



ENGINEERING & TECHNOLOGY EXCELLENCE

iRING

ISO 15926 Realtime Interoperability Network Grid

Semantic Days, May 31-June 3

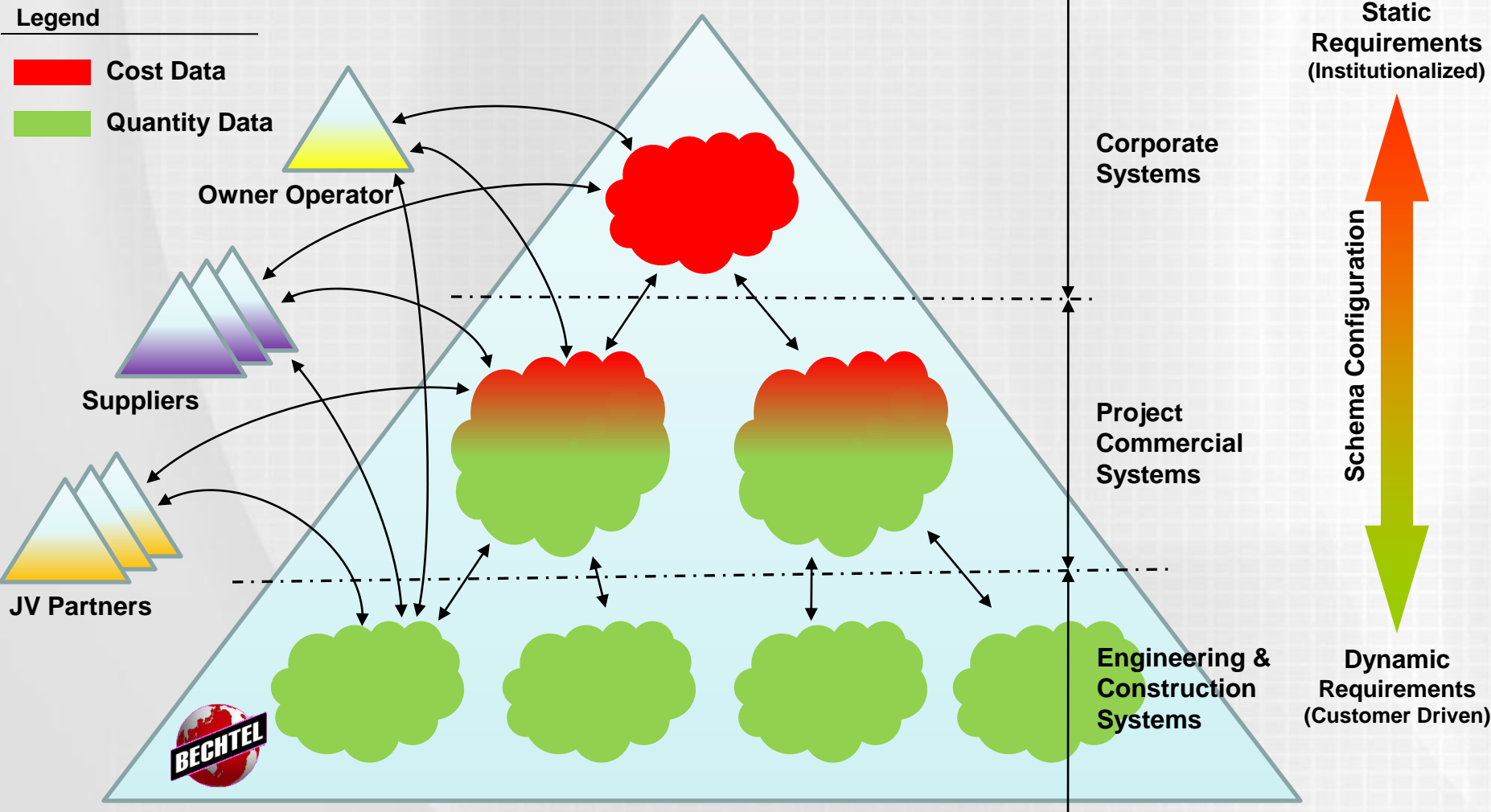
Robin Benjamins

Bechtel

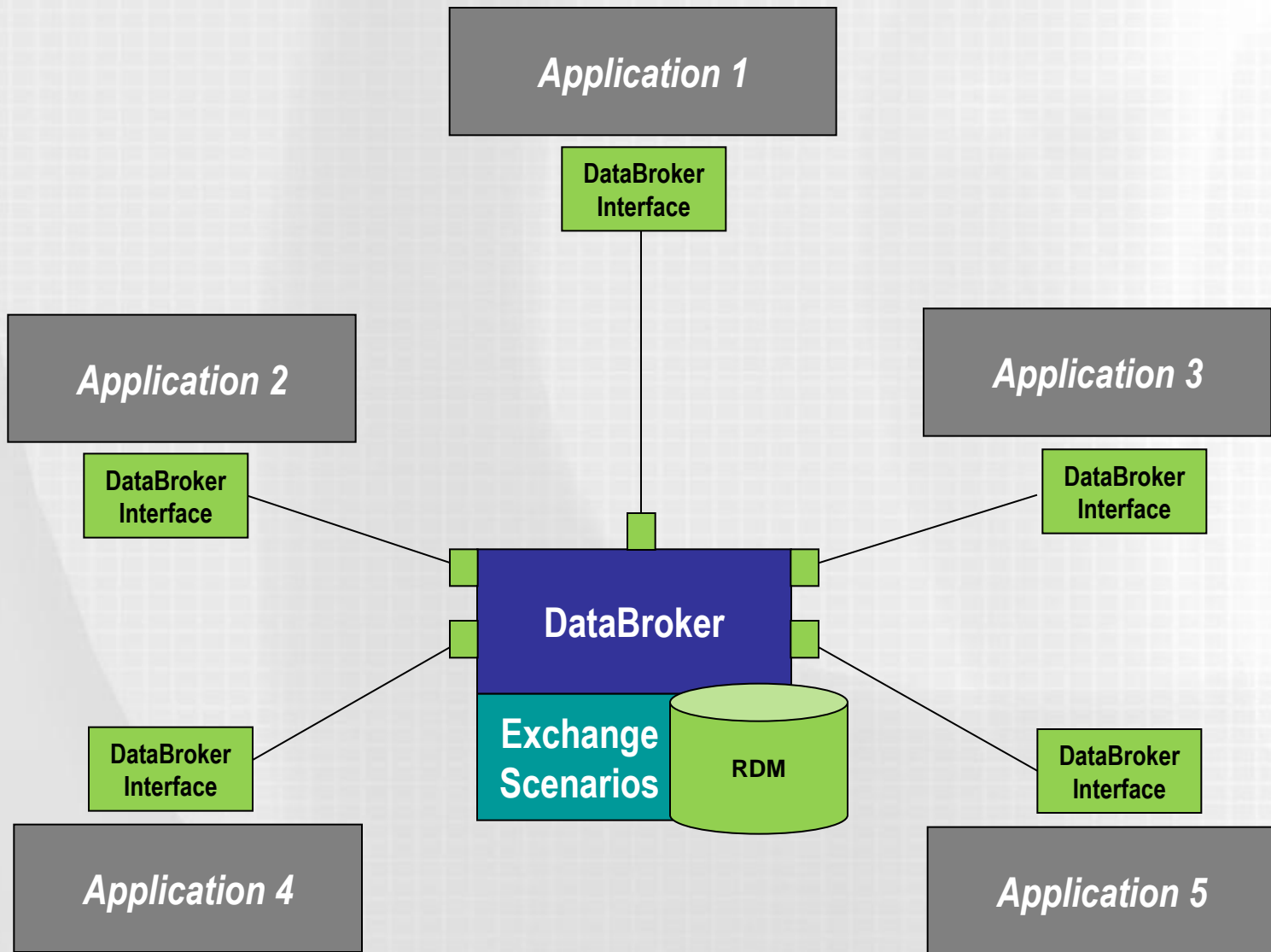
Central Engineering & Technology



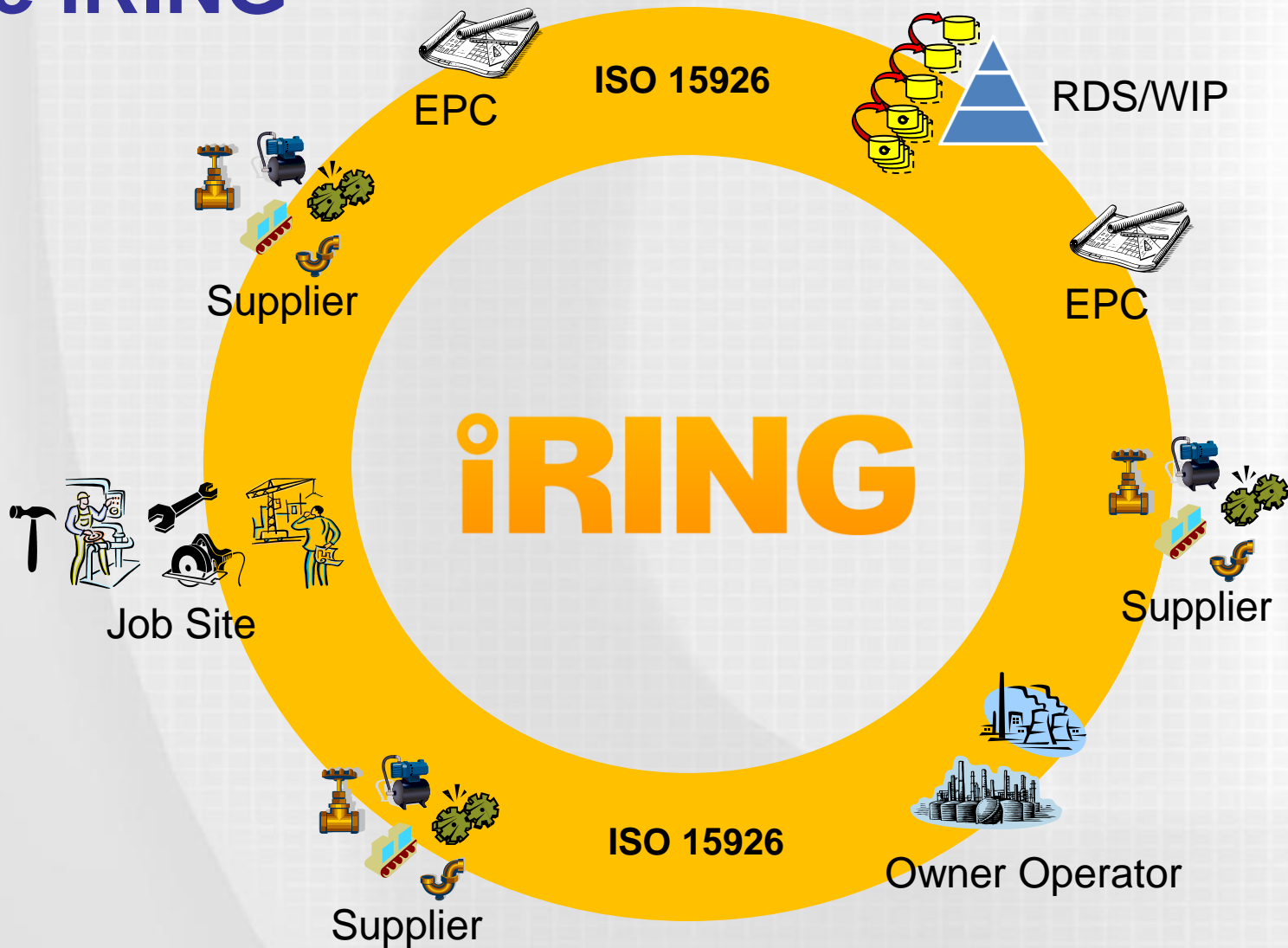
Bechtel's Information Landscape



DataBroker and the RDM

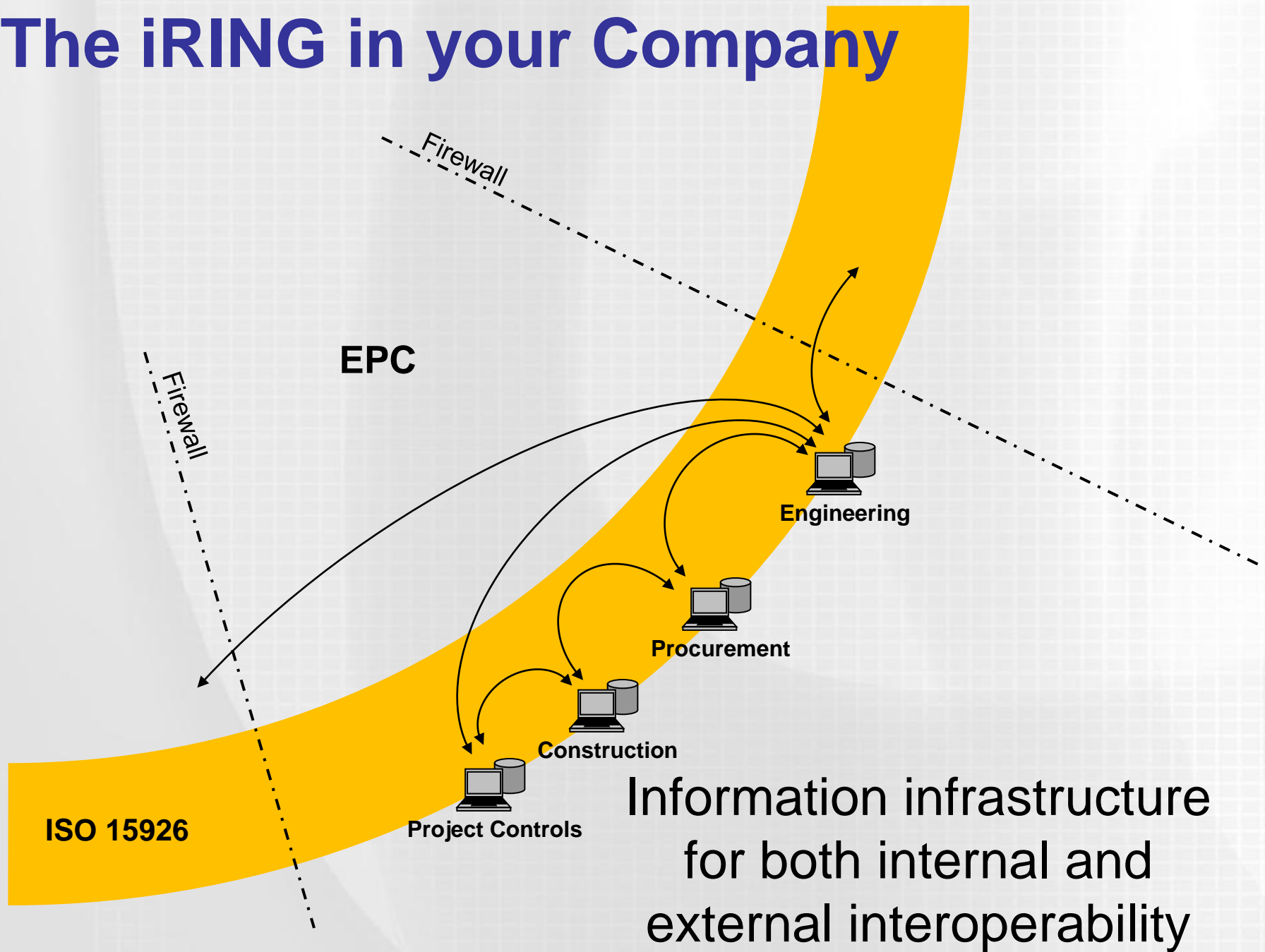


The iRING

