCERNS	91 (51.1%)
COPYRIGHT AND LEGAL ISSUES	84 (47.2%)
LOSS OF JOBS/ JOB INSECURITY	82 (46.1%)
NEEDING TO RE-TRAIN OR RE-SKILL	80 (44.9%)
CHANGE TO JOB TASKS & ROUTINES	58 (32.6%)
RISK OF LEAVING SOME BUSINESSES BEHIND	39 (21.9%)
DISRUPTION TO MY WORK ENVIRONMENT	24 (13.5%)
CHANGES TO YOUR SALARY	22 (12.4%)
OTHER	12 (6.7%)

WHAT DO YOU THINK THE OPPORTUNITIES OF AI ARE WITHIN YOUR SECTOR?

INCREASED EFFICIENCY AND PRODUCTIVITY	280 (90%)
LESS REPETITIVE WORK	218 (70.1%)
SMARTER SOLUTIONS AND PRODUCTS	200 (64.3%)
COST SAVINGS	176 (56.6%)
OPPORTUNITIES TO LEARN AND GROW	154 (49.5%)
MORE ENJOYABLE TASKS	91 (21.3%)
GREATER WORK / LIFE BALANCE	80 (25.7%)
MORE CROSS-DISCIPLINARY WORKING	65 (20.9%)
EASIER TO COLLABORATE	59 (19%)
OTHER	8 (2.6%)

ARE YOU INTERESTED IN LEARNING MORE ABOUT AI TECHNOLOGY?

93.2%
4.8%
1.9%
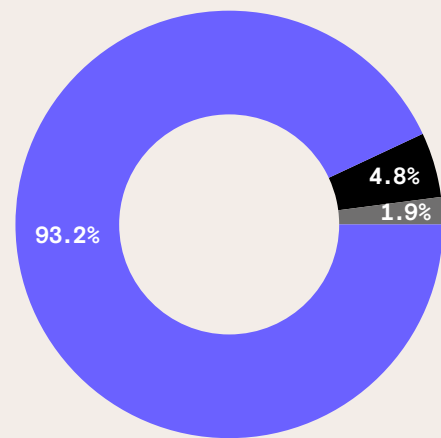
- ● YES
- ● NO
- ● DON'T KNOW

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