

Cost and Schedule Integration Lessons learnt

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Project work can be grouped by disciplines (Schedule, Cost, etc.)
but all areas interact and eventually must be
integrated as a single unit.

EXPOSITOR

9° Congreso

AACE Internacional
de Ingeniería de Costos



- ✓ 30 years of experience in fields of Information Technology (software development, system implementation), Fiscal, Project Controls (Cost and Schedule Management, Change Control, Document Control, Risk Management and Integration)
- ✓ Experience in different industries: Oil and Gas, Utilities, Financial sector, Information Technology Consulting companies, Education.
- ✓ Hybrid academic and professional experience: Public Accountant, Industrial Engineer, Master of Sciences in Computer Sciences, Business Analyst and Programmer

ALGO QUE NO SABEN DE MÍ:

The need for integration....

- External references and foundation:
 - Industry standards
 - Best Practices
 - Regulatory laws



**TOTAL COST MANAGEMENT
FRAMEWORK**
An Integrated Approach to Portfolio,
Program, and Project Management



- Internal requirements
 - Manage the project
 - Report the status/progress
 - Identify variances
 - Make decisions

Analysis &
Management
Reports

Planning,
Scheduling &
Budgeting



Organization

AACE
PERU
SECTION

The TCM Framework

Basic Processes of Total Cost Management

- 1 Introduction
- 2 The TCM Process Maps
 - 2.1 Basis
 - 2.2 Total Cost Management
 - 2.3 Strategic Asset Management
 - 2.4 Project Control

Functional Processes for Strategic Asset Management

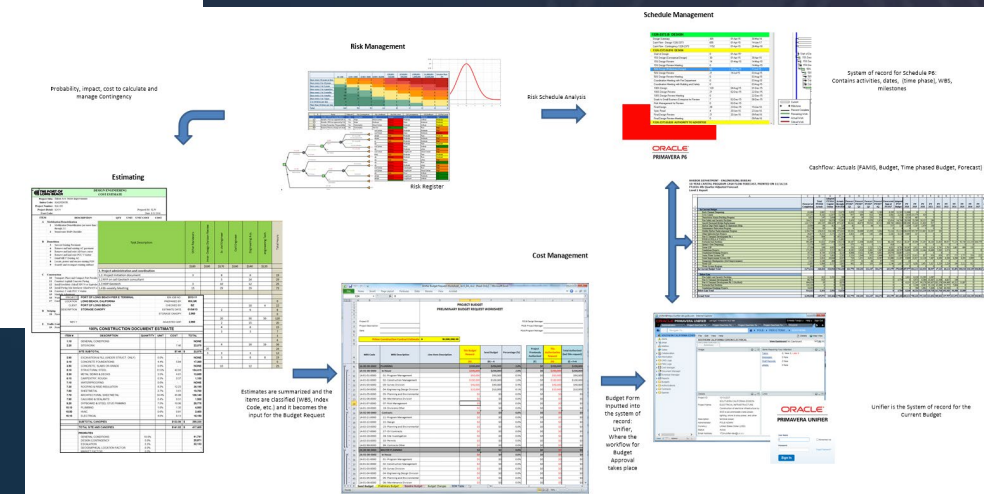
- 3 Strategic Asset Planning
- 4 Project Implementation
- 5 Strategic Asset Performance Measurement
- 6 Strategic Asset Performance Assessment

Functional Processes for Project Control

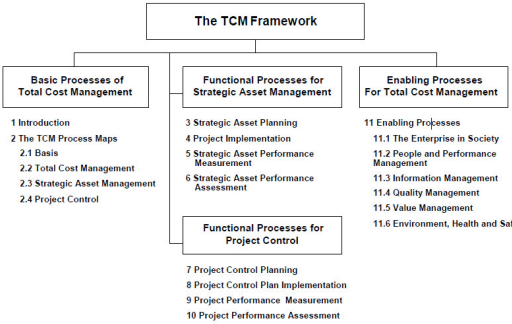
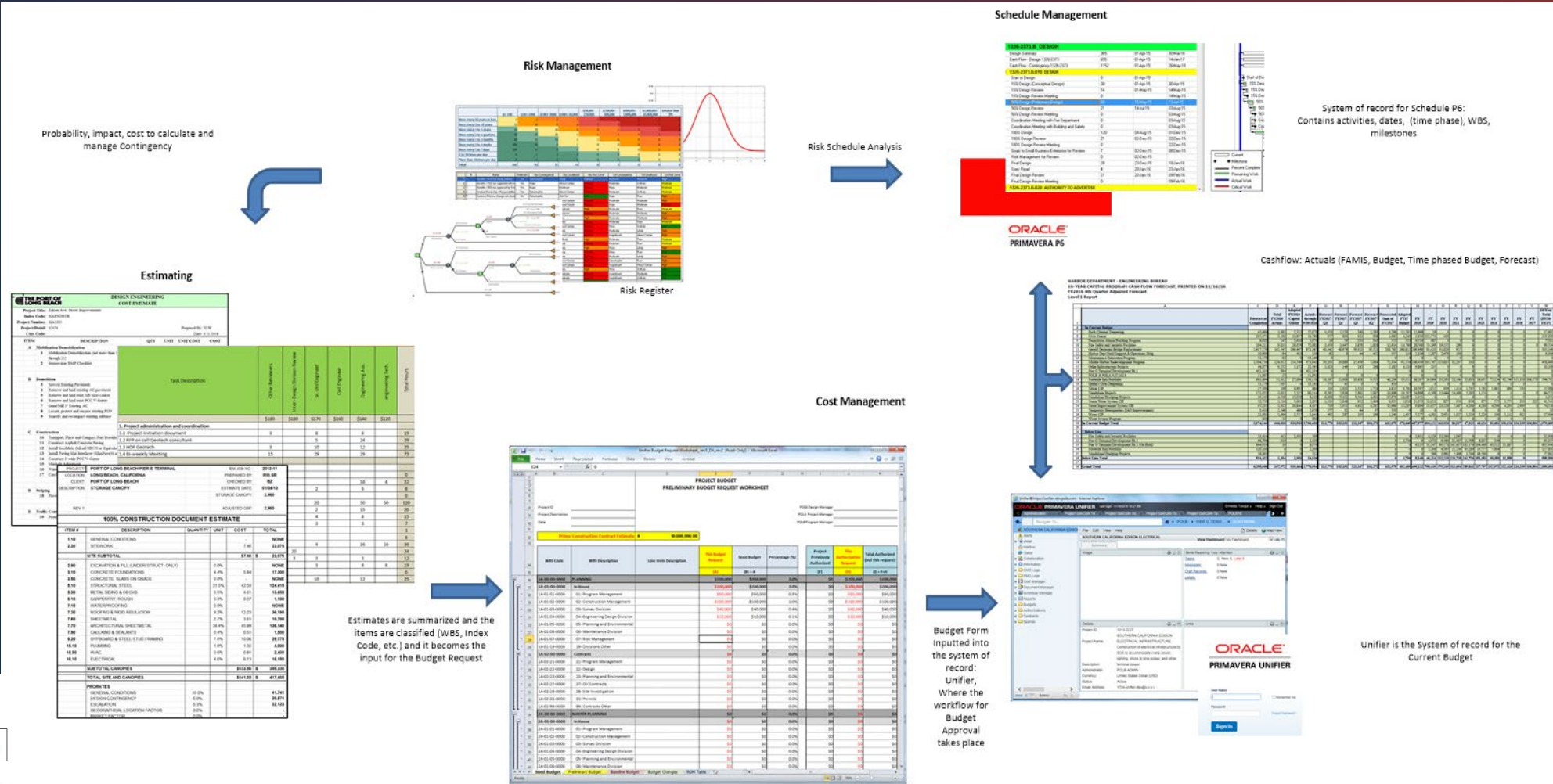
- 7 Project Control Planning
- 8 Project Control Plan Implementation
- 9 Project Performance Measurement
- 10 Project Performance Assessment

Enabling Processes For Total Cost Management

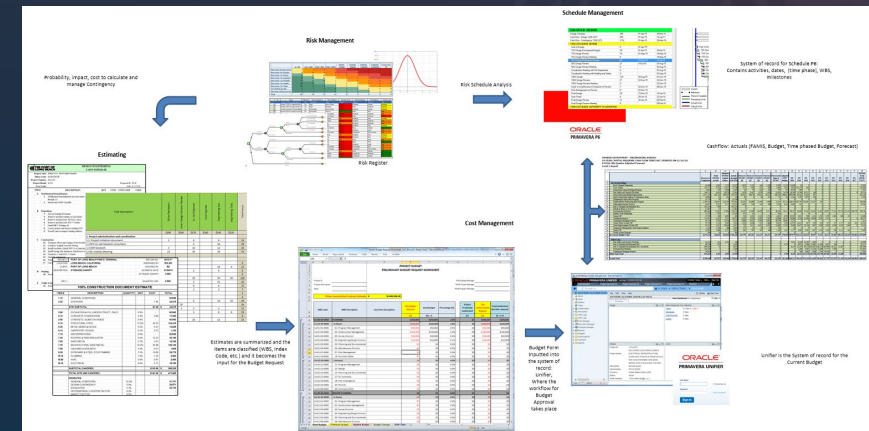
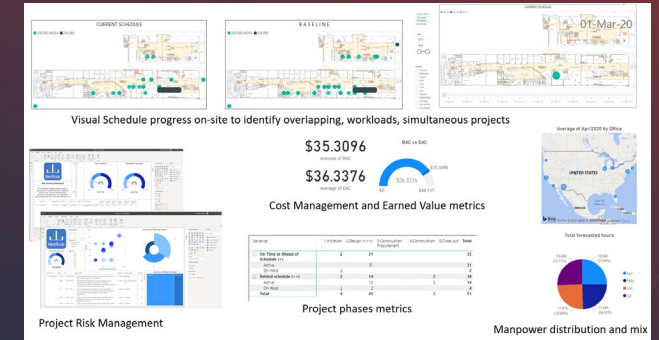
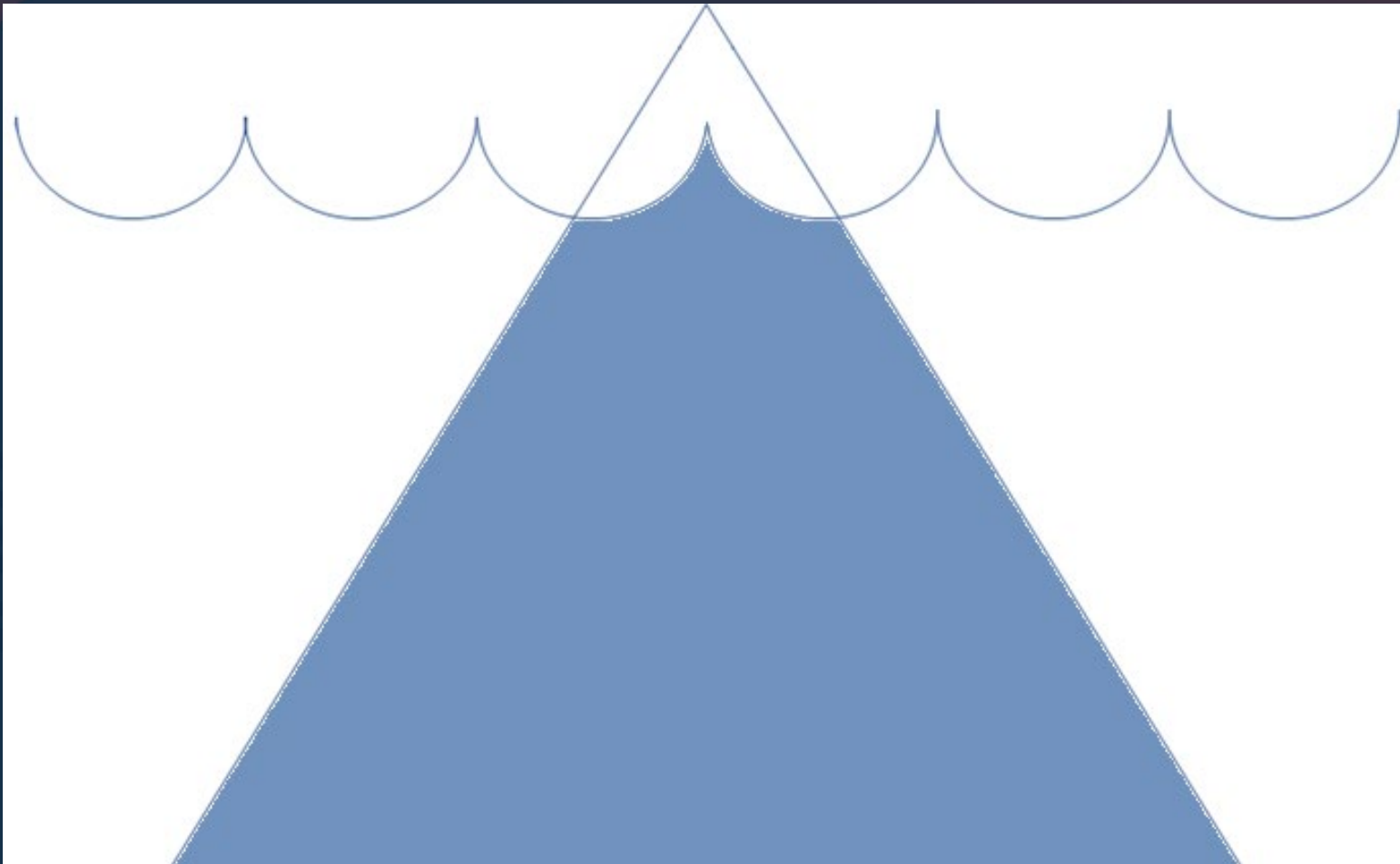
- 11 Enabling Processes
 - 11.1 The Enterprise in Society
 - 11.2 People and Performance Management
 - 11.3 Information Management
 - 11.4 Quality Management
 - 11.5 Value Management
 - 11.6 Environment, Health and Safety



