Dave Bradbury
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Dave Bradbury - Portfolio

- Roles & Accountabilities
- Problem Solving Examples
- Technology Examples
- Current Work

Dave Bradbury
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Position: # Senior R&D Manager
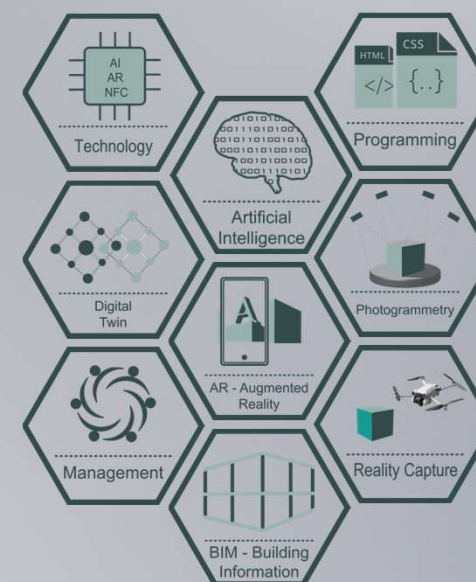
Accountabilities

- Administer & configure Autodesk Construction Cloud

- Power BI bespoke reports from ACC data updated daily

- Manage ACC Admin & Technical Products team

- Engage business & solution ideas including budget, plans & ROIs

- Be the main knowledge on Digital Twins, robotics in construction, AI & AR

- Create apps in iOS & low-code to provide bespoke solutions, particularly in AI & AR (using iPads & HoloLens)

- Lead the Citizen Coders group for Microsoft Power Platform

- Actively involved in MMC (Modern Methods of Construction) & DfMA (Design for Manufacturing & Assembly) with the acquisition of ESS to the company

Company

Company: ISG Ltd.

Sector: UK Construction

Functions

Dave Bradbury
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Position: Manager of Information Management

Project Accountabilities

- Manage team of 20 IM people on all Oil Sands construction projects
- Accountable for standards & governance for all data & docs
- Audit Engineering Contractors for compliance to standards
- Contract & manage off-shore resources for data scraping
- Turn-over project data, validated & correct to Operations
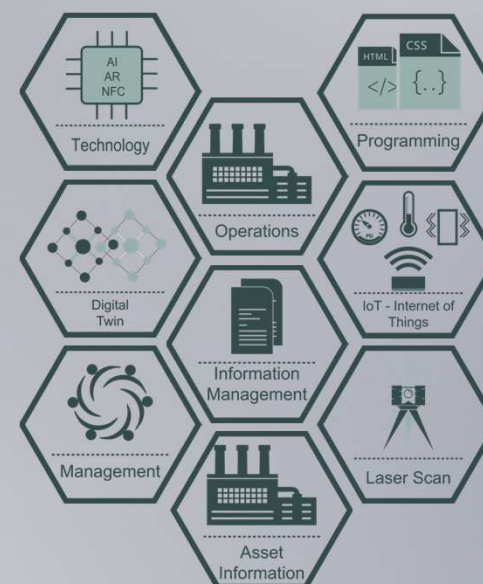
Operations Accountabilities

- Accountable for updated Operations projects data & documents
- Validated Operations projects compliance to standards
- Managed turn-around & shut-downs data preparation
- Managed the docs & data needed for work face planning
- Periodic audits to standards for legacy documents & data
- Reporting to Operations leadership on state of information

Company

Company: Nexen & CNOOC

Sector: Oil & Gas, Canada

Functions

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Position: Senior Systems Implementor

