



WHITE PAPER

The Role of XDS-Compliant Vendor Neutral Archive in Promoting Integrated Care

Sponsored by: GE Healthcare

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March 2016

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IN THIS WHITE PAPER

This IDC Health Insights white paper, sponsored by GE Healthcare, provides an overview on how the adoption of next-generation vendor neutral archive (VNA) (renamed by IDC as application-independent clinical archive or AICA) can support healthcare providers in implementing a new and more economically sustainable information management strategy. AICA will support healthcare providers in addressing the challenges posed by the exponential growth of healthcare data and the changes in population health needs demanding new and integrated business models based on collaboration and evidence-based decision making.

This white paper includes a description of the capabilities of GE Healthcare's Centricity Clinical Archive (CCA) and the related benefits realized by clients that have adopted CCA.

SITUATION OVERVIEW

The Evolution of Healthcare: Personalized and Integrated Care to Face New Healthcare Need Challenges

Across the globe, a significant number of health system reforms share the aim of transforming traditional hospital-centric systems into integrated care systems. This structural transformation is addressing the challenges posed by an aging population increasingly affected by chronic diseases. Traditional healthcare systems are poorly equipped to deal with the management of chronic diseases. The consequences are particularly visible in terms of quality and safety of care, rising demand of healthcare services, and cost pressures.

Chronic conditions are responsible for the largest share of healthcare services demand. For example, the latest estimates of the European Commission show that chronic conditions are responsible for 70-80% (approximately €700 billion) of healthcare costs in Europe. The elderly population is the most affected, and with increasing life expectancy, the impact of chronic diseases is expected to grow further. Beyond these direct costs, GDP loss associated with disability related to chronic diseases is becoming a serious issue: The WHO estimates that over 48% of loss of healthy life years worldwide is due to chronic disease (sources: WHO,¹ European Commission,² and WEF³). In the context of the broader economic uncertainty, this translates into fewer economic means available for healthcare systems. In addition,

¹ http://apps.who.int/iris/bitstream/10665/148114/1/9789241564854_eng.pdf?ua=1

² http://ec.europa.eu/health/major_chronic_diseases/docs/reflection_process_cd_en.pdf

³ http://www3.weforum.org/docs/WEF_Harvard_HE_GlobalEconomicBurdenNonCommunicableDiseases_2011.pdf

complicating factors such as the shortage of highly skilled clinicians and the increasing burden of compliance for healthcare organizations are further reducing resources available for care delivery.

National healthcare authorities and private and public payers are trying to curb healthcare expenditure with specific measures, including budget cuts, new reimbursement models, and initiatives aimed at reducing operational costs. However, these measures can be effective only if accompanied by a broader transformation of the care delivery model. Hospital care is effective for the acute phases of chronic diseases. But because these are life-long conditions, it is important to complement and coordinate acute care with prevention and disease management services in the ambulatory community to improve the patient experience and to avoid the worsening of symptoms.

Integrated care is emerging as the most appropriate service delivery model to provide a safer and higher-quality patient experience, built on services addressing specific patients' needs and preferences while reducing costs. The shift toward an integrated care paradigm requires healthcare provider organizations to redefine their role into wider and flexible, outcome-focused collaboration networks, delivering innovative care pathways and services along the patient journey. The integrated care approach demands a closer and more proactive collaboration not only among health providers but also among social services, public health organizations, payers, research institutions and, most important, patients. The traditional hierarchical and siloed approach, driven by single organizations' or departments' specific missions and short-term objectives, should be overcome. For example, Danish healthcare authorities and the different local governments have launched a €5.5 billion investment plan⁴ to build 16 new digital hospitals that will work as key regional hubs, coordinating care provision with other healthcare providers (primary care, community care, home care, and social services).

Adopting this comprehensive approach requires addressing a wide range of changes not only in terms of technology but also in terms of processes, governance, and skills. To encourage a more rapid transition toward the new model, healthcare policy makers are introducing new financial incentives that will reward the adoption of integrated pathways. For example, creating penalties for preventable hospital readmissions, or providing specific reimbursement for services to support post-discharge care continuity, will encourage care providers to work in closer collaboration and share patient information. Schemes that will fund chronic disease management programs will encourage primary care physicians to take an active role in the coordination of different care providers involved in patient care.

