Enterprise Architecture in Healthcare v2.0

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Enterprise Architecture: Much More Than You're Thinking

Most usage of the term "EA" is focused primarily on what might more precisely be called "IT architecture" or "information systems architecture," which is concerned with the logical and physical descriptions of data, applications, and hardware assets.

EA "is a blueprint for organizational change defined in models [using words, graphics, and other depictions] that describe (in both business and technology terms) how the entity operates today and how it intends to operate in the future; it also includes a plan for transitioning to this future state." And blend in the notion that EA is all about creating a dynamic tool for understanding the enterprise and managing enterprise transformation, an analytical tool for controlling enterprise complexity, a shared language to facilitate and expedite communication about the enterprise, and a decision-supporting knowledge base to help management create and more quickly achieve objectives like strategic advantage, alignment, agility, efficiency, synergies, and value.

EA- related activities: systems development, systems analysis, systems design, network design, cyber-security, and data design and administration, but also non-IT things like strategic planning, business process reengineering, change management, human resources planning, security and continuity planning, innovation and transformation, financial systems and controls planning, and much, much more.

At some point you'll need to deal with EA processes and procedures, and the place of EA in things like resource allocation, project management, cyber and physical security, IT standards development, and enterprise strategic, tactical, and operational planning.

https://www.zachman.com/resources/ea-articles-reference/320-enterprise-architecture-much-more-than-you-re-thinking-dr-leon-kappelman

The Rising Importance of the Enterprise Architect

Enterprise architecture focuses on four crucial C's: connection, collaboration, communication and customers. In its simplest terms, enterprise architecture is the process of aligning a business's strategic vision with its information technology. It connects different business units for synergistic communication and collaboration, creating a more seamless customer (or end-user) experience.

http://www.cio.com/article/2439397/it-organization/the-rising-importance-of-the-enterprise-architect.html

Where Is Enterprise Architecture in Healthcare?

Over the past two decades, enterprise architecture (EA) has gradually emerged to help institutions in many markets build new operating models and connect their as-is and to-be business strategies and IT capabilities. Though the discipline still lacks industrywide consistency, EA advocates in both academia and industry readily point to successful EA frameworks offering business-IT governance, standardization, and more sophisticated software and information infrastructures.

In fact, virtually all of today's healthcare buzzword initiatives -- population health, health information exchanges, health analytics, medical neighborhood models, performance and quality management -- share common capabilities manageable through EA.

There are clear reasons why EA should be at the top of every health enterprise project portfolio:

1. **Improving performance and health outcomes:** The quality of an organization's process execution and analytical insights is directly dependent on interoperability, automation, data quality, and timeliness. If you want to build a performance-oriented health delivery machine, EA provides the engine and fuel.

2. **Controlling costs:** EA has a proven track record of helping organizations control operational expenditures and increase return on assets through reductions in hardware purchasing, software licensing, staff training, and support costs. EA is good business regardless of transformational goals.

3. **Protecting profitability:** Health organizations are increasingly carrying higher financial risks. These risks are compounded when spending does not address sustainable capability creation and instead erodes margins.

4. **Managing security and risk:** For all the right reasons, ACOs and PCMHs often increase the number of people, processes, and systems involved in care delivery. But complexity is the enemy of security. EA offers a means of controlling risks.

5. **Encouraging better planning:** Quality and consistency go hand in hand. In the face of rising care practice and business model diversity, frontline practitioners need consistent processes for treating and managing patients. EA provides a common framework for both defining and operationalizing the to-be state of the business.

http://www.informationweek.com/healthcare/leadership/where-is-enterprise-architecture-in-healthcare/d/d-id/898882

Enterprise Architecture in Healthcare

Many architecture groups in healthcare organizations are struggling with the communication with the rest of the organization. In healthcare, the patient cure and care processes are the center of focus, and the information is seen as relatively unimportant by most healthcare professionals and managers. This makes it difficult for architecture groups to gain recognition from both the organization at large and from management in particular. In organizations like banks, insurers or government agencies, where large parts of the primary process are 'inside' the information systems, the perception of architecture is different.

We also see that the responsibilities for architecture are often not assigned properly. That has to do with the previous point, but also with the organization structures in healthcare. The relatively autonomous role of physicians in hospitals makes centralized decision-making on information- and IT-related issues difficult to organize. Vested interests and specific local needs clash with the general goals of effective and efficient information systems across the organization.

