ZACHMAN ISA FRAMEWORK FOR HEALTHCARE INFORMATICS STANDARDS

Each cell contains standards for healthcare and healthcare information system:

	Why (Motivation)	When (Time)	Who (People)	What (Content)	How (Function)	Where (Network)
	Vision (Guidelines)					
Scope (Contextual)	1. Personal and public health impact, and care delivery business case.	2. Identification of significant health care and care delivery events.	3. Essential health service organizations and their functions.	4. Description of important health service and care delivery information.	5. Important health care and care delivery services.	6. Identification and description of organization and individual locations.
	Design (Standards)					
Enterprise and Environment (Conceptual)	7. Personal health benefit and care delivery business objectives.	8. Sequence and timelines of health care services.	9. Healthcare information system workflow.	10. Semantic description of health care processes.	11. Conceptual activity model of health care delivery.	12. Structure and interrelationship of health care facilities.
Health Information System (Logical Design)	13. System functional requirements.	14. Health care event phases and process components.	15. Health care information system human-system interface architecture.	16. Logical data model for health care information.	17. Application architecture with function and user views.	18. Connectivity and distributed system architecture.
	Implementation (Standards)					
Health Information Technology (Physical Design)	19. System operational requirements.	20. Health care information system control structures.	21. Health care information system human-system interface description.	22. Physical data model for health care information.	23. System design, language specification, and structure charts.	24. Health system information network detailed architecture.
Health Information Components (Modules and subsystems)	25. Technical requirements.	26. Health care information system component timing descriptions.	27. System security architecture and operations.	28. Health care information metadata, and DBMS scripts.	29. Code statements, control blocks, DBMS stored procedures, etc.	30. Physical data network components, addresses and communication protocols.
	Operation (Standards)					
Functioning Health Information System	31. Technology operational requirements.	32. Health care information system operation schedules.	33. IS participant description.	34. Functioning database, knowledgebase.	35. User procedural and system documentation.	36. Operating health system communication network.

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Description of framework cells:

Cell	Row	Column	This cell is appropriate for standards, models and descriptions which:	Example of standards which may fit in this cell:
1.	Scope	Why	Address public and individual health and the business of care delivery across enterprise boundaries.	A standard method to quantify the public health impact of healthfulness in society.
2.		When	Identify and describe the fundamental health care and care delivery events independent of profession, specialty or care delivery environment.	A standard characterization of essential health care and care delivery events useable by all professions, specialties, disciplines, and in all care delivery environments.
3.		Who	Identify the essential components of the health care delivery system.	A standard method for identifying the key organizational components of the care delivery system and the standard description developed by this method.
4.		What	Identify and describe the important global health service and care delivery information.	A designation of the principal information components in health care.
5.		How	Identify, describe, and regulate important health care and care delivery services.	A standardized designation of the fundamental processes shared by health care delivery organizations.
6.		Where	Identify and describe the global entities involved in delivering health care services.	A standard identification and description of individual and organizational participants in health care.
7.	Enterprise & Environment	Why	Identify and describe the means to quantify individual healthfulness and the business objectives of a health care delivery organization.	A standard method for quantifying the value of individual healthfulness and its contribution to organizations.
8.		When	Determine the order and timing for the processes of fundamental health care services in a care delivery organization.	A standardized process modeling methodology or a conceptual process model which could be a standard for a group of similarly functioning care delivery organizations.
9.		Who	Identify and define the roles of individuals participating in health care delivery in an organization.	A standardized workflow modeling method, or specification which could be a standard for similarly operating care delivery organizations.
10.		What	Define and describe the essential types of information required for operation of a care delivery organization.	A standard method for semantic description, narrative or conceptual data model useable for health care delivery.

