



Integrating Device Intelligence – Providing a Competitive Advantage

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ISA Edmonton



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**PRESENTER
IAN VERHAPPEN**

BIO:

IAN VERHAPPEN, P.ENG. IS AN ISA FELLOW, ISA CERTIFIED AUTOMATION PROFESSIONAL (CAP), AND A RECOGNIZED AUTHORITY ON FOUNDATION FIELDBUS, INDUSTRIAL COMMUNICATIONS TECHNOLOGIES AND PROCESS ANALYZER SYSTEMS. IAN IS AN ACTIVE MEMBER OF ISA INCLUDING MANAGING DIRECTOR ON THE STANDARDS BOARD, CHAIR OF ISA-103 (FDT TECHNOLOGY STANDARD), AND CHAIR OF THE CANADIAN IEC TC65 COMMITTEE. IAN ALSO PARTICIPATES ACTIVELY ON THE FDT NORTH AMERICAN MARKETING TEAM. WITH 30 YEARS OF EXPERIENCE IN THE AUTOMATION INDUSTRY, VERHAPPEN PROVIDES CONSULTING SERVICES IN FIELD LEVEL INDUSTRIAL COMMUNICATIONS, PROCESS ANALYTICS AND HEAVY OIL / OIL SANDS AUTOMATION.



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Agenda

- Acronyms
- Current Business Drivers
- The FDT Standard – Refresher Overview
- Examples of Users Getting a Competitive Advantage
- FDT and Field Device Integration – An Introduction
- Conclusion



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Acronyms

- FDT (Field Device Tool) – FDT Technology Standard
- DTM – (Device Type Manager) – Device Driver
- AMS – Asset Management System
- PLC – Programmable Logic Controller
- DCS – Distributed Control System
- FDI – Field Device Integration
- DD/EDD – Electronic Device Description
- IIoT – Industrial Internet of Things



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Current Business Drivers

- Improve Plant Reliability & Culture Change
- The Industrial Internet of Things
- Risk Avoidance



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Current Business Drivers

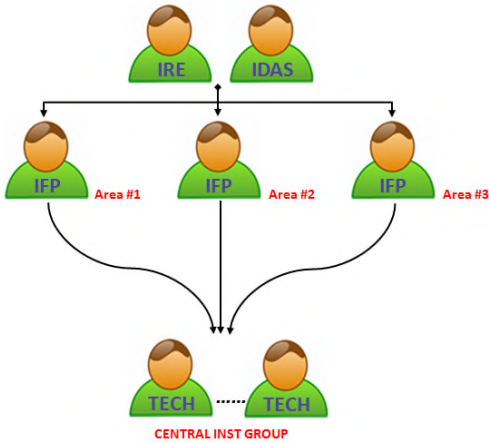
- **Improvements in Plant Reliability and Culture Change**
 - Improvements in plant reliability delivers value to the bottom line
 - Actionable information from intelligent devices provides the analytics needed to avoid unscheduled shutdowns
 - A culture change is required to understand and use the diagnostic information from intelligent devices
 - Workforce transition from baby boomer to millennial provides opportunity to change from analog to digital practices
 - ISA108 Guidelines and Best Practices outlines a process & procedures for using intelligent device information
 - Working together, the above drivers provide a competitive advantage



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Dow Culture Change - Old Structure






Challenges:

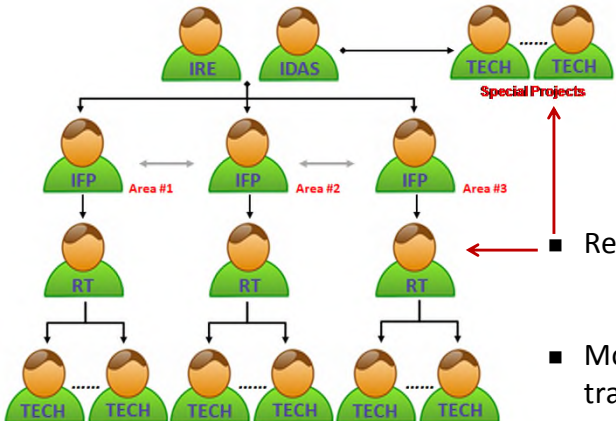
- All work filtered through a central group.
- High turnover with contractors.
- No specific focus on reliability.
- Little consistency between areas.
- Workmanship was questionable.