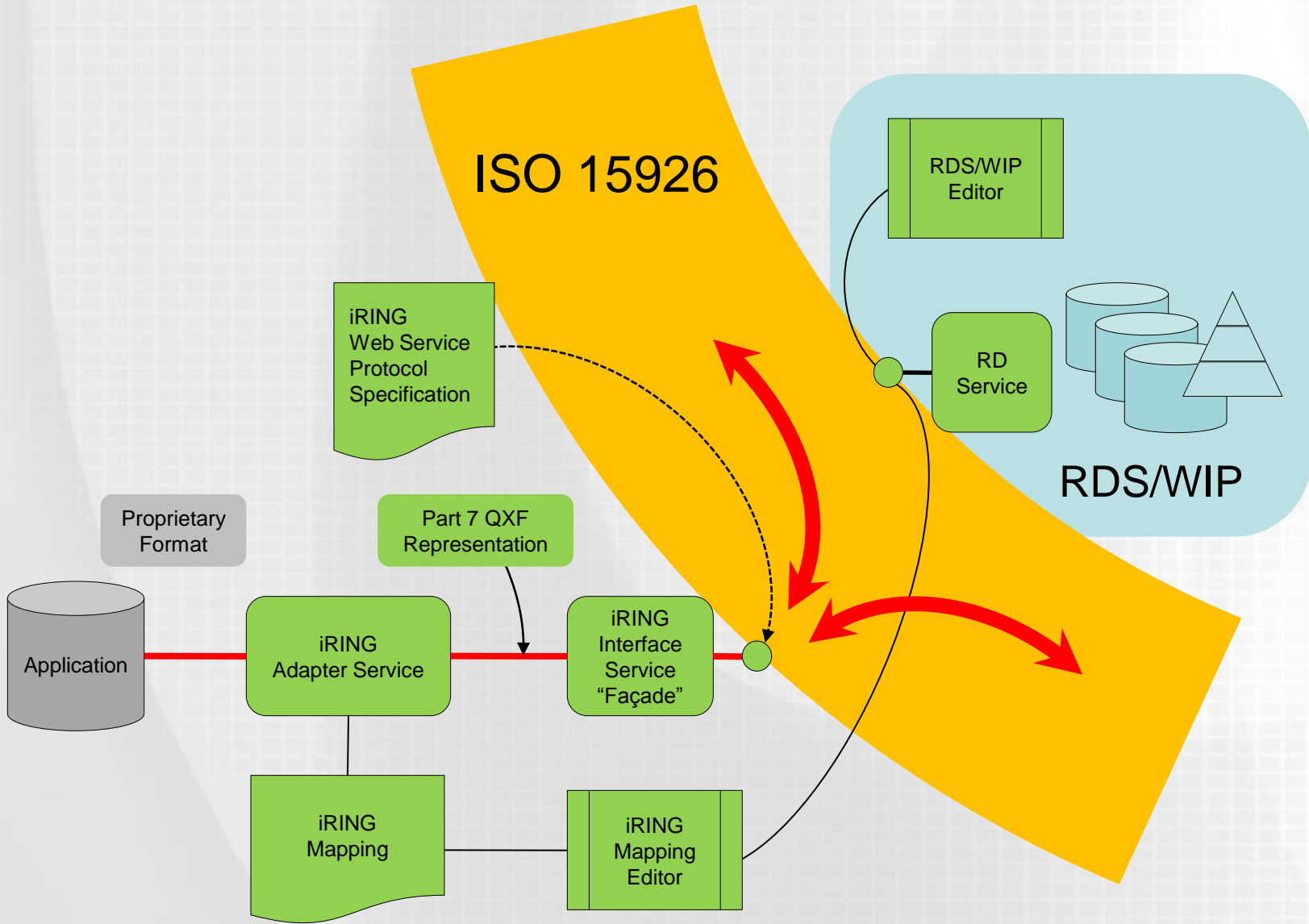


ISO 15926 Realtime Interoperability Network Grid

The iRING in your Company

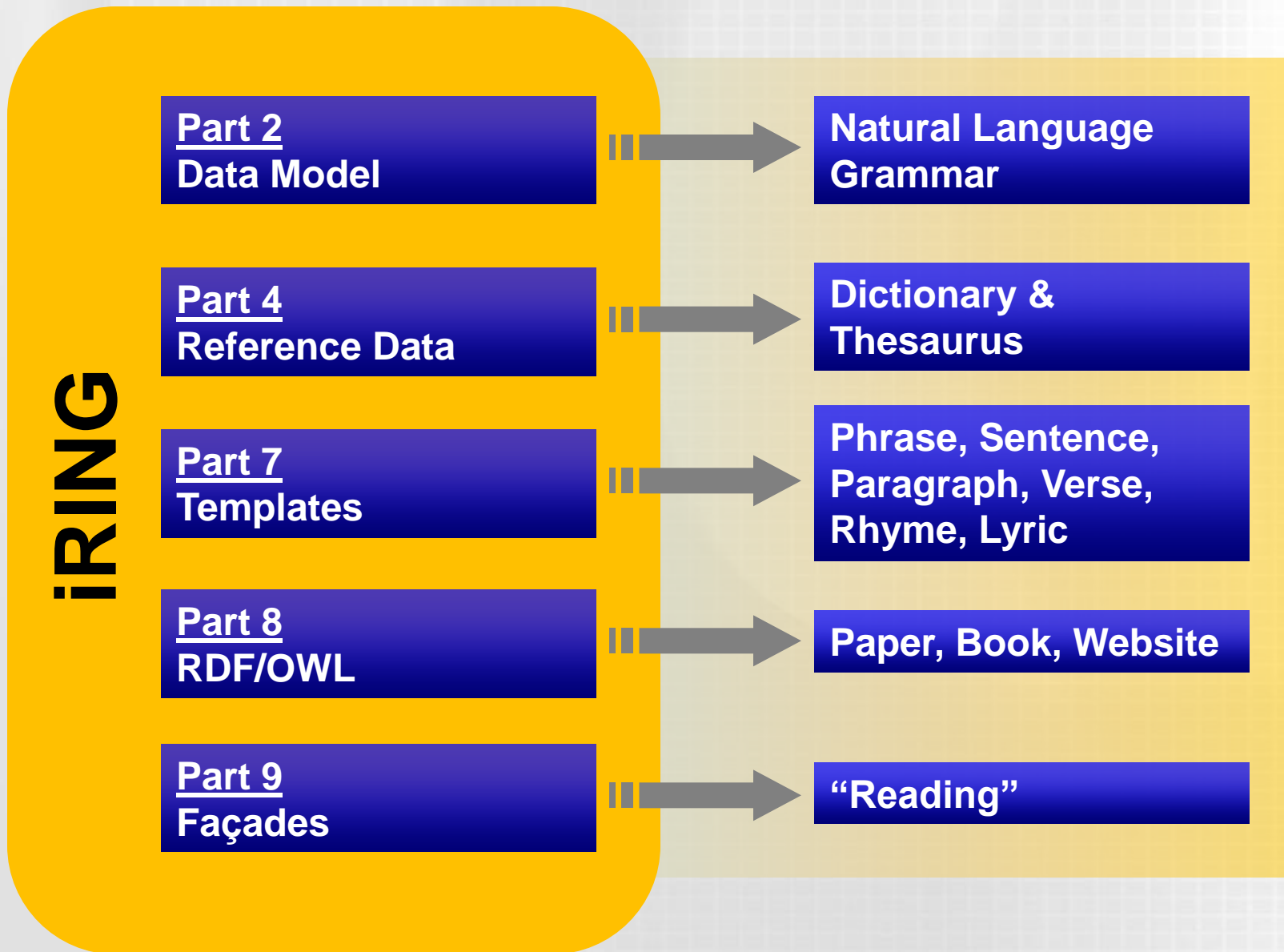


iRING v1.0.0 Deliverable

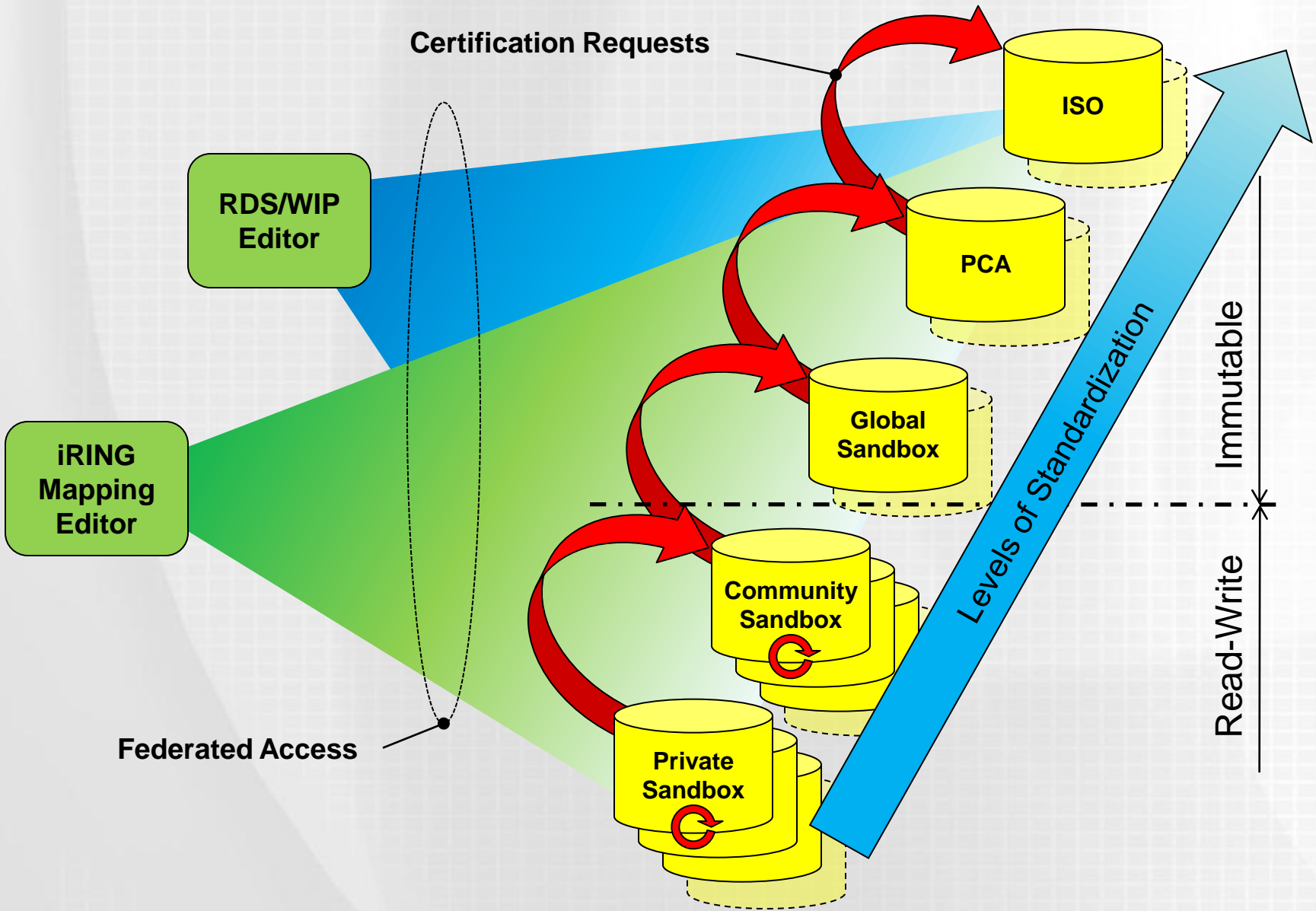


Note: Components shown in green are included in the May 29th, 2009 delivery

ISO 15926 “Parts” Analogy



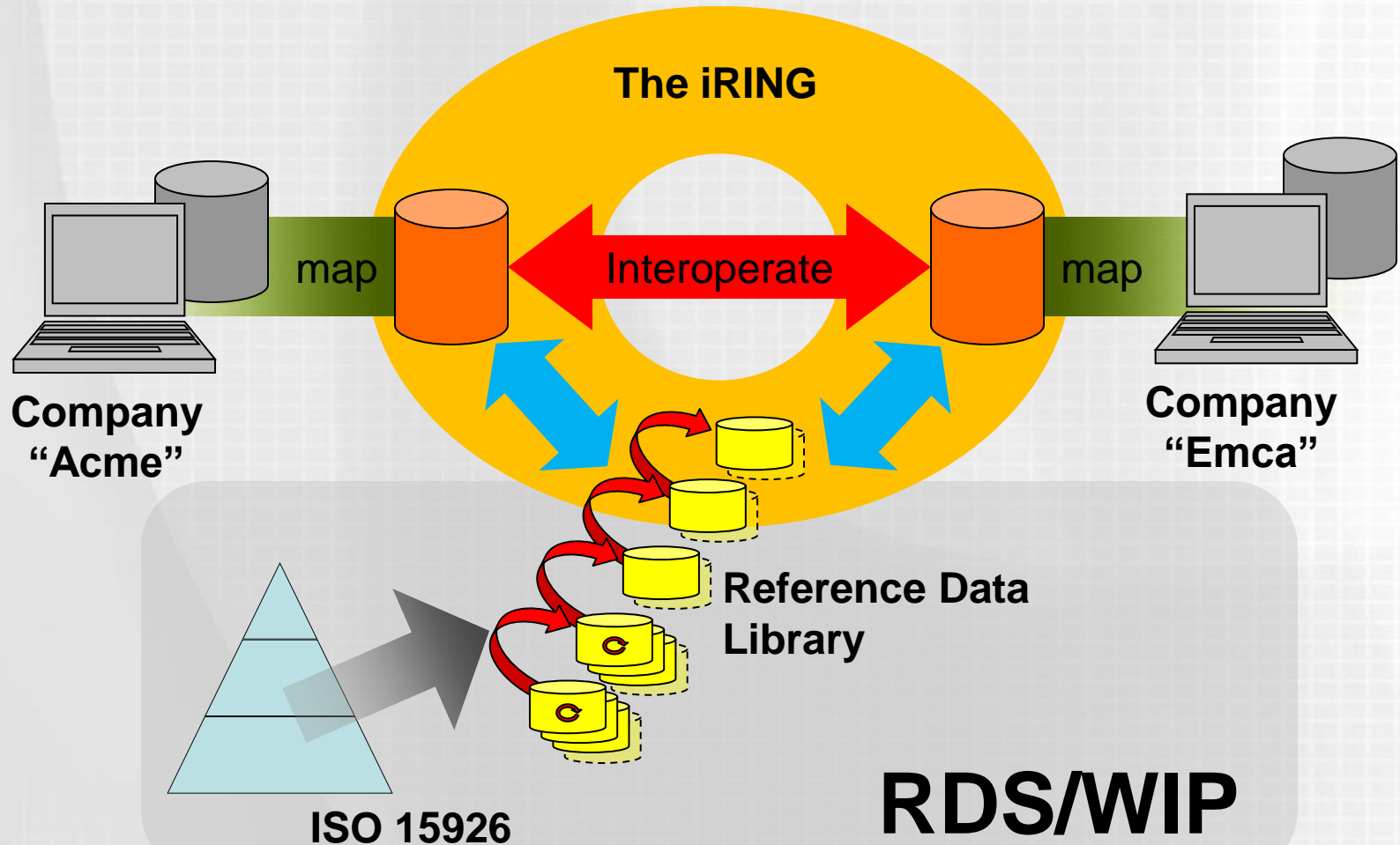
Reference Data Federation



Improve Your Interoperability

