



Integrated BIM

Chris Pennington

Director, Energy & Utilities

Global Sales & Services

Siemens PLM







The *(Construction)* Task Force's ambition for construction is informed by our experience of radical change and **improvement in other industries**, and by our experience of delivering improvements in quality and efficiency within our own construction programmes.

Sir John Egan Rethinking Construction Report for the UK Deputy Prime Minister



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Challenges & Trends

Information Quality

The right information...

Collaboration

...to the right person...

Project Control

...in the right context

Summary







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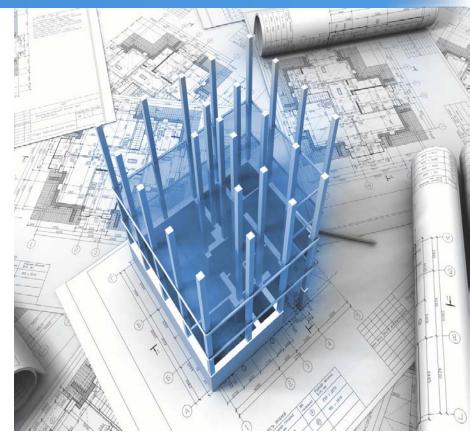




Drivers for BIM

- Predictability & Profitability
 - Accuracy of quote
 - Reduce issues on site
 - Schedule overruns

- Client & stakeholder pressure
 - Government push
- Available technology
- Benefits understood







Challenges & Trends

Pre-fabrication

Collaboration

By moving from on-site construction to manufacturing in a controlled factory environment, we can drive down costs while increasing quality

Economic pressures are forcing companies to work globally, increasing the demand for collaboration tools and driving the need for effective digital communication





Complexity

Complex projects put more pressure on companies to perform. When ROI figures are often around two to five percent, cost overruns, delays and mistakes can result in financial loss



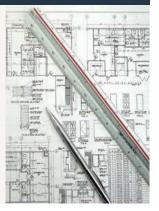




AEC Maturity in IT adoption

Lack of project definition

Requirements 2D tools Error prone Lacking information Ambiguous



Inadequate Data Management

Windows folder structures Excel Lack of revision control No traceability



Fragmented delivery organization

Client Design company Specialist design agencies Contractors Suppliers Building occupier



Islands of excellence

Infrastructure 4D & 5D simulation Plant design Visualization



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Product Lifecycle Management

Adding value with PLM

Complexity

- Regulations
- Customer requirements
- Permits / Licenses
- Documents
- Improved project definition results in creation of more data

Project and Process

- Schedule deliverables
- Transmittals
- Collaboration
- Change control
- Handover













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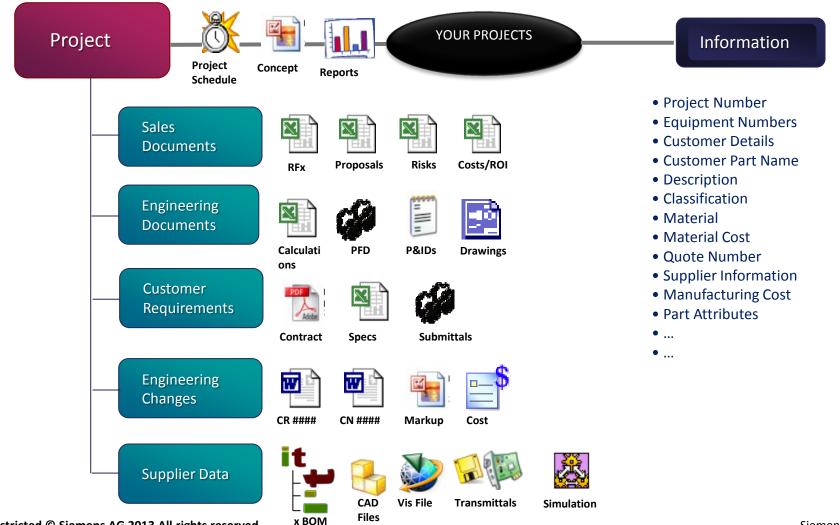
... in the right context

