CAL-ACCESS Replacement System (CARS) Project

California Secretary of State

Political Reform Division (PRD)
CARS System To-Be Architecture

v1.2

July 19, 2017

REVISION SUMMARY

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0.1	05/26/2017		Initial Draft
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0.3	05/30/2017		Revision based on feedback
1.0	06/01/2017		Submission to ITD
1.1	06/23/2017		Submission to ITD
1.2	07/19/2017		Updates based on feedback

DOCUMENT APPROVAL

Signatures below indicate approval of the attached document.

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Signatures:

CARS Project Director Date

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1 CARS Project To-Be-Solution Architecture

The following sections describe the To-Be Solution Architecture for CAL-ACCESS Replacement System(CARS). Following The Open Group's Architecture Framework (TOGAF's), we describe the proposed Solution Architecture for the CARS Project from the following perspectives:

- Business Architecture
- Data Architecture
- Application Architecture
- Technology Architecture

The tool used to create the diagrams in this document is called ArchiMate. ArchiMate is a technical standard and registered trademark from The Open Group and is based on the IEEE 1471 standard for describing enterprise architecture. See Appendix A for a basic summary of ArchiMate's Core and Relationships Notation. For more information, the following link provides an introduction to ArchiMate along with descriptions of the notations used in this document:
https://opengroup.org/archimate/2.1/ArchiMate2_intro.pdf

1.1 Business Architecture

Business Architecture describes the product and/or service strategy, as well as the functional and process aspects of the business environment.

1.1.1 Users Context Diagram for Political Reform Division (PRD) CARS

The following diagram shows all the users, groups of users, and external partner systems that will access the CARS system.

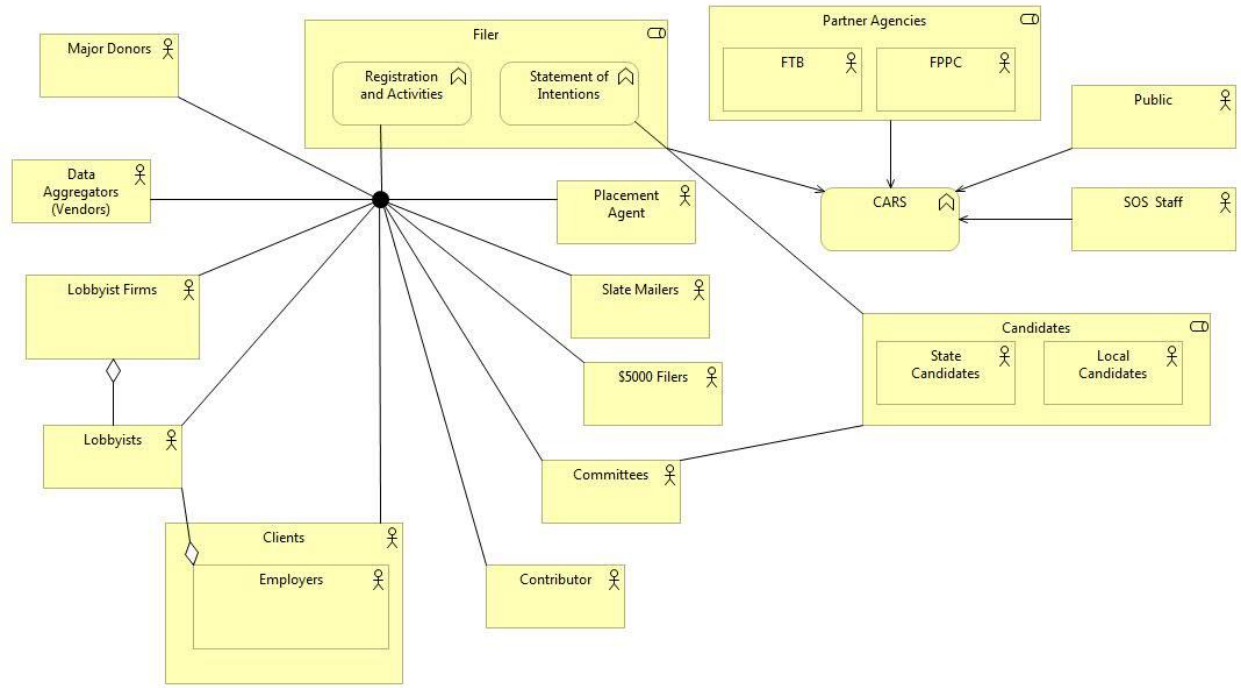


Figure 1: CARS User Context Diagram

Major Donors - They are individuals or businesses that contribute to campaigns, ballot measures, positions, etc. totaling more than $10,000 in any election year in California.