Accountabilities

- Pre-sales support & product demonstrations
- Producing technical proposals for solutioning ideas
- Customer success scopes for select clients
- Consultancy to clients, owner/operators, engineering & general contractors
- Understanding business processes to offer solutions
- Providing budget, plan & schedule for sales team
- Creating bespoke applications to transition data for client's requirements
- Travel throughout UK to attend client's offices & sites
- Perform training on products, including in France (in French)
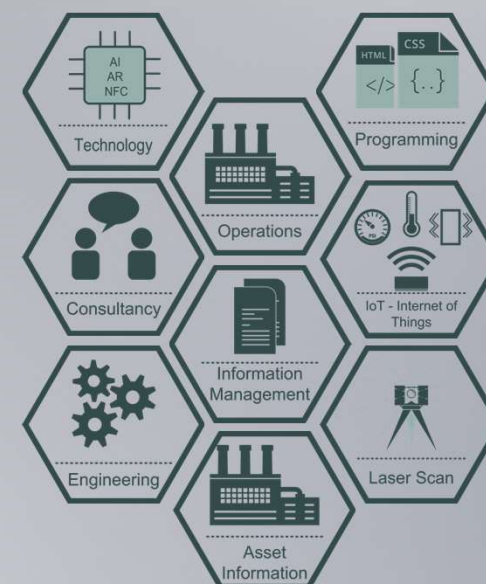
Clients (examples)

Company

Company: CADComp DataCAD

Sector: UK Engineering

## Functions

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Problem Solving – Incompatible Software

Problem: In 2004, Fluor Canada was invited to bid on part of Petro-Canada's $12 billion Fort Hills plant. Fluor used OptimEyes, containing proprietary design standards, to model their portion. The client required delivery in AutoPLANT format based on AutoCAD, with no conversion possible between the systems.

Proposed Solution: Dave Bradbury proposed a two-pronged solution to company leadership. Fluor could leverage its experience and standards by designing in OptimEyes. A custom Visual Basic program would then convert the data to AutoPLANT script. This program would be developed in stages - starting with structural steel, then equipment, then pipes - providing time for designers to model before final translation. It would also validate the data, flagging any issues. A 3-month plan with weekly sprints and validation milestones was drawn up and presented to the board, who approved the proposed cost.

Outcome: Fluor's bid, with the required deliverable formats, won them the scope. Dave Bradbury received a special financial award and client commendation for ingeniously leveraging software to solve the problem. After award, he trained designers on AutoPLANT for continued design through project completion.
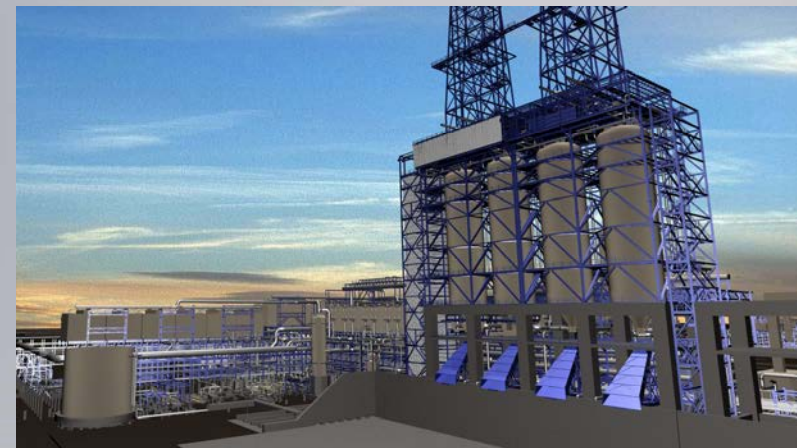
Above image taken from translated 3D model

Translated: 2500 pipelines, 150 separate pieces of equipment & multiple steelwork members in 2.5 hours

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Problem Solving – Resistance to Change

Problem: ISG signed an Enterprise Agreement with Autodesk for BIM360 / Autodesk Construction Cloud but projects resisted adopting the products. Dave Bradbury was tasked with overcoming resistance and implementing the suite on two key projects.

How was this Achieved?: Dave Bradbury met with Project Directors and Managers to understand concerns about adopting the new software. Minimum adoption criteria were established and agreed upon. Each criterion was further broken down into required processes, documentation, training, and resources needed from the projects so that budget, schedule, and work impacts could be detailed, shared, and planned. Power BI reports were also set up to showcase additional benefits and intelligence the solution would provide.

Feedback & Engagement: Regular feedback was gathered from leadership and implementation teams. This was shared transparently so the entire team felt engaged and could track progress of the software adoption.

