



**U.S. FOOD & DRUG
ADMINISTRATION**

DIGITAL TRANSFORMATION SYMPOSIUM

2023

Hosted by FDA's Office of Digital Transformation

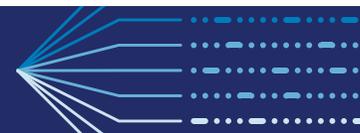




Knowledge Aided Assessment And Structured Application (KASA)

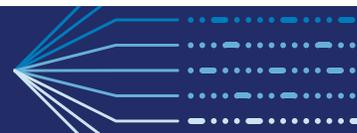
Sunitha Mathews and Archana Narayanaswamy
Office of Business Informatics
Office of Strategic Programs, CDER

December 4, 2023



Agenda

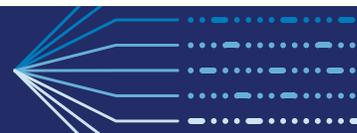
- What is KASA
- KASA Journey
- Implementation/Technical Approach
- Technical Framework
 - Example(s)
- Architecture
- Future Roadmap



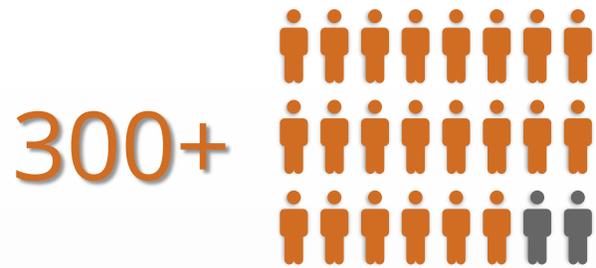
What is KASA?

Knowledge-Aided Assessment and Structured Application (KASA) is a data-based platform for structured quality assessments and applications that supports knowledge management

- Captures and manages knowledge during lifecycle
- Establishes rules and algorithms for risk assessment, control and communication for product, manufacturing, and facilities
- Performs computer-aided analyses
- Provides framework for a structured quality assessment



Knowledge Aided And Structured Assessment (KASA) Journey



300+

ACTIVE USERS

2+

YEARS
of Continuous
Operation



1000+



ANDA Reviews completed across drug product, drug substance, manufacturing, and facilities, and biopharmaceutics

- Paper based assessments
- Narrative format
- Assessment history not linked
- No Data Analytics
- No Knowledge Management
- No automated risk
- Manual comparisons



PAST



CURRENT

- Drug quality review disciplines across three applications types for Solid Oral dosages
- Modern analytics & search capabilities
- Pre-defined risk algorithms
- Data integrations where available
- Optimal security controls within the end-to-end workflow



FUTURE

- Expansion across more quality review assessment types
- Increased automation to reduce administrative burden
- Robust repository of historical assessment outcomes
- Full drug lifecycle auditability
- Expanded data availability
- Advanced search capabilities
- Advanced reporting
- Adjustable risk calculations using AI to re-baseline initial risk based on historical assessment outcomes

Innovative Accelerators

Agile Development Framework (Agile4Gov)

Analytics

Structured Review Framework

Enterprise Collaboration Framework

UI/UX - Human Centered Design (HCD)