Summary





Document Management – unstructured data



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Siemens PLM Software





Document Management – through the project life of a



- Access Teamcenter from within Microsoft Office
- Edit Teamcenter data live via Microsoft Office
- Insert data from Teamcenter into Word, Excel, or PowerPoint



- Save an email to Teamcenter
- Browse & Search Teamcenter from Outlook
- Insert data from Teamcenter in Outlook messages
- Track and Manage Teamcenter tasks in Outlook

Perform Teamcenter signoff tasks in Outlook Unrestricted © Siemens AG 2013 All rights reserved.





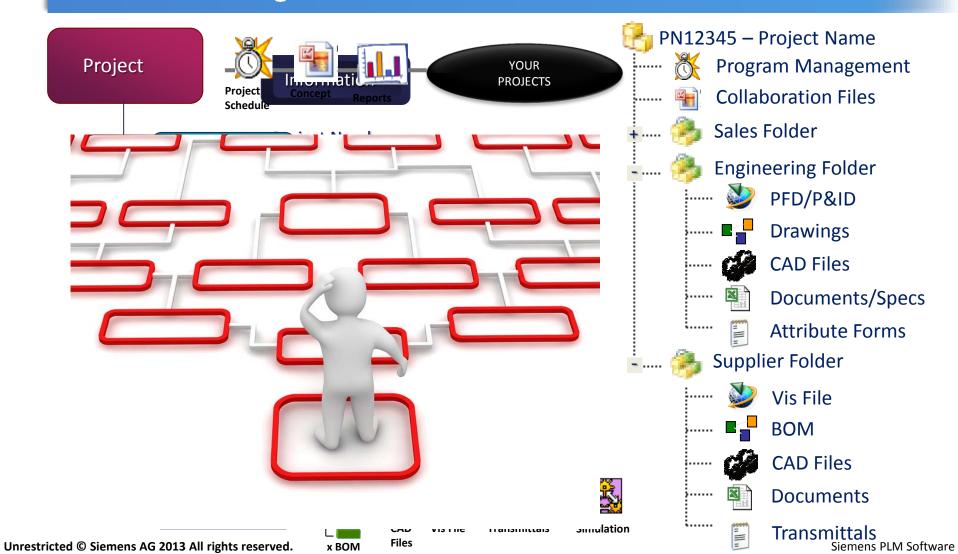








Document Management – structured data

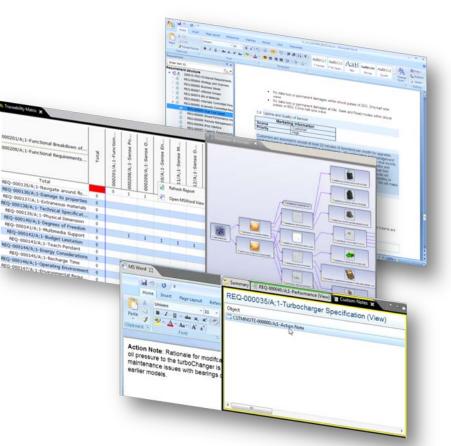






Requirements Management

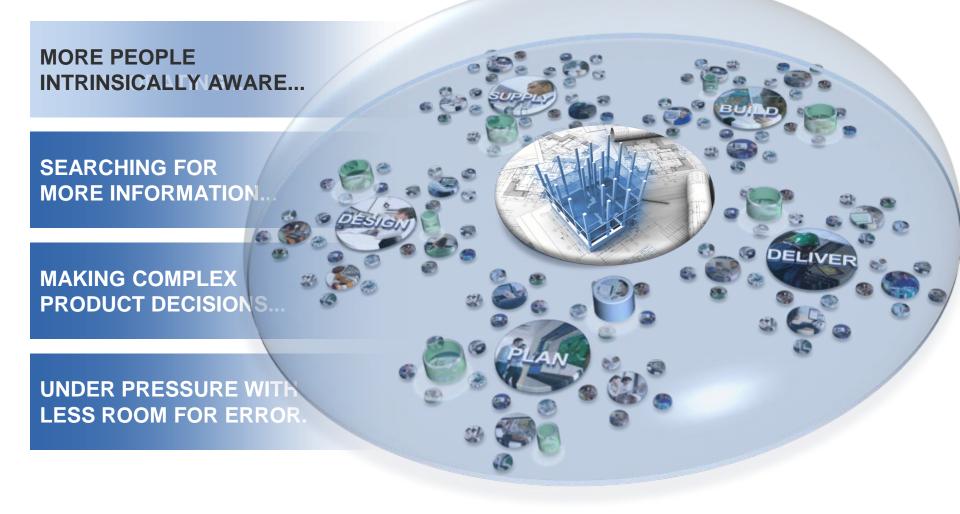
- Use standard tools such as Microsoft Office client to improve productivity
- Real-time traceability to see allocations and validate compliance
- Rationale and decision capture to enable reuse







Intelligently integrated information









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Transmittals

Vendor Management

- Record vendor contact details, contracts, quality agreements
- Create vendor parts
- Manage preferred parts

Workflow

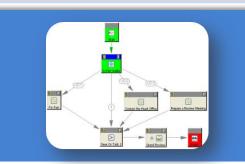
