IT'S A FAÇADE –

Interoperability Architecture Patterns, Explained

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INTRODUCTIONS

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WHY INTEROPERABILITY?

Enterprise-level drivers and complexities to governing / promoting an interoperable ecosystem.

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INTEROPERABILITY IS MORE IMPORTANT THAN EVER.

Design patterns are not just the domain of the data or technical architect.

Business Drivers	**CMS Enhanced Funding Requirements (7 Standards and Conditions)** **Unprecedented pace of policy, program operations, and technology innovations**
Constraints	**Large, complex, and heterogenous state technology ecosystems** **Overlapping spheres of system governance and funding streams**
Benefits of Interoperable Design Patterns	**Simplicity in definition of business-facing services** **Utilization of data and components across programs**

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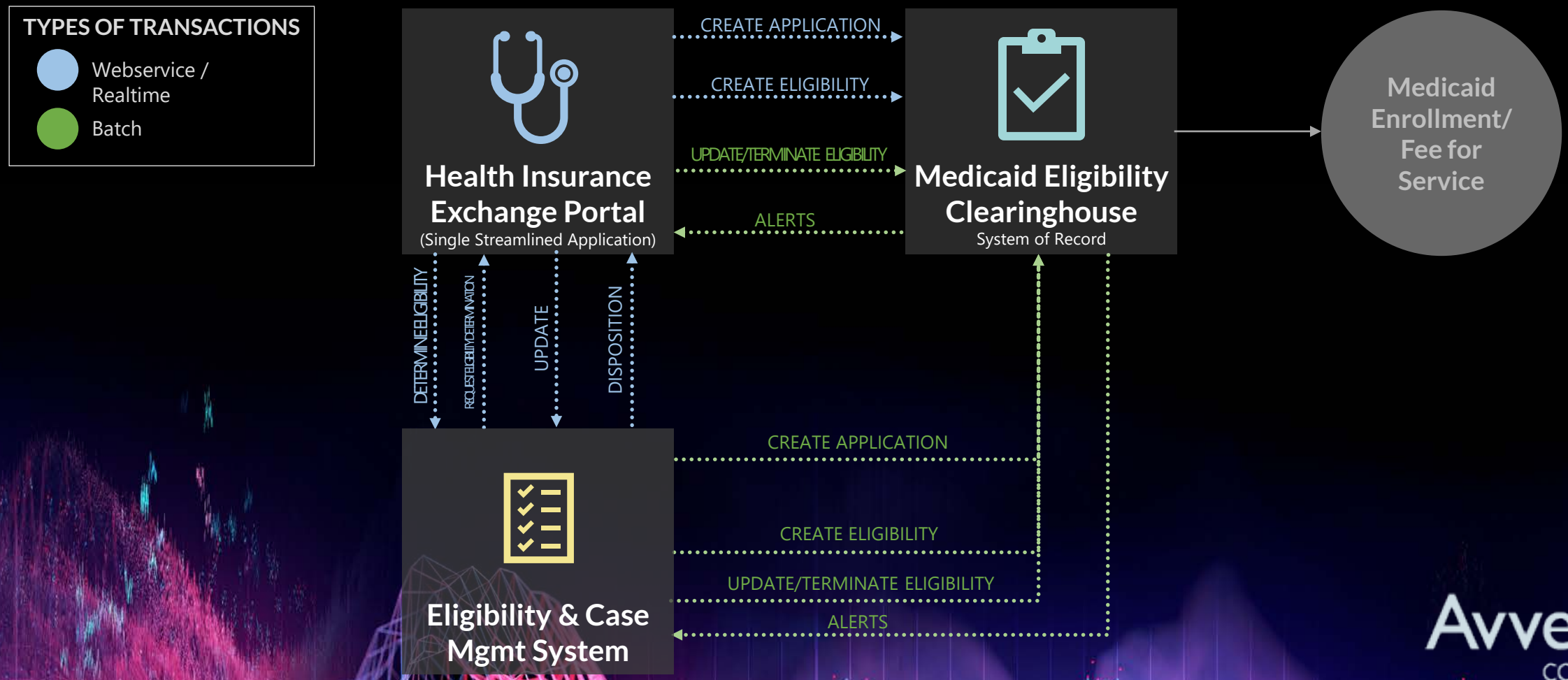
STATE ECOSYSTEM