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Dow Culture Change - New Structure

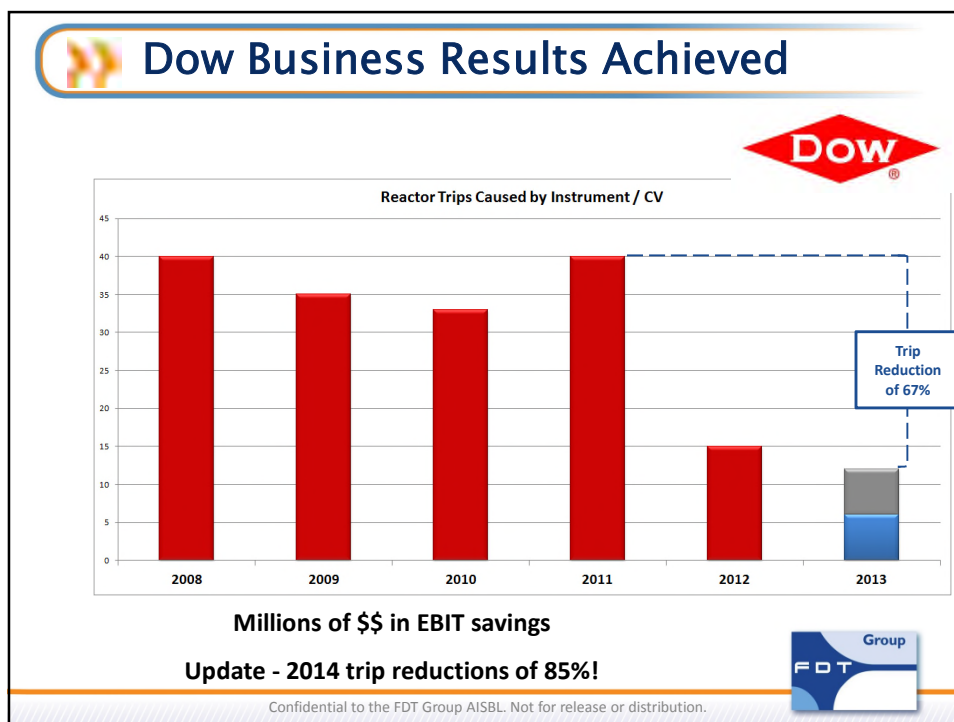




- Reliability focus
- More robust selection & training, set expectations



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Current Business Drivers

➤ **The Industrial Internet of Things (IIoT)**
Provides remote access to connected machines and devices to enable transformative operational and process performance improvements

- Information access throughout the enterprise keeps plants competitive
 - Remote access to information that drives production
 - Big data, analytics, visualization, collaboration, the cloud
- Management sees value in the need for more information to move forward with plant reliability improvements
- IIoT may also improve safety, quality, compliance, culture change and more!

Group
FDT

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Current Business Drivers

➤ Risk Avoidance

- Failing to actively manage all of the intelligent assets creates a risk of losing a competitive advantage!
- Doing nothing or keeping the status quo is also a risky strategy
- Leveraging existing assets – devices, systems and workforce – to become part of the IIoT can be a low-risk, high-return investment
- Many options exist to integrate smart assets with smart solutions
 - Asset management solutions
 - Smart or configurable I/O
 - Internet protocols



FDT Technology provides solutions for these business drivers!



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The FDT Standard – Refresher Overview

- Allows any compliant device and its graphical representation to be easily integrated into a host system – independent of the protocol, the host and device supplier.

