An innovative solution for Business Intelligence

Adam Jeffries – Conchango

Paul Verey - Capula

Background

- Our client collects a vast amount of data from its assets. However, this data is stored in multiple locations in various stages of manipulation, making whole scale data analysis problematic.
    - Disparate systems (some performing same function), leading to large numbers of interfaces, often highly complex in nature, and considerable maintenance overhead;
    - 'Silos' of data, leading to duplication of data (no single authoritative source available to all) and making it very difficult to aggregate or drill down to desired levels of detail, and making cross-asset and vendor comparisons very difficult;
    - Large number of Excel spreadsheets in use, leading to de-centralised data and intellectual capital, and in some cases compliance issues (e.g. Sarbanes-Oxley).
    - Current user visibility tools are "application based" and do not provide ease of user customization

VALUE NOW, VALUE OVER TIME

Benefits

Safety

- Identification of trends (number of incidents)
- Positive behaviour modifications
- Common source of information
- Company image within the industry

Environment

- Up to date information (environmental issues = costs)
- Analysis of spill thresholds (off shore / land)
- Integration with other portal information as to why spills are occurring
- Provision of up to date information
- Obtaining best energy efficiency

Safety & Environment

OPEX per Barrel

- Tracking mechanism for Asset Managers & Line Supervisors etc.
- Transparency of operations information – proactive management
- Real-time comparisons between assets
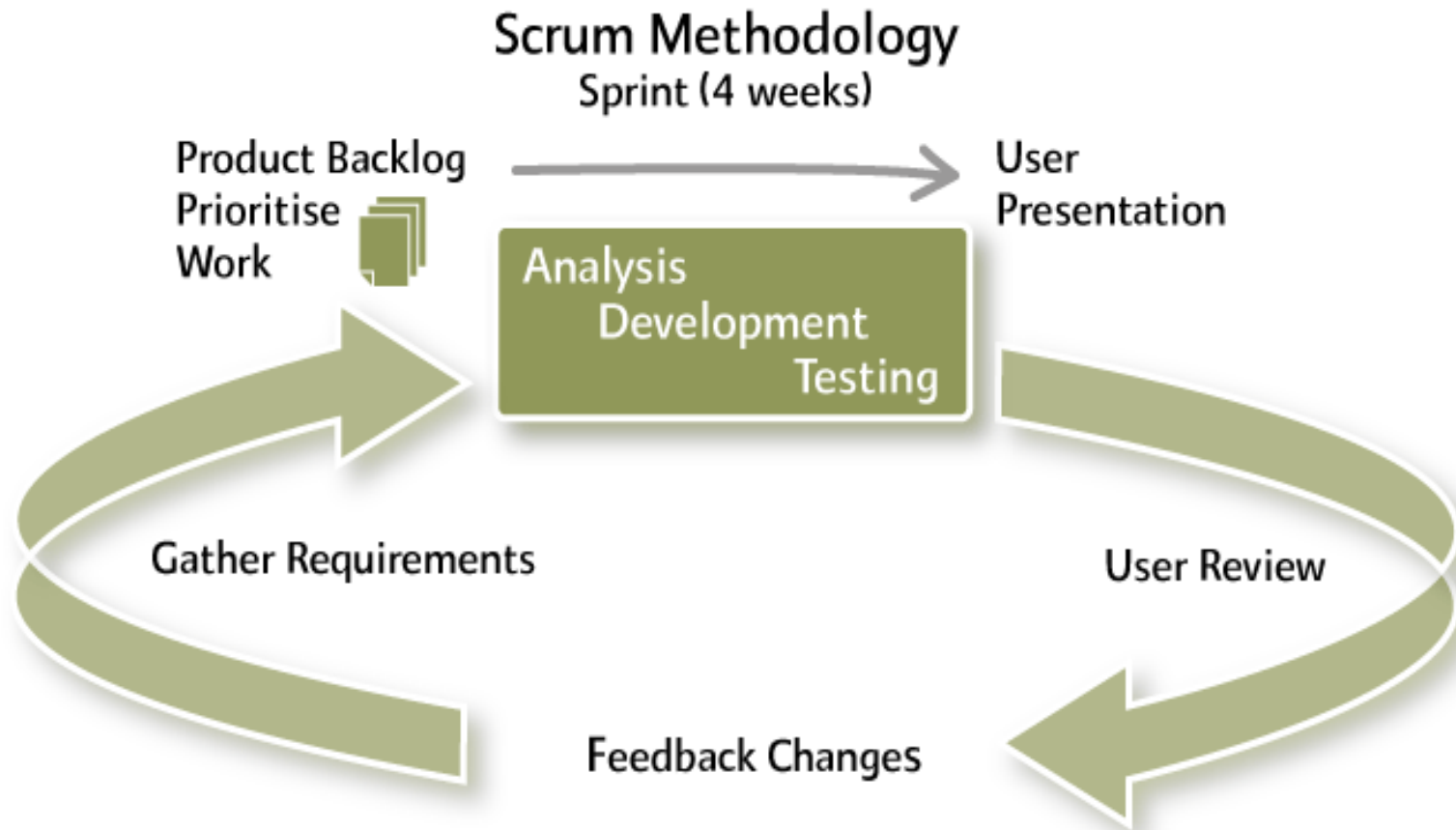- Linkage with operational facility CAPEX reporting