Complex, point-to-point transactions dominate the landscape



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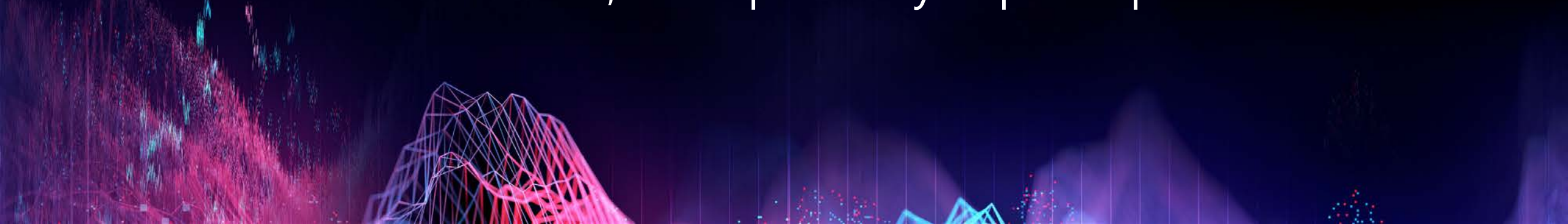
Interoperable Architecture Patterns

Common patterns to support an interoperable ecosystem

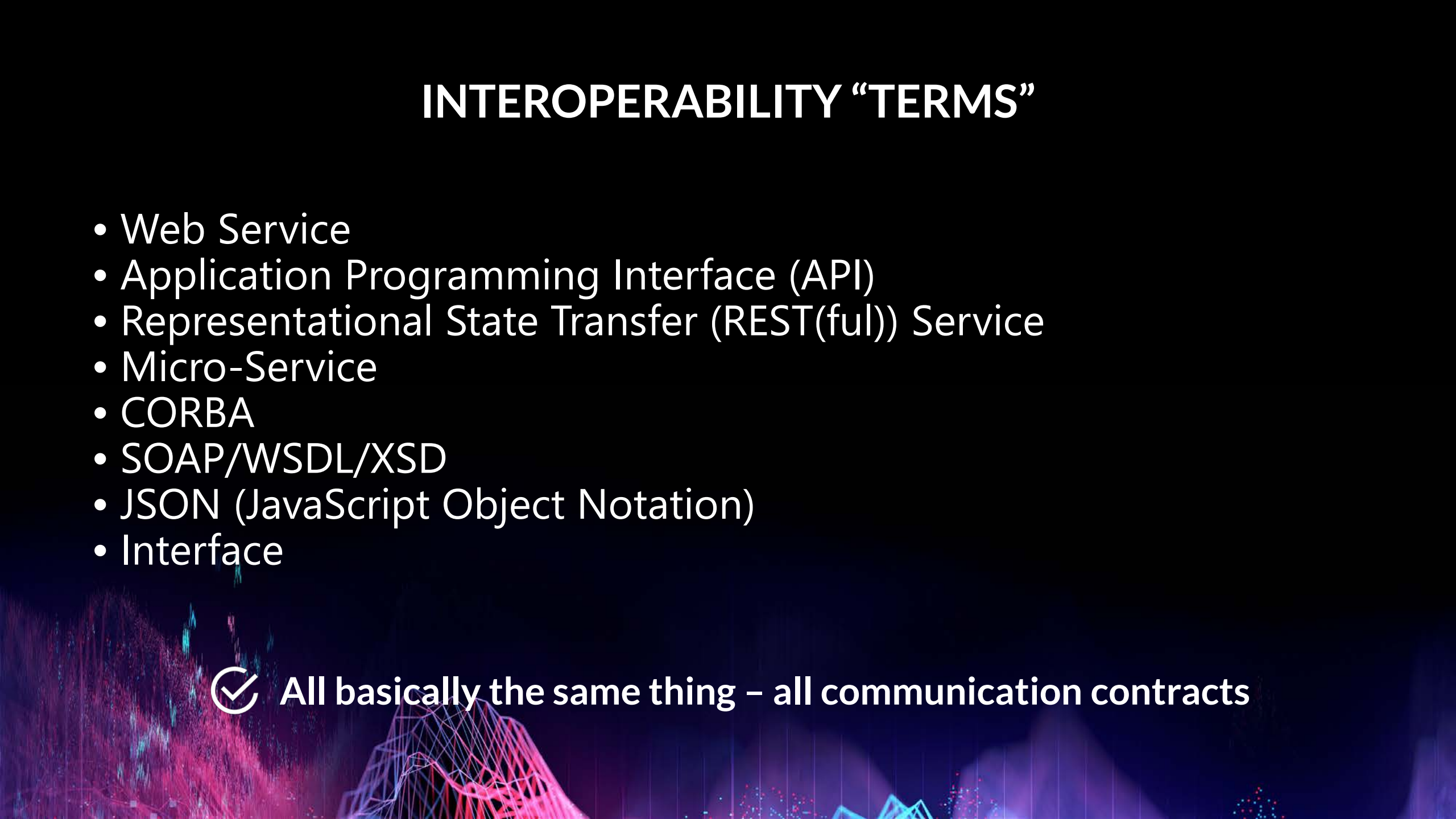
INTEROPERABILITY, EXPLAINED

- Two or more computer systems communicate with each other using an agreed upon format and rules (just like people).
- The information exchanged can be automatically interpreted according to those outlined in the communication contract (format and rules).
