Data Management Office

Data Architecture and Modeling Policy

Saudi Commission for Health Specialties

Version 1.0

Table of Contents

Document Control & Approval History

Name of Document	Version	Reason	Date	Drafted / Updated by	Reviewed by	Approved by	Date of Approval
Data Architecture and Modeling Policy	1.0	Initial draft	04/11/2024	Ascend Solutions	1. Zeeshan Ali 2. Hesham Elbially 3. Dr. Abdullah Alamoudi 4. Ahmed Soliman		

1. Introduction

This policy outlines the SCFHS approach to establishing a comprehensive and structured Data Architecture and Modeling framework to enhance data quality, security, and accessibility while aligning with SDAIA's National Data Management Office (NDMO) framework guidelines and DAMA DMBOK best practices. The policy aims to ensure that data architecture supports the organization's strategic goals, optimizes data usage, and maintains compliance with data governance standards. This document serves as a guideline for data architects, modelers, and other stakeholders involved in data management to develop, maintain, and safeguard the SCFHS' data assets.

2. Scope

This policy applies to all SCFHS employees, contractors, and third-party vendors who are involved in managing, designing, or accessing data and data models across operational, analytical, or business intelligence systems. The policy covers all data assets within the SCFHS and includes processes for data classification, architecture management, and lifecycle management across all structured and unstructured data forms.

3. Goal

The primary purpose of this policy is to establish a robust data architecture and modeling framework that aligns with the SCFHS' data management and personal data protection strategy. This policy ensures consistent and structured data management, aids in achieving compliance with regulatory requirements, and enables informed, data-driven decisions. The SCFHS aims to:

a. Enhance data quality, governance, and access control.
b. Standardize data modeling practices across all business areas.
c. Ensure data architecture supports strategic requirements and aligns with the SCFHS' enterprise architecture.

4. Definitions

i. **Data Architecture**: The structural framework that manages data assets and aligns with the SCFHS strategic objectives.
ii. **Target Data Architecture**: The desired future state of the SCFHS data structure and organization.
iii. **Baseline Data Architecture**: The current, existing data structure and organization at the SCFHS.
iv. **TOGAF**: The Open Group Architecture Framework, a model for developing and managing IT architecture.
v. **Zachman**: A framework for organizing enterprise architecture with a focus on comprehensive data structures.
vi. **Data Model**: Representation of data at various abstraction levels (conceptual, logical, physical) within the SCFHS.
vii. **Key Processes**: Business operations essential to the SCFHS mission and activities.
viii. **Key System Components**: Critical IT elements, including applications, databases, and platforms.
ix. **Architecture Change Management**: The process for reviewing, approving, and implementing data architecture modifications.
x. **SDLC**: Software Development Lifecycle, a process for designing, testing, and deploying software.
xi. **Data Architecture Checkpoints**: Milestones within SDLC to ensure alignment with data architecture standards.
xii. **Conceptual Model**: High-level depiction of business entities and their relationships.
xiii. **Logical Model**: Detailed, attribute-focused expansion of the conceptual data model.
xiv. **Physical Model**: Database-specific structure detailing tables, keys, and data types.
xv. **Metadata**: Data describing other data, including lineage, ownership, and definitions.
xvi. **Version Control**: System for tracking and managing changes to data models.
xvii. **Data Integration**: Process to combine data from various sources for a unified view.
xviii. **Interoperability**: Ability for different data systems to operate in conjunction with one another.
xix. **Data Quality**: Standards ensuring data accuracy, consistency, timeliness, and completeness.
xx. **Data Governance**: Policies and practices to manage data integrity, security, and usage.
xxi. **Data Stewards**: Individuals responsible for managing data quality and compliance within assigned areas.
xxii. **Data Architects**: Professionals designing and managing data architecture solutions.
xxiii. **Data Modelers**: Specialists who build and document data models at all levels of detail.
xxiv. **Access Control**: Security measures restricting data access to authorized users only.
xxv. **Privacy**: Safeguards protecting personal or sensitive data in compliance with regulations.
xxvi. **PII**: Personally Identifiable Information, sensitive data subject to privacy regulations.
xxvii. **SDAIA NDMO**: Saudi Data and Artificial Intelligence Authority National Data Management Office, regulatory body for data standards.
xxviii. **Data Governance Committee**: Group overseeing policy compliance and data architecture standards.
xxix. **Exception**: Authorized policy deviations granted under specific conditions.
xxx. **Policy Review**: Annual process to ensure policy relevance and alignment with goals and regulations.

