BIM and Digital Construction
Enterprise VDC for Design and Operations

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Telkom Group Holding Structure Contains 7 Subsidiaries Directly Consolidated Under Telkom

- PT Sigma Metrasys Solution (Metrasys) is a subsidiary of PT Sigma Cipta Caraka (TELKOMSIGMA). Established in 2009 as Telkometras’ SBU and spun off officially under Telkomsigma in 2011. Metrasys provides SAP to strengthen Solution Integration Business.
- Metrasys leverage on Telkom’s extensive experience in implementing SAP in order to provide best value and benefit for the customer
- Since October 2009, SAP AG appointed Metrasys, as Certified Service Partner for Indonesia. And since April 2012. SAP AG appointed Metrasys as SAP Value Added Reseller (VAR) and by end 2013 achieved GOLD Level.

Note:
T: Telecommunication
IME: Information, Media & Edutainment
A Digital Thread for Integrated Facility Information is Needed

Automating the delivery of data sources (CAD, BIM, PLM, ERP, EAM, etc) to all downstream stakeholders creates an efficient and connected organization.
Virtual Design and Construction

VDC manages automation and management of all digital facility information from the Engineering and Construction phases into Operational status to support Operational Excellence.
Virtual Design and Construction

SAP’s Virtual Design & Construction (VDC) Solution

SAP VDC Solution:

✓ Single version of the truth … One “system of record” for each function

✓ Real time information … critical information is accessed on-demand

✓ Lossless information from subcontractor & product tools

✓ Many cost, schedule, supply chain dimensions (5D, 6D, 7D,…)

✓ Structured and unstructured data

✓ Compressed Lightweight Visualization

✓ Role based views (WYSIWYN)

SAP VDC Solution:

✓ Automate Process

✓ Change Management & Version Control
SAP 3D Visual Enterprise Architecture Integration

Autodesk
Intergraph
Bentley
Trimble

Pro / E
CATIA
UG nX

More than 120
2D and 3D Authoring Tools

Compliant with BIM Standard with
IFC format
(ISO 16739 and ISO 15926)

Imports of 3D graphic
and metadata

Consolidated 3D
graphic and metadata

Mappings, projects,
materials, documents

SAP ERP

Cost estimates
Times schedules
Documents

SAP 3D Visual Enterprise

Converter
UI
Browser

Manual mappings
Search and analyze

Mapping to
ERP structures

Visualized objects

Access through
multiple devices

Autodesk
Intergraph
Bentley
Trimble

Pro / E
CATIA
UG nX
Innovation in the Construction Industry
VDC with BIM

VDC concepts
- Model exploitation, not creation
- Standardized processes across the enterprise
- Model as interface to business data
- Delivered to the field through a mobile device

Partnering to provide the complete solution:
- Project Administration
- Schedule
- Cost Estimates
- Risk Management

SAP S/4 HANA

- Project Cost
- Material Mgt.
- Comm. Mgt.
- Manufacturing
- Financials
- Logistics
- Supplier Mgt.
- Equip. Mgt.

5D Construction
Full Product Life Cycle Management
Access information everywhere
Search, find, analyze, share, track and re-use information
Work and collaborate through various devices

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SAP 3D Visual Enterprise Architecture Integration

CAD to Material Master data creation: Options for EPC and Asset

**CAD extract**
Minimum information exported
- CAD assembly shattered
- Individual parts are separated
- Assembly hierarchy
- Part quantities
- CAD object /part tag ID
- Can be uploaded into SAP 3D Visual Enterprise Generator as individual assets

**Visual enterprise processing**
Minimum information created
- CAD object tag ID
- Material ID (18 digits)
- Material type (such as "Halb")
- Industry sector (such as "A")
- Unit type (such as "EA")
- DIR ID (DIR also created)
  - Assembly hierarchy
  - Part quantities

(Optional) business data integration

Information created
- Profit center assignment
- Plant assignment
- Purchase organization assignment
- Purchase group assignment

**SAP ERP material master upload**
Minimum information required
- CAD object tag ID
- Material ID (18 digits)
- Material name
- Material type (such as "Halb")
- Industry sector (such as "A")
- Unit type (such as "EA")

Optional information added
- Controlling area assignment
- Company code assignment
- Business area assignment
- Profit center assignment
- Plant assignment
- Purchase organization assignment
- Purchase group assignment
- Detail input requirement
- Procurement strategy
- Planning strategy

Note: TagIDs often = Material IDs

**Bills of materials (BOMs)**
Minimum information required
- Material ID (18 digits)
- BOM usage
- Lot size
- Usage quantities
- ...