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Client Value-Add Examples

Flour / Petro-Canada 3D Plant Conversion

- Design++ OptimEyes to AutoPLANT 3D conversion
- Dave Bradbury wrote routines to automatically route objects
- Actual conversion of 2500 pipes, 150 equipment & multiple steel in 2.5 hrs

Huntsman Tioxide PDF Printing Solution

- Dave Bradbury wrote a routine to re-purpose 1 machine as an Acrobat server
- 50+ users ran another program to print to PDF using a single license only

Huntsman Tioxide Cable DB to Drawings

- Electrical discipline maintained an Access database of cable connections
- Wrote routine that extracted 2500 DWG files in 1 hour based on templates

Dow Corning 3D Pipe Conversion

- Translated PDMS pipe routes to AutoPLANT 3D model
- Re-purposed the Isogen output files to save over 2000 hours of draughting changes

Shell UK AutoPLANT 3D BOMs to SAP

- Dave Bradbury was requested to write input files for SAP from AutoPLANT 3D BOM
- Data export directly from 3D models, validated & auto created input files for SAP

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Material Handling with ACC

The client required an efficient system to manage site-shipped materials, with a centralised data source providing visibility into status and storage locations
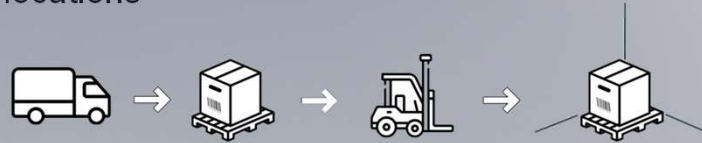
Through Dave Bradbury's innovative approach, the existing ACC system was repurposed to track and manage each pallet of material arriving on-site. Each storage or lay-down location was identified, and comprehensive reports are able to be generated to track materials not yet installed.

This solution reduces the time and effort required to locate materials, including the need for contractors to charge for "missing" items. Unlike systems that rely on adding new barcodes or identification tags to material packaging, Dave's system leveraged the existing shipping barcodes provided by vendors or logistics companies. When the materials were unboxed, the barcodes or NFC tags on the individual equipment were then repurposed for tracking purposes.

Leveraging existing shipping barcodes, rather than new tags, the system tracks materials through unboxing, providing real-time, permission-based visibility for all stakeholders via mobile devices.
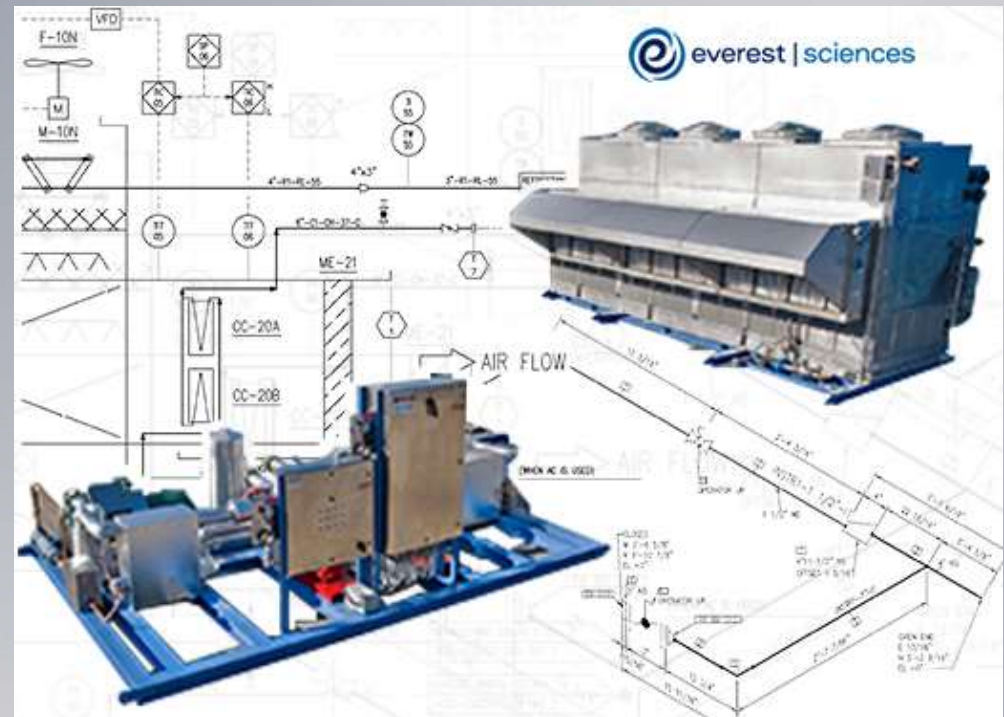
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Everest Sciences – 3D Modeling Upgrade

