FDT
A Good Fit for Foundation Fieldbus

FOUNDATION™ Fieldbus End User Council Meeting - Middle East
December 4-5, 2007

Hartmut Wallraf
Chairman FDT Group
FDT is the right fit for FF

- End Users requests
- Recent FDT technology developments towards FF
- Test evaluation by Shell Global solution
- Positioning FDI
- JERP a sterling reference
Users’ requirements
Inputs from users organizations, key end users and users’ forums

Interoperability for all products, devices, frames and protocols
Unified MMI: same look & feel for all devices
Investment protection over product life time
Certification for all protocols, frames and DTMs

Suppliers requirements
Streamline development effort, eliminate duplication
Leverage existing products (DD, EDD)
Evolve with state of the art in technology
Provide development support tools and services, and Interoperability tests
Recent technology developments

- Over 800 DTMss and more than 10 FDT frames in the market

- Support of 11 communication protocols
  AS-interface, ControlNet, DeviceNet, EtherNet/IP, FOUNDATION Fieldbus, HART, INTERBUS, MODBUS SL/TCP, PROFIBUS DP/PA, PROFINET IO, CIP Annex configuration

- Field Device Integration project
FDT Quality Program

- Striving towards NAMUR NE105 compliance
  - DTM style guide released
  - FDT/DTM Lifecycle policy specified

- Certification:
  - Certification Process operational for DTM devices
  - Release of DTM inspector 2.0: FF, CIP, Interbus, HART, PROFIBUS
  - Frame Certification started

- Five FDT test sites established:
  - Yokogawa SG, BIS, E+H, ifak, M&M,

- Regular interoperability projects for continuous improvement
  - I - 2006 at R&M: FDT is mature
  - II - 2007 internal
  - III - 2007/2008: Prove sufficiency of FDT compliance tests

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FDT Quality Program

- Technical support line operational
  - Phone, email, discussion forum, central record and database

- 2nd developers’ conference
  - Update on latest developments and enhancements
  - Scheduled at regular intervals

- Best practice documents for clarification of specification
Technology program 2008

- Continue with IEC standardization
- Continue FDT adaptation to state of the art technology
  - Vista
  - .Net
- Further improvement of interoperability
  - Permanent test bed for interoperability
  - Interoperability test 3
- Implement Frame test and certification procedure
- Pursue FDI development
  - Become major player in FDI development
  - Move FDT specification resources to work on next generation of device integration FDI
- Implement tools for reduced DTM development costs
- Implement Factory Automation Program
FDT/DTM and eEDDL applied in FF Technology
An End Users Status Evaluation

Rong Gui, WIB

FDT User Forum
Antwerp 2007
Evaluation Objective

Compare present functionality of FDT/DTM and eEDDL for FF devices.

Assess the data accessibility and effectiveness in commissioning and maintenance execution
DD, eEDDL and FDT/DTM in FF

- **DD**
  - Developed for Device Configuration & Methods
  - Visualized and configured by DCS vendor; Text file
  - eEDDL replaces DD in DCS systems

- **eEDDL**
  - Visualized and configuration by device vendor; Executable file
  - eEDDL replaces DD in DCS systems

- **DTM**
  - DTM requires DD in DCS systems
Evaluation Set-up

DCS  Asset Man. System

FF H1 card

Conditioner

250 m cable

NI FF card

Standalone Frame (FDT) Applications
- Fieldmate (Yokogawa)
- Pactware (P&F)
- Fieldcare (Metso; E&H)

DCS systems
- CS3000 (Yokogawa)
- DeltaV (Emerson)
- IACC (Invensys)
- Experion PKS (HW)
- 800xA (ABB)
## Interoperability results

<table>
<thead>
<tr>
<th>Device</th>
<th>CS 3000 Yokogawa</th>
<th>Delta V Emerson</th>
<th>IACC Invensys</th>
<th>Field Mate</th>
<th>PACT Ware</th>
<th>Field Care</th>
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<tbody>
<tr>
<td><strong>ND 9000 Metso Positioner</strong></td>
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<tr>
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<td>Yes</td>
<td>Yes</td>
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<tr>
<td>eEDDL</td>
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<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>DTM</td>
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<td>No</td>
<td>Yes</td>
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<td><strong>DVC 6000 Emerson Positioner</strong></td>
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<tr>
<td>DD</td>
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<td>Yes</td>
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<tr>
<td>eEDDL</td>
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<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td><strong>SRD 991 Invensys Positioner</strong></td>
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<tr>
<td>DD</td>
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<td>Yes</td>
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<tr>
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<td>Yes</td>
<td>Yes</td>
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<td><strong>EJX MV Yokogawa Multivariable</strong></td>
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<tr>
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<tr>
<td>DTM</td>
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<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Evaluation Result DD (Example)