Many countries are adopting new regulations and funding schemes to support integrated care. For instance:

- In the United States, the recent update to Transitional Care Management services⁵ introduces new incentives:
 - For post-hospital discharge care coordination, by paying physicians and qualified non-physician providers for care within two business days of discharge
 - For managing multi-morbidity by paying Medicare physicians for management services provided to patients with two or more chronic conditions expected to last at least a year
- In the United Kingdom, since the adoption of the 2011-2012 Payment by Results guidance, health commissioning authorities will no longer pay for any eligible emergency readmissions to a hospital within 30 days of discharge following a planned hospital stay. This approach has been recently extended to include some readmissions occurring after a previous emergency hospital stay.⁶

⁴ <http://healthcaredenmark.dk/the-case-of-denmark/the-future.aspx>

⁵ <http://www.sccma-mcms.org/Portals/19/assets/docs/TCM-CPT.pdf>

⁶ <http://www.hscic.gov.uk/sus/pbrguidance>

Patient-centric integrated care models and accountable care models have patient information sharing at their heart. Information sharing can reduce costs, for example, by reducing duplicate test ordering, and it can improve the quality of care by avoiding prescription errors due to the lack of information on potential drug interactions or allergies. From an information systems point of view, a new approach toward data aggregation, storage, and sharing is needed. Healthcare providers need to invest in technologies that provide a 360-degree patient view that takes into consideration not only patients' clinical care information but also information about other health determinants such as genetics, personal behaviors, and social and economic factors likely to produce health inequalities.

Operating with silos of data is no longer sustainable, especially today when healthcare data volume is growing exponentially. Progress in high-resolution medical imaging; continuous advances in bioinformatics, as in the case of genomic sequencing; and the increasing adoption of technologies such as picture archiving and communication systems (PACSs), radiology information systems, and digital pathology systems are among the key causes of this volume explosion. For example, as shown in Figure 1, Western European healthcare providers are continuing to invest to replace their old PACS solutions with new solutions offering more advanced capabilities. This will trigger the need to migrate high volumes of data without data loss, a nontrivial task, despite the use of DICOM-standard formats for image encoding.

The current lack of systems interoperability so far has been one of the major causes of workflow inefficiencies, resulting in unnecessary costs and in detriment to care quality. A 2010 U.S. study (a preliminary look at duplicate testing associated with lack of electronic health record [EHR] interoperability for transferred patients⁷) demonstrates that digitizing medical records per se is not enough. The study shows how incompatible EHR systems can also lead to potentially costly duplicate testing behaviors during patient transfers: Duplication of testing (repeat within 12 hours) was found in 32% of the cases examined, while 20% of cases had at least one duplicate test not clinically indicated.

