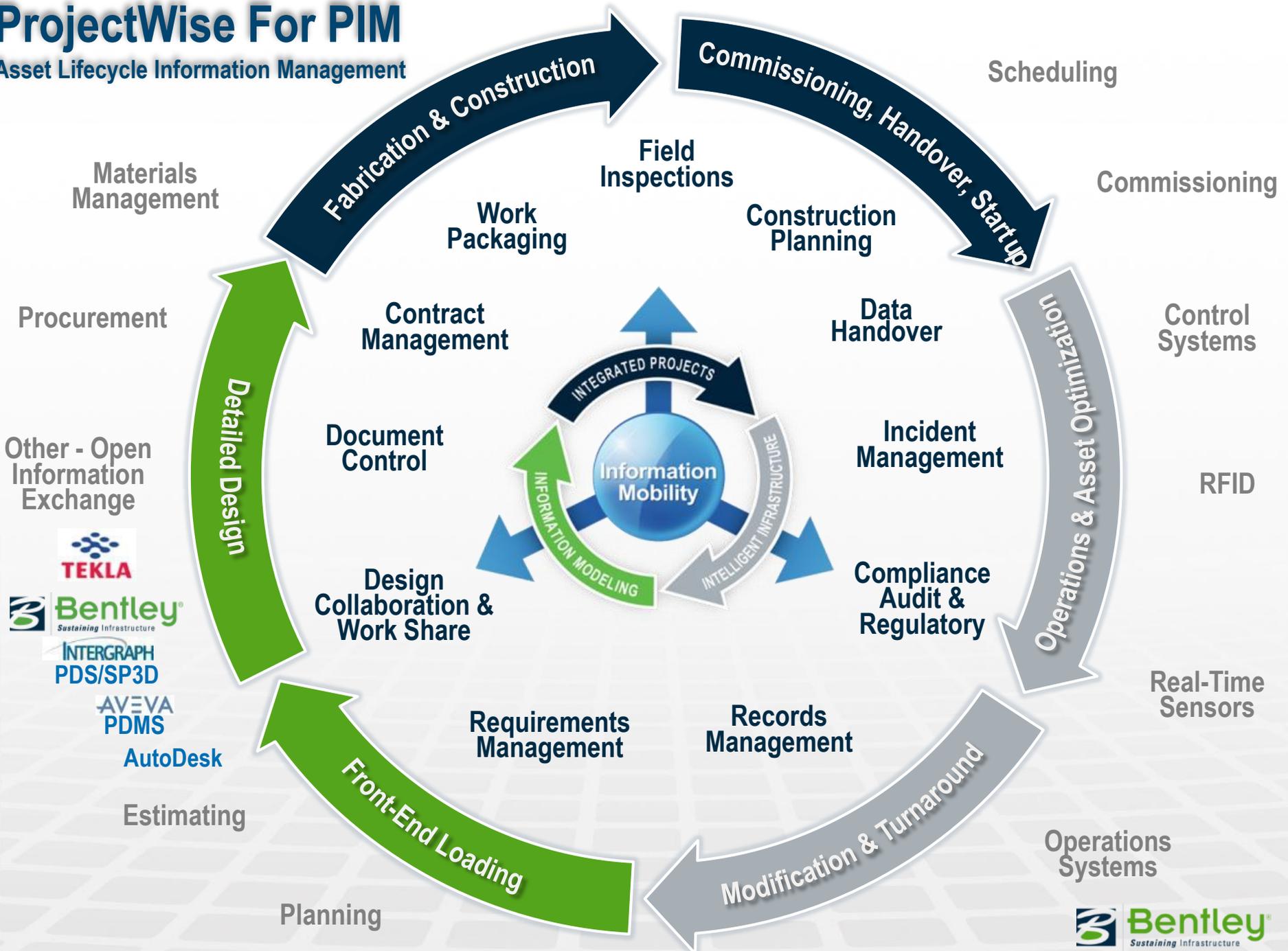




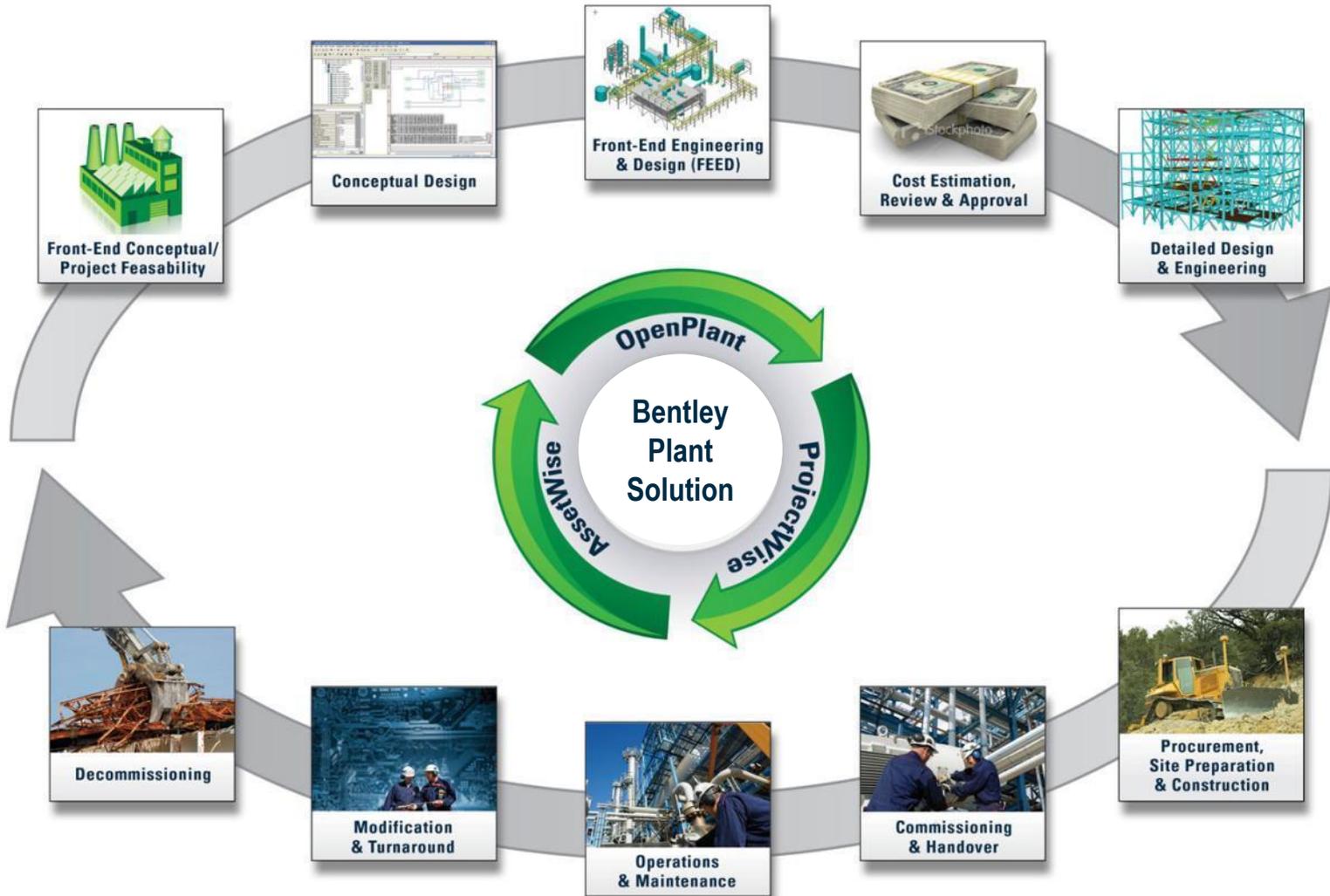
Bentley Plant Design Solutions Interoperability

ProjectWise For PIM

Asset Lifecycle Information Management



Bentley – Sustaining Infrastructure



Bentley Helps Solve These Challenges

Problem

- Proprietary lock-in
- How to track changing information in an auditable manner
- Connecting and empowering distributed teams
- Time and accuracy lost through non-repeatable processes

Solution

- Interoperability
- Tracking impact of change
- Facilitating global project team collaboration
- Risk reduction through data quality and reuse

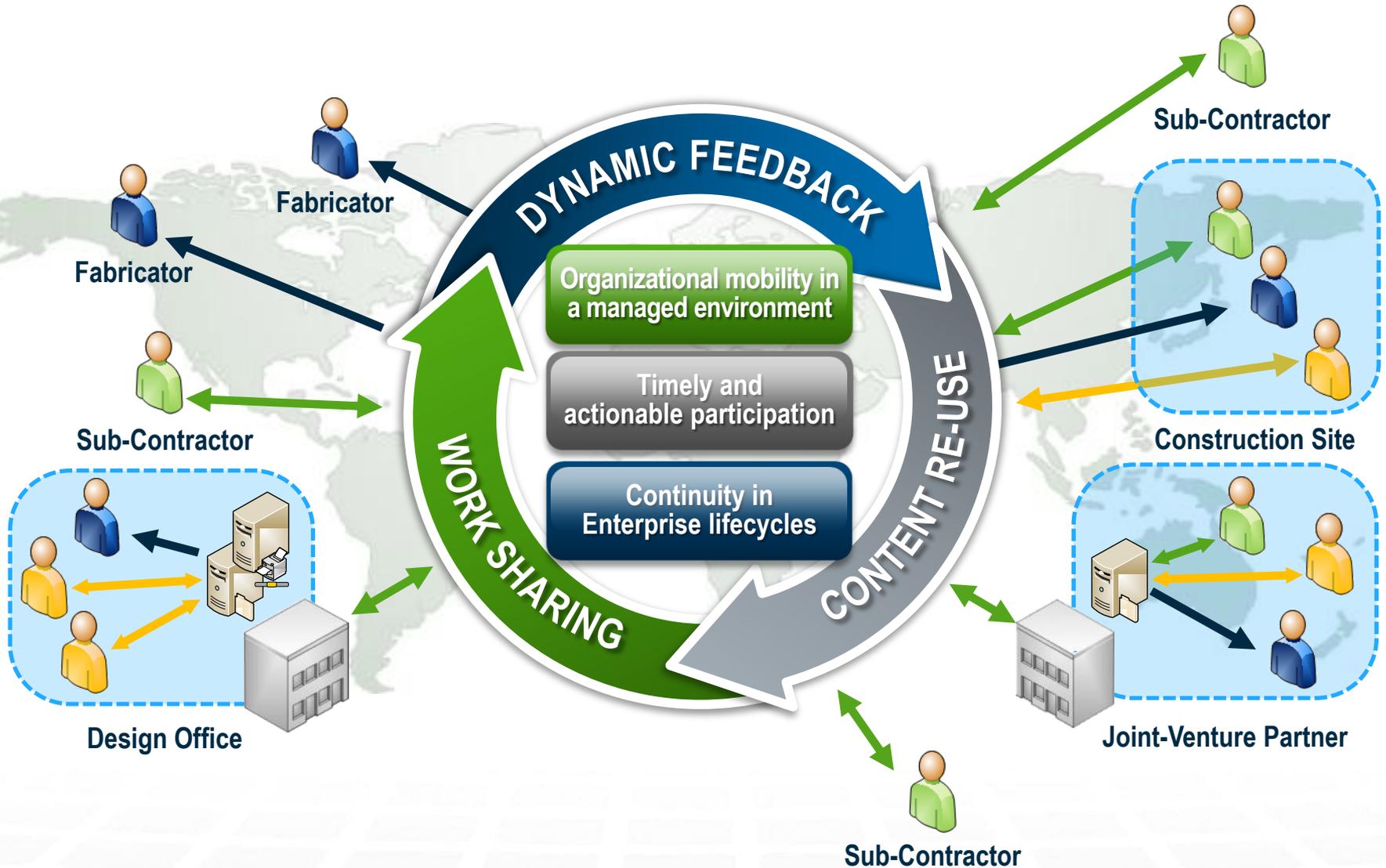
Agenda

- Bentley's Distributed Engineering Strategy
- Bentley's Information Mobility and Interoperability with i-models
- Bentley's Collaboration and Interoperability Strategy
- Cross-Discipline Coordination Services
- Summary



