What is the Future Role of Architects in the Age of AI and Data?

Arch daily
Valeria Montjoy
June 23, 2023

The complexity of our world is constantly increasing, and with it, the pressure and demands placed upon our built environment. Architects are faced with a monumental task: to translate society's ever-changing needs into tangible, effective and sustainable solutions. Pressing issues such as the climate crisis, rapid urbanization, population density and housing shortages call for a new architecture –one that isn't afraid to question the traditional way of working and is prepared to take on the challenge. Today the industry must adapt, evolve and innovate to cope with these challenges. The availability of data is changing the game, and as technology continues to advance, it will open new ways of thinking, creating and engaging with the built environment.

In this article, we delve into the effects of the digital transformation, how it is reshaping the industry and the questions it raises about the future role of architects.

The industry is moving toward data-driven design

From AutoCAD to BIM in the cloud, the architecture industry has come a long way –but this digital transformation is just starting. Data has become fundamental to how people work and companies from all fields have successfully integrated it into their daily workflow. In architecture, more and better data allows professionals to deliver user-oriented projects that integrate seamlessly with their surroundings, which in turn generates more data, complexity and optimization. While the rise of BIM enabled stakeholders to collaborate through a common database, the introduction of cloud-based solutions with user-friendly interfaces is expanding the accessibility of complex architecture projects to a wider range of stakeholders such as developers, governments and citizens. This allows them to become a more integral part of the planning process, enabling more inclusive communications right from the beginning.

"*Today, you may have all the data all the time. In the future, as data is freed from file types and made granular and interoperable, you'll have the right data at the right time. Granularity, along with unified secure access, unlocks key workflows for architects. Think of the ability to define the outcomes of a project at its earliest phases, when decisions are less expensive to make; the ability to get real-time and on-demand insights as you're designing; and the ability to leverage AI for co-creation. – Nicolas Mangon, Vice President, AEC Strategy, Autodesk*"

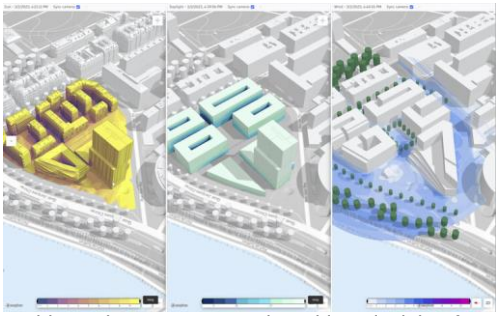
The role of architects is expected to evolve in the future as data becomes more connected across the AEC (architecture, engineering and construction) industry and with our built environment encompassing infrastructure, buildings, public space, water structures, airports and more. Image Courtesy of Autodesk

AI: the next evolution in the architect's toolbox

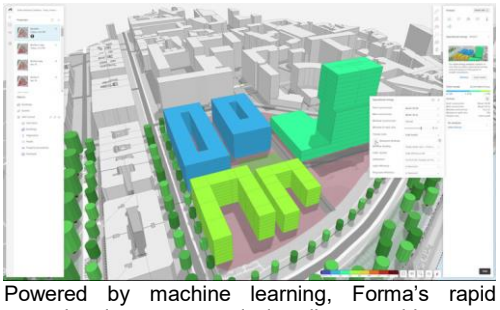
The conversation about data-driven design and AI often goes hand-in-hand. AI is the next evolution in the architect's toolbox, and together with data, it is helping architects move towards a more outcome-based way of working to achieve better end results. AI and data have a complementary relationship; AI-powered tools can process, analyze and make sense of the vast amounts of data generated during the design, construction and operation of a building. AI algorithms can be used to identify patterns and trends in the data, make predictions and generate insights that can inform different design decisions. And the more and better data is input into

the system –from sources such as BIM databases, IoT devices, weather and traffic data and user feedback– the better the AI gets at learning.

Cloud-based software Autodesk Forma, for instance, enables architects to drive better outcomes by harnessing data from day one. With the help of AI-powered capabilities, they can create 3D massing models. They can test in real time a wide range of scenarios and analyze the impact from diverse environmental conditions –sun, daylight, wind, noise, microclimate and more– in order to find optimal solutions within the chosen parameters. They can rapidly create and iterate different versions to streamline the design stage, minimize rework and lay a solid evidence-based foundation for a more sustainable and efficient process.



Architects have access to data-driven insights from day one using Autodesk Forma, where they can quickly compare and analyze massing models for a wide range of factors–from sun and wind to noise and operational energy–all within one single cloud-based software. Image Courtesy of Autodesk



Powered by machine learning, Forma's rapid operational energy analysis allows architects to easily assess the impact of design decisions on the potential operational energy of their buildings during early-phase design. Image Courtesy of Autodesk

Although the use of AI in architecture is still relatively in its early stages, its potential for shaping the future of the industry is vast. Many already consider the groundbreaking technology to be an established field, and some have even dared to call it "the other designer in the room."

AI will not replace architects, but it will augment their work

Automation and artificial intelligence will not replace architects, yet this does not mean that the industry will not undergo profound transformations. As 3XN Architects explain, we know that "the opportunities that AI brings can ultimately change the existing workflow within architecture."

While AI certainly makes the design process more efficient, it will not be able to replace the architect's creative mindset and ability to deliver unique designs that respond to specific clients' needs, environmental demands, and social and cultural contexts. AI still has its limits; it is only as good as the data it is trained on and is determined by the ability of the algorithms to analyze and learn from that data. Much of what architects do involves creative analytical thinking, original perspectives, problem-solving abilities and soft skills that rely on human decisions and cannot yet be accurately replicated by technology. It's about working with each other's strengths: computers and software can automate tedious and repetitive day-to-day tasks, freeing up more time for architects to focus on the creative and personal sides of architecture. Their expertise and minds remain irreplaceable but can now be complemented with data and new technology.

In fact, according to an Oxford University study, architects have a very low chance (only 1.8%) of having technology and AI replace their jobs. As architect and founder of Finch 3D Jesper Wallgren states, "AI presents many new opportunities for our profession, and I believe that the architect is harder to replace with AI than many other professions due to our job's subjective nature. The decisions we make to create great buildings often depend on opinions, and as a result there is no right or wrong."

"*It is important to acknowledge that AI technology is currently nowhere close to possessing true intelligence and feelings comparable to human consciousness. It is limited in the types of tasks it can complete, but there is a general consensus that the technology that already exists has the potential to be extremely powerful. – Kåre Stokholm Poulsgaard, Head of Innovation at GXN"*

As AI technology continues to advance and data flows improve across the entire project lifecycle, removing traditional siloed ways of working, this will strengthen the role of architects as orchestrators. Architects will potentially gain a greater responsibility for managing the processes, data and relationships throughout a project, starting from early phase planning and ending with disassembly at the end

of a building’s lifecycle. And with this holistic approach to designing and constructing our built environment, it is possible to improve both quality and efficiency. To enable this transformation, AI will have to be integrated into a modern design firm’s workflow, and architects must acquire the necessary skills to work with these tools and avoid falling behind. In essence, we must recognize the power of data and AI-powered tools for assisting architects in their work, helping them create better solutions for the complex problems that our societies and cities are facing now and in the near future.