PETRONAS E&P Technical Data Standards Triple-A Approach – Value through collaboration

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Overview

Technical Data, PETRONAS EP

- Department structure
- Relationship model
- EP Data dimensions

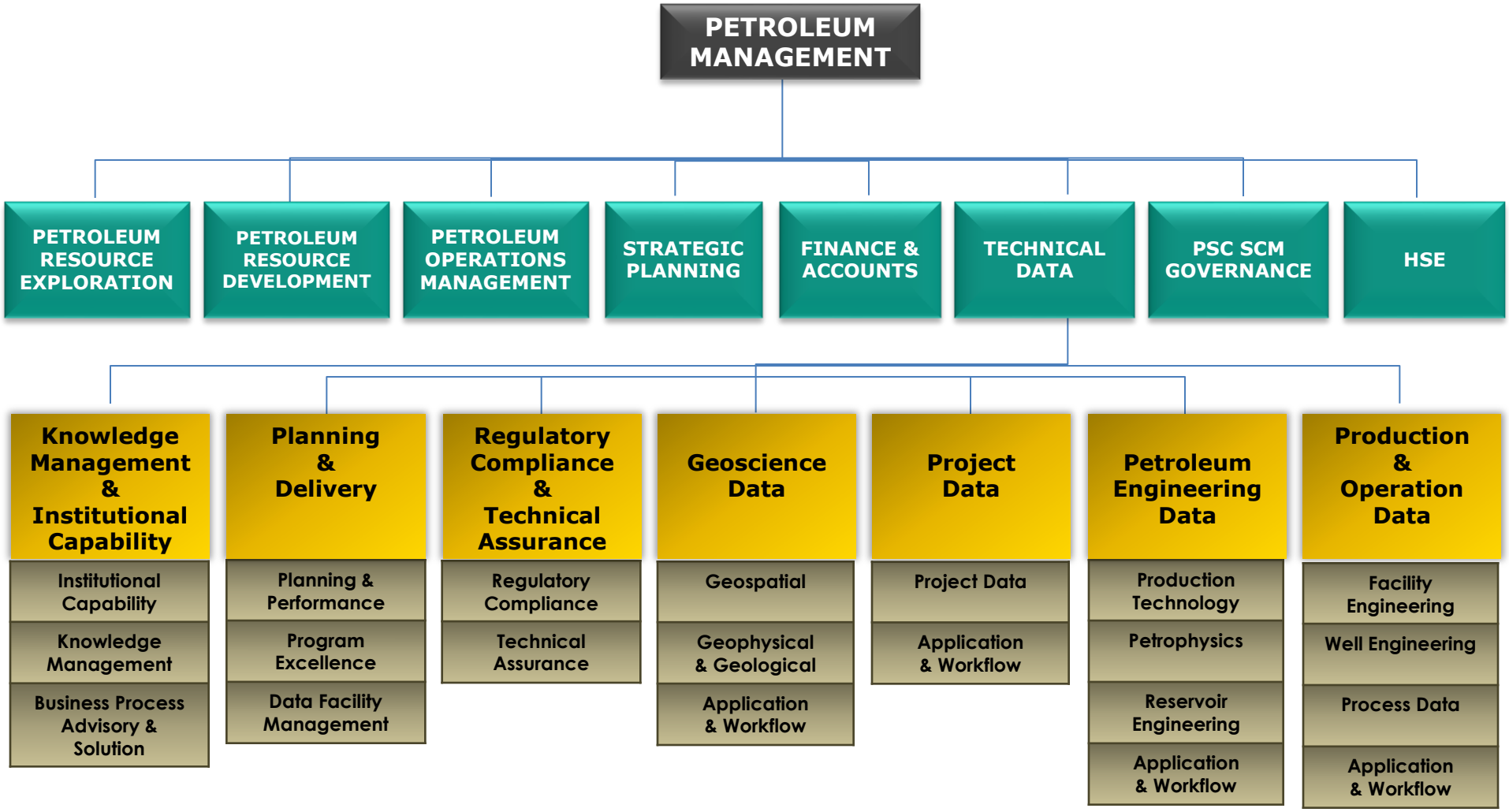
Technical Data Management Perspective

- The role of data management in value creation
- Types of data standards in EP
- What problems are we trying to solve?
- Example – Well status comparisons across projects