Distributed Engineering Strategy

Distributed Engineering

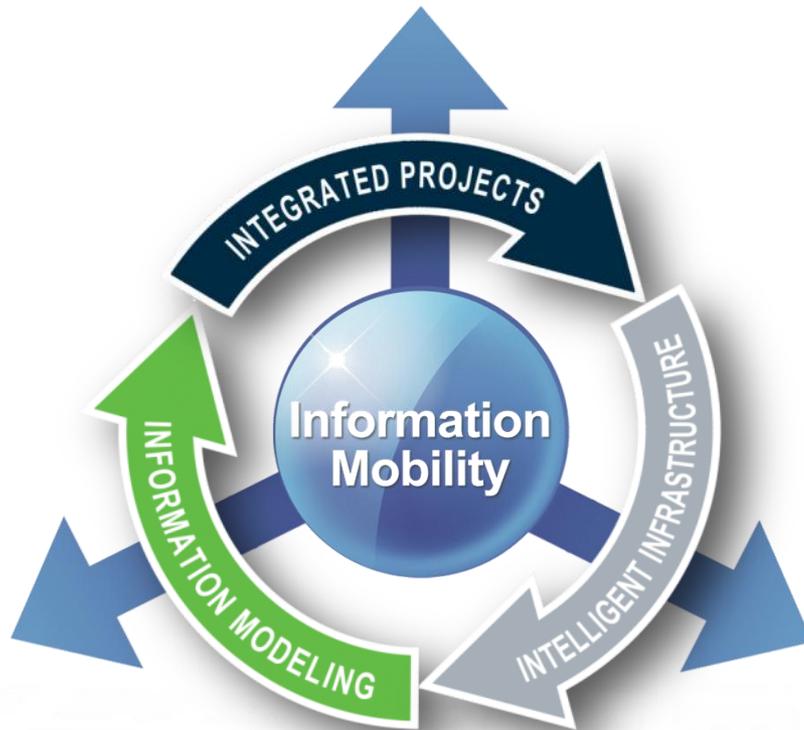




Information Mobility and Interoperability with i-models

Infrastructure Lifecycle...

*Information Modeling through
Integrated Projects for
Intelligent Infrastructure*

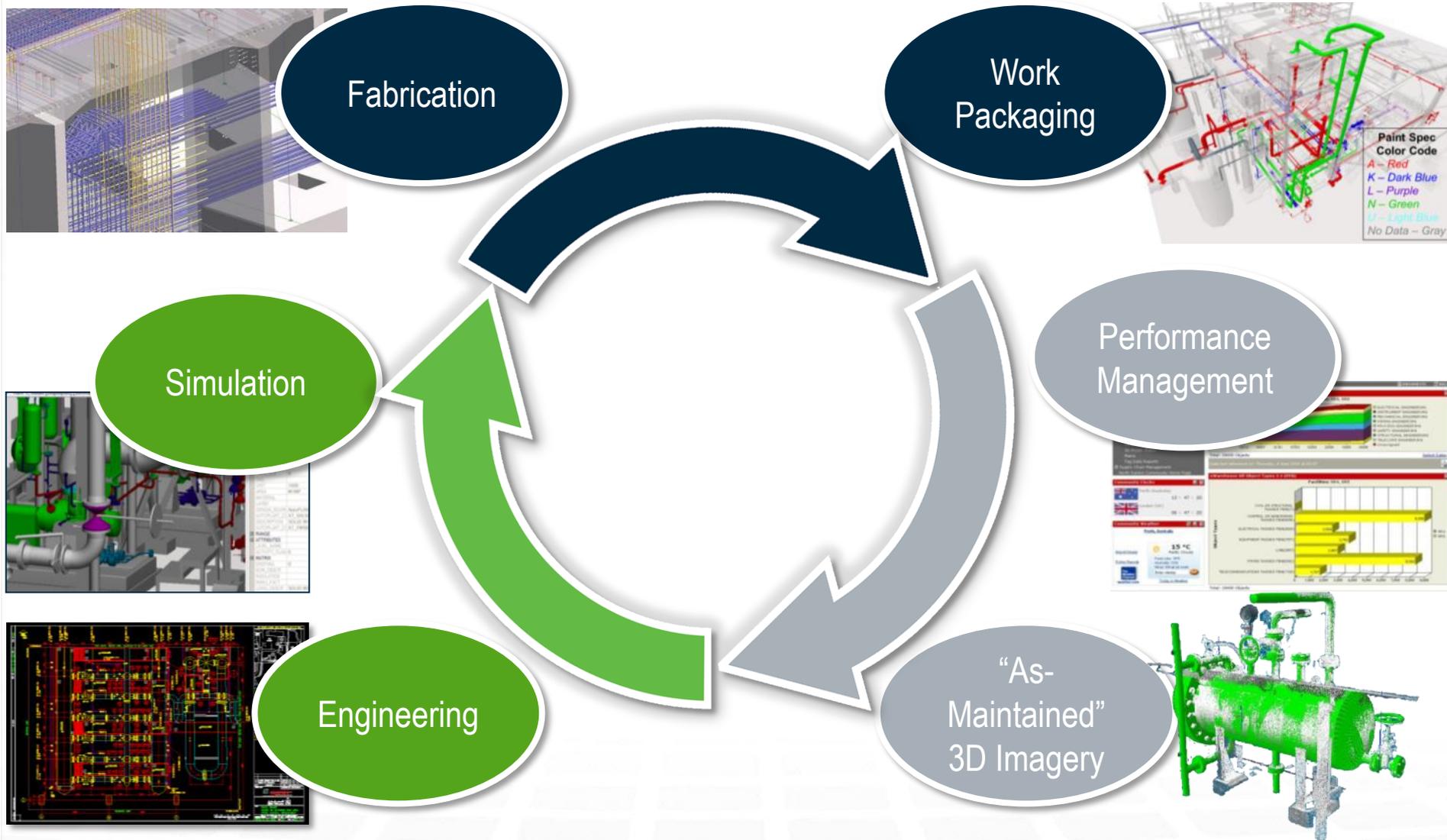


**RETURN ON
INVESTMENT**



**RETURN ON
TALENT**

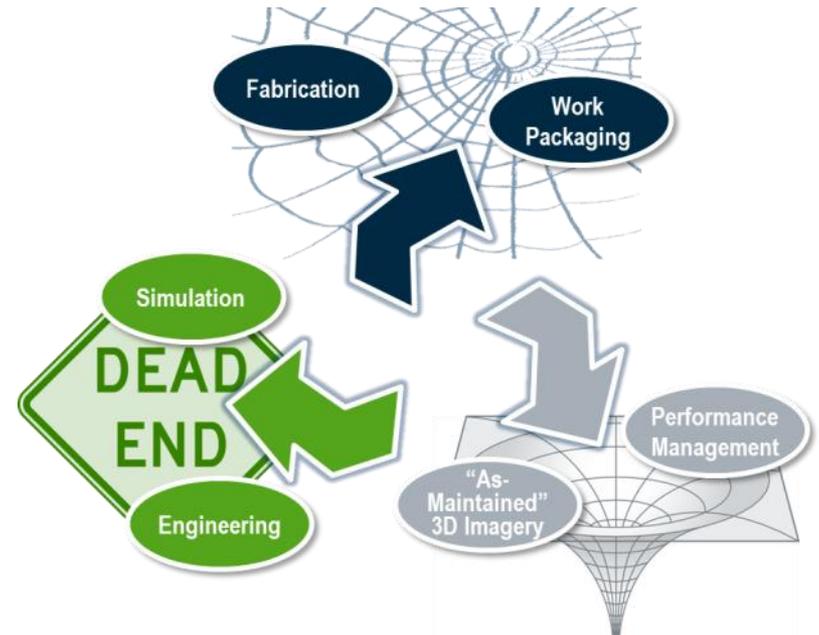
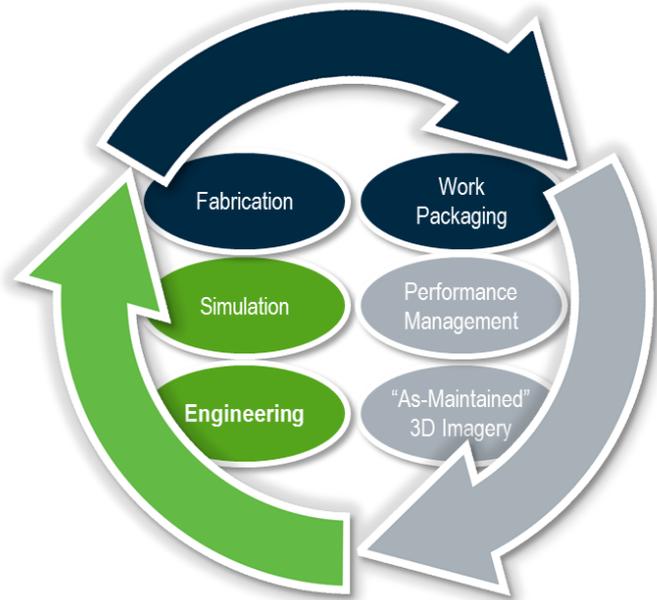
Infrastructure (Information) Lifecycle



Information Lifecycle

vs.

Information Mortality



Information Mortality Waste...

Can't ~~complete~~
the work



$2 + 2 = 5$



No access for
unauthorised
persons

Information Lifecycle (!)

