From Scattered Data to Process Intelligence

How GILT empowers process engineers to find answers faster and optimise performance

The Process Engineer's Challenge

Process engineers navigate one of the most data-intensive roles in any operating facility. P&IDs, datasheets, heat and mass balances, process simulation models, operating procedures, HAZOP reports, equipment performance curves, historian data, line lists and equipment lists all feed into daily decision-making. Yet these data sources are scattered across EDMS platforms, shared drives, historians, CMMS systems and filing cabinets — often spanning multiple revision states and decades of accumulated documentation.

When you need to check the design basis for a heat exchanger, you're hunting through revision-controlled datasheets across multiple systems. When you're investigating a production bottleneck, you're manually pulling historian trends and cross-referencing equipment ratings against actual operating conditions. When a HAZOP study is scheduled, you're gathering documentation from half a dozen disconnected systems. When an operator transition occurs, critical process knowledge walks out the door with the departing team.

This fragmentation doesn't just waste time — it introduces risk. Decisions made without full context lead to suboptimal outcomes, missed hazards and lost production.

How GILT Assists Process Engineers

- **Equipment-level digital twin** — Every item tagged on a P&ID is linked to its full documentation context: datasheet, line list, C&E diagram, HAZOP record, maintenance history, spare parts inventory and live process data from the historian. Ask "What is the design pressure of E-4201 and what is its current operating pressure?" and get the answer with the source document, page and revision for the design value and the live historian reading for the operating value. This extends across all equipment classes — vessels, heat exchangers, pumps, compressors, control valves, instruments and piping.
- **Performance monitoring & degradation detection** — Continuous analysis of historian data against equipment performance baselines detects early signs of degradation. Heat exchanger fouling is tracked through UA trending. Compressor performance drift is identified by monitoring polytropic efficiency against design curves. Pump curve deviation flags bearing wear or impeller damage. Catalyst deactivation trends are monitored against expected decline rates. Early detection shifts maintenance from reactive to predictive, reducing unplanned downtime and extending asset life.
- **HAZOP preparation & support** — GILT ingests historical HAZOP reports and cross-references them against the current facility's P&IDs and design basis. Common hazard scenarios are identified automatically with proposed controls and source traceability. Automated application of LOPA rulesets determines SIL requirements with full audit trail. The result is a pre-populated HAZOP worksheet that lets your team focus workshop time on genuinely novel risks rather than rediscovering known hazards. Workshop time is reduced by 40–60% with improved consistency in hazard identification.
- **Production optimisation** — Systematic analysis of plant-wide operating data identifies genuine production bottlenecks and quantifies their impact in dollar terms. GILT generates prioritised improvement recommendations — software tuning, hardware modifications, procedural changes — each with an automated business case including estimated production uplift and implementation cost, enabling data-driven capital allocation.
- **Knowledge recovery & preservation** — When projects change hands, experienced engineers retire, or operator transitions occur, decades of institutional knowledge risk being permanently lost. GILT captures and structures this knowledge into a persistent, queryable format that is accessible to the incoming team from day one. Design decisions, operating philosophy, lessons learned and historical context are preserved and retrievable.

Supported Data Sources & Integration

GILT connects to the systems process engineers already use. Engineering documentation from EDMS platforms (Documentum, Meridian, Aconex, SharePoint) including P&IDs, datasheets, line lists, equipment lists and design basis documents. Process data from historians (OSIsoft PI, Honeywell PHD, Yokogawa Exaquantum, OPC-UA/DA). HAZOP reports, SIL studies and risk assessments in any format. Equipment performance data and maintenance records from CMMS (SAP PM, IBM Maximo). Process simulation models and heat/mass balance data. Vendor documentation and correspondence. All formats are supported — PDF, DWG, DXF, scanned TIFFs, Excel, CSV, XML and proprietary historian exports. Data is linked at the equipment tag level across all sources.

Impact for Process Engineering Teams

- 30–50% reduction in time spent searching for information, freeing engineers to focus on analysis and decision-making
- 40–60% reduction in HAZOP workshop time with improved hazard identification consistency and full audit trail
- Early detection of equipment degradation enables predictive maintenance, reducing unplanned downtime and extending asset life
- Production bottlenecks identified and quantified with automated business cases for data-driven capital allocation
- Institutional knowledge preserved through personnel transitions and operator handovers — no more knowledge walking out the door
- Design basis documentation accessible in seconds rather than hours of manual search across multiple disconnected systems
- MOC support — when modifications are proposed, GILT identifies all affected equipment, documents and safety studies

Data Security

Process design data — including proprietary process configurations, equipment ratings, production data and operating philosophy — is commercially sensitive. GILT's security practices are informed by ISO 27001 and IEC 62443. Data sovereignty is maintained within agreed jurisdictions — for Australian clients, all processing occurs on Australian-hosted infrastructure. All data is encrypted in transit (TLS 1.3) and at rest (AES-256) with per-client key management. Access is role-based with multi-factor authentication and full audit logging. Processing environments are logically isolated per client. No client data or intellectual property is retained beyond the engagement period — all data, embeddings, vector indices and knowledge graph contents are securely deleted upon completion with cryptographic verification.