- The communication contract is unambiguously defined. It has to be exceptionally clear for information to be correctly interpreted.
- In the realm of software, interoperability implies open standards.



INTEROPERABILITY “TERMS”

- Web Service
- Application Programming Interface (API)
- Representational State Transfer (REST(ful)) Service
- Micro-Service
- CORBA
- SOAP/WSDL/XSD
- JSON (JavaScript Object Notation)
- Interface



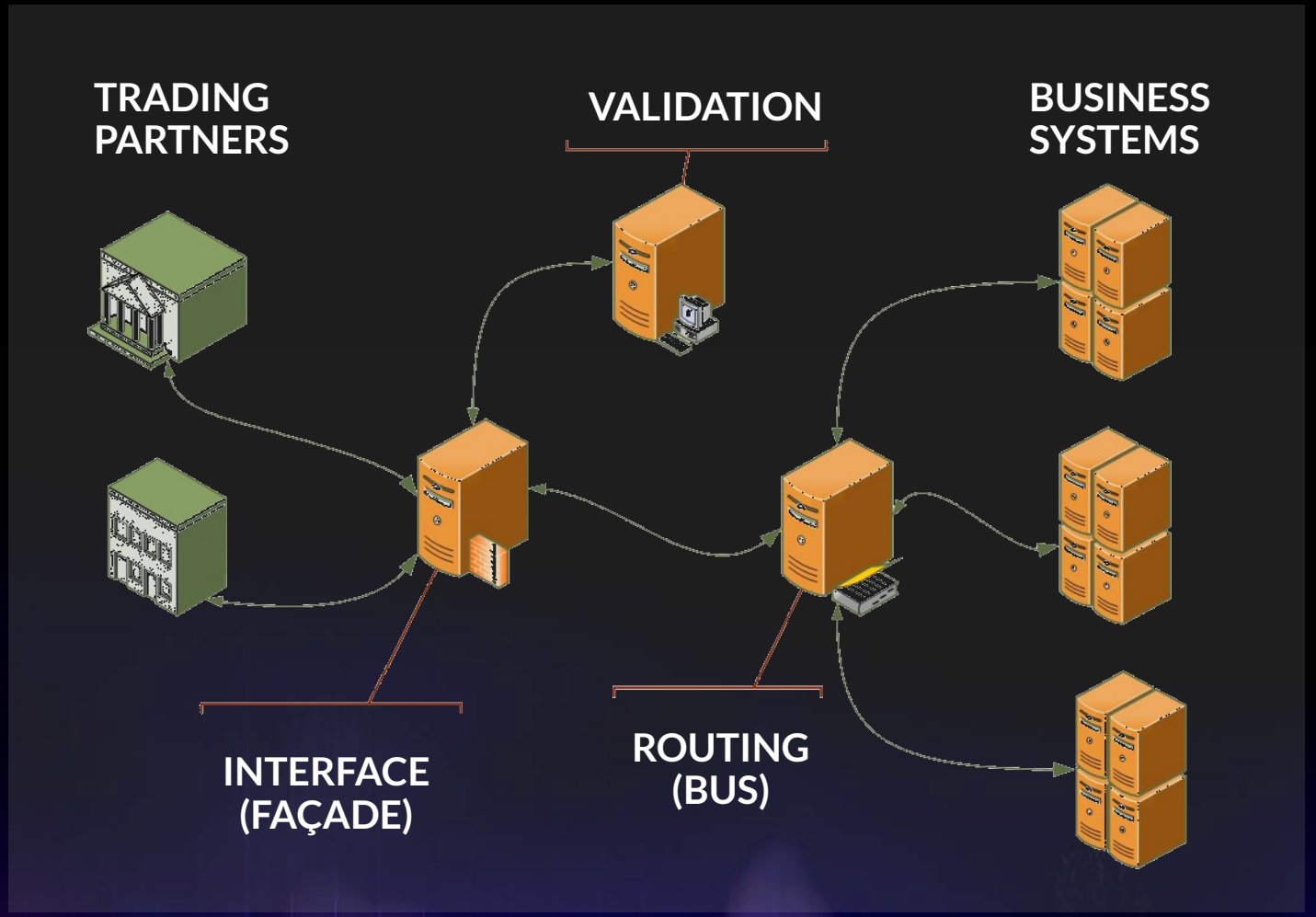
All basically the same thing – all communication contracts