Client Scope: AutoCAD Plant 3D & P&ID

- Introduce intelligent design & re-use
- Incorporate client standards
- Create a default project configuration & database
- Add a client-specified configuration

Client Benefits Realised

- Reduced time to create a new projects
- Modular approach brought consistency of equipment & material
- Asset "just-in-time" delivery realised
- 2D drawings exported from model & database
- Consistent reporting

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Refrigeration 3D Design

AutoCAD Plant 3D & P&ID

- Redesign of a unit Dave Bradbury designed & manufactured in the mid-1990s for York International
- Refrigeration specific line classes & valves
- Autodesk Inventor was used for the big items like the compressor, then "shrink-wrap" function exported the graphics to Plant 3D
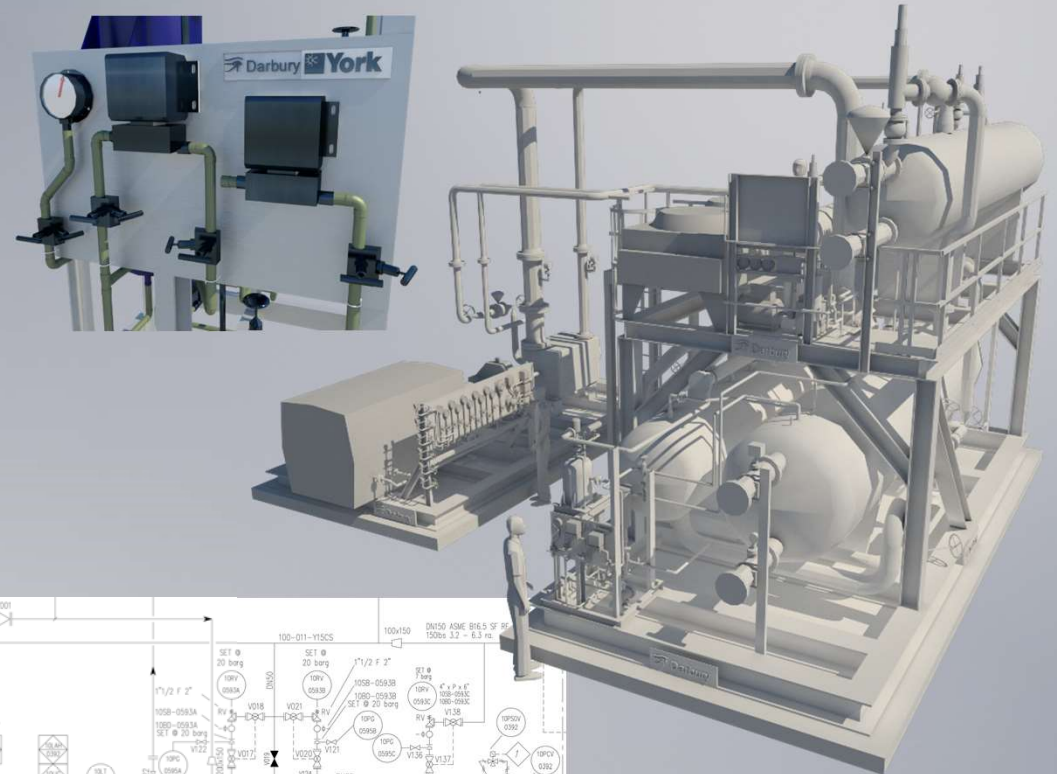
Benefits Realised