- Dynamic Participant for assignments
- Forward / backward branching
- Specify custom signoffs per Task

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- Manage supplier interaction
- Capture target and actual dates
- Report supplier status

endor		
Steps 🔳	(1) Define the basic information for the new vendor.	
 Select Type Enter Vendor Is Enter vendor Role a 	Vendor Information Vendor ID / Revision ID - Name 000016 • / A • vendor1	• Acres
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Ø Define Options	Address:	
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	Phone:	
	Email: Contact Name:	

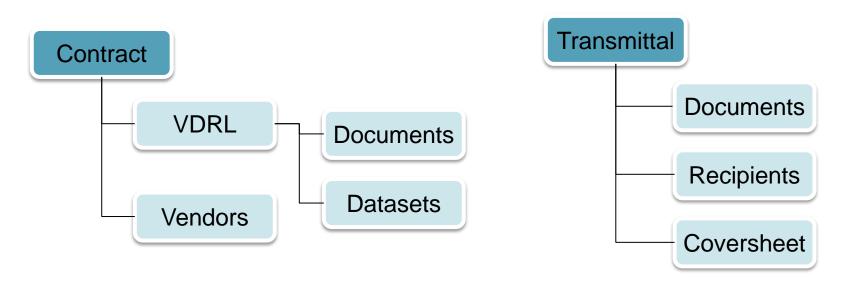
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 Capture the agreed supplier terms and conditions, provide direct access to vendor contact information, quality ratings and current tasks.

Record the data sent to the vendor, manage the transfer of data. Automatic generation of cover sheet, and ability to capture vendor response.





Contractors

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Vendor Data Requirements List (VDRL)

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Automatic email & cover sheet

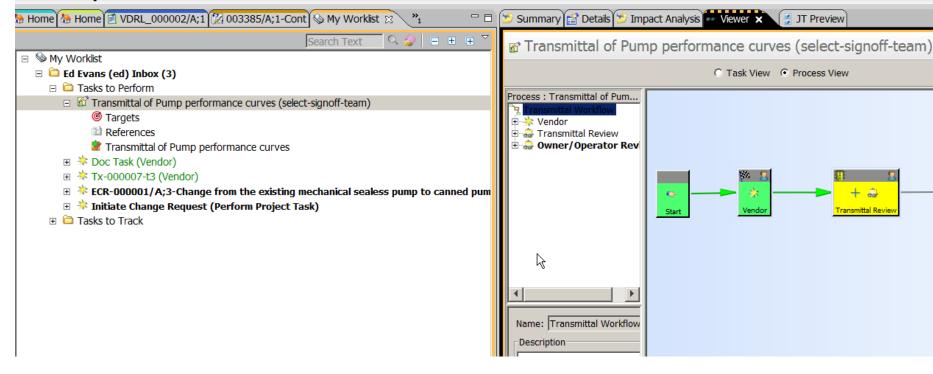
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Review & Approval

