AI AGENTS IN DESIGN: TRANSFORMING MEP WORKFLOWS

From clash detection and compliance to automation, simulation, and sustainability, SSH is harnessing AI to drive faster, cleaner, and more resilient project outcomes

By Yashin Maharaj, MEPI Technical Director, SSH

Artificial intelligence (AI) has moved beyond experimentation to become an engineering essential. Across the global AEC sector, AI drives predictive maintenance, energy optimisation, building automation, and security.

SSH is now building on these proven applications to reshape how MEP systems are designed and delivered.

SMARTER COORDINATION

One of AI's most immediate impacts is in design coordination. Traditional clash detection within BIM can produce thousands of issues with little context, creating bottlenecks. SSH's AI-assisted coordination detects conflicts earlier, ranks them by severity, and filters out false positives. Engineers focus on what affects constructability and compliance rather than minor overlaps.

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Diriyah Sales Centre, Riyadh

On SSH's recent Diriyah projects in the Kingdom of Saudi Arabia, the use of AI assisted with the coordination of services in complex plant rooms, ensuring efficient spatial layouts and coordinated installation sequences. The result: fewer delays, cleaner construction documents and reduced rework on site.

AUTOMATION AND CODING

AI excels at handling volumes of data beyond human capacity. By integrating smart agents with Autodesk Revit and BIM 360, repetitive tasks such as updating schedules or verifying load data now take minutes instead of hours.

Another breakthrough lies in computational design. Today's AI systems can generate Dynamo code in seconds. Engineers describe what they need in plain language, and the system produces parametric scripts that automate repetitive design tasks. This expands computational design capability across all project teams and not just specialists.

COMPLIANCE AT SPEED

Building code compliance has traditionally meant searching through hundreds of pages of regulations. AI-powered code assistants now allow engineers to ask questions in natural language and receive precise interpretations in seconds. At SSH, this reduces the risk of oversight and ensures our designs remain aligned with complex local and international codes.

DATA INTEGRITY AND SECURITY

The use of third-party AI platforms raises valid questions about confidentiality and security. SSH maintains robust safeguards to protect client and project data.

All artifical intelligence applications run within secure environments, using either local infrastructure or vetted cloud services with enterprise-grade certifications. Sensitive data never leaves controlled networks, and strict non-disclosure commitments are upheld. This ensures clients benefit from AI without compromising data sovereignty.

STANDARDISATION AND QUALITY

AI integration at SSH follows a disciplined

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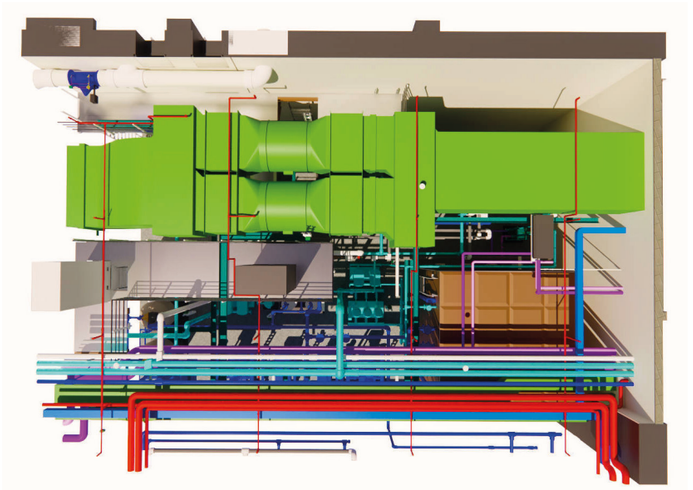
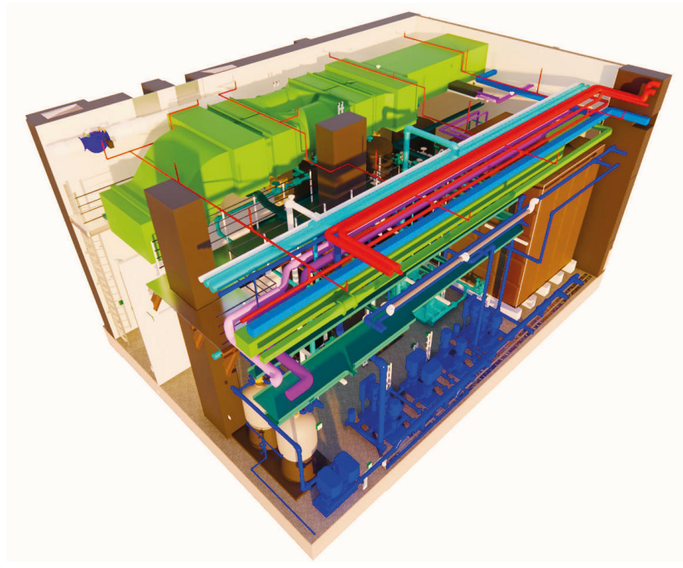
QA/QC framework. Outputs such as equipment schedules or electrical load verifications are structured, traceable and consistent. Standardisation not only reduces tendering errors but also strengthens integration across MEP, structural and architectural teams. By combining speed with control, AI enhances both quality and accountability.

SUSTAINABILITY THROUGH SIMULATION

Sustainability targets are now non-negotiable across the Middle East's construction sector. AI-enabled simulation tools allow SSH engineers to test multiple MEP options early in design and select the most energy efficient and sustainable paths.





Pump room

Digital twinning takes this further by creating virtual replicas of building systems. These dynamic models simulate operations, optimise controls, and predict energy use over the entire lifecycle. Insights gained reduce costs, extend asset life, and support environmental objectives, ensuring performance continues long after handover.

LOOKING AHEAD

The next phase of AI adoption will focus on generative design and predictive analysis. Generative systems propose balanced designs that weigh efficiency, cost and space utilisation. Predictive tools forecast energy use and maintenance decades ahead, supporting more resilient asset planning.

In the Middle East, where projects are large, complex and fast-tracked, the advantages are immediate: faster turnaround, fewer coordination disputes and stronger sustainability outcomes. For SSH, AI is not an abstract future trend, but an applied enabler of better, quicker and more resilient designs that help clients realise forward-looking, compliant and innovative solutions today.