- Principles of Modularisation & DfMA used
- Traditional documents extracted from the 3D model
- Reports directly from the model database
- High quality images extracted via Autodesk Cloud Rendering system

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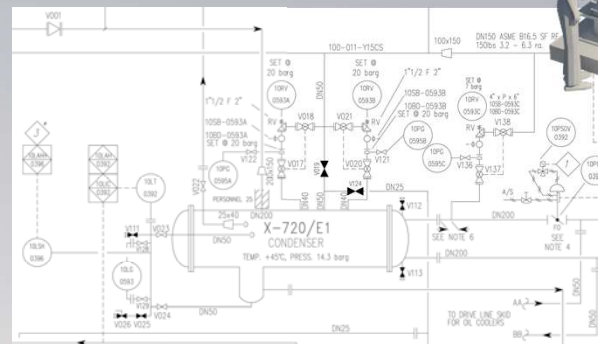
Augmented Reality Examples

Dave Bradbury has been involved with Augmented Reality using both Microsoft HoloLens & Apples iOS devices for a number of years. These are 2 examples of the applications produced during this time:
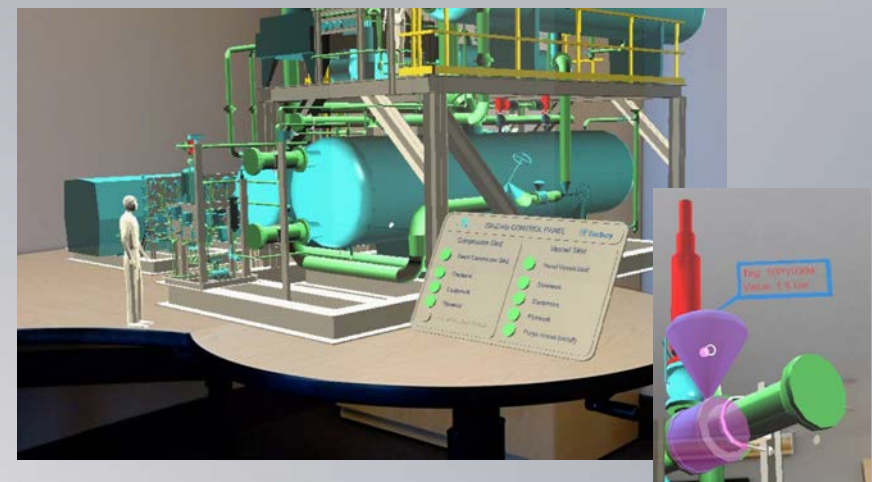
Apple iPhone App

User selects a plane & the 3D model is fixed in place. Using the crosshairs, the asset information is displayed in the bottom-left of the screen.


Microsoft HoloLens App

User selects a point to place the 3D model using the HoloLens. As the user moves the live cloud data is shown in visual boxes to the user.

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Reality Capture – LiDAR & Drone

