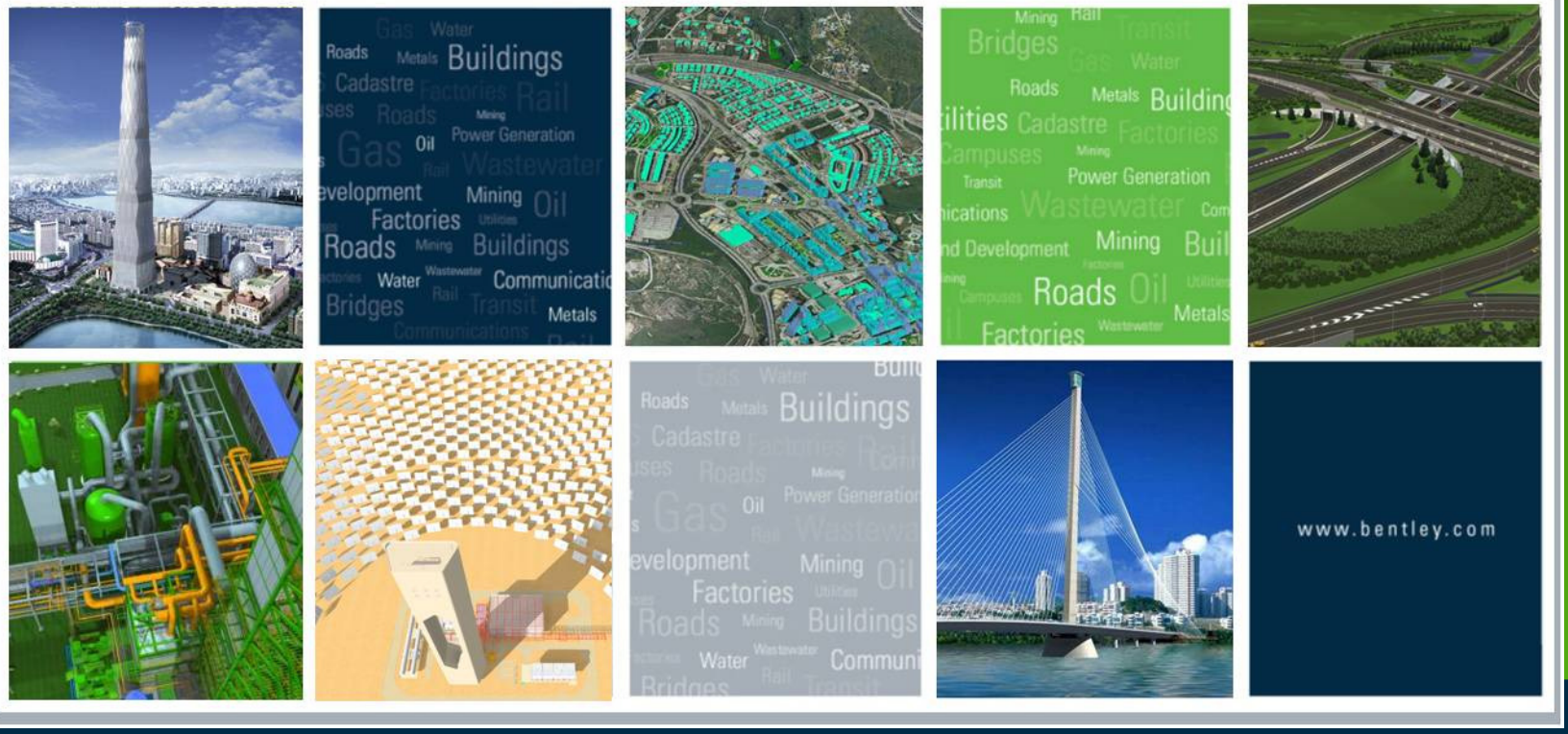

Are you ready for ISO 15926 ?

Glen Worrall – Solutions Team

Bentley
Sustaining Infrastructure

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Menu

- Bentley Systems
- ISO 15926
- Semantic Web
- Federated Reference Data
- iRing
- An Engineering Workflow
- An ISO 15926 Solution
- Review

Bentley®
Sustaining Infrastructure

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Click on button to go to a topic

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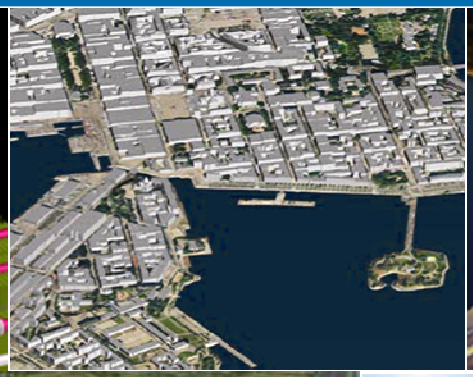
Bentley Systems

Return to Top Menu

About Bentley

Bentley is the global leader dedicated to providing architects, engineers, constructors, and owner-operators with comprehensive software solutions for sustaining infrastructure.



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Bentley
Sustaining Infrastructure

About Bentley

Bentley Subscribers are the *ENR* Top Design Firms:

- 20 of the Top 20 in:
  - General Building
  - Transportation
  - Power
  - Manufacturing
  - Water
  - Sewer/Waste
- 19 of the Top 20 in:
  - Industrial Process/Petroleum
  - Telecommunications
  - Hazardous Waste
- 47 of the Top 50 Designers in International
- 97 of the Top 100 Pure Design Firms

47 out of 50 U.S. State DOTs use Bentley

Global Business:

- Nearly 3,000 colleagues in 45 countries
- $500 million in annual revenues

Bentley is:

#1 in Plant Operations
#1 in Structural Engineering
#1 in Water Modeling
#1 in Roads and Transit Design
#1 in Bridge Engineering
#1 in Building Performance

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Bentley
Sustaining Infrastructure

ISO 15926

Introduction
Semantic Web
Federated RDL
iRing

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Return to Top Menu

What is ISO 15926?

- ISO 15926: Integration of life-cycle data for process plants, including oil and gas production facilities
  - Standard for interoperability and the integration of lifecycle information
- Standardizes:
  - Dictionary and Taxonomy
  - Information Organization
  - How computer systems connect, exchange and share information
- Implemented using standards from the World Wide Web Consortium (W3C)

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Who develops ISO 15926?

- FIATECH Members – including owners(15), contractors(12), equipment suppliers, and software providers (19) are working together with the POSC Caesar Association and DNV, to create ISO 15926 online reference data library.
- FIATECH is an industry consortium that provides global leadership in identifying and accelerating the development, demonstration, and deployment of fully integrated and automated technologies to deliver the highest business value throughout the lifecycle of all types of capital projects. www.fiatech.org.
- POSC Caesar is a global, nonprofit organization that promotes the development of open specifications to be used as standards for enabling the interoperability of data, software, and related matters. www.posccaesar.com

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ISO 15926

Authors
PCA / F Members

EPC's

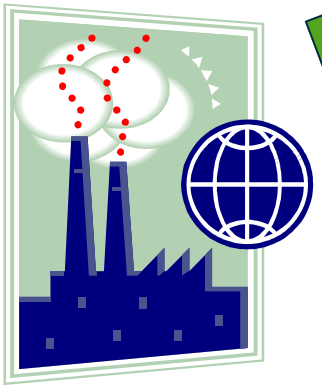
Suppliers

Technology Providers

PCA

Senior Engineer Approval / Acceptance

ISO



O/O

Subscribers

Customers

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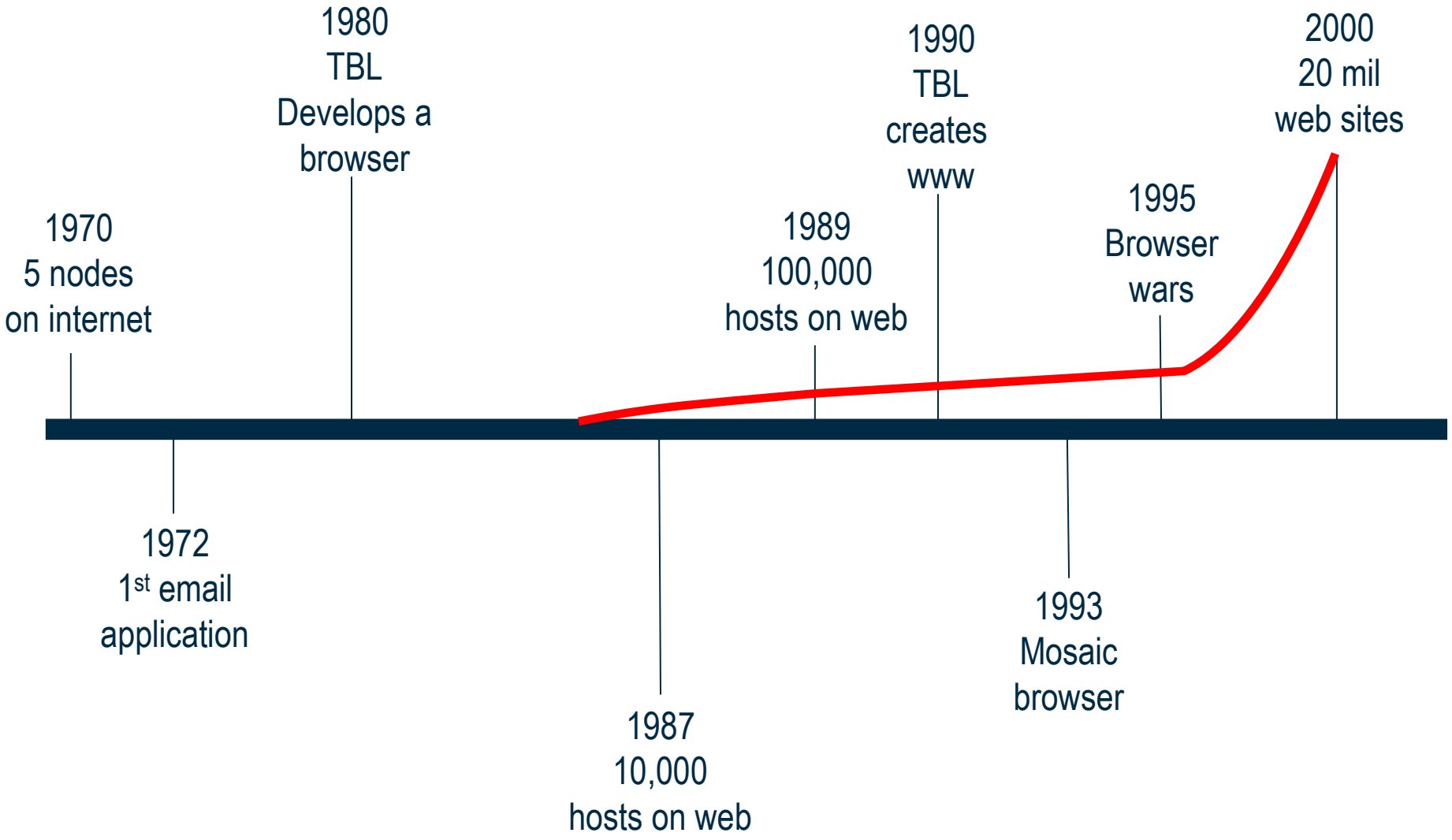
Bentley
Sustaining Infrastructure

http Timeline



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Ontologies & Inference Engines

"For the semantic web to function, computers must have access to structured collections of information and sets of inference rules that they can use to conduct automated reasoning."