Information flows have become the 'circulatory system' of the organization. Many organizations, however, lack a clear overview and do not pay adequate management attention to information. Fragmentation of data in silos, inconsistencies, unclear responsibilities, privacy sensitivity, complexity and a large number of external information flows are just some of the issues that make this a growing problem.

In particular, the increased reporting pressure from the government, insurers and regulators makes good management information paramount. This is really an issue for the boardroom, given the serious risks involved. In the Netherlands, recent publicity about substantial fines for hospitals and physicians because of inaccurate invoicing, and the refusal by accountants to approve the financial statements of healthcare organizations clearly show the need for improvement in this area. The complexity of the healthcare system in the Netherlands and many other countries makes this a challenging task.

http://blog.bizzdesign.com/enterprise-architecture-in-healthcare

Role of Enterprise Architecture in Healthcare Organizations and Knowledge- Based Medical Diagnosis System

Healthcare organizations are confronting various issues; the major issue in these issues is medical errors and providing medical services where doctors are inexperienced or absent. The healthcare industry addresses the lack of interoperability and integration among systems; it will never get the advantages of an Electronic Medical Record (EMR). Many healthcare organizations operate Electronic Medical Record systems independently. These systems are incapable to connect with other systems.

The Open Group Architecture Framework (TOGAF): It is based on United States Defense Department Technical Architecture Framework. The TOGAF was introduced in 1995 for information management. It is a generic framework and, for this reason, any firm may employ the TOGAF freely to design EA.

The TOGAF is the best to develop an enterprise architecture model for Knowledge-Based Medical Diagnosis Systems because it provides a step-by-step process in the form of layered architectures. The TOGAF divides enterprise architecture into four layered categories

- **Business architecture** explains the processes used for a business to achieve its goals for instance the business architecture of health information system consist of health services like patient records, individual health records, classification of diseases, symptoms and procedures, diagnostic reports, suggestions, prescriptions and treatment plans, etc.
- **Application architecture** deals with the development of different applications and the interaction between them. This architecture is highly applicable in the designing and development of relevant software requirement for interfacing with healthcare systems like standardized instruments for data collection, data-communication services, data analysis and modeling, report generating and speech recognition application in local language.
- **Data architecture** explains methods of data storage and retrieval, Data models, Metadata dictionary, Classification standards and systems
- **Technical architecture** explains how software infrastructure and hardware infrastructure support applications and their interactions, Local/wide area networks, Operating system Interoperability, mobile phone technology, speech recognition technology and web technology.

http://www.scielo.br/scielo.php?script=sci_arttext&pid=S1807-17752016000200181

Iterative Approach to Build an Enterprise Architecture for Health Insurance Exchange