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Description of framework cells:

Cell	Row	Column	This cell is appropriate for standards, models and descriptions which:	Example of standards which may fit in this cell:
11.		How	Identify and describe the fundamental health care, management and support activities in a care delivery organization.	A standardized activity modeling methodology or a conceptual activity model standardized for organizations which operate in an essentially identical manner.
12.		Where	Specify and describe the layout of health care facilities and their interconnection.	A standard functional schema for the organization and linkage of facilities within an organization.
13.	Health Info System	Why	Relate to the functional requirements and the test and acceptance criteria for a health care information system.	Standards for information system project life cycle management, testing, and documentation, along with standard functional requirements shared by similarly functioning organizations.
14.		When	Detail the methods used to describe or descriptions of processes and event sequences within a care delivery organization.	Standard methods for specifying events and timing at the logical level and a specification for event sequence which could be standardized for similarly functioning care delivery organizations.
15.		Who	Detail the methods used to describe, or the description of the functioning architecture for the interaction of individuals with the health information system.	Standard methods for specifying the architecture of the human-computer interface, and descriptions of such interfaces used by similarly functioning care delivery organizations.
16.		What	Detail the methods used to prepare a logical data model, or the non-technological description of the data used for care delivery in an organization.	Standard methods for preparing logical data models, and logical data models useable by similarly functioning care delivery organizations.
17.		How	Describe the structure of software to support health care and care delivery processes.	Standard methods, techniques and software components for fundamental health care and care delivery processes.
18.		Where	Describes the communication architecture supporting health care and care delivery.	Standard methods and techniques for representing information system linkages within health care organizations.
19.	Health Info Technology	Why	Translates health care and care delivery functional requirements into system operational requirements.	Standard high level technical specifications of system operational requirements.
20.		When	Technical design of health care information system control and timing structures.	Standard technical specifications for healthcare information system control mechanisms.

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Description of framework cells:

21.		Who	Technical descriptions of the interaction of individuals with the healthcare information system.	Standard practices for the human-system interaction in healthcare information systems.
22.		What	Detail the methods used to prepare a physical data model, or the technological description of the data used for care delivery in an organization.	Standard methods for preparing physical data models, and physical data models useable by similarly functioning care delivery organizations.
23.		How	Specifies the technical design of a healthcare information system, including structure, language, database and communication components.	Standard specifications for program languages and communication protocols.
24.		Where	Details the technical network architecture of a healthcare information system.	Standard practices for representing network architecture along with standard architectures for networks supporting similarly functioning health care organizations.
25.	Health Info Components	Why	Description of technical requirements for health care information system function.	Standard rules and specifications of end conditions and means to obtain results.
26.		When	Timing descriptions of the components of health care information systems.	Standard timing and machine cycle descriptions and definitions.
27.		Who	Identification of individuals and their access to specific components of the health care information system.	Standard definitions and descriptions of individual roles, data access and system operation permissions.
28.		What	Physical data definitions, fields and addresses for healthcare information.	Standard metadata for technology specific implementations of healthcare information.
29.		How	Descriptions or scripts for component level applications in health care information systems.	Standard “programs” and similar structures such as relational database stored procedures for information systems that support similarly functioning health care organizations.
30.		Where	Description of the physical network components as nodes and linkages.	Standards for specification of node addresses and the protocols for communicating among nodes.
31.	Functioning Health Info System	Why	Definition of the business and operational strategy for a health care organization.	Standards for health care outcomes and quality assurance of care delivery processes.
32.		When	Schedule of health care organization tasks and operations.	Standard timelines and cycles for health care and care delivery tasks such as billing cycles, order entry to fulfillment, etc.

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Description of framework cells:

33.		Who	The physical health care organization.	Standard list of providers and practitioners.
34.		What	Description of health care information.	Standard specification of health care information.
35.		How	Actual health care and care delivery activities.	Practice guidelines, accepted practices, and activities and outcomes required by regulatory authority.
36.		Where	The health care facility and provider network.	Standard addresses (e.g. postal codes) for health care facilities and practitioners.

When filling out the chart consider that the framework is a continuum from theory to practice: healthcare informatics standards and standardization activities as well as non-informatics activities may be relevant to all cells in this framework.

Standards developers and other organizations may identify a cell for a primary classification and possibly one or more other cells for secondary classifications. For example:

- ANSI X12N and Health Level Seven specifications would likely have a primary classification in Cell 30 as information communication protocols.
- ASTM E 622, 627, and 1340 would likely be relevant to Cell 13 while the Federal Information Processing Standard for IDEF1X data modeling would most likely fit in Cells 16 and 22.
- Organizations such as AHCPR and JCAHO could add practice, care delivery, and information standards to the framework.

While a proponent may enter a standard or activity in any number of cells in the framework, identification with a single cell indicates that the standard or activity is highly focused and concentrated on a single important aspect of healthcare informatics.

Additional information on the Zachman Architecture can be found at **http://www.zifa.com/**, the home page for the Zachman Institute.

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