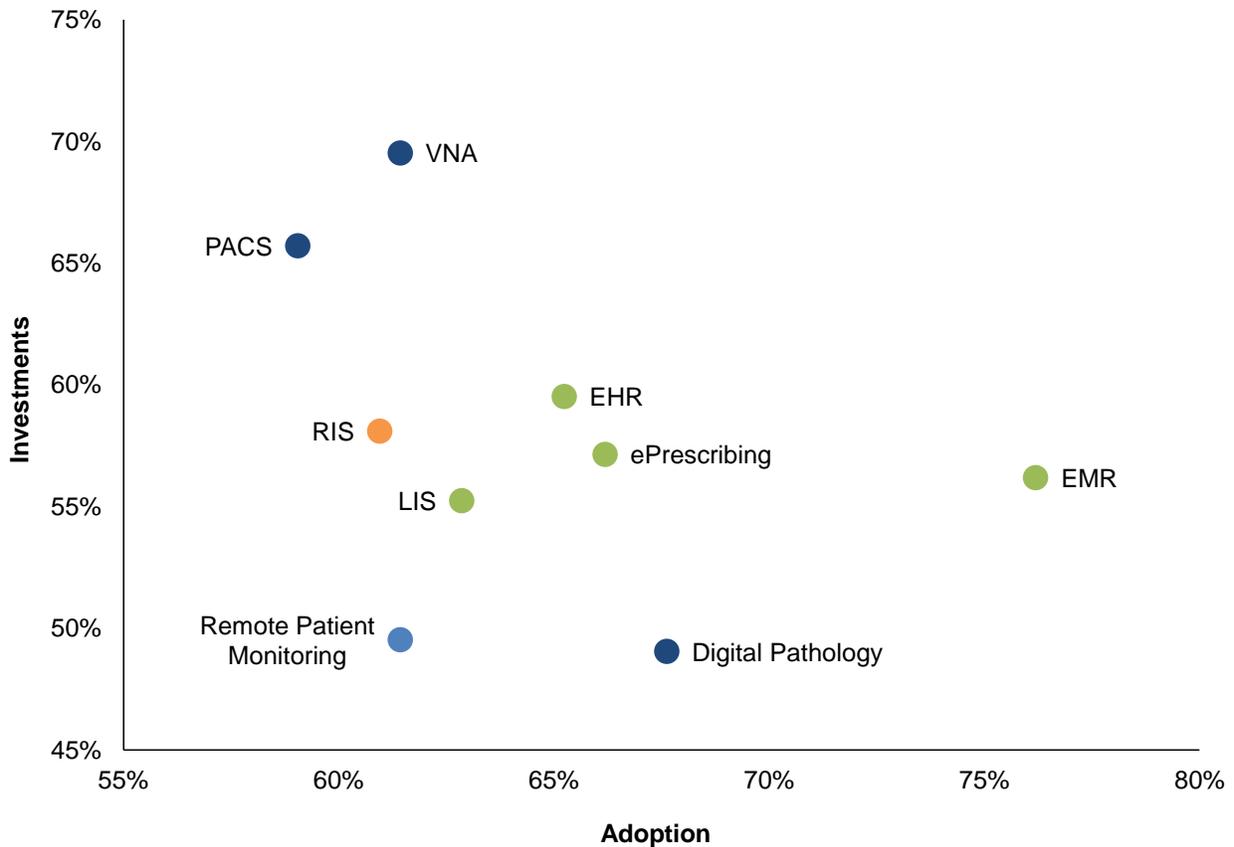
Variety is a dimension that makes healthcare data management both interesting and challenging. Today, only about 20% of patient data produced in a typical healthcare organization is structured (*Big Data and Health Analytics*, Katherine Marconi, Harold Lehmann, CRC Press, December, 20, 2014, ISBN 9781482229233). Structured data, such as information in patient administration systems, traditional EHR, and billing systems, can be easily stored, queried, recalled, analyzed, and manipulated by computer systems to support care processes. The remaining 80% that is unstructured (and semistructured) often is not appropriately captured, stored, and organized. Unstructured data holds valuable patient information (e.g., nursing and physician notes, visible light images, videos, and information from monitoring devices and sensors). Nevertheless, this value is often limited to a single episode of care and remains with the department or the professionals that created it.

Providing a 360-degree patient view entails harnessing the opportunity of identifying the most effective treatments and care initiatives for individual patients (or specific populations) derived from the combination and analysis of underutilized structured and unstructured information. A longitudinal patient record is essential not only to document the patient journey but also to provide a flexible information platform that supports all healthcare providers involved in the process of care delivery. Healthcare providers need to address the complexity of patient information management by adopting a new approach. They need a reference framework for information governance and information systems architecture, flexible enough to incorporate and manage a wide mix of data types and sources and to support secure access and sharing of patient information.

⁷ <http://www.ncbi.nlm.nih.gov/pubmed/20442154>

FIGURE 1

Adoption and Investment Plan of Western European Healthcare Providers, (% of Respondents)



n = 210

Source: IDC Health Insights' *Western European Healthcare Providers Survey, 2014 and 2015*

IDC HEALTH INSIGHTS OPINION

A New Approach to Healthcare Information Management

Moving toward integrated care requires adopting a comprehensive strategy for patient information management. As healthcare organizations increasingly need to use and share more types of patient information internally and externally, they seek to provide a level of transparency and information access to this data, regardless of its origin and format.

The new approach to information management should be based on comprehensive syntactic, semantic, and process interoperability principles and standards that will enable decoupling data from different applications. The new approach will provide the necessary agility to repurpose data in different settings (e.g., care, administration, research) in the most appropriate way, thus unlocking its value.