- Information Mortality...
- Information *Mobility!*



Information *Mobility* (at Work!)

Delivering
Referencing
Reusing
Reviewing
Transforming
Sharing
Updating
Approving
Improving
Validating
Analyzing



REUSE



Information Mobility *Dividends*

Quality

Confidence

Teamwork

Alignment

Virtualization

Globalization

Agility

Responsiveness

Synchronization



Accelerating Information Mobility



Professional Workplace

Internet



Project Workplace

Accelerating Information Mobility



Wireless



Professional Workplace

Project Workplace

Accelerating Information Mobility



“Industrialization”

- Modularization
 - Manufacture (offsite)
 - Assemble (onsite)
 - Simulate (models)
 - Operate (intelligence)
- Productization
 - Global sourcing
 - Of engineering, construction!
- Commissioning



Industrialization: *Leveraging* Information Mobility



Professional
Workplaces

Global Sourcing



Project Workplace



Supply Chains

Industrialization: *Leveraging* Information Mobility



Professional
Workplaces

Fabrication



Project Workplace



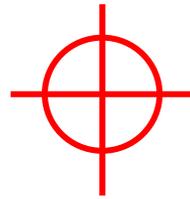
Supply Chains

Industrialization: *Leveraging* Information Mobility



Professional Workplaces

Intelligent Positioning



Project Workplace



Supply Chains

Industrialization: *Leveraging* Information Mobility



Professional Workplaces

Construction Simulation

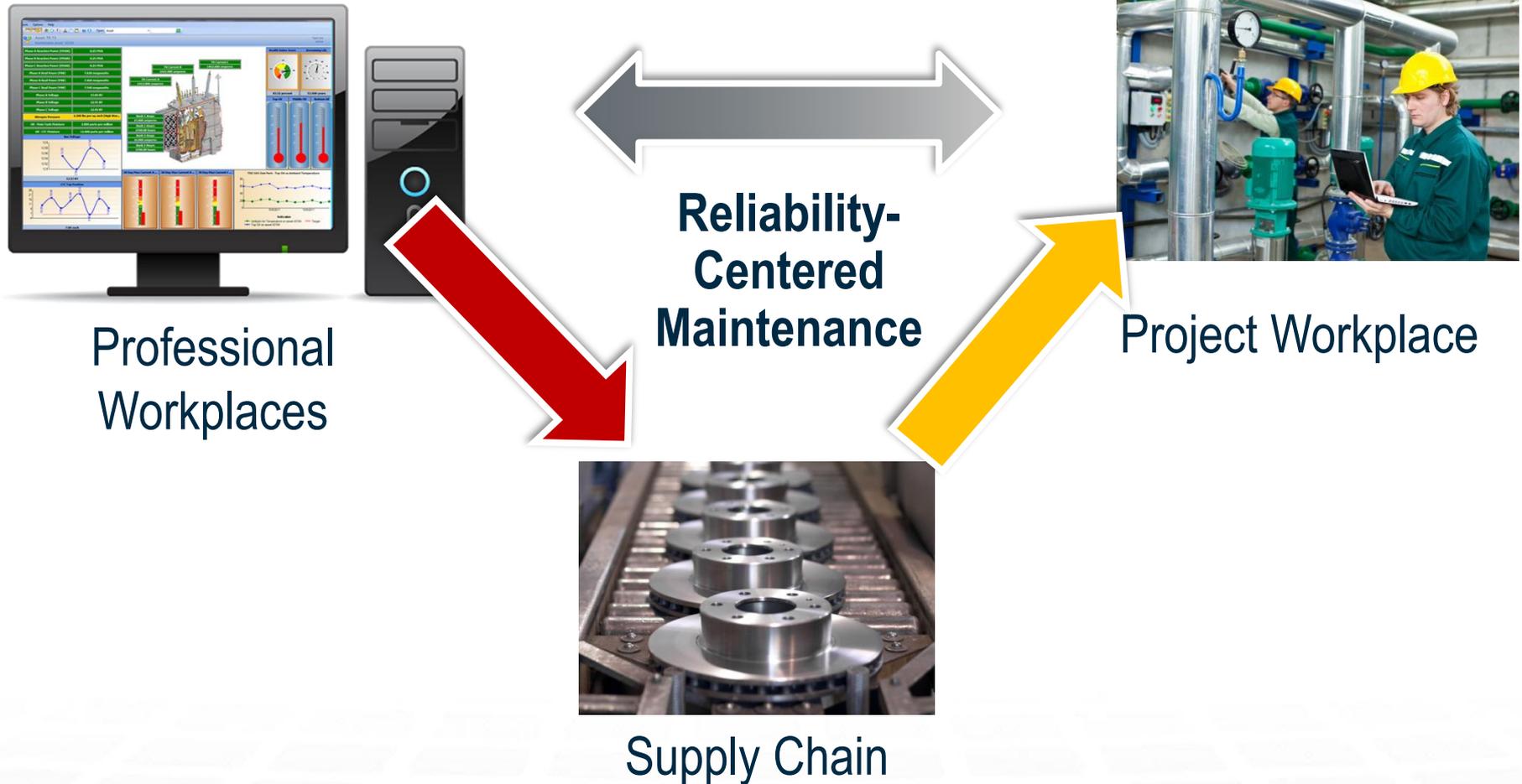


Project Workplace

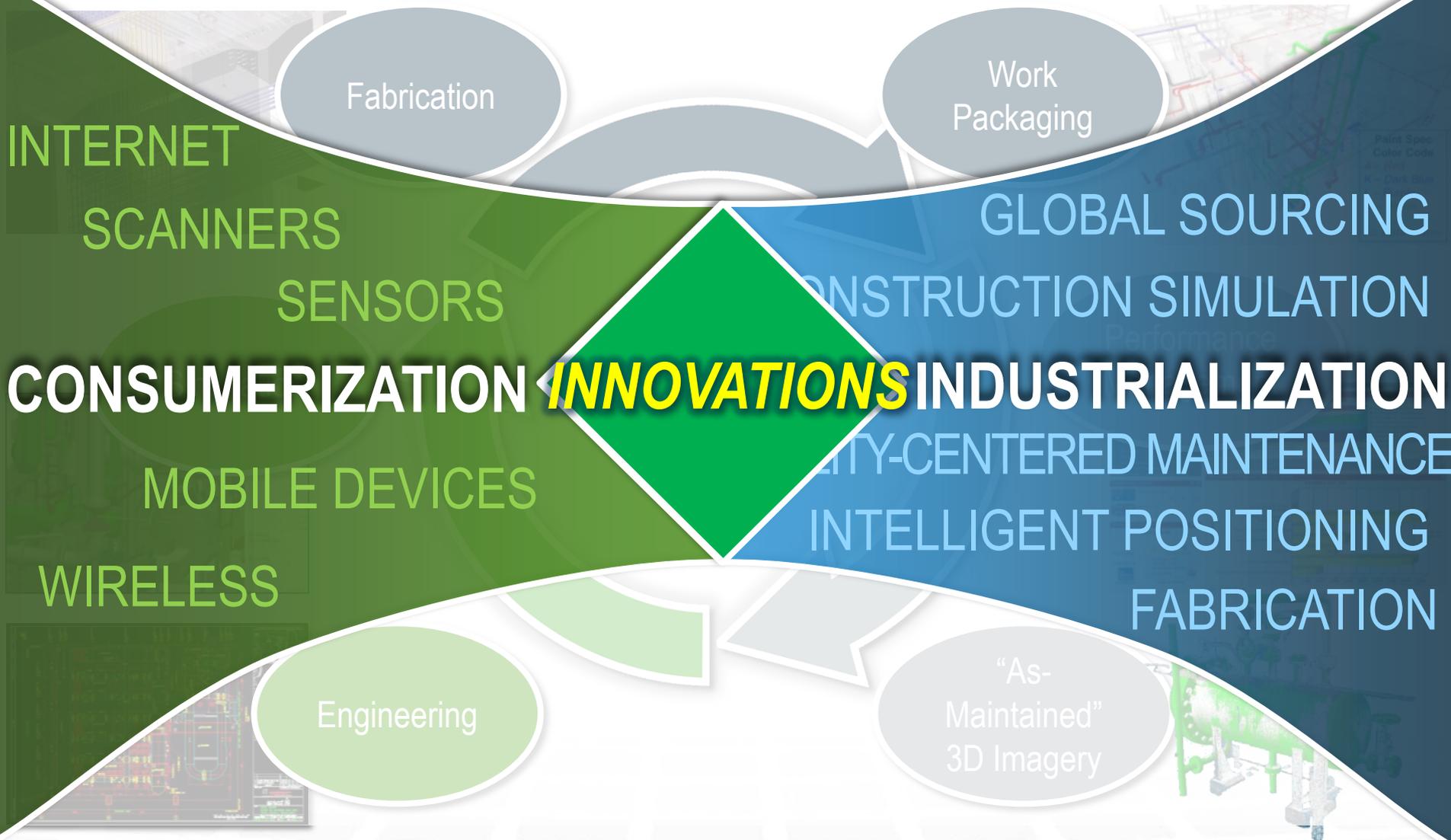


Supply Chain

Industrialization: *Leveraging* Information Mobility



Information Mobility "Sweet Spot"