Berners-Lee, T, Hendler, J & Lassila, O 'The semantic web', *Scientific American*, May 2001

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Semantic Web

What humans are good at

- Understanding
- “Why”
- Tacit knowledge
- Stories
- Following hunches
- Checking external refs

What machines are good at

- Executing
- Facts and figures
- Explicit knowledge
- Keeping track and logs
- Analyzing big style
- Calling web services

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What Wikipedia knows

- Wikipedia has articles about…
  - … all cities
  - … their populations

But it turns out unless someone answers the question you cannot find out any related information …

It turns out WIKIPEDIA cannot even answer the question of what are the 10 largest cities in Asia …

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Computers cannot make connections

Computers need our help

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The European Commission's View

"We believe, as many others do, that today's Web gives us just an inkling of the full potential globally distributed systems may achieve in terms of information access and use. This note is an invitation to the relevant European R&D communities to participate jointly in realizing this potential."

Stork, Hans-Georg and Mastroddi, Franco, *Semantic Web Technologies - a New Action Line in the European Commission's IST Programme*, 2001

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Metadata

"given the sheer size and dynamics of the contents involved, it is a case in point for automating to the largest extent possible the production of metadata ..."

Stork, Hans-Georg and Mastroddi, Franco, *Semantic Web Technologies - a New Action Line in the European Commission's IST Programme*, 2001

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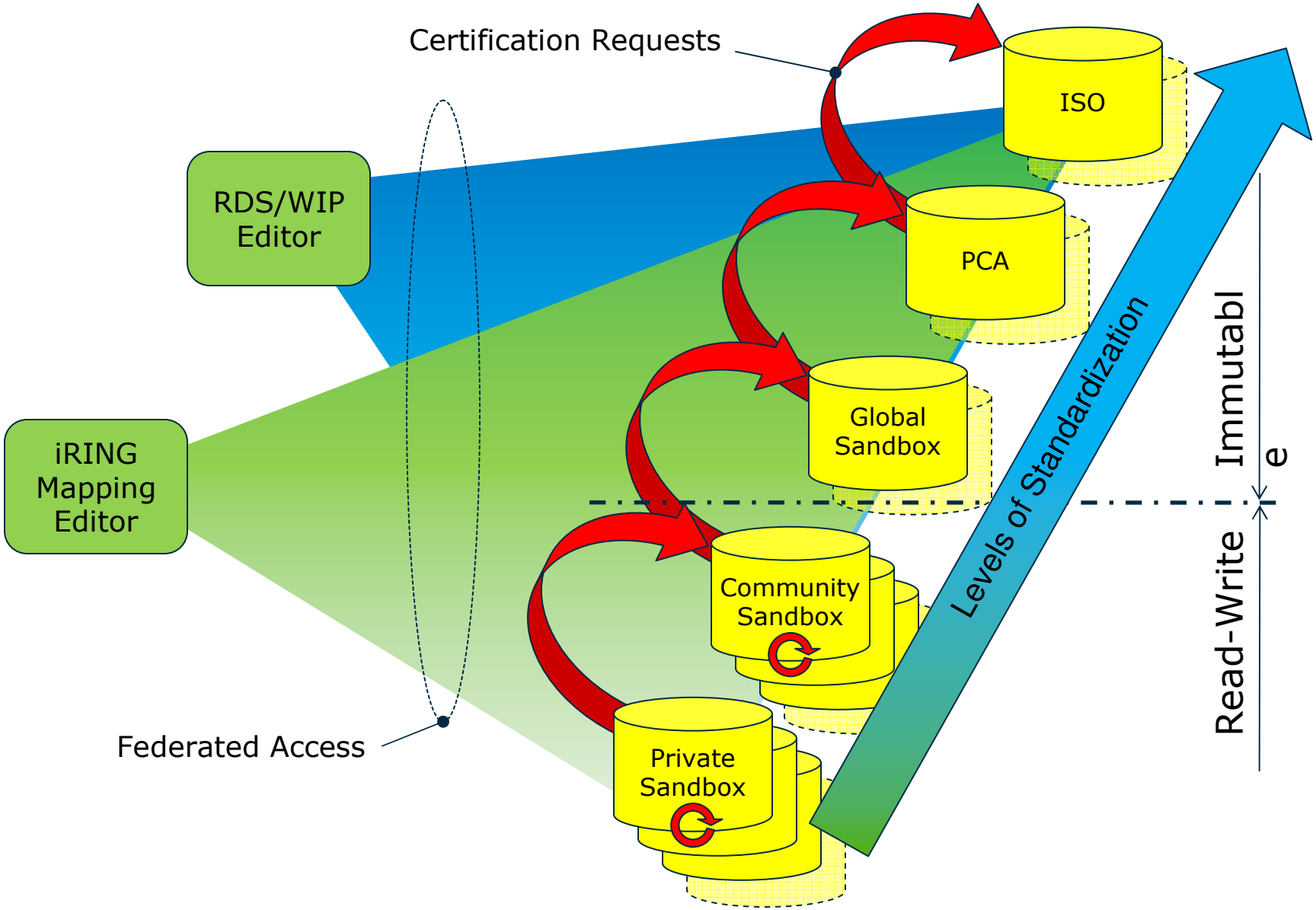
Reference Data Federation



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ISO 15926

The semantic answer for engineering and interoperability

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iRING

ISO 15926 Realtime Interoperability Network Grid

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iRING – A set of information interoperability and integration protocols and reference data that are compliant with the ISO 15926, Parts 7, 8, & 9 standards, which builds and depends on ISO 15926 Parts 1 - 6.

The FTP of ISO 15926

Bentley Sustaining Infrastructure

iRING User Group

http://iringug.org

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iRINGUserGroup - An open online community of users, companies, and organizations who use, are considering using, or are developing or deploying *iRING* protocols. The *iRINGUserGroup* is also responsible for the management, enhancement, and maintenance of *iRINGTools* and *iRINGSandbox*.

iRING TOOLS

http://iringtools.org

iRINGTools - A set of free, public domain, open source (BSD 3 license) software applications and utilities that implement *iRING* protocols. *iRINGTools* provide users with production ready deployable solutions. *iRINGTools* also provides technology solution providers with usage patterns for the implementation of *iRING* protocols in their respective solutions.

The Filezilla of ISO 15926

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iRING SANDBOX

http://iringsandbox.org

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iRINGSandbox – An internet hosted, publicly accessible and publicly downloadable, *iRING* reference system that will showcase the use of *iRINGTools* and other technology solution provider's products that implement *iRING* protocols. This reference system will also include an example *iRING* community sandbox that will hold ISO 15926 RDL extensions.

The FTP site of ISO 15926

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ISO 15926
An Engineering Workflow

Return to Top Menu

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ISO 15926

- That handover data format ?

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ISO 15926 Benefits

- Interoperability
  - NIST Study shows poor integration wastes 30% of costs
- Ageing Skilled Workforce
  - US Dept of Labour state 50% of engineering workers will retire in the next 5-10 years
- Knowledge Capture
  - No system for knowledge capture (we have the design ... but not the reason)
- Semantic Capture
  - Current designs do not capture the meaning
- Standardise Content (as well as the format)
  - Is water the same as H_2O

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How do I use it

- Simple Scenario ....
  - A hookup
  - Where Mechanical meets I&W ....
  - Interoperability right ....

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Hookup definition

A configuration of mechanical parts or devices providing a link between a process source and an instrument or instruments.