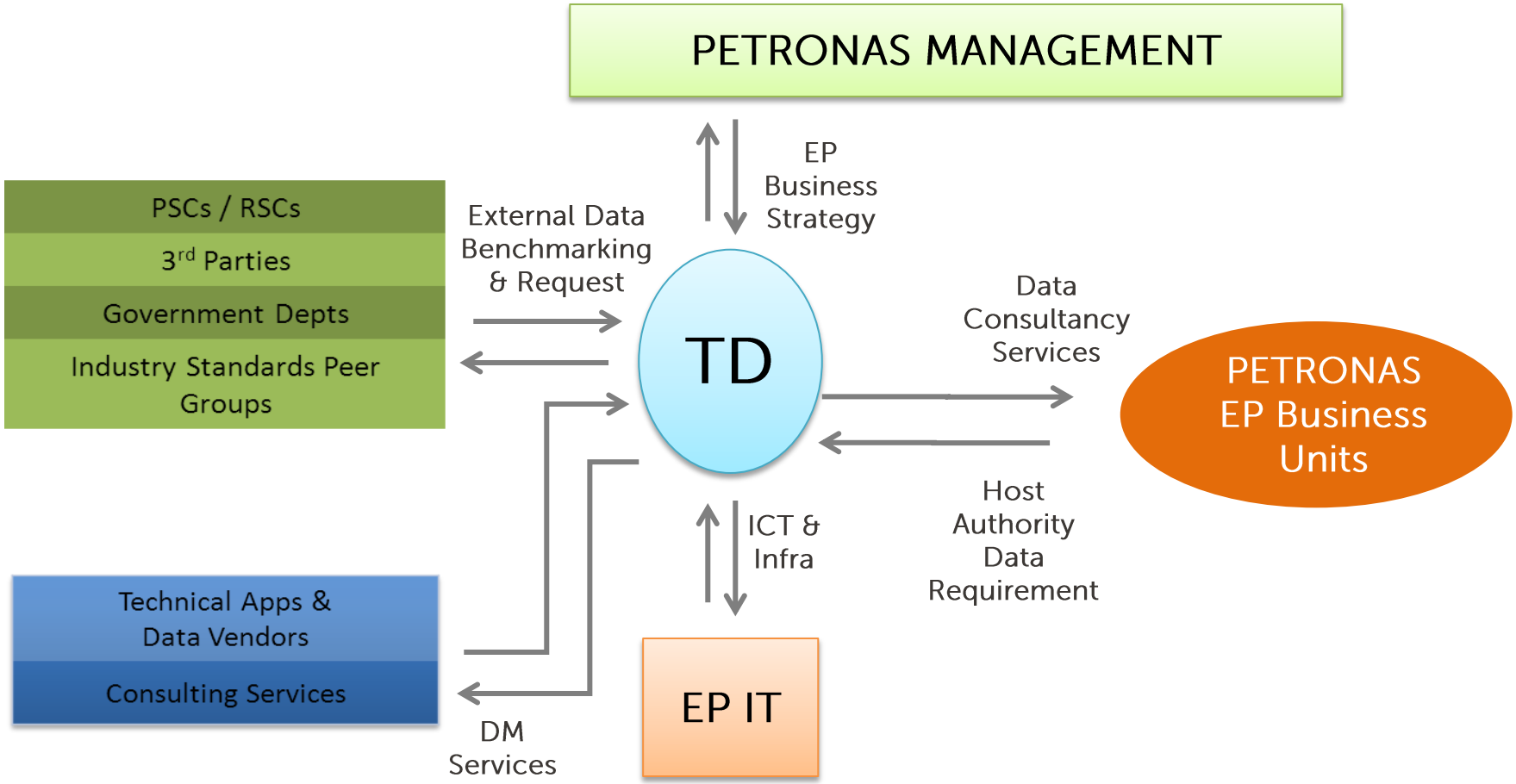
Technical Data Standards – The Approach

- Data management standard role - relationships
- Standards Bodies for EP
- Moving the organization towards standards
- The Triple-A approach
- Technical data standards – high level roadmap