5. Policy Statements

5.1 Data Architecture Framework

5.1.1 Target Data Architecture Development

a. The target data architecture shall be developed in line with the SCFHS strategic data management objectives.
b. Data architecture shall adopt widely recognized frameworks, such as TOGAF or Zachman, to ensure consistency and interoperability within the SCFHS' IT ecosystem.

5.1.2 Baseline Data Architecture

The SCFHS shall define its baseline, or current state, Data Architecture to support the transition to the target state. This includes:

a. **Data Model**: Representation of the SCFHS' enterprise data at conceptual, logical, and physical levels.
b. **Key Processes**: Documentation of current business processes critical to operations.
c. **Key System Components**: Identification of essential applications, databases, and analytics platforms supporting key processes.

5.1.3 Architecture Change Management

a. A formal architecture change management process shall be followed to review, approve, and implement changes to the current and target state data architectures.
b. Changes may include requests for new architecture initiatives or modifications to existing projects, ensuring all updates are aligned with the SCFHS strategic goals.

5.1.4 SDLC Data Architecture Checkpoints

Data Architecture checkpoints shall be integrated within the Software Development Lifecycle (SDLC) to:

a. Assess reusability of existing components.
b. Validate adherence to the Enterprise Data Model.
c. Identify any necessary updates to the overall data architecture.

5.2 Data Modeling Framework

5.2.1 Data Modeling Levels

a. **Conceptual Model**: Defines the high-level business entities and their relationships, aligning data design with core business objectives.

b. **Logical Model**: Expands the conceptual model with attributes and relationships for detailed structuring.
c. **Physical Model**: Represents the logical model's actual database structure, including table names, primary keys, and data types.

5.2.2 Metadata and Version Control

a. All data models shall include comprehensive metadata documentation, detailing lineage, definitions, and ownership.
b. A formal version control and change management process shall be followed to document changes to data models, ensuring consistency and traceability.

5.2.3 Data Integration and Interoperability

a. All data models shall promote interoperability and standardization by following established data integration protocols.
b. Data integration shall prioritize reusability and consistency across all systems.

5.3 Data Quality and Governance

5.3.1 Data Quality Standards

a. Data models shall adhere to quality standards of accuracy, consistency, timeliness, and completeness.
b. Regular audits and quality assessments shall be conducted to ensure models support high data quality standards.

5.3.2 Data Governance Compliance

a. Data modeling activities shall align with the SCFHS' data governance policies to ensure data integrity, accessibility, and compliance.
b. Data Stewards shall manage and uphold the quality of data within their assigned domains, maintaining alignment with data quality standards.

5.4 Security, Privacy, and Compliance

5.4.1 Security Controls

a. Data models and architecture assets shall be protected in accordance with the SCFHS' Data Protection Policy, ensuring the confidentiality, integrity, and availability of data.
b. Access controls and encryption shall be applied to safeguard data assets against unauthorized access and potential breaches.

5.4.2 Privacy and Compliance Requirements

a. Data handling shall comply with all applicable privacy laws and regulations, with specific measures to protect sensitive or personally identifiable information (PII).
b. Regular compliance assessments shall verify adherence to SDAIA NDMO Regulations and any other relevant regulatory frameworks.

6. Policy Review

This policy shall be reviewed at least annually to ensure continued alignment with regulatory changes, organizational goals, and technological advancements. Reviews shall be coordinated by the Data Management Office with input from relevant stakeholders. Any revisions shall require approval from the SCFHS' senior management.

7. Exception

Exceptions to this policy shall be granted only under exceptional circumstances and shall be approved by the Chief Data Officer. All exceptions shall be documented, and corrective actions to mitigate risks should be established.

