

Building an Online Community for Radiologists

Supporting Collaboration and Decision Support among Radiologists through a Reference Case Repository

The stereotypical image of radiologists is that of isolated practitioners sifting through thousands of images and recording their thoughts into microphones. There is, however, a growing network of radiologists thriving off one another's expertise and experiences. This online community of experts helps its members provide top-quality patient care in a convenient, efficient and enjoyable manner. The ability to find the right information – and discuss it with the right people – is becoming an increasingly vital ability in today's connected world. This digital community frees the radiologist from out-of-date resources and difficult-to-find references. The biggest question is: "How does one join the community?"

Background and Challenges

Radiologists today use a number of references and sources of information that have stood the test of time, consistently proving their worth. In recent years, new avenues of research and resources have begun appearing through digital networks. These reference case repositories (RCR) resemble other public digital knowledge repositories, such as Wikipedia®, Flickr® and YouTube®. Like these popular tools, the RCRs allow community members to publish contributions from across the world. There is direct and immediate access to RCRs with little to no administration and vetting of information prior to it being published. However, the value of these resources is not diminished by the relative youth of the tools or the decentralization of the unmonitored information — provided a few key characteristics are present.

This paper presents the key considerations to use in evaluating these new resources.

Optimizing RCRs for Decision Support

Information needs to be available at the right time and in the right format. Images that are postage-sized and lossy-compressed, or are from an unrelated case, result in an RCR that cannot be used by the radiologist. In ensuring the system is optimized for decision support, the following should be considered:

- **Timely access.** Radiologists should not have to wait for access to images while in the midst of decision making. For example, the information should be available to the radiologists immediately. Access to this information should not require that they log into another system. Accessing the resources should be seamless and noninterruptive to the radiologists' decision workflow.

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- **Image quality and licensing.** *Once radiologists find the image or case of interest, it is important that the fidelity of the image is suitable for their needs. For example, pixilated or miniscule images are of minimal benefit to radiologists. Image licensing rights can also be an issue, suggesting that access first be gained by purchasing rights to the image. Radiologists' first concern is their patient, making it imperative that the image quality and licensing issues should be seamlessly resolved.*
- **Image interactivity.** *A static image is no longer the norm during diagnostic reading. Now, reading environments typically have specialized means of adjusting the appearance of images, including window/level adjustments, zooming and panning across the image. This same degree of interactivity should be available in RCRs. Advanced interactions could also be a consideration, depending on the nature of the particular radiologist's needs (e.g., 3D manipulations or reconstruction).*
- **Hard-to-find-comparable cases.** *It is imperative that radiologists be able to find what they need as quickly as possible. Sifting through unrelated cases can take minutes – or even hours – in large image repositories. Any RCR that does not provide radiologists the information they need with minimal involvement will be abandoned. For example, RCRs should enable the use diagnosis indexing to provide the radiologist a quick means of accessing the relevant cases.*

Collaboration

Digital communication is a new tool in radiologists' arsenal, opening new avenues of collaboration. Where radiologists once had access to only local colleagues or well-known specialists, their professional network now includes international experts and colleagues. As RCRs are digital in nature, they can be used to connect with previously unavailable expertise, providing community insight via digital networks such as the Internet. This path to collaboration is an important evolutionary step in the radiology community's knowledge base. Some specific aspects of a RCR that should be examined when evaluating potential RCR solutions include:

- **Local knowledge and comparable cases already in local PACS.** *The best resource is often close to home. Radiologists place value in leveraging local knowledge and referencing comparable cases that already exist within their own picture archiving and communication system (PACS). While face-to-face communication is beneficial, radiologists should be able to easily access data (such as from local cases) from the digital repository — without having to track down their colleague via telephone.*

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- **Case certification.** *One of the major challenges of using communal collections of information such as the Internet, Wikipedia and, potentially, an RCR is the difficulty of validating a particular contributor's credentials or expertise. The result can be the availability of a large amount of data but minimal trust in its veracity. An RCR should provide radiologists a means of verifying particular cases as accurate and that the images appropriately correspond to the relevant diagnosis. This validation assures radiologists that the information being used is accurate, up-to-date and trustworthy according to the radiology community's standards.*
- **Single-click collaboration.** *Reducing barriers to collaboration is important. There should be minimal steps in opening a channel of communication among colleagues: A single-click option is ideal. Existing communication tools should be used as much as possible, such as e-mail communication. A final consideration would be to ensure artificial barriers to collaboration are removed: Colleagues should not need to have credentials or an account in the system in order to participate when invited. Individuals should be able to openly and actively participate, collaborate and communicate — all the while growing the available body of knowledge.*

Conclusion

As the digital collection of radiology expertise grows, it is important to enable radiologists to access, consume and contribute to the body of knowledge. An RCR can be extremely beneficial to radiologists seeking decision support or collaboration because it provides access to global expertise. To fully achieve the benefits of an RCR as a knowledge-sharing tool, it is important to be mindful of several key aspects, including optimization for decision support and collaboration considerations. Once these challenges are met, the door to the worldwide radiology community can be opened and the facility's radiologist can share in the wealth of this knowledge base.

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