Start with ISO 15926!

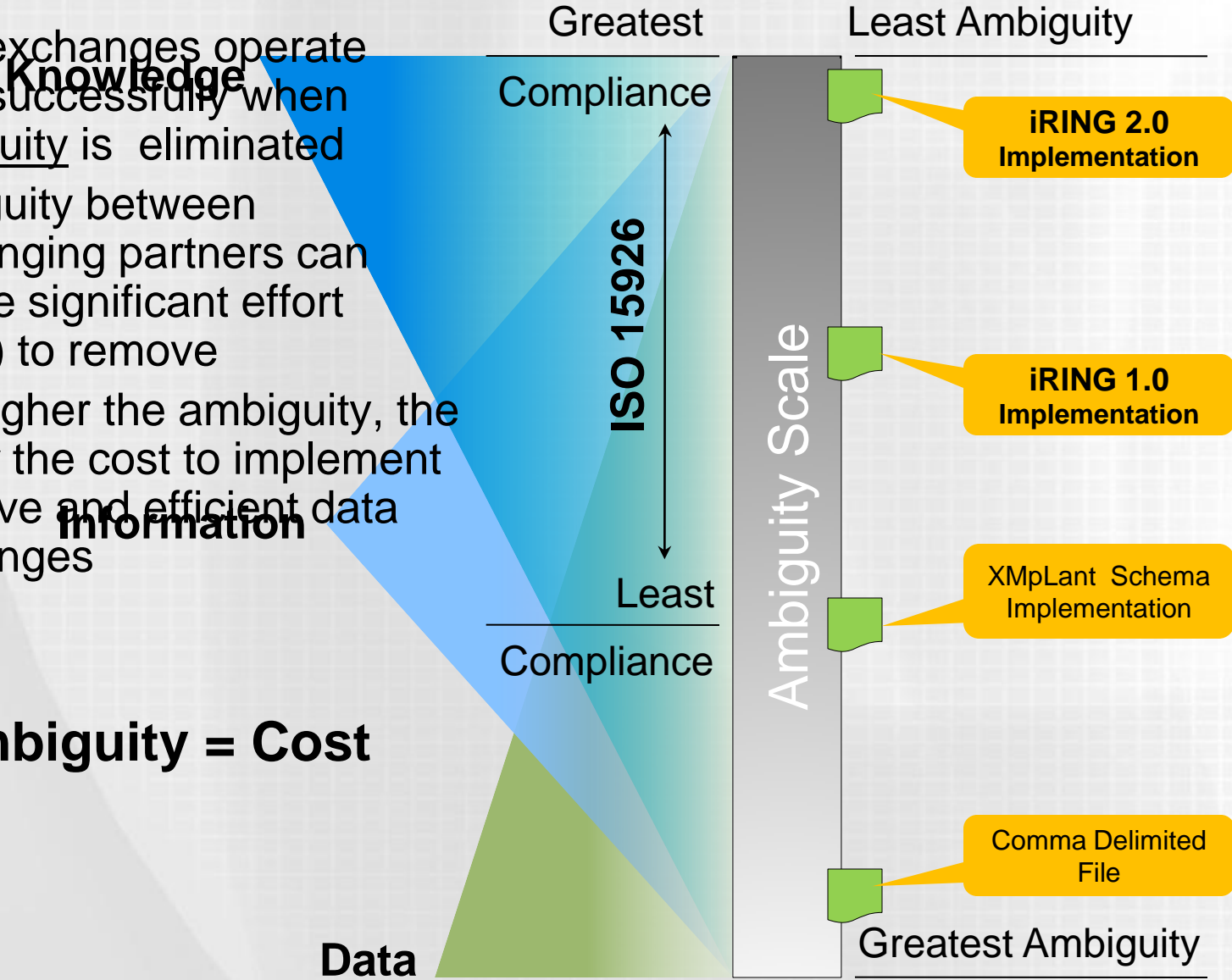
ISO 15926 is a standard for interoperability and the integration of lifecycle information



Information Ambiguity

- Data exchanges operate most successfully when ambiguity is eliminated
- Ambiguity between exchanging partners can require significant effort (labor) to remove
- The higher the ambiguity, the higher the cost to implement effective and efficient data exchanges