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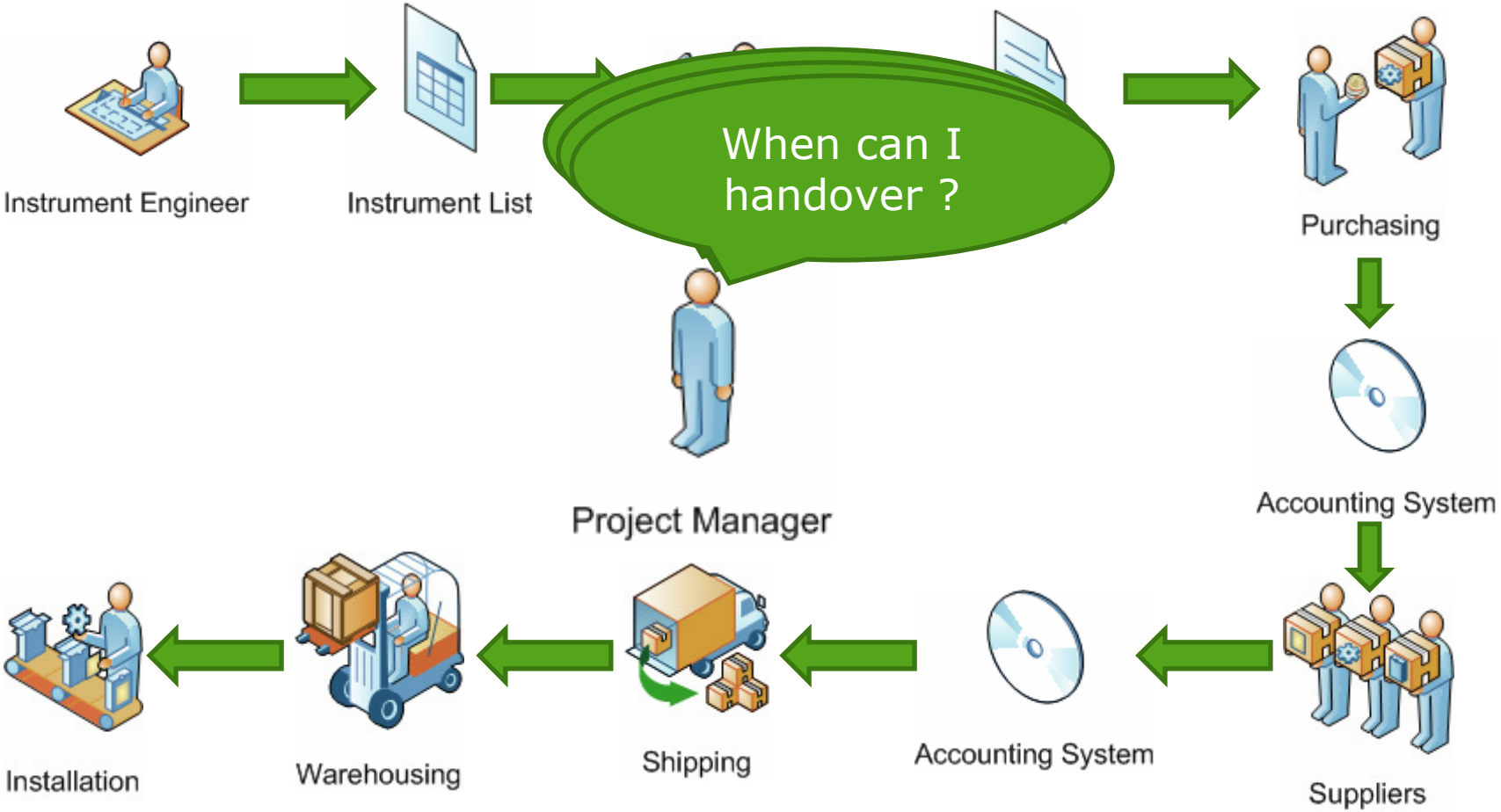
Hookups - Dataflow



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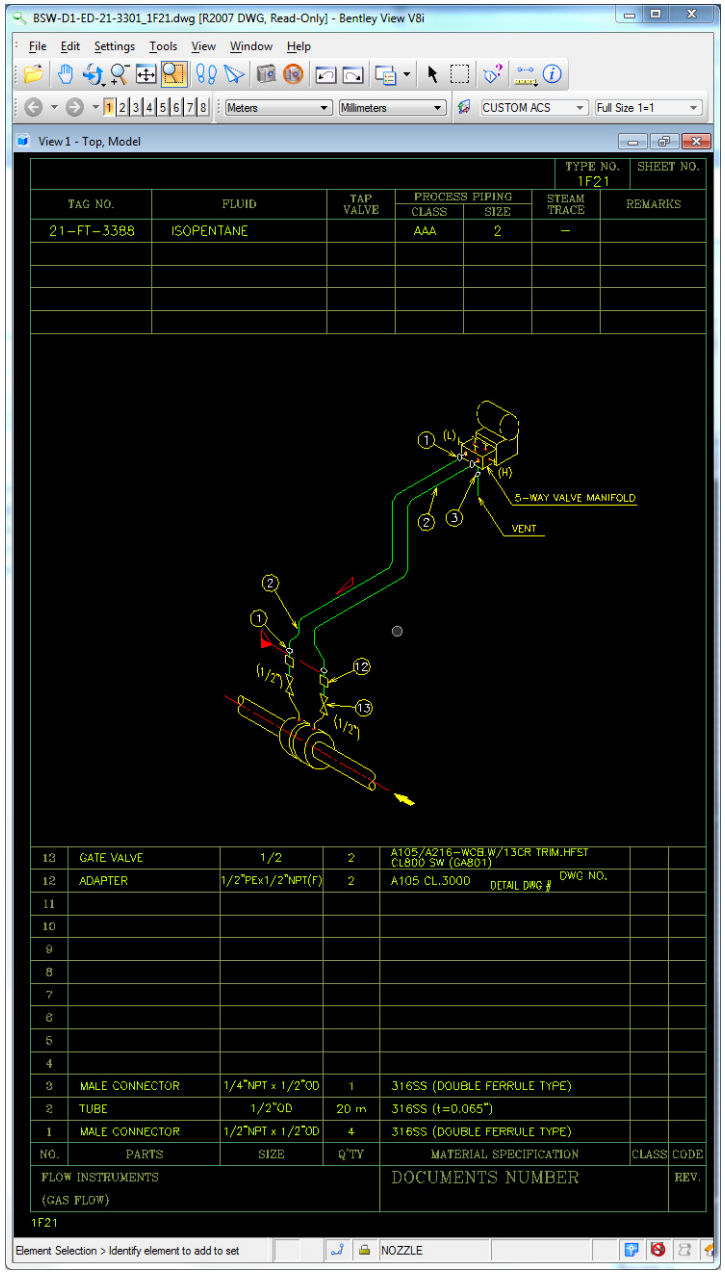
Hookup ...

- Hookup ...
- Unambiguous ...
- Clear Information



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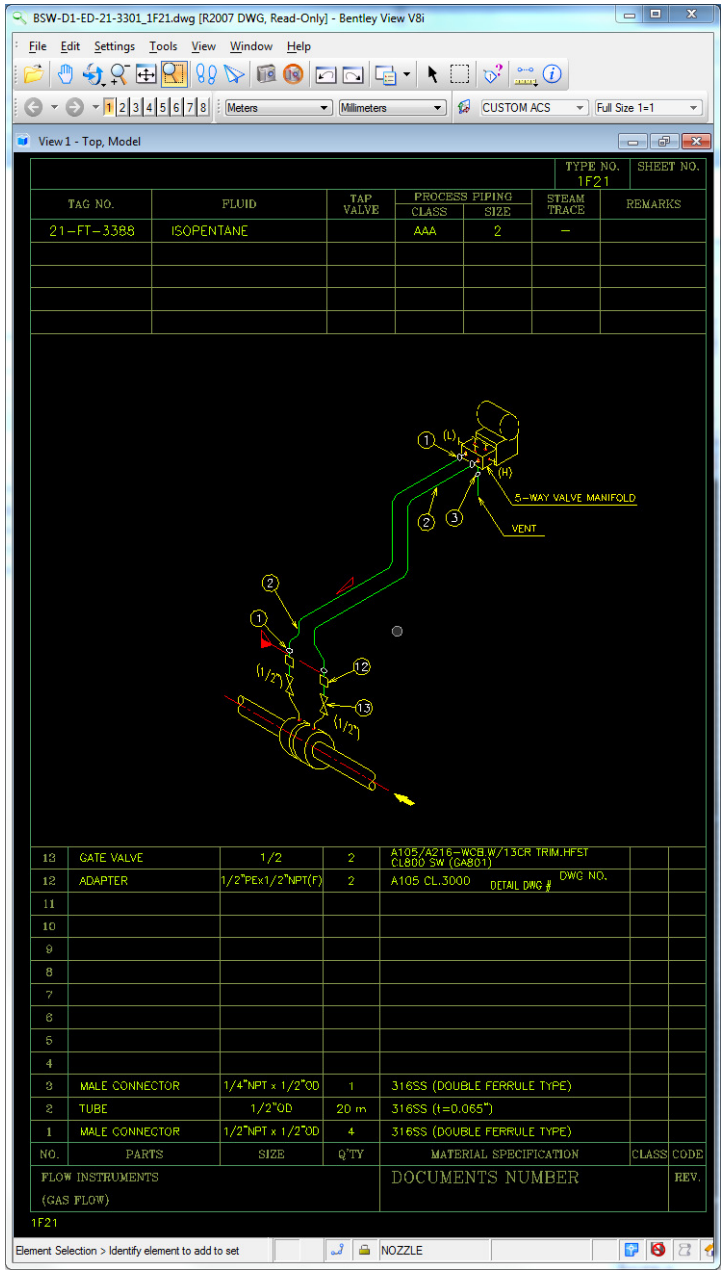
Hookup

- Unambiguous ?
- ISOPENTANE ?
  - Older plants may have this **methylbutane**

ISO 15926 can resolve this



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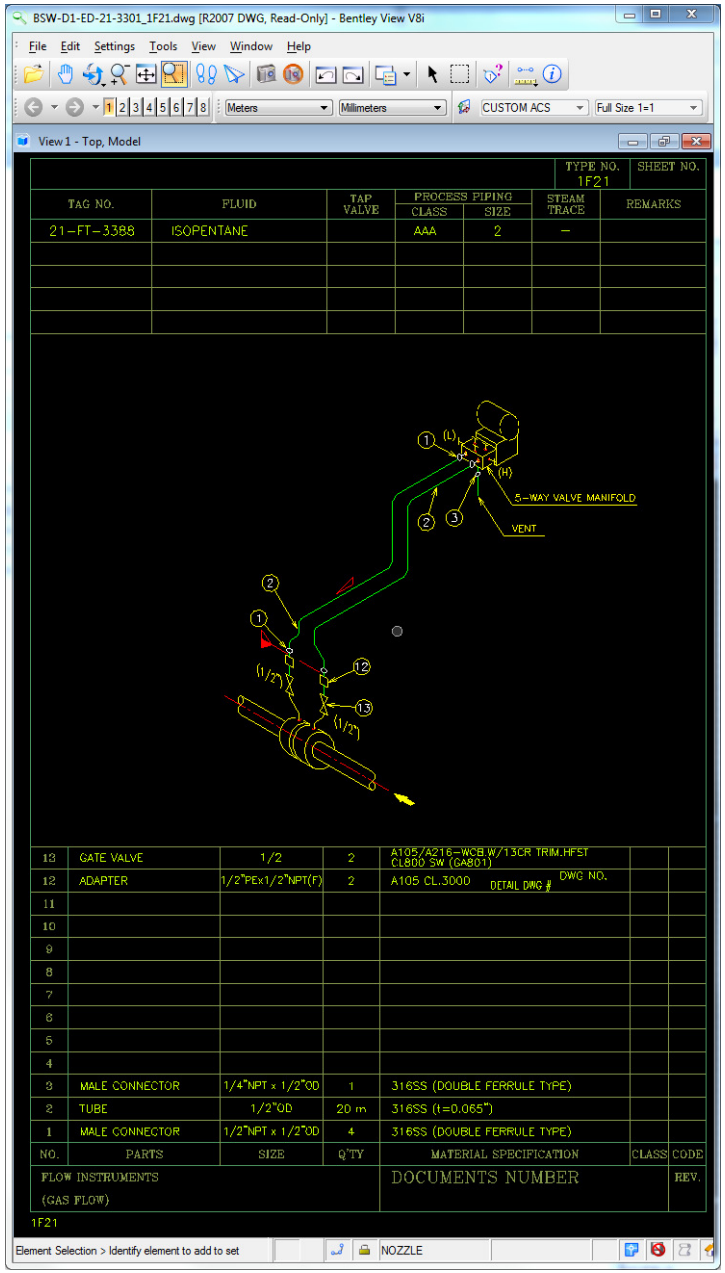
Hookup

- Unambiguous ?
- Material list is obvious ...