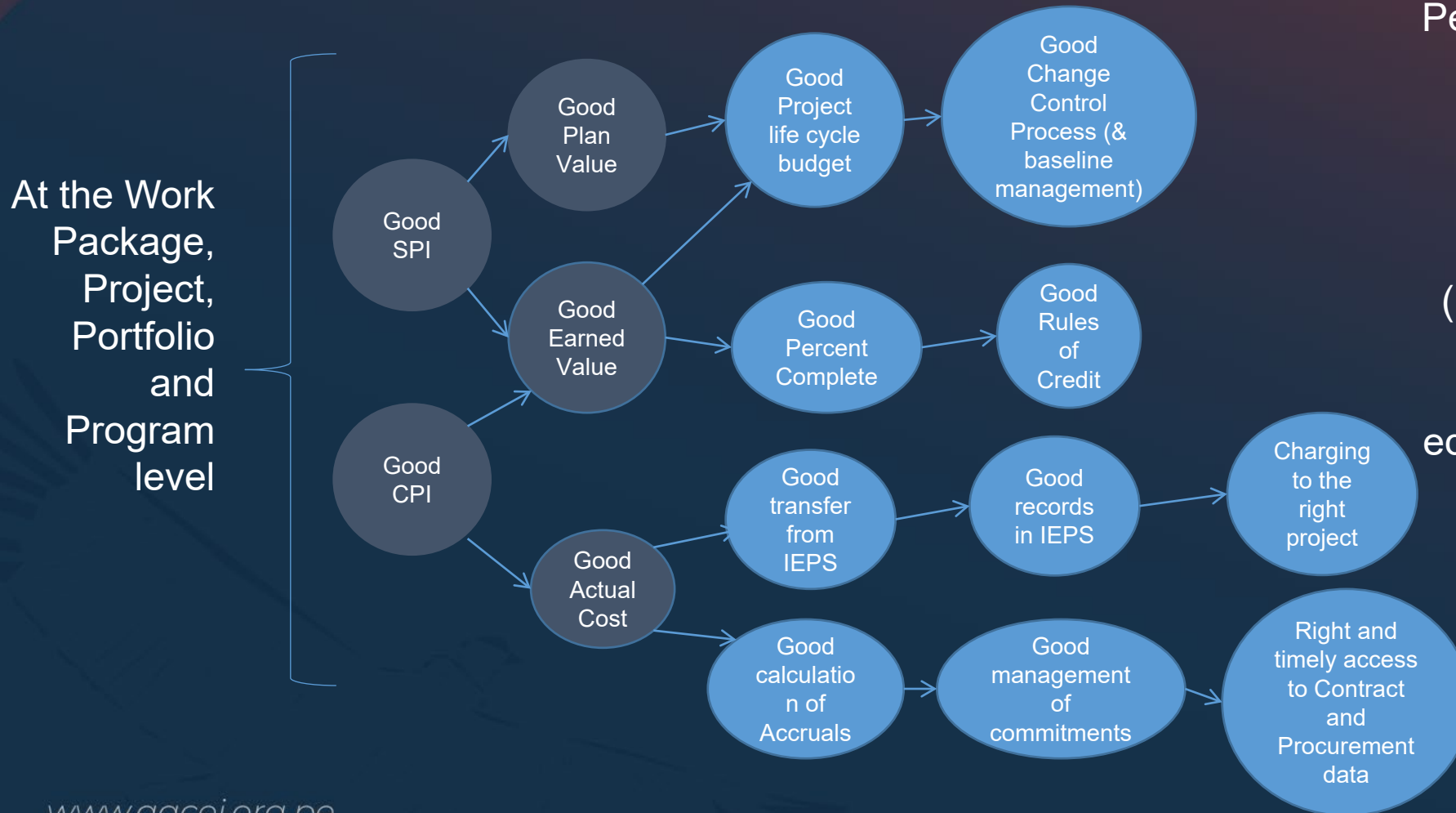
The Outcome



What is the output? Or the next step of the integration?



Cost and Schedule integration



Budget At Completion
Performance Measurement Baseline
Project Total Budget Cost

*

Earned Value technique
(Rules of credit: percent complete, milestone percentage, progress, achievement, fixed formula, equivalent or actual units completes, level of effort)

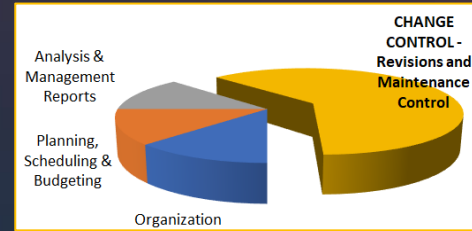
Scope

Organization

Capacity

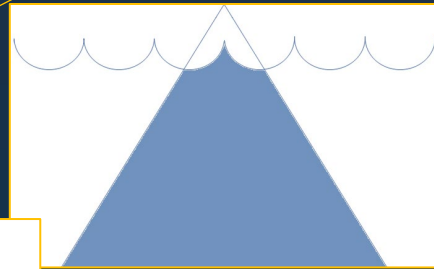
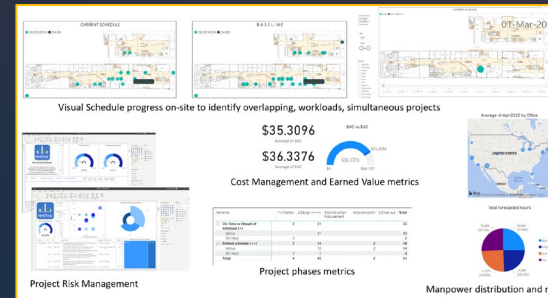
Outputs

Duration

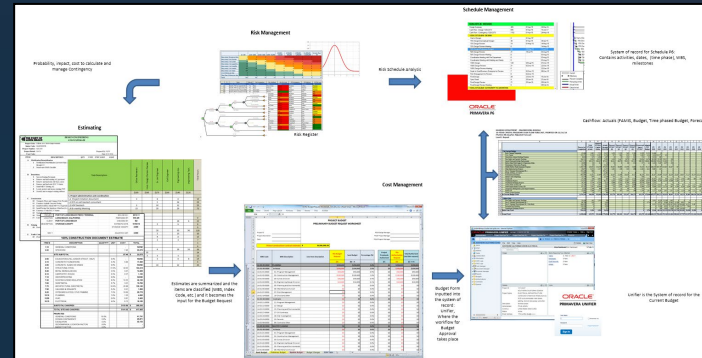
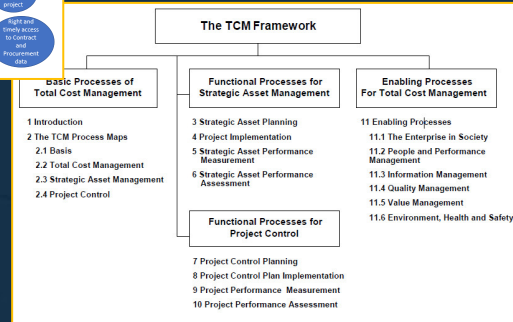
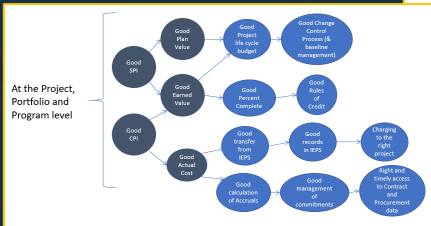


Internal Procedures

Integration
Implementation Strategy



ANSI
American National Standards Institute



TOTAL COST MANAGEMENT
FRAMEWORK
An Integrated Approach to Portfolio,
Program, and Project Management

AAACE INTERNATIONAL
The Authority for Total Cost Management™

Technology

Budget

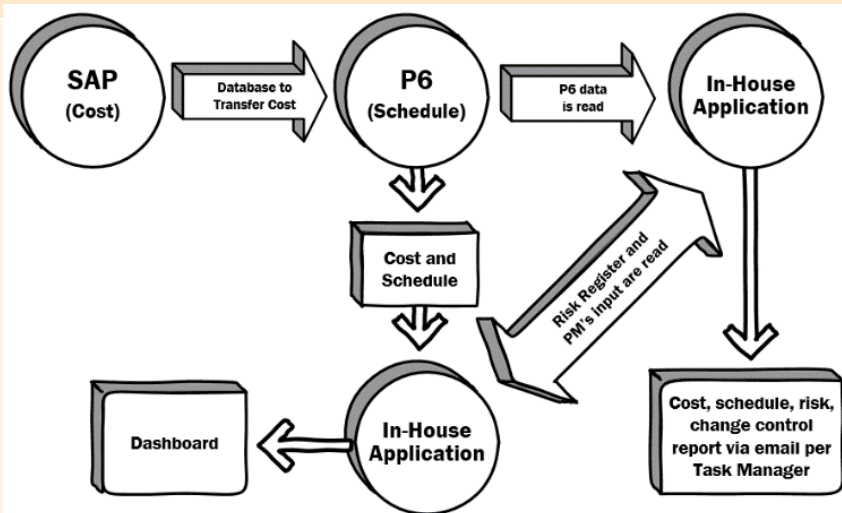
Best Practices / Mandatory requirements

Maturity

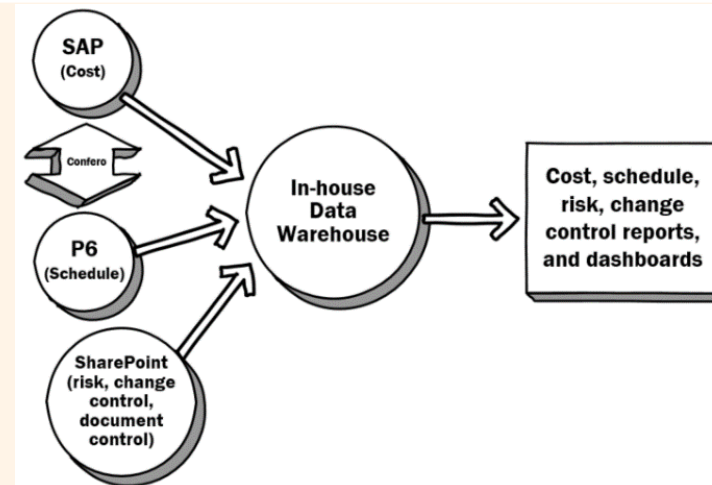
Some key questions – checklist to consider

- Right systems for the right data?
- Right processes to handle the right data?
- Manual and automated processes working in tandem? E.g. interfacing Financial information, transferring data into the spreadsheets from the systems like P6
- Right timing to avoid double-work (three cost updates during the month)?
- Right alignment of disciplines? E.g. when Finance closes the Accounting GL, the Actuals are passed to Project Controls, Contracts and Procurement discloses the commitments so Accruals can be calculated correctly
- Roles and responsibilities are clearly defined (at the project, program, planning/work package, task level, per discipline, etc.)
- Are schedules provided enough for the audience (levels 1, 2, ..., project lifecycle, short term: 90 days look ahead, critical path, milestones, milestones at risk, etc.)?
- Is the project aware of fluctuations, part of the nature of their business (i.e. currency rates, inflation, labor rates, fees, etc.)? If so, do they follow GAAP, IFRS?
- Right transactions on Direct Cost, Indirect: Allocation of Overhead?
- Is it following correctly the standard so it can be auditable (a proper Change Control process and tool implemented)? Earned Value Management System (ANSI-748C, PMBOK, etc.)
- Is there a proper QA process of: the Project Controls processes, data and tools?
- Is there budget to upgrade the current tools (document controlling, reporting, etc.)?

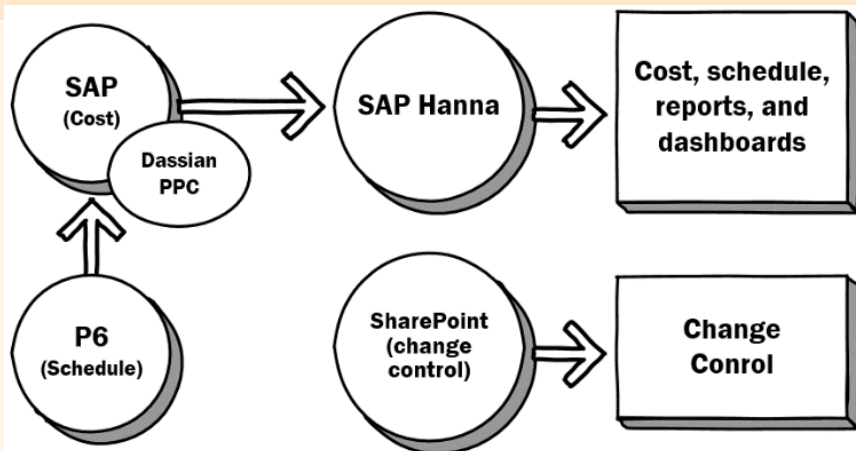
In-house applications are incorporated to process the transfer and reports



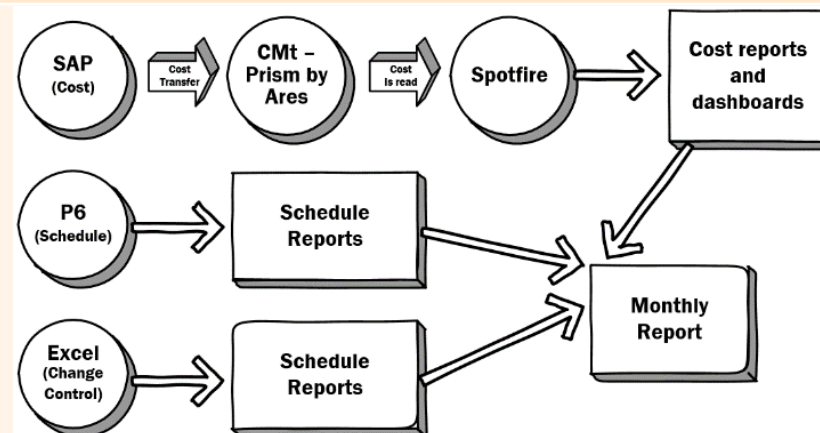
A third party software is configured to transfer cost and schedule; the major investment is put into the data warehouse



A third party software is installed in SAP to handle earned value; data is read from SAP Hana to produce reports



Schedule and Cost work separately and at the end of the process, all information is combined into a monthly report



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Mass data transfer of funding and actual costs from Hyperion and Peoplesoft

Overview

- Every month, the Cashflow of over 300 projects had to be produced within the same first five business days by the Project Controls team (3 people) and it was practically an unmanageable task within the timeframe.

The tasks included:

- Processing the Actual Cost data and convert it into a format that can be imported into P6-EPPM
- Processing the Funding and Forecast data and convert it into a format that can be imported into P6-EPPM

Bulk processing and data transfer for portfolio monthly Cashflow

- Technology: P6-EPPM, SOAP web services, VBA Excel macros
- Sources: Oracle Hyperion, Peoplesoft

What does “Processing” entail?