Technical Data was formed to elevate functional excellence and delivery discipline of data management



Technical Data Department relationship model

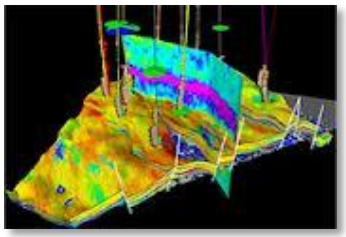


Background – PETRONAS EP data dimensions

~ 1,000 2D/3D seismic surveys
~ 12,000 wells
- All EP data types

Measured Data
> RM35 Billion investment on data acquisition

>766 active projects
~ 159 ventures in 25 countries
~ Average 100 wells drilled per year



Interpreted (Result) Data
Subsurface understanding which has direct impact on business decisions

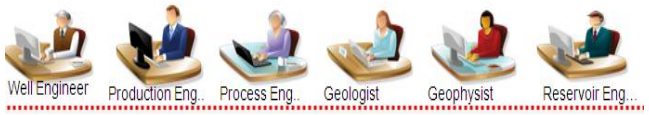
> 1,000,000 media
> 700,000 technical docs
> 3,500 TB disk space
>120 data bases

Media & Corporate DBs
Media, hardcopies and Geosamples

Dimensions of PETRONAS EP Data Management

>250 specialized technical applications (Multiple disciplines & related application workflows)