Oracle Architecture Development Process

Oracle Enterprise Architecture Framework

http://www.oracle.com/us/solutions/enterprise-architecture/arch-planning-healthcare-exchange-1556909.pdf
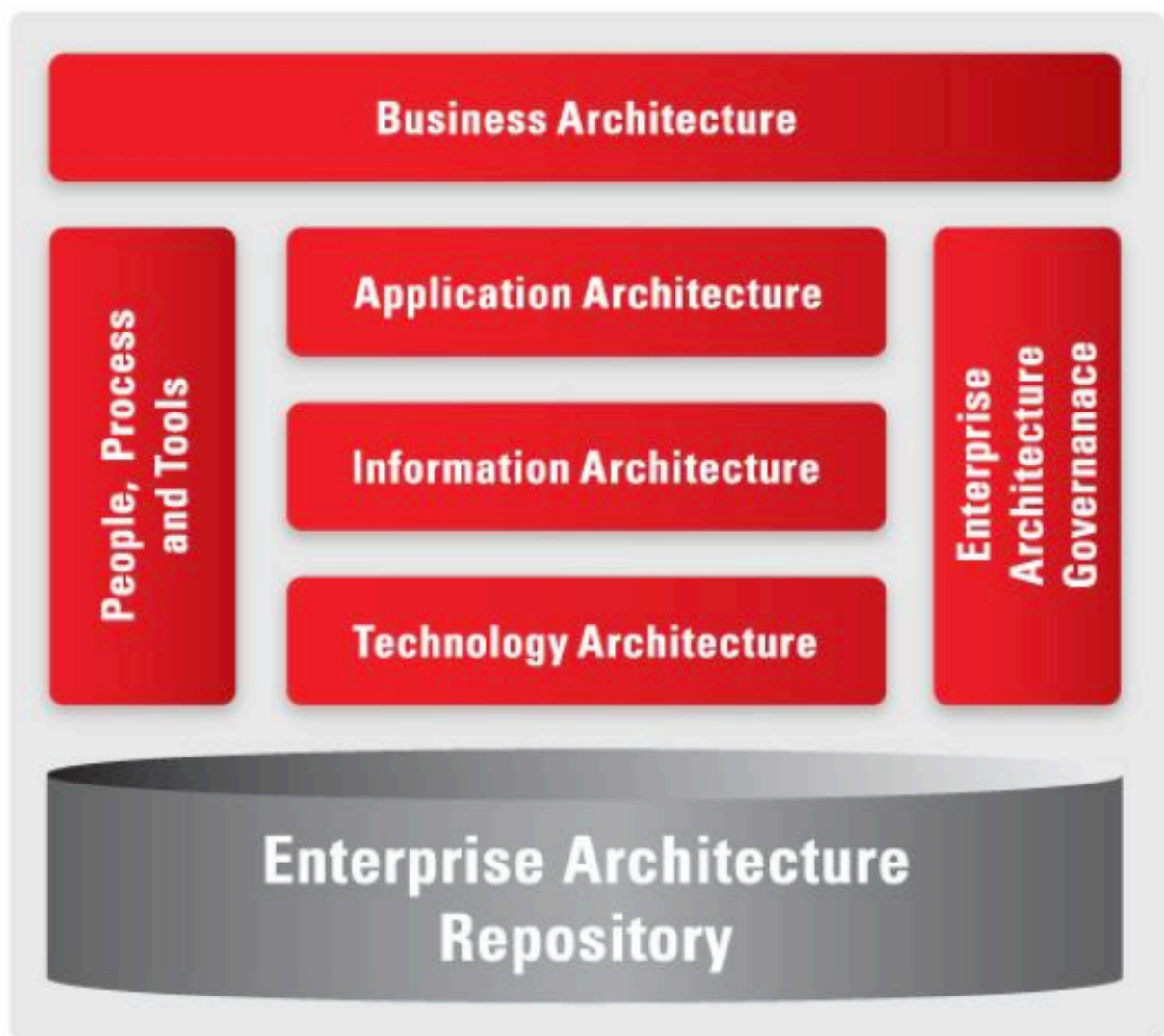
A Practical Guide to Developing Enterprise Architecture

Enterprise architecture is a logical organization of a business and its supporting data, applications, and IT infrastructure, with clearly defined goals and objectives for the future success of the business. A typical architecture consists of diagrams, or models, that show how aspects of your business relate. For example an organizational chart is a model of how business units relate to each other.

Businesses should have an "as-is" architecture that represents its current state, and a planned architecture to show the direction of the business over the next one to five years.

Enterprise architecture aligns the following key areas. Note the examples in each area:

- Business: Processes, strategies, organization charts, and functions
- Information: Conceptual, logical and physical data models to show what information is needed and how it relates to other information For example, a customer and an order
- Application: Portfolios, interfaces, and services
- Infrastructure: Network concept diagrams, technology reference models

Step 1. Identify the purpose of your architecture

- What information is important for the architecture?
- How much detail is needed to support analysis and decision making?
- Who will produce or use the architecture?
- What is the expected ROI of the architecture?
- What are the maintenance considerations?

Step 2. Identify your business questions

- What is the impact of retiring an application?
- What is the impact of moving a location?
- What applications are needed to support a business process?
- What is the impact of replacing servers?
- What processes need to be developed to support a new strategy?
- Where are the gaps or redundancies in our application portfolio?

Step 3. Identify assumptions and business rules

Every business has rules. For example, if you are capturing information about critical business processes, you must also capture any regulations or corporate standards for the process.

You should capture assumptions about your architecture, such as "New application information will be uploaded on Friday" or "Every business unit is responsible for documenting business processes."

Step 4. Identify your framework

The following industry standard frameworks can help you create an enterprise architecture: ToGAF, Zachman, EA3, and DoDAF. Using a standard framework gives your architecture a "skeleton" that you can then build out with your models.

A framework also provides guidance on what information you need to capture based on the stakeholders who will use the architecture. It provides guidance on organizing information but does not suggest a specific implementation for your architecture.