The processing included the definition of the rules: use of resources (dollar amount for cost), activities (that carry the cost), activity relationships (successors and predecessors), control accounts (to identify and classify the source of the cost and funding) and split the cost to different sources of funding.

And creating the 300+ templates (Excel import files) for each project.

Received Actual Cost – raw Peoplesoft data

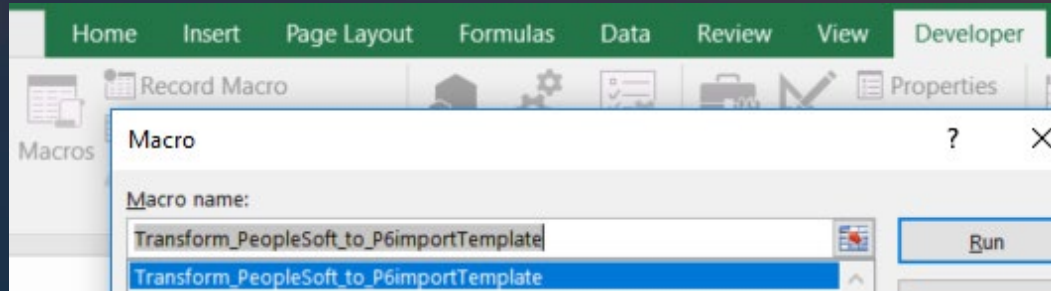
se	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y		
	Project	Hyperion	Class	Project S	Line Desc	Journal II	Sum Amc	Invoice	Inv. Date	Voucher	PO No.	Vendor ID	Vendor N	Status	Source	Period	Acc. Date	PC Bus U	Budget C	Contract		
A197	Exists	080					6880.380													02		
A197	Exists	080					437.050														09	
A310	Exists	080					3245.200														02	
A310	Exists	080					24005.400														05	
A310	Exists	095					3245.200														02	
A310	Exists	095					24005.390														05	
A322	Exists	095					26963.430														12	
A326	Exists	080					557105.500														17	
A349	Exists	080					262334.120														17	
A353	Exists	080					39186.000														09	
A353	Exists	080					3430.000														09	
AT17	Exists	080					30960.540														17	
H257	Exists	080					430.390														06	
H268	Exists	080					11391.060														02	
H268	Exists	080					19896.080														09	
H275	Exists	095					40540.220														02	
H281	Exists	080					9038.600														02	
H291	Exists	080					340.000														14	
L1018	Exists	080					-2172.490														05	
L1018	Exists	080					-39622.400														05	
L1018	Exists	095					3531.730														06	
L1018	Exists	108					35375.340														02	
L1018	Exists	108					59249.680														05	
L1018	Exists	108					31031.040														02	
L1018	Exists	108					812197.900														05	

KRSRC USERDATA Peoplesoft Actuals Hyperion Funding

Received Funding – raw Hyperion data

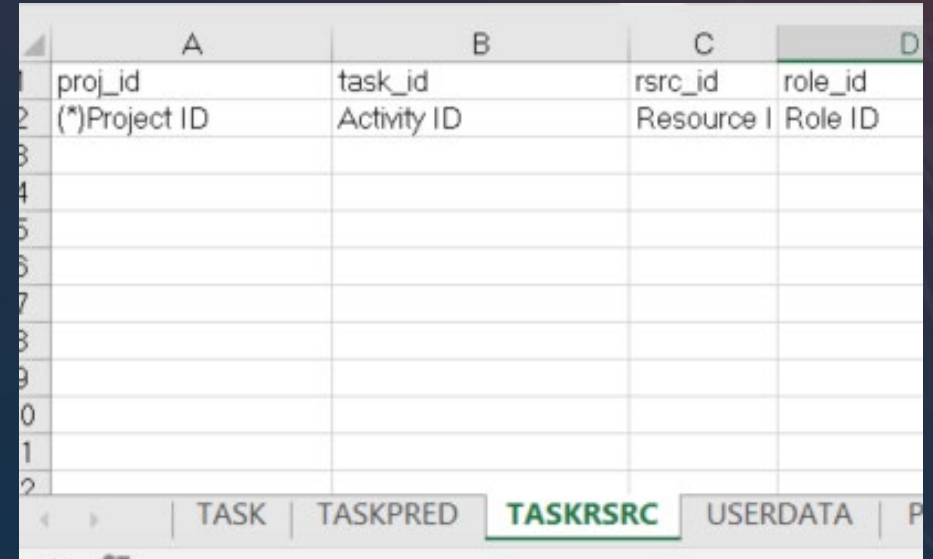
Project	Class										Project Title	Project Status	NTE	Y0	Y1	Y2	Y3	Y4
L1108	C080										No Title Reported	Not In Current Program	64.95396	64.95396				
L100	C203										CENTERFIELD TAXIWAY	Not In Current Program	9753.7887	9753.7887				
L100	C095										CENTERFIELD TAXIWAY	Not In Current Program	32307.205	32307.205				
L100	C080										CENTERFIELD TAXIWAY	Not In Current Program						
L107	C095										FIRE TRAINING FACILITY UPGRAD	Unfunded	3000			500	2500	
L110	C080										3000 GALLON ARFF TRAINING VEI	Unfunded	1,300				1300	
L166	C203										RUNWAY-END 33L SAFETY IMPROV	Not In Current Program	15000	15000				
L166	C287										RUNWAY-END 33L SAFETY IMPROV	Not In Current Program	15,000	15,000				
L166	C095										RUNWAY-END 33L SAFETY IMPROV	Not In Current Program	51,809	51809.373	0			
L166	C080										RUNWAY-END 33L SAFETY IMPROV	Not In Current Program	15,766	15,766				
L166	C197										RUNWAY-END 33L SAFETY IMPROV	Not In Current Program	-15,000	-15,000				
L199	C080										REHABILITATE NORTH CARGO AIR	Proposed	16,400				400	6000
L521	C080										AIRPORT EMPLOYEE TRAINING F	Not In Current Program	635	635	0	0		
L531	C095										NORTH SERVICE AREA STORMWATER	Unfunded	2150			150	2000	
L556	C080										SNOW REMOVAL EQUIPMENT REPLAC	Not In Current Program	3,694	3,694				
L568	C080										FIRE APPARATUS REPLACEMENT	Not In Current Program	1,247	1246.871				
L582	C095										REHAB R/W 9-27 & DELTA TAXIWAY	Not In Current Program	12,701	12,701				
L582	C080										REHAB R/W 9-27 & DELTA TAXIWAY	Not In Current Program	0.43032					
L584	C080										REHAB R/W 15R	Not In Current Program	22,059	22051.895				
L633	C095										RON PARKING AT GOVERNOR'S I	Unfunded	12,000			4000	4000	4000
L652	C095										FAA LOGAN FLIGHT TRACK STUDY	Not In Current Program	8455	8455				
L727	C203										REPLACEMENT OF MARINE 1	Not In Current Program	0			0	0	

Creation of P6 import files, from the raw files



Run a macro to convert the raw data into 300+ files (one per project), ready to be imported into P6-EPPM, containing:

- Activity (task)
- Relationships
- Resource Assignments (Actual Cost, forecast, curves)



	A	B	C	D
1	proj_id	task_id	rsrc_id	role_id
2	(*)Project ID	Activity ID	Resource I	Role ID
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				

Outcome: 300+ projects processed

Desktop > Massport - macro

Name	Date modified	Type	Size
P6 import template - Ver 6.0 Final 20181022	11/9/2018 2:01 PM	Microsoft Excel Macro-...	202 KB

This PC > Desktop > Massport - macro

Name	Date modified	Type	Size
P6 import template - Ver 6.0 Final 20...	11/9/2018 2:01 PM	Microsoft Excel Macro-...	202 KB
A104-MPA	11/9/2018 2:02 PM	Microsoft Excel Worksh	15 KB
A106-MPA	11/9/2018 2:02 PM	Microsoft Excel Worksh	15 KB
A197-MPA	11/9/2018 2:02 PM	Microsoft Excel Worksh	15 KB
A247-MPA	11/9/2018 2:02 PM	Microsoft Excel Worksh	15 KB
A248-MPA	11/9/2018 2:02 PM	Microsoft Excel Worksh	15 KB
A250-MPA	11/9/2018 2:03 PM	Microsoft Excel Worksh	15 KB
A259-MPA	11/9/2018 2:03 PM	Microsoft Excel Worksh	15 KB
A282-MPA	11/9/2018 2:03 PM	Microsoft Excel Worksh	15 KB
A294-MPA	11/9/2018 2:03 PM	Microsoft Excel Worksh	15 KB
A304-MPA	11/9/2018 2:03 PM	Microsoft Excel Worksh	15 KB
A308-MPA	11/9/2018 2:03 PM	Microsoft Excel Worksh	15 KB
A310-MPA	11/9/2018 2:03 PM	Microsoft Excel Worksh	15 KB
A316-MPA	11/9/2018 2:03 PM	Microsoft Excel Worksh	15 KB
A317-MPA	11/9/2018 2:03 PM	Microsoft Excel Worksh	15 KB

310 items | 1 item selected 201 KB

Web-Services to import directly into P6

The screenshot displays a SOAP client interface with the following components:

- Request Panel (Left):** Shows the raw XML request for the `ReadActivities` operation. The URL is `https://p6ws/services/ActivityService`. The XML includes a `<vl:ReadActivities>` element with various fields and a filter for `ProjectId='Ernesto-MPA'`.
- Response Panel (Middle):** Shows the raw XML response, which is a `<ReadActivitiesResponse>` containing a list of `<Activity>` elements. Each activity includes details like `Id`, `Name`, `ObjectID`, `ProjectId`, `ProjectName`, `ProjectObjectID`, `Type`, and `WBSCode`.
- Toolbar (Top Right):** Contains buttons for `SOAP`, `REST`, `Import`, and `Save All`.
- Tree View (Right):** Lists the available web service methods, categorized into `Activity - Massport`, `Activity Relationships - Massport`, and `Cost Account - Massport`. Methods include `CopyActivity`, `CreateActivities`, `DeleteActivities`, `DissolveActivity`, `getFieldLengthActivity`, `ReadActivities`, `ReadAllActivitiesByWBS`, `UpdateActivities`, `RelationshipPortBinding`, `CreateRelationships`, `DeleteRelationships`, `getFieldLengthRelationship`, `ReadRelationships`, `UpdateRelationships`, `CostAccountPortBinding`, `CreateCostAccounts`, `DeleteCostAccounts`, `getFieldLengthCostAccount`, `ReadCostAccountPath`, `ReadCostAccounts`, and `UpdateCostAccounts`.

Web Services incorporated in the macro

Actuals and Forecast processing and transfer into P6 EPPM



Actual Cost, Budget at Completion and Estimate At Completion:
Processing, import into P6 via Web Services

Prepare data

User:

Password:

Update P6 - EPPM

Generate Excel Import files

A log was incorporated to document the exceptions.
These exceptions can be dealt with a regular import.

	A	B	C	D	E
1	MASSPORT - Data transfer to P6-EPPM using Webservice for bulk processing				
2	Budget (Funding), Forecast (At completion) and Actuals -Cost and Units- transfer on 11/6/2018 3:29:28 PM				
3	TABLE	ROW	PROJECT	TASK	MESSAGE
4	TASK		3 Ernesto-MPA	MPA1001.069	New activity was not created in P6-EPPM
5	TASK		4 Ernesto-MPA	MPA1101.069	New activity was not created in P6-EPPM
6	TASK		5 Ernesto-MPA	MPA1101.080	New activity was not created in P6-EPPM
7	TASK		6 Ernesto-MPA	MPA1201.095	New activity was not created in P6-EPPM
8	TASK		7 Ernesto-MPA	MPA1001.095	New activity was not created in P6-EPPM
9	TASK		8 Ernesto-MPA	MPA1101.095	New activity was not created in P6-EPPM
0	TASK		9 Ernesto-MPA	MPA1101.198	New activity was not created in P6-EPPM
1	TASK		13 Ernesto-MPA	MPA1200.080	New activity was not created in P6-EPPM
2	TASK		14 Ernesto-MPA	MPA1000.080	New activity was not created in P6-EPPM
3	TASK		15 Ernesto-MPA	MPA1100.080	New activity was not created in P6-EPPM
4	TASKPRED		3 Ernesto-MPA	MPA1001	New relationship was not created in P6-EPPM. Predecessor Id: MPA1001, Successor Id: MPA1001.069, relationship: SS
5	TASKPRED		4 Ernesto-MPA	MPA1101	New relationship was not created in P6-EPPM. Predecessor Id: MPA1101, Successor Id: MPA1101.069, relationship: SS
6	TASKPRED		5 Ernesto-MPA	MPA1101	New relationship was not created in P6-EPPM. Predecessor Id: MPA1101, Successor Id: MPA1101.080, relationship: SS
7	TASKPRED		6 Ernesto-MPA	MPA1201	New relationship was not created in P6-EPPM. Predecessor Id: MPA1201, Successor Id: MPA1201.095, relationship: SS
8	TASKPRED		7 Ernesto-MPA	MPA1001	New relationship was not created in P6-EPPM. Predecessor Id: MPA1001, Successor Id: MPA1001.095, relationship: SS
9	TASKPRED		8 Ernesto-MPA	MPA1101	New relationship was not created in P6-EPPM. Predecessor Id: MPA1101, Successor Id: MPA1101.095, relationship: SS
0	TASKPRED		9 Ernesto-MPA	MPA1101	New relationship was not created in P6-EPPM. Predecessor Id: MPA1101, Successor Id: MPA1101.198, relationship: SS
1	TASKPRED		13 Ernesto-MPA	MPA1200.080	New relationship was not created in P6-EPPM. Predecessor Id: MPA1200.080, Successor Id: MPA5700, relationship: FF
2	TASKPRED		14 Ernesto-MPA	MPA1000.080	New relationship was not created in P6-EPPM. Predecessor Id: MPA1000.080, Successor Id: MPA5700, relationship: FF
3	TASKPRED		15 Ernesto-MPA	MPA1100.080	New relationship was not created in P6-EPPM. Predecessor Id: MPA1100.080, Successor Id: MPA5700, relationship: FF
4					

Administrator username
and password are
required to access the
backend of P6

Summary for data processing

- A macro is used to process 300+ actual cost and funding/Forecast data (when done with formulas, it was not possible to achieve during the timeframe of 5 days)
- The macro enables to create 300+ files, with the right format to be imported into P6 (The manual import takes 3 days).
- The macro –with the incorporation of Web Services- can handle the import directly (It is expected to reduce the 3 days to half-day, including exceptions).