Tools
(Technical Software Application)
> RM1.2 Billion investment

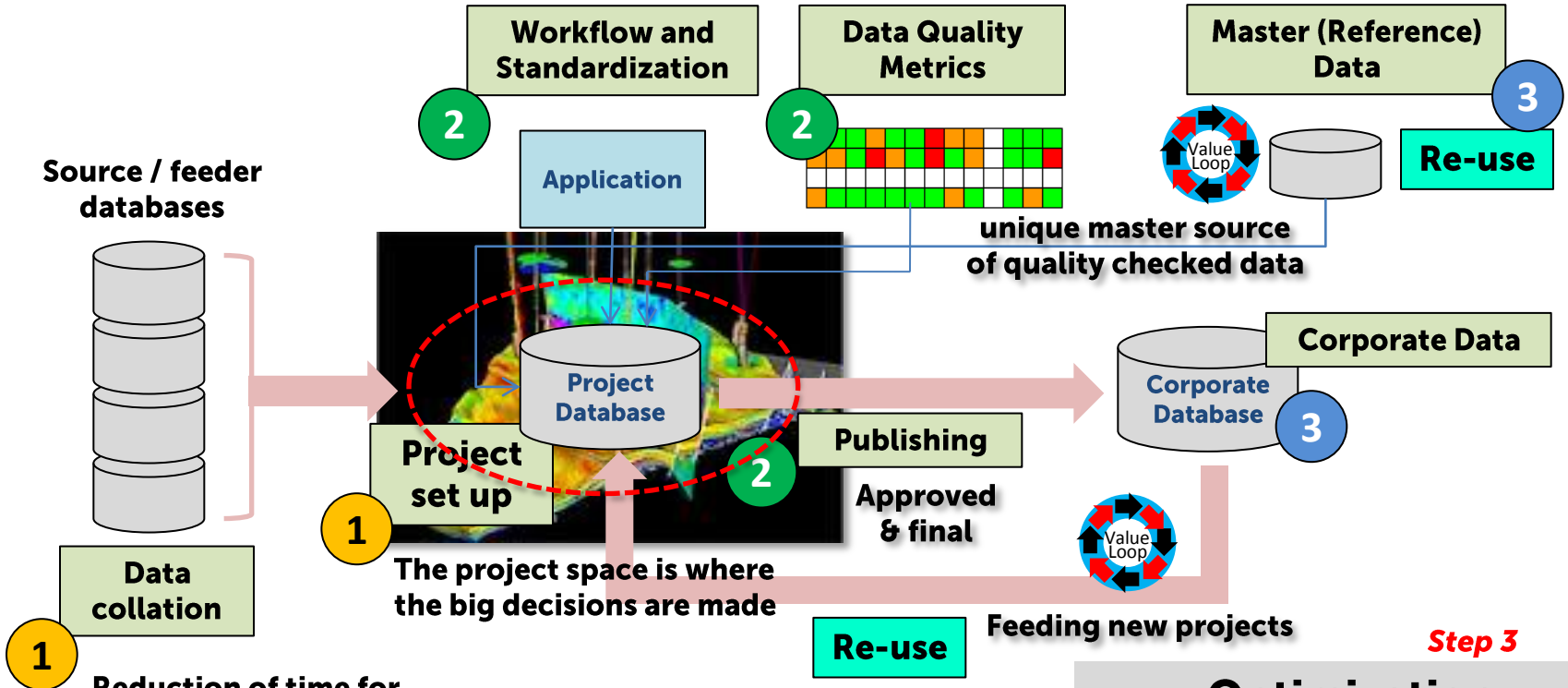


End Users
> 400 geoscientists and engineers from all technical domains in E&P

External Stakeholders
Potential investors, PSCs, government agencies, universities

Role of Data Management in Value Creation

Previous studies : Geologists spend up to 60% of their time looking for & quality checking data for their projects



1 Reduction of time for data collation and project setup

Step 1

Cost management

Reduce the 60% to __%

1

Step 2

Process improvement

Standards & workflows
Bring to acceptable quality
Capture work done for re-use

2

Step 3

Optimization

'One version of truth' datasets
Re-use many times

3

Types of standards in EP

TYPES	Examples	Category
▪ Reference data	Country codes, symbols, abbreviations	DATA STANDARDS
▪ Naming conventions	Wells, horizons, projects, logs	
▪ Datatype standards	Well logs, velocity	
▪ Database footprint stds	Openworks, Petrel	
▪ Data transfer standards	Data migration, integration, workflows	
▪ Data quality standards	Business rules	
▪ Compilation standards	Fileplans, Completion logs, TRAPIS	
▪ Industry standards	ISO, WITSML, PRODML	
▪ Standard applications		APPLICATION PORTFOLIO MANAGEMENT
▪ Standard Configuration		ARCHITECTURE STANDARDS
▪ Standard architecture		
▪ Standard infrastructure		
▪ Standard desktop environment		

What problems are we trying to solve?