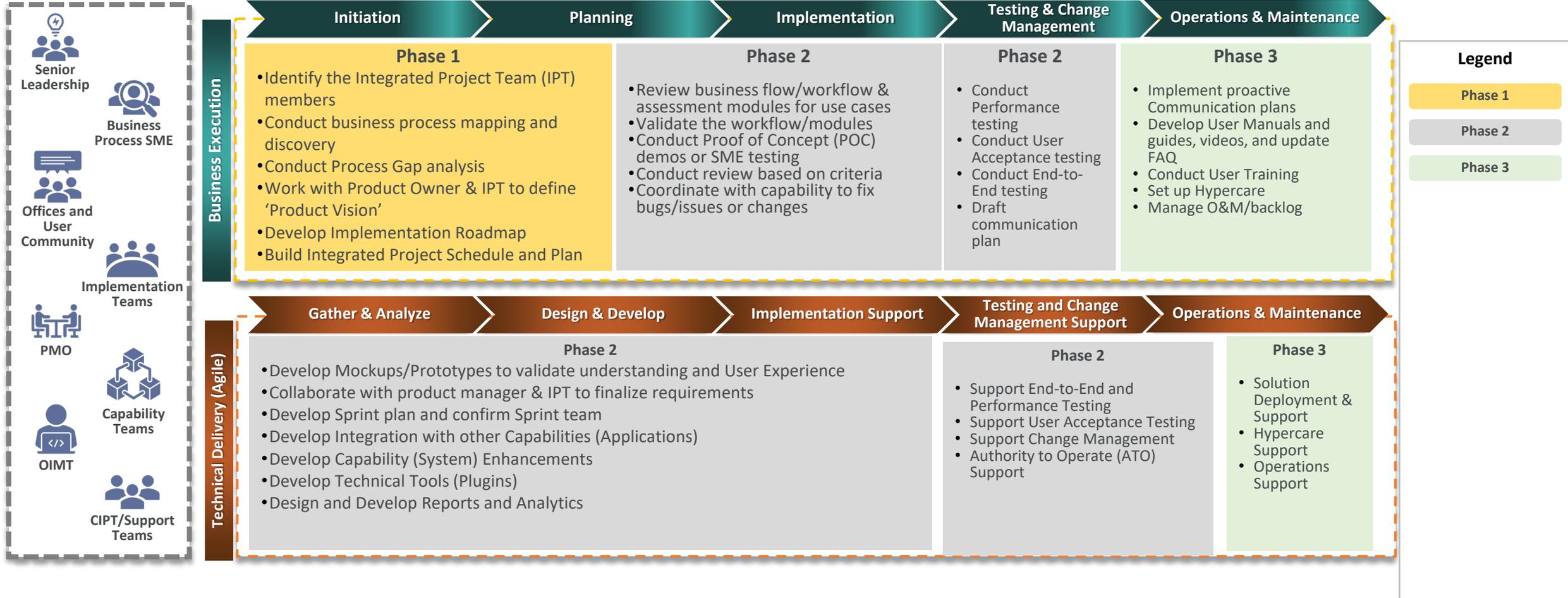
Common Identity / Security Framework

Cloud App and Data Migration Framework

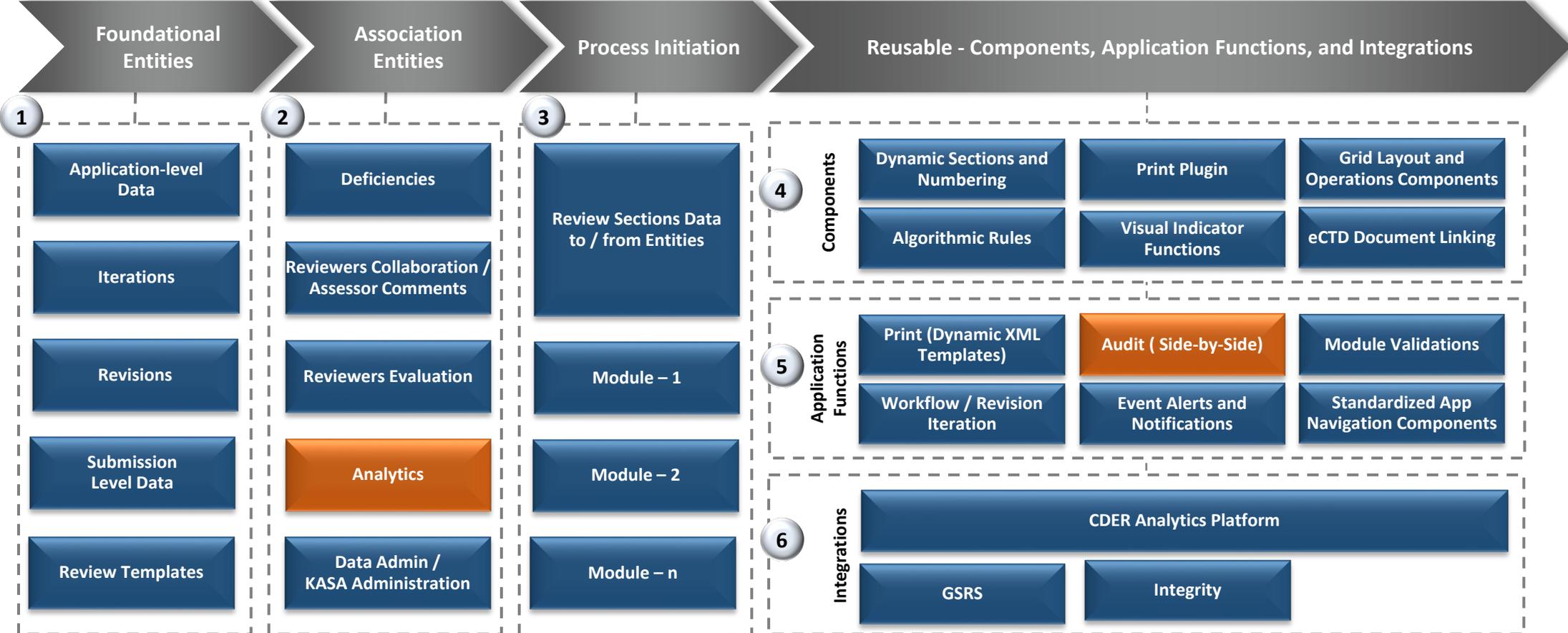
Reusable Components

Automation Framework (RPA/AI/ML)

Phased Implementation Approach For Better User Adaption



Structured Review Framework for KASA



KASA Assessment Dashboard





KASA Generics | New Drugs | Biologics

KASA: Knowledge-aided Assessment and Structured Application [CONTACT HELP DESK](#)

Search for Application

Application Type **1** Application Number **2**

Enter at least 3 digits

ATL Executive Summary **3**

Review Cycle	Status	Action
1	New	Start

Drug Product Assessment **4**

Iteration Name	Status	Action	
Iteration 1	Original Review	New	Start

Manufacturing Integrated Assessment **5**

Iteration Name	Status	Action
New Iteration	---Select---	New

Biopharmaceutics Assessment **6**

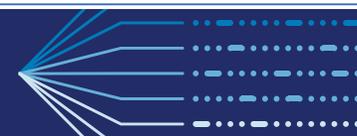
Iteration Name	Status	Action	
Iteration 1	Original Review	New	Start

Drug Substance Assessment **7**

Drug Substance	Iteration Name	Status	Action	Reference(s)
	New Iteration	---Select---	New	

- 1** Ability to select application type
- 2** Search criteria will display the current assessment status for the selection
- 3** The ATL Executive Summary provides a roll-up of key information across the assessments
- 4** The Drug Product Assessment
- 5** The Manufacturing Integrated Assessment
- 6** The Biopharmaceutics Assessment
- 7** The Drug Substance Assessment

Please Note: Data listed here is dummy and presentation purpose only



KASA Audit (Side by Side)