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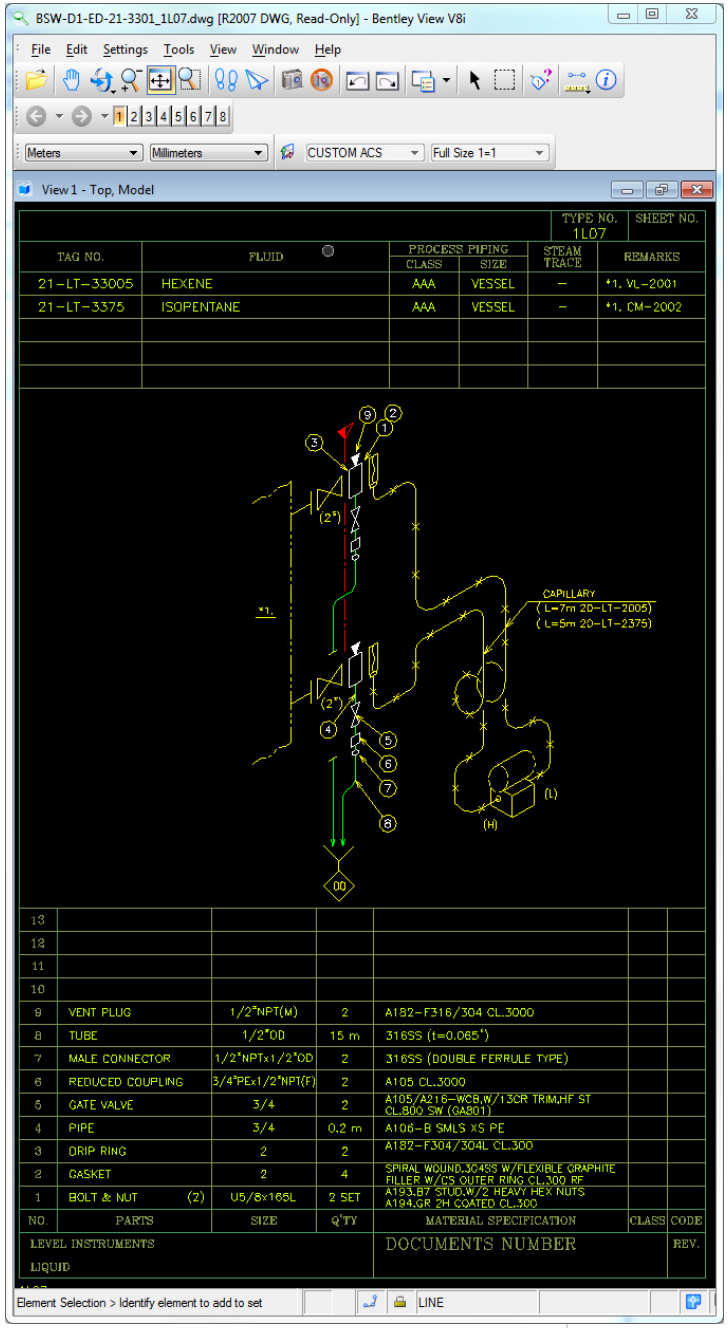
Hookup ....

- Unambiguous ...



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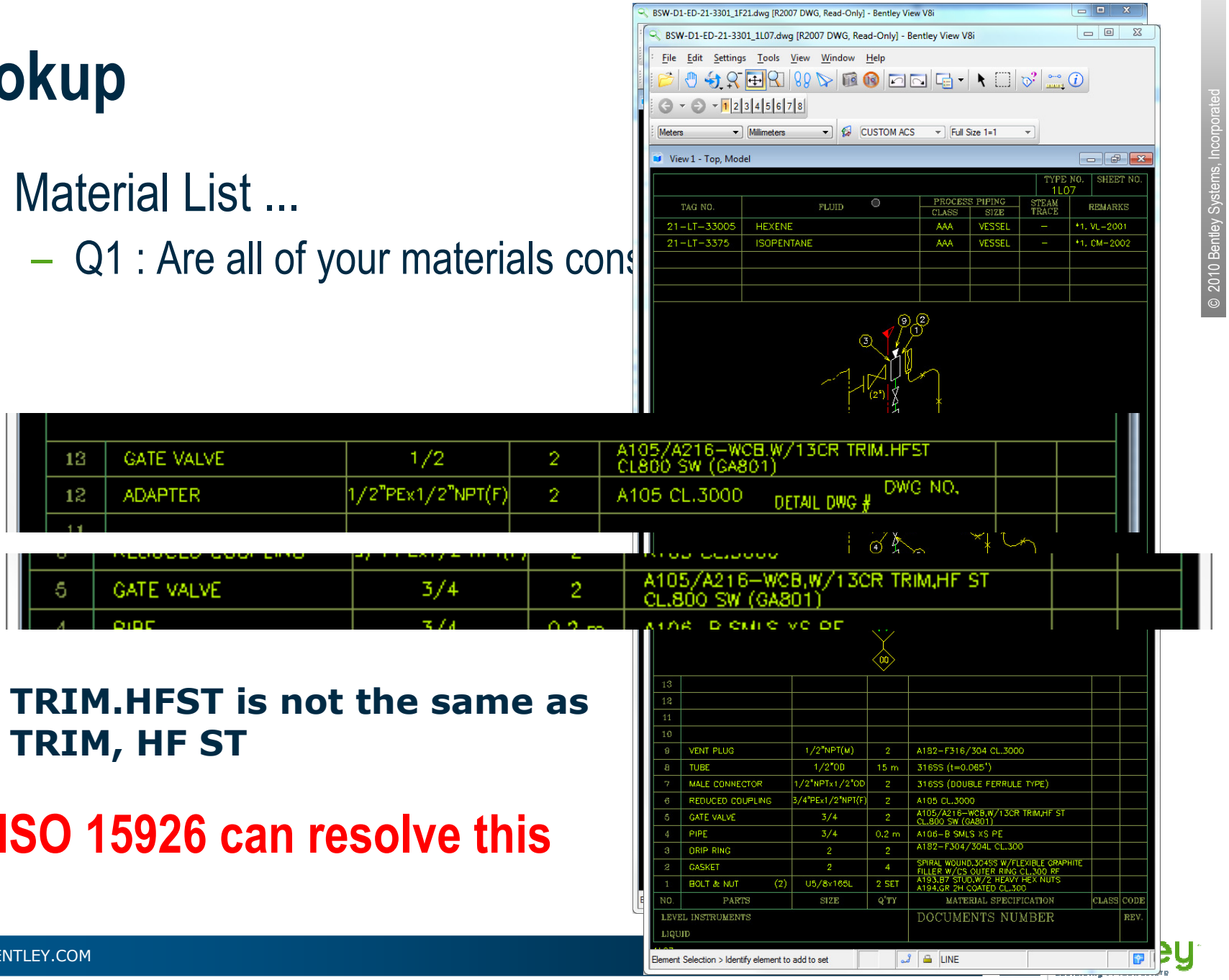
Hookup

- Material List ...
  - Q1 : Are all of your materials cons



TRIM.HFST is not the same as TRIM, HF ST

ISO 15926 can resolve this

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Hookups ...

- Answer : Yes all of my descriptions are consistent ...
- Q2 : Can all consumers of data use the information ...

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Hookups

- In this instance we would not only need to know how to read DWG ... Which is common format ... but also know that all of this text has some content ..., extracting this brings little benefit to down stream users ... too much ambiguity … and all context is lost with extraction …

ISO 15926 can resolve this

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Hookups ...

- Answer ... Yes I have it in a format which is readable by my suppliers ...

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Hookups

- Q3 : Can your suppliers provide the required information back in a format you can use ...

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Hookups

- Answer : Yes my supplier and I have a great relationship and he always provides the best price for all materials ... and knows exactly when a superior / cheaper item can replace an inferior / longer lead time item

ISO 15926 can resolve this

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Hookups

- Q4 : Can your installers / stock controllers create an installation package ?
- Answer : of course ...
- Is this automated ? Is it linked to RFID ? Is there real time management of item availability ... ?

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Interoperability

- More than handover ...
  - Projects have more communication channels than a single handover to O/O ...

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ISO 15926 Benefits

- Interoperability
- Ageing Workforce
- Knowledge Capture
- Semantic Capture
- Standardise Data (as well as format)

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ISO 15926
An Engineering Implementation

Return to Top Menu

What are Bentley doing to facilitate ISO 15926?

- Common Class Editor
  - Common way to define, manage and maintain the ISO 15926 data model
- Data transfer mechanisms
  - Exchange information between applications using common “language”
- Common tools and utilities
  - Common catalog definitions
  - Common Isometric management tools
  - Common interfaces to analysis
- Collaboration, collate and viewing technology
  - Bring all the drawings, models and data together for review, comment, mark-up etc

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Bentley's commitment to Open Standard: 2008 FIATECH CETI Award winner

FIATECH

The 2008 Award:

ceti
celebration of engineering & technology innovation

Bentley is honored for its collaboration on FIATECH's **"Accelerating the Deployment of the ISO 15926"** (ADI) project, and recognizes Bentley's extensive work this past year on the ISO 15926 international standard for process plant information…

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Bentley's participation in ISO 15

- Active member of FIATECH and POSC C
- Co-founder of FIATECH ADI Projec
- Steering Committee member of
- Active participation in the i nd Avalon projects
  - Bentley is driving the c rotocols from the Technology Provider Perspectiv
- Collaborating wi participants on ISO 15926 implementati
- Activel O 15926 and providing feedback to improve

Bentley's OpenPlant products use ISO 15926 natively !