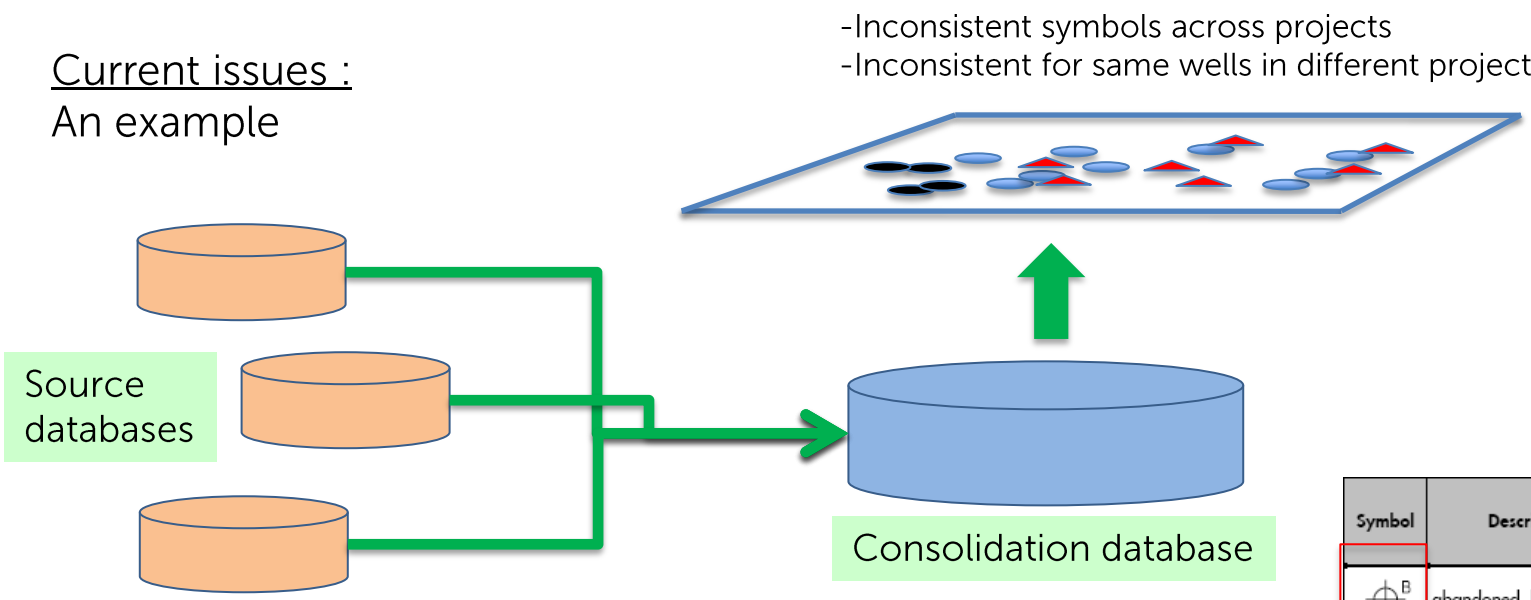
- Over the past 20 years in PETRONAS, many data initiatives have been carried out and documented
- Several technical data standards reports are in our archives
- We do not have a full picture of what we have
- Implementation of standards is ad hoc and very much dependent on individual projects
- Sustainability is questionable
- Technical data standards governance is an ongoing issue

Example – Well status comparisons across projects

Business requirement :
Plotting of well status symbols across regional projects. Medium to large scale geological reviews require rapid compilation of data from various sources into a working area and map view.

Current issues :
An example

-Inconsistent symbols across projects
-Inconsistent for same wells in different projects



What we need to do :
- Standardize well status symbol set
- Standardize symbol to definition to code table
- Implement in relevant applications & databases

Symbol	Description/Tag	Code
B	abandoned, bitumen	WB00A
BW	abandoned, brackish water	WBW0A
CD	abandoned, carbon dioxide	WCD0A
	abandoned, condensate productive	W002A
	abandoned, condensate shows	W001A
	abandoned, condensate to surface	W003A
	abandoned, dry	W000A

Data management standards role - relationships

Standard Bodies (1)

- ENERGISTICS
- PPDM
- PIDEX
- ISO
- Joint Industry Projects (JIPs)

Maintain a watching brief of activities in standards bodies for adoption if appropriate

Oil & Gas companies (2)

- Data sharing meetings
- Standards exchange
- Joint Industry Projects (JIPs)
- Collaboration

Actively collaborate with other oil & gas companies in mutually beneficial , non-competitive standards projects

EXTERNAL PERSPECTIVE

INTERNAL PERSPECTIVE

PETRONAS internal (3)

- SMEs (Subject Matter Experts)
- Business requirements
- Business driven
- Standards methodology
- Standards Approval Process
- Business take-up

Work with inhouse experts to define needs, scope, usage and implementation.

