DICOM Validation Toolkit

Enables testing that will increase interoperability between medical devices

Interoperability between medical devices is patient safety critical. Ensuring the communication between these devices behaves as expected, this will need thorough verification. When dealing with DICOM communication, the DVTk library and the DVTk based applications will help to accomplish this.

The DVTk library and DVTk based applications allow for an independent validation of the DICOM interface of a medical device. By using the DVTk tooling the users themselves are able to develop the DICOM interface of their product and resolve interoperability issues upfront. The first effort on this library started 20 years ago, when the first versions of the DICOM Standard became available. After 10 years, the DVTk project became Open Source. Philips Healthcare, Agfa Healthcare and ICT Healthcare were active in this transition. Integral part of this transition was the introduction of the DVTk website, that enables and supports interaction between the DVTk users.

DVTk library and applications

The DVTk library consists of the original C++ communication and validation core which has been wrapped by a .Net layer, which enables users to use modern programming languages. Detailed HTML validation results are generated run-time to get a full overview of the communication combined by

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validation results that are structured just like the DICOM specification part 3 (module oriented). On top of this, the DVTk high level interface has been built which allows for flexible VB.NET test scripts to be run inside DVT. Finally, several applications have been created that make full use of the DVTk library including validation capabilities.

Role ICT Healthcare

For over 10 years ICT Healthcare is investing in DVTk. ICT Healthcare helped with the transition from a Closed Source to an Open Source project working together with Philips Healthcare and Agfa Healthcare. Besides the technical coordination of the resources in the project from the different contributors, ICT Healthcare helped extend the DVTk library and in creating new applications based on this library. Currently ICT Healthcare is the main contributor of the DVTk Open Source project and takes care of the community website, necessary software updates for more than 5000 registered users and promotional activities (e.g. SIIM 2017 meeting).

DVTk Website

The DVTk website www.dvtk.org is the place to keep in touch with the latest DVTk news and its community. The website provides an active communication forum where users are discussing interoperability issues or make proposals for future features of the DVTk tooling.

Keywords

DICOM, IHE, Testing, Windows, .Net, C#, C++, DVTk Library, RIS Emulator, Query Retrieve SCP Emulator, DICOM Validation Tool, DICOM Network Analyzer, DICOM Editor, DICOM Definition Files, DICOM Compare, Modality Emulator, Storage SCP Emulator, Storage SCU Emulator, Open Source, Commercial Services, DICOM Training, Mirth Connect Training, DICOM Consultancy, DICOM Verification and Validation, DICOM Implementation, DICOM Conformance Statement, DICOM Interface Scan, DICOM Data Sets Creation, Forum.

PROJECT RESULT

The DVTk library and DVTk library based applications are used by a relatively large group of people that deal with DICOM on a daily basis. In the last 20 years, DVTk has been used as an independent means of validating the DICOM interface(s) of medical devices, which has resulted in a better DICOM interoperability between these devices. DVTk is also used as the basis for the IHE-RO test tools, specifically improving the interoperability within Radiation Oncology.

The following information can be found on this website:

- **DICOM products description**
  - DICOM Compare.
  - DICOM Editor.
  - DICOM Network Analyzer.
  - DVT.
  - Query Retrieve SCP Emulator
  - RIS Emulator.
  - Storage SCU Emulator.
  - Storage SCP Emulator.
- **Information about related commercial services offered by the ICT Group**
  - Training DICOM Fundamentals and DVT applied.
  - Training Mirth Connect Fundamentals.
  - DICOM Verification & Validation.
  - DICOM Implementation.
  - A Conformance Statement in a week.
  - DICOM interface scan.
  - DICOM Dataset(s) creation.
- **Downloads of the DVTk application installers**
- **Webinars**
- **Forum**

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