Digital Project Delivery for Rio Tinto Projects

Conveyor Design Utility for AVEVA E3D Design

Paul Rushton - Manager, Digital Delivery, Rio Tinto Projects
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About Rio Tinto

• Rio Tinto is a global mining and metals company. Our purpose is to find better ways to provide the materials the world needs.

• Founded 150 years ago in 1873 when a group of investors bought the Rio Tinto mines in Spain.

• Product Groups: Iron Ore, Bauxite, Alumina, Aluminium, Copper, Minerals (includes Borates, Salt, Molybdenum, Titanium, Lithium and Diamonds).

• Statistics:
  - 52,000 Employees (2022)
  - 35 Countries
  - 20,000 Suppliers
  - 2,000 Customers
  - $55.55 Billion (USD) Revenue (2022)
Mines, smelters, refineries, power facilities and processing plants remote from mine Projects Offices

Rio Tinto Global Footprint
52,000 Employees 2023

- Aluminium
- Copper
- Iron Ore
- Minerals

Mines
Smelters, refineries, power facilities and processing plants remote from mine
Projects
Offices
Reliable and repeatable project delivery success

Challenges

• Custom-made designs for each project, steered and held by EPCMs – limited data/design re-use
• Data & information is fragmented, often manually processed and not easily reusable across the portfolio
• Consistent cost, schedule & quality challenges post contract award
• Path of construction and commissioning not consistently used to steer engineering activities
• Engineering contract environment based on ‘consuming hours’

Solution

• Leveraging enhanced data management and digital innovation
• A single Rio Tinto ‘preferred’ platform based on the AVEVA suite of engineering and design software
• A single Rio Tinto controlled and hosted project delivery environment
• An Engineering Systems and Data Management (ESDM) platform supported by in-house specialist digital engineering capability

Benefits

• Cost and schedule reduction / certainty for major projects:
  o reduced project set up, configuration utilising common systems & administration
  o automated rules-based design based on Rio Tinto Standards
  o re-use of standard designs & designed assemblies from catalog
  o increased control over project specifications, catalogs & standards - single source of truth
  o minimal duplication of data
Reliable and repeatable project delivery success

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Digital delivery implementation details

Reframing how we define, engineer, deliver and handover projects to ‘engineer for value’

**ASSET INFORMATION REQUIREMENT SPECS.**
The Foundations for Digital Delivery through Consistent Metadata & Handover Standards
- fully defined requirements for the format and content of the digital project handover
- fully defined class library requirements & tagging specs.
- engineering key list requirements
- fully defined requirements for engineering & design systems

**ASSET DATA MANAGEMENT**
A Common Data Environment to provide access to Engineering & Asset Data for all Stakeholders
- compliance & validation against the class library requirements
- integrating information from various repositories including engineering systems, the DMS and SharePoint.
- finds & reports inconsistencies
- deploy AWP execution methodology

**ENGINEERING & DESIGN**
A fully configured Project Delivery Platform based on a preferred set of Engineering & Design Tools
- a fully defined/preferred platform for all design tools - ‘What Good Looks Like’
- a fully configured & integrated tool set
- built on the corporate class library & tagging standards
- options open for ESPs to use their own authoring tools (with conversion to Rio Tinto systems prior to handover)

**HOSTED PLATFORM**
Maximise the benefits of Digital Delivery via Mandated Design Tools in a Hosted Environment
- fully defined & mandated platform for all engineering & design tools
- Rio Tinto controlled & managed project delivery environment
- ESPs must use this environment for project delivery – no handover req’d.
- optimal AWP execution methodology (full access to all potential DD benefits)
Digital delivery implementation details

Reframing how we define, engineer, deliver and handover projects to ‘engineer for value’

**ASSET INFORMATION REQUIREMENT SPECS.**
The Foundations for Digital Delivery through Consistent Metadata & Handover Standards
- fully defined requirements for project handover
- issued for use & available in PM+
- included in all contracts Schedule N and Specs List

**ASSET DATA MANAGEMENT**
- Asset Portal
- Asset Class Library
- AVEVA AIM (formerly AVEVA Net)
- AVEVA ISM for Standards & Compliance Management

**ENGINEERING & DESIGN**
- Engineering Authoring Tools
- AVEVA E3D
- AVEVA Diagrams
- AVEVA E&I
- AVEVA Engineering
- AVEVA ERM

**HOSTED PLATFORM**
- Cloud based AVEVA Platform for ESPs to use.

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Maximising Design Re-Use & Automated Design

Reuse a complete Primary Crushing Building design from a previous project

Parametric Utilities for Conveyor Trusses & Trestles

Low Level Conveyor Modules as Designed Assemblies

Primary Crushing Indirect-fed including ROM bin, static grizzly, apron feeder, vibrating grizzly feeder and C200 jaw crusher. (25MTPA)

Discharge 1500mm wide, 226m long primary crushing discharge conveyor and transfer station

Overland 1500mm wide, 7.9km long overland conveyor with four horizontal curves. Belt speed = 4.2m/s. 3x 1.1MW drives.

Surge Bin 740t surge bin facility, feeding onto a single existing plant conveyor, includes one fixed apron feeder.
<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary Crushing</td>
<td>Indirect-fed including ROM bin, static grizzly, apron feeder, vibrating grizzly feeder and C200 jaw crusher. (25MTPA)</td>
</tr>
<tr>
<td>Discharge Conveyor</td>
<td>1500mm wide, 226m long primary crushing discharge conveyor and transfer station</td>
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<td>Overland Conveyor</td>
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<td>Surge Bin</td>
<td>740t surge bin facility, feeding onto a single existing plant conveyor, includes one fixed apron feeder.</td>
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</tbody>
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Parametric Utility for Conveyor Design

MODELLING CONVEYORS IN RIO TINTO'S AVEVA E3D
Typical Conveyor Trusses
Parametric Utility for Conveyor Design
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Questions?
Please wait for the microphone.
State your name and company.

Please remember to...
Navigate to this session in the mobile app to complete the survey.

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Over 20,000 enterprises in over 100 countries rely on AVEVA to help them deliver life’s essentials: safe and reliable energy, food, medicines, infrastructure and more. By connecting people with trusted information and AI-enriched insights, AVEVA enables teams to engineer efficiently and optimize operations, driving growth and sustainability.

Named as one of the world’s most innovative companies, AVEVA supports customers with open solutions and the expertise of more than 6,400 employees, 5,000 partners and 5,700 certified developers. The company is headquartered in Cambridge, UK.

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