Ambiguity = Cost



Top Down versus Bottom Up Modeling

Top Down: The best get together to make the industry models

Debate Driven

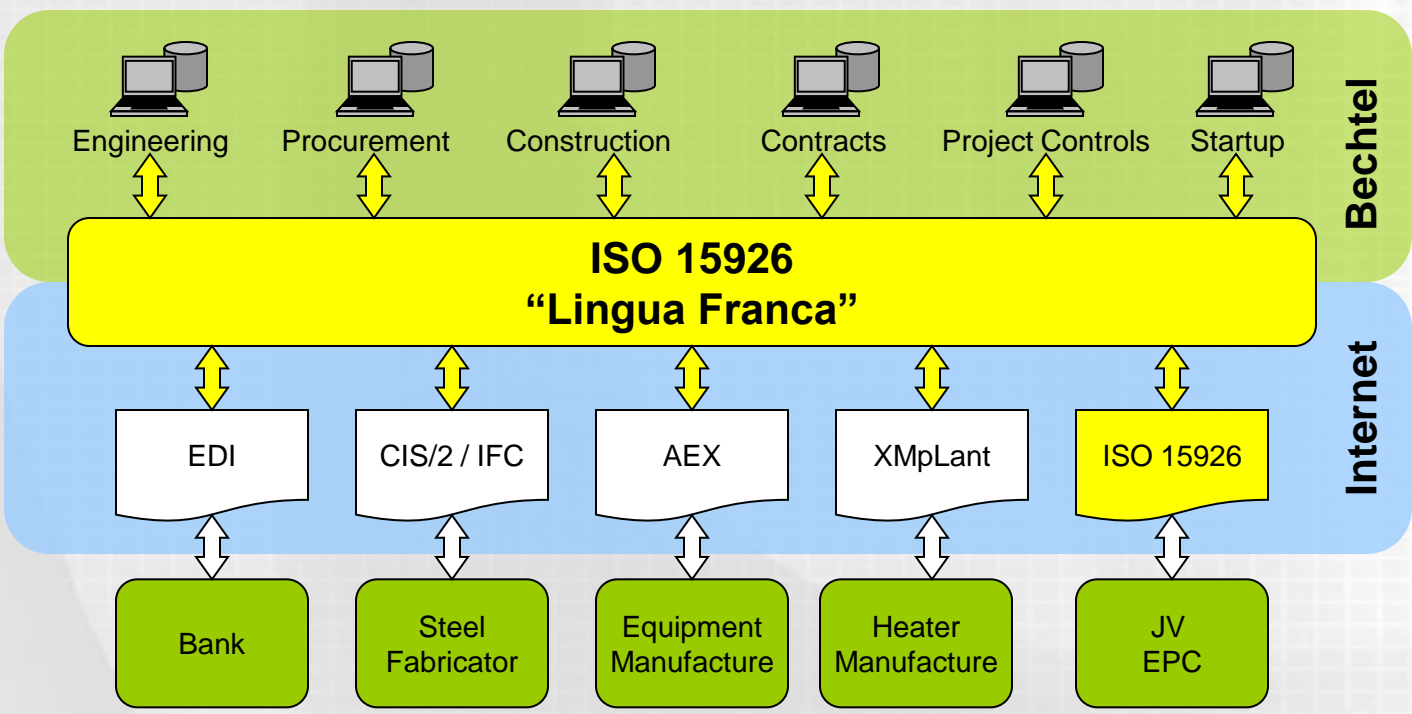


Business Driven

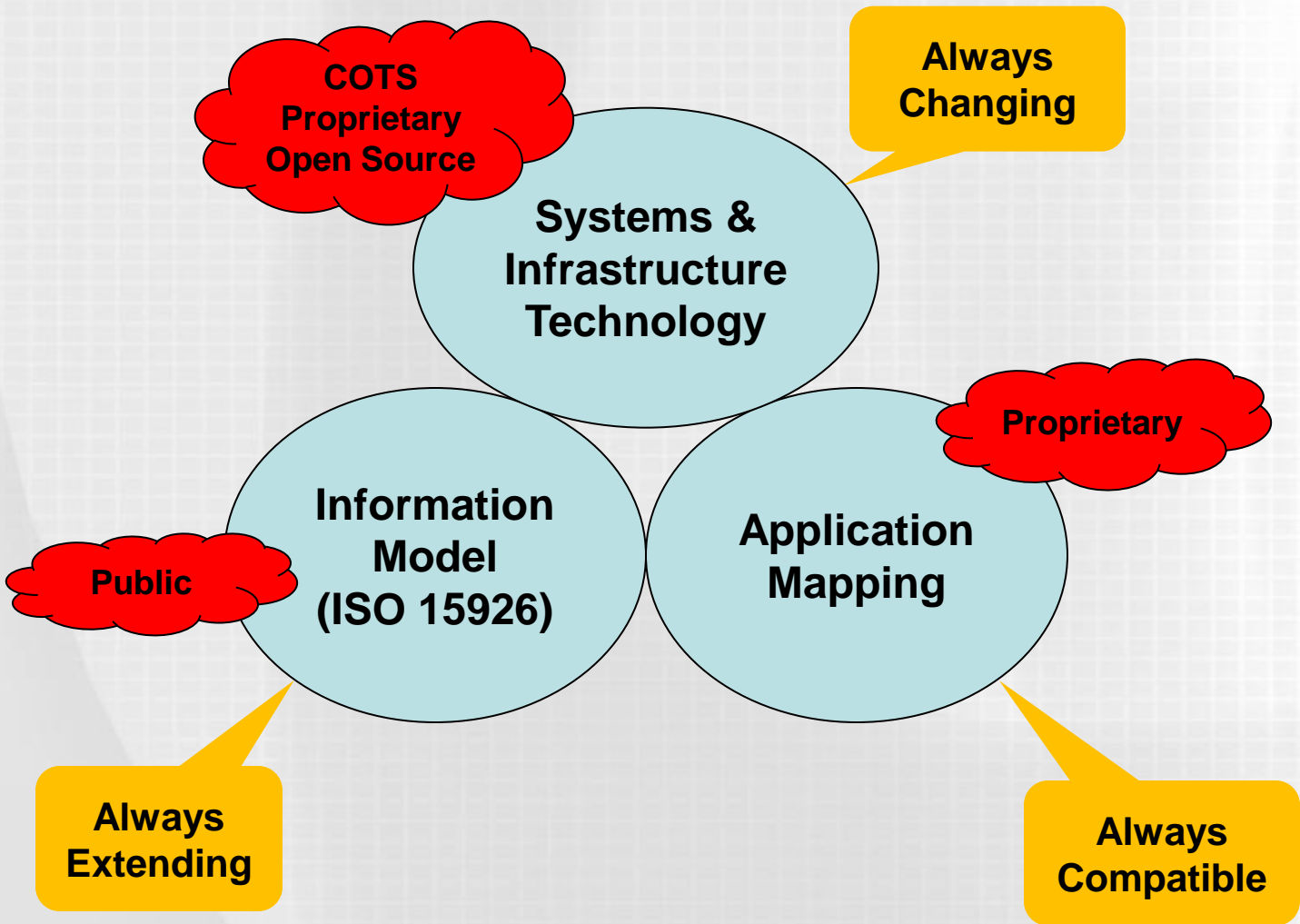


Bottom Up: You are on a project and you need the model now!

