

**Purpose:** To present an enhanced DICOM-RT viewer for clinical practitioners and R&D scientists and engineers in radiation therapy. **Methods and Materials:** DICOM-RT is a set of DICOM extensions for radiotherapy. Despite the fact that DICOM-RT was devised in 1997 and has currently been adopted by all major manufacturers, the DICOM-RT viewer is not readily available to many healthcare providers and R&D scientists and engineers in radiation therapy. Triggered by clinical needs, a DICOM/DICOM-RT viewer, DICOMan, was developed on Microsoft Windows XP platform started from scratch three years ago. It supports all kinds of DICOM-RT objects, namely RT Image, RT Structure Set, RT Plan, RT Dose and RT Record. Added to the viewer, a set of built-in tools were also implemented, such as DICOM Decompressor, DICOM Pusher, DICOM Retriever, DICOM editor, DICOM Anonymizer, DICOM Format Converter and so on. Some RT information that is not explicitly expressed in RT objects, such as incident energy fluence and isodose curves, can be reproduced and rendered to facilitate plan review. **Results:** DICOMan has been tested, routinely used and constantly upgraded for about three years. It has been frequently used to view DICOM CD-ROMs, push DICOM images to treatment planning systems, retrieve images from RT PACS, review treatment plans and help perform dose summation. The anonymizer, format converter and editor are handy tools for R&D scientists and engineers who need to handle DICOM/DICOM-RT objects. **Conclusion:** DICOM RT extension models radiation therapy practice in many modules related to clinical components of radiation therapy. Many of them are cross-referenced and coexist with the referenced ones in different objects. The regular DICOM viewer can not render RT objects appropriately. A dedicated DICOM RT viewer is needed.