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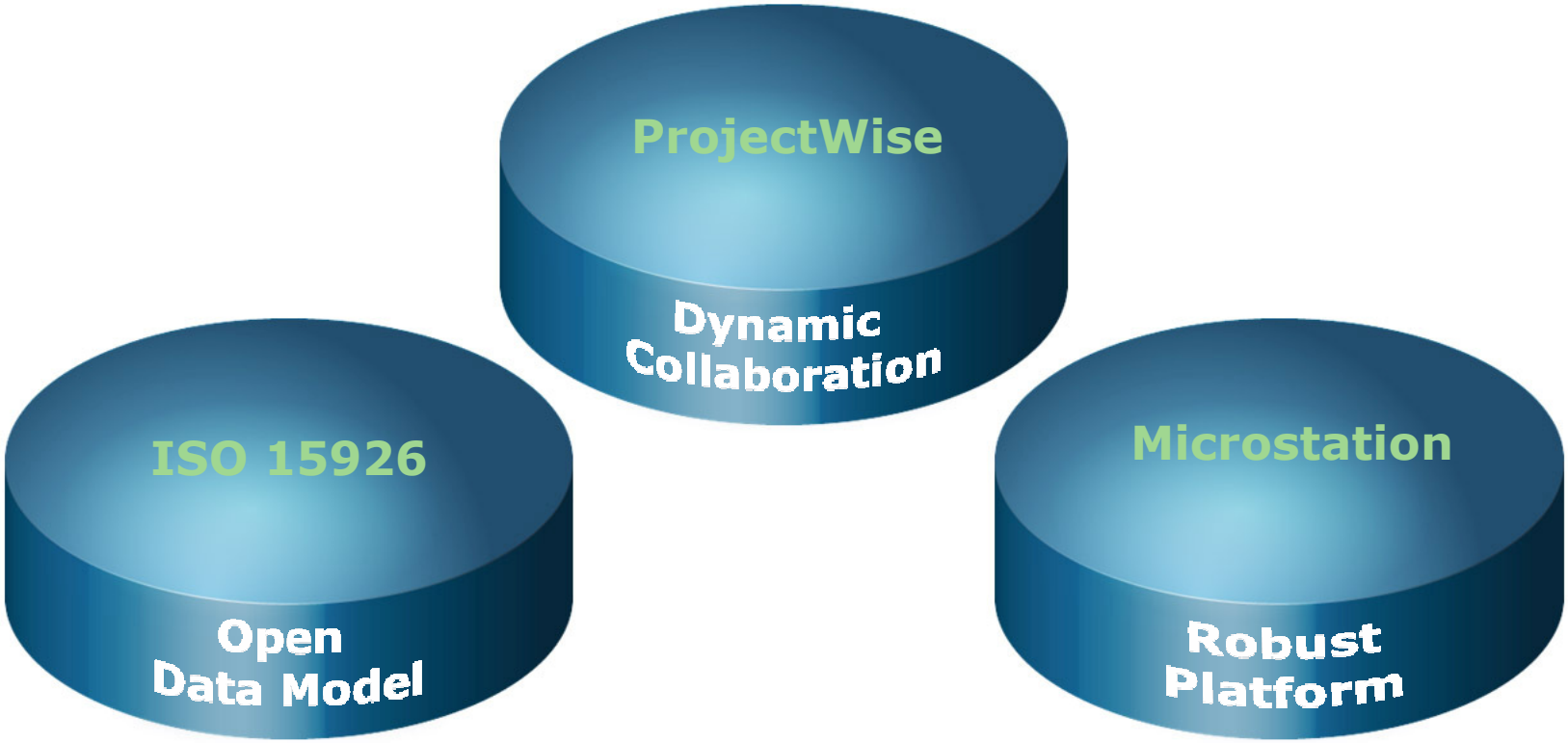
Solution for Today's Globally Sourced and Loosely Coupled Project Environments



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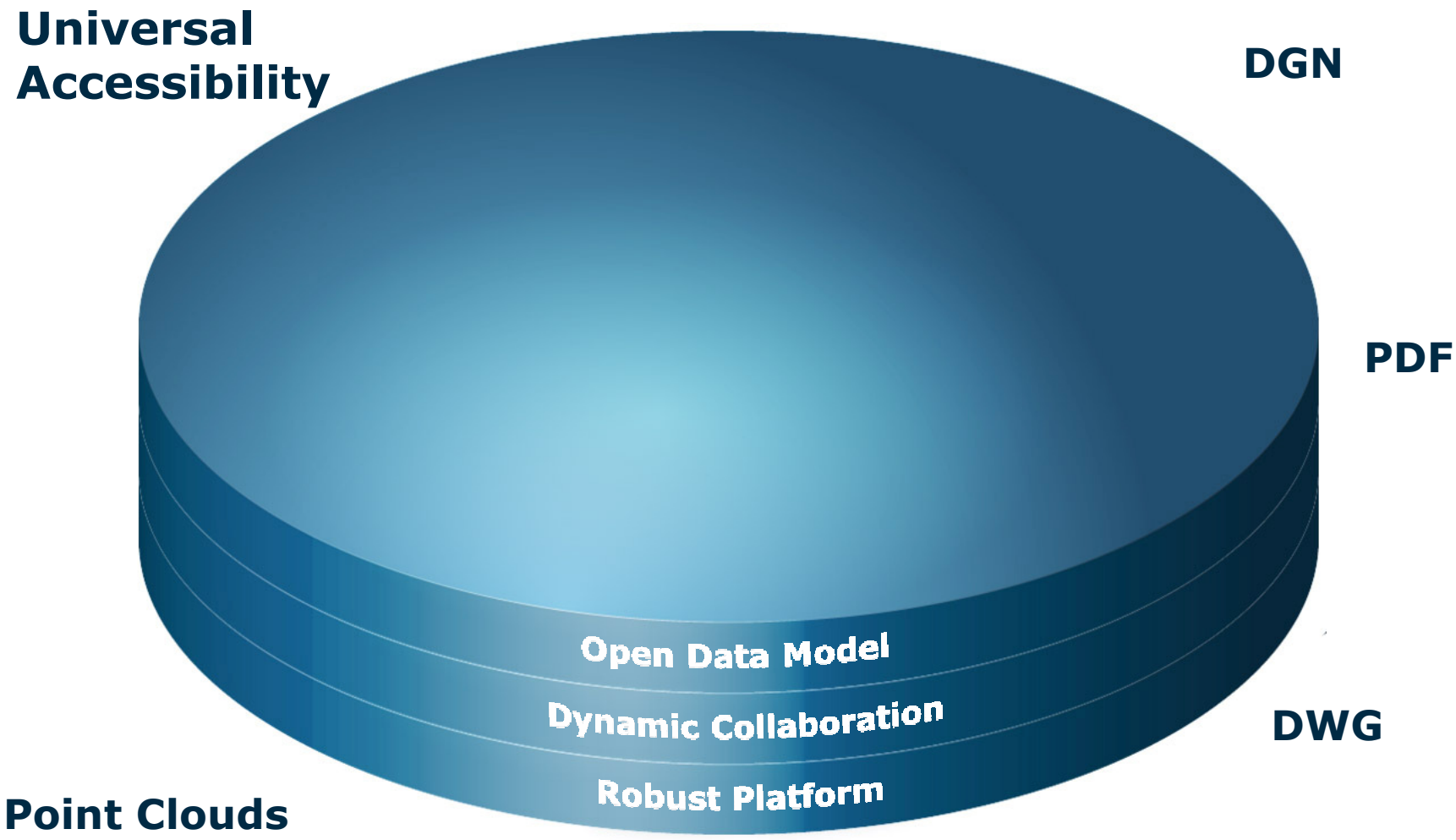
Solution for Today's Globally Sourced and Loosely Coupled Project Environments



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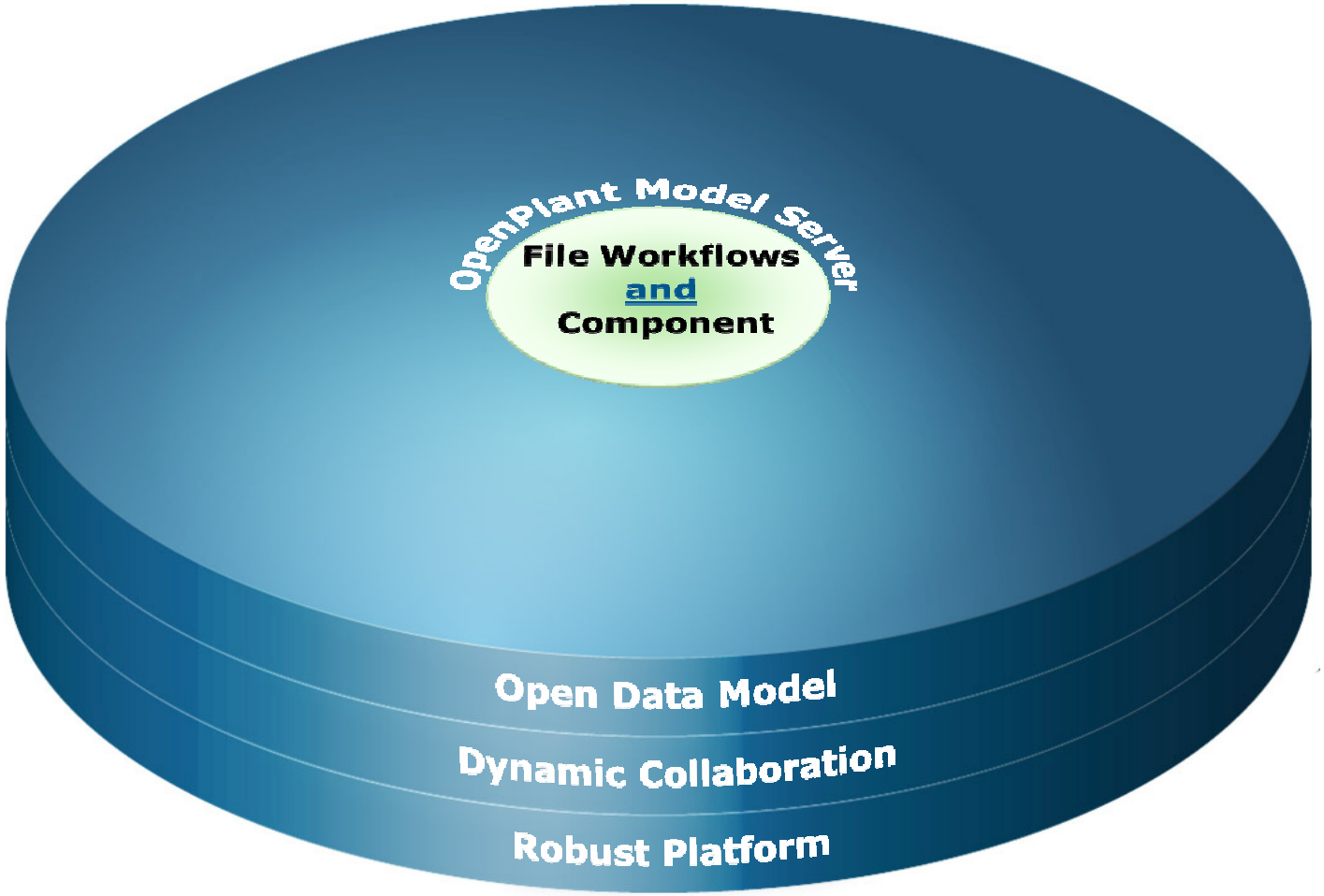
Solution for Today's Globally Sourced and Loosely Coupled Project Environments