A framework helps organize the key areas of the architecture and identifies the views you need to model, such as the perspective and the data needed to answer business questions.
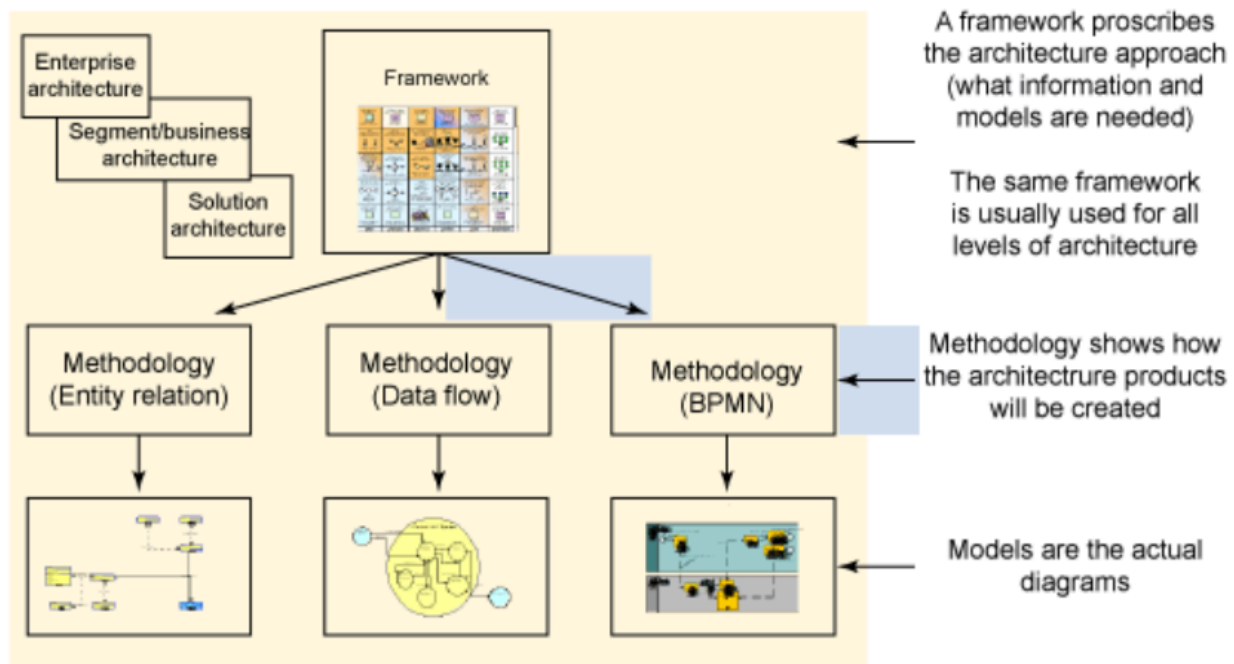
Step 5. Create a metamodel

A metamodel is an abstract view of your architecture. It shows the data you are trying to capture, and the relationships among the data. This is where you realize alignment, which is based on answers to your business questions.

Your metamodel should include the following features:

- Relationships between the architecture elements. For example, a business process to an application.

- Definitions of the elements. For example, the meaning of the term "application" and what properties you will capture.
- Traceability to business questions. For example, if your question is "What applications support what business processes?" You know you need a business process and an application in your metamodel, with a direct or indirect relationship between them.

Step 6. Identify the models needed in the architecture

After knowing the audience and the content you want to model you can then identify the diagrams you need to create. It is important to remember that you cannot use a single diagram to model everything in your EA. Further, separation of the architectural views, such as the application view from business view, is a best practice.

Step 7. Integrate the architecture

Link the data that you captured together based on the relationships you identified earlier. If you have existing architectures for projects or lines of business, and you want to create an enterprise architecture, the easiest approach is to populate your EA from the bottom up. Take existing architectures and pull common elements into a repository. Moving forward, try to standardize the models and terminology that is used across the organization.

Allow for at least 50% of the time allotted to developing a model to be for analysis; this includes reviewing the model to verify and validate it. Do quantitative as well as qualitative analysis. Math is important, especially for showing ROI. Quantitative analysis can be used to show bottle necks in a process, time savings, cost savings, and elimination of redundancies if you use an industry standard method.

https://www.ibm.com/developerworks/rational/library/enterprise-architecture-maximum-value/index.html

Enterprise Architecture Paving the Way to World Class Healthcare Digital Strategies in the Middle East

More specifically Healthcare Enterprise Architecture (EA) is the practice that shows an organization how to balance the delivery of immediate business-value while developing a longer-term strategic capability. This strategic capability holds the promise of making the organization more responsive to change through the detailed understanding of business processes, the alignment of business and IT, and the coupling of knowledge management with enterprise transformation programs.