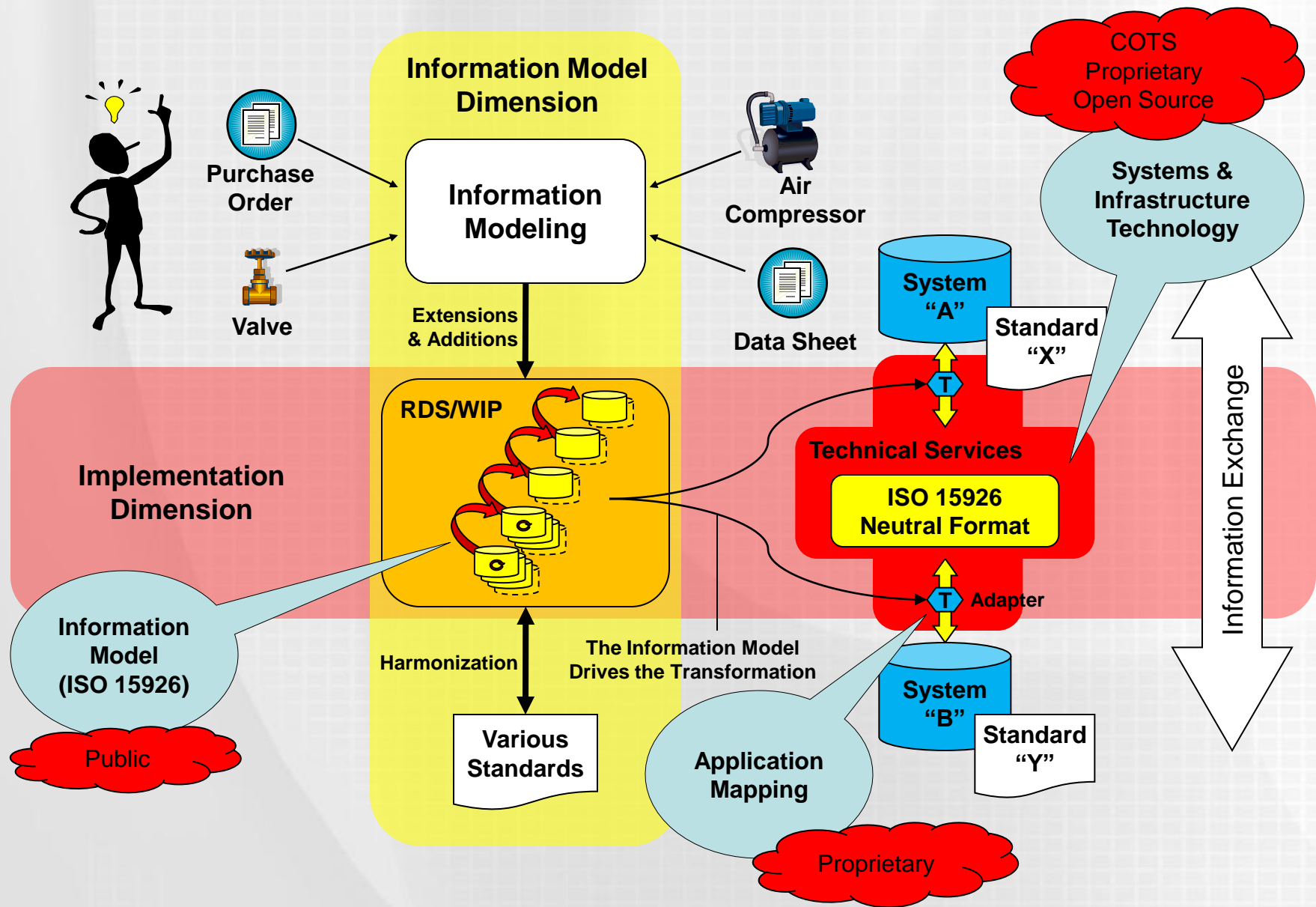
Plethora of Standards



Automation Investment



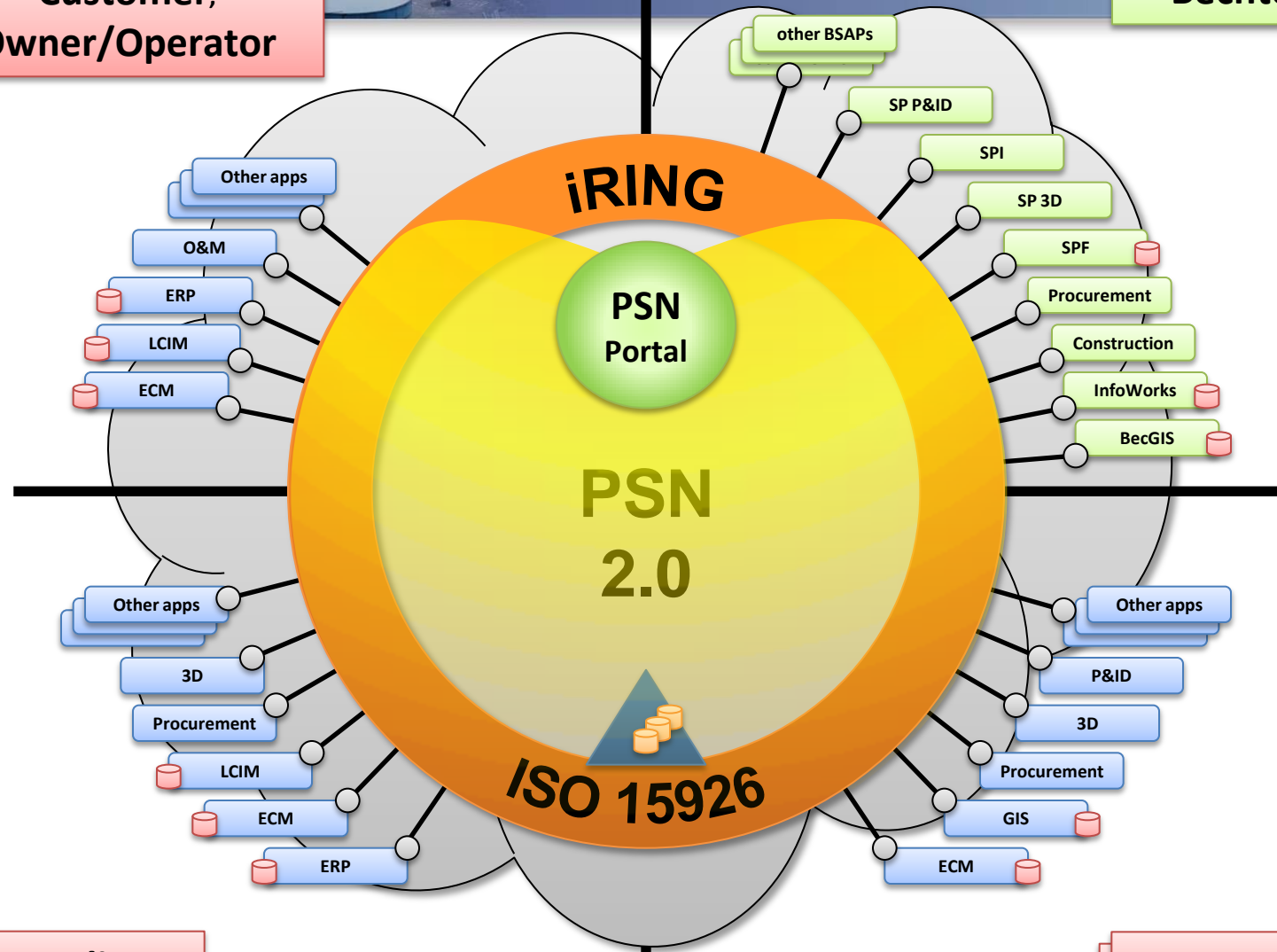
Model Driven Interoperability



iRING Deployment

Customer,
Owner/Operator

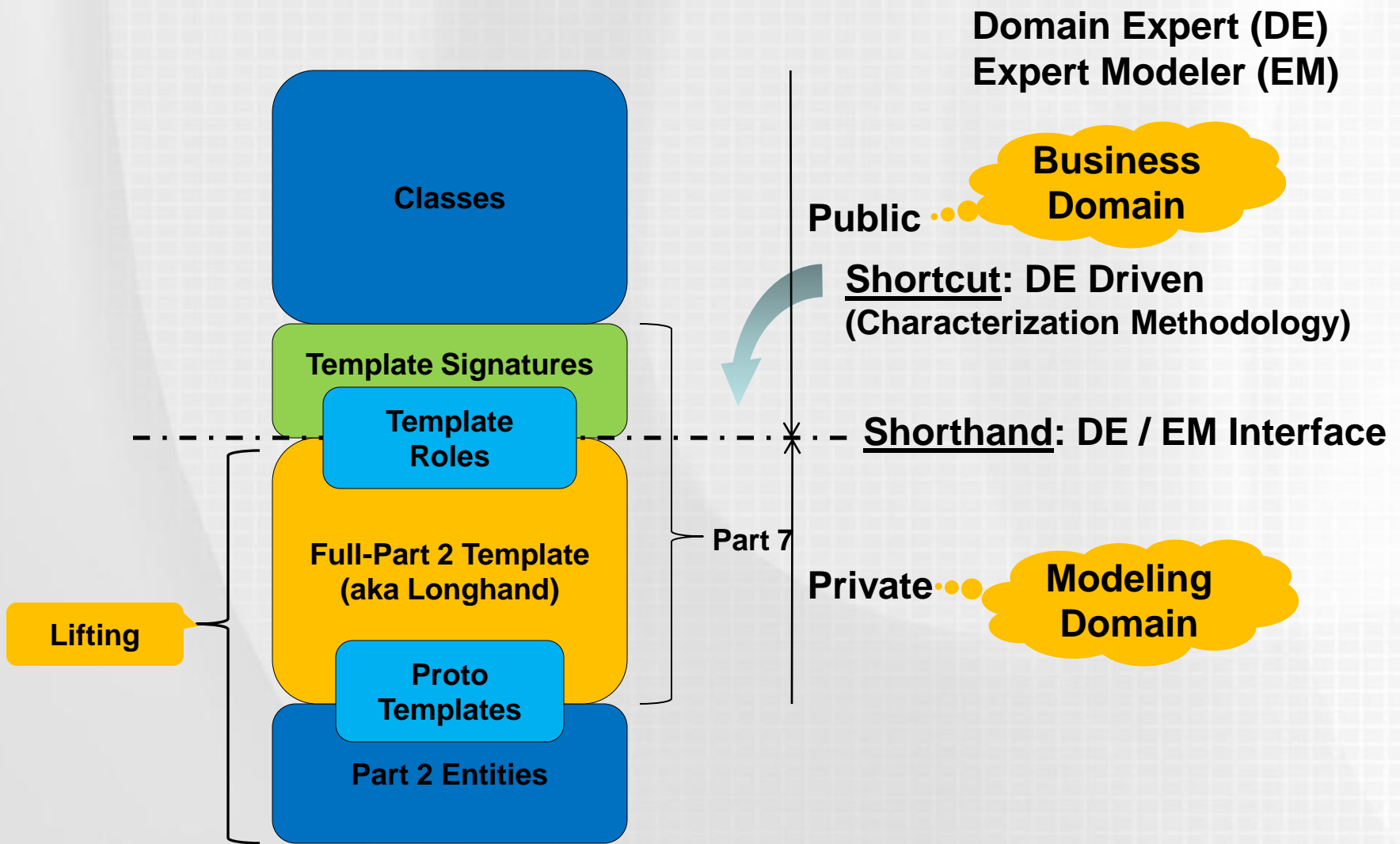
Bechtel



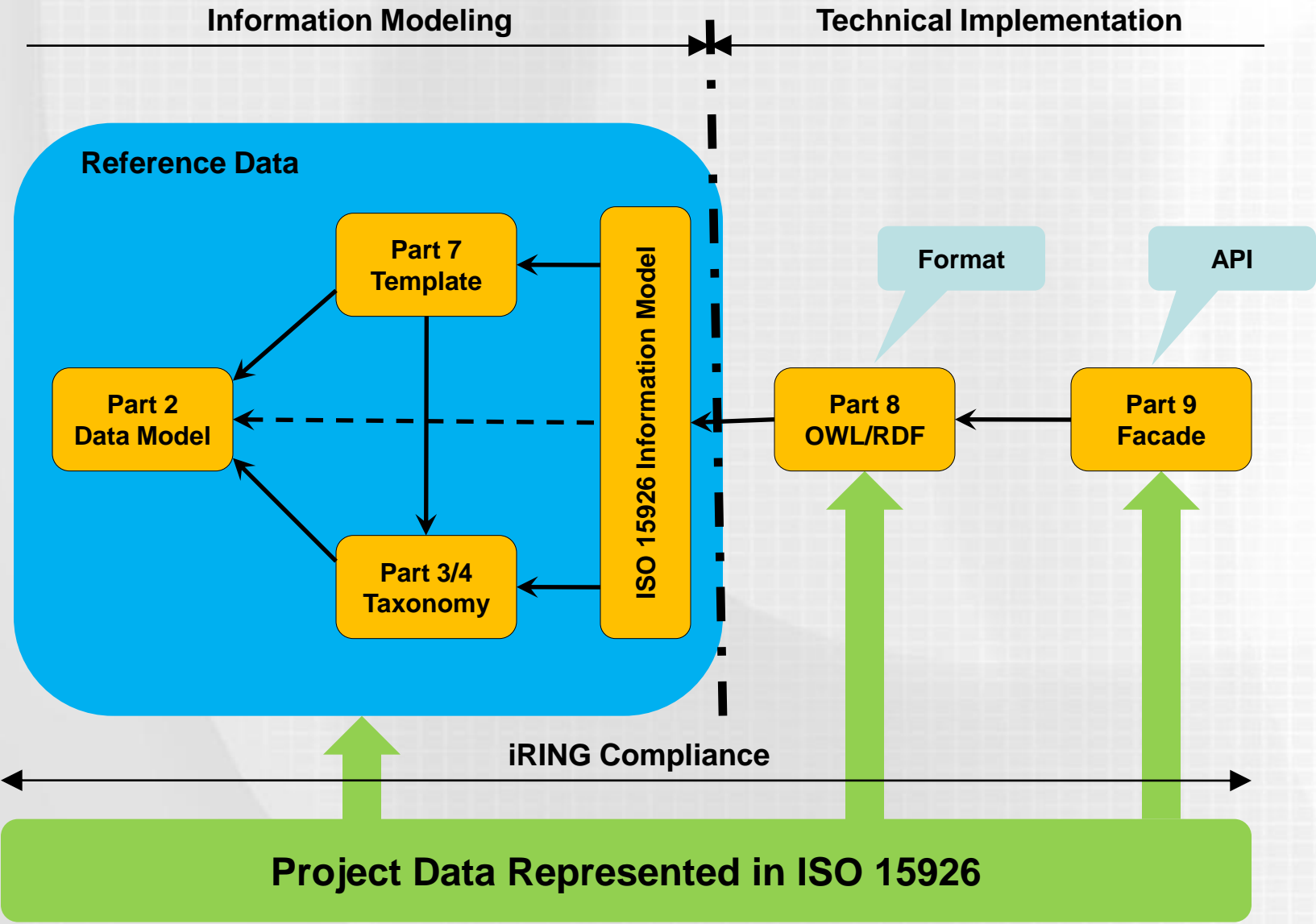