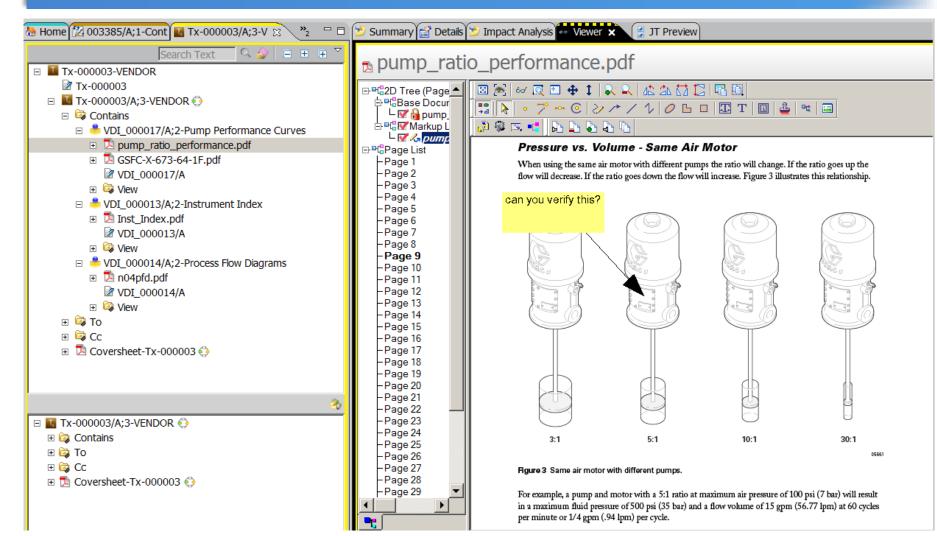
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View & Markup of Documents



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Project Handover

Open model for document-based data exchange

Transfer neutral files using mechanism of choice – email, ftp etc

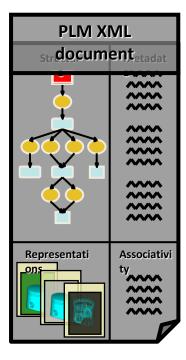
Provides flexibility for a rapidly changing environment

Separation of application internal data model from external view

Support for data model extensions

Simple mapping to other data models

Enables us to map to standards-of-choice



White Paper - PLMXML

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DELIVE

Intelligently integrated information

MORE PEOPLE INTRINSICALLY AWARE...

RECEIVING THER RIGHT INFORMATION...

MAKING COMPLEX PRODUCT DECISIONS

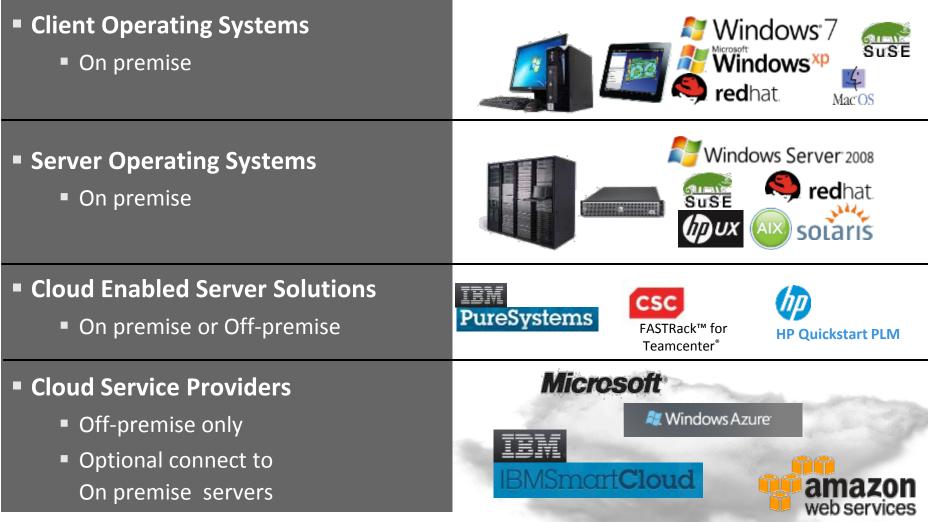
UNDER PRESSURE WITH LESS ROOM FOR ERROR.