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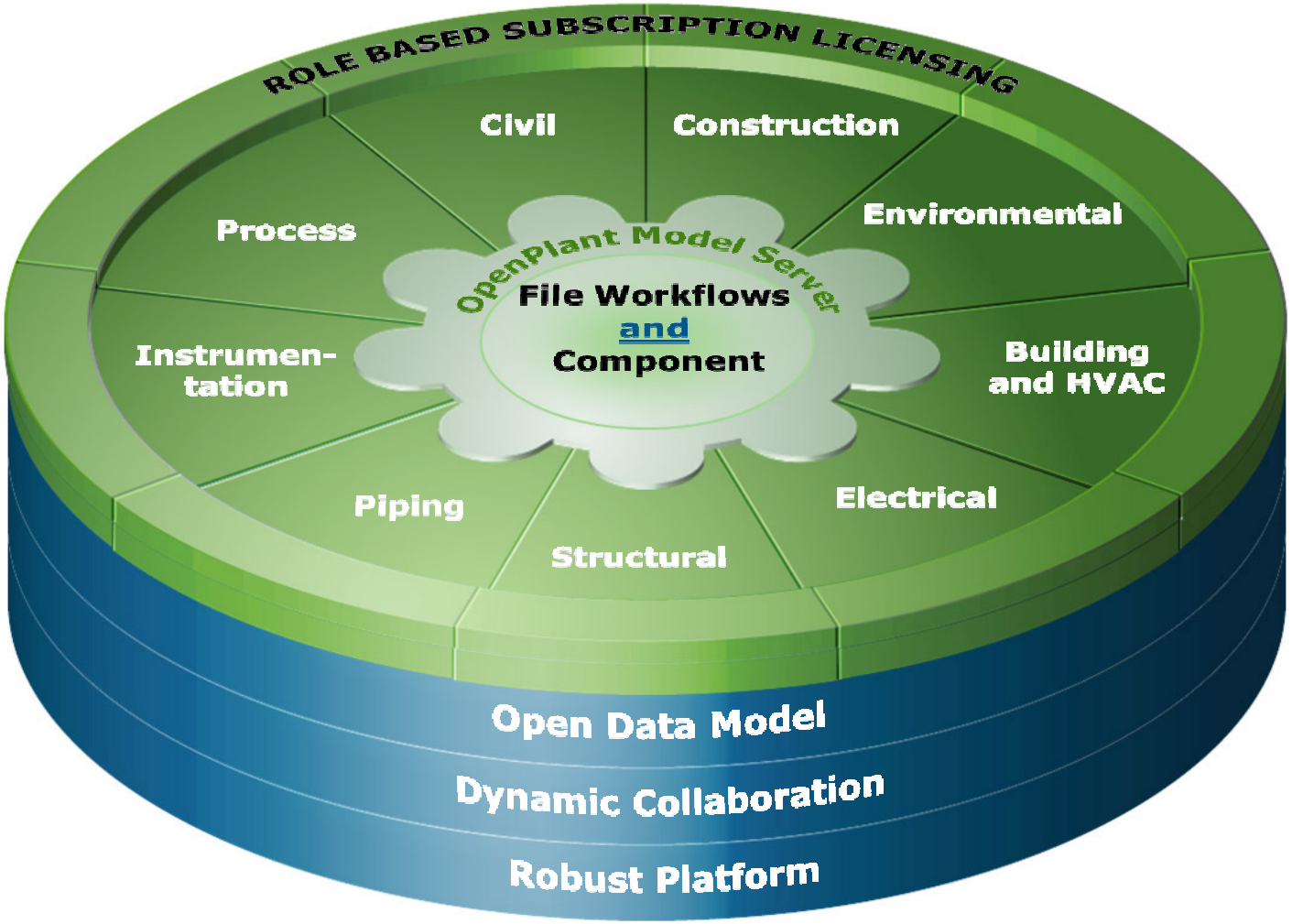
OpenPlant Piping Designer

Open Minds think

OpenPlant



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Bentley
Sustaining Infrastructure

OpenPlant

"The new plant offerings from Bentley are the first commercially available products to share and meet the primary goal of the iRING user community (www.iringug.org) – that is, to enable real-time, seamless sharing and interoperability of data and information across different organizations and systems using an internationally recognized standard."

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Early Adopter Comments …

"With OpenPlant products, all the tools use the same platform, leverage the same dynamic views and data sources, and provide a single hub of information, helping to improve efficiencies"

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Our Vision...

- Data interoperability using Industry Standards
- Open & Common Information Model
- Bentley OpenPlant™ products designed for the distributed world;
  - Uses ISO 15926 reference data natively
  - Quick access & sharing of data, facilitating collaboration
  - Provides complete, consistent & correct data throughout the plant lifecycle
  - Provides an integrated, functionally complete set of solutions supporting key engineering disciplines

The Benefits ...

- Achieves standardization across key plant lifecycle workflows
- Reduces the time to implement & learn
- Increases end-user productivity
- Improves plant safety & performance
- Delivers greater return on investment in information
- ISO 15926–based Open Information Model offers true data & application interoperability lowering overall cost of ownership

Our Solution ...

Bentley OpenPlant™

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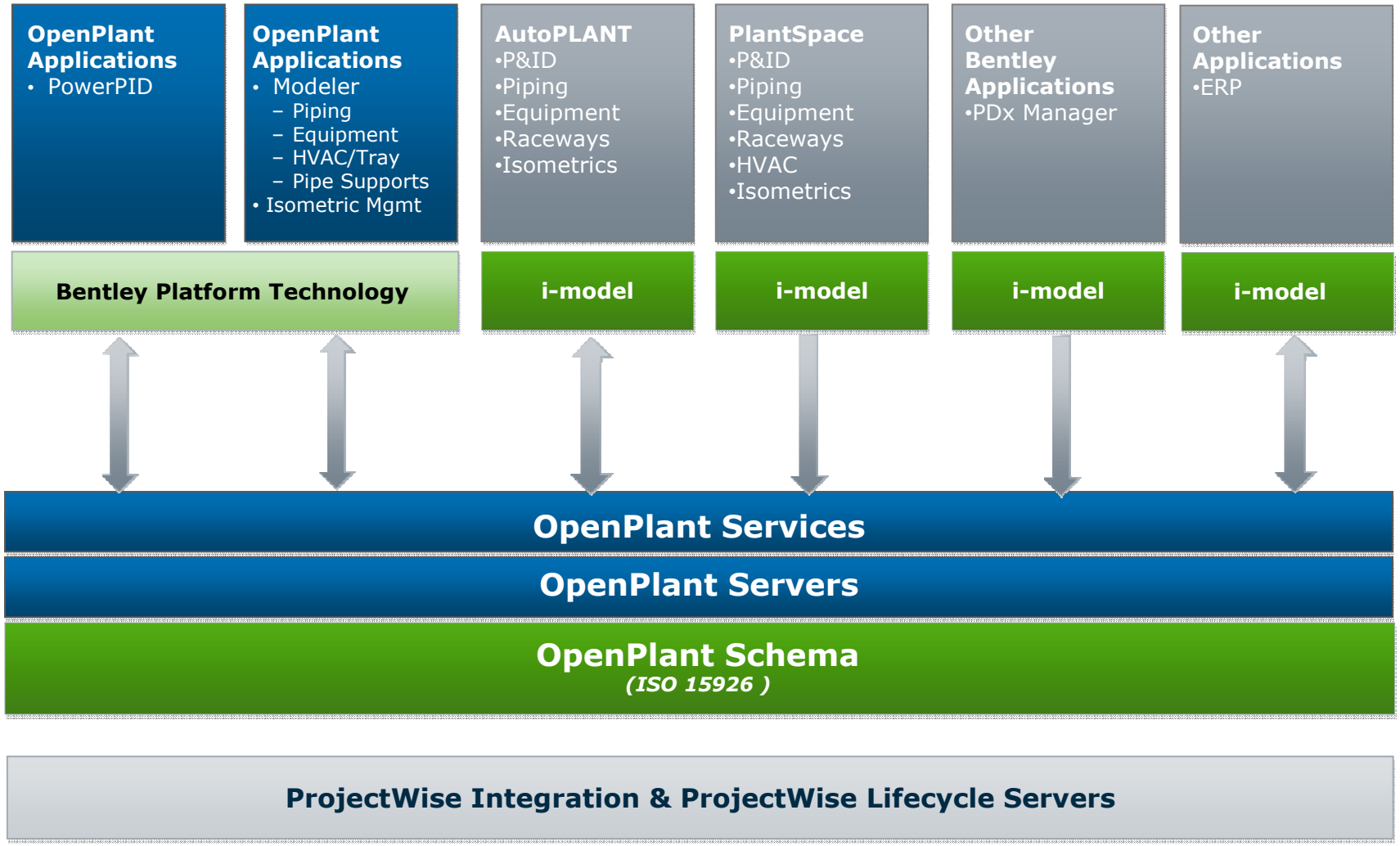
Bentley OpenPlant Design Technology