Cost

- Forecasting values – supports production chain, e.g.
  - Could reduce cost of chemicals needed
  - Ensures they get maximum $ return for oil produced
  - Identification of mature wells
  - Reduce storage costs of slop tanks
- Trending over time
- Real-time Operational Excellence metrics
- Reduction of Well Production Chain constraints

Reliability & Production

- Early identification / forecasting ability (i.e. before a flare situation is reached)
- Improving % increase in production = increase $ revenue
- Real time analysis of cause and effect (base business)
- Analysis of equipment efficiency (i.e. maintenance costs)
- CAPEX / OPEX impact – investments are data driven
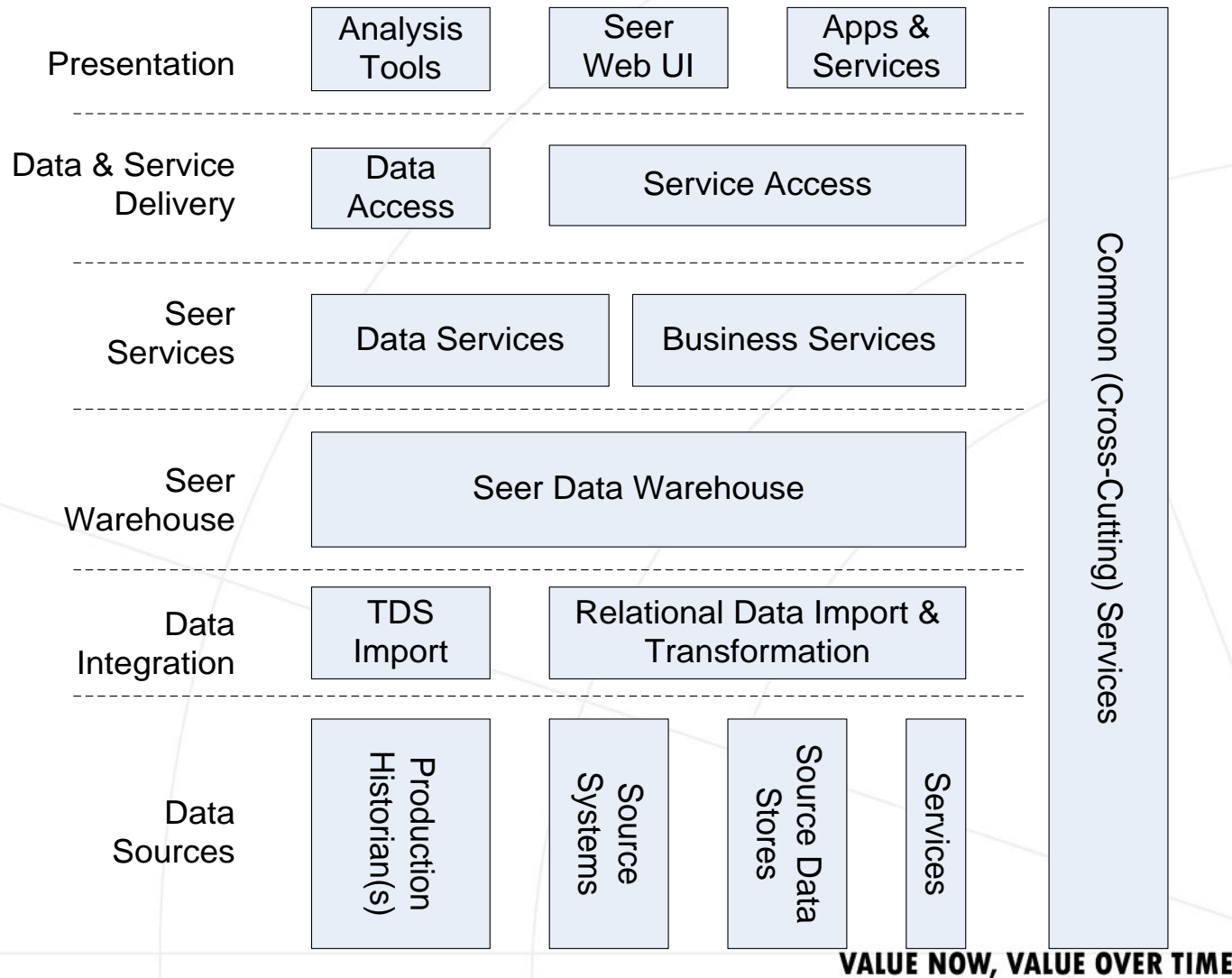
An 'agile' delivery