Bottom-Line: FDT supports any device type, any vendor, any mix of industry buses

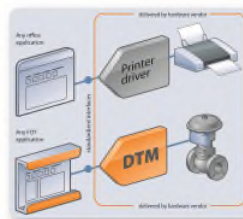
- FDT is comprised of two software components that must be in place:

- **DTM (Device Type Manager)**

- A software representation of the device supplied by the device supplier
 - Configuration (wizards, smart guides, etc.)
 - Diagnostics
 - Troubleshooting
 - Manuals

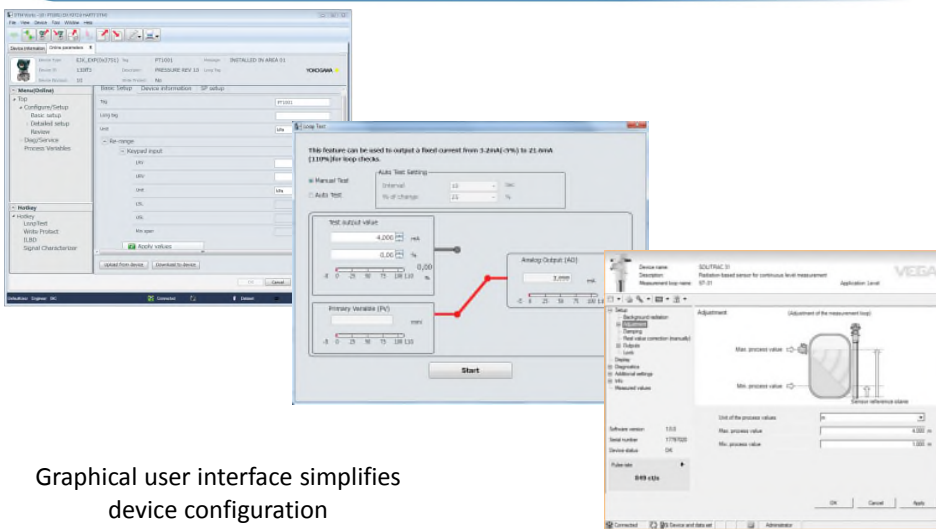
- **Frame Application (Host System)**

- (can “host” any number of DTMs)
 - Device Configuration Applications like; FieldCare, FieldMate, PACTware
 - Asset Management Systems; like PRM, AMS, Field Device Manager
 - Distributed Control Systems – many vendors




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DTM Examples – Configuration




The screenshot displays a software interface for configuring a device. It includes a main configuration window with tabs for 'Manual Test' and 'Auto Test'. A 'Start' button is visible. A separate window shows a graphical representation of a device with a red line indicating a signal path. Another window shows 'Adjustment' settings for a measurement loop, including 'Max process value' and 'Min process value' fields.

Graphical user interface simplifies device configuration




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DTM Examples – Diagnostics Including Fieldbuses




The screenshot shows a diagnostic software interface with multiple panels. The central panel displays a tree view of segments and their status. The right panel shows a waveform graph. The left panel shows configuration settings. The interface is designed for network and device diagnostics.

Facilitates network and device diagnostics

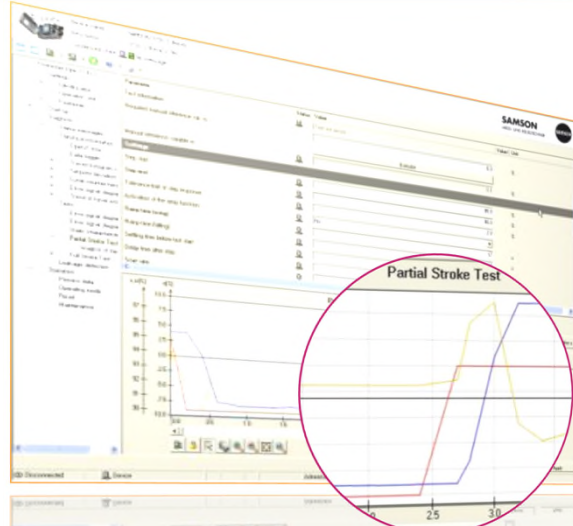


NAMUR NE 107 Guideline Symbols



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DTM Example – Device Diagnostics