Addressing the traditional information systems fragmentation requires healthcare providers to look at data formats and organization. For example, when considering solutions for EHR, healthcare providers will need to look for solutions based on interoperability standards such as HL7, tested on profiles developed by Integrating the Healthcare Enterprise (IHE), and using standard terminology such as SNOMED CT. In addition, healthcare providers need to focus on nimble, API-driven solutions that will provide a platform environment and are able to rapidly meet the demands of specific clinical roles and specialties for integrating new applications and data sources into the patient record. These solutions are also able to meet new regulation demands: For example, in the United States, meaningful use objectives include that at least 10% of the imaging test results should be accessible through the electronic medical records (EMRs).⁸

These systems should be able to add, associate, and organize more unstructured data with the patient record and to make this unstructured content and its metadata available for:

- Sharing across care settings and organizations to deliver care continuity along the patient journey
- Adopting analytics technology to support healthcare providers in their decisions both at the patient level (e.g., for clinical decision support) and at the organization level to ensure compliance as well as operational and economic performance

This is possible only if these systems are leveraging a new generation of vendor neutral archives, defined by IDC Health Insights as application-independent clinical archives – a new range of solutions able to deliver data, independently from the systems that originated the data, to applications that further clinical care and advance productivity.

INDUSTRY OVERVIEW

How AICA Is a Key Enabler to the New Information Management Approach

AICA is a standards-based solution that stores patient-related content (images, documents, and any file of clinical relevance) in a standard format with a standard interface such that it can be accessed (queried and retrieved) independently from the system where the data originated. The AICA is integrated via APIs to different data sources and coherently manages the different users and consumers of information. AICAs create IT and operational efficiencies by separating applications and virtualized data down to the layers in the storage devices. AICAs apply data management policies and standard access mechanisms to securely distribute content to the different systems.

Traditional VNAs organize mainly medical images, albeit from multiple PACS and departmental image acquisition systems, but do so in a manner that is normally driven by radiology workflow and not necessarily by the patient's clinical encounters and specific needs. AICA, instead, takes the clinical context of images, videos, reports, physician notes, metrics from medical devices, or other types of unstructured clinical content into account, storing them alongside structured clinical content in what is essentially a longitudinal patient record. AICA operates alongside EHR's workflow capabilities, organizing the different content and making it available to all clinical users. The different clinical users continue to use their departmental solutions (PACSs, digital pathology solutions, and other departmental systems) as their desktop environment to organize their workflow. However, with AICA, clinicians can also benefit from a single complete view of patient information, provided in the correct

⁸ https://www.healthit.gov/facas/sites/faca/files/HITPC_MUWG_Stage3_Recs_2014-04-01.pdf

clinical context, without needing to query multiple systems. In this sense, while AICA per se is not involved in display technology, its combination with new-generation zero-footprint enterprise viewers, which are able to display DICOM images and documents (CDA, PDF, etc.), compared with traditional PACS viewers, further enhances AICA's benefits in terms of:

- Intelligent integration and consolidation of all available patient information in a longitudinal patient record that delivers a 360-degree patient view
- Efficient distribution of the relevant patient information into the workflow associated with delivering clinical care across multiple care pathways, workflows, and care providers

Ensuring Interoperability: IHE Profiles

To achieve the interoperability necessary to ensure access to information, collaboration, and appropriate workflow management, AICAs need to support the key integration profiles developed by IHE. These profiles ensure that critical interoperability issues related to information access, clinical workflows, security, administration, and information structure are addressed. In particular, IHE has developed a series of profiles for any group of healthcare organizations (also called in IHE terms an "Affinity Domain") that want to share patient clinical documents and images:

- Cross-Enterprise Document Sharing (XDS)
- Patient Identifier Cross-Reference (PIX)
- Patient Demographics Query (PDQ)

XDS: Enabling Patient Documents Sharing for Greater Benefits to Clinical and Administrative Processes

XDS profile is an access protocol that allows healthcare documents produced by different information systems to be shared over a wide network of healthcare providers (e.g., from a private physician office to an outpatient clinic to a hospital to a community and social care facility) aiming to deliver integrated care. XDS provides coherent specifications for managing the sharing of documents between any healthcare organizations in the network. In particular, by facilitating the registration, distribution, and access of patient data and documents and by defining common methods for IT security, patient information integrity, and ID management, XDS provides a range of benefits to healthcare clinical and administrative processes. Ubiquitous access to information without the need for duplicating data enables safer clinical workflows, with shorter report turnaround, fewer tedious tasks repetitions, and thus fewer opportunities for errors. Moreover, XDS not only better informs clinical decisions but also speeds up administrative tasks such as reimbursement and eases compliance-related processes.

