The ‘Smart’ Implementation
Intergraph’s Approach & Strategy to Support Successful System Implementations
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OUTLINE …

- Technology Implementation
  - Historical Review & Perspective
  - Technology Adoption & Implication

- Market Dynamics & Drivers
- Customer Case Study – Fluor

- SmartPlant 3D ‘Smart’ Implementation
- Customer Case Study – URS, Washington Division

- The ‘Smart’ Implementation – Intergraph’s Perspective
- SmartPlant Virtual Web-based Training - Overview

- Q & A

- Summary & Close
- **Characteristics of 3D CAD system adoption & implementation**
  - Install/ configure the software
  - Run user training courses
  - Prepare (but not complete) reference information before 1st project roll-out
  - Carry on system training ‘on-the-job’
  - Complete developing reference information during the 1st project

- **Observations**
  - Sequential implementations, typically 3 – 6 months in duration
  - Minimal realignment or update of working procedures/ workflows to reflect implemented software use
  - Minimal user training linking application training to working procedures/ workflows to support projects
  - No validation of end user training knowledge take-up & understanding

- **Implications**
  - Slow technology take-up
  - Potential risk to project schedule during detailed design phase
  - Full exploitation of main system tools may not be achieved or fully understood
The ‘Smart’ Implementation …

- **People** (Organization):
  - Streamlined Web-based User Training
  - SmartPlant 3D Training/ Skills Audit
  - Project Organization, Roles & Responsibilities Optimization

- **Processes:**
  - Complementary Workflows, Procedures & Best Practice Guidelines
  - Integrated CAx/ Data Standards

- **Technology**
  - Rules-based Design/ Knowledge Capture
  - Workshare
  - Design Automation/ Data Reuse
  - Environment Integration/ Interoperability ~ Plant – Marine - Offshore

*Extending Enterprise Advantage*
Addressing the Business Environment with Excellence in Execution

- People
- Systems and tools
- Procedures and practices
  - Alignment
  - Quality management
  - Data integrity and management
  - Consistency in execution
  - Knowledge management

Added-value from Intergraph:
- Helping the organization and its people work ‘smarter’
- Providing data & application integration linking our technology solutions to best practice working methods
- Increasing designer productivity
- Capturing & harnessing organizational knowledge
Today’s Challenging Business Environment

- Record backlog
- Rapid growth
- Scarcity and mobility of workforce
- Global project execution
- Multi-party execution
- Supply chain integration and collaboration
- Demand for schedule reductions
- Increased material prices
- Increased delivery times
- Supplier performance

Industry Challenges – Intergraph Added-Value:
- Too many projects with too few experienced resources to support projects
- Global project execution
- Demands to increase designer productivity without compromising design quality & integrity
- Reduce overall project schedule
Added-value from Intergraph:

- Providing ‘Next-Generation’ Integrated Plant Design to extend competitive advantage supporting new project execution strategies
Case Study of URS Deployment of SmartPlant Enterprise & SmartPlant 3D
  Excerpt of Session 2047 Presented at Intergraph 2008 conference by David Collett, Senior Project Director URS Washington Division

Can a technology platform be delivered within cost and schedule constraints?

How do you do it?

- Business Case
- Detailed Planning
- Project Execution – Scope, Schedule, Cost
- Startup & Operation – Deployment
The Business Case – SmartPlant Enterprise

- **Standardization**
  - Brings further efficiency and quality as work is completed similarly each time
  - Enables multi-office execution with global resources

- **Integration**
  - Data-centric approach and enhanced quality and efficiency through integration

- **Competitive Advantage**
  - SmartPlant architecture specifically designed to enable multi-office execution
  - Enables leveraging of global resource base through standard processes and tools

- **Leveraging resources** - SmartPlant efficiency allows lower cost
  - Testing shows high potential for reduction in design times
  - Tight labor market is becoming a business reality - reduce impact of shortage of specialty technical resources in different locations
Strategic Initiative Sanctioned at Executive Level – Vital

Focus on Outputs

- Test Out of the Box (OOTB) functionality
- Configure authoring tools to create standardized output
- Pilot test based on previously executed project
- Integrate through SmartPlant Foundation after configuration of individual tools

Initially located in Huntsville

A Project Approach Delivers Results
Business Case - Why A Project Approach?