CDER Nexus HOME MY TASKS ADVANCED REPORTING DATA ADMIN SUPPORT

ANDAs Specifications

Please Provide DS Reference: MFC Drug Substance: ACETAZOLAMIDE (UNII : O3FX965V01)

DS Reference Status DEF

1 DS Reference Status Pending DEF

S.4.1 Specifications - Previous Revision

ANDAs Specifications

Specification	Specification Details	Release	Justification	AD	Evaluation
Description		White to 2 <u>practically</u> white, odorless <u>crystalline powder</u>		3 <i>No Value</i>	Consistent with DMF
Identification A		The IR absorption spectrum of sample is concordant with that of Prednisone standard spectrum.		Yes	Consistent with USP Monographs and DMF
Identification B		An orange-red color should be produced.		No	Consistent with USP Monographs and DMF
Assay		Between 97.5 % w/w and 100.0 % w/w	Compendial	Yes	Consistent with USP Monographs and DMF
Residue On Ignition		Negligible	Compendial	Yes	Consistent with USP Monographs and DMF

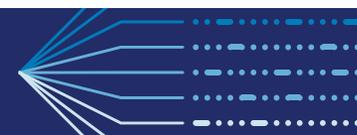
S.4.1 Specifications - Current Revision

ANDAs Specifications

Specification	Specification Details	Release	Justification	AD	Evaluation
Description		White to faintly yellowish white, crystalline, odorless powder.		Yes	Consistent with DMF
Identification A		The IR absorption spectrum of sample is concordant with that of Prednisone standard spectrum.		Yes	Consistent with USP Monographs and DMF
Identification B		An orange-red color should be produced.		Yes	Consistent with USP Monographs and DMF
Assay		Not less than 98.0% and not more than 102.0%	Compendial	Yes	Consistent with USP Monograph...