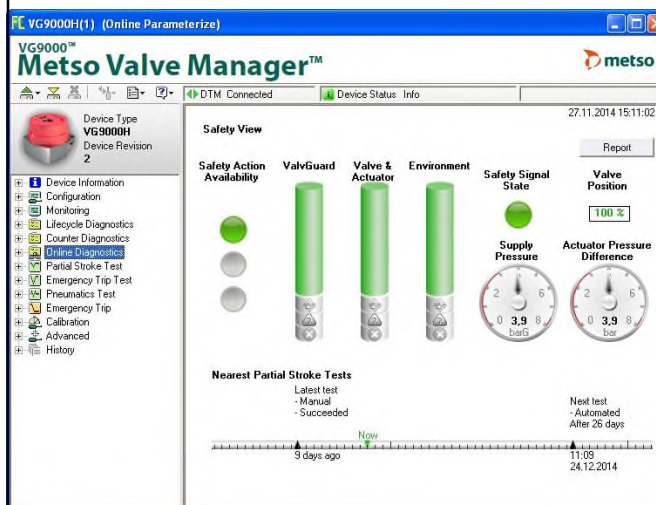


May provide automated functions like Partial Stroke Test



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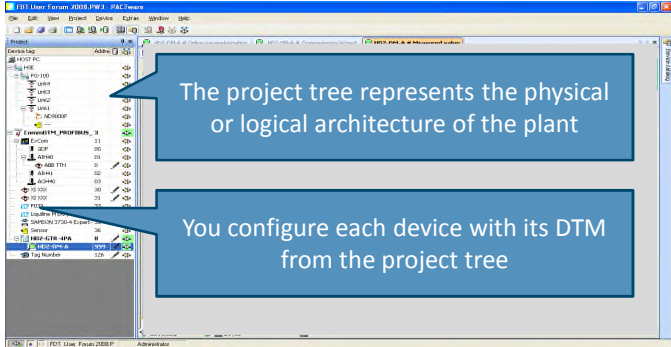
DTM Example – Shell Valve



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Frame Application – Example



The project tree represents the physical or logical architecture of the plant

You configure each device with its DTM from the project tree


Frame Application Style Guide provides recommendations for use of graphical and functional elements



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Versatile Communications

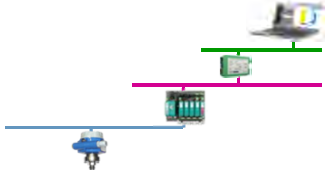
Point to Point and Mobile



Workstation or Field


- Commissioning
- Maintenance
- Diagnostics

Network and Centralized



Transparent routing across networks

- All networks are supported
- Allows remote device diagnostics and maintenance
- Smart information access is available using many standard devices like multiplexers, remote I/O and others



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Widely Supported by Suppliers and Users

Open Ended Integration...

Process and Factory Supported Protocols

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Integrating Device Intelligence

- Integrating and using intelligent device information is not a matter of if, but when!
- Low-risk and low cost (in many cases)
- Maximize existing assets and infrastructure
- FDT enabled user features like NE107



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FDT Supports NAMUR NE107 Guidelines

Recommended Automation Symbols

Maintenance required		oder		oder	
Out of specification		oder		oder	
Check function		oder		oder	
Failure		oder		oder	
Diagnostics active		oder		oder	
Diagnostics passive		oder		oder	



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End User Success Using FDT

- **Problem:** Need to Improve Plant Reliability
- **Solution:** Use information from existing devices as part of an asset management solution to provide – early warning of device problems, lower maintenance cost, reduce downtime and avoid unscheduled shutdowns
- **Method:** Use FDT enabled applications and the intelligent device information to deliver valuable information to the stakeholders
- **Results:** MOL Refinery and Shell are typical examples!