Siemens PLM Software

Supported on the platforms that you use in your enterprise



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Business Philosophy

	OPEN PLM COMMUNITIES	OPEN PLM APPLICATIONS						
	 Open partners Open adopters Customers Interest groups (GAAG,) Standards (STEP, ISO,) 	NXTeamcenterTecnomatix						
a	OPEN PLM COMPONENTS	OPEN PLM ARCHITECTURE						
	 Parasolid D-Cubed PLM Vis NX Nastran PLM XML SDK ISO14306 & XT Toolkits FMI 	 Lifecycle data architecture Web services Knowledge Fusion NX automation kernel 						
	OPEN DATA MODEL							







Challenges & Trends

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Teamcenter – Project Management Backbone

Workflow	Schedule Manager	PPM Connector
 Dynamic Participant for assignments Forward / backward branching Specify custom signoffs per Task 	 Task Focused User Interface Specialized Change Objects PR → ECR → ECN Work Breakdown Structures tasks 	 Associate Deliverables and Reference Information with tasks Master/Sub-Schedule Management Extensible scheduling architecture
	Problem Implemented Visual Issue Problem By Change Asts as Authority to Request By Track (Task) (Tas	Advance fact factor (in a discussion) Andread State of State Strateger Andread State Strateger Andread State Strateger Andread State Strateger Andread State State Strateger Andread State State Strateger Andread State Strateger Andread State Stat

Implementer

Change

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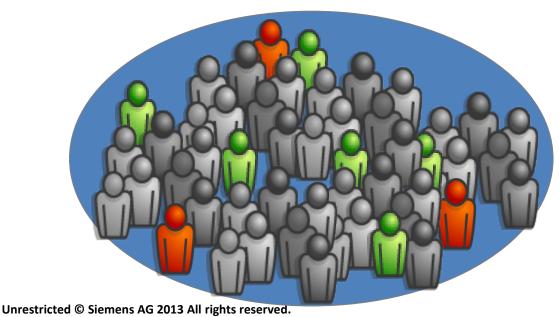
Program Management & Execution - Process Participants & Responsibilities

Leadership Team

Business unit managers, finance / operations, executives
 Business initiative success

PMO (program management office)

Planners, program managers, project managers
 Program definition, planning and management



Products/Operations Organization

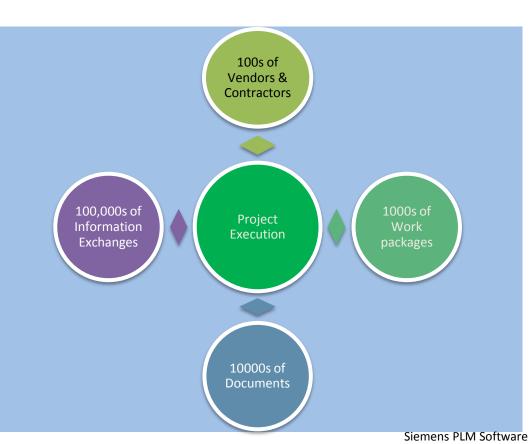
- Managers, team leaders / coordinators, team members
- \rightarrow Program execution & delivery





Project Execution Challenge - Typical Project Complexity

- Concrete 460,000 cubic yards (not including concrete for site preparation).
- Reinforcing Steel and Embedded Parts 46,000 tons.
- Structural Steel, Miscellaneous Steel, and Decking 25,000 tons.
- Large Bore Pipe (> 2½ inch) 260,000 feet.
- Small Bore Pipe 430,000 feet.
- Cable Tray 220,000 feet.
- Conduit 1,200,000 feet.
- Power Cable 1,400,000 feet.
- Control Wire 5,400,000 feet.
- Process and Instrument Tubing 740,000 feet
 1000+ Equipment tag items