- 1 Indicates the prior and current revision data that is being displayed
- 2 **Red, underlined text** indicates that the content from the previous revision has been removed in the current revision
- 3 **Blue, italicized text** indicates that where there was no data in the previous revision has now been updated in the current revision
- 4 **Green, bold text** indicates new content in the current revision that was not in the previous revision

Please Note: Data listed here is dummy and presentation purpose only



KASA Analytics - Drug Product Manufacturing Facility



OVERVIEW

FACILITIES ASSESSMENT

- Drug Product Manufacturer**
- Drug Substance Manufacturer
- Commercial Testing
- Primary Packaging

MANUFACTURING RISK ASSESSMENT

Evaluation of Drug Product Manufacturer

Facility 1: FEI: 3

Profile Code(s): POW,CHG

Manufacturing
 Packaging
 CMS
 Mercado
 OSAR
 Previous Facility Evaluation
 ANALYTICS

Primary Packaging: Yes, this is also a primary packaging facility and the only proposed primary packaging facility for commercial ma...

Initial Facility Assessment

Process Experience: Withhold recommendations for products using the same operations (WH for any other PAI; deficient PPQ)

1 Analytics Link in an assessment module for reviewer to access

- 2 Report filtered to a FEI
- 3 Toggle option to show all unit operations
- 4 Current Application in review

KASA Analytics - Drug Product Manufacturing Facility | FEI 3

Summary **Related Actions**

Show All Unit Operations

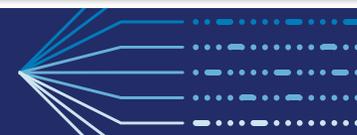
4 Current ANDA

Application Number	Drug Product	Profile Code	Outcome of Final Facility Assessment	Date of Final Facility Assessment	PAI/704(a) (4)Indicated	Drug Load	Blending	Compression	Hot-Melt Extrusion	Drying	Milling	Wet Granulation - Drying - Milling
A1	IR	POW, CHG	Approve - Based on PAI		Yes 704(a)(4)	22	x	x	x	x	x	x

Search KASA DP Manufacturing Facility

Application Number	Drug Product	Profile Code	Outcome of Final Facility Assessment	Date of Final Facility Assessment	PAI/704(a) (4)Indicated	Drug Load	Blending	Compression	Hot-Melt Extrusion	Drying	Milling	Wet Granulation - Drying - Milling
A2	IR	CHG	Pending PAI		No	34						
A2	IR	CTR				34						
A2	LIVADENIV TABLET DR	CSG	Pending PAI	9/24/2021	Yes PAI			x		x		
A2	IR	POW	Approve - Based on PAI		No	18	x	x				
A2	IR	CSG	Pending IR	9/28/2021	No		x		x			