Information Mobility

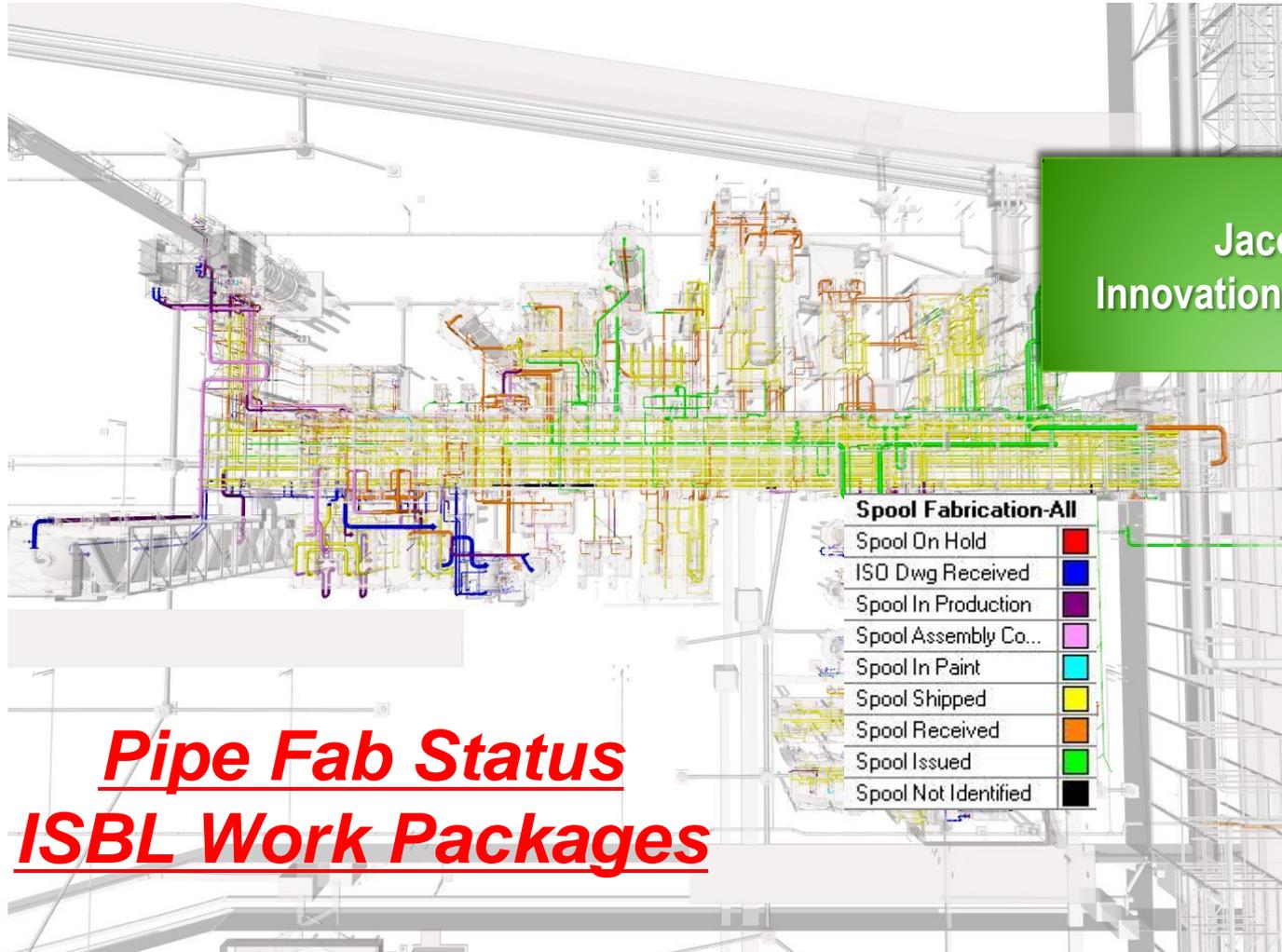
- **The long awaited payoff for interoperability:** ensuring the right information, in the appropriate format and level of precision, can be accessed by the right people at the right time.
- Bentley's *i-models* deliver this information mobility while *ProjectWise* secures it. Together, they ensure *information mobility with integrity*.



“Hand-off” Becomes *Hands-on!*



Jacobs Engineering
Innovation in Construction



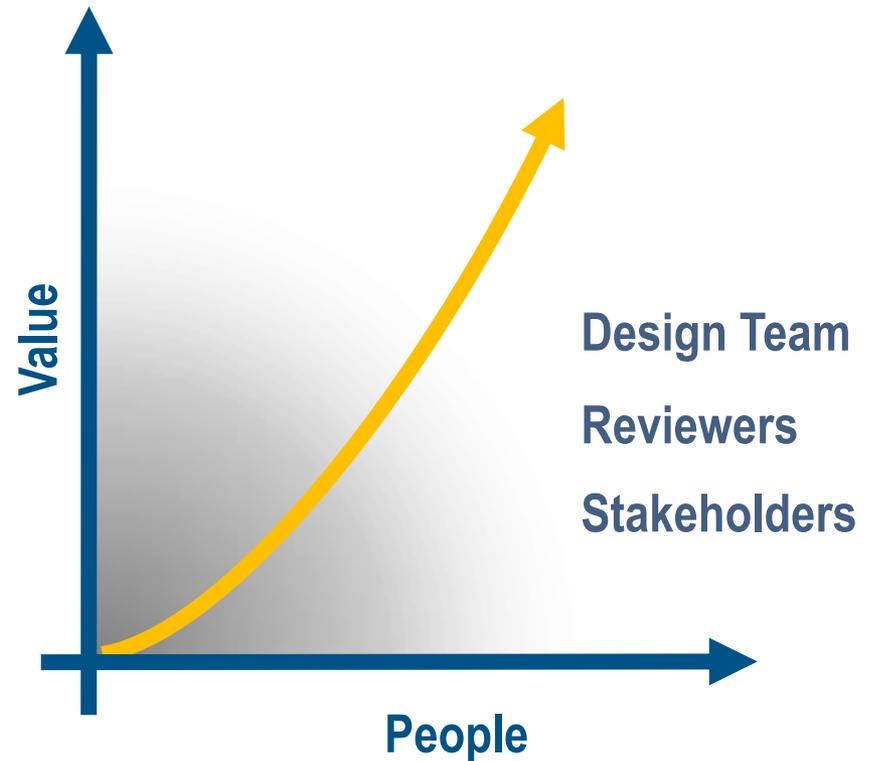
Pipe Fab Status
ISBL Work Packages

ProjectWise Secures Information Mobility



Greater Information Mobility

- Better coordination and teamwork
- More and better feedback
- Broader understanding



Information Mobility

i-models are:

- The key component of information mobility
- Remove information mobility roadblocks
- Applicable to all project and life-cycle workflows



iWare Apps for Information Mobility

- www.Bentley.com/iWare

- View models
- Exchange information
- Streamline workflows

- Many apps are free,
- others are passport-enabled.

iWare Apps for Information Mobility

Bentley's software serving information mobility for infrastructure professionals



One click and discover apps to view models, streamline workflows, and exchange information

Bentley recognizes that information mobility is crucial to the successful, cost-effective design, delivery, and operation of infrastructure. That's why Bentley is offering the following iWare Apps - many apps are free to download and use, others are passport enabled as indicated.

● Free ● ProjectWise Passport Enabled

Apps for All AECO Professionals

Bentley View ● Interact with DGNs, DWGs, and i-model files	AGS Toolkit ● Quickly validate AGS files and use them in Excel	FlexUnits ● Easily perform unit conversions
Structural Dashboard ● Manage structural workflows and information exchange	Structural Synchronizer ● Synchronize data, obtain revision history, and view models	Structural Synchronizer for iPad, iPhone, and iPod Touch ● View structural models on your iOS device
Bentley Navigator for the iPad ● Review 3D design models on the iPad	ProjectWise Explorer for the iPad ● Create, browse, and view ProjectWise documents on the iPad	i-model plug-in for Adobe Reader ● Leverage i-models for intelligent 3D PDF (coming soon)

Apps for Microsoft Windows 7 Users

Bentley DGN Reader for Windows 7 ● Preview and search DGNs and i-models in Windows Explorer and Microsoft Outlook	i-model Driver for Excel ● Access data within DGNs and i-models with Microsoft Excel	i-model Driver for Access ● Access data within DGNs and i-models with Microsoft Access
i-model Driver for Crystal Reports ● Access data within DGNs and i-models with SAP Crystal Reports	i-model Driver for Visual Studio ● Access data within DGNs and i-models with Microsoft Visual Studio	i-model ODBC Driver for Windows 7 ● Access data within DGNs and i-models
i-model plug-in for Adobe Reader ● Leverage i-models for intelligent 3D PDF (coming soon)		

Mobile Innovations

- Extending the reach of project data



iPad Apps (on Apple App Store)



- Navigator Pano Review
- ProjectWise Explorer
- Structural Synchronizer View
- Navigator Mobile
- InspectTech Collector Mobile
- ...and more.

go to

www.bentley.com/iware

i-model ODBC Driver

iWare Apps for Information Mobility
Bentley's software serving information mobility for infrastructure professionals

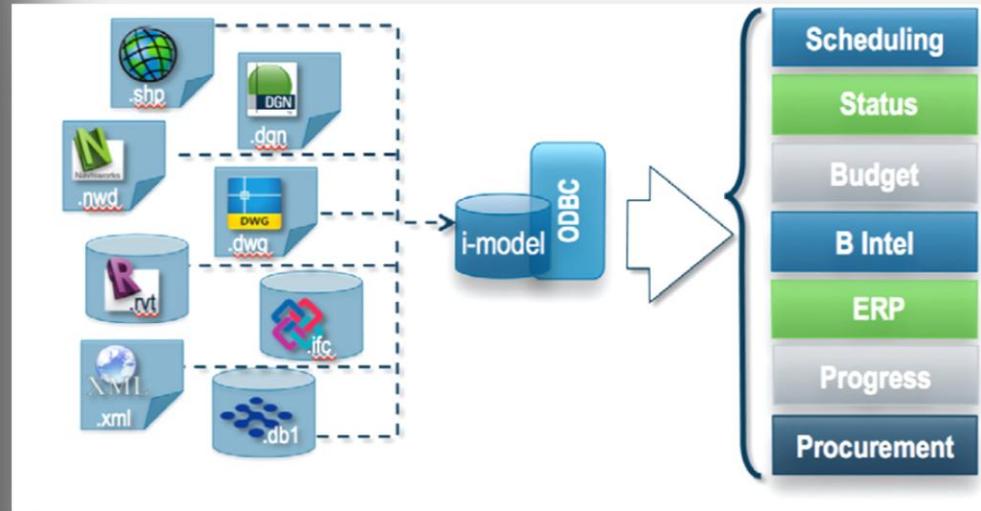
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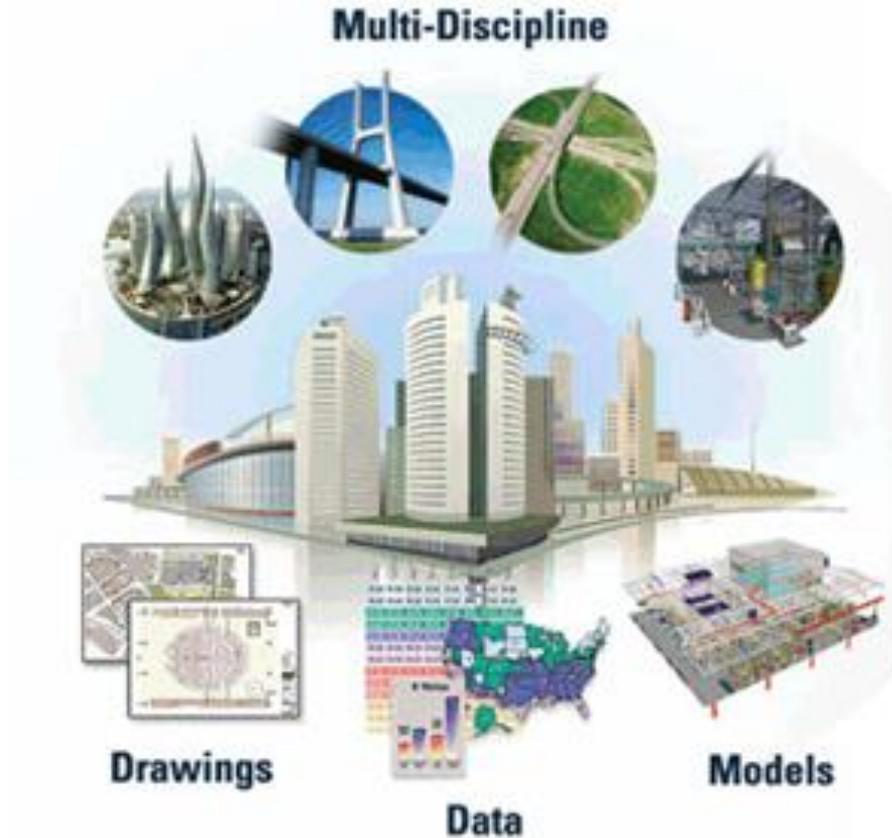
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	i-model Driver for Crystal Reports ● Access data within DGNs and i-models with SAP Crystal Reports	i-model Driver for Visual Studio ● Access data within DGNs and i-models with Microsoft Visual Studio	i-model ODBC Driver for Windows 7 ● Access data within DGNs and i-models
	i-model plug-in for Adobe Reader ● Leverage i-models for intelligent 3D PDF (coming soon)		