Source : IAEA (Gen III+ Plant)

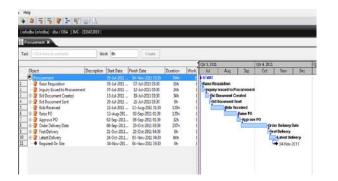




Teamcenter delivers Project Execution

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mand GB	Milling, Isolo- Pure Washington 2 Kas. to drige unit (White)	- 21	100	2	Congriss		112	1.01			TIL		11

Master Schedule Management in Primavera

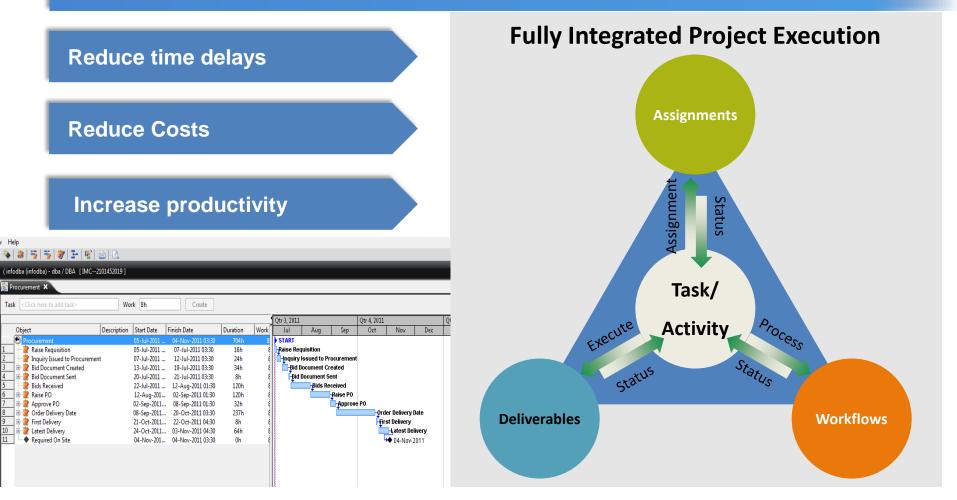


Project ExecutionManagement in TeamcenterDrawingsDocumentsRequirementsCADSpecificationsProcesses





Project Execution Management in Teamcenter



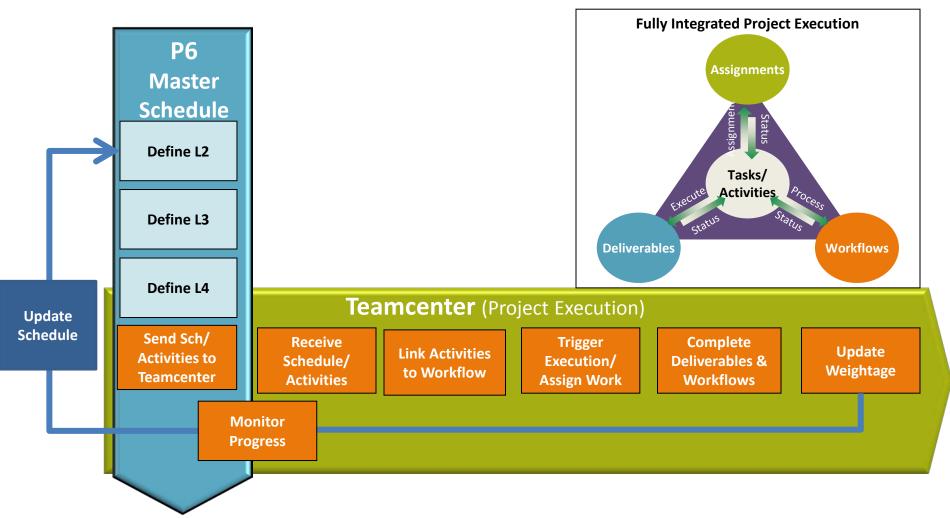
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Linking Master Schedule and Project Execution