- Previous Experience with Technology Projects
- Culture Change
  - Leadership from top
  - A Marathon, not a Sprint
- Maturity Cycle of Platform
- Close access to Intergraph
- Strong Controls
- Focus on outputs – No Disruption of Existing Functionality
- Gain Confidence of PM Community – Key
Detailed Planning

- Multi-Discipline Team led by Engineering
- Consultation with Intergraph
- Scope Development – Include everything needed to deploy
  - Focused first on creating required Outputs (drawings, lists, reports, etc)
- Detailed Schedule
- Project Execution plan
- Risk Analysis and Contingency Calculation
- Executive Review Committee
Detailed Planning - Focus First on Outputs

- Focus First on Outputs
  - Content and Format of Outputs
  - Does the tool allow more efficient work processes to create outputs?
- Focus on outputs leads to Standardization
  - SmartPlant comes with Out of the Box functionality
  - Requires Users to configure to Coding, Naming, and Numbering Conventions; Symbology; Drawing/Document Formats, etc...
- Provides Opportunity & Catalyst to Standardize
  - Using Standard Conventions
  - Forcing Establishment of a Single Standard
  - Input from Diverse Team Representing All Business Units and Offices
  - Flexibility to Apply Standards to Client Unique Requirements
Detailed Planning - Scope of Work Tool Summary

SmartPlant
- SP P&ID
- SP Instr
- SP 3D
- SP Elec

SP Foundation

MARIAN
- MLCL: Used to manage material specs
- EPI: Develop bill of materials & reqs
- MSCM: Issue RFPs, assess bid tabs, issue POs, expedite, and coordinate logistics
- SM: Used for site receiving, warehousing, and issuance of materials for construction

Financial & Accounting Systems
- CAES
- Prism
- P6

Other Enterprise Systems

Other Integrations
Project Execution

- Team Building & Alignment Kickoff Workshop
- Project baseline for Performance Management
  - Scope
  - Schedule
  - Budgeted Cost for Work Schedule (BCWS)
- Monthly Project Reviews
- Estimate At Completion (EAC) Forecasting
  - Monthly based upon trends
  - Quarterly base on detailed estimating
- Change Control
- Reporting
  - Team Level
  - Executive Sponsor
## Project Execution – 25 Person Team

### Makeup

- **SmartPlant 3D - 7**
  - Piping & Equipment – 2 discipline specialists
  - Structural – 2 discipline specialists
  - Electrical – 2 discipline specialists
  - HVAC – 1 discipline specialist

- **Schematics - 6**
  - P&ID – 2 discipline specialists
  - Instrumentation – 2 discipline specialists
  - SmartPlant Electrical – 2 discipline specialists

- **Material Control - 8**
  - SmartPlant Reference Data – 3 specialists
  - Material Take Off Integration – 1 specialist
  - Material Control Work Optimization – 4 specialists
    - Includes configuration of SmartPlant Materials

- **IS - 4**
  - 4 discipline specialists covering administration, database, equipment/setup

- **Leadership**
  - IS, Engineering, & Project Management

### NOTE:

- Initial SP3D & Schematics Teams located in Huntsville approximately 1 year

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**Process, Power & Marine**
Project Execution - Monthly Reporting

- Detailed Cost Report
- Schedule Performance
- Earned value performance
- Executive Reporting
Project Execution - Communication

- Various Audiences
  - Functions, Engineering Disciplines, Project Management, Business Units, Executive
- Diverse Locations and Stakes
- Highly Technical Application and Issues
  - Candor & Accuracy vs. Rumor Mill
- Perception of What Change Brings
- One of a Kind Project
- Two Way Communication
- Tools
  - Meetings
  - Monthly Reports
  - Articles in Company Magazines
  - Presentations
  - Business Unit PM Focus Group
Deployment - Strategy

- Single Project to Start – Strong positive Feedback from Project
  - Assure platform is ready for production
  - Assure support capability is available
  - Build confidence

- Training and Support with Setup – Very Positive

- Support – Projects are not Alone
  - Coaching
  - Mentoring
  - Immediate correction of challenges
  - Production work
  - Identify and create administrators and super users

- Configuration Management a Must
  - Complex system
  - Testing of new releases prior to production
  - All architecture, system state, and settings maintained

- Move to Next Project
  - Build resources
Deployment – Configuration Management

Configuration Management - Prevent Local Customization & Maintain Standard Configuration w/Flex to Client ONLY
Deployment - Status

- Prior versions of Intergraph tools have been used for years
  - PDS, P&ID, & INtools
  - Anticipate these will be in production for some time to come

- New URS Configuration of tools on 5 projects
  - SP P&ID, SP Instrumentation, SP 3D, SP Foundation
  - SP Electrical not yet deployed – still configuring and piloting

- Early Feedback is Positive

- Building Resource Pool to Support

- Will not deploy Broader Than Ability to Support
  - Positive feedback so far rooted in support provided
  - Engineering Services organization being deployed for global support

Process, Power & Marine
Deployment – Positive Results

- Every project in deployment providing positive feedback

- Cautious but encouraged by early development

- Estimates based on previous methods have been more than sufficient using new tools