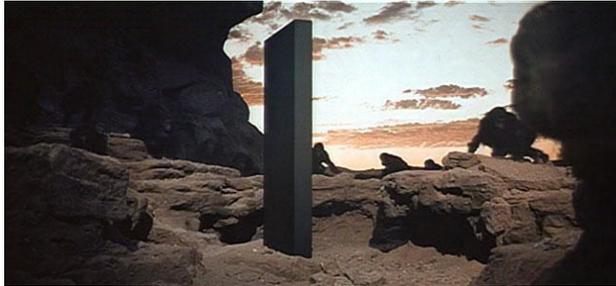
- Available as an iWare downloads
- Available in multiple forms
 - Excel, Access, Crystal Reports, Visual Studio



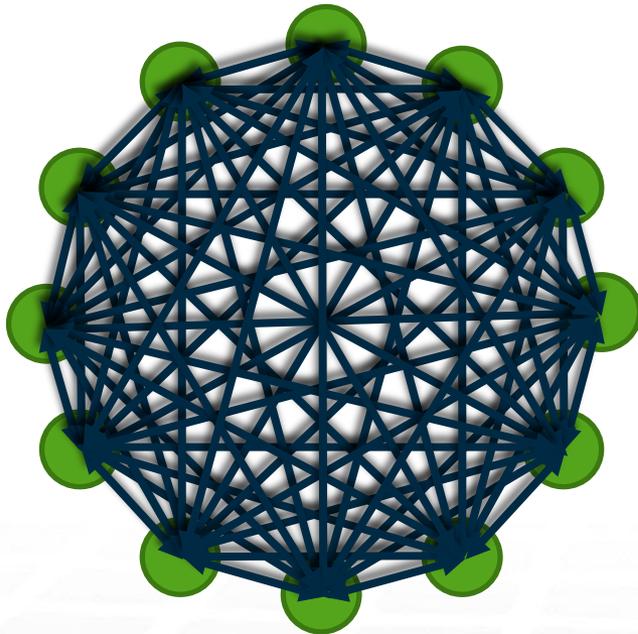
Information Exchange - Challenges



Information Exchange – Old World



- **Monolithic, centralized approach is incompatible with the dynamic and inherent uniqueness of each project**

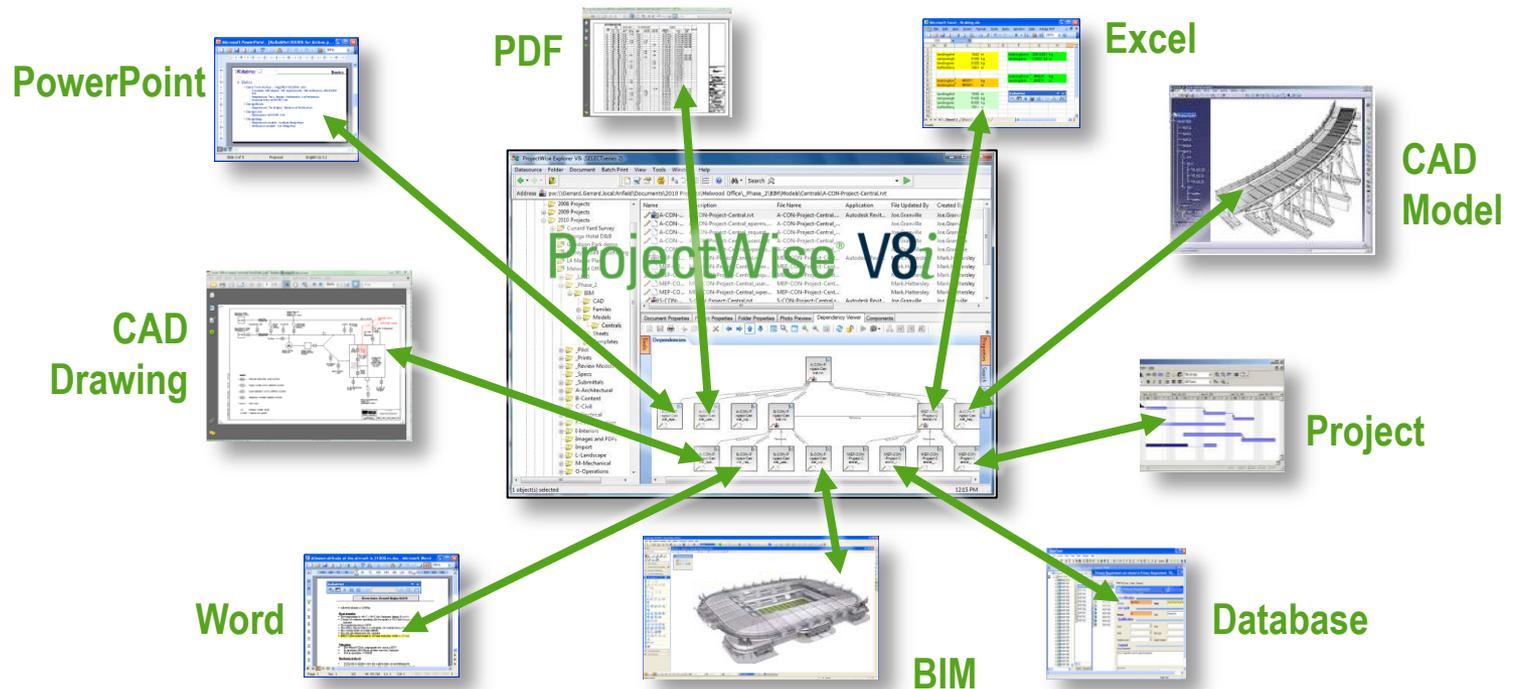


Point-to-point information sharing between applications seldom goes beyond importing and exporting file formats and does not scale.

Information Exchange – New World

“Federated” Project Data = Efficiency:

Each participant uses their own applications and file formats in their own locations.



Interoperability is achieved by federated strategy that supports information exchange using an application-neutral container (i-model).

i-model Container for Information Exchange



Precise

Provenance

Self-Describing

Portable

Summary

- Why use an i-model?
 - Secure “container” for rich component data including business properties, geometry, graphics, and relationships
 - Read-only, supports digital rights and digital signatures
 - Self-describing
 - No application knowledge is required to interpret an i-model
 - Provenance
 - Source, date, scope, purpose, history
 - Precise
 - Geometrically and geospatially
 - Open
 - Free applications, plugins and interfaces for viewing, query and integration
 - SDK available for 3rd parties and users

Go to www.bentley.com/interoperability

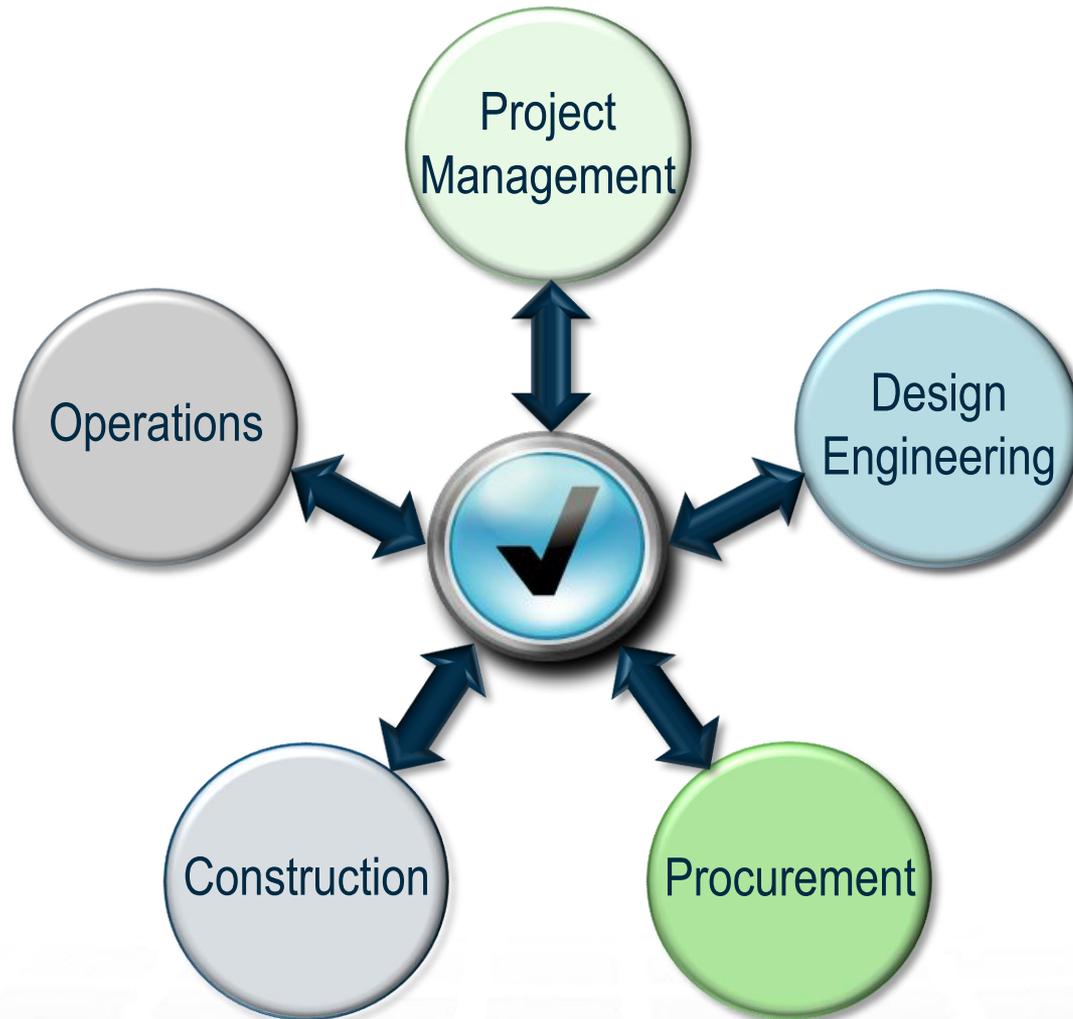


Collaboration and Interoperability Strategy

Interoperability Matters



Compliance with OPEN Standards





Engineering and Design Workflows *Addressing Federated Workflow Issues*

Engineering & Design Application Integration

- Engineering and design is
 - Complex
 - Iterative in nature
 - Focused on specialties/disciplines
 - Distributed with literally thousands of participants
- Interoperability is performed by binding like minded specialties/disciplines into “shared data repository”.