Data Management Standards Role

To be the advisory and coordination point for all technical data standards activity in PETRONAS EP

Reference data standards

- Standard Legend
- Units of measure
- Symbol sets
- Reference lists eg.
- - Well types
- - Well status
- - Code types etc

Ensure a consistent set of reference standards, to support cross application consistency

Data footprint standards

- Databases & apps
- Rules for which data attributes must be used
- Mandatory data fields defined
- Necessary connectivity identified
- Key essential workflows addressed

Consistent population of data makes it easy to search for data.

Data type standards

Collaborate & co-create standards with the right parties in PETRONAS

Some examples

Geology standards

EXAMPLES
- Stratigraphic scheme
- Geological time scale
- Lithology standard
- Environment of deposition
- Picks and tops

Seismic standards

EXAMPLES
- VSP (Vertical seismic profiling)
- TZ/Checkshot
- Horizon/volume naming convention
- Seismic handbook

Petrophysics

STANDARDS TYPES
- Log naming convention
- Dipmeter standards
- Standard curves
- Lithofacies standards
- TRAPIS standard

Well engineering

EXAMPLES
- Deviation data
- Well schematics
- Well integrity

Well header data

EXAMPLES
- Well naming convention
- Coordinate standards
- Geog. Ref. standards
- Reference data standards

Standards bodies for EP

Source : SLC (Standards Leadership Council)
http://oilandgasstandards.org/about

SLC STANDARDS LEADERSHIP COUNCIL

energistics
http://www.energistics.org/
The Energy Standards Resource Center

MIMOSA
http://www.mimosa.org/
An Operations and Maintenance Information Open System Alliance

OGC
http://www.opengeospatial.org/
The Open Geospatial Consortium

OPC FOUNDATION
http://www.opcfoundation.org/
Open connectivity via open standards

PIDX INTERNATIONAL
http://www.pidx.org/
The Petroleum Industry Data Exchange

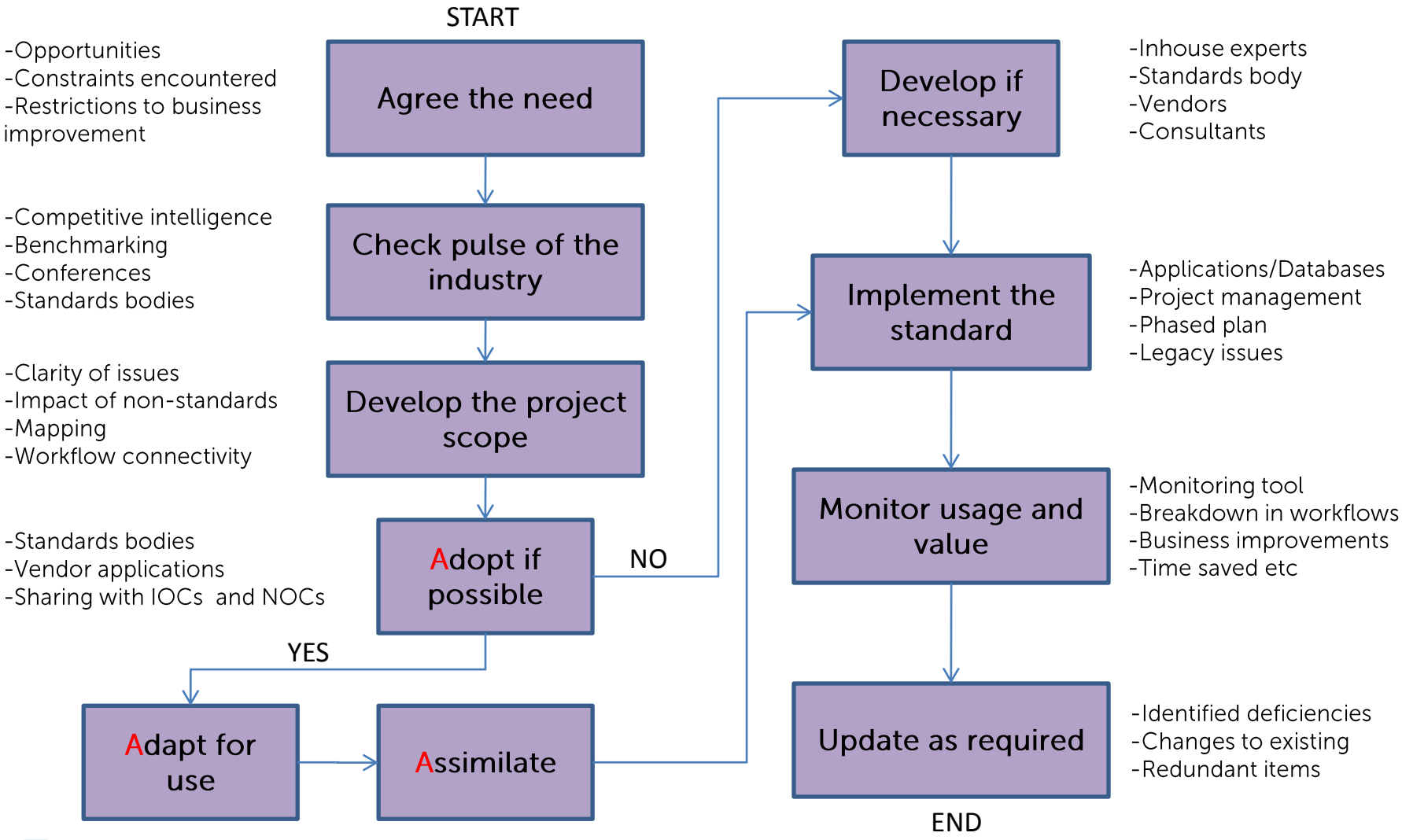
PODS™ Pipeline Open Data Standard
http://www.pods.org/
Scalable pipeline database architecture with geospatial location