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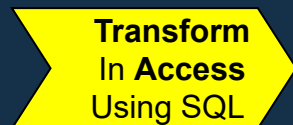
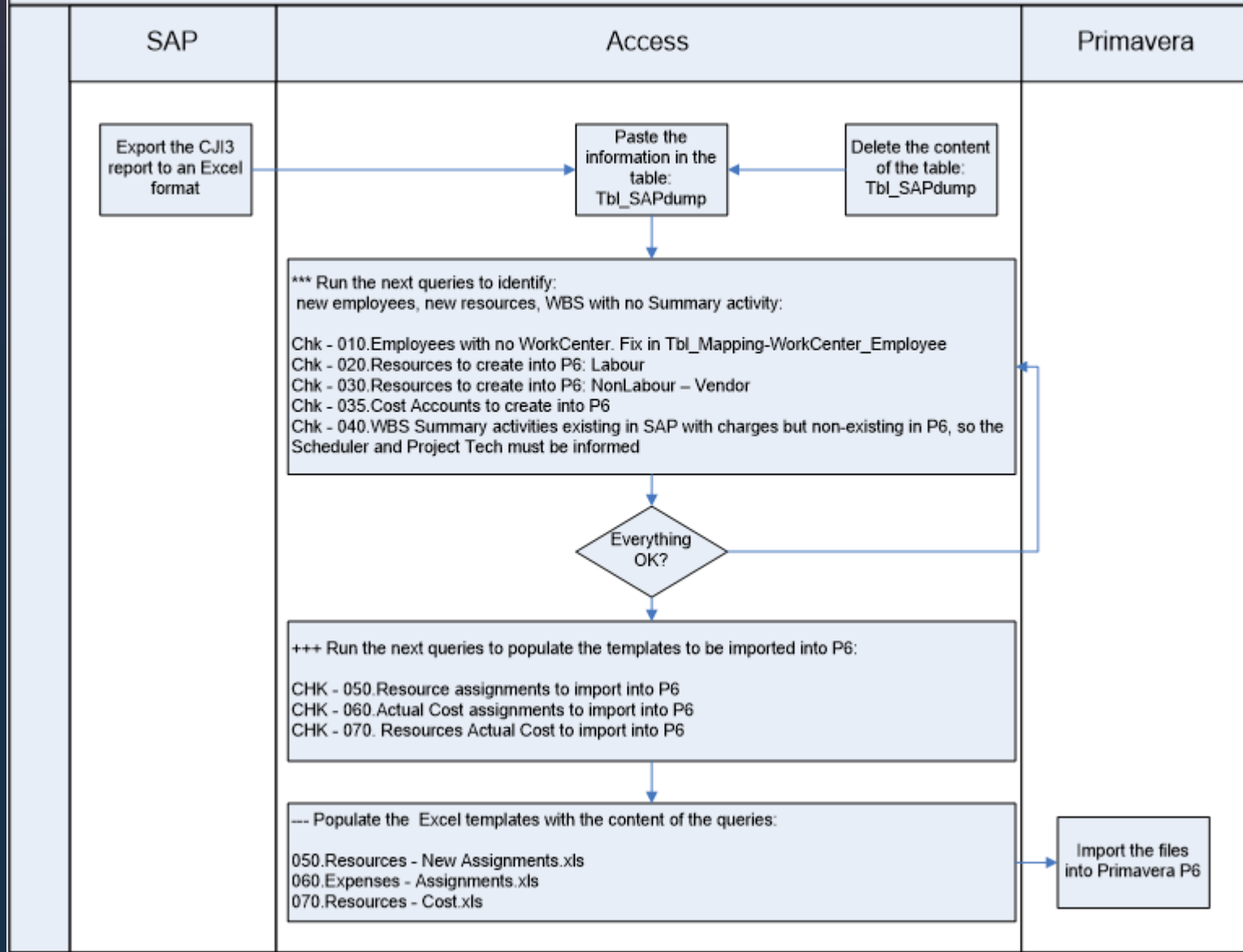
SAP actual cost transfer using an in-house Microsoft Access database

Overview

- In lieu of not having access to Web Services and Oracle P6 SDK, this solution processes the data from the SAP format (CJI3) into the current architecture (cost at the WBS Summary level).
- Due to security restrictions, the access to the MS-Access database where the queries are run is restricted.
- The P6 user has rights to import files and run Global Changes.
- The user of the Access database must have:
 - Login password to the Primavera Database (not only to the GUI)
 - Access to SharePoint
 - An ODBC connection in his computer to the Primavera Database

Transfer of Actual Cost from SAP to Primavera P6

ETL



Report Edit Goto Extras System Help

Display Project Actual Cost Line Items

Project Management Selections (DB profile: 0000000000001)

Project GZ-0001 to GZ-0004

WBS Element to

Network/order to

Activity to

Materials in network to

Cost Elements

Cost Element to

Or

Cost Element Group P_100

Posting Data

Posting date 2010-01-01 to 2010-10-31

Settings

Layout P_100_ET

Further Settings...

CJI3 ccsapp04 INS

In SAP, run the CJI3 and input the next fields:

-Project: GZ-0001 to GZ-0004

-Cost Element Group: **P_100**

-Posting date: the transfer is cumulative, therefore select 2010-01-01 and the last day of the reporting month. I.e. 2010-10-31; 2010-11-30

-Layout: **P_100_ET**. The order of the columns of this layout matches the table of the Access Database.

-Further Settings: enter a huge number like 9999999.

Execute the report

SAP

List Edit Goto Settings Extras Environment System Help

Display Actual Cost Line Items for Projects

Document Master Record

Layout P_100_ET P_100_but_forTransfer
 Object PRJ GZ-0001... JOHN HART -
 REPLACEMENT...
 Cost Element 410000 To 999998 Elect Rev - Resident...
 Posting Date 2010-01-01 To 2010-10-31

Posting Date	Project Def	WBS Element	CO object name	Cost Elem.	Cost element name
2010-04-30	GZ-0001	GZ-0001.Z.Z.02.0460	PeopleSoft Only DataZ.Z.02.0460	665310	Int Chg to Cnst-F
2010-05-31	GZ-0001	GZ-0001.Z.Z.02.0460	PeopleSoft Only DataZ.Z.02.0460	665310	Int Chg to Cnst-F
2010-06-30	GZ-0001	GZ-0001.Z.Z.02.0460	PeopleSoft Only DataZ.Z.02.0460	665310	Int Chg to Cnst-F
2010-07-31	GZ-0001	GZ-0001.Z.Z.02.0460	PeopleSoft Only DataZ.Z.02.0460	665310	Int Chg to Cnst-F
2010-08-31	GZ-0001	GZ-0001.Z.Z.02.0460	PeopleSoft Only DataZ.Z.02.0460	665310	Int Chg to Cnst-F
2010-09-30	GZ-0001	GZ-0001.Z.Z.02.0460	PeopleSoft Only DataZ.Z.02.0460	665310	Int Chg to Cnst-F
2010-10-31	GZ-0001	GZ-0001.Z.Z.02.0460	PeopleSoft Only DataZ.Z.02.0460	665310	Int Chg to Cnst-F
2010-03-31	GZ-0001	GZ-0001.Z.Z.02.0460	PeopleSoft Only DataZ.Z.02.0460	999512	Conv P&L WIP-C
2010-06-30	GZ-0001	GZ-0001.Z.Z.03.0300	A200 Estimating 1118867	665310	Int Chg to Cnst-F
2010-07-31	GZ-0001	GZ-0001.Z.Z.03.0300	A200 Estimating 1118867	665310	Int Chg to Cnst-F
2010-08-31	GZ-0001	GZ-0001.Z.Z.03.0300	A200 Estimating 1118867	665310	Int Chg to Cnst-F
2010-09-30	GZ-0001	GZ-0001.Z.Z.03.0300	A200 Estimating 1118867	665310	Int Chg to Cnst-F
2010-10-31	GZ-0001	GZ-0001.Z.Z.03.0300	A200 Estimating 1118867	665310	Int Chg to Cnst-F
2010-06-21	GZ-0001	GZ-0001.Z.Z.03.0300	A200 Estimating 1118867	700040	Salary RT
2010-06-30	GZ-0001	GZ-0001.Z.Z.03.0300	A200 Estimating 1118867	741500	Spec Attributable
2010-06-30	GZ-0001	GZ-0001.Z.Z.03.0300	A200 Estimating 1118867	841801	CGAAP/BCUC E

CJI3 ccsapp04 INS

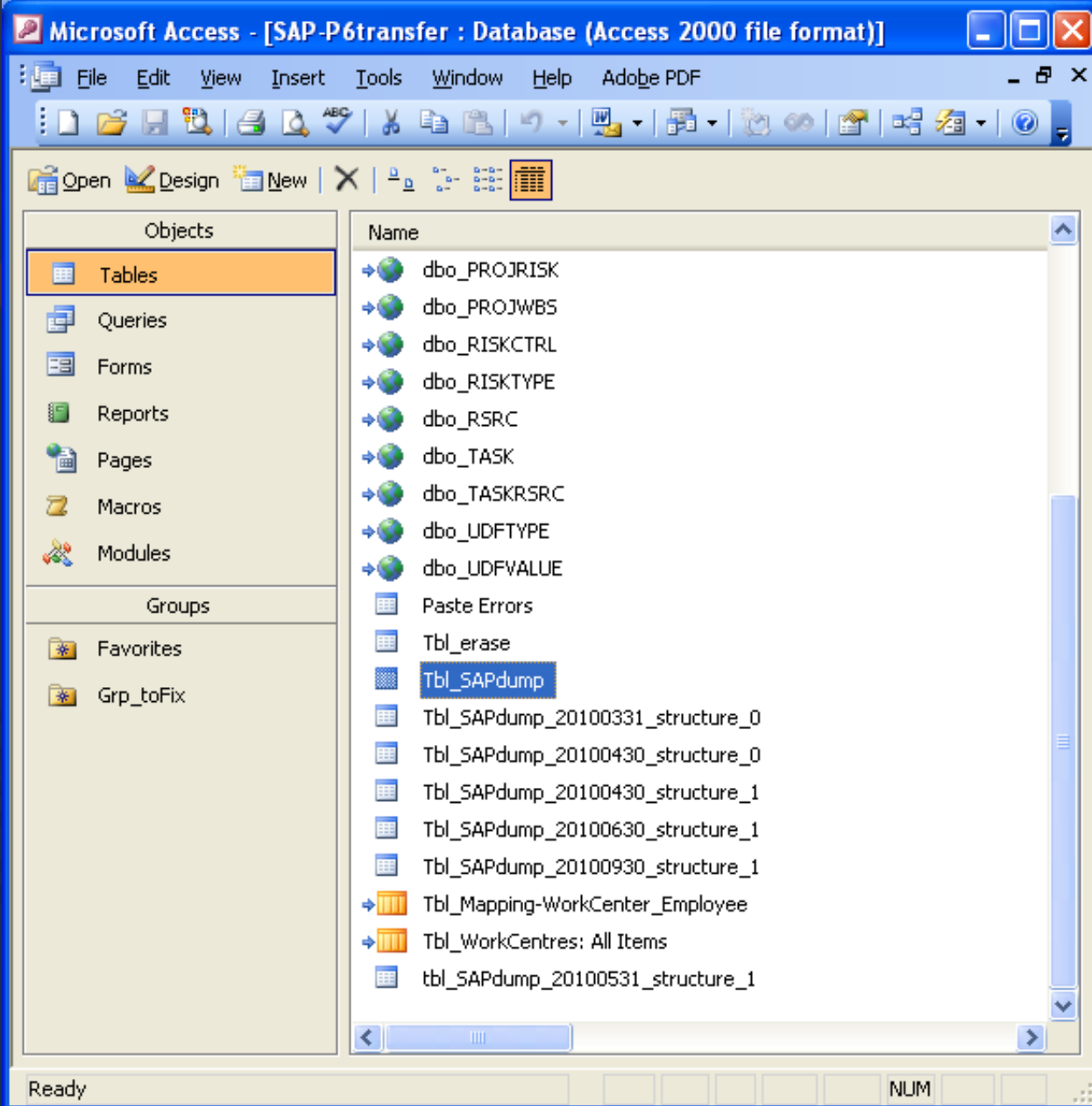
SAP report

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Export the information to an Excel format by clicking the X icon (Spreadsheet).

Save the file.

Keep the file open.



In Access

Run the Access database **SAP-P6 transfer** and open the table **Tbl_SAPdump** and erase all the content (this will be replaced by the imported files in the previous step).

In Excel

	L	M	N	O	P	Q	R	S	T	U
45083	Mica / Wa	300541	Terance Edwards				PAHR Tim RKL	ORD		
45084	Gen Alloc						KZPI	ORD		
45085	Gen Alloc						KZPI	ORD		
45086	Mica / Wa	300541	Terance Edwards				PAHR Tim RKL	ORD		
45087	Mica / Wa	400085	Lance Swanson				PAHR Tim RKL	ORD		
45088	Gen Alloc						KZPI	ORD		
45089	Gen Alloc						KZPI	ORD		
45090	Mica / Wa	300541	Terance Edwards				PAHR Tim RKL	ORD		
45091	Mica / Wa	300541	Terance Edwards				PAHR Tim RKL	ORD		
45092	Mica / Wa	406336	David Poisson				PAHR Tim RKL	ORD		
45093	Mica / Wa	300541	Terance Edwards				PAHR Tim RKL	ORD		
45094	Mica / Wa	300541	Terance Edwards				PAHR Tim RKL	ORD		
45095	Mica / Wa	300541	Terance Edwards				PAHR Tim RKL	ORD		
45096	Mica / Wa	406336	David Poisson				PAHR Tim RKL	ORD		
45097	Mica / Wa	409094	Braeden Wright				PAHR Tim RKL	ORD		
45098	Mica Town	304865	Dave Palmer				PAHR Tim RKL	ORD		
45099	Mica / Wa	409094	Braeden Wright				PAHR Tim RKL	ORD		
45100	Gen Alloc						KZPI	ORD		
45101	Gen Alloc						KZPI	ORD		
45102	Mica / Wa	409094	Braeden Wright				PAHR Tim RKL	ORD		
45103	Gen Alloc						KZPI	ORD		
45104	Gen Alloc						KZPI	ORD		
45105				245410	Passprt Gi	Z-160240-12	2010-10-00	COIN	ORD	
45106	Mica / Wa	406336	David Poisson				PAHR Tim RKL	ORD		
45107	Mica / Wa	406336	David Poisson				PAHR Tim RKL	ORD		
45108	Gen Alloc						KZPI	ORD		
45109	Gen Alloc						KZPI	ORD		
45110										
45111										
45112										
45113										
45114										

Select all the content and copy the selection of the spreadsheet by pressing Ctrl-C.