Assumptions/Facts

Ideal Solution in a “Perfect World”

- Engineering is executed in a linear fashion
- A single provider meets all your needs at the right cost
- Management of change is inherent
- A single database can represent all information to all parties
- All projects are created equal
- Technology is static

Reality

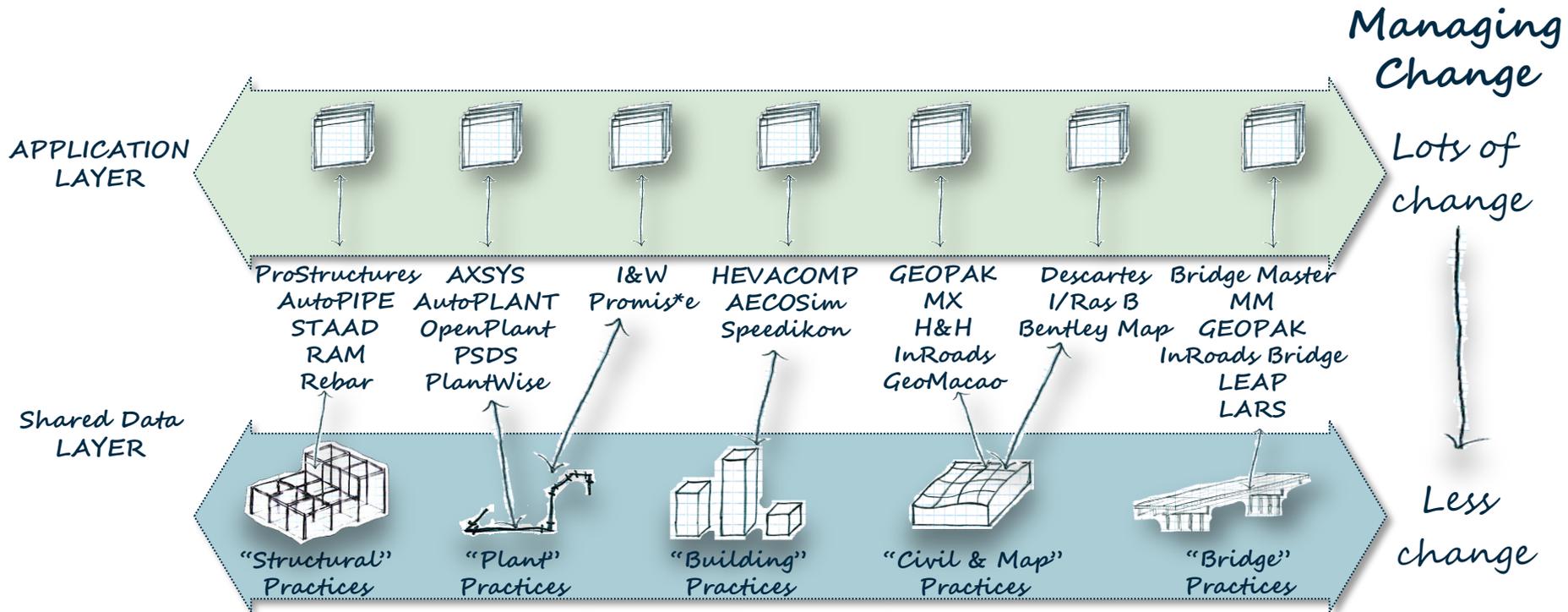
- Engineering process is not linear
- Data comes from various sources in a variety of forms and at unpredictable times
- Change Management is complex and change will happen
- A single database for the entire plant project lifecycle is too complex
- Every project is different
- Technology rate of change impacts everybody

Bentley Addresses These Problems By:

- Handling the non-linear exchange of information in complex workflows
- Helps you address the “what do I need, when do I need it and who do I need it from”
- Providing you with a control point to manage change
- Insulating the project from dynamic change within specialized applications

Cross-Discipline Coordination Services

Shared Data Repository

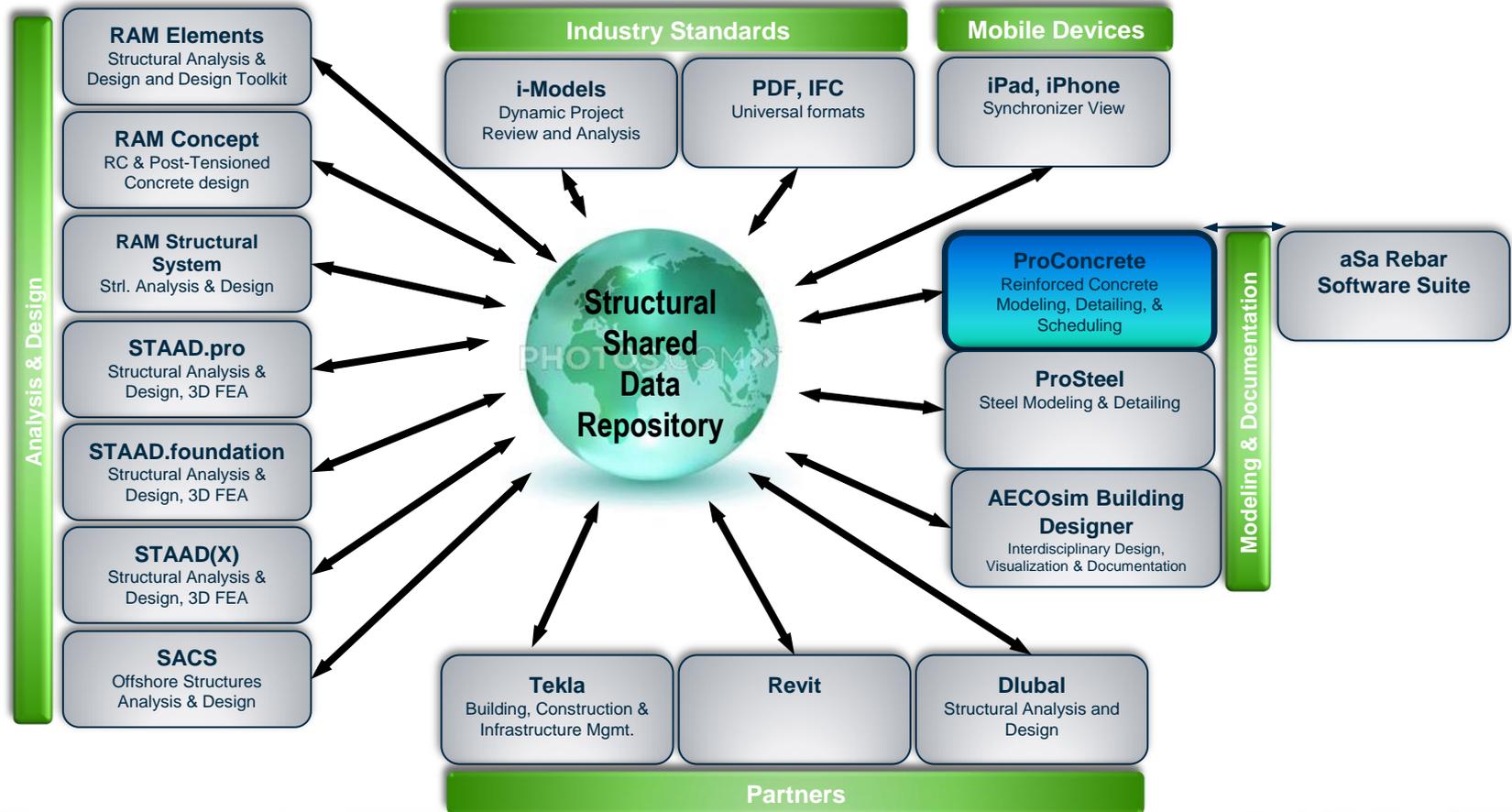




Shared Data Repository

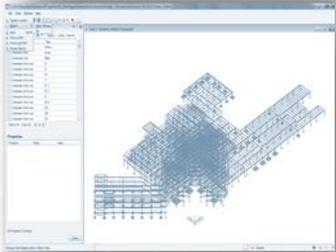
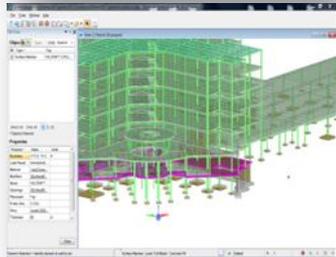
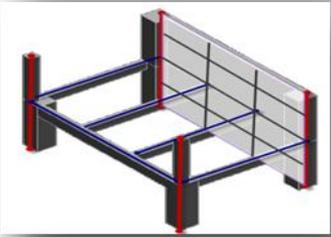
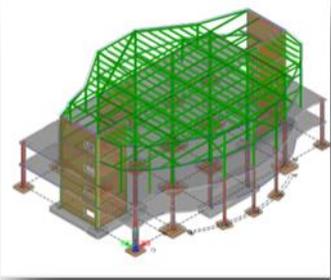
Working Examples: Structural Practice