Suppliers

JV Partners

ISO 15926 Reference Data

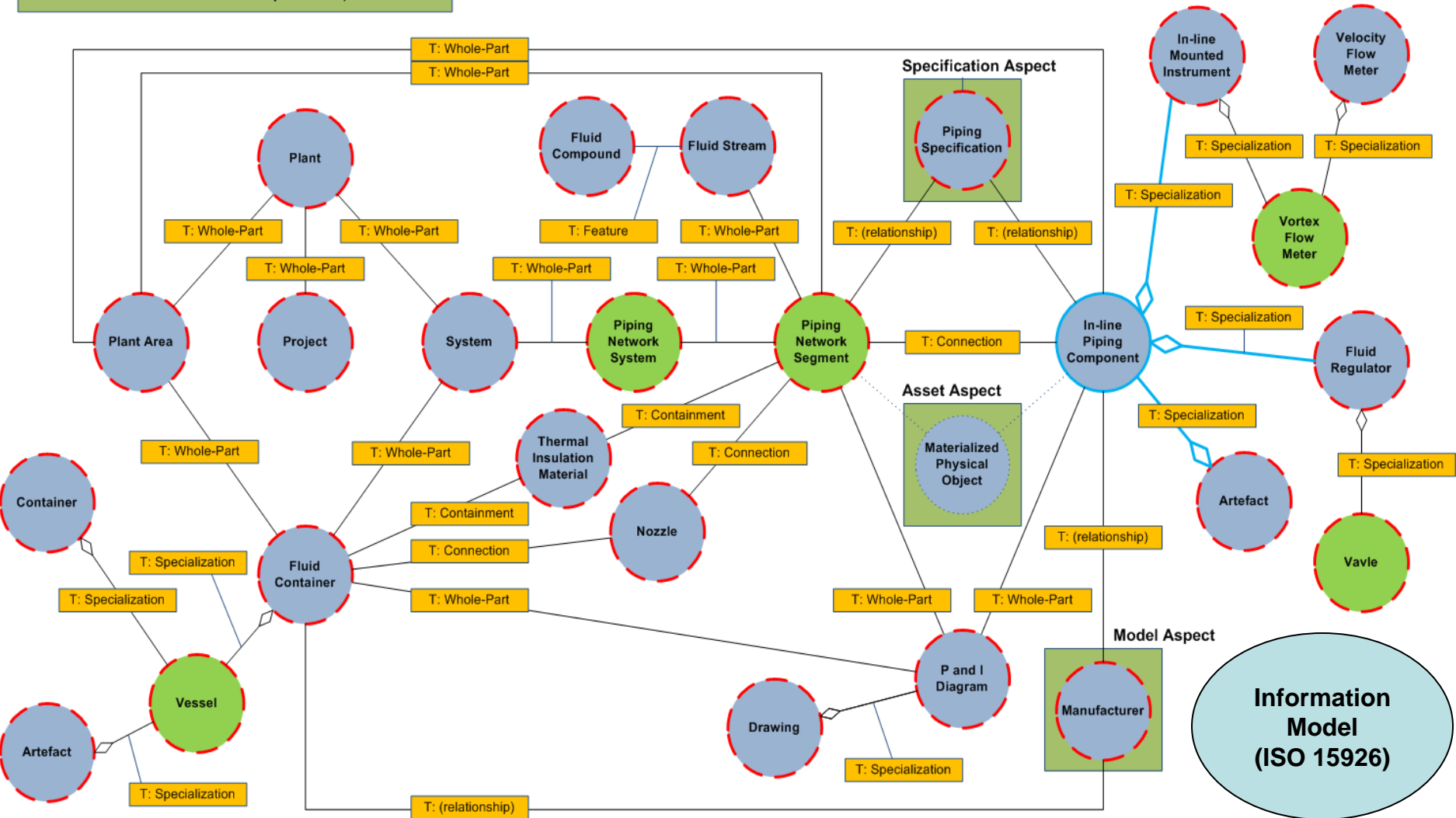


ISO 15926 Standard Conformance

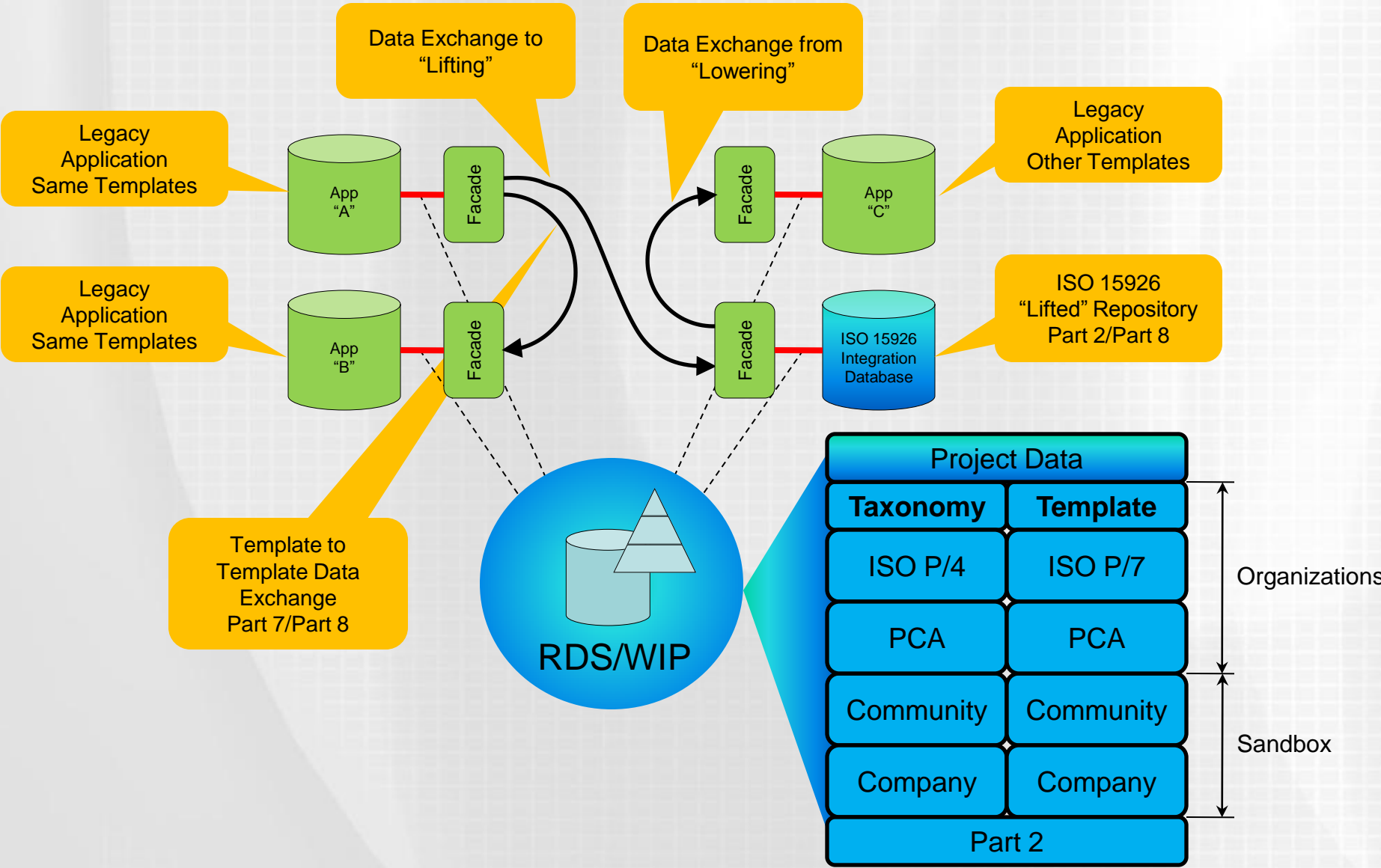


Initial ISO 15926 Information Model

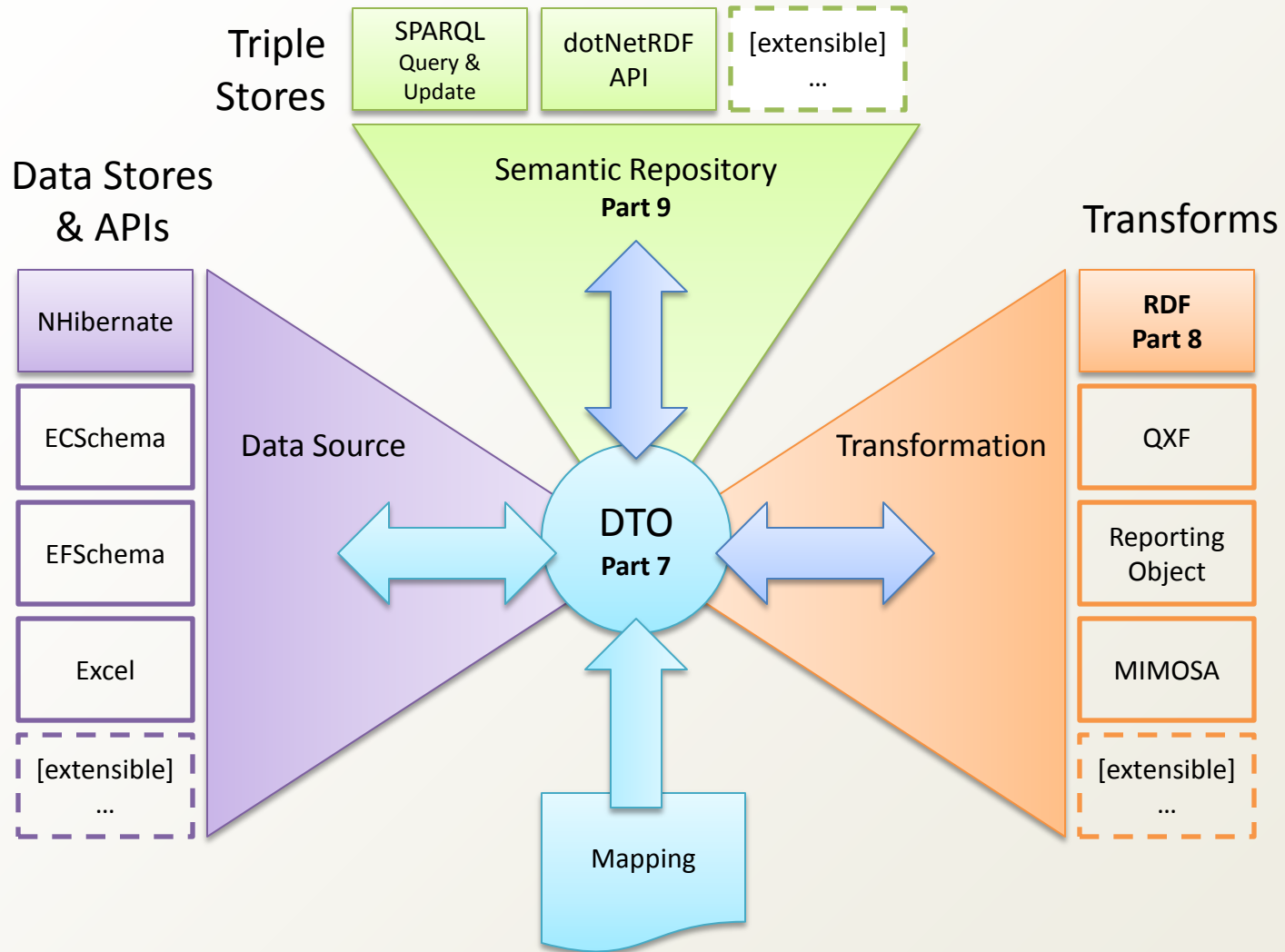
Note: All classes are **Functional Aspect** except where noted