INTEROPERABILITY DESIGN PATTERNS

First and foremost, a service/API should be an expert at performing one task.

Two Patterns:

1. Façade - hides details from user
2. Message Bus (Observer) - sends information to the entity that needs it



EDI DATA GATEWAY

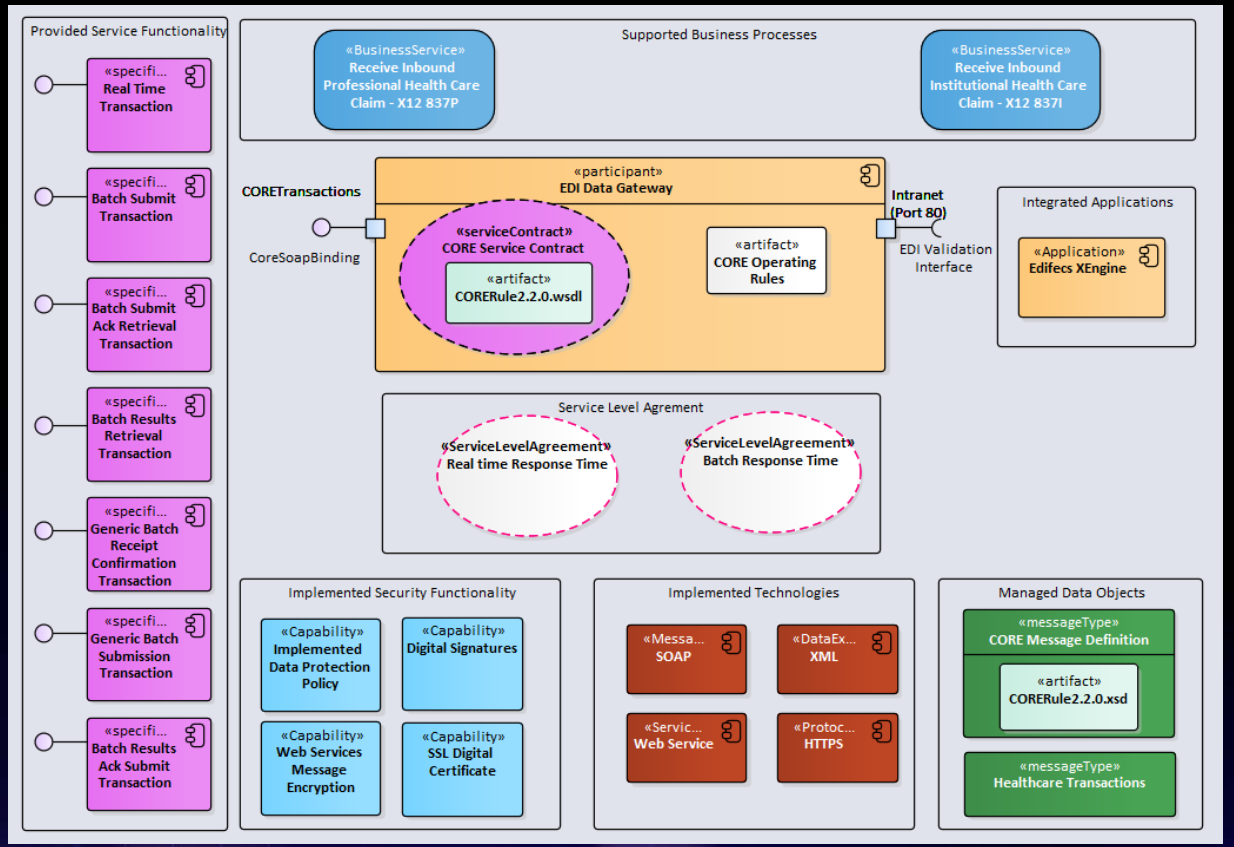
Façade/Message Bus Patterns

Business Problem:

- Multiple systems performing siloed HIPAA transaction validations
- Multiple trading partner interfaces
- Increased administrative burden

Solution:

- CORE Operating Rules
- Create single trading partner interface
- Encapsulate all HIPAA validations in one area
- Abstract HIPAA Transaction processing from business systems
- Ease administrative burden



California Health & Human Services Agency

OAIO
Enterprise Architecture – Approach to Interoperability


California
Department of
AGING


CSD
California


CHHS
California Health & Human Services Agency


EMERGENCY MEDICAL SERVICES AUTHORITY
EMSA
CALIFORNIA


California Department of
Child Support Services


oshpd
Office of Statewide Health
Planning & Development


DHCS
California Department of
HealthCareServices


CDPH
California Department of
PublicHealth


DEPARTMENT OF
Managed
Health
care


CalOHII
State of California
Office of Health
Information Integrity

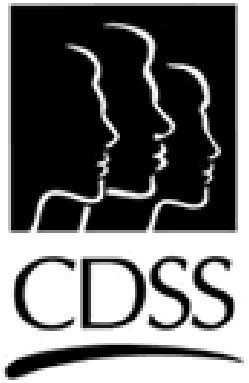

Office of
Systems
Integration
"SERVING CALIFORNIA"


DDS


THE PATIENT
ADVOCATE


DOR
DEPARTMENT of
REHABILITATION


SAFETY TREATMENT RESPONSIBILITY
DEPARTMENT OF
STATE HOSPITALS


CDSS

Office of the Agency Information Officer -Enterprise Architecture (EA)

Focusing on common enterprise capabilities

- Cloud Investment Strategy
  - Supports the State of California ‘Cloud First’ Policy
- API First Strategy
  - Supports the CHHS Agency ‘Data Sharing’ Policy and ‘Shared Services’ Policy
- Identity and Access Management Strategy
  - Supports Single Sign-On and Identity Federation among Departments and Trading Partners

OAIO EA – Interoperability Approach

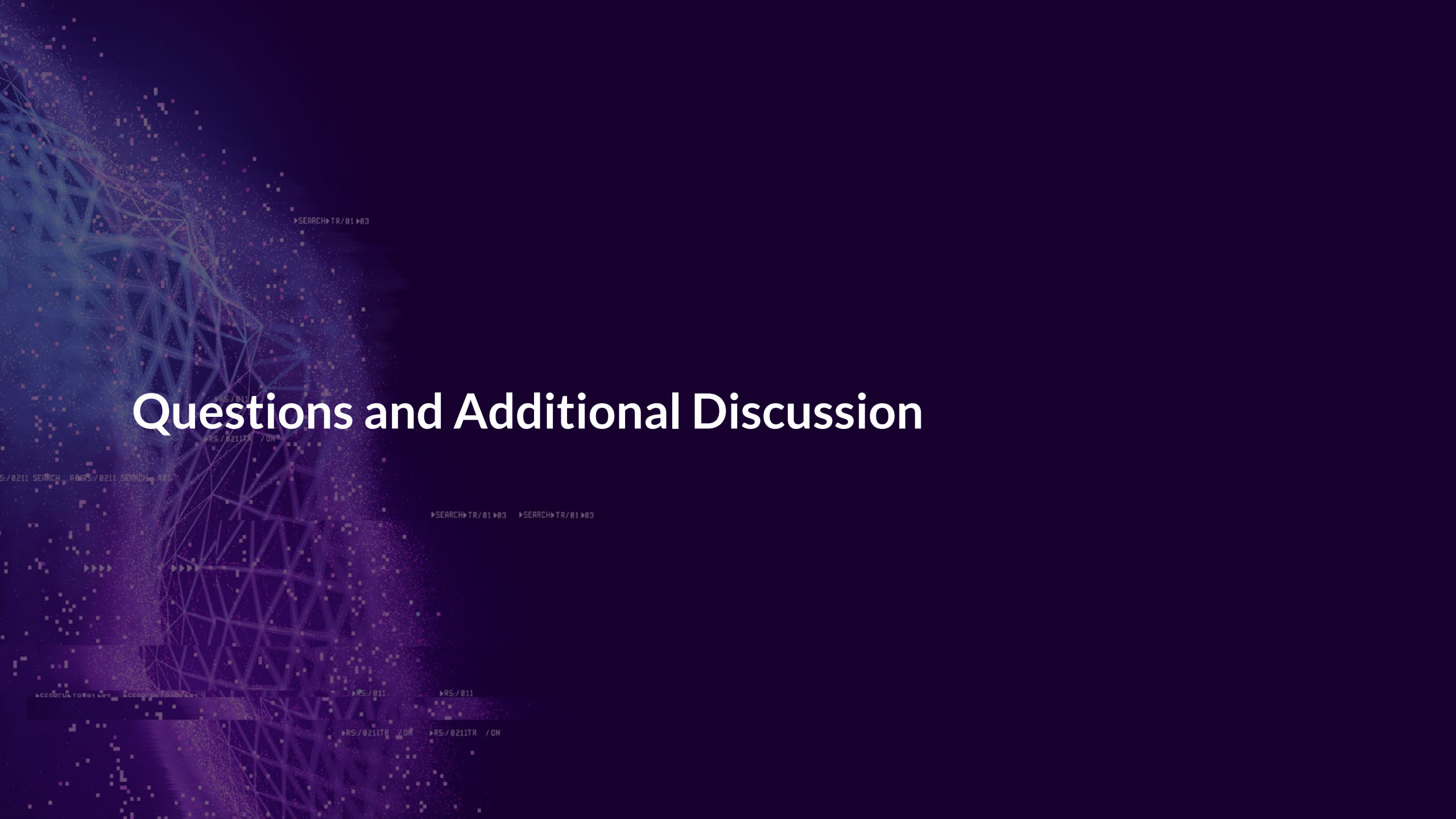
Facilitate adoption of standards, protocols and methods of data exchange throughout the Agency