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MOL Danube Refinery

- Largest refinery in Hungary
~ 30,000 intelligent devices
- Control systems – Emerson, Honeywell, Yokogawa
- Devices – Emerson, Endress+Hauser, Yokogawa
- Valves – Fisher, Flowserve, Masoneilan, Samson



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MOL Group Summary

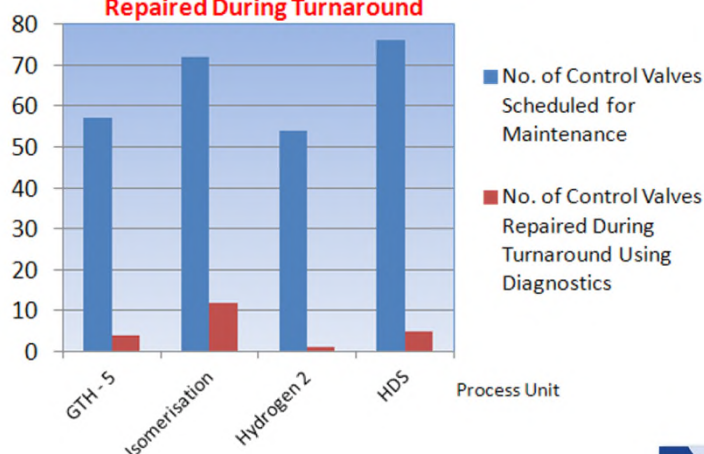
- Commitment to a predictive and proactive maintenance strategy as part of long term maintenance plan
- Use intelligent device information for carrying out daily maintenance tasks making the maintenance processes faster and more efficient.
- Since 2003, MOL standards have stipulated only intelligent devices may be purchased – providing a foundation of intelligent measurement devices on which to build.
- Leverage the benefits of device information to the greatest degree possible.
- MOL Group is committed to sharing and utilizing the benefits of field communication protocols to their broadest possible scope, including the other refineries at MOL Group.