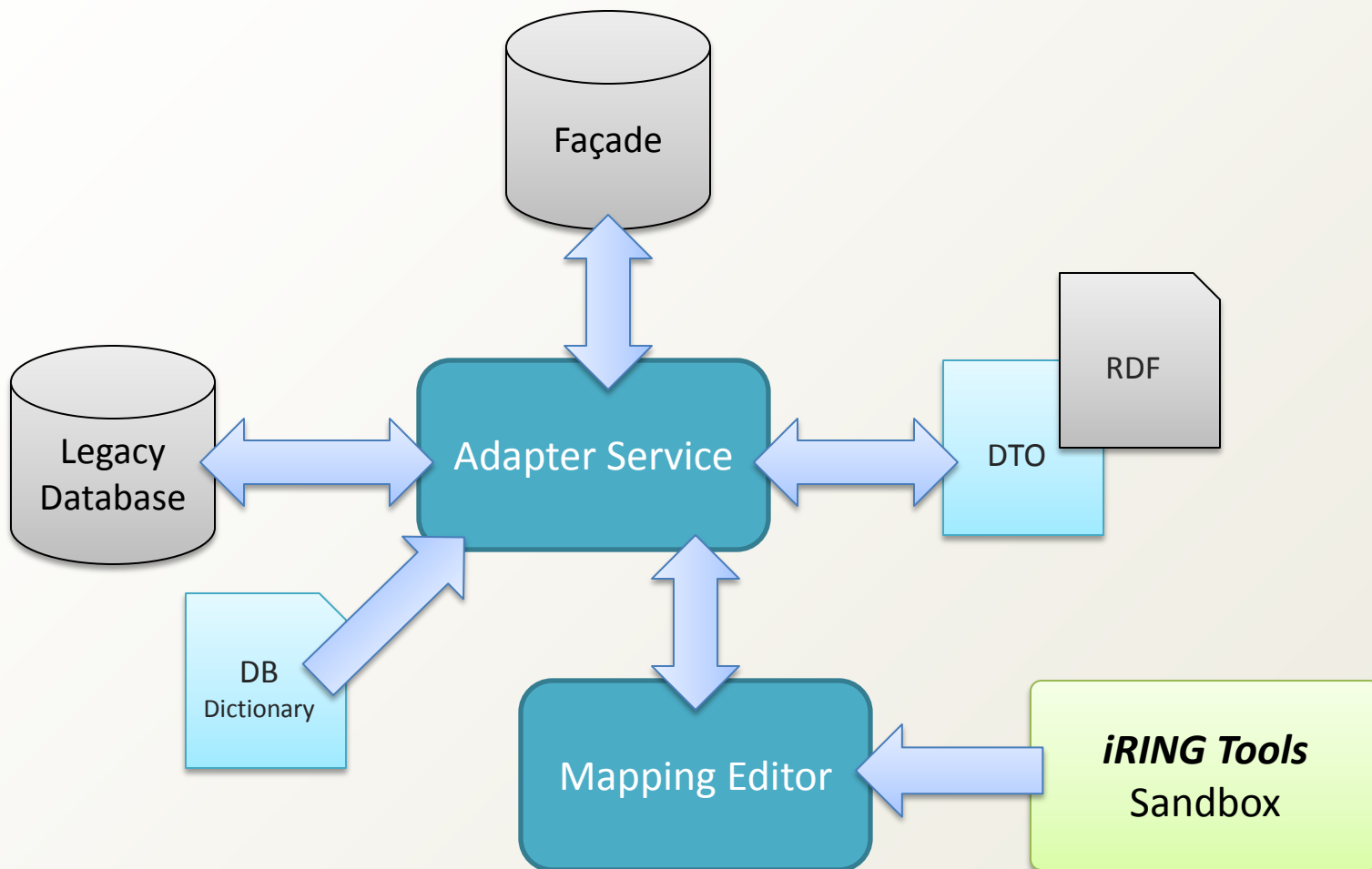
Reference Data Federation



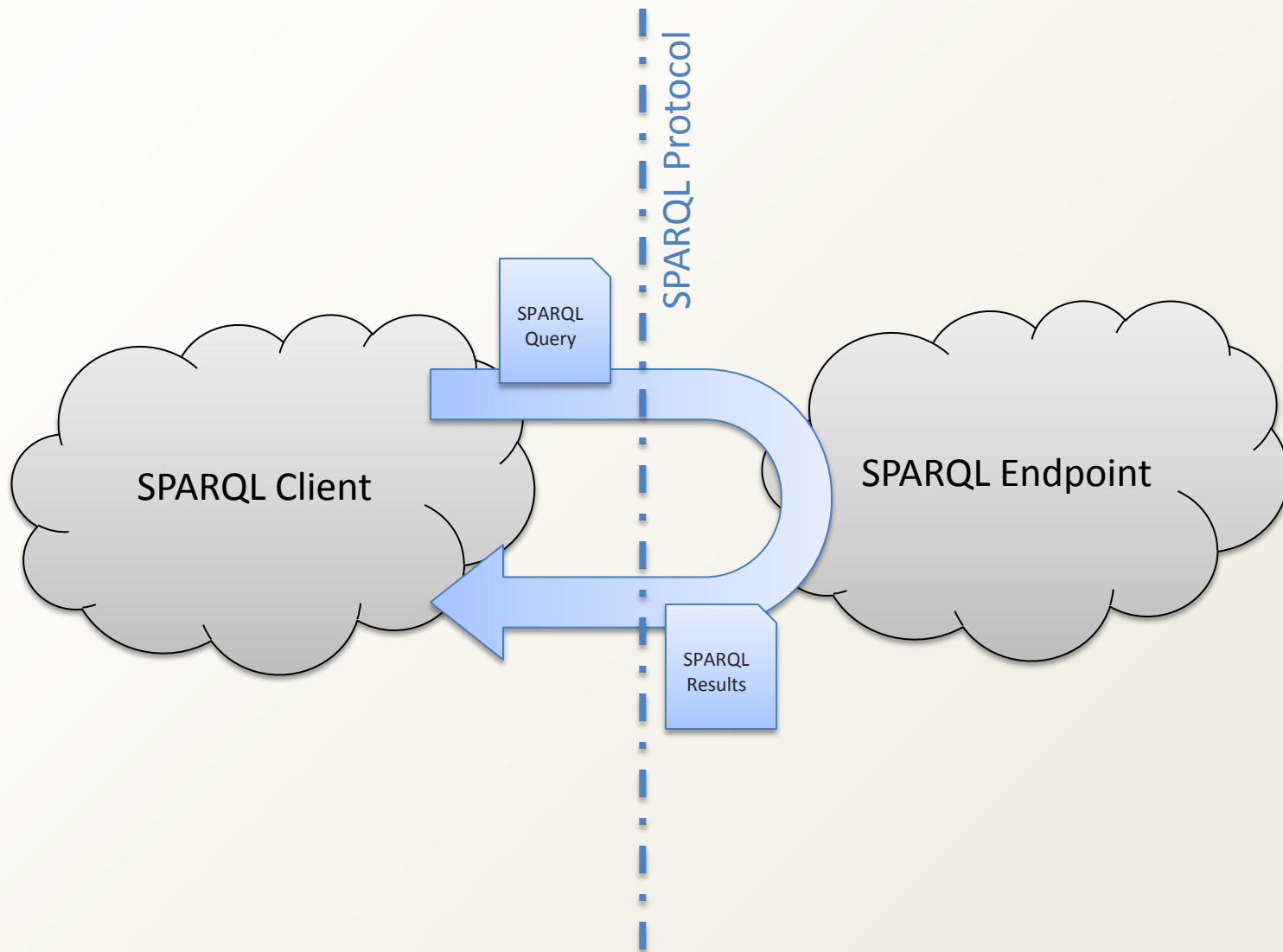
Adapter Framework



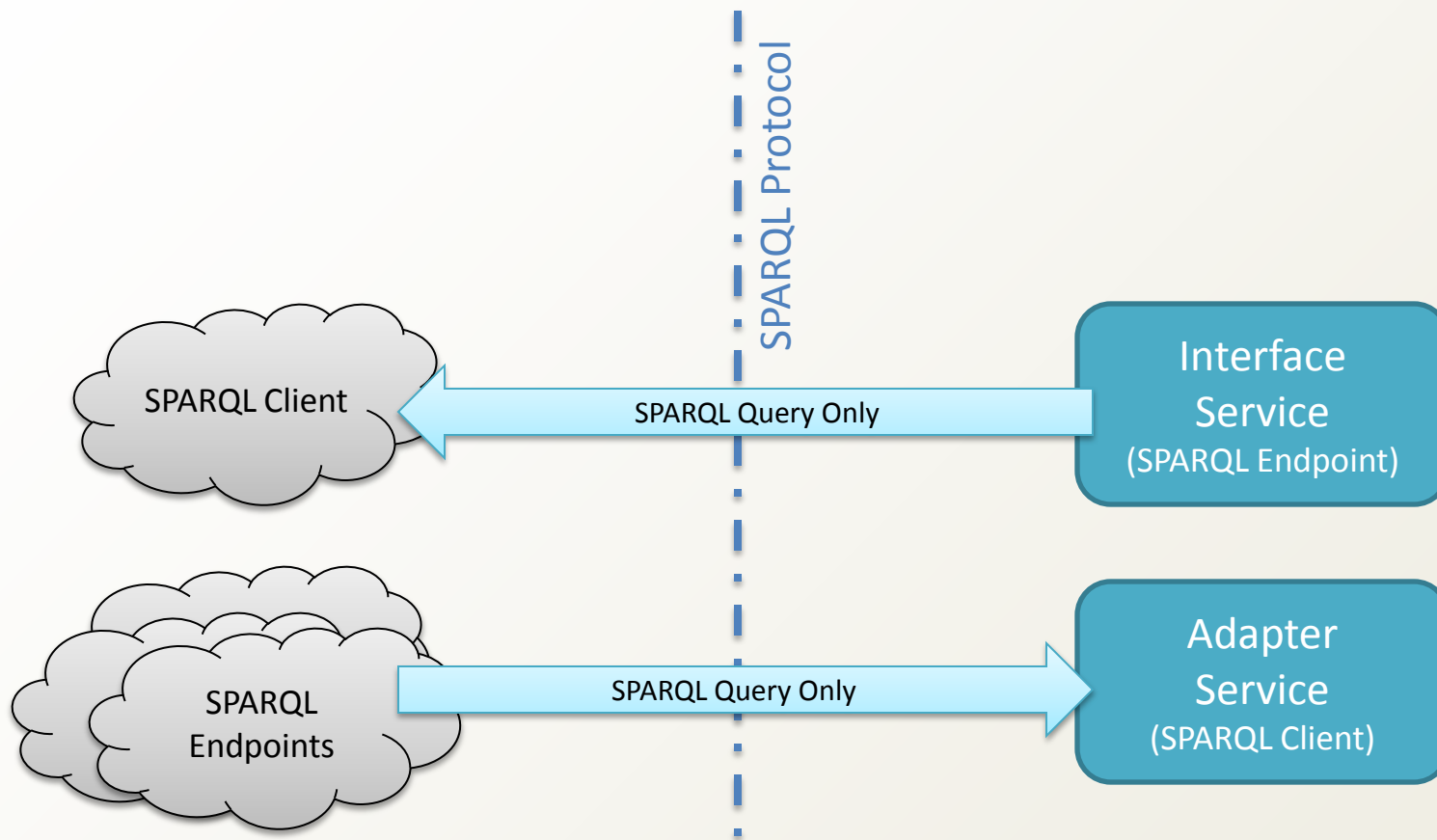
Adapter Overview



SPARQL Protocol



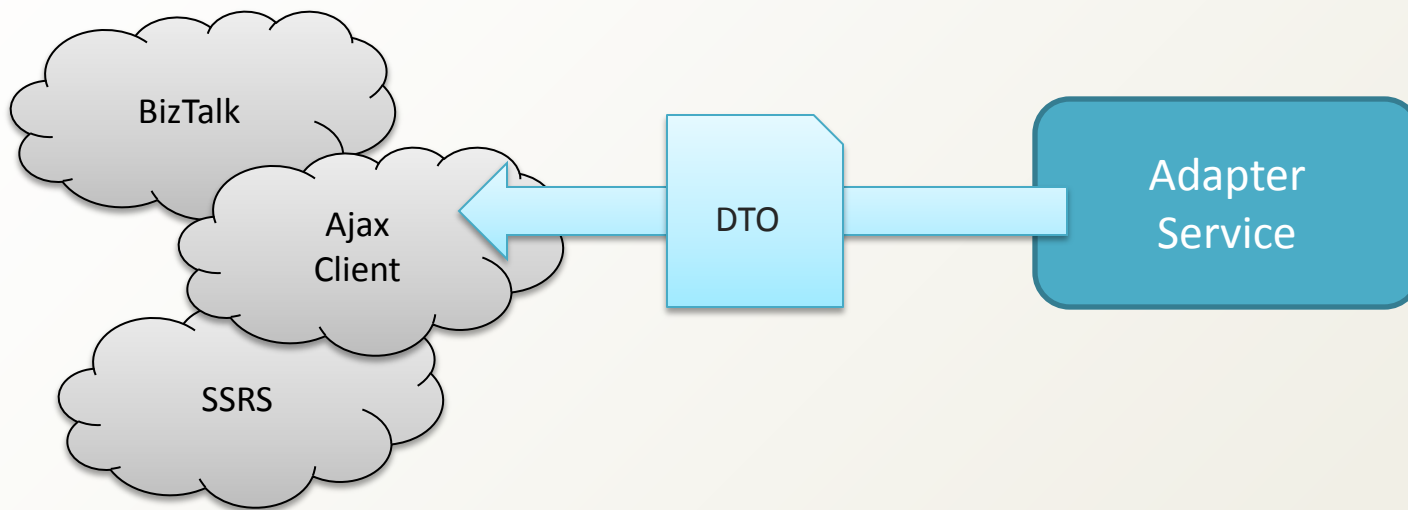
SPARQL Data Exchange



XML Data Exchange



Data Services



Dependency Injection



```
interface IWeapon
{
    void Hit(string target);
}

class Sword : IWeapon
{
    public void Hit(string target)
    {
        Console.WriteLine("Chopped {0} clean in half", target);
    }
}

class Samurai
{
    private readonly IWeapon _weapon;

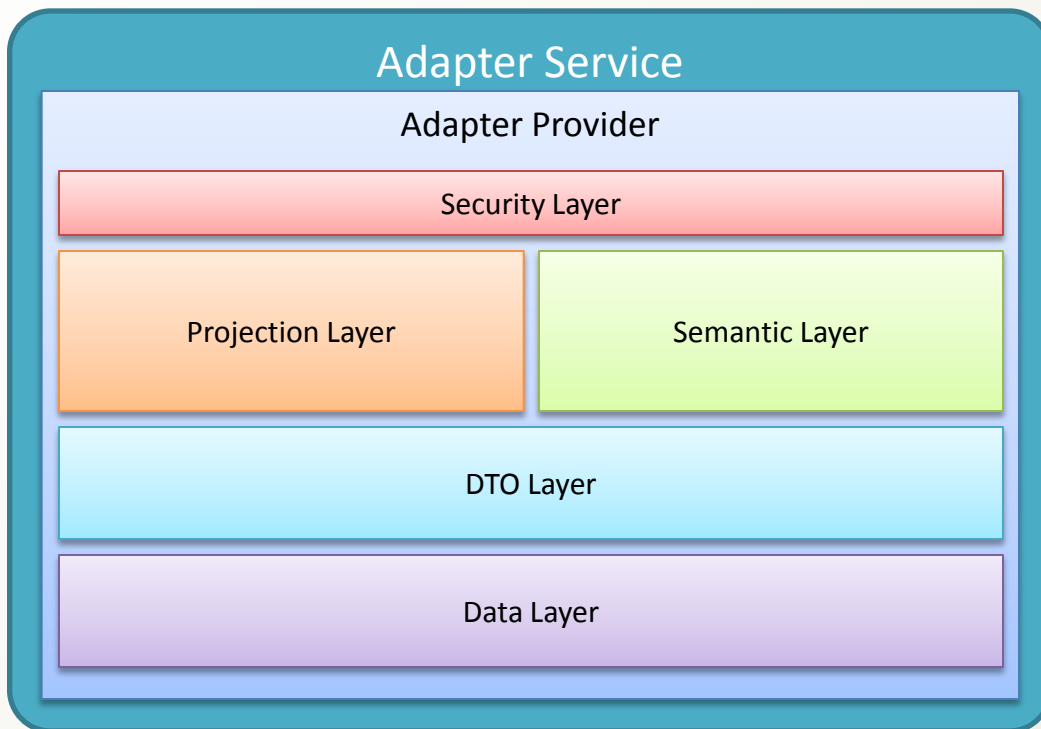
    [Inject]
    public Samurai(IWeapon weapon)
    {
        _weapon = weapon;
    }
    public void Attack(string target)
    {
        _weapon.Hit(target);
    }
}
```

```
class Program
{
    public static void Main()
    {
        IKernel kernel = new StandardKernel();
        Bind<IWeapon>().To<Sword>();
        var samurai = kernel.Get<Samurai>();
        samurai.Attack("the evildoers");
    }
}
```