Scrum Methodology
Sprint (4 weeks)

Product Backlog
Prioritise
Work

User
Presentation

Analysis
Development
Testing

Gather Requirements

User Review

Feedback Changes

VALUE NOW, VALUE OVER TIME

Logical Architecture

Presentation	Analysis Tools	Seer Web UI	Apps & Services
Data & Service Delivery	Data Access	Service Access	
Seer Services	Data Services	Business Services	
Seer Warehouse	Seer Data Warehouse		
Data Integration	TDS Import	Relational Data Import & Transformation	
Data Sources	Production Historian(s)	Source Systems	Source Data Stores	Services

Common (Cross-Cutting) Services

VALUE NOW, VALUE OVER TIME

The Data Warehouse

- Some source systems are 3rd-party owned. Providing query-time table level access may invalidate existing support agreements with the application vendor.

- The source systems do not have the structure or capacity to support ad-hoc queries.

- The source systems hold a varying amount of history which will make medium or long term historical trending difficult.

- There is little or no integration between the systems, many of which are tactical in nature.

- The systems do not share standard business reporting hierarchies.

- Data warehouse provides an open platform for our client reporting (the single version of the truth for Business Intelligence data) that is one of the key project drivers.

- Allows us to leverage industry standard data model

VALUE NOW, VALUE OVER TIME

Data Integration - PPDM

- There is a growing PPDM community within the energy industry

- Seer had a validated data model in place from day one

- All extensions to the core PPDM data model would be driven through our client to ensure other business units can leverage the work done as part of Seer.

- Seer is using PPDM 3.8a – this allows us to take advantage of the new HES module, and to feed the client's requirements into the development of this module.

- PPDM have made two site visits to the UK to validate our use of the model. All changes have been approved in principle.

VALUE NOW, VALUE OVER TIME

Common Hierarchy Service

- The Common Hierarchy Service was created to provide:

  - Facility to store the common data structures as defined by the business.

  - The tree of locations, organisational units, facilities and production entities that allow navigation around Seer.

  - Cross reference between the commonly used names of locations, fields, wells, products, loss causes etc. and those used by all client systems.

  - Provide a system of record for future applications and services in our client which require a definitive source of hierarchy information.

VALUE NOW, VALUE OVER TIME

Hierarchy Data Sample

Well	DISWin Code	DTI Name	Slot Number	Pre-Spud	Target
C1	UB6004	13/22a-C1	01	UI1	CUC
C2	UB6005	13/22a-C2	15	UP5	CUD
C3	UB5934	13/22a-C3		LP4	CLA
C4	UB6006	13/22a-C4	27	WSW1	CWA
C5	UB6023	13/22a-C5		UP2z	CUA
C6	UB5958	13/22a-C6Y		UP1	CUB
C7	UB6007	13/22a-C7		LP2	CLB
C8	UB6008	13/22a-C8	28	UP8	CUJ
C9	UB6009	13/22a-C9	16	UP4	CUI
C10	UB6010	13/22a-C10Y	26	UI3	CUG
C11	UB6011	13/22a-C11		LP3z	CLD
C12	UB6012	13/22a-C12	23	UI2	CUH