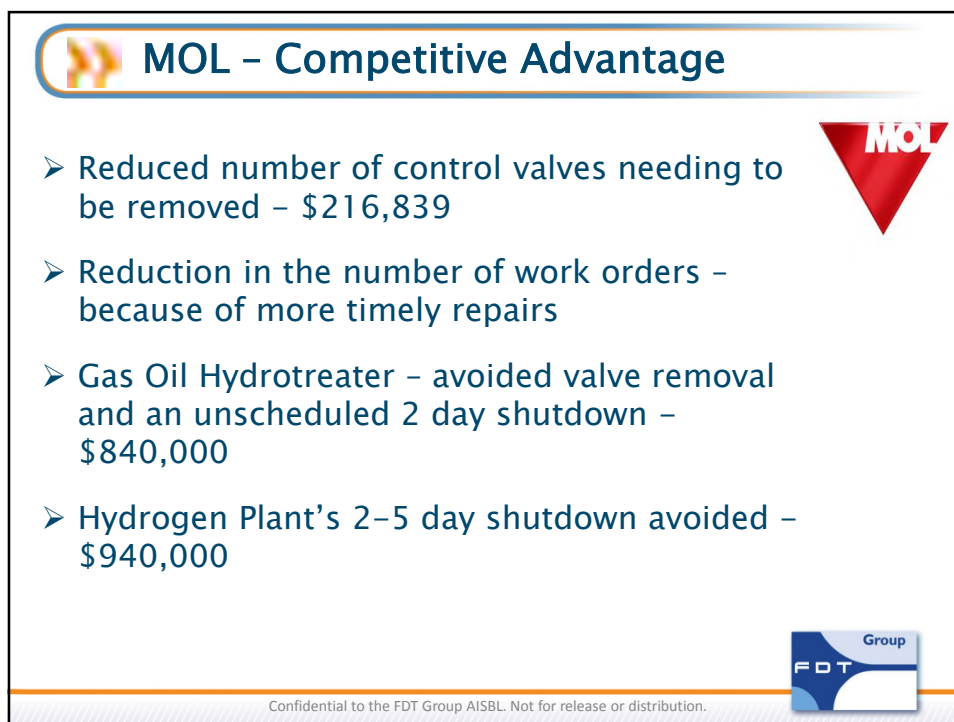
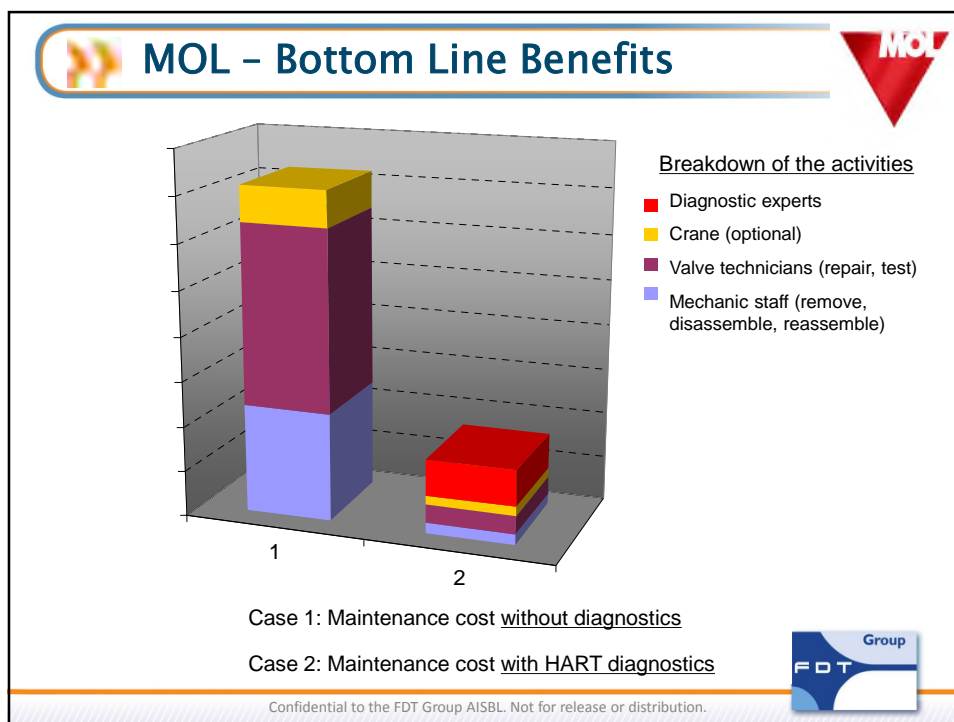
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MOL – From Reactive to Predictive

Number of Scheduled vs. Actual Control Valves Repaired During Turnaround



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Shell Canada Scotford Upgrader

- 255,000 bpd total capacity
- 1,500 intelligent devices
- Control systems – Honeywell (Upgrader) and Foxboro (Refinery)
- 26 different device types – including Rosemount, Endress+Hauser, Krohne, Magnetrol, K-TEK, Fisher, Ohmart, Metso



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Bottom Line Competitive Advantage

- Loop testing and process variable simulation in **30% of the time**
- Simulation of critical safety narratives for more than **50% time saving**
- Eliminated external hardware to 700 valve positioners saving **\$2,000 per valve**
- Improve maintenance efficiency on heated instrument boxes saving **more than \$200,000 per yr**
- Re-calibration, parameter checks and device diagnostics performed from central control room saving of **\$100,000 annually**



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FDT and Field Device Integration (FDI) – An Introduction