POSC Caesar Association
https://www.posccaesar.org/
Standards for enabling the interoperability of data, software and related matters

PPDM™
https://www.ppdm.org/
The Professional Petroleum Data Management (PPDM) Association

SEG
http://www.seg.org/seg
Society of Exploration Geophysicists

Moving the organization towards standards



The Triple A approach

ADOPT

For any data standards required, look first outside PETRONAS

1) Standards Bodies
2) Oil & Gas companies
3) Service providers

ADAPT

Identify all the areas where the standard is applicable and develop plan for implementation.

Get internal stakeholder buy-in, go through the approval process. Endorse for use.

"Adapt" may require working jointly to make it usable

ASSIMILATE

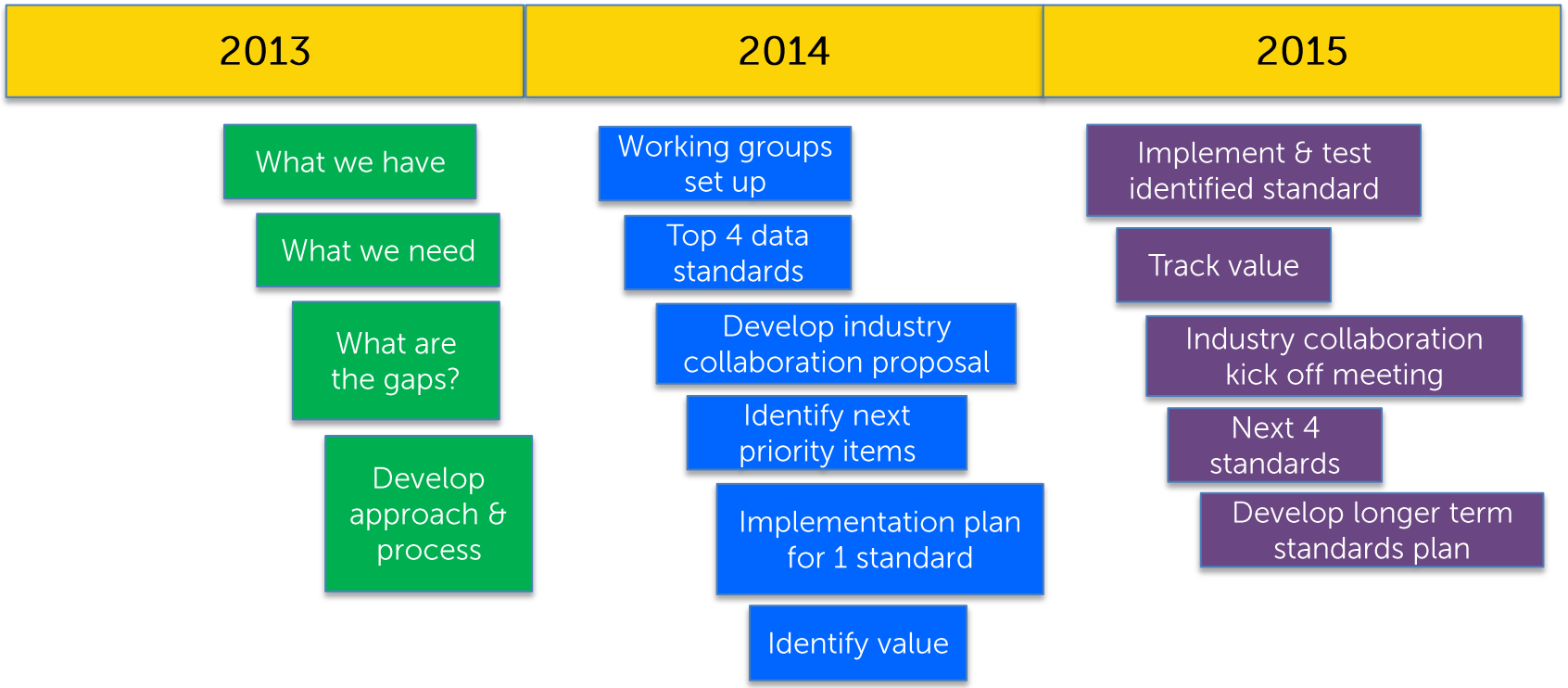
Agree priority. Proceed with implementing in key applications and databases.

Develop plan to address legacy issues.

Implement compliance metrics for the implemented standard(s).

Improve over time.

Technical data standards - high level roadmap



Deliverables:
1) Inventory
2) Standards workshop
3) Priority list
4) Agreed process

Deliverables:
1) 4 standards agreed
2) Standards workshop
3) Priority list
4) Implementation plan
5) JIP proposal
6) 1st quantified value

Deliverables:
1) 1 standard implemented
2) Learnings report
3) Value tracking ongoing
4) JIP kick off meeting
5) Priority list
6) Longer term plan

Conclusion

- Technical data standards is a huge area
  - *Therefore prioritization and a phased plan are essential elements*
- Standards are non-competitive
  - *Therefore it makes sense to collaborate, share, use and re-distribute*
- Sustainability is high on our priority list
  - *Hence standards compliance tracking will be a core part of our approach*

PETRONAS

Thank You

Paper Abstract

Data standards are an essential component of the data management challenge in any organization. This is especially true in an upstream E&P organization where the cost of data acquisition is significant and the data entropy effect is high. Much of the value of data is derived in workflows, reusability and sustainability. However, the creation of good data standards is not easy. It is not exciting, with no quick short term gains, it is tedious, requires meticulous checking of dependencies within the organization as well as knowledge of the availability of similar work outside the organization. Very often, this work is also not well recognized.

With the recent creation of a Technical Data Division with PETRONAS E&P, data standardization is given due recognition as an important part of the Technical Data Management Framework. This paper describes the phased approach that is now being followed to address this gap and to build up PETRONAS E&P's data management capability for the longer term.