

FDT Open Access to Device Intelligence Unlocks Interoperability to Bridge Information Silos

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Keywords

FDT, Interoperability, Field Devices, Plant Asset Management, Condition-based Maintenance, Communication Protocols, ROI

Users are not fully realizing the potential of their intelligent devices - not due to their lack of knowledge - but because there hasn't been a standard way for field device vendors to create user interfaces on multiple system platforms for users to gain access to embedded device data and take advantage of advanced device management.

Summary

The user benefits of truly open industrial device management continue to be an elusive goal in virtually every industry. For example, in the process industry, users have accepted that there will never be a single, standardized protocol for all applications. Other industries are suffering similar issues. If history is an indicator of the future, users will be working with multiple incompatible protocols for many years to come. Users continue to dream of the day when one can plug & play hardware and software seamlessly without a second thought regardless of industry, device, actuator, control system or application. FDT is making this closer to reality than anyone would have thought possible only a few years ago.

Analysis

Users are frustrated with the methods and cost of integration associated with new plant solutions. A typical plant might have field devices and systems from 10 different vendors running multiple protocols, each with its own configuration tool.

Despite significant investments in intelligent devices, users may not be maximizing the value of the information contained within those devices. Whether deploying a comprehensive Plant Asset Management (PAM) system or a niche diagnostic application, the cost of managing equipment from different device and/or system vendors invokes unrecoverable costs



on users who are already operating with limited resources. FDT is addressing the long-standing problem of maintaining devices within control systems and asset management tools with an interface that is easy to deploy and supported by virtually all automation suppliers.

FDT Addresses an Industry-wide End User Issue

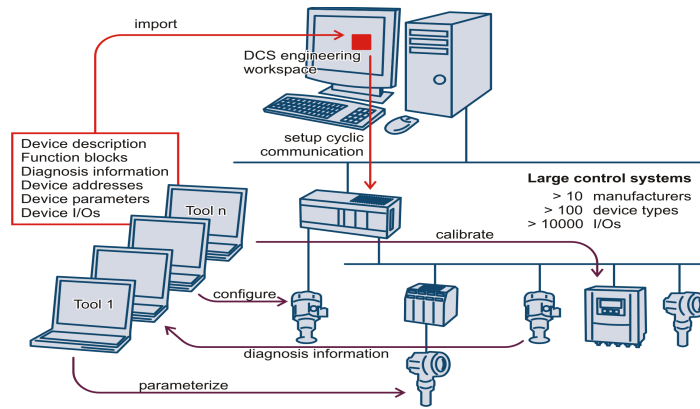
Regardless of the region, the changing workforce creates an increasing need for Plant Asset Management (PAM) solutions. The combined reductions in

FDT provides an answer to the long-standing problem of how to connect multiple protocols into a single, common easy to use platform, leveraging the knowledge of device suppliers that minimizes the cost and risk to the end user.

FDT provides true open connectivity of field device information to applications in a common interface, giving Microsoft Windows users universal interoperability regardless of industry, device supplier and device type.

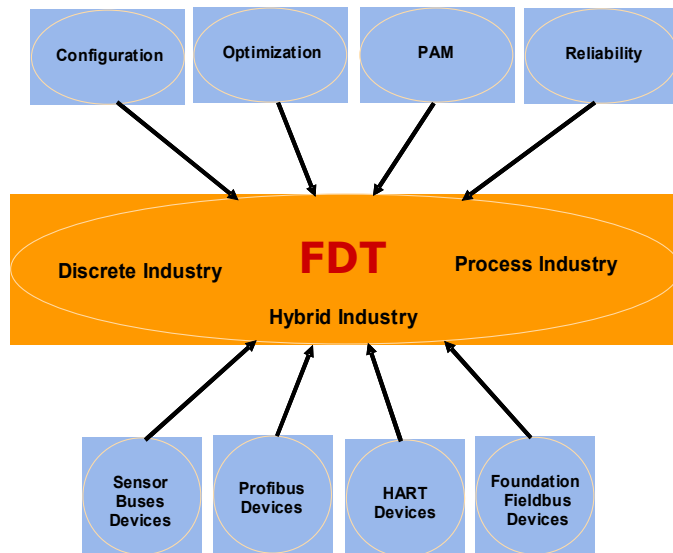
staff and the need to manage an increasing number of diverse assets with multiple communication protocols are exasperating the situation. The current workforce can not sustain the current level of productivity without an easy way to implement common standardized tools and applications, which improve efficiency, reduce training, and capture knowledge of the experienced workforce.

