Intergraph Smart™ Data Validator is a comprehensive data validation, transformation, and migration platform that helps our customers to ensure the quality of information and significantly reduce the time and costs associated with data take-on.
THE CHALLENGE OF ENSURING DATA QUALITY

Monitoring and maintaining data quality is a challenging task. It is even more difficult to manage when data is being moved from one source to another, like during project handover, brownfield data take-on, data loads and migrations.

Managing the handover of data and documentation from projects to operations is especially daunting. The volume of data handed over is vast. Data and documents arrive throughout the project from multiple sources – often delivered with missing, incorrect, or inconsistent data. As a rule, data handover can easily account for 1-2 percent of total capital expenditure (CAPEX) costs and can take a year or more to complete.

As important as data handover is during projects, the real value associated with quality data handover is in the operations phase. High-quality data is critical to the safe, reliable, and effective operation of any manufacturing facility. If the quality of information handed over to operations is questionable, there is a constant need to physically verify the true physical state of the plant. This can drive up the cost of modifications by 30 percent or more over the entire lifecycle of the facility.

THE SOLUTION – SMART DATA VALIDATOR

Intergraph Smart™ Data Validator is a comprehensive data validation, transformation, and migration platform that helps you significantly reduce the time and costs associated with ensuring the quality of information. Smart Data Validator supports the import, validation, and export of data, providing consistency and traceability of the entire data migration process.

Smart Data Validator enables you to:

- Check the quality of information being transferred
- Keep records of which checks have been performed and the results obtained
- Load approved information into target systems
- Route unapproved information back to responsible parties for remediation
**HOW IT WORKS**

With Smart Data Validator, you have complete control of how data is imported, validated, and loaded into one or more target systems.

Data files – such as equipment lists, cable schedules, valve lists, etc. – are imported into the Smart Data Validator staging area using an import definition. The imported data elements are mapped against the data structures of the target system. Validation rules are then applied to check the quality of the data before exporting to the target system.

Smart Data Validator is bundled with a pre-configured export adaptor to Intergraph®’s SmartPlant® Foundation (SPF)*, which means that it works out-of-the-box with any SPF-based system, like SmartPlant Construction, SmartPlant Fusion, and SmartPlant Enterprise for Owner Operators. In these cases, Smart Data Validator will auto-generate a set of validation rules using the existing class, property, and relationship definitions of the target system. This means that you can validate your input data against the data structure of your target system simply by creating the mapping.

Subject matter experts with no IT knowledge can easily set up additional rules that go beyond those that are automatically generated. For example, a rule that ascribes an error related to one instrument to all other instruments in the same loop can easily be created. In this way, you can ensure that a loop is only sent to the target system when all objects pass testing.

Established rules and rule sets ensure efficiency and consistency in testing. As a project develops and more data is available, or as data quality improves, additional rules can be added to improve quality even further. A staging area captures all results from testing, providing full auditable traceability of what testing has been performed, by whom and when, as well as the results of the testing.

When a job is approved, a flexible export mechanism initiates external loading programs for the specified target system, and a report is generated with complete job statistics.

**EXAMPLES OF VALIDATION RULES INCLUDE:**

- Checking that an item exists. Does Project 401-A exist in the target system?
- Confirming mandatory fields. A tag classification is required for each tag.
- Ensuring relationship cardinality is maintained. A tag can only belong to one area.
- Verifying data types and properties. Design temperature must be a numeric value with a correct unit of measure.
- Verifying pick list values. Does the tag classification match one of the values in the defined list?
- Detecting inconsistent property values. If the same tag was loaded from more than one input source, does it have the same description?

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**SET UP**
- Define Target Systems
- Import Mappings
- Validation & Delete Rules
- Export Mappings
- Job Definitions

**VALIDATE**
- Inconsistency Check
- Process Rules
- Propagate Errors
- Generate Report
- Approve or Reject

**IMPORT**
- Identify Job Scope
- Check Integrity
- Prompt for Inputs
- Process Job
- Bulk Load Staging Area

**EXPORT**
- Filter Data
- Run Preprocessor
- Generate Report
- Export and Load
- Generate Statistics

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USAGE SCENARIOS FOR SMART DATA VALIDATOR

Verify project data prior to handover: EPCs can use Smart Data Validator to check the quality of incoming information from their subcontractors and suppliers. They can also use it to verify data quality prior incremental or final data handover to their customers, even if the target system is disconnected.

Validate project data take-on: The solution enables owner operators and project management contractors to verify the quality of incoming engineering data prior to loading into a target system.

Updates from plant modifications: Data from turnaround projects and operational expenditure (OPEX) modifications can be validated to ensure correctness and completion prior to loading into operations systems.

Initial data loads: Smart Data Validator can play a key role in initial data loading of engineering data management systems or other operational applications.

Data migrations: The solution can also be used to manage data migrations from legacy systems. Data can be imported from one or more existing applications for consolidation and verification before loading into new target systems.

Improving data quality in operations: Smart Data Validator can also play a key role in maintaining or improving legacy data quality during the operations phase of a plant. Data may be extracted from operational systems into Smart Data Validator to check data quality and perform corrections before reloading.

* SPF 2014R3 or later version

Data mapping in Smart Data Validator