Cross-Discipline Coordination for Structural Practice



Advantages of Information Modeling

Cross-Discipline Co-ordination for Structural Practice



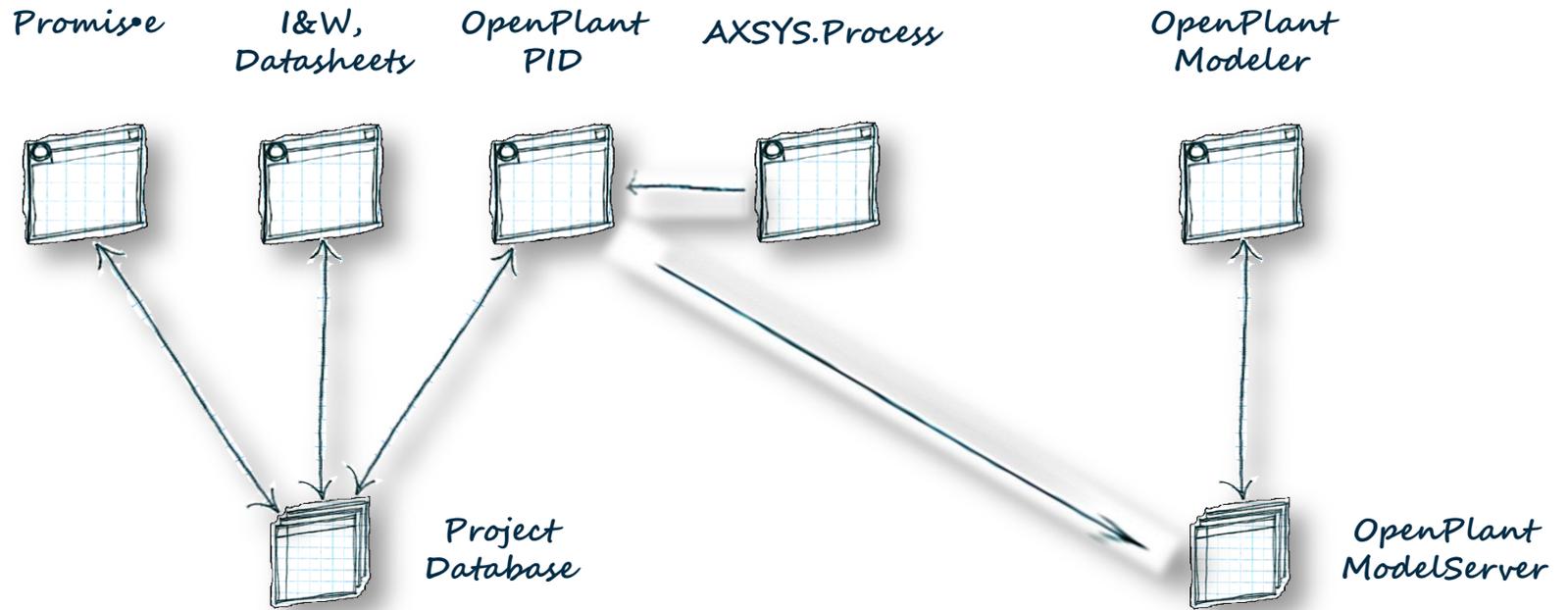
- Effective Change Management
- Precise Analytical – Physical Design
- Realistic Visualization/Simulation
- Reliable and Persistent Revision History