The Technical Innovation Brought by XDS

The basic XDS has been refined to support documents' special requirements for DICOM images (XDS-I), for HL7 CDA medical summaries (XDS-MS), and for structured laboratory reports (XDS-LAB). The innovation brought by XDS is the logical and physical separation of the document metadata (the indexing information used for retrieval) from the actual content. XDS enables users (document consumers) to retrieve different types of documents (letters, results, images, and folders) in a quick and consistent way. XDS allows handling of any type of content so that each document is viewed in its original form. XDS thus provides a foundation on which to build virtual longitudinal patient record on the fly from a variety of clinical documents created by different organizations.

XDS has four distinct roles or actors:

- **Document source** produces the original documents, submits the documents to a document repository, and generates the related metadata, which is published in the centralized document registry.
- **Document repository** securely stores the documents and supports their retrieval; documents may be stored in a number of different formats, such as AVI, CDA, and PDF.
- **Central document registry** indexes documents, supports searches, and maintains a URL link back to the document repository.
- **Document consumer** is a user system that queries the registry for relevant patient information and retrieves and displays selected documents from their repositories.

To ensure security, the central document registry has no access to content of any document but entirely depends on standardized metadata provided by the source to retrieve relevant items. The set of metadata is key to XDS and includes dates/times, clinical event context, document type, author, size, format, location, and patient identifiers.

PIX and PDQ: Identity Management for Patient Centricity

Managing patient identity is essential to ensuring patient centricity in an IHE-compliant architecture. AICA needs to rely on an enterprise master patient index (EMPI) that supports PIX and PDQ profiles to manage patient IDs from multiple systems and to create a common patient identifier. This will ensure that, when sharing a patient document, all the participating organizations are referring to the same patient. Despite the fact that different countries have created and tried to enforce national identifiers, many information systems still create independent (domain) patient IDs, which hampers the creation of complete electronic patient records including all documents produced in the organization. PIX profile supports the linking of patient identifiers from multiple identity domains. PDQ profile supports the ability to search for patients' documents: It allows querying by a minimal set of demographics and getting in response a complete set of demographics, usually including patient identifiers in domains of interest.

Enhanced Security and Clinical Document Retention Compliance

Compliance is a key priority for healthcare organizations worldwide. Evolving regulatory requirements regarding data privacy, retention, protection, and security and the increasing risk of severe legal and financial consequences are increasing costs related to data protection, archiving, and recovery. The typical siloed architectures of healthcare information systems make compliance with new requirements more error prone and resource intensive. AICA standards-based architecture instead can ease the complexity and the risks associated with patient information sharing and collaborative care provision.

- **Information privacy and data integrity.** Thanks to the features document repository and central document registry, it is easier for healthcare organizations to enforce strong role-based access policies to maintain patient information confidentiality according to the different national and local legislations and to run thorough compliance audits on information access more easily.
- **Long-term retention.** Medical data retention requirements vary on a national basis. It is not uncommon for retention requirements to last decades and for some providers' organizations to retain patient information indefinitely. AICA allows healthcare organizations to ease the impact of costs related to patient record retention by applying life-cycle data management policies that will support the movement of data toward the most economically efficient storage devices while maintaining information integrity and accessibility and thus auditability of the data.

Benefits for the IT Department: Lower TCO and Information Infrastructure Reliability

From an IT department management perspective, AICA will deliver tangible benefits in terms of total cost of ownership of the IT infrastructure:

- Preserving from future data migrations and reducing costs, when healthcare providers decide to implement new applications and decommission old applications
- Reducing the consumption patterns for primary storage over time and large capacities in the long-term archive
 - Mitigating the costs related to management and retention of the growing volumes of healthcare data
 - Avoiding premature decommissioning of the existing storage systems

Ensuring uptime and recovery for mission-critical information is a top priority for all health providers' IT departments. Healthcare providers must have an effective business continuity and disaster recovery (DR) strategy to cope with natural disasters and unpredictable technology failures. AICA with its unified architecture offers a more coherent environment to deploy high availability (HA) and disaster recovery solutions, adding system redundancy by eliminating single points of failure, promptly detecting failures, and balancing workloads between storage and database.