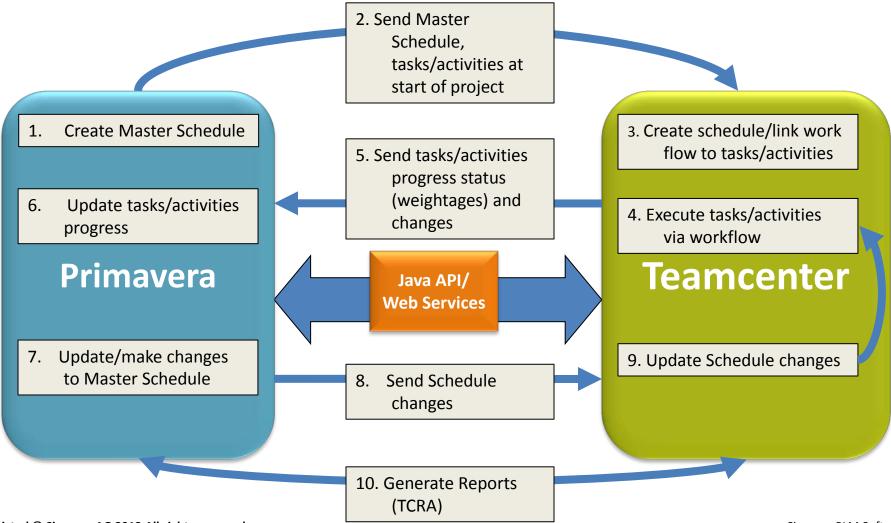


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Integration Approach



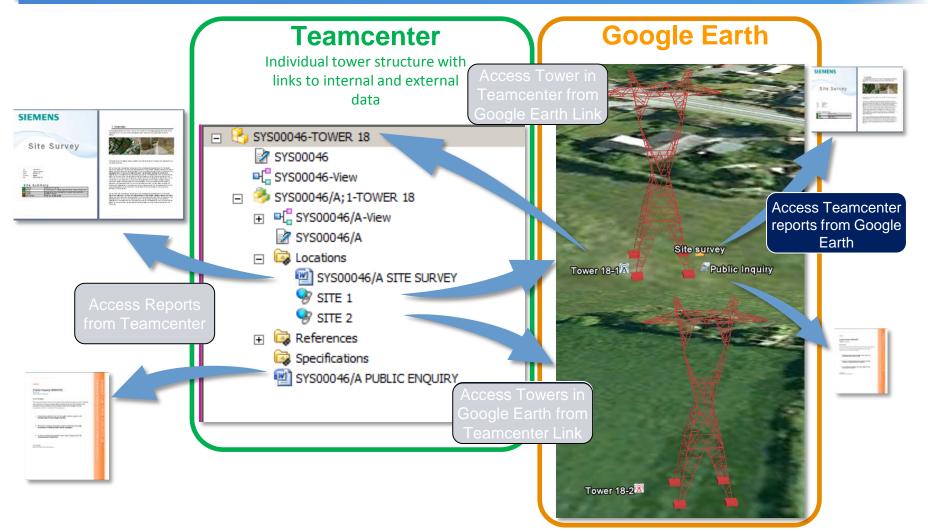
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Google Earth Integration

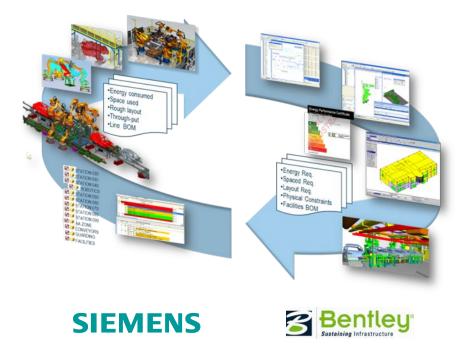


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Strategic Collaboration – Bentley Systems