**Functional Location Master**
Minimum information required
- External_Number (18 digits)
- Labeling System
- Description
- Maintenance Plant
- Superior FLOC
- FunctLocCat
- Strlndicator

**Asset Master**
Minimum information required
- Asset ID (18 digits)
- Functional Loc.
- FunctLocCat
- Strlndicator
# High Level Business Process Flow

## Business Process

<table>
<thead>
<tr>
<th>Design</th>
<th>Master Data</th>
<th>Plan</th>
<th>Build</th>
<th>Support</th>
</tr>
</thead>
</table>
| Engineering Data Creation | Master Data Creation:  
  - Material Master from VEG  
  - Consider Material Number structure for once off Project Material  
  - Bills of Material from VEG | SAP Project System:  
  - Project Creation  
  - Project Planning  
  - Material Demand from Project WBS | SAP Project System:  
  - Project Execution | Service, Operations and Maintenance |
|               | SAP Material Management:  
  - Material Demand from Project WBS  
  - Project MRP Run  
  - Purchase Planning  
  - Manufacturing Planning | | SAP Materials Management:  
  - Execute Purchase Plan from Project WBS Demand  
  - Execute Purchase Plan from Project MRP | |
|               | SAP Production Planning:  
  - Execute Production Plan | | SAP Production Planning:  
  - Execute Production Plan | |
|               | SAP Quality Management:  
  - Notifications and Issue Management | | SAP Quality Management:  
  - Notifications and Issue Management | |

**Integration Areas:**
- Master Data integration
- Materials Management integration
- Financial integration
Virtual Design and Construction with SAP
Digital Systems for Engineering & Construction

Building on this Best Practice foundation allows for

- Multiple business dimensions can be linked with as-designed information
- Change management from design to construction / delivery
- Cost and margin management visibility from engineering to delivery

Single source of truth integrated to EBOM is the fix
Integrate BIM into the Enterprise (Examples)
Visual Enterprise with Construction Business Process and Data

Procurement Manager Manage Buyout

- Integrate Bid Package with Visualization
- Enable Creation of Bid Packages and Execution
- Evaluate Actual vs Target (with selected visual highlights)
- Evaluate Savings in Buyout
Integrate BIM into the Enterprise (Examples)
Visual Enterprise with Construction Business Process and Data

Site Manager
Manage Material on Site

- Integrate Material on Site with Visualization
- Evaluate Planned Target vs Actual on Site (with selected visual highlights)
- Enable Actions to accelerate orders or re-schedule activities
Integrate BIM into the Enterprise (Examples)
Visual Enterprise with Construction Business Process and Data

Cost Manager
Manage Job Costs

- Integrate Job Costs with Visualization
- Evaluate ECAC vs Budget and Variance (with selected visual highlights)
- Enable Clearer Visibility and Actions to manage Costs and Forecasts
Virtual Design and Construction with SAP
Digital Systems for Engineering & Construction

**Simplify**
- Simplify Interface to Multiple CAD’s
- Consistent Business Processes
- Integrate Total Lifecycle of Project and Asset
- Exceptional User Experience

**Value**
- 3D Integration to Business Information
- Drive Business Efficiencies
- Visual Insight, Decisions and Actions
- Reduce Risk and Improve Operations

**Transformation**
- Compress Process Cycle Time
- Transform Business Processes
- Enable New Practices
- Create New Business Models

1 Centralized System of Truth

20% Faster Project Delivery*
Thank you.