GE HEALTHCARE SOLUTION

Centricity Clinical Archive

GE Healthcare's Centricity Clinical Archive is a vendor neutral archiving and viewing solution based on the functional architecture provided by IHE profiles XDS and XDS-I – enabling content management and distribution across a collaborative care network. CCA helps healthcare organizations consolidate silos of structured and unstructured data and supports several formats and specialties, and CCA's value proposition is generally aligned with IDC's AICA information sharing capabilities.

CCA offers access to different patient information for healthcare providers and facilitates patient information sharing. A combination of vendor neutral architecture with dynamic tag morphing and content consolidation capabilities, along with a standalone or integrated Web-based zero-footprint viewer, allows the EMR to become a one-stop shop for access to a comprehensive patient record.

CCA also supports healthcare organizations' compliance with medical record privacy. CCA user management and audit log components support local IAM policies, ensuring appropriate access to patient records and user accountability. Message transmission is compliant with Secure Sockets Layer (SSL) standards, thus establishing encrypted links between servers and clients.

CCA information life-cycle management tools help healthcare organizations transition patient data to the most cost-efficient storage tiers, compressing content, while maintaining accessibility to the data through the long times required by the various national and local patient records retention laws.

CCA provides an HA/DR solution based on a combination of software from VMware and Symantec, helping ensure:

- System redundancy, eliminating single point of failure and detecting failures as they occur
- Operational performance by balancing workloads
- Establishing tested failover processes when major disasters occur

Centricity Clinical Archive includes the products and services described in the sections that follow (see Figure 2).

Product Components

- Centricity Enterprise Archive (EA) provides a multi-ology, multisite clinical content repository, enabling consolidation of IT infrastructure for archiving and managing DICOM and non-DICOM medical content.
- An IHE XDS registry stores the catalog of patient clinical information available and supports user query.
- Centricity Universal Viewer Zero Footprint (ZFP) integrates with the registry and provides Web access to patient clinical records for care providers.
- Media Manager mobile application supports the acquisition, documentation, and storage of visible light images in CCA, making it part of the patient record. Media Manager supports wound care, skin donor assessment, burn assessment, pressure ulcers, emergency department, plastic surgery, and ad hoc image capture and documentation workflows – with automated patient identification and guided documentation steps to publish on the XDS registry.
- An enterprise master patient index supports both PIX and PDQ queries to link patient identifiers across multiple clinical information systems and create a commonly known patient identifier for each patient.
- A clinical gateway provides the messaging interface engine, which allows the different clinical information systems such as HIS, RIS, and CVIT to insert and update medical content in the content repository (EA) and in the EMPI.
- Audit Trail Repository receives audit messages from other components of CCA via interfaces based on the IHE profile Audit Trail and Node Authentication (ATNA) establishing security measures, which provide patient information confidentiality, data integrity, and user accountability.
- A device interface engine connects nonstandard devices and systems to store data in the content repository (EA) using either IHE XDS or XDS-I.

Service Offering

GE Healthcare offers a team of clinical and IT experts to help enable solution planning, implementation, service, and management of feature enhancements:

- **Solution consulting.** Assessing the status and future needs including the number and type of departmental systems, IT infrastructure, and processes to provide recommendations for long-term sustainable data management and sharing
- **Implementation services.** Professional services to help interface existing departmental IT systems from various vendors with the solution, enabling regular consolidation of information (DICOM and non-DICOM)
- **Data migration services.** A onetime service to migrate and link historical data from the departmental systems