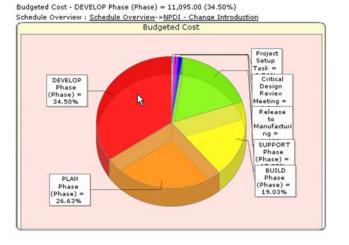
- Bi-directional transfer of information using ISO14306 (JT)
- Better design coordination
- Share knowledge between integrated lifecycles
- Predictable asset design and installation
- Reduction in launch time and costs

Siemens PLM and Bentley Systems – Redefining the Digital Factory

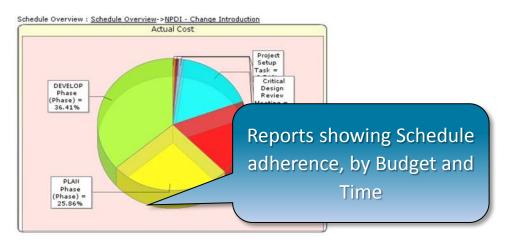


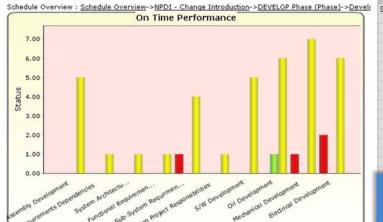


Transparency – Management Dashboards



Schedule Overview





Schedule Overview 🛧	Budgeted Cost 🛧	Actual Cost +*	Actual Eff	
E Schedule Overview	32,157.00	33,122.00	ñ	
NPDI - Change Introduction	32,157.00	33,122.00		
Milestone	0.00	0.00		
GO / NO-GO Milestone Meeting	0.00	0.00		
Release to Production	0.00	0.00		
Project Setup Task				
E Critical Design Review Meeting	E Contra de			
Final Issue Resolution	D	oporte	chow	ing status
Change Administration	L L	eports	SHOW	ing status,
Update Requirments				
Update eBOM / CAD-eBOM Ali	gnment	and o	n Mat	turity and
Project Plan Update		Jaseu u	li ivia	tunty and
Update Dashboard				
Release to Manufacturing	fi	Itorod k	av Dro	iact Dhaca
E SUPPORT Phase (Phase)		iteleu i	UY PIU	ject Phase
Quarterly Service Review				~
On-going Service Sustainment				
Support Phase Start	5,400.00	5.400.00		

Continuous visibility

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DELIVE

Intelligently integrated information

MORE PEOPLE INTRINSICALLY AWARE...

RECEIVING THER RIGHT INFORMATION...

MAKING INTEGRATED SYSTEMS DECISIONS...

ON TIME WITH URE WITH GREATER ACCURACYOR.







Challenges & Trends

Information Quality

Collaboration

...to the right person...

Project Control

... in the right context

Summary







Siemens PLM is committed to AEC *The strong position of Siemens AG provides us with unrivalled access to industry information*



Open Tools *Our 'open solutions' approach enables the integration with other software tools – ERP, Program Management and Authoring*



Support the entire lifecycle

PLM has a role to play throughout the industry lifecycle, from portfolio planning through to product decommissioning





Integrated design and Capital project construction management Visually and collaboratively Collaboratively manage **3D Simulation** manage the process for Integrated RFP, your innovation projects Provide a fully interactive developing and producing with respect to O/O, EPC contract and 3D environment for your equipment and suppliers specification testing and analysis management Manage the entire contracting and Develop Construct specification process **Supplier** relationship Governance and management compliance Identify and validate suppliers around the reporting world Ensure compliance and trace decisions and actions end to end Integrated **Portfolio** Construction management Plan Link Virtual development Support Gain full visibility into your with physical operational risks and construction rewards **Asset lifecycle** Maintenance, Repair and overhaul management Maintain lifecycle Manage the service-Commission/ information from design to **Sustainability** related aspects of mission decommissioning critical equipment decommissioning Execute responsible Fully leverage all business practices information required at the start-of-life or end-of-

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Making the HD-PLM Vision a Reality HD-PLM Investments Delivered in Every Product