Posting Date	Project Definition	WBS Element	CO object name	Cost Element	Cost element
2010-09-20	GZ-0001	GZ-0001.3.5.10.6000	Public Sector Comparator Design Report	700040	Salary RT
2010-09-20	GZ-0001	GZ-0001.3.5.10.6000	Public Sector Comparator Design Report	700040	Salary RT
2010-09-23	GZ-0001	GZ-0001.3.5.10.6000	Public Sector Comparator Design Report	700040	Salary RT
2010-09-20	GZ-0001	GZ-0001.3.5.10.6000	Public Sector Comparator Design Report	700040	Salary RT
2010-10-19	GZ-0001	GZ-0001.3.5.10.6000	Public Sector Comparator Design Report	700040	Salary RT
2010-10-18	GZ-0001	GZ-0001.3.5.10.6000	Public Sector Comparator Design Report	700040	Salary RT
2010-10-18	GZ-0001	GZ-0001.3.5.10.6000	Public Sector Comparator Design Report	700040	Salary RT
2010-10-25	GZ-0001	GZ-0001.3.5.10.6000	Public Sector Comparator Design Report	700040	Salary RT
2010-10-28	GZ-0001	GZ-0001.3.5.10.6000	Public Sector Comparator Design Report	700040	Salary RT
2010-10-29	GZ-0001	GZ-0001.3.5.10.6000	Public Sector Comparator Design Report	700040	Salary RT
2010-10-01	GZ-0001	GZ-0001.3.5.10.6000	Public Sector Comparator Design Report	700040	Salary RT
2010-10-14	GZ-0001	GZ-0001.3.5.10.6000	Public Sector Comparator Design Report	700040	Salary RT
2010-10-12	GZ-0001	GZ-0001.3.5.10.6000	Public Sector Comparator Design Report	700040	Salary RT
2010-10-25	GZ-0001	GZ-0001.3.5.10.6000	Public Sector Comparator Design Report	700040	Salary RT
2010-10-29	GZ-0001	GZ-0001.3.5.10.6000	Public Sector Comparator Design Report	700040	Salary RT
2010-10-29	GZ-0001	GZ-0001.3.5.10.6000	Public Sector Comparator Design Report	700040	Salary RT
2010-10-04	GZ-0001	GZ-0001.3.5.10.6000	Public Sector Comparator Design Report	700040	Salary RT
2010-10-04	GZ-0001	GZ-0001.3.5.10.6000	Public Sector Comparator Design Report	700040	Salary RT
2010-10-25	GZ-0001	GZ-0001.3.5.10.6000	Public Sector Comparator Design Report	700040	Salary RT
2010-10-14	GZ-0001	GZ-0001.3.5.10.6000	Public Sector Comparator Design Report	700040	Salary RT
2010-10-12	GZ-0001	GZ-0001.3.5.10.6000	Public Sector Comparator Design Report	700040	Salary RT
2010-08-31	GZ-0001	GZ-0001.3.5.10.6000	Public Sector Comparator Design Report	741500	Spec Attribute
2010-08-31	GZ-0001	GZ-0001.3.5.10.6000	Public Sector Comparator Design Report	741500	Spec Attribute
2010-09-30	GZ-0001	GZ-0001.3.5.10.6000	Public Sector Comparator Design Report	741500	Spec Attribute
2010-10-31	GZ-0001	GZ-0001.3.5.10.6000	Public Sector Comparator Design Report	741500	Spec Attribute
2010-08-31	GZ-0001	GZ-0001.3.5.10.6000	Public Sector Comparator Design Report	841801	CGAAP/BCUC
2010-08-31	GZ-0001	GZ-0001.3.5.10.6000	Public Sector Comparator Design Report	841801	CGAAP/BCUC
2010-09-30	GZ-0001	GZ-0001.3.5.10.6000	Public Sector Comparator Design Report	841801	CGAAP/BCUC
2010-10-31	GZ-0001	GZ-0001.3.5.10.6000	Public Sector Comparator Design Report	841801	CGAAP/BCUC
2010-08-31	GZ-0001	GZ-0001.3.5.10.6200	Tunnel Design	665310	Int Chg to Cns
2010-09-30	GZ-0001	GZ-0001.3.5.10.6200	Tunnel Design	665310	Int Chg to Cns
2010-10-31	GZ-0001	GZ-0001.3.5.10.6200	Tunnel Design	665310	Int Chg to Cns
2010-09-30	GZ-0001	GZ-0001.3.5.10.6200	Tunnel Design	635020	Consultants E

Paste the content in the MS-Access database by selecting the row and pressing Ctrl-V.

In Access

Run the next queries in the assigned order.

If the results are *empty*, it means that there are *no issues to resolve*; otherwise these are the recommendations:

- **Qry_Chk_EmployeeWithNoWorkCenterMatched.**

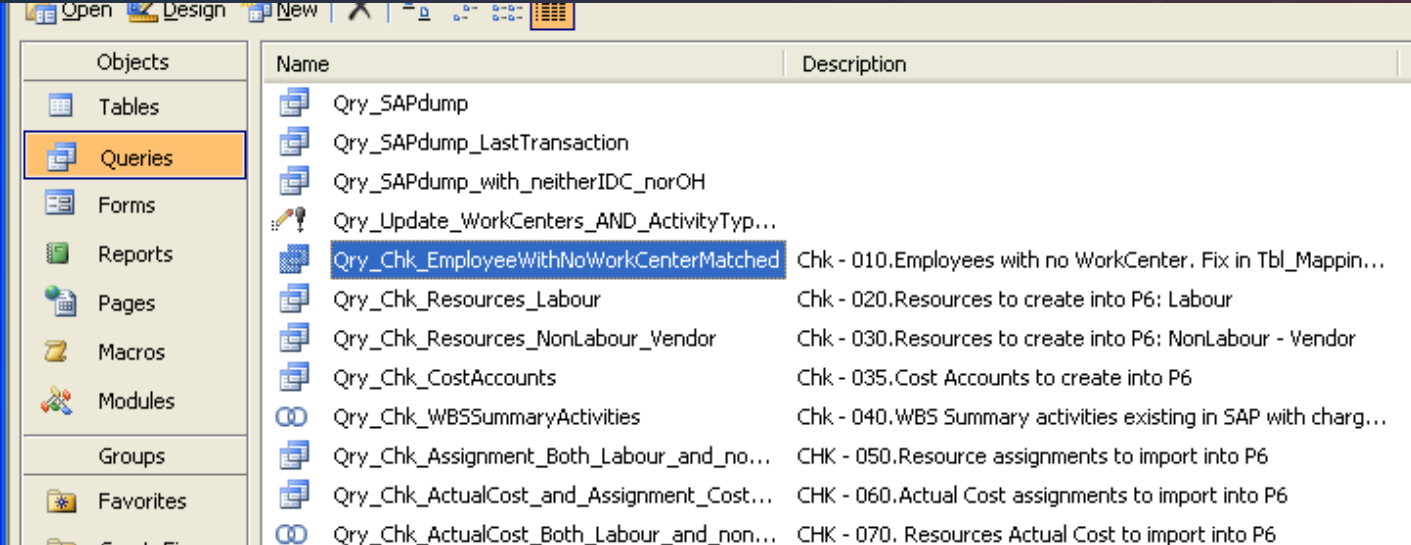
Contact the Project Tech to match the Employee to the right Work Center and input the record into the table **Tbl_Mapping-WorkCenter_Employee** located in SharePoint.

- **Qry_Chk_Resources_Labour.** Helps you identify a new combination of valid Work Center and valid Activity Type. This must be input in P6, taking care of the prices/unit.

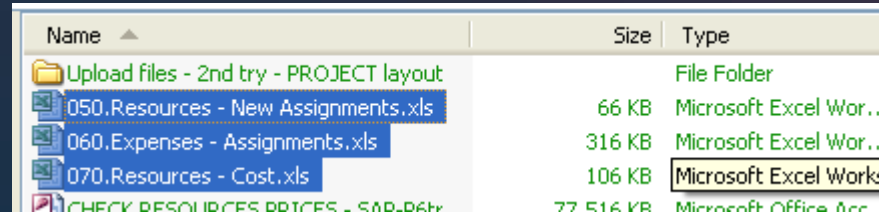
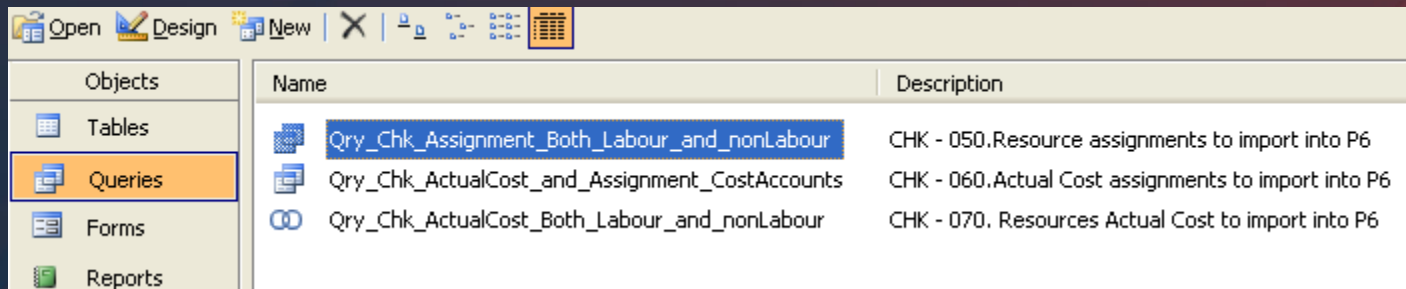
- **Qry_Chk_Resources_NonLabour_Vendor.** Does not apply currently (no PS02)

- **Qry_Chk_CostAccounts.** Helps identify new Cost accounts that are not yet in P6. The records here must be inputted in P6.

- **Qry_Chk_WBSSummaryActivities.** Every cost must be placed in a specific WBS Summary activity. If the WBS does not have a WBS Summary activity with the nomenclature **GZ000#-whatever**, that WBS Summary activity must be created in their respective WBS.



Name	Description
Qry_SAPdump	
Qry_SAPdump_LastTransaction	
Qry_SAPdump_with_neitherIDC_norOH	
Qry_Update_WorkCenters_AND_ActivityTyp...	
Qry_Chk_EmployeeWithNoWorkCenterMatched	Chk - 010. Employees with no WorkCenter. Fix in Tbl_Mappin...
Qry_Chk_Resources_Labour	Chk - 020. Resources to create into P6: Labour
Qry_Chk_Resources_NonLabour_Vendor	Chk - 030. Resources to create into P6: NonLabour - Vendor
Qry_Chk_CostAccounts	Chk - 035. Cost Accounts to create into P6
Qry_Chk_WBSSummaryActivities	Chk - 040. WBS Summary activities existing in SAP with charg...
Qry_Chk_Assignment_Both_Labour_and_no...	CHK - 050. Resource assignments to import into P6
Qry_Chk_ActualCost_and_Assignment_Cost...	CHK - 060. Actual Cost assignments to import into P6
Qry_Chk_ActualCost_Both_Labour_and_non...	CHK - 070. Resources Actual Cost to import into P6



Final Result Queries

The last three queries are to populate the templates to be imported into P6. They have a correspondence:

Query	Excel Template
Qry_Chk_Assignment_Both_Labour_and_nonLabour (CHK – 050.Resource assignments to import into P6)	050.Resources - New Assignments.xls
Qry_Chk_ActualCost_and_Assignment_CostAccounts (CHK – 060.Actual Cost assignments to import into P6)	060.Expenses - Assignments.xls
Qry_Chk_ActualCost_Both_Labour_and_nonLabour (CHK – 070.Resources Actual Cost to import into P6)	070.Resources - Cost.xls

New assignments

	A	B	C	D	E	F	G
1	task_id	rsrc_id	target_qty	target_cost	act_qty	act_cost	delete_record_flag
2	GZ0001-0060	B_SPLANR-S44	0	0	0	0	
3	GZ0001-0080	E_PROCUR-S44	0	0	0	0	
4	GZ0001-0080	E_PRPENG-S45	0	0	0	0	
5	GZ0001-0170	E_PRPENG-S45	0	0	0	0	
6	GZ0001-0940	E_PRPENG-S45	0	0	0	0	
7	GZ0001-0960	E_PRJENG-S45	0	0	0	0	
8	GZ0001-0980	E_CVDEGE-S11	0	0	0	0	
9	GZ0001-1090	E_PRPENG-S45	0	0	0	0	
10	GZ0001-1100	E_CVDEGE-S44	0	0	0	0	
11	GZ0001-1100	P_BUSDEV-S44	0	0	0	0	
12	GZ0001-1140	E_PRPENG-S45	0	0	0	0	
13	GZ0001-1150	E_EIT-S11	0	0	0	0	
14	GZ0001-1150	E_MTCLK-S07	0	0	0	0	
15	GZ0001-1150	E_MTELSV-S44	0	0	0	0	
16	GZ0001-1160	E_PRJENG-S45	0	0	0	0	
17	GZ0001-1180	E_PROCUR-S45	0	0	0	0	
18	GZ0001-1230	G_RESMGT-S45	0	0	0	0	
19	GZ0001-1240	E_EIT-S11	0	0	0	0	
20	GZ0001-1270	E_CTRLCK-S06	0	0	0	0	
21	GZ0001-1270	E_PRJENG-S04	0	0	0	0	
22	GZ0001-1270	E_PROCUR-S44	0	0	0	0	
23	GZ0001-1290	B_ESTMTR-S44	0	0	0	0	
24	GZ0001-1290	E_PRJENG-S04	0	0	0	0	
25	GZ0001-1290	G_OPSSVAN-S12	0	0	0	0	
26	GZ0001-1310	E_PRPENG-S45	0	0	0	0	
27	GZ0001-1350	E_CONOFF-S12	0	0	0	0	

Sample of the 050. New Assignments file:

It is specific for each project;

It contains only **new** resource assignments

Expenses

	A	B	C	D	E
1	task_id	cost_name	cost_per_qty	act_units	delete_record_flag
2	GZ001-0060	0000665310	1	7	
3	GZ001-0060	0000741500	1	7	
4	GZ001-0060	0000841801	1	27	
5	GZ001-0080	0000665310	1	45	
6	GZ001-0080	0000741500	1	58	
7	GZ001-0080	0000841801	1	-72	
8	GZ001-0090	0000999510	1	44	
9	GZ001-0090	0000999512	1	16	
10	GZ001-0100	0000665310	1	278	
11	GZ001-0100	0000741500	1	33	
12	GZ001-0100	0000841801	1	-33	
13	GZ001-0100	0000999510	1	7171	
14	GZ001-0100	0000999512	1	2506	
15	GZ001-0110	0000665310	1	254	
16	GZ001-0110	0000999510	1	7185	
17	GZ001-0110	0000999512	1	2530	
18	GZ001-0120	0000665310	1	152	
19	GZ001-0120	0000999510	1	4307	
20	GZ001-0120	0000999512	1	1548	

Sample of the 060.
Assignments file:

It is specific for each
project;

It contains Expenses
Cost:

- All Cost/Units equals 1
- Actual Cost

Update existing Assignments

Sample of the 070.
Resources – Cost file:

It is specific for each
project;

It contains all resource
assignments with their
respective cost (actual
units and actual cost)

	A	B	C	D	E
1	task_id	rsrc_id	act_cost	act_qty	delete_record_flag
2	GZ0001-0060	E_P&CDEE-S43	205	2	
3	GZ0001-0160	E_CIVADM-S06	54	1.5	
4	GZ0001-0160	E_CVDEST-S43	1381	16	
5	GZ0001-0170	E_PRPENG-S45	895	5.5	
6	GZ0001-0340	P_PMRED-S45	154	1.5	
7	GZ0001-0860	E_CVDEST-S43	9969	146	
8	GZ0001-0930	E_CIVADM-S06	72	2	
9	GZ0001-0930	E_CVDEHY-S43	579	8.5	
10	GZ0001-0940	E_MECVDR-S09	734	15	
11	GZ0001-0940	E_P&CADM-S06	90	2.5	
12	GZ0001-0940	E_P&CDEC-S43	6729	78	
13	GZ0001-0940	E_P&CDEE-S43	5391	52.5	
14	GZ0001-0950	B_SPLANR-S44	2238	28	
15	GZ0001-0950	B_TCBLDE-S44	742	10	
16	GZ0001-0950	E_MEMEDR-S10	160	3	
17	GZ0001-0950	E_P&CADM-S06	108	3	
18	GZ0001-0950	E_P&CDEE-S43	18844	275.5	
19	GZ0001-0960	E_CONCLK-S06	72	2	
20	GZ0001-0960	E_MEDEHE-S44	2672	29.5	
21	GZ0001-0960	E_MEDETU-S44	14252	223	
22	GZ0001-0960	E_P&CDEE-S43	34189	333	

Enter the Actual cost into P6

The import process repeats four times:

- 1. Import **new** resource assignments (**050**) – to enter missing assignments.
- 2. Import Expense assignments (**060**) – first time to input **all** expense assignments.

Then run two Global changes to zeroed out all the Actual Cost in the project:

- A) Zero down Actuals Resources-> for Resource Assignments (labour and non-labor)
- B) Zero down actuals Expenses -> for Expense Assignments

The Total Actual Cost of the project must be zero.

Resume the import:

- 3. Import **again** Expense assignments (**060**) – to enter the Expense Cost
- 4. Import Resources – Cost (**070**) – to enter the Resources Cost

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Integration of systems of the same vendor

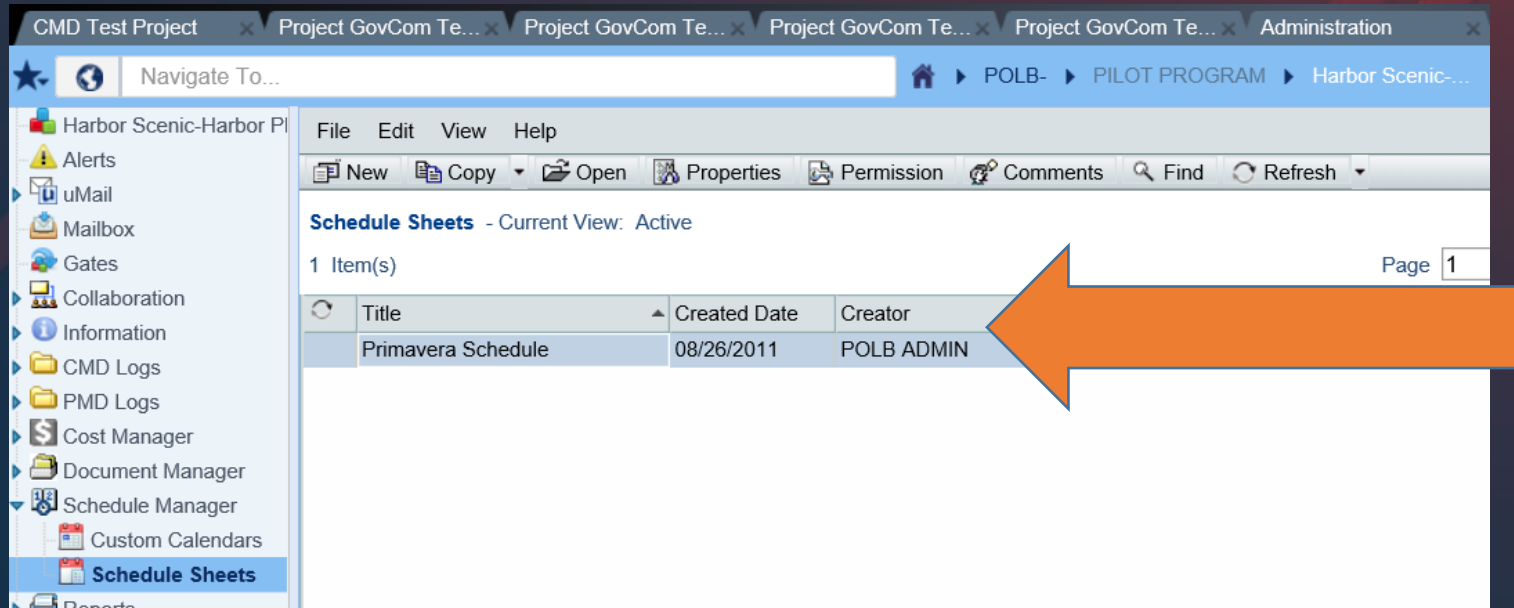
P6 – Unifier integration

- Both systems from the same vendor: Oracle.
- Unifier contains a schedule module and an option to receive dates from Primavera P6
- Besides the effort to transfer data, the ultimate goal is to produce a Cash-Flow report and populate the cost and schedule sections of a Monthly Progress Report, with a flexible design as close as what the client is already utilizing and dynamic to react to future requirements.
- All Project Controls reports were developed out of Unifier using Oracle BI Publisher. Unifier as the system of record for Cost was missing the schedule data (plan, actual, baseline dates, percent complete)

Unifier Configuration

Current:

One single records that grabs only the latest information (current schedule) and even only some fields



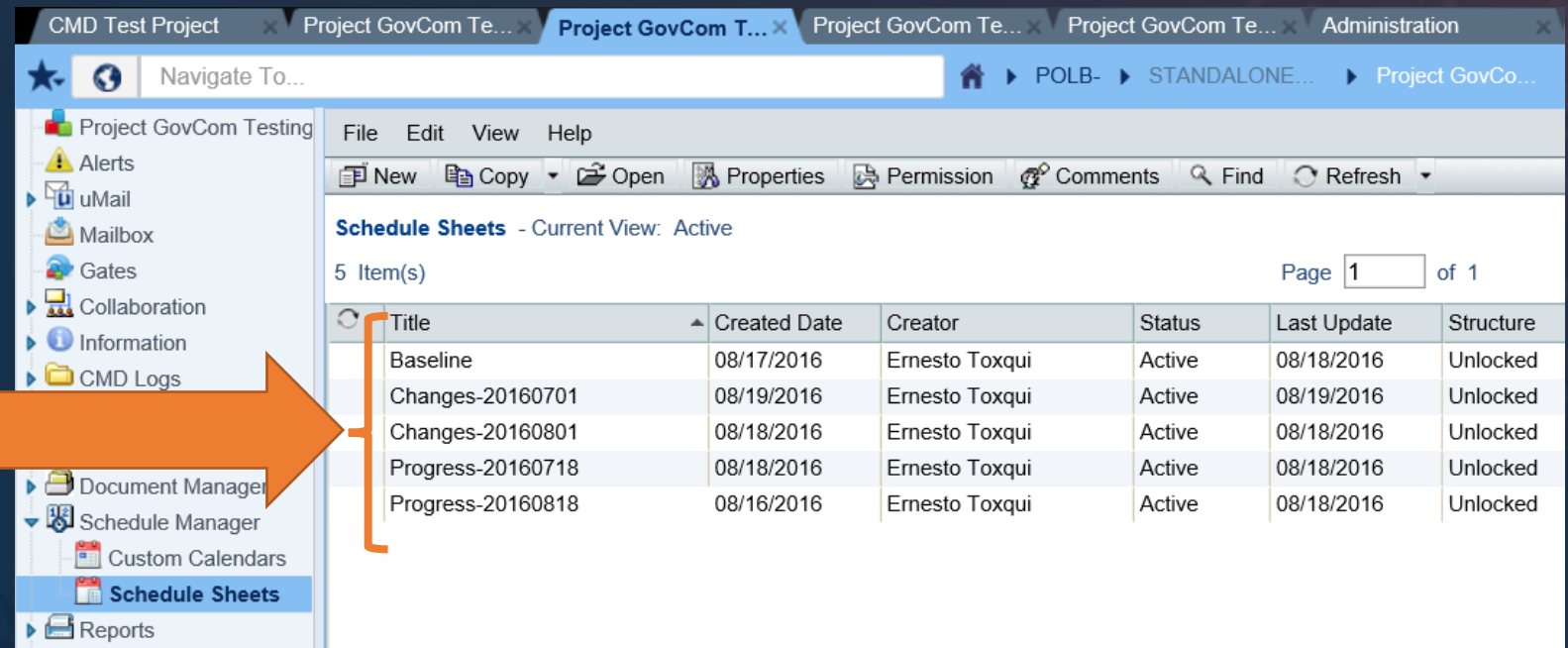
The screenshot shows a web application interface with a navigation menu on the left and a main content area. The main content area displays a table titled 'Schedule Sheets - Current View: Active'. The table has one row with the following data:

Title	Created Date	Creator
Primavera Schedule	08/26/2011	POLB ADMIN

An orange arrow points from the text 'Current:' to this table.

Proposed :

More granularity, more detail, allow to make comparison, display Current, last month, baseline, changes, beginning of the month, sent to board, etc.



The screenshot shows a web application interface with a navigation menu on the left and a main content area. The main content area displays a table titled 'Schedule Sheets - Current View: Active'. The table has five rows with the following data:

Title	Created Date	Creator	Status	Last Update	Structure
Baseline	08/17/2016	Ernesto Toxqui	Active	08/18/2016	Unlocked
Changes-20160701	08/19/2016	Ernesto Toxqui	Active	08/19/2016	Unlocked
Changes-20160801	08/18/2016	Ernesto Toxqui	Active	08/18/2016	Unlocked
Progress-20160718	08/18/2016	Ernesto Toxqui	Active	08/18/2016	Unlocked
Progress-20160818	08/16/2016	Ernesto Toxqui	Active	08/18/2016	Unlocked

An orange arrow points from the text 'Proposed :' to this table.

Current data fields set up in Unifier

Screenshot of the Unifier 'Data Mapping' interface. The 'Activity' tab is selected. The table below shows the mapping between Column, CSV Header, and XML Element.

Column	CSV Header	XML Element
Activity Name		Name
Actual Finish Date		ActualFinishDate
Actual Start Date		ActualStartDate
Data Date		PrimaryConstraintDate
Finish date		FinishDate
Primavera Activity ID		Code
Primavera Actual Durat		UDF
Primavera At Completic		UDF
Primavera Original Dur:		UDF
Primavera Remaining [UDF
Primavera WBS Code		GUID
Program Code		TotalFloat
Project ID		Id
Schedule Confidence		Status
Start date		StartDate

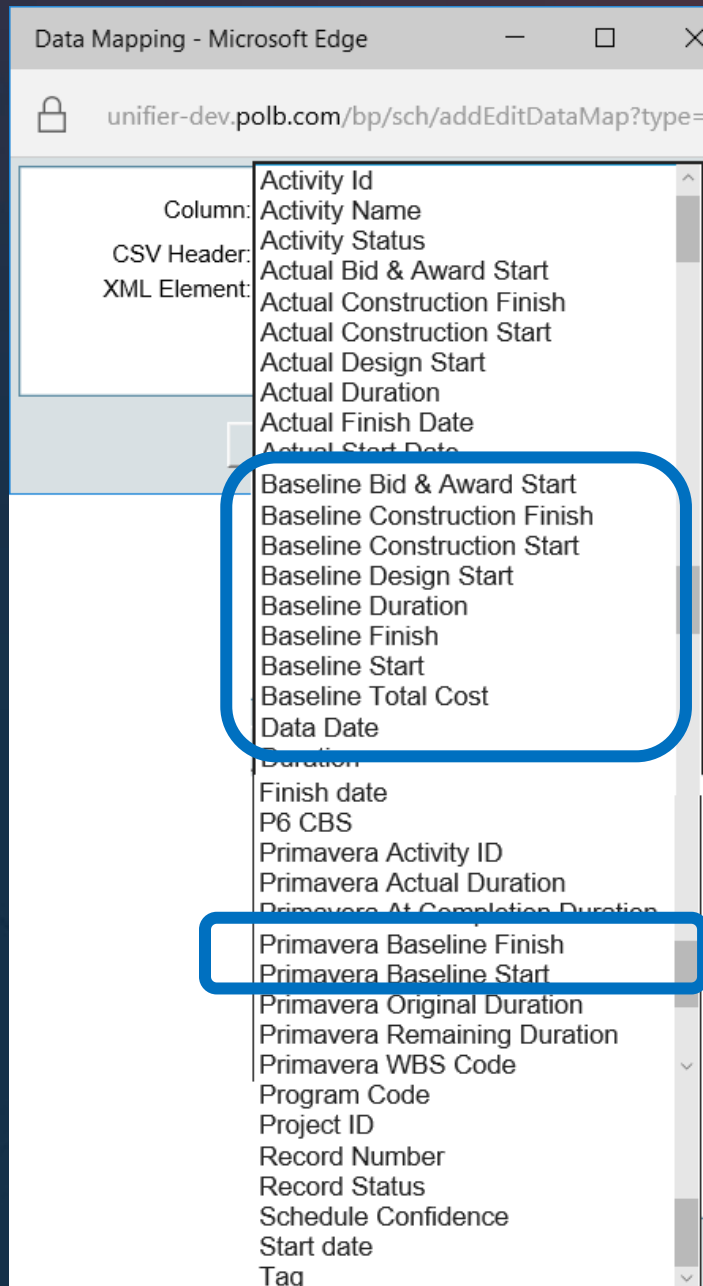
Buttons: Add..., Remove, Export..., Import..., OK, Cancel

Used data fields in Unifier during the proposed solution

Screenshot of the Unifier 'Data Mapping' interface. The 'Activity' tab is selected. The table below shows the mapping between Column, CSV Header, and XML Element. The 'Baseline Finish' and 'Baseline Start' rows are highlighted with a red box.