Lobbyists - They are individuals who engage in lobbying activities directly. All lobbyists work for one or more lobbying firms.

Lobbyists Firms - They are businesses that engage in lobbying activities and employ lobbyists.

Clients - They hire lobbying firms to lobby on their behalf. They could be businesses or association or interest groups.

Data Aggregators (Vendors) - They collect and file activity information on behalf of committees and lobbying entities (Clients, Firms, Employers, Lobbyists).

Contributors - They are individuals or businesses who contribute to committees.

Employers - They are Clients who can also have their in-house lobbyists.

Committees - They raise money and expend funds to advocate a position for an election subject like candidates, ballot measures, initiatives, positions. They can also be involved with positions that are not meant to be on a ballot.

Candidates – They are individuals who get on a ballot for local and statewide elections.

Public – They are the consumers of the information made available by the CAL-ACCESS system.

Partner Agencies – California Franchise Tax Board (FTB) and California Fair Political Practices Commission (FPPC) access the financial data pertaining to the filings.

Filers - This is a role or a group of users that use one of the two functions of the CAL-ACCESS System which are: Registration and Activities and Statement of Intentions.

SOS Staff – This group of users performs functions ranging from manual entry of data to approval of registrations and filings.

$5000 Filers – They are individuals or entities that do not make payments to lobbyists or a lobby firm, but spends $5000 or more in a calendar quarter to influence legislative or administrative action.

Slate Mailers – an organization involved in producing slate mailers

Placement Agent –a person hired for the benefit of an external manager in matters of CalPERS or CalSTRS or state retirement systems

1.1.2 High Level Business Functions and Processes

The following subsections illustrate the business functions and processes the new CARS solution will support.

1.1.2.1 Committee Registration

The following diagram displays the processes and actors that collaborate to fulfill the Committee Registration function. This diagram is unchanged from the current CAL-ACCESS system.

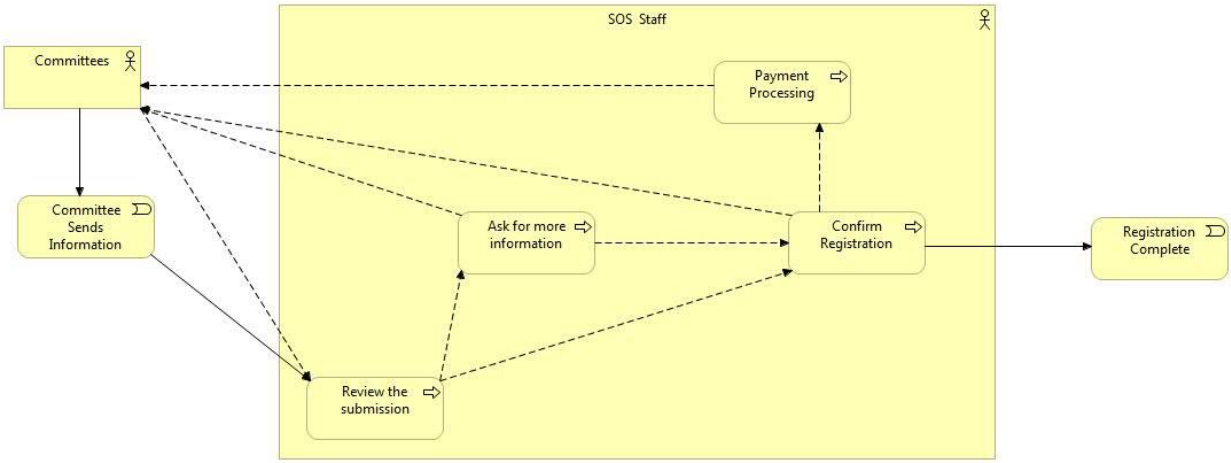


Figure 2: Committee Registration Function

1.1.2.2 Lobbying Registration

The following diagram displays the processes and actors that collaborate to fulfill the Lobbying Registration function. This diagram is unchanged from the current CAL-ACCESS system.