Dave Bradbury is a qualified drone operator & uses the device to capture video & 3D models of facilities. Using the capabilities of the iOS devices LiDAR sensors, he is currently investigating more advanced methods of using the data in construction & design.
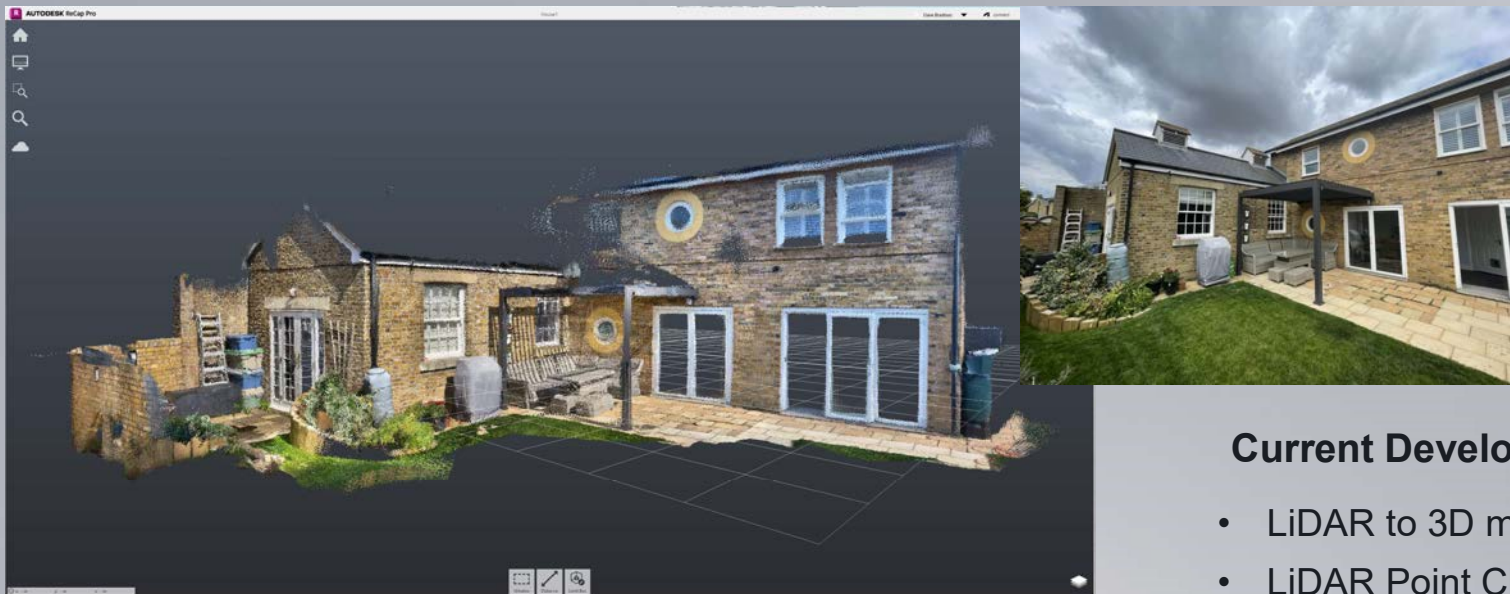
Current Development Scopes

- LiDAR to 3D model formats
- LiDAR Point Cloud position analysis
- Drone Photogrammetry best practices
- HoloLens scanning enhancements
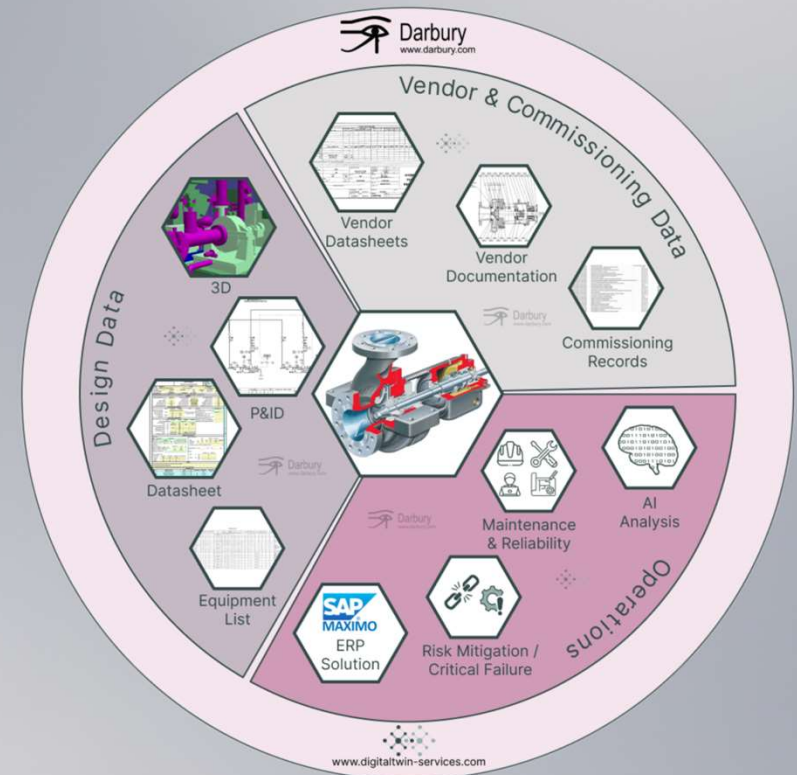
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Asset Information Management (AIM)

Whilst working in the Canadian Oil & Gas industry, Dave Bradbury was accountable for all aspects of Information Management (not just Document Control) on live Operational facilities.

