FDT for Mobile Devices
Currently the established FDT2 technology is bound to PCs with Windows Operating System.

However, there is an increasing trend for mobile applications in automation industry.

This presentation is about a concept study where these limitations are overcome by providing a platform independent user interface.
OVERVIEW

Intro
• Challenge
• Points of interest

Concept
• Mobile support
• Mobile Scenario
• Technology Translation

Example
• Signal R
• Frame on Windows RT
• Live Demo

Summary
• Conclusions
**INTRO - THE CHALLENGE**

- **FDT2 focus on PC / server application**
  - Based on .NET
  - Executable on Microsoft Windows platforms

- **Web and mobile application not in scope**
  - Web UIs in web browser
  - Applications on smartphones
  - UIs and frame applications on tablets
INTRO – POINTS OF INTEREST

- How may a mobile enabled DTM look like?
  - Which files have to be provided in the Installation package?
  - How does a DTM developer create HTML5 / JavaScript UIs?

- What kind of changes are necessary in the frame application?
  - How can a Frame Application load mobile enabled DTMs?
  - How can JavaScript and HTML5 files be deployed and hosted?

- Which parts may require standardization to allow the described scenario in a vendor independent way?
  - What about compatibility to FDT2?
  - What is the suggested use case for this extension?
FDT2 DTM provides **additional user interface** for web/mobile support

Best of **both worlds** for user interfaces
- DTM mobile user interface is based on **HTML 5**
- “Normal” DTM user interface

**Business logic** is based on Microsoft **.NET** as specified in FDT2 specification today
FDT2 Frame Application is divided into **server** and **client** part

**Frame Application on client side**
- Requests DTM Mobile UI (HTML5) from server and **hosts** it
- **Communicates** with Frame Application on server side via **web-technologies** (vendor specific)

**Frame Application on server side**
- **Runs** the DTM **business logic** (Microsoft .NET)
- Includes a **web-server**
FDT2 UI messaging concept is also used for DTM Mobile UIs

1. DTM Mobile UI creates XML message and sends it via IDtmUiMessagingMobile interface (new introduced Java-Script interface)

2. Frame Application wraps DTM XML message in own XML message and provides additional information (e.g. target DTM business logic)

3. Frame Application converts XML message to corresponding .NET message and sends it to DTM business logic via IDtmUiMessaging (existing FDT2 interface)

3. Client Frame Application sends XML message to Server Frame Application
**SignalR for connection** between Frame Application and Mobile Frame Application

**Web-server is Microsoft IIS** and supports all web browsers

- **Generated Stub** runs on web server
- **Interface** is exposed and can be used by HTML5 stub to exchange messages
- **Generated HTML5 stub** runs on client side
- **Messages** are translated to SignalR representation format
- Internally the conversion to Mobile FDT messages is done
EXAMPLE – LIVE DEMO ON WINDOWS RT

- **Windows RT App**
  - Represents Client Frame Application
  - **Shows DTM Mobile UI** pages with HTML5

- **Mobile enabled DTM**
  - Represents FDT2 DTM
  - Shows online parameterization page
SUMMARY

- **Concept** enables use of **DTM UIs on mobile devices**, in web browser.
- Concept is **platform independent** through the usage of **HTML5**.
- Concept is **backward compatible**, new DTMs can run in today's FDT2 Frame Applications.

- Existing **FDT2 DTMs can be mobile enabled**
  - New / **additional mobile UI** is provided
  - Existing DTM business logic and UIs remain unchanged

- New FDT2 DTMs **can provide** mobile **UIs only**
  - New **common component** needed to host mobile UIs in existing FDT2 Frame Applications

- **Client/Server** architecture is **Frame Application specific**
  - No need to standardize the architecture
  - New **Interface IDtmMobileUiMessaging** has to be implemented
  - Security aspects have to be handled by the Frame Application vendor.
The concept study shows the feasibility of the general idea.
However, the idea of FDT is to provide vendor independent solutions.
The concept study also provides input for potential standardization.

The following key aspects were identified to be specification relevant:

- JavaScript API definition which can be used in DTM UIs
- Definition of message envelope
- Definitions for Deployment of DTM which has a “mobile” UI
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FDT2 annex specification
- How HTML5 is used for DTM Web UIs / how Frame Application shall host the UIs
- Registration of DTM Mobile UIs (extension of DTM UI manifest files)
- Definition of `IDtmMobileUiMessaging` Java-Script interface
- Envelope for FDT message transport
  - Conversion from .NET to XML is already defined in FDT2
  - Therefore only the envelope structure and contents have to be defined

Style guide for HTML5 Web UIs (e.g. for PC, Tablet and Phone)
- UI form factors (supported screen sizes, scaling behavior ...)
- etc.

DTM Web UI host common component
- To host Web UIs in todays classic FDT2 Frame Applications
- Ensures **backward compatibility**
- **Envelope** is used to enable **FDT message translation** from FDT2 to FDT Mobile

- **Meta information** is needed for **deserialization** in .NET
FDT2 EXTENSION - CLASSIC SCENARIO

- Concept is **full backward compatible** to existing FDT2 Frame Applications

- If FDT2 Frame Application asks DTM for “normal” WinForms or WPF user interfaces, then **mobile DTM UI is wrapped**

- DTM wrapper user interface may be provided as FDT common component