VALUE NOW, VALUE OVER TIME

Common Hierarchy Service

- Will:
  - Integrate reference data from the identified systems of record.
  - Support the concept of views on the hierarchy for the purposes of personalisation and role-specific presentation.
  - Expose hierarchies via web services and data interfaces to Seer (and other) client systems.
  - Include an admin User Interface for administration of the service.
- The implementation of a common set of data structures would accomplish:
  - The ability to integrate data from client systems into Seer within a common structure. This is a pre-requisite for the provision of Business Intelligence.
  - The provision of a foundation to support the immediate data requirements of Seer quick-wins and Seer core platform must also be flexible enough to support data requirements across all the client's assets, systems and processes moving forwards.
  - The hierarchies defined in this process will become a central point of reference for other applications and systems within the client

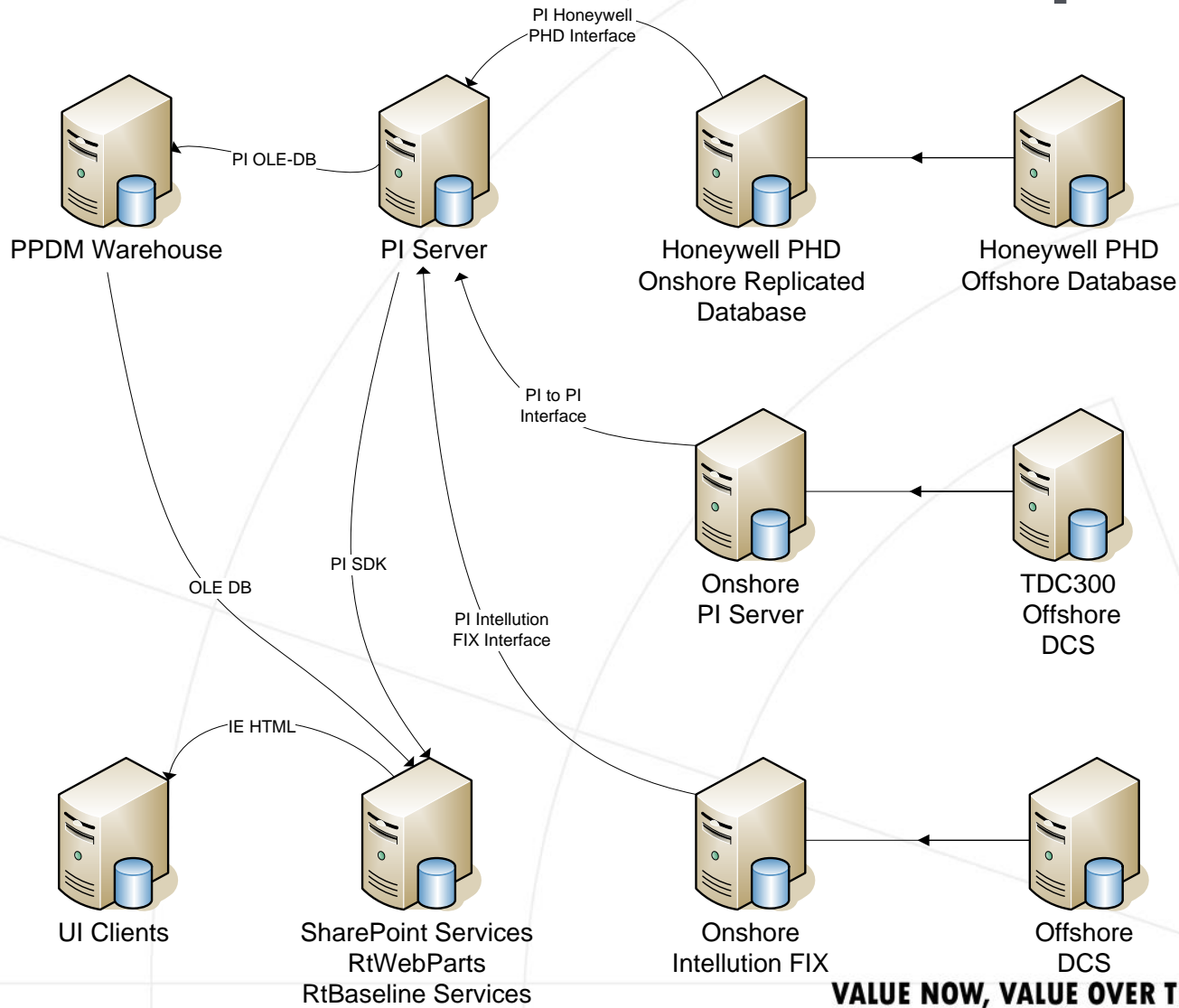**VALUE NOW, VALUE OVER TIME**

Technologies used

- OSISoft RT WebParts

- SQL 2005

- ASP.NET Framework V2.0

- ASP.NET 2.0 WebParts

- Reporting Services user control

- SharePoint 2003 (WSS)