- Adopt standard formats for exchange of data
  - HL7 FHIR
  - FHIM
- Adopt standard security protocols
  - SAML
  - OAuth 2.0
- Facilitate the adoption of API / EDI Gateway concepts
  - Defined data exchange contracts
  - Published schemas
  - Discoverable metadata
- Facilitate the adoption of ‘Big Data’ concepts
  - Data Pipeline and Data Hub Patterns

Agile Enterprise Architecture – Federated EA

Evolve Enterprise Architecture from oversight to self-governance

- Collaborate
  - Focus on strategic alignment and use of agreed upon patterns and practices
  - Agency and Department collaborate on those projects deemed most critical and/or where the opportunity to realize Enterprise Capabilities exists
- Federate
  - Departments and projects are enabled and then accountable for alignment and use of agreed upon patterns and practices
  - Agency provides support as or if needed
- Automate
  - Where possible, provide departments and projects with reference implementations through IT automation tools



Questions and Additional Discussion

REFERENCES/ADDITIONAL SOURCES

- Lost in Translation: Interoperability Issues for Open Standards, Rajiv Shah and Jay P. Kesan, University of Illinois at Chicago
- Emergent Robustness in Software Systems through Decentralized Adaptation: an Ecologically-Inspired ALife Approach, Franck Fleurey, Benoit Baudry, Benoit Gauzens, Andr´e Elie, Kwaku Yeboah-Antwi
- Exploring the impact of situational context – A case study of a software development process for a microservices architecture, Rory V. O'Connor, Peter Elger, and Paul M. Clarke
- Governance of Online Intermediaries Observations From a Series of National Case Studies, Urs Gasser Wolfgang Schulz, Harvard Berkman Center for Internet & Society Research
- Finding A Cure: The Case For Regulation And Oversight Of Electronic Health Record Systems, Sharona Hoffman & Andy Podgurski, Case Wester Reserve University
- Contribution of Standards and Profiles to the Interoperability in eHealth, Karima BOURQUARD, IN-SYSTEM, IHE-Europe
- A Proposed National Health Information Network Architecture and Complementary Federal Preemption of State Health Information Privacy Laws, John W. Hill, Arlen W. Langvardt, Anne P. Massey, and Jonathan E. Rinehartl
- RETRO: A Consistent and Recoverable RESTful Transaction Model, Alexandros Marinos Amir Razavi Sotiris Moschoyiannis Paul Krause