Column	CSV Header	XML Element
Activity Id	Activity_ID	Activity_ID
Activity Name	Activity_Name	Activity_Name
Activity Status	Activity_Status	Activity_Status
Actual Finish Date	Actual_Finish_Date	Actual_Finish_Date
Actual Start Date	Actual_Start_date	Actual_Start_date
Baseline Finish	Baseline_Finish	Baseline_Finish
Baseline Start	Baseline_Start	Baseline_Start
Finish date	Finish_date	Finish_date
Primavera Actual Durat	Primavera_Actual_Dur:	Primavera_Actual_Dur:
Primavera At Completic	Primavera_At_Complet	Primavera_At_Complet
Primavera Original Dur:	Primavera_Original_Du	Primavera_Original_Du
Primavera Remaining [Primavera_Remaining_	Primavera_Remaining_
Primavera WBS Code	Primavera_WBS_Code	Primavera_WBS_Code
Start date	Start_date	Start_date

Buttons: Add..., Remove, Export..., Import..., OK, Cancel



There are more fields to pick (as needed) that can be:

- Either transferred from P6 or other Scheduling software
- Or manually inputted
- Or transferred via XML or CSVs

Key features of the processes

Current process:

- Used web-services – semi automated process, still requires manual intervention by placing the files in a specific folder
- Quick to process all schedules at once into Unifier
- Modification of the current process may likely require to update the configuration of the web-services (similar to Arunee's integration process)

Proposed:

- Used CSVs – meaning more manual intervention
- More control on the transferred data (as long as there are some business rules like naming convention) that allow more sophisticated reporting and integration Cost/Schedule/contract
- It allows more flexibility to pick the needed fields and update the process
- Slow to update all the files/schedules at once into Unifier

Expected outcome

1. The schedule section of the *Project Monthly Progress Report*:
 - Original Baseline (a schedule sheet was added: Baseline)
 - Current Baseline (several schedule sheets can be added to reflect re-baselines: Changes-yyyymmdd)
 - Current (latest) schedule sheet: Progress-201608 (assuming the data/update date is August/2016)
 - Last month schedule sheet: Progress-201607 (for July/2016)
 - Additional calculations, like variances

2. The *Cash-flow*, basically time-phasing the Cost Values (plan and forecast values) at the project and portfolio levels.

Integration at the reporting level (no data transfer)

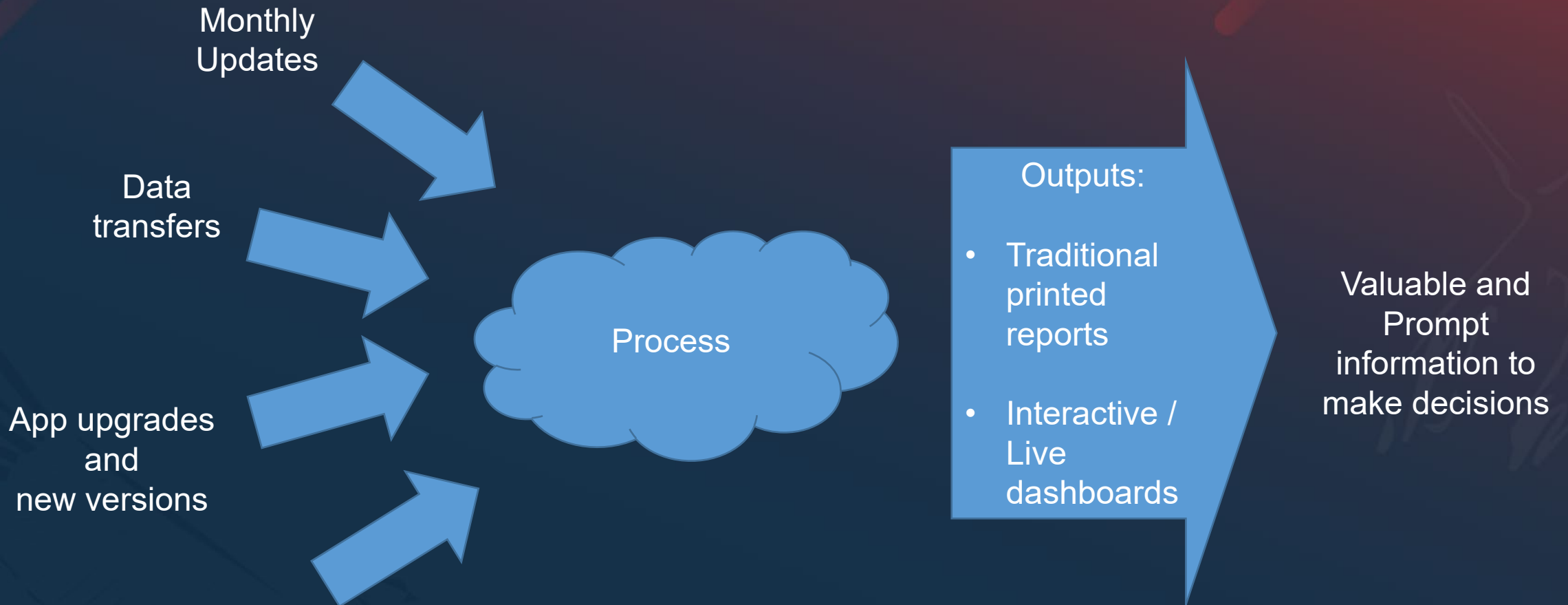
Business Intelligence (BI) tools

With the advent, popularity and accessibility of BI tools, there is less need to transfer data as the integration can be done only at the highest level: the reporting.

Common functions of business intelligence technologies include reporting, analytics, dashboard development, data mining, performance management, predictive analytics (forecast), and prescriptive analytics (explanation of actual data).

Among the common software packages: Tableau, Power BI, Analytics.

Integration of different data formats



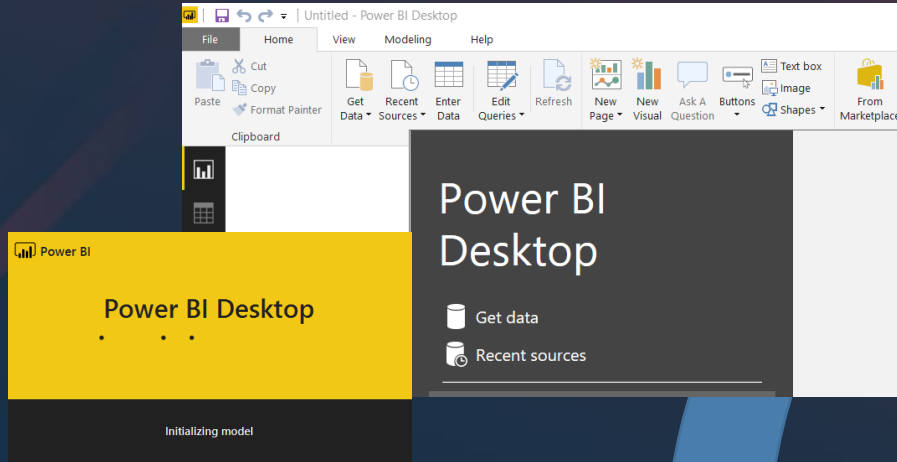
“Without data... you’re just
a person with an opinion”
- Edwards Deming

Advantages of a BI solution and specifically, Power BI)

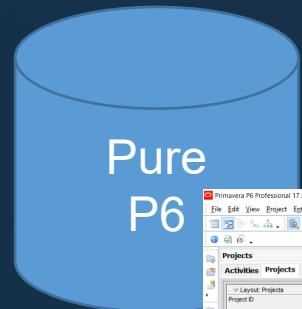
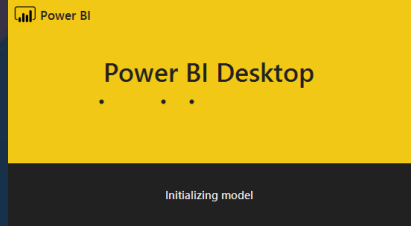
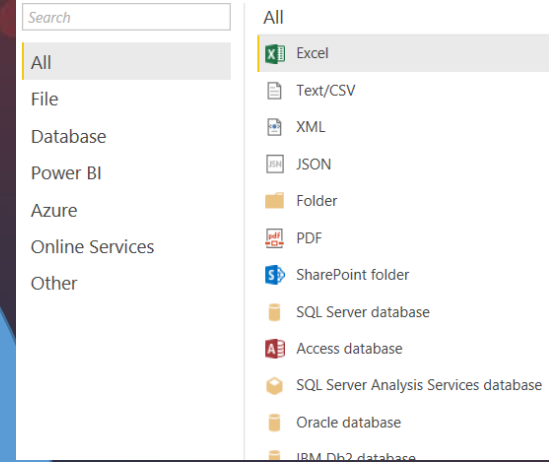
- Not only another sophisticated graph, but a way to slice and dice (analyze) the data and convert it into valuable information
- If the company has Excel, Word, Power Point... very likely is a Microsoft shop, and has “free” access to Microsoft Power BI
- Power BI comes from predetermined visualizations (graphs, charts, etc.) but they can be expanded from the store (Marketplace)
- There is no restriction about what is the data source (Peoplesoft, SAP, Oracle Unifier, P6, etc.)
- In a wider scope, a dashboard can be constructed not only from a Project Controls system but any Information System
- Integration: the same graph/visualization/dashboard can be fed from multiple data sources (systems and vendors), like Excel, SQL, Oracle, XML, CVS, SharePoint, etc.
- The data can be analyzed with natural language (it requires some normalization, but...is possible!)

Hints that an organization needs a dashboard

- Constant use of Excel graphs, and a need to dig (drill down) to the detail.
- Massive amount of records, reports, systems
- Having a need to simplify or summarize the data
- Many audiences with distinct and conversely similar needs
- Overwhelm with too much information or total lack of information
- Output from the systems not properly formatted
- Delays in the process to provide information (Remember: the information comes with an expiration date)
- Several apps, each providing different but related information
- Different owners of a piece of information

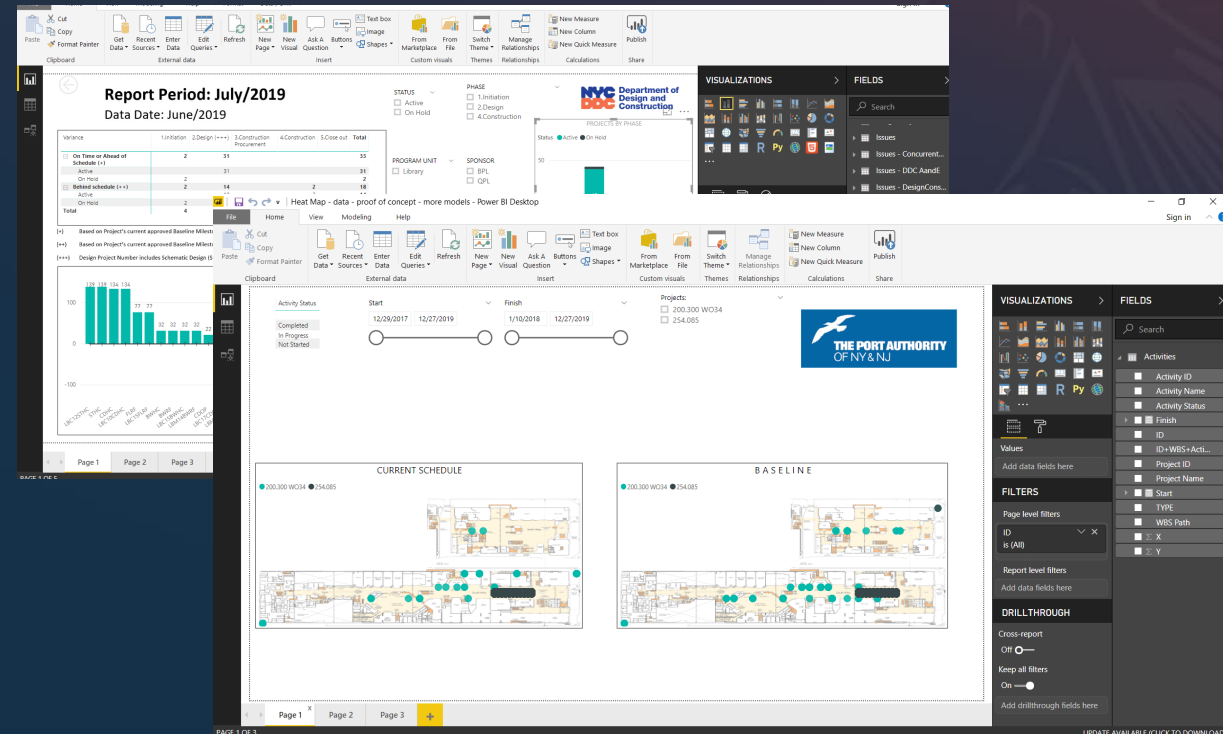


Get Data



Primavera P6 Professional 17 - LKX12EDHC (Method: P6AC Upgrade)