End users are demanding a standardized single engineering human interface environment to manage, commission, and configure any field device, control valve, and other process equipment from any supplier, connected to any field bus communication protocol. They want the flexibility to choose best-in-class products without being restricted to a specific vendor. End users desire an open technology that preserves the installed field device investments as much as possible while achieving seamless data exchange from devices to asset management applications - a critical requirement if they are to compete in the future.



End Users must use Disparate Applications without FDT

Today’s typical plant has multiple generations of control systems and field devices from many suppliers communicating via a number of field device and sensor protocols. This automation landscape is blocking the access to information that PAM systems need and the workforce requires. The current work-around is to deploy multiple applications, which require added training, support and maintenance that defeats the goal of PAM



FDT Enables Interoperability Regardless of Industry, Protocol, and Application

solutions. The general consensus of end users is that the poor dissemination of timely information to the workforce is the largest obstacle to increasing productivity. Compounding this issue is the difficulty in accessing and maintaining even the most fundamental data such as information from field devices and other plant and factory equipment.

FDT - The enabling technology for multi-vendor plants

Open protocol and vendor independent solutions are necessary for long-term sustainable productivity improvements. FDT technology is comprised of three key components: the Frame Application, Communication DTMs and Device DTMs.

The host system supplier typically creates the Frame Application, which opens the plug-in or field device software from the device vendor, called the Device DTM.

The Frame Application visually surrounds the Device DTM performing actions like navigating to a selected device or saving device databases. The Device DTMs let the user interact with the field device in a wide variety of ways. The vendor of the Device DTM can create a graphically rich user interface that does virtually anything possible in an advanced Windows PC type interface.

The host system vendor supplies a Communication DTM, which manages the pass through communications, for each supported fieldbus protocol, which ensures that the details of the PC, network, interface cards, and pass through protocols of the host system are transparent to the device vendor's DTM.

This architecture allows for innovation of communication protocols to continue without affecting the end-user's initial investment, making the benefits of FDT very appealing to end users.

Benefits of FDT

Reduce Training

Enables Intuitive Solutions Across Various Asset Categories

Eliminate Cost to Map Protocols

Promotes Development of Unique Solutions

Preserve Automation Investments

Application Focus not Technology

FDT Enables the Productivity of Automation Investments

Freedom to Choose

More technology for the sake of innovation without adding user benefits is the last thing that users want. Of the many benefits of FDT, interoperability will be one of the prime motivators for many users to adopt FDT. Interoperability has typically been associated with the integration of devices, systems, applications, and business solutions in a standardized way to reduce time and cost of implementation. Because FDT bridges the chasm between different communication protocols used in different industries, FDT is suitable for the process, hybrid and discrete industries. More importantly, for end users, it also allows them the freedom to choose best-in-class devices from any device supplier. If the supplier products support FDT, then an end user will have the freedom to choose any FDT enabled product from many suppliers without worrying about incompatibility.

Interoperability Tests

Parameterization

Up- & Download

Language, Printing, and Help functions

Special behavior

Behavior in case of disturbances

Advanced DTM functions

Load tests

Simultaneous Operation of Multiple DTMs

Installation / De-installation tests

Licensing

Update Frame and DTM software

R&M Performed a Comprehensive Battery of Tests

Successful Interoperability Testing

The recent interoperability testing of multiple DTMs with multiple frame applications typifies the accelerating accomplishments of the FDT Group. This large interoperability project was performed by Rheinhold & Mahla Prozesstechnik GmbH, a large recognized test lab in Germany. Six different frame applications were tested in combination with 25 certified DTMs from a total 12 suppliers. Between May and September of 2006, R&M accomplished 5,000 test steps.