Multiple tabs
List of parameters
Look and feel is same within a single DCS system, but is very different per DCS
Not userfriendly parameterisation
No graphics
Evaluation Result DTM (Example)

Full graphical support

No loss of results during open/closing of different DTM screens

Data storage

Configuration and test results in one view
WIB test : Conclusions

- Basic claims on pros/cons of FDT/DTM and eEDDL are confirmed using FF technology

- Both technologies as applied in FF technology are not mature yet (not enough devices supported)

- eEDDL offers required data accessibility and functionality as used in commissioning of FF smart devices

- FDT/DTM offers enhanced data accessibility and extended functionality as used in commissioning and maintenance of FF smart devices in a very effective manner.
- Basic claims on pros/cons of FDT/DTM and eEDDL are confirmed using FF technology

<table>
<thead>
<tr>
<th>FUNCTION</th>
<th>Basic DDL</th>
<th>Enhanced DDL</th>
<th>FDT</th>
</tr>
</thead>
<tbody>
<tr>
<td>FF block configuration</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Calibration Methods</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Device Setup Wizards</td>
<td>No</td>
<td>Limited</td>
<td>Yes</td>
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<tr>
<td>Programming flexibility</td>
<td>Very limited</td>
<td>Limited</td>
<td>Yes</td>
</tr>
<tr>
<td>State of the art GUI</td>
<td>No</td>
<td>Very limited</td>
<td>Yes</td>
</tr>
<tr>
<td>Data storage and reporting functionality</td>
<td>No</td>
<td>Limited</td>
<td>Yes</td>
</tr>
<tr>
<td>Capable of any type of complex calculations</td>
<td>No</td>
<td>Limited</td>
<td>Yes</td>
</tr>
<tr>
<td>Advanced diagnostics for sophisticated devices</td>
<td>No</td>
<td>Limited</td>
<td>Yes</td>
</tr>
</tbody>
</table>
eEDDL and FDT/DTM are complementary technologies
Systems should support both eEDDL and FDT/DTM
  eEDDL should be used for data access, parameterization and commissioning
  FDT is the right platform for applications in commissioning and maintenance

- eEDDL’s and DTM’s are required for more FF devices
- Certification for Frame (FDT) applications is necessary (DTM’s have DTMInspector 2.0)
- Improve style guide for DTM’s to obtain same look and feel (use commissioning and maintenance views)
- Vendors should more exploit the opportunities to implement intelligence in DTMs
The independent WIB test confirms:

- FDT Technology delivers new capabilities – as promised
- There is a real need for FDT/DTM technology – protocol and supply independent
- We are encouraged to provide more DTMs covering many device types and communication protocols
- Many benefits can be realized by using FDT technology. Central access of all data from all devices delivers added value. This is highlighted in commissioning and maintenance test scenarios
Cooperation on FDI

Ensure evolution of FDT technology with state of the art while ensuring backward compatibility with current solutions

End Users requirements:
- Deliver a common solution based on DTM and EDDL.
- This common approach is adopted by all suppliers (devices and host systems)
- Ensure interoperability of all devices and systems irrespective of the fieldbus protocol
- Ensure backward compatibility with current solutions

Suppliers requirements:
- Eliminate investments in parallel developments / focus on product features
- Combine benefits of EDDL and DTM technologies
- Continue support of current technology

Objective:
- Design a common solution for Field Device Integration FDI in Industrial Automation and make it an international standard

Steps:
- Cooperation with ECT for common development of FDI
- Draft specification and first prototypes end 2008
- Timing of IEC standard depends on development schedule
FDT and FF work together in a sterling reference

- Crude processing capacity of 580,000 Barrels per Day.
- Polypropylene plant with a capacity of 0.9 MTPA.
- 20,000 plus Tags connected to FF
- More than 3500 Segments in the project.
- All selected devices to carry FF “Check mark” Logo.
- Host System using FDT / DTM technology.
Group

59 Members (Status November 2007)

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FDT and FF
A good fit for now and in the future