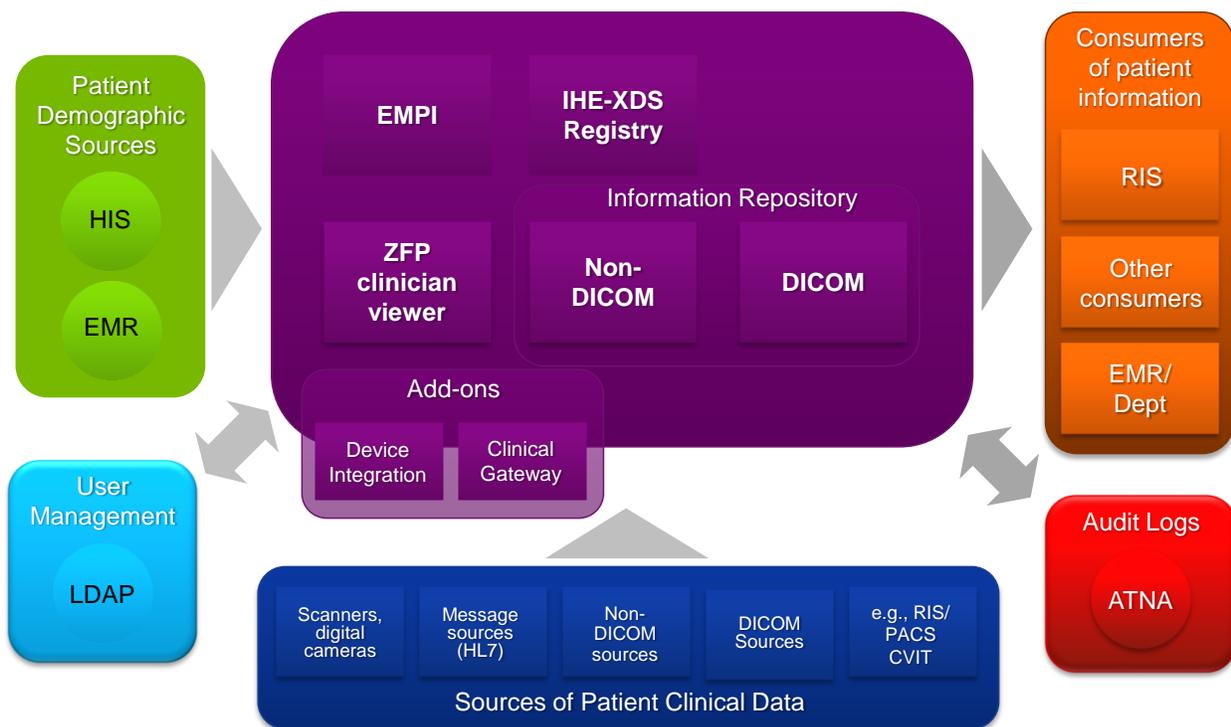
Solution Modularity

CCA is structured around modules that can be implemented in different steps according to the organization needs. The solution provides a highly scalable environment that can serve different levels – single department, enterprise, multi-institution – and can be progressively enriched with the needed functionalities depending on the organization's goals:

- A departmental DICOM archive only to enable independence from PACS
- An enterprise DICOM archive to extend the independence to other "-ologies" beyond radiology
- An enterprise multimedia archive to enable independence from data formats (DICOM and non-DICOM content) and enable access through new form factors (e.g., mobile)
- A multi-institution archive and data management to help ensure seamless collaboration across organizations belonging to an integrated care network

FIGURE 2

Centricity Clinical Archive Solution



Source: GE Healthcare, 2015

GE Healthcare's Centricity Solutions Customer Achievements⁹

Globally, healthcare providers that adopted CCA are reporting key benefits in terms of:

- **Improved clinician productivity:** In Belgium, the Antwerp University Hospital, after deploying an XDS-compliant CCA, reported approximately 30% improvement in clinicians' productivity as a result of greater visibility to patient data produced across different departments. Moving from silos of data to a single, unified source and gaining secure access in the enterprise resulted in more effective collaboration between care professionals and sped up cross-functional workflows including administering and accounting.
- **Reduced total cost by consolidation of disparate PACSs and RISs:** In Canada, Southwestern Ontario Diagnostic Imaging Network (SWODIN) relies on CCA to connect 62 hospitals with disparate systems. SWODIN reports that the deployment of CCA helped it eliminate 60,000 to 90,000 duplicate exams annually, resulting in \$2.1 million to \$4.5 million of savings per year.
- **Regional Image Exchange for more accurate and collaborative decision making:** In Sweden, Västra Götaland Region (VGR) developed a single information sharing infrastructure, connecting 17 different public and private hospitals, 121 healthcare centers, and 170 public dental care centers by deploying CCA and the Web Viewer. This provided immediate access to the complete patient history, improving turnaround of second opinions by remote specialists, enabling teleradiology across the region (approximately 40,000 exams per year from external providers), and enhancing the quality of care and the patient experience.
- **Enhanced productivity with Web-based access to patient records throughout the enterprise:** In the United States, a large academic medical healthcare system deployed CCA to enable multisite clinical content repository for radiology and cardiology. This helped provide economies of scale through data consolidation while enabling enterprisewide access to a unified patient record for enhanced quality of care.