Enterprise Architecture uses well developed frameworks such as Zachman, TOGAF (The Open Group Architecture Framework) and SoA (Service Oriented Architecture) to define the business, information, data, applications and technology landscapes.

In simpler terms each of these dimensions have artifacts like the business layer would include the organizations roles, the organizational structure, their strategic objectives, documented business process maps, their value chain, etc.

By creating relationships between the modules used by specific organizational units using the frameworks of Enterprise Architecture you would be able to understand the gaps in each of these dimensions as well as have a high-level (somewhat aerial) view of each artifact (asset) in your business also referred to as your enterprise and be able to plot the desired target state enterprise architecture which will clearly demonstrate the deployment roadmap for your business to achieve the desired level of maturity in your healthcare digital strategy. The other very valuable aspect is the ability to have clear visibility of all your business, information, data, applications and technology assets and re-use rather than re-purchase with the intent of reducing cost and duplication.

http://health-e-solutions.com/blog/enterprise-architecture-healthcare/

Healthcare Architecture for the Real World Making EA, SOA, and Localization More Than Buzzwords

Five success measures of your architecture…

5) Durable, with decreasing rate of change
- Evolution, not revolution. If you get it right, changes become small and incremental

4) Standards-based, with variances that are localized to minimize impact.
  - Build on existing work
  - Depart only where you need to
  - Any time two things touch, that touch-point should be a standard

3) Product-neutral
  - Organizations cannot afford to base their entire future on a dependency of any one product

2) Clear
  - Make sure your architecture is understandable, concise, and accurate
  - Use "separation of concerns" and "viewpoints"
  - Make sure your architecture is suitable for its intent
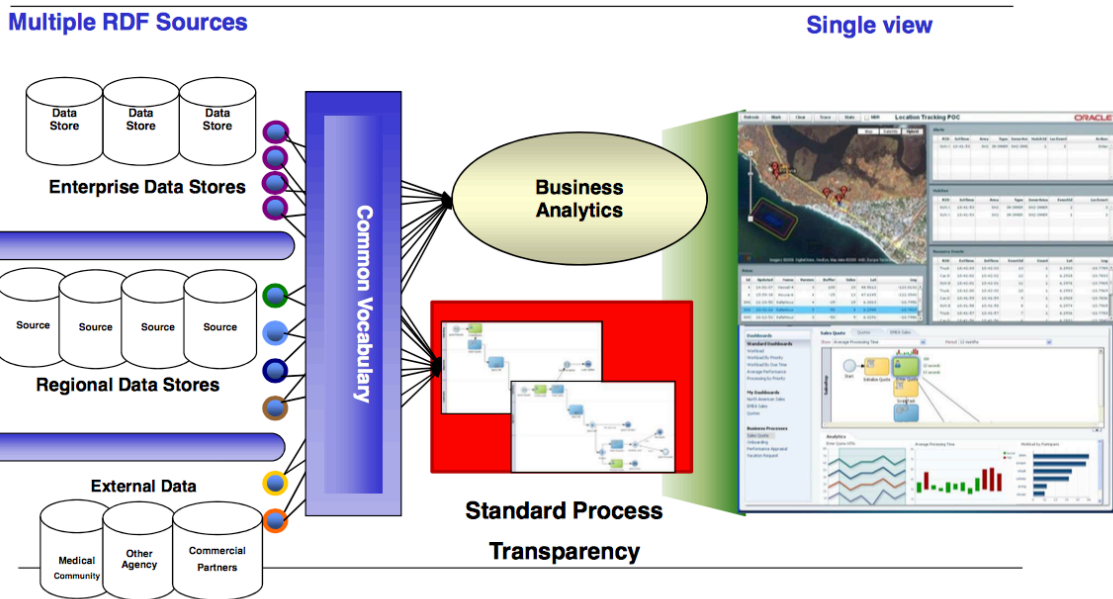
1) Useful
  - Architectures that sit on shelves add no value
  - Receiving and accommodating feedback indicates that the architecture is being used.
  - Measuring feedback is a metric of use

https://www.uef.fi/documents/677096/736588/Solea09-Rubin.pdf/a8da086a-73a4-4bba-bd42-13d18042d764

Enabling an Agile Healthcare Enterprise Architecture with BPM/SOA and Semantic Technologies

Semantic E2E Architecture

*Source Business Mission Area CTO/CA Office of the DCMO

http://www.omg.org/news/meetings/workshops/SOA-HC/presentations-2011/14_A-6_Chow.pdf