8. Roles and Responsibilities

8.1 Data Governance Committee

The Data Governance Committee oversees and enforces compliance with this policy, ensuring that data architecture and modeling align with the SCFHS' objectives. Responsibilities include:

a. Reviewing architecture frameworks and approving data modeling standards.
b. Ensuring policy adherence through regular audits and compliance checks.

8.2 Data Stewards

Data Stewards are responsible for the accuracy, consistency, and security of data within their assigned areas. Duties include:

a. Managing data quality, governance, and compliance within their data domains.
b. Ensuring timely updates and registration of data models in accordance with the SCFHS' standards.

8.3 Data Architects

Data Architects design and oversee the implementation of the SCFHS' data architecture, including:

a. Creating and maintaining architectural documentation.
b. Ensuring the data architecture supports both current and future business needs.

8.4 Data Modelers

Data Modelers are responsible for the development and maintenance of data models, including:

a. Building conceptual, logical, and physical models in alignment with the SCFHS' architecture.
b. Documenting model attributes, relationships, and lineage.

8.5 IT and Development Teams

IT and Development Teams implement and maintain data architecture solutions, ensuring:

a. Compliance with security and access control measures.
b. Data model integration within applications, with adherence to approved standards.

9. RACI

Roles / Tasks	Data Governance Committee	Data Stewards	Data Architects	Data Modelers	IT and Development Teams	Chief Data Officer
Develop Target Data Architecture	A	C	A/R	I	I	I
Establish Baseline Data Architecture	A	I	R	I	I	I
Architecture Change Management	A	I	R	I	C	I
Integrate Data Architecture in SDLC	C	I	A	R	R	I
Define Data Modeling Levels	C	C	A	R	I	I
Metadata and Version Control	R	R	C	A	I	I
Data Integration and Interoperability	C	C	A	R	R	I
Data Quality Standards	C	A	R	R	I	I
Governance and Compliance	A	R	C	I	I	C
Security Controls	C	I	R	I	A	I
Privacy Compliance	R	C	C	I	I	A
Conduct Policy Review and Updates	R	I	C	I	I	A
Approve Policy Exceptions	C	I	I	I	I	A

R (Responsible): The role primarily responsible for executing the task.

A (Accountable): The role accountable for ensuring the task is completed correctly and on time.

C (Consulted): Roles that need to be consulted before a decision or action is taken.

I (Informed): Roles that should be informed about decisions or progress.

10. Process

10.1 Target Data Architecture Development

a. Define and document target architecture in compliance with standards like TOGAF or Zachman.
b. Validate that architecture supports interoperability and alignment within SCFHS's IT ecosystem.

10.2 Baseline Data Architecture Definition

a. Document the current data model at conceptual, logical, and physical levels.
b. Outline key business processes and supporting system components in detail.

10.3 Architecture Change Management

a. Establish a formal process for reviewing, approving, and implementing architectural changes.
b. Address both new architecture initiatives and modifications to existing projects.

10.4 Integration of Architecture in SDLC Checkpoints

a. Validate reusability of architecture components for new requirements.
b. Ensure adherence to the Enterprise Data Model at each checkpoint.
c. Identify any necessary updates to the overarching data architecture.

10.5 Data Modeling Standards

a. Develop and document conceptual models that outline business entities and their relationships.
b. Expand models logically and physically, detailing attributes, tables, primary keys, and data types.

10.6 Metadata and Version Control

a. Document metadata, including lineage, definitions, and ownership for each model.
b. Implement version control to track model changes and maintain traceability.

10.7 Data Integration and Interoperability

a. Apply standard data integration protocols across all models.
b. Ensure consistency and reusability in system interactions to support interoperability.

10.8 Data Quality Management

a. Implement data quality checks for accuracy, consistency, timeliness, and completeness.
b. Conduct regular audits and align with SCFHS data governance requirements.

10.9 Security, Privacy, and Compliance

a. Apply security controls, access restrictions, and encryption to safeguard data.
b. Conduct regular compliance assessments to align with SDAIA NDMO and regulatory standards.

11.Annexure

Not Applicable