Investing in AICA solutions will enable healthcare providers to have a complete view of the information they produce and use that information to support new evidence-based care models, measure operational performance, and implement optimization efforts. The clinical and IT benefits brought by AICA will be essential requirements for securing the future of healthcare organizations. The openness of the information environment and the scalability of the infrastructure offered by AICA solutions will also enable new cost-effective technology delivery models (e.g., cloud-based solutions).

ESSENTIAL GUIDANCE

Building a Future-Ready Information Management Architecture

Healthcare providers that want to leverage the benefits offered by AICA solutions should plan the deployment of these solutions as a key part of an end-to-end information strategy aimed at supporting integrated care objectives. AICA is an essential part of the technology layer of this strategy: Its configuration and use must be aligned with processes and organizational aspects, such as when, with whom, and how information can be shared and accessed. AICA is a long-term strategic investment that demands a step-by-step approach based on a shared vision between IT departments, clinicians, and organization executives.

⁹ GE Healthcare's Centricity Clinical Archive case studies. These case studies were produced by GE Healthcare without any independent validation by IDC. Results may vary.

Next Monday: Know the Unknown

- Map all the data produced in the organization, including multimedia data sets that will be managed through the AICA.
- Assess how data is managed (or unmanaged), what the current life cycle of the data is, where data is stored, and how data is shared with other departments and patients (hardcopy, CD or other devices, digital format). Assess the reliability and the security of current IT infrastructure.
- Assess the information requirements of clinical staff, administration, and executives and how they currently use data.
- Start quantifying the costs of managing information using the current infrastructure and processes organization.
 - **IT costs:** Maintain and eventually grow the supporting infrastructure.
 - **Clinical and business costs:** Understand the current limits of using the various information types produced and how they affect compliance, operational efficiency, care quality, and collaboration across departments and other organizations.
- Establish where the organization is failing to meet strategic objectives, such as compliance, quality of care and patient safety, and financial performance, as a result of the current approach to information management and lack of systems interoperability.
- Define a team of key project leaders between IT, clinical, and administration departments that will decide on a set of priorities and advocate for and support the project among their peers.

Next Month: Establish and Start to Implement a Plan for Consolidating Your Information Management

- Organize your plan in key steps. First, address information sources that will deliver value against your set of priorities faster. Demonstrating short-term benefits will ensure continuous support for your business case with organization executives.
- Use industry standards to unify clinical IT infrastructure, preserving existing investments and helping lower costs of information management.
- Establish key requirements for your AICA solution in terms of scalability, security, availability, and disaster recovery, and verify the fitness of the current IT infrastructure (and eventually invest to meet the requirements).
- Establish standard rules on access to information and sharing based on optimized clinical workflows: Set up the necessary interfaces with line-of-business applications producing/consuming information and in particular the EHR.
- Start with the migration of more homogeneous/standardized information sources, such as DICOM-compliant information, to build a coherent basis that can then be extended to other sources through the adoption of XDS.
- Start measuring the impact of consolidated information management to build the business case to expand the reach of the repository.

Next Year: Your Data as the Platform

- Once you achieve a unified clinical IT infrastructure, continue to assess your organization's performance along the dimensions of care quality, patient experience, and operational efficiency.
- Use all health data produced by your organization and partner organizations to assess population health needs and how your current health services offering is meeting them.

- Use information to build new and more appropriate services driven by analytics aimed at enabling greater convergence on the patient journey across the health value chain. Use intuitive visualization tools such as dashboards to support end users in their decisions.
- Maintain a closed-loop learning environment based on data-driven decision making and the judgment of experts. Engage in business process reengineering in response to new insights coming from data analysis. Assess progress and adjust internal investment priorities to match evolving requirements.

About IDC

International Data Corporation (IDC) is the premier global provider of market intelligence, advisory services, and events for the information technology, telecommunications and consumer technology markets. IDC helps IT professionals, business executives, and the investment community make fact-based decisions on technology purchases and business strategy. More than 1,100 IDC analysts provide global, regional, and local expertise on technology and industry opportunities and trends in over 110 countries worldwide. For 50 years, IDC has provided strategic insights to help our clients achieve their key business objectives. IDC is a subsidiary of IDG, the world's leading technology media, research, and events company.

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