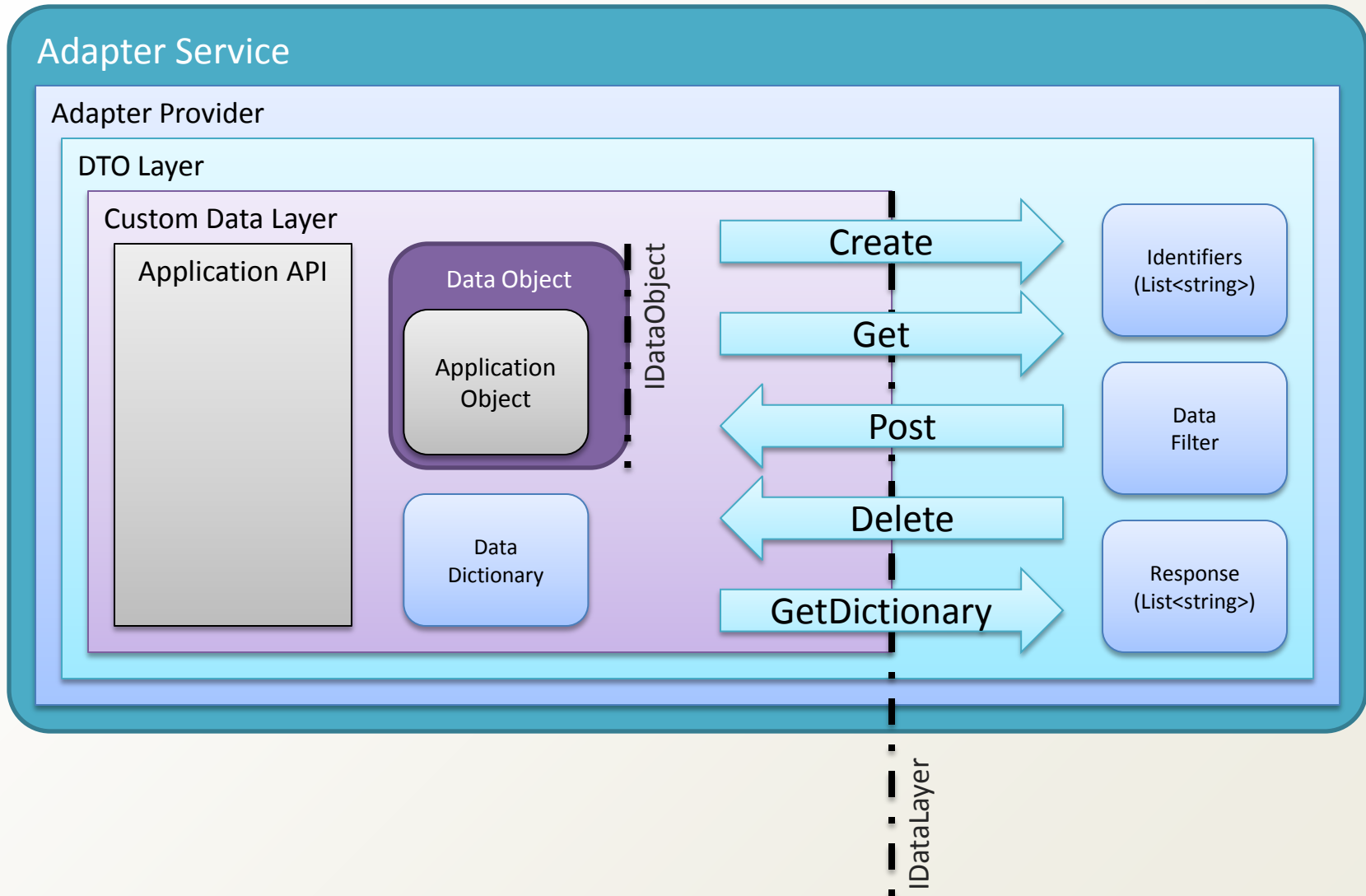
```
C:\>program
Chopped the evildoers clean in half
```

```
C:\>
```

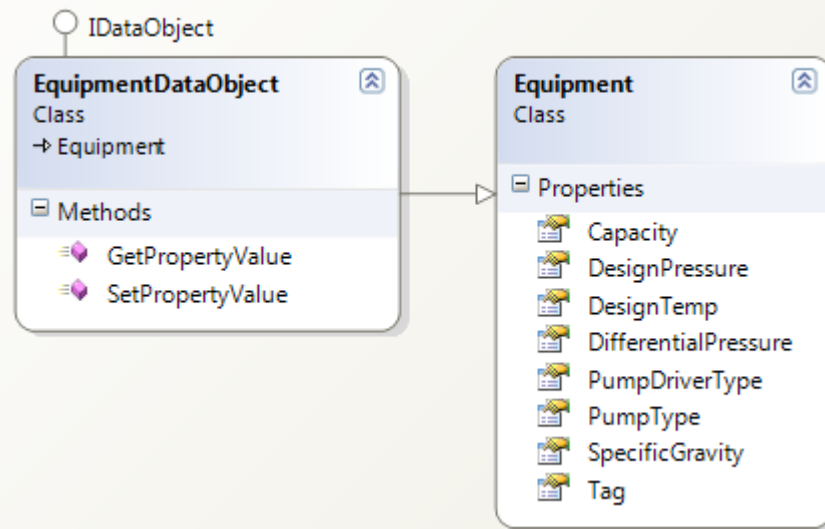
Adapter Layers



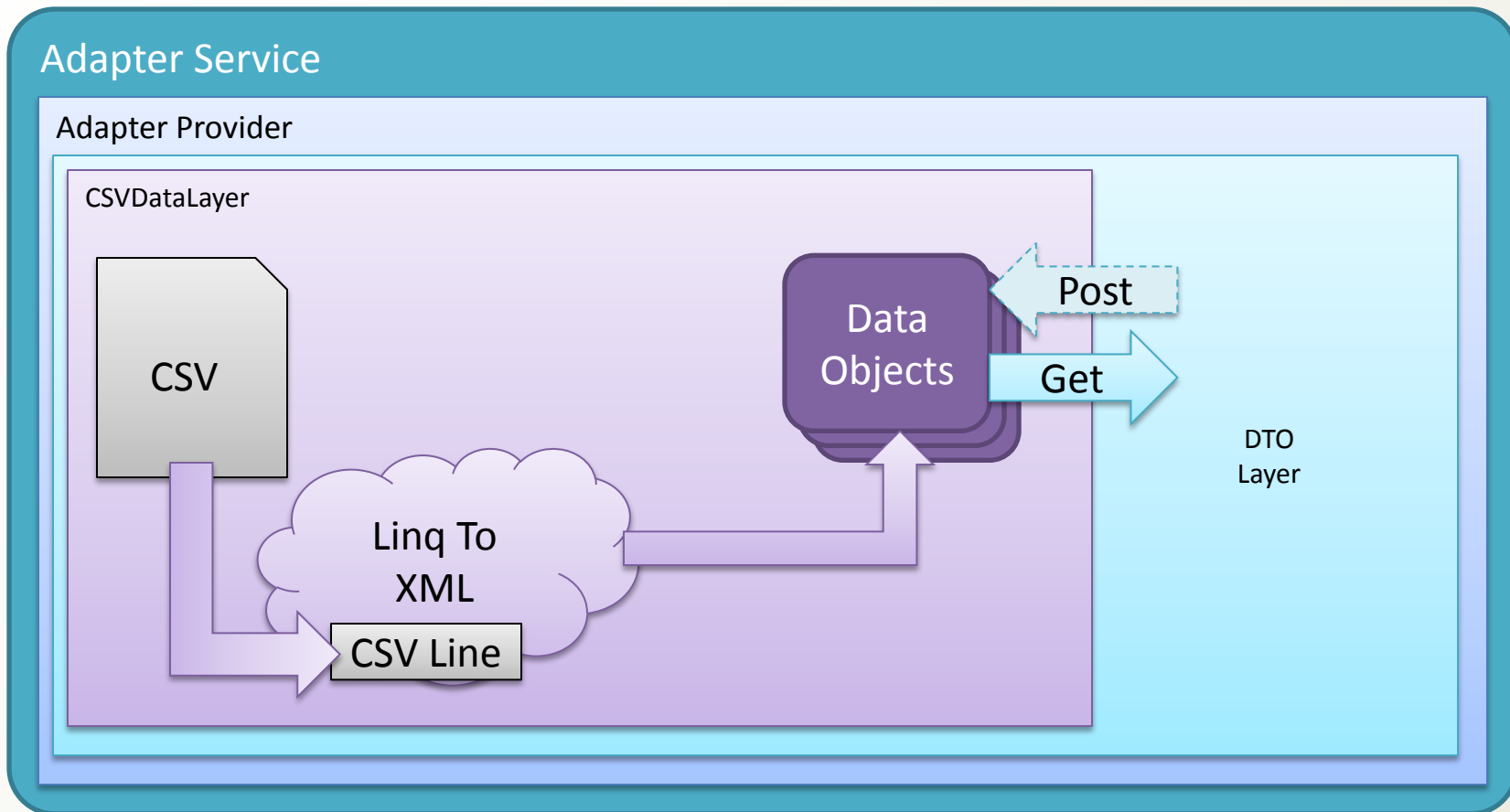
Data Layer Extensibility



Data Layer Extensibility



CSV Data Layer



Collaboration is the Key

- To develop the standard
- To build the reference data
- To develop and test prototypes
- To create production software
- Gain access to the experts
- Share the costs
- Leverage knowledge
- Common problem for all
 - Glass is half full or glass is half empty?

iRING — **USER GROUP**

www.iringug.org

2010 Demonstrations

- Digital Plant 2010
 - iRINGUserGroup
 - iRINGTools/Bentley demonstration
- Private Demonstrations
 - Bechtel
 - Hatch
 - Emerson
- FIATECH Conference 2010
 - Bechtel
 - Bentley
 - CCC
 - CH2M Hill
 - Dow
 - Emerson
 - Hatch
 - Intergraph
 - TCS

FIATECH iRING Demo



OpenPlant
PDxManager

Bentley
Exton, PA

Dow
Houston, TX

SmartPlant
P&ID

Hatch
Brisbane,
Australia

Emerson
Pune, India

PlantSpace
P&ID

EIO

CCC
Athens,
Greece

Conference 2010

CH2M Hill
Denver,
CO

iRING

C3D

PDB

ISO 15926 Realtime Interoperability Network Grid

Demonstrations

Bentley
Walnut,
CA

Bechtel,
Frederick,
MD

ISO 15926

ProjectWise
LCS

Inspec

SPI

TCS
New Delhi,
India

Intergraph
Huntsville,
AL

SPF

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Questions?