



# Digital Twinning Australia

## Case Studies



### Infrastructure Case Study

**Predictive asset maintenance, condition and criticality data accuracy managing aging capital-intensive assets.**

**Business Challenge** Aging assets with significant bow-waves competing for capital investment.

**Solution Delivered** Visualisation of asset portfolio remaining lifecycle demands comparative analysis, evidence-based collaboration and inclusive decision-making.

**Value Created** Direct line-of-sight from strategic asset management plans, five-year rolling works program, annual work plan to work-order completion AND closed loop data asset condition and criticality updating.

### Mining Case Study

**Dynamic digital twin of mining systems reduces Return on Capital Employed, freeing up cash.**

**Business Challenge** Visualisation of critical pit to packing processes for collaborative remote decision making.

**Solution Delivered** Merging of a static, digital engineering-rich 3D model of the asset with operating data from SCADA, PLC and IoT sensors, delivering a dynamic digital twin.

**Value Created** Data rich augmented reality for better, faster and cheaper decision making. Less travel, more engagement, higher accuracy, more confidence and more capability. Overall less total cost of ownership through better planned and more efficient maintenance and shutdowns.

### Mining Case Study

**Advanced data analysis to assess asset health and determine root cause of “drift” and premature aging in Gyratory Crusher**

**Business Challenge:** Asset critical to 24/7 operations aging prematurely. Why? What is the prognosis? How to extend actual useful life to meet expected useful life?

**Solution Delivered:** Multi-variant analysis of Gyratory Crusher assembly data over two year period. Asset health report detailing key findings and recommendations. Created the as-is of the asset.

**Value Created:** Uncovered areas of concern / likely contributors to root cause of drift not previously considered or documented as part of the assembly. Provided clear line of sight from the as-is to the to-be with improved diagnostics. Demonstrated pathway to extending useful life of the Gyratory Crusher and reducing unscheduled downtime.

## Construction Case Study

**Climate change is pervasive, not theoretical or belonging somewhere else.**

Business Challenge	Translating building, solar, water and instrumentation into STEM [Science, Technology, Engineering, Math] curriculum in primary and secondary schools.
Solution Delivered	Enhanced an existing building information model with system critical meta-data, making a comprehensive static 3D model. The operating data is fed into the 3D model, visualising the electricity being captured, transferred and used for example.
Value Created	Theoretical and unrelated information is replaced with information that has a direct impact on students and their families. Digital jobs will be seen and students will undertake digital jobs at school and leave school job-ready.

## Manufacturing - User Story

**Asset design supply chain integrity... what is the final design and how do I know it is approved?**

Business Challenge	Reducing the number of steps from design receipt to delivery while adding value to upstream customers at the same time.
Solution Options	Agree protocol for approved design access; remove paper-based designs; centralised digital design sandpit with structured collaboration.
Value Expected	Reduced cost to deliver [design receipt to delivery]. Tighter operating model. Evidenced based decision making. Highly visual, accessible and secure change control.

## Engineering - User Story

**When critical assets fail, how can they be fixed if getting there takes too long?**

Business Challenge	Replacing break-fix operating model with predictive asset maintenance.
Solution Options	Critical assets are digitally twinned on behalf of Customers; digital twinning the assets includes smart sensor or machine vision systems; Platform as a Service.
Value Expected	Increased resource utilisation. Additional revenue sources uncovered that clearly deliver robust tangible added value. Enhanced reputation with less risk.

## Port - User Story

**How can ports go from spreadsheets to the intermodal digital hub?**

Business Challenge	Achieving significant uplift in throughput.
Solution Option	Create a digital minimal viable product to use for awareness and knowledge building, offsetting unnecessary risk. Digital twin core systems [Platform as a Service] while skill and capability are developed. Uncover the best balance of technology, machine and human.
Value Expected	Increased asset utilisation. Reduce product loss. Less downtime. Increased tonne per hour throughput.