FDI Overview

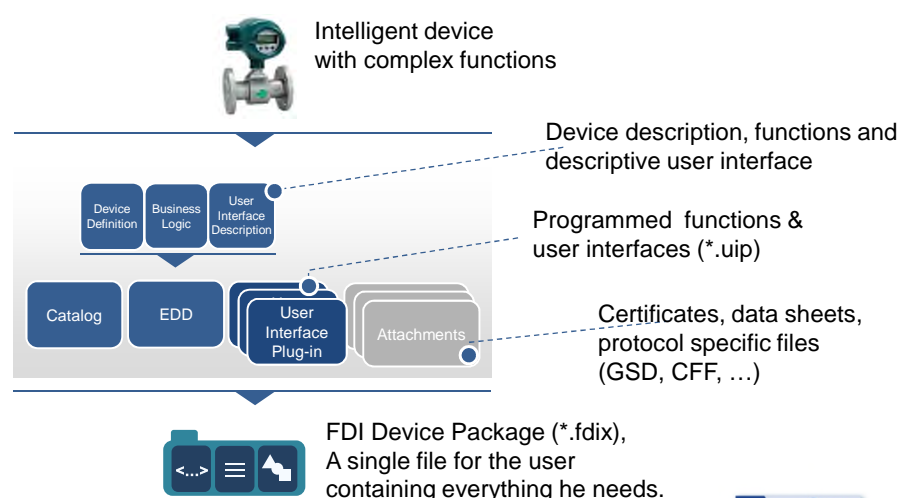
- A soon to be released standard
 - Covers EDD based networks
 - HART, FF, and Profibus
 - Funded by seven companies
 - Sponsored by five foundations including the FDT Group
- Provides a common DD/EDD interpreter for host systems
 - Result of harmonization of EDD language
 - Simplifies architecture and enhances interoperability
- Adds an optional graphical user interface
 - Similar to DTM features
- Bundles components into a “device package”
 - Analogous to a DTM
- Designed to be compatible with FDT



