

Shayna Knazik
Candidate Essay

Value of Strategic Standardization to U.S. Industry

A classic parable describes two young fish swimming along when an older fish asks them, “Hey, how’s the water?”

They reply, incredulously, “What is water?”

Much like these young fish, most of us are blissfully unaware of the technological mediums underpinning our digital reality. The standards most valuable to US industry are those so well-entrenched they become common place words and ways of describing things, akin to standards of measurement. Most of us can’t consider a reality without the ubiquity of standards such as GPS, USB, TCP/IP, HTTP, MPEG, and UPC barcodes. Wi-Fi and Ethernet connections abound amongst those who have never considered the value of IEEE strategic standardization. Digital Imaging and Communications in Medicine (DICOM) stewards a comparably unique privilege and responsibility as *the* international standard for medical images and related information. Of all human experiences, few are more centralizing than medical emergencies, for which diagnostic imaging (with rapidly-developing vendor technology) becomes ever more integral. I’m very grateful we can rest assured these different imaging modalities (MRI, CT, X-ray, ultrasound, etc.) from various manufacturers have a standardized format and communication protocol that allows for seamless integration. Since being thrust into my new role as DICOM General Secretary I’m beginning to feel like the older fish for perhaps the first time in my life, and can’t imagine a better time to harness the unique opportunities the IEC Young Professionals Competition affords as I represent a growing cohort of young standards professionals driving the US economy.

A full appreciation of the true value of DICOM may require a brief venture into a history of medical imaging standardization that precedes many of our experiences with the highly integrated process we enjoy these days. The fragmented field of medical imaging prior to the 1990s impacted the very independence and mobility that underlies our most highly developed economies and societies. Proprietary formats and protocols, limited operability, and reliance on manual processes meant technicians engaging in costly, time-consuming, and error-prone delays and misdiagnoses. Physical transportation of film or digital media, which could be lost or

damaged, combined with the lack of integration with Picture Archiving and Communication Systems (PACS), stagnated technological development absent strategic standardization. The implementation of the DICOM standard ushered in a new paradigm of diagnostic technology, extending interoperability to PACS and electronic health records (EHRs). DICOM facilitated the latest generation of radiological and therapeutic modalities, while complying with all FDA regulatory requirements, ensuring data privacy, security, and proper documentation. This level of interoperability improves compatibility among vendors therefore reducing costs and streamlining healthcare operations. As impactful as a national or regional standard may be, thankfully the international healthcare industry has recognized the transcendent nature of their unique position and DICOM has been perpetually empowered to make best practice decisions with real human beings in mind, on a global scale.

The value of the most successful standardization strategies is often experienced most tangibly by consumers as a better quality of life, and in DICOM's case, improved patient care. The exemplary standards produced and maintained by teams of experts across various industries reflect countless hours of debate and consensus, and the national and international prosperity that follows are a testament to this invaluable collaborative effort. Our economic growth depends on continued international coordination, with US industry reaping the benefits of global acceptance of standards already adopted domestically. Strategic integration of US manufacturing with international markets will continue to improve healthcare delivery, and electrotechnical standards such as DICOM are perfectly positioned to facilitate improved standards of living for consumers worldwide.