Please Note: Data listed here is dummy and presentation purpose only



KASA Drug Substance Synthetic Pathway – Machine Readable



MANUFACTURING MODULE

3.1 Manufacturer(s)

3.2 Synthetic Route & Process

3.3 Control of Starting Material(s)

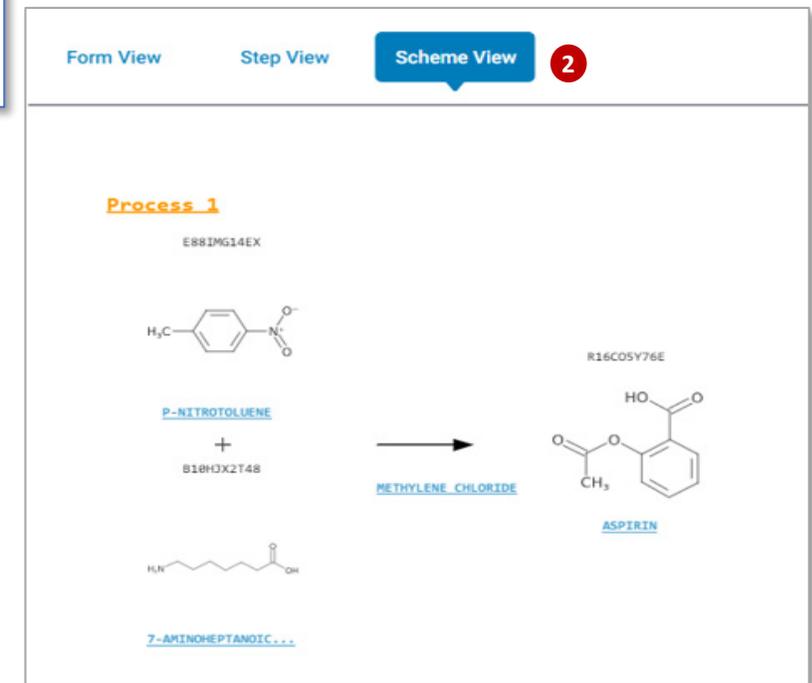
3.4 Control of Process Intermediate(s)

3.5 Control of Reagent(s), Organic Solvent(s) & Other Material(s)

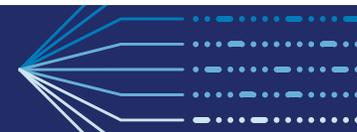
3.6 Process Validation

1 The Synthetic Route & Process module contains the embedded GRSR (*Global Substance Registration System*) machine readable form view to capture the manufacturing process and a set of questions to assess the synthetic route

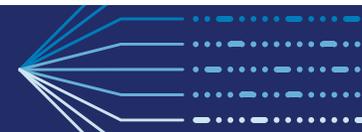
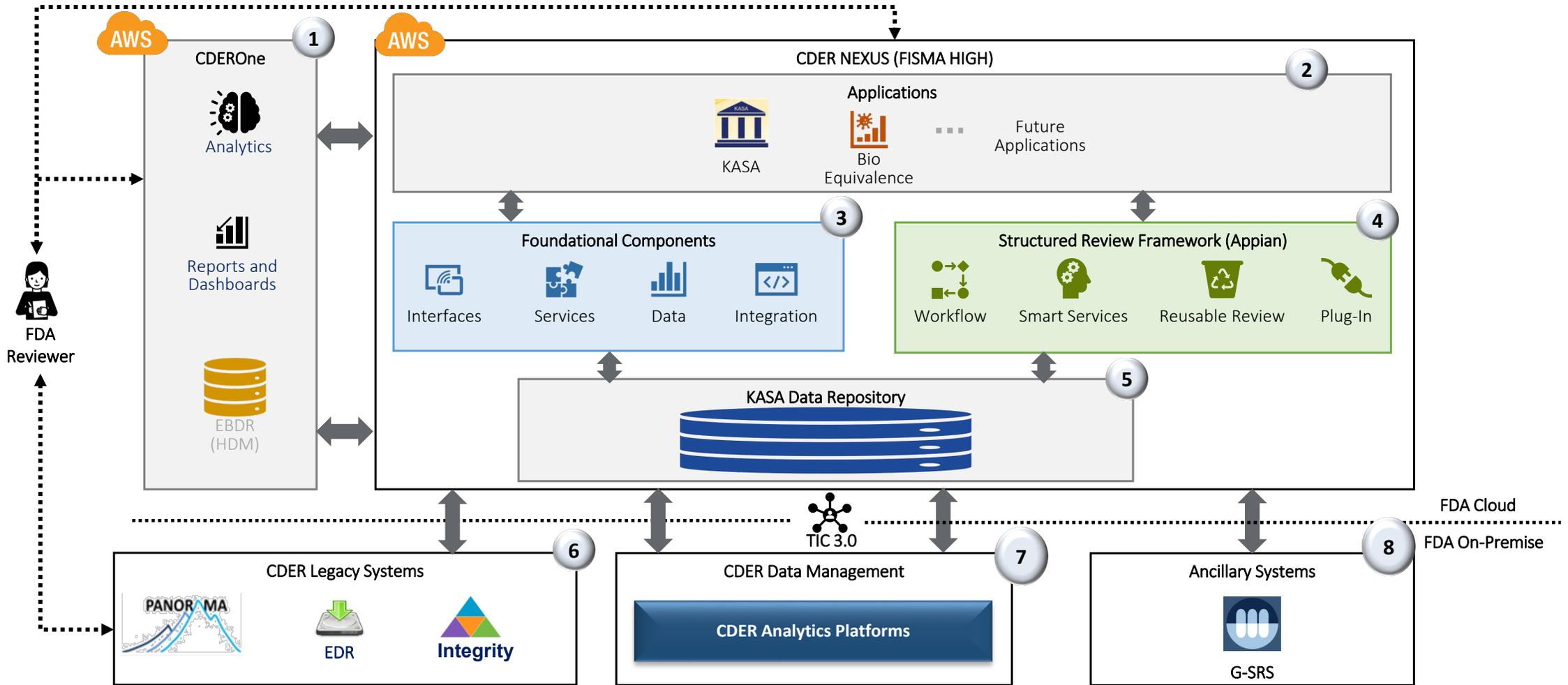
2 **Scheme View:** Converted to machine readable scheme view that is available in KASA for all drug substance FDA assessors



