ARC Centre for Next-Gen
Architectural Manufacturing

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Arch_Manu's Seventh Hackathon Brings Mirvac into Cross-Disciplinary Design Innovation

Arch_Manu's seventh hackathon brought together 24 researchers and industry practitioners from Sydney, Melbourne, Adelaide, and Vienna to develop and test new ideas for architectural practice. Held last week, 20-28 October 2026, the event marked an important milestone. For the first time, an organisation outside the Arch_Manu partnership joined the hackathon – award-winning Australian property developer Mirvac contributed a project proposal, which two teams explored under a participation agreement signed ahead of the event.

Across four projects, five groups developed prototypes and concepts addressing challenges in design knowledge, product information, digital modelling, and modular construction. Industry participants included architecture firms Architectus, Cox Architecture, and Tzannes; engineering consultancy Bollinger+Grohmann; and Mirvac, representing the development and construction sectors. The participating universities were University of New South Wales, Swinburne University of Technology, and Adelaide University.

The projects developed are summarised below:

1. **Geometry Version Control with Embedded Design Thinking Rationale**

   Design teams make many changes as an architectural project develops, but the documentation of the reasons behind those decisions can be scattered across conversations, notes, and model files. This hackathon group developed a workflow to connect design rationale directly to model geometry and its history. Designers can record voice notes against geometry in Rhino, with notes transcribed locally and stored as metadata on model elements. The information is then organised into linked geometry, decision and version graphs. This makes it possible to trace an element from its current form back to the reasoning behind a change and the model version in which it occurred. The project's prototypes allow this information to be explored through Rhino and a web-based viewer.

   Project team: Matthew Tam (Bollinger+Grohmann), Alina Schuster (Bollinger+Grohmann), Abraham Lai (Architectus), Alireza Abdolmaleki (Swinburne University of Technology), Jorge Castillo (Swinburne University of Technology)

2. **Product Data Source of Truth**

   This project addressed the disconnection between architectural design workflows and up-to-date building material information from suppliers. Currently, architects manually research and record material specifications in spreadsheets or internal systems, which can become outdated, leading to inconsistencies, material shortages, and construction delays. The proposed solution connects supplier databases with architectural modelling environments such as Rhino and Revit through Oculus OS, which translates model information into a standardised format. AI agents retrieve and monitor supplier information, including technical specifications, environmental performance, certifications, availability, and product updates. Through a browser-based 3D interface, designers can review material information, assess the impact of changes, and approve updates before synchronising them with their models. Version histories and decision logs ensure transparency and traceability. Ultimately, the project aims to streamline material selection, improve information accuracy, and generate comprehensive material schedules, supporting more efficient decision-making throughout design and construction.

   Project team: Kevin Trinh (Architectus), Shahdad Soheyli Fard (University of New South Wales), Sasanka Gallage (Adelaide University), Zhengnan Liu (University of New South Wales), Thao Pham (Swinburne University of Technology)

3. **Revit Precognition**

   Revit, a Building Information Modelling software used in the architecture, engineering, and construction sector, allows users to synchronise changes to a central model without a review, meaning teams may discover problems only after they have propagated. Most architecture firms implement dashboards and data management pipelines to help them react to the health of their Revit models, but this data is a reflection of what has already happened – by the time the outcome of a mistake is registered, the model has likely proceeded from this point, causing inefficiencies and rework. This project proposed a solution to stop the fire rather than dashboard the ashes. Informed by interviews with six BIM coordinators and digital leads across four practices, the group developed a prototype that intervenes at the point of risk. The prototype works within Revit to hold a sync when a link is unloaded, offer a rollback when a critical element is deleted, or prompt a user to link an imported CAD file. It explains its interventions, escalates repeated issues, and records overrides to help teams understand and address problems. A supporting web service stores session data and identifies sessions that may be at risk. The team also developed a repeatable process for improving the tool through user interviews, synthesis, and re-briefing.

   Project team: Gavin Nicholls (Architectus), Dr Lisa LuBowden (University of New South Wales), Houssame E. Hsain (University of New South Wales), Guanlin He (University of New South Wales)

4. **Master-Planned Community Modular Prefabricated Kit of Parts**

   Within this project, two teams explored how modular construction could support housing in master-planned communities. The teams received advice from Mirvac's subject matter experts Ari Salehi (National Operations Manager), Elias Tawk (Pre-Construction Manager), and Arron Tanoai (Senior Development Manager).

   Group 4A explored how computational design could identify repeatable panel types across housing designs for master planned communities. Using AI-assisted scripting, the team analysed panel geometry from reference house types and clustered similar shapes into component families. The work showed how digital tools could help define a prefabricated kit of parts, revealing opportunities for repetition while making design variation visible. It opened discussion about how standardisation, manufacturing efficiency and architectural flexibility could work together.

   Project team: Andrew Butler (Cox Architecture), Hirusheekesan Selvnesan (Adelaide University), Mark Crabbe (Mirvac), A/Prof Mehrnoush Latifi Khorasgani (Swinburne University of Technology), Carlos Franco (Mirvac)

   Group 4B explored how temporary local assembly facilities could support modular housing in master planned communities. Factory-made panels and components would be assembled close to their final lots, using shared equipment and reusable access platforms across successive homes. The team also investigated alternative assembly sequences, accessible module connections and digital configuration tools. AI-assisted modelling, animation and app development helped communicate the concepts and identify questions for further research and collaboration.

   Project team: Guido Rivai (Mirvac), Michael Lewarne (University of New South Wales), Lily Tandeani (Tzannes), Shiva Ghaznavi (Swinburne University of Technology), Dr Geoff Kimm (Swinburne University of Technology)

The final presentations were held concurrently in the offices of Mirvac in Sydney, Bollinger+Grohmann in Melbourne, and Architectus in Adelaide. The discussions surfaced questions that extend beyond the prototypes themselves: how teams share reliable information, coordinate across the supply chain, and adopt new tools in ways that work for the people using them. Mirvac's participation opened a new chapter for the event, and the projects offer a starting point for continued collaboration and research.

For more information about Arch_Manu's research and upcoming events, visit archmanu.com or contact archmanu@unsw.edu.au.

About Arch_Manu: Arch_Manu is an interdisciplinary, industry-focused research and training initiative funded by the Australian Research Council's Industrial Transformation Training Centre scheme. It brings together academic and industry leaders to drive digital transformation in the architecture and engineering industries, fostering cutting-edge innovation and professional development.