- Projects without prior experience in data centric systems are enamored by the ability to design and create data at the same time
  - Reports, lists, data sheets, drawings, etc. are a by-product output
Deployment – P&ID and SPI Trends

- Early trends for URS Washington Division

- Projects continue to provide positive feedback

- Data integration between P&ID and SPI
  - Saves time because of enter once use many
  - Assures quality and consistency of data
  - Enforces consistent application of work process

- Savvy Project Managers realize time savings
  - Data generation during design
  - Outputs are a by-product of the process
  - Enter once use many
Deployment – SP3D SPI Trends

- Early trends for URS Washington Division
- Designers like consistent interface
- Productivity enhancement tools reduce design time
- After training, designers do not want to go back to prior tools

A few comments from designers
- SP3D shines when design revisions occur
  - Relationships between objects is a real time-saver
  - Integration with other tools makes “enter once use many” a reality; reusable data saves time
- Drawing generation saves a lot of time
  - Drawings by Query
  - Visibility when data has changed and drawing is out of date
**SmartPlant 3D ‘Fast-Track’**

- **Objectives**
  - De-risk new technology introduction
  - Compress implementation schedules
  - Allocating the right levels of resources (internal & external)

- **What is it?**
  - A set of template-based implementation planning tools, workflow templates & customizable procedures
  - A set of pre-configured packaged RDB solutions (multi-discipline reference data/ symbols)
  - Drawings, Isometrics & Reports
  - SmartPlant Reference Data (SDB) for materials across process plant industries
  - ‘Fast-Track’ integration with other SmartPlant Enterprise applications & internal software

- **Why is this important?**
  - Implementation Planning Guidance/ Validation
  - Achieving early success to support projects capitalizing technology investment as quickly as possible
1.0 PURPOSE

This Procedure covers the coordination and management of SP3D specifications and their associated reference database (SP3D Catalog).

2.0 SCOPE

This Procedure applies to all engineering work performed on the SP3D system.

The project multi-discipline 3D design model will be generated using Intergraph's SmartPlant 3D (SP3D) software running on a Windows NT networked environment. For specific application of the SP3D software, reference must be made to the user guides listed in section 7. The Manager 3D Plant Design holds controlled copies of these manuals.

3.0 DEFINITIONS

SP3D Catalog – Reference Database

SP3D Specification – SP3D Catalog entries defining discipline specific physical components incorporated in a specification which are available for modeling activities.
What is SmartPlant Virtual Training?

- SmartPlant 3D End User Training (available now)
- Hosted on a commercial LMS system by ElementK
- Provides access for up to 86 virtual sessions organized in courses for 1 year
- Ability to track progress
- Ability to download tutorials and practice labs
- 24x7 support with web site and forum for technical help

Learning Management System

Virtual Instructor Led Training

Administrative Interface for Enterprise Customers
Benefits of SmartPlant Virtual Training

- **Quality and Consistency**
  - Exact same presentation regardless of time or locations - removes the variations introduced by individual instructors
  - Prepared experts for given topic from the product centers
  - Reviewed by customers & software designers
  - Educationally sound materials, consistent terms across all topics, objectives, prerequisites & summary screens for every topic.

- **Schedule Compression**
  - Users from multiple disciplines can learn simultaneously resulting in shorter startup time for projects starting with team new to SmartPlant 3D
    - Typical reduction from 3 weeks to 1 week
  - Ability to train new members of the team earlier rather than waiting for class with minimum enrollment requirements

- **Cost Effective**
  - List price of US $1200 per student is ½ of class room enrollment at US $2,500
  - Further savings based on quantity in addition to travel costs
Frequently Asked Questions

- **Does SPVT replaces traditional class room training?**
  - SPVT best suited for Roll-out scenarios, small & remotes teams of 3-5 users, or new additions to the teams. Traditional class room training best suited for CAE teams and Discipline Application Specialists (Super Users / Early implementation teams).

- **Does SPVT requires 3D software License?**
  - SP3D / SM3D license is not required to purchase SPVT, however training experience is not complete without hands-on experience. Practice Labs provided with SPVT match up with training plant backup available on Siebel web site.
  - Intergraph is exploring alternatives for making training environment available via web based virtual lab setup and/or providing increased access to regional training facilities at Intergraph Offices.

- **What is plan to update the training to match new software versions?**
  - Intergraph plans to update training for every major version release. Scope of change depends on number of enhancements in new version. Our goal is to make training available as soon as new versions are released. Most likely users will get option to access version specific training sessions.

- **Is there a certification/evaluation program to access skills after the training?**
  - Currently one question quiz is added to each session as trial basis, however answers are not tracked. Completion and time spent on each session is tracked. System is capable of handling certification requirements.