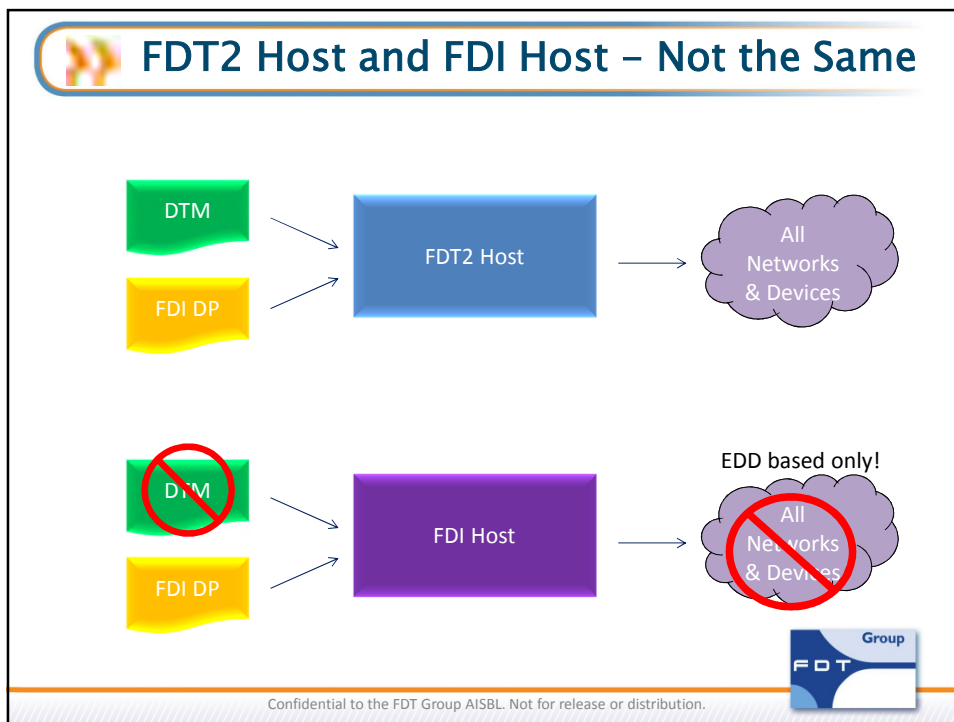
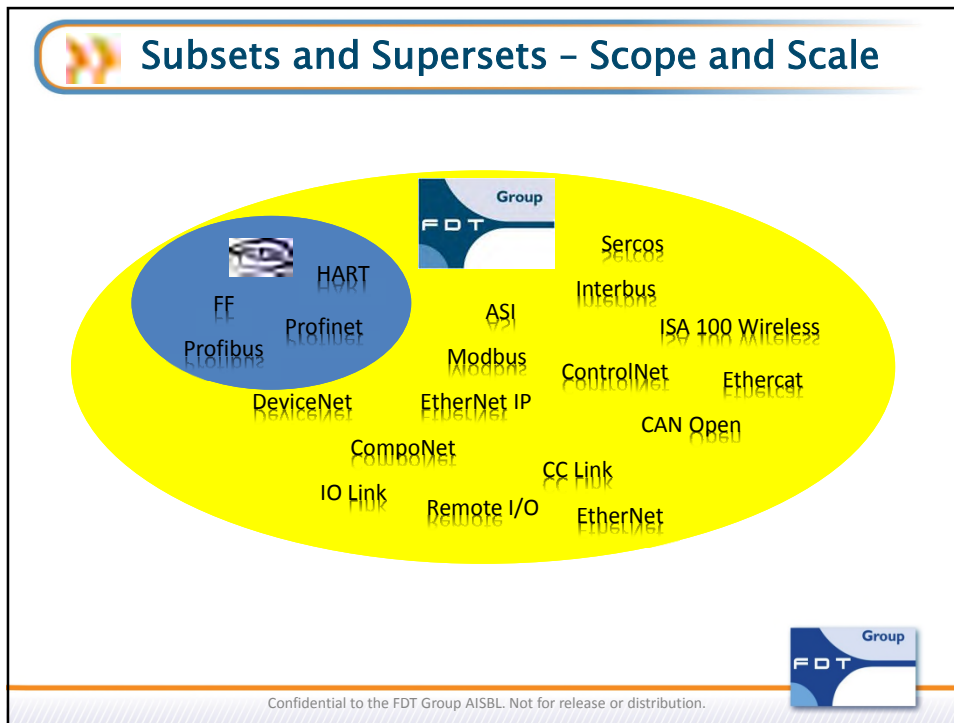
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The FDI – DP (Device Package)



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FDT Your Competitive Advantage

➤ Change the culture, avoid risk and improve plant reliability over the life cycle of the plant

- Think about what you have – not what you don't have!
- Integration of asset intelligence unleashes the competitiveness of your facility
- Prepare and participate in the Industrial Internet of Things
 - Get the right information to the right place at the right time!
- FDT Technology enabled solutions can help you realize the potential of your existing assets



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End Users...Start Here

- Take inventory of your intelligent “smart devices” – check with your device suppliers to get DTMs. Or visit <http://www.fdtgroup.org/product-catalog/certified-dtms>
- Check to see if your system is FDT enabled. If it is, pick a device and test out a DTM today to see what you are missing!
- No FDT enabled system currently, speak to your device supplier for a FDT solution! There are stand alone configuration software options like PACTware available for free...Remember, FDT is flexible with the option to integrate 'at-your-own-pace'! Scalability!
- New Construction or Upgrade: Contact your automation professionals (ie: integrator and system and device suppliers) and make sure to specify FDT! The demand for products comes from user requests!



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Suppliers...Start Here

Customers asking for Device DTMs or a Device Integration Interface (Frame Application) embedded in your system?

Getting Started is easy...

Contact the FDT Group

Maggie Carlson

Phone/fax: 512.428.4979

Email: maggie.carlson@fdtgroup.org



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 Email: maggie.carlson@fdtgroup.org
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