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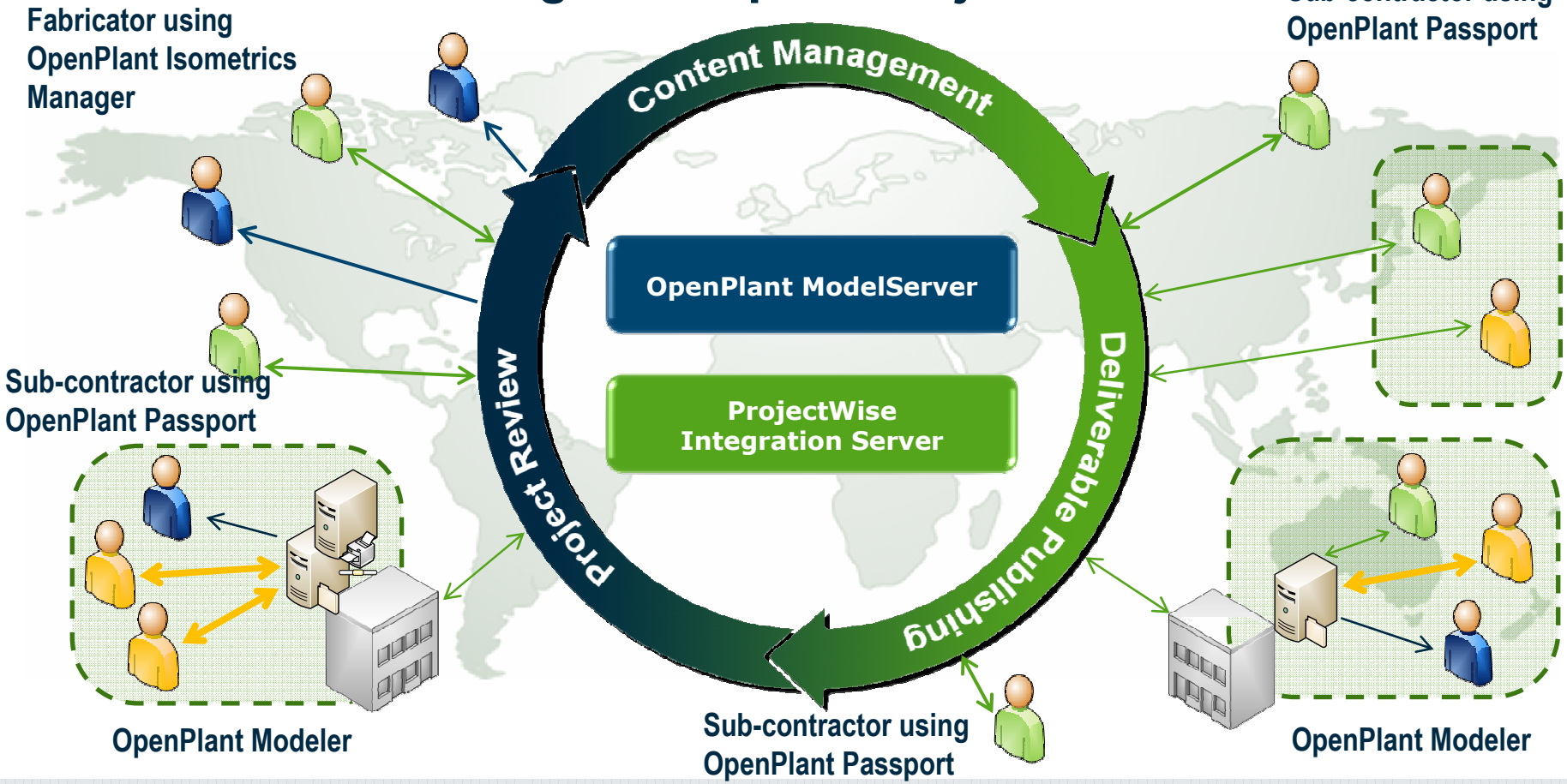
OpenPlant and ProjectWise is a Project Team Collaboration Platform for the Design of Capital Projects



Bentley ProjectWise V8*i*

Engineering Project Collaboration Platform

Open Minds think OpenPlant

Built on ISO 15926

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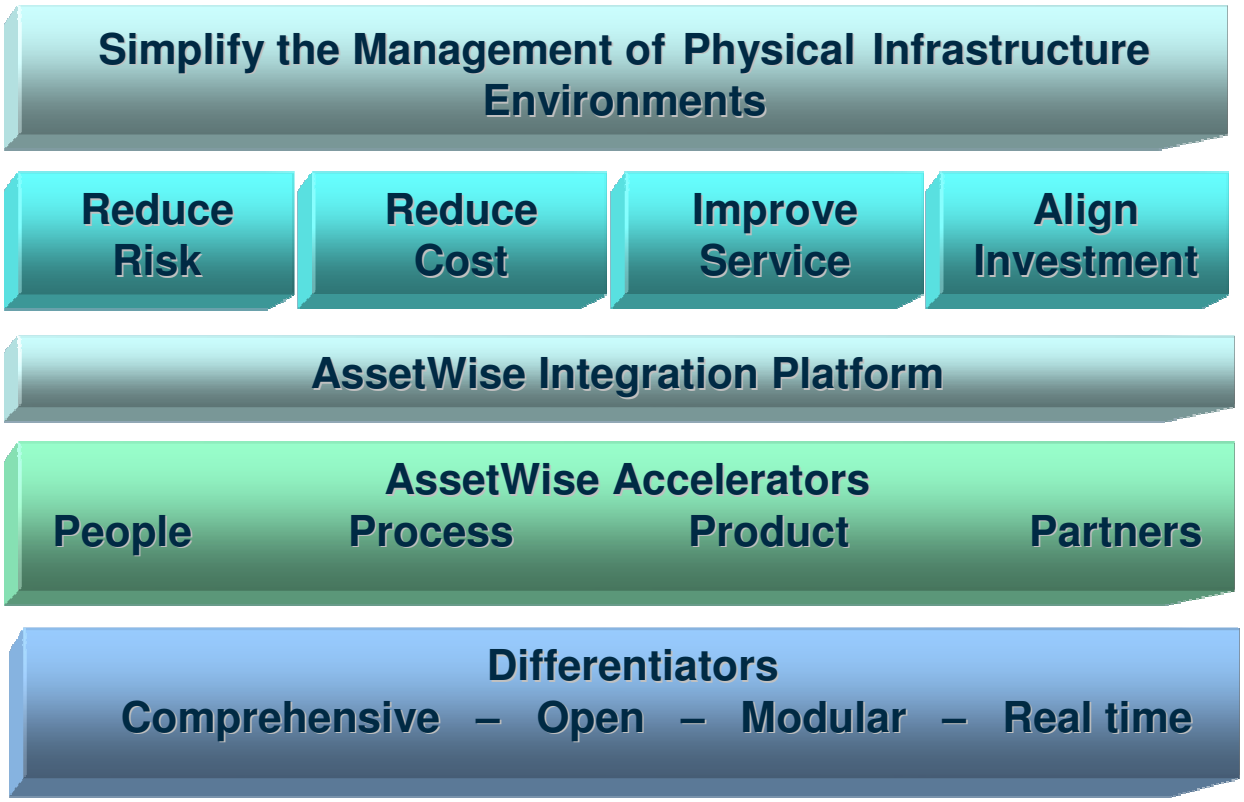
Bentley Sustaining Infrastructure

AssetWise Delivers Customers Business Requirements?



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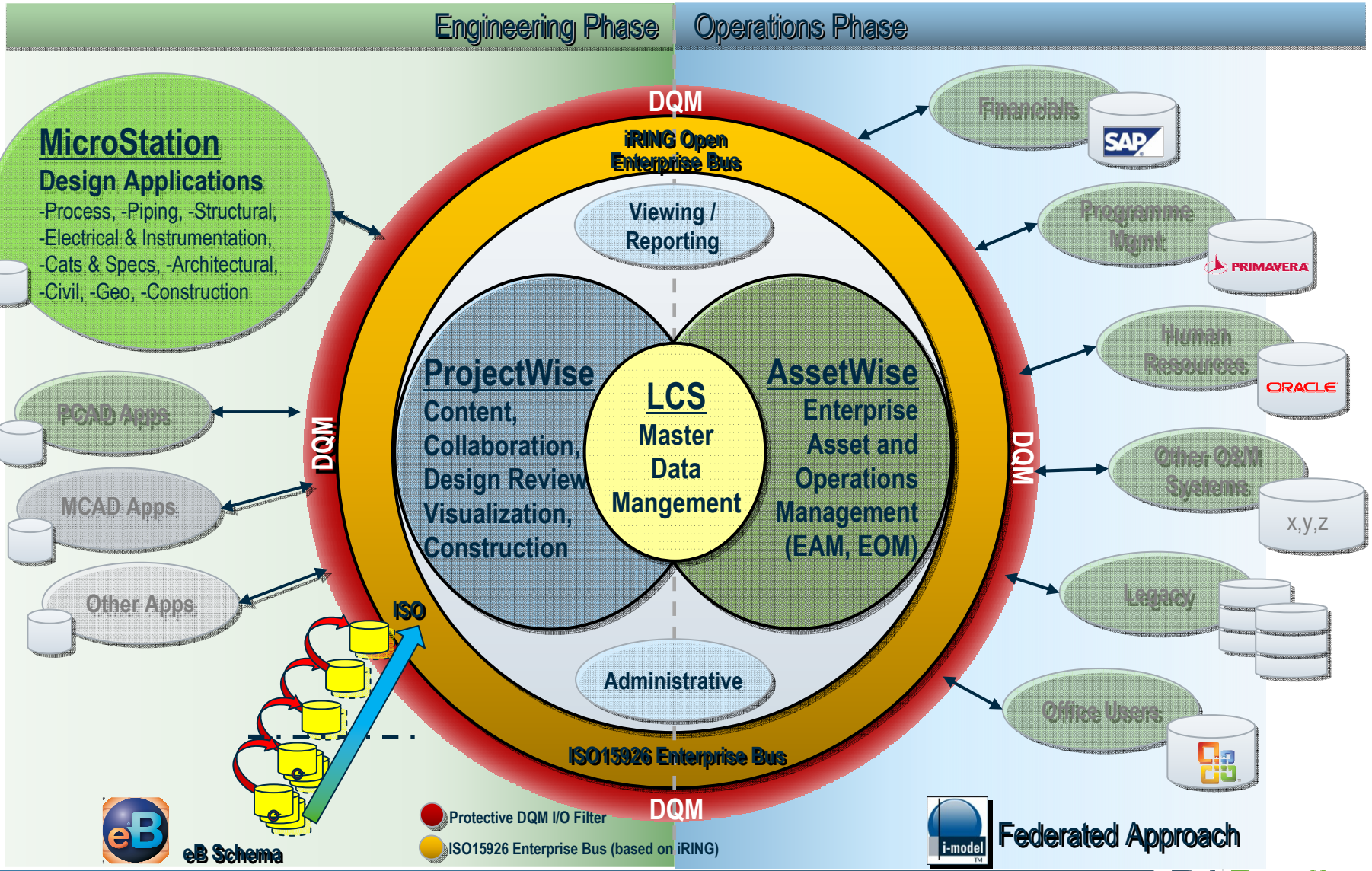
Collaborative Solution Architecture



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Validate….