## Asset Information Management (AIM)

Understanding how to combine the **Document**-centric Project Information with the **Tag**-centric Operations for everything from new facilities to retrofitting of existing plants & buildings. This is a foundation level for Digital Twins.

AIM Implemented for Clients

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Digital Twin Implementation

Dave Bradbury has been involved with Digital Twins & their predecessors for 10+ years. He has created a website to increase the accurate knowledge & discussions of the subject.
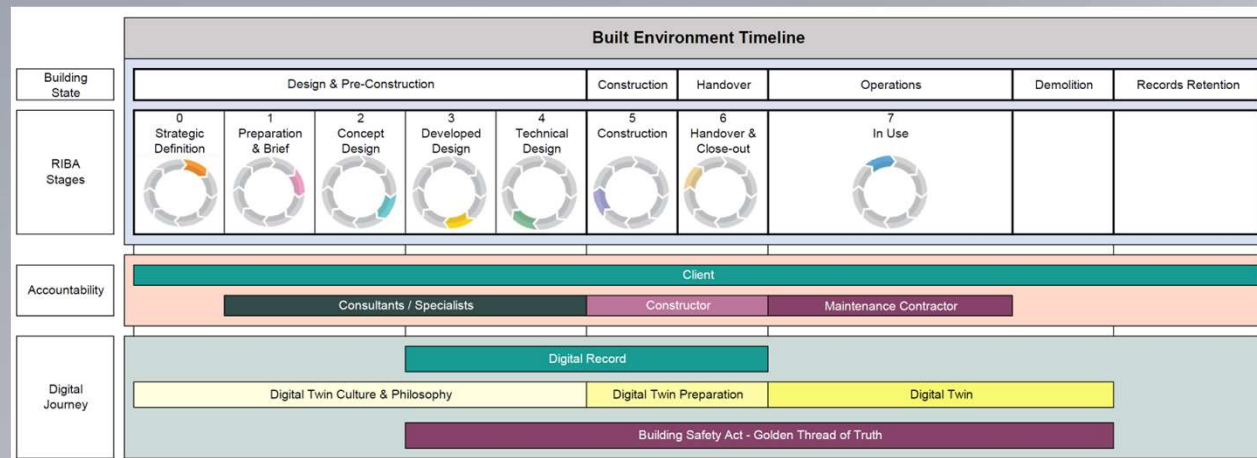
www.digitaltwin-services.com

Industry

- Completed early Digital Twin for Long Lake site at Nexen (@2016), using 2D drawings, spreadsheets & live plant data

- Showing that Digital Twins have different definitions in different industries

- Consulting to Oil & Gas industry on best practises

At ISG

- Held board-level discussions about Digital Twin definition

- Assisting ISG in having standard bid responses

- Proposed new group to consult with clients about best practises for Digital Twins

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MoMC, DfMA, Robotics & Sustainability

During the recent employment with ISG, Dave Bradbury was working on the following emerging technologies in conjunction with selected sites & the ESS (modular fabricators) acquisition

Methods of Modern Construction (MoMC)

- Material Tracking solution using ACC, demonstrated to client on Google KGX1 project
- Off-site Modularisation & early engagement with contractors

Robotics

- Review of vendor capabilities
- Analysing IT requirements per machine
- Pilot projects of HoloLens & HP SitePrint

Design for Manufacturing & Assembly (DfMA)

- Using previous Manufacturing experience to assist ESS with bespoke AR solutions
- Advising on initial increase of cost for DfMA
- Defining material selection & standardisation

Sustainability

- Directly engaged with Material Passports on Google KGX1 project
- Passport fields defined within ACC
- Using NFC tags for ACC Asset tracking