Project ID	Project Name	Project Phase	Publsh	Summary Level(S)	Data Date	Project Status	COs
DDC	Department of Design and Construction	Active			June 2019	Active	
BPL	Borough Public Library	Active				Active	
2019-09 BPL	2019-09 BPL	Active				Active	
LBM17AFBR	ARLINGTON BRANCH RENOVATION	OSGN	Yes	BPL	26 Jun-19	Active	
LBM12EDHC	Berkley P6AC Upgrade	OSGN	Yes	BPL	21 May-19	Active	
LBC13EFF	Borough Park Major Renovation	OSGN	Yes	BPL	31 May-19	Active	
LBM18BFGH	BROOKLYNVILLE LIBRARY MAJOR RENOVATIONS	OSGN	Yes	BPL	31 May-19	Active	
LBM18TFF	BUILDINGS ENVELOPE RENOVATION	OSGN	Yes	BPL	31 May-19	Active	
LRC15EMVC	Buswick HVAC Upgrade	OSGN	Yes	BPL	31 May-19	Active	
LBM18BVP	Buswick Floor Replacement	OSGN	Yes	BPL	31 May-19	Active	
LBM12EDHC	Canell Garden HVAC and Fire Alarm Upgrade and Teen Space	OSGN	Yes	BPL	31 May-19	Active	
LRC12EDHC	Claremont HVAC & BMS Upgrade	OSGN	Yes	BPL	31 May-19	Active	
LRC12GOP	CLAREMONT OUTDOOR PLAZA	PEP	Yes	BPL	31 May-19	Active	
LKX13EER	East Flatbush Major Rehabilitation	CONS	Yes	BPL	31 May-19	Active	
LBM18EPOH	EASTERN PATHWAY LIBRARY MAJOR RENOVATIONS	OSGN	Yes	BPL	31 May-19	Active	
LRC13EJFF	Flushing Roof Replacement	OSGN	Yes	BPL	31 May-19	Active	
LBM18GJFC	Greenwood Foye & Foundation Upgrade	OSGN	Yes	BPL	31 May-19	Active	
LBM13LJDC	Leewood Library HVAC Replacement	OSGN	Yes	BPL	31 May-19	Active	
LRC14GJFC	Leewood Roof Replacement	OSGN	Yes	BPL	31 May-19	Active	
LRC13MFC	Mapleton Babel EMS System Replacement	OSGN	Yes	BPL	31 May-19	Active	
LBM18MFPF	Mapleton Building Envelope Rehabilitation	OSGN	Yes	BPL	31 May-19	Active	
LRC14MFC	Mapleton HVAC Upgrade	OSGN	Yes	BPL	31 May-19	Active	



9° Congreso

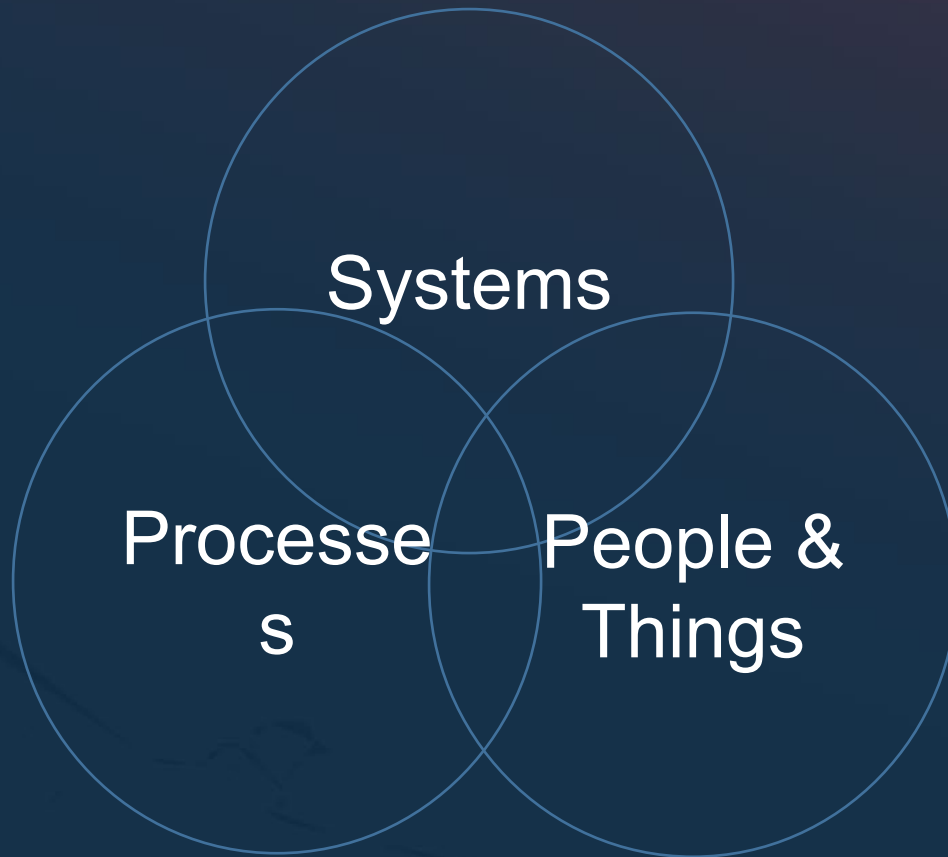
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Bonus: a process approach to integrate

Integration: Cause – effect relationship

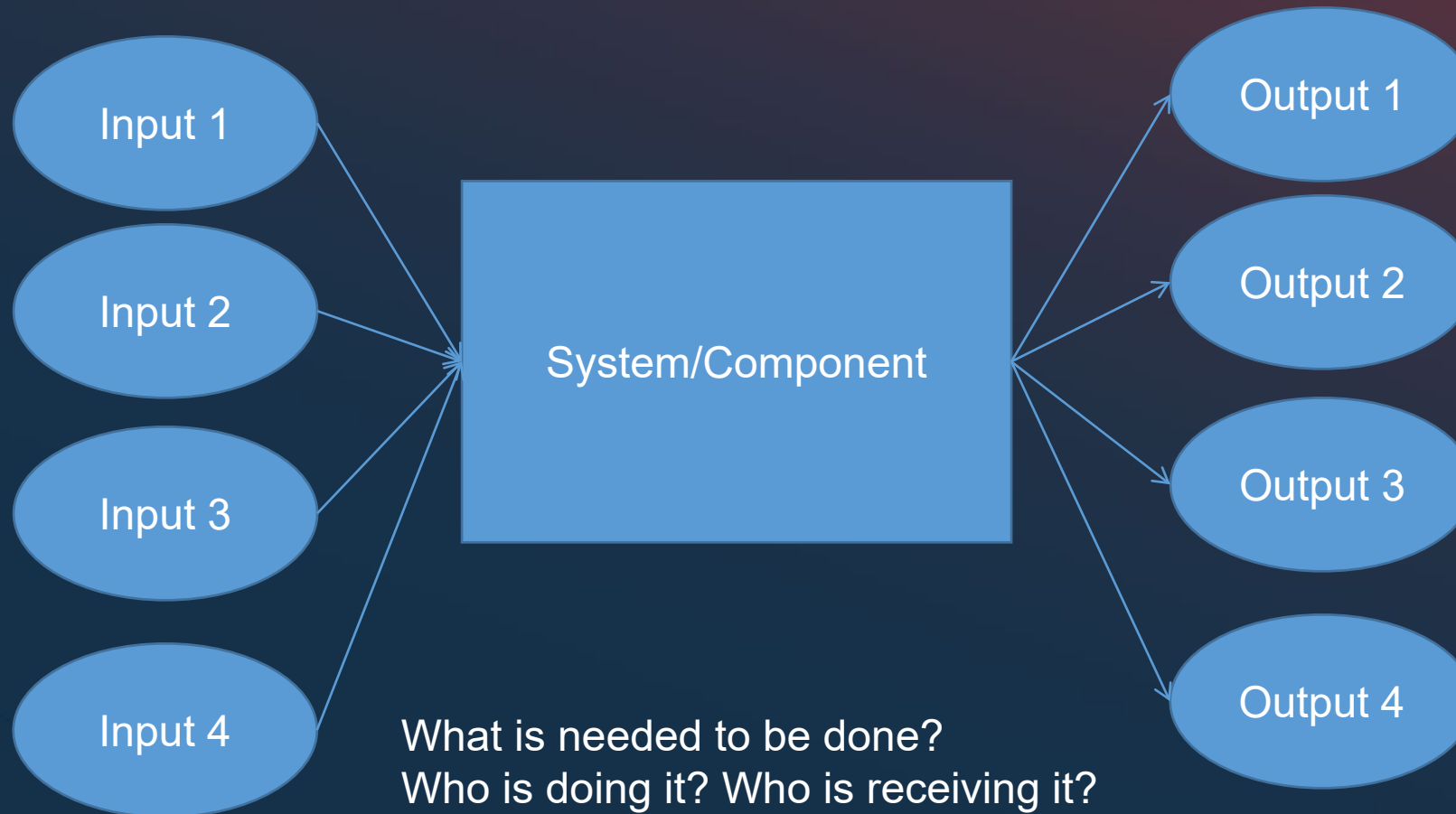
Pseudo-code	Example
IF <<something happens: CAUSE>>	If an activity X falls behind
THEN <<something else reacts: EFFECT>>	Then there is an increase in the Y resources and will increase cost Z

Brainstorm - interactions



- Systems/components (Unifier, eBuilder, Kahua, PM web, Microsoft Project, Net Suite, Ecosys, Excel, etc.)
- People/things (Project Controls, external Stakeholders, Project Management team, etc.)
- Processes (Accounts receivable/payable, mandatory requirements, monthly reporting progress, etc.)

Input -> Process -> Output approach



What is needed to be done?
Who is doing it? Who is receiving it?
How is done?, How is
communicated, transferred,
transmitted, submitted?

During the lifespan of a project, work package; Current administration, sponsorship

During the
project

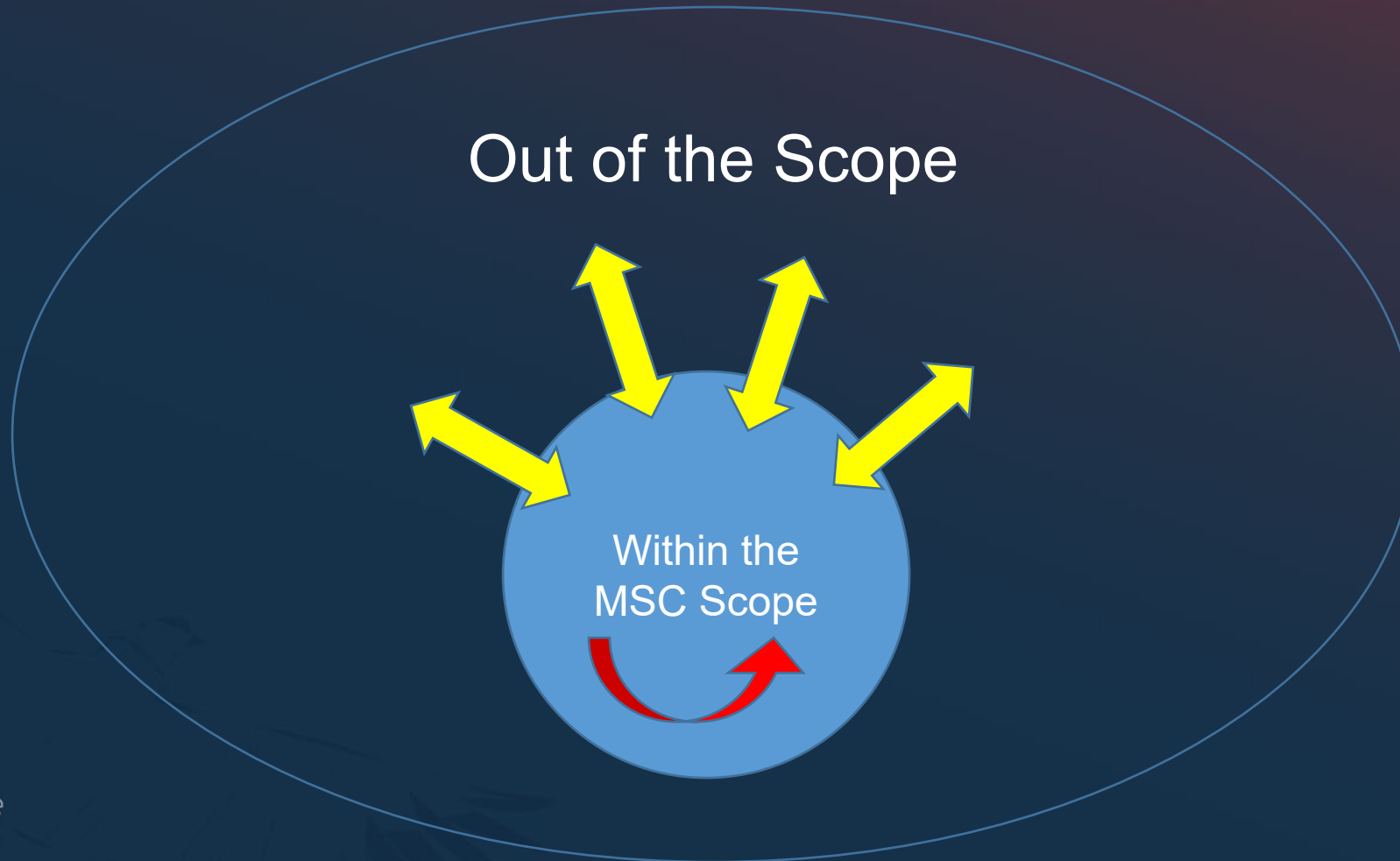
Decommission of old
components

Ongoing operation
(commissioned)

Interaction with old/existing components

Decommission of the new components

Interaction with components within and without the scope



References:

AACE TCM framework

ANSI 748D – Earned Value Management System Implementation

57R-09 - Integrated Cost and Schedule Risk Analysis Using Risk Drivers and Monte Carlo Simulation of a CPM Model

114R-20 – Project historical Development

IFRS – International Financial Reporting Standards

SAP CO – Management Accounting – Controlling

For each integration implementation, the appropriate rules and standards must be followed depending on the nature of the project and company. Examples:

Oil and Gas: NORSOK, Buildings/Commercial/Infrastructure: CSI Masterformat, SCCSS, AACE RP

21-R-98 (process), AACE 103R-19 (Mining-assets), ICMS (International Construction Measurements Standards)

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Questions **?**
comments ●

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Thanks.