Equipment tested included Profibus DP and Profibus PA devices, gateways, and remote I/Os connected to HART field devices. Among the six frame applications are the three stand-alone tools PACTware, FDT Container (M&M Software) and FieldCare (Endress+Hauser) as well as three different control systems from ABB. All of this equipment will remain at the R&M site to allow suppliers to comprehensively test their DTMs in a real multi-vendor environment.

The final results confirmed the interoperability of all tested components. The DTMs operated well in different frames and were found to be easy to use with the new intuitive enhancements deployed in the newest version of FDT. The navigation in the DTMs was clearly laid out, parameters were easy and fast to configure, and the Windows compliant operating environment worked without any faults. As a result, the Rheinold & Mahla test lab formally certified the suitability of FDT technology for industrial automation applications.

FDT takes advantage of full Windows capabilities

FDT-based applications allow backward compatibility with the installed base and future scalability to new devices and solutions regardless of industry. End users are not so much concerned with technology but what it can do to increase tangible benchmarks such as reliability, maintenance cost, productivity, and production availability. FDT has come a long way in meeting these goals and many more.

Despite ongoing debates suggesting that FDT and EDDL are competing technologies, they in fact are complementary to each other. For example, Enhanced Device Description Language (EDDL) is ideal, and with some protocols absolutely required, to enable the host vendor to build a universal configuration tool for any vendor's field device. EDDLs are necessary to describe the device connected to a control system and for simple measurement devices such as a pressure transmitter; it may be all that a user may need. The FDT DTMs are ideal for creating specialized device specific user interface applications, such as advanced device maintenance and diagnostics that plug into device software applications like PAM software created by the host vendor. DTMs and higher-level programs can provide information-rich diagnostic applications for virtually all plant equipment residing in the same environment regardless of communication protocol.

FDT on the Move

Imagine getting the scores of suppliers located in countries dispersed around the globe, each with varying needs and cultures, to agree to one way of doing things. The challenges of this scenario underscore the progress that FDT has made in a very short time. Because of the unmet needs of end users driving this effort forward, the FDT initiative has become stronger.

Finalized Draft of IEC Standard
Gained Support from All but One PAS Supplier
Gained Support from Field Device and Control Valve Suppliers
Automated the Development and Maintenance of DTMs
Gained Support from End Users
Low Cost DTM Development
Certified Interoperability
Microsoft Version Management (not only specific to FDT) – Will be Addressed in Future Releases

FDT has Made Significant Progress

The FDT Joint Interest Group has been reorganized into the FDT Group, headquartered in Belgium. The FDT Group, a non-profit association of international companies, develops and maintains the FDT specifications, and supports the adoption and promotion of FDT technology. The FDT Group is open to all automation suppliers and users who wish to participate.

The success of FDT in gaining increasing support from suppliers and users is helping it to expand into a formalized entity with sufficient financial and personnel resources for future growth. Since the emergence of the FDT initiative in 2000, support has steadily grown from a handful of suppliers

to 56 members (November 2006) primarily in process automation with an increasing percentage coming from the factory automation space.

In addition, leading end users Saudi Aramco and Shell Global Solutions have thrown their support for the FDT initiative. Despite the evolution of FDT as it moves toward IEC certification, end users are employing FDT today in an increasing number of sites around the globe. Users are finding that the benefits of deploying FDT solutions far outweigh the risk associated with changes to their systems, since the goal of FDT from the outset has been to ensure backward compatibility.

However, despite these accomplishments, much work lies ahead for FDT to become a way of life in process automation. Some of the issues that the group will tackle in the months ahead include:

- 1) Building awareness of FDT Technology, particularly in the North American and Asian markets
- 2) Increasing membership, both among automation suppliers and end users
- 3) Continued active participation of the IEC SC65C WG 14 working groups
- 4) Lead the development ISA SP103 standard
- 5) Increase the number of certified DTMs

Conclusions

- FDT is unlike any other initiative, and is destined to improve productivity through open connectivity and open applications
- End users with issues highlighted here must investigate the potential of FDT in their unique enterprises

This paper was written by ARC Advisory Group on behalf of FDT. The opinions and observations stated in the paper are ARC's. For further information or to provide feedback on this paper, please contact the author.