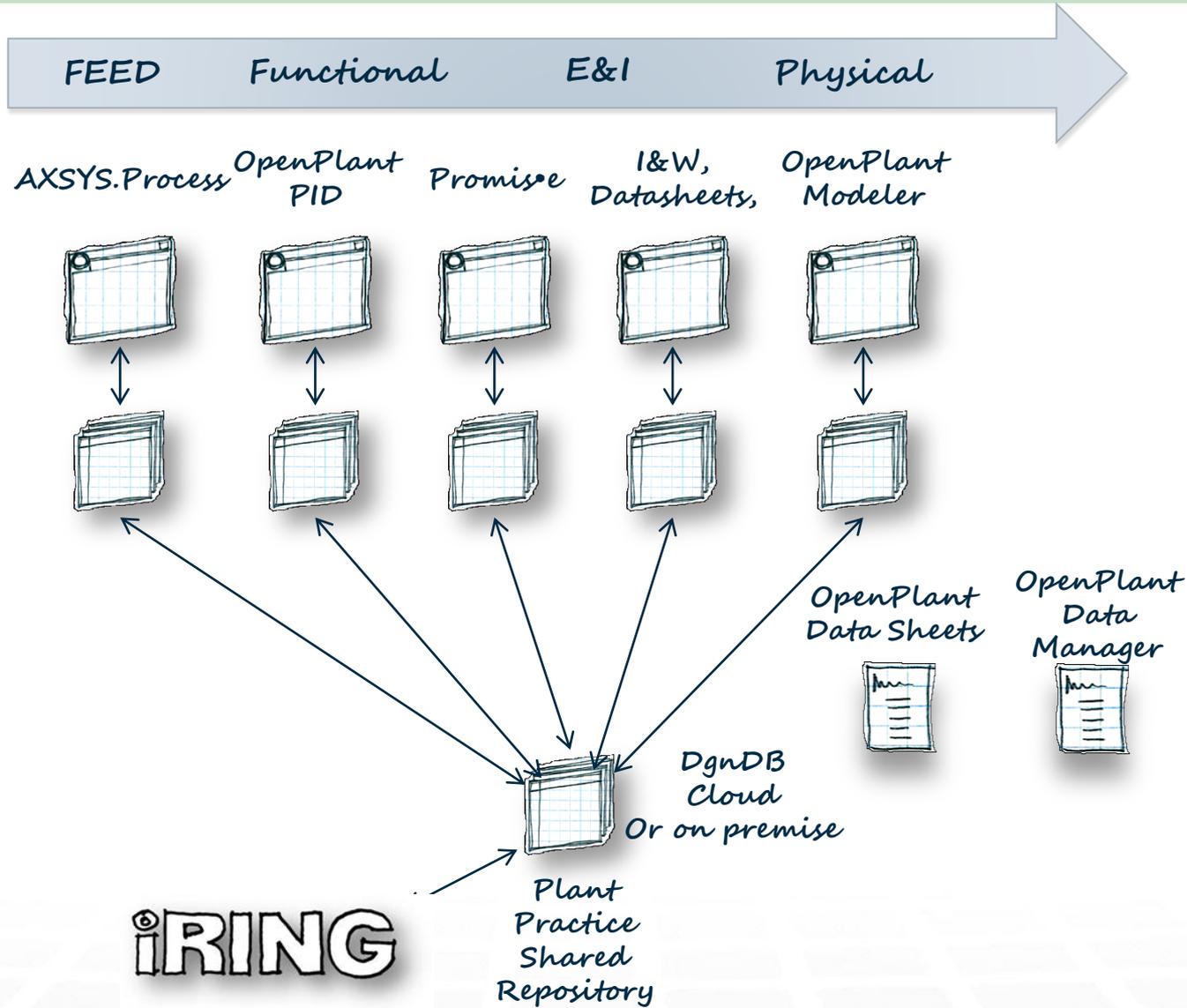
Shared Data Repository

Working Examples and Future: Plant Practice

Today

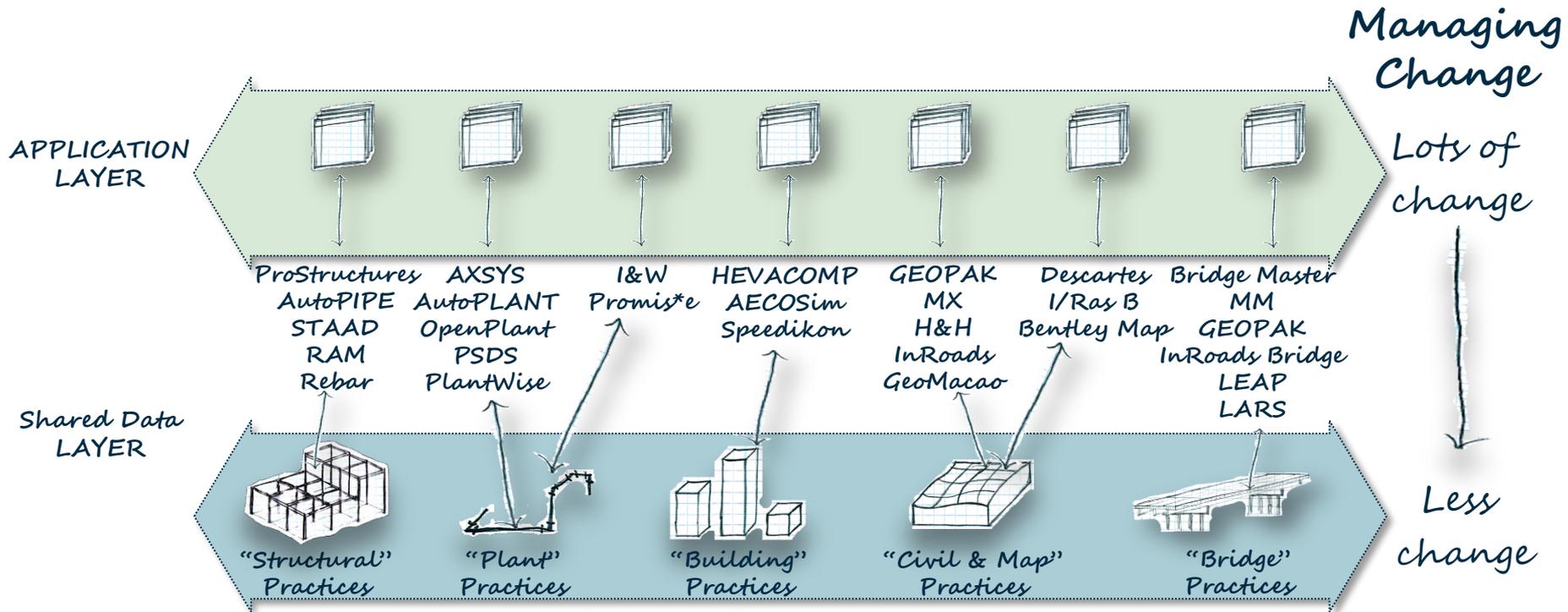


Future



Cross-Discipline Coordination Services

Shared Data Repository



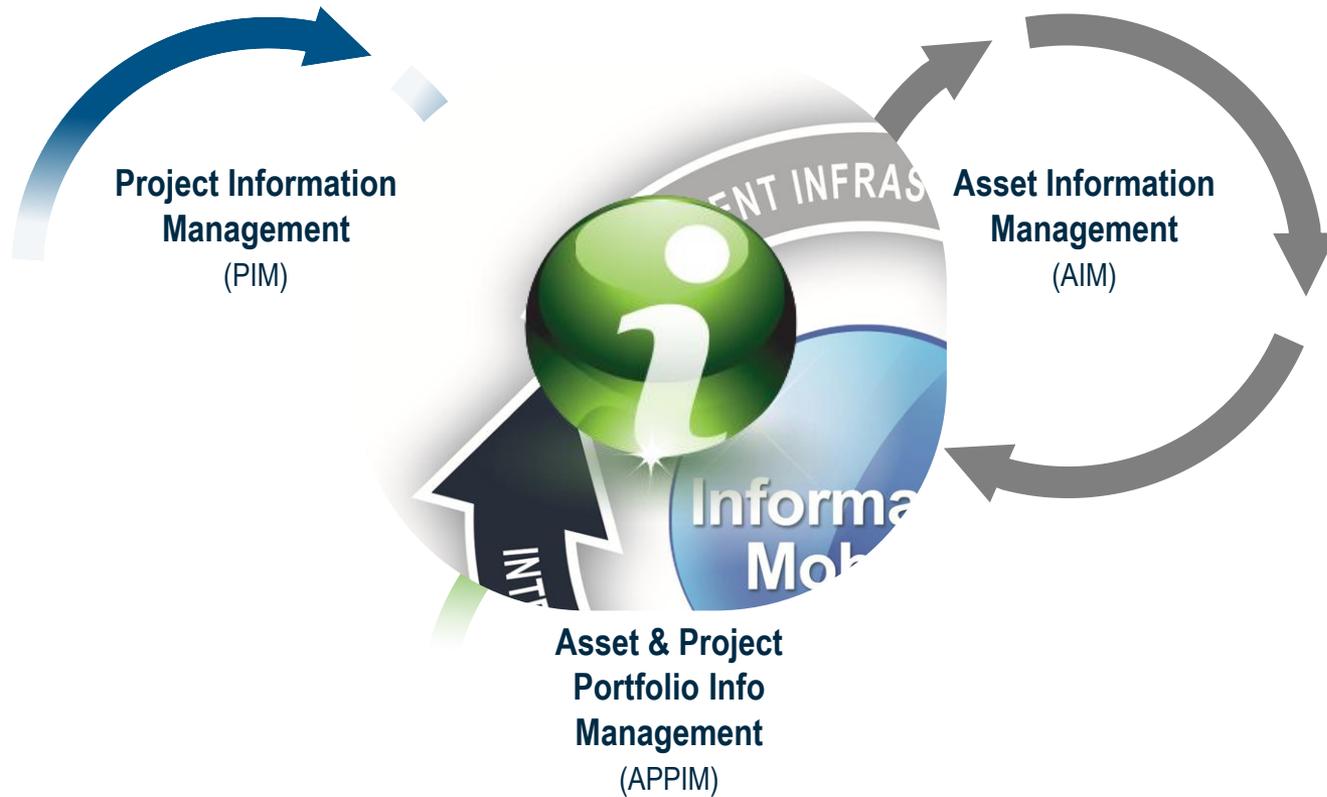


Asset Lifecycle Information Management

Infrastructure Creation & Sustainment



Bentley Delivers ALIM



Spanning CapEx through OpEx

Project Information Management
Simulate (Design) & Construct (Build)

Asset Performance Management
(Operate & Maintain)



Design and Construction Organizations
Handover
Co-creation of Value

Owner-Operators
Operational Readiness
Whole Life Value



Offering Overview

Bentley Mobile Apps



✓ Highlight and extend Bentley desktop and server products



✓ Provide connection to Bentley CONNECT



✓ Available on multiple platforms:

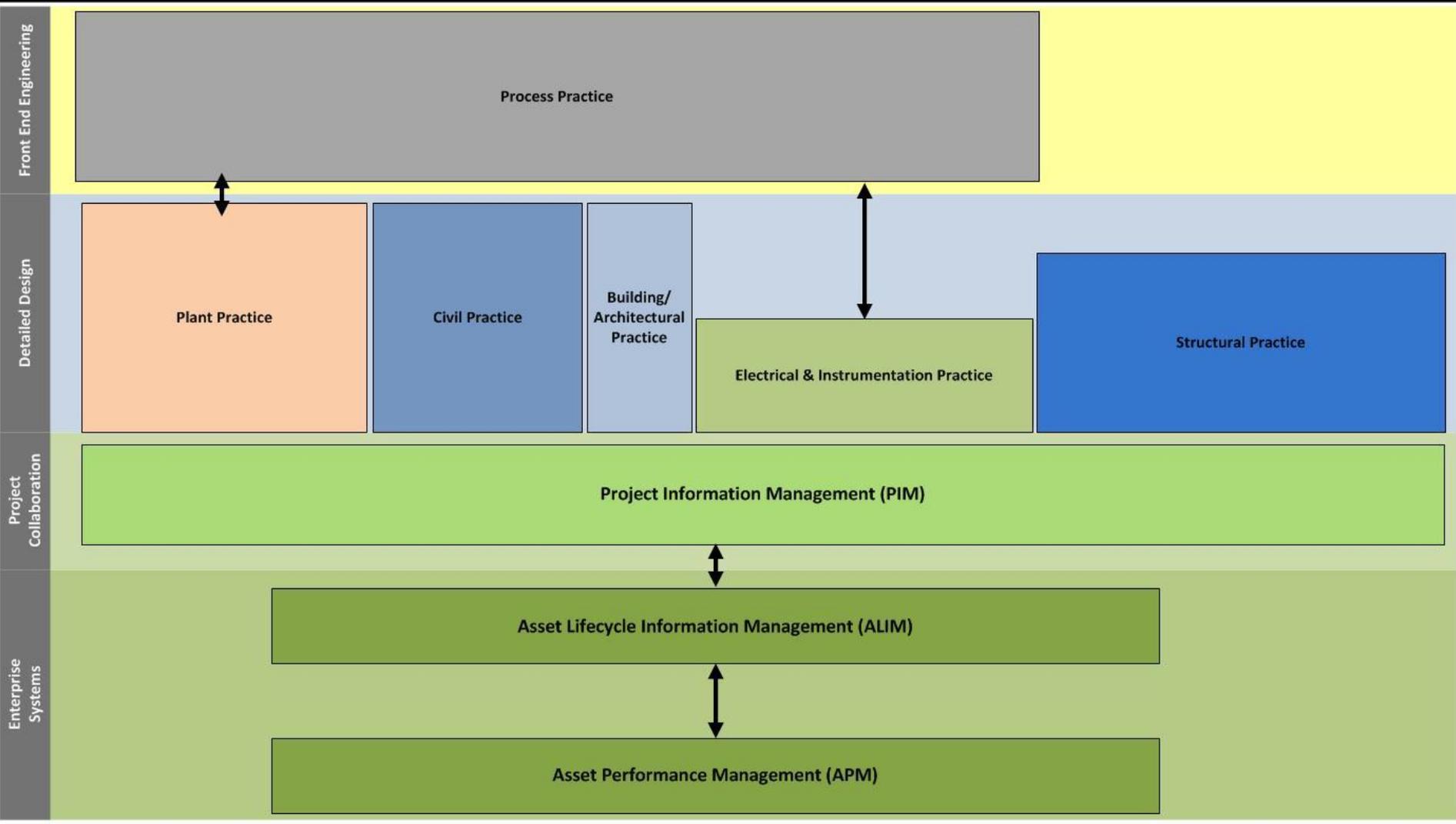
- iOS, Android, Windows RT
- Phone & Tablet

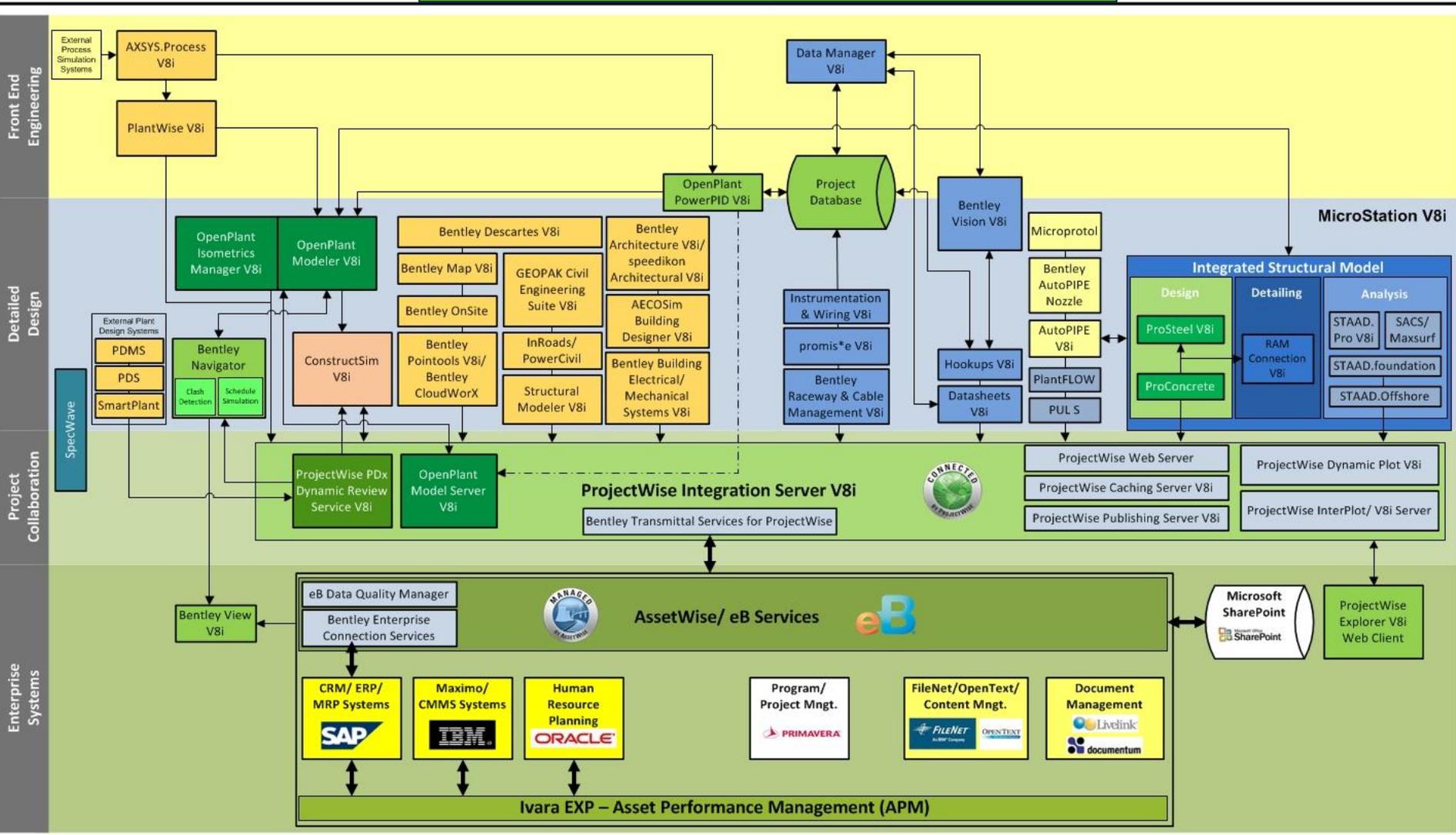


✓ Support disconnected use



✓ Based on Bentley's mobile developer tools





Summary

- Provides access to secure, trusted and accurate information when and where it is needed
- Provides visibility to interrelated information so stakeholders have access to accurate information in context for better decision making
- Supports a continuous engineering lifecycle



Thank you