Estimated Total Number of Tags

70,753

Summary of Tag Validation

Valid Tags	Failed Tags	Predicted Tags
51,002	3,184	16,567
72.08 %	4.50 %	23.42 %

Summary of Tag Information

	Attributes	Documents
Expected	969,769	437,283
Actual	238,040	51,376
	24.55 %	11.75 %

	Attributes	Documents
Estimated	315,010	142,043

	Attributes	Documents
TOTAL	1,284,779	579,326

Tag Information Required	1,864,105	289,416
		15.53 %

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Validate – based on your criteria…

EPC	Number of Tags	No Of Attributes	Populated	Populated Percentage	Populated (not NA)	ercentage of Values Collected	uality Issues	Percentage Quality Issues
	23,397	484,883	348,799	71.93 %	282,541	58.27 %	24,134	4.98 %
	29,667	622,095	258,185	41.50 %	213,312	34.29 %	38,572	6.20 %
	53,064	**1,106,978**	**606,984**	**54.83 %**	**495,853**	**44.79 %**	**62,706**	**5.66 %**

Supplier Name	No Of Attributes	Null Value	Populated	Populated Percentage	Populated (not NA)	Percentage of Values Collected	Quality Issues	Percentage Quality Issues
ABB	46,453	20,019	26,434	56.90 %	18,661	40.17 %	691	1.49 %
HSP	70,456	16,991	53,465	75.88 %	47,167	66.95 %	3,145	4.46 %
PETROLVALVES	26,986	8,128	18,858	69.88 %	15,292	56.67 %	1,537	5.70 %
ABB Limited	9,466	6,999	2,467	26.06 %	2,467	26.06 %	0	0.00 %
R & M Caspian Ltd.	34,896	6,676	28,220	80.87 %	26,854	76.95 %	3,436	9.85 %
N/A	18,217	5,724	12,493	68.58 %	8,154	44.76 %	729	4.00 %

Attribute Name	No of Tags	Populated	Populated Percentage	Na	Populated (not NA)	ercentage of Values Collected	Invalid Lookup	Invalid Uom	uality Issues	Percentage Quality Issues
Calibrated Range Max	7,521	4,478	59.54 %	676	3,802	50.55 %	0	834	834	11.09 %
Calibrated Range Min	7,521	4,481	59.58 %	745	3,736	49.67 %	0	853	853	11.34 %
Cause and Effect Doc No	13,400	5,195	38.77 %	4,122	1,073	8.01 %	0	0	0	0.00 %
Certificate Number	1,815	1,083	59.67 %	499	584	32.18 %	0	0	0	0.00 %
Detail Drawing Doc No	37,751	17,681	46.84 %	6,746	10,935	28.97 %	0	0	0	0.00 %

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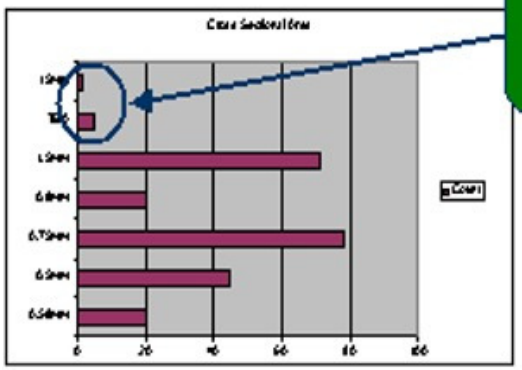
Bentley Sustaining Infrastructure

Data Analysis

Data Source	No of Tags	No of Atts	No of Blanks	% Populated
Alstom	80	2,148	1,578	26.54%
ALSTOM	15	490	350	28.57%
Boustead	26	588	400	31.97%
Burgess Manning	1	14	9	35.71%
Copa				1,363	22.47%
Genergy				88,056	18.37%
Nuovo Pignone				663	45.83%
Prosernat				7,061	19.08%
ROLLS-ROYCE				14,707	19.98%
SAFT-AEG Industrial Di				364	39.53%
Wellman				277	26.33%
FLOWSERVE PUMPS LIMITED	103	3,435	2,126	38.11%

Attribute Name	Attribute Value	Count	Percentage
Cross sectional area	0.58mm	20	8.33%
	0.5mm	45	18.75%
	0.75mm	78	32.50%
	0.8mm	20	8.33%
	1.5mm	71	29.58%
	TBA	5	2.08%
	15mm	1	0.42%
Total		240	100.00%

Low occurrences of a particular value may suggest erroneous data



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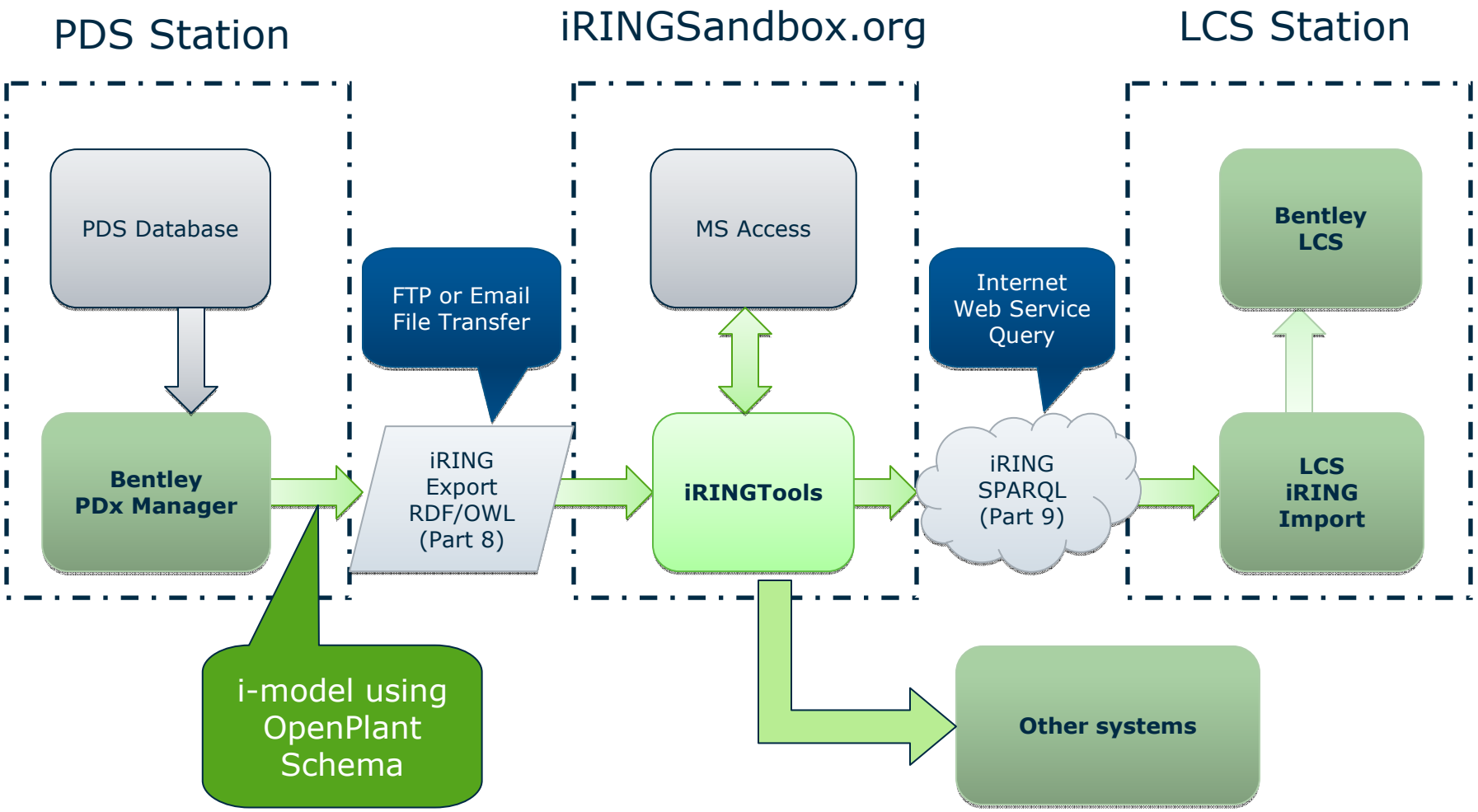
Bentley and iRING Demonstration



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Are you ready for ISO 15926 ?

- Are you systems semantically
- You have a work force wh uting knowledge)
- You have a conne
- You and your mantically searchable Knowledg
- You h rflow where you can swap an nal supplier

If you can say YES to all - You are already using ISO 15926 !

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How can you prepare for ISO 15926

- Join POSC Ceasar
  - www.posccaesar.org
- Sponsor JORD Project
  - Joint Operational Reference Data
- Implement iRing technologies
- Invest in ISO 15926 as a core technology
- Implement Work Process which recognise the important of data

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Thank You!!

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