- SmartPart v1.1

VALUE NOW, VALUE OVER TIME

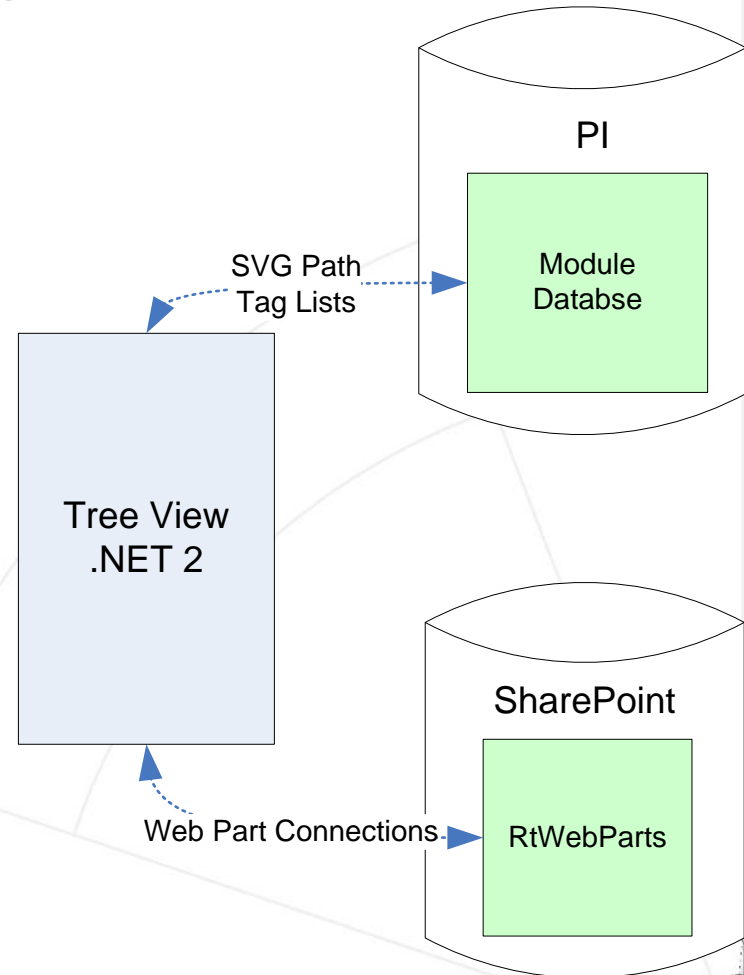# Real time consumer, real time provider

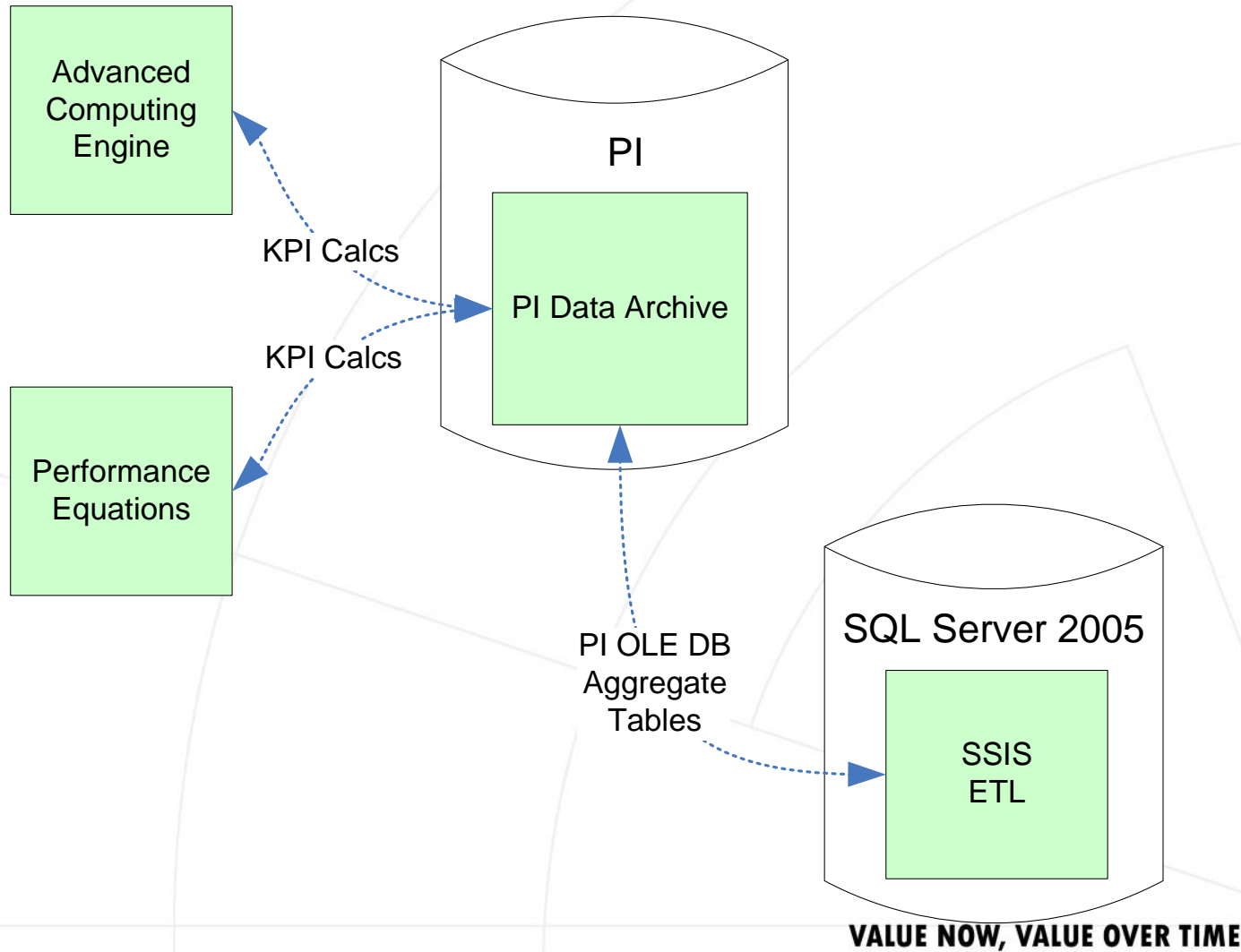VALUE NOW, VALUE OVER TIME

RtBaseline, RtAnalytics, RtPortal

- PI System

- Interfaces, ICU

- OLE DB

- Advanced Computing Engine

- RtWebParts, Connected Web Parts

PI

Module Databse

SVG Path
Tag Lists

Tree View
.NET 2

SharePoint

RtWebParts

Web Part Connections

VALUE NOW, VALUE OVER TIME

PI Analytics

Initial Deliverables

- Production & Operations data

- Daily Production Report ("DPR")

- Facilities - Process Graphics

- Loss Reporting - Viewer

- HES - Viewers

- POWER reporting (Team level participation data)

- IT operational reporting

- M&R splash page

- Standardised reporting

VALUE NOW, VALUE OVER TIME

Management of Change

- Communications
    - Communication Plan
    - Seer Intranet site
    - Monthly Newsletter
    - Development Reviews

- System Governance
    - Data Integrity
    - Data Governance

- Plan and Timelines
    - Formal training plan for deployment
    - Alignment with IT Change Plan/Strategy Roadmap
    - Alignment with other major initiatives & change programmes

VALUE NOW, VALUE OVER TIME

Next steps

- Concentrate on adding new functionality:
  - Maintenance & Reliability
  - Supply Chain & Logistics
  - Finance/Accounting
  - Subsurface

- Assist other Business Units by standardising architecture and using best of breed products

VALUE NOW, VALUE OVER TIME