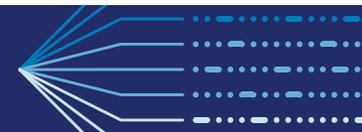
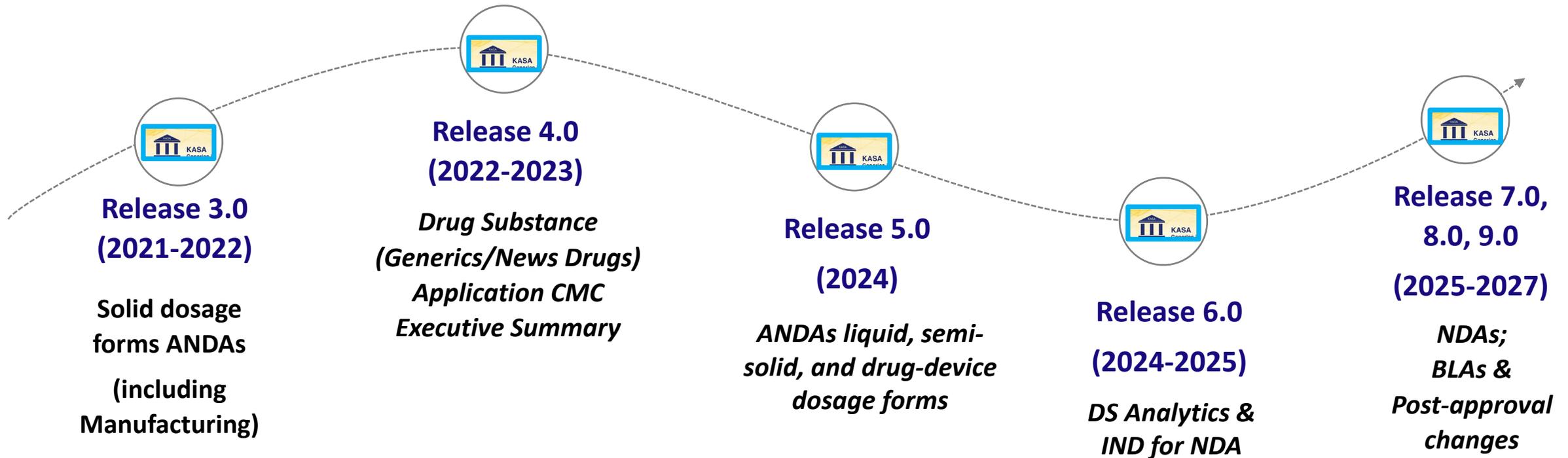
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KASA System Architecture



Aspirational Roadmap for KASA Production



Questions?

Thank you!

For additional information, you may email [KASA Program KASAProgram@fda.hhs.gov](mailto:KASAProgram@fda.hhs.gov)