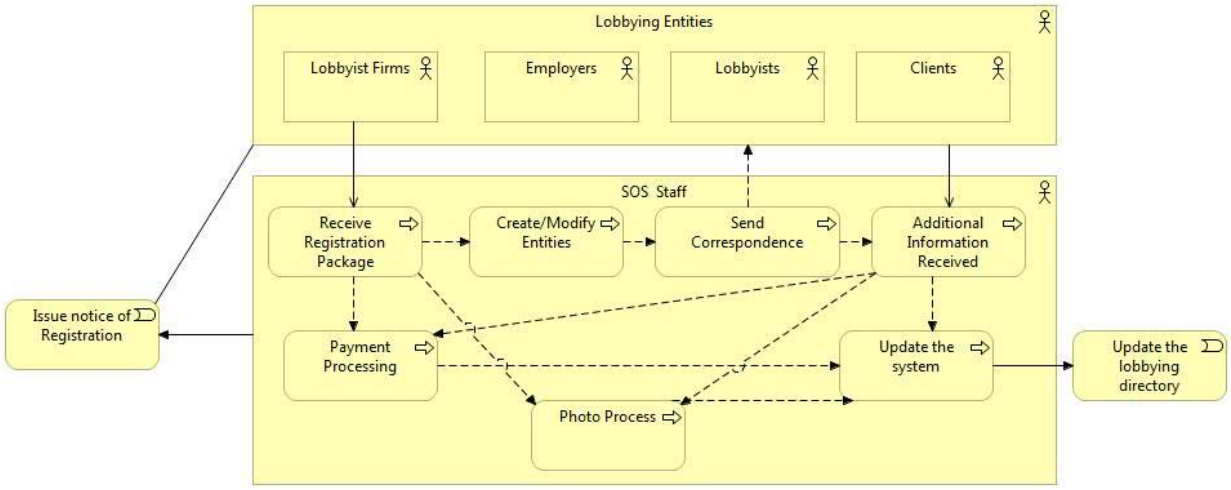


Figure 3: Lobbying Registration Function

1.1.2.3 Filing Disclosure

The following diagram displays the processes and actors that collaborate to fulfill the Filing Disclosure function. This diagram is unchanged from the current CAL-ACCESS system.

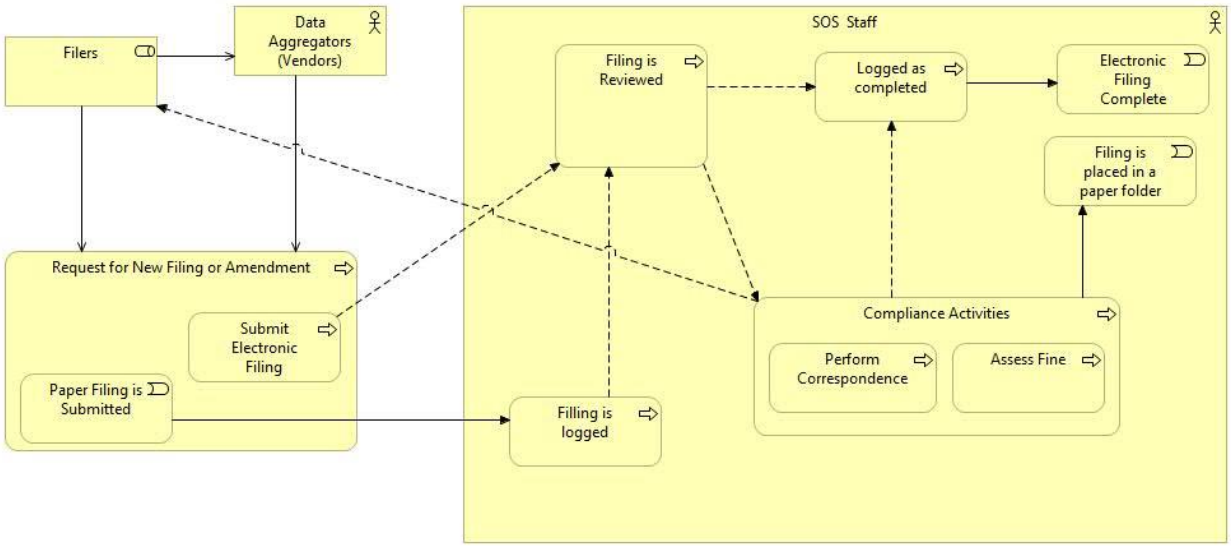


Figure 4: Filing Disclosure Function

1.1.2.4 Filing Disclosure by Data Aggregators (Vendors)

Data Aggregators (Vendors) collect and file activity information on behalf of committees and lobbying entities (Clients, Firms, Employers, Lobbyists). The following diagram displays the processes in CARS that will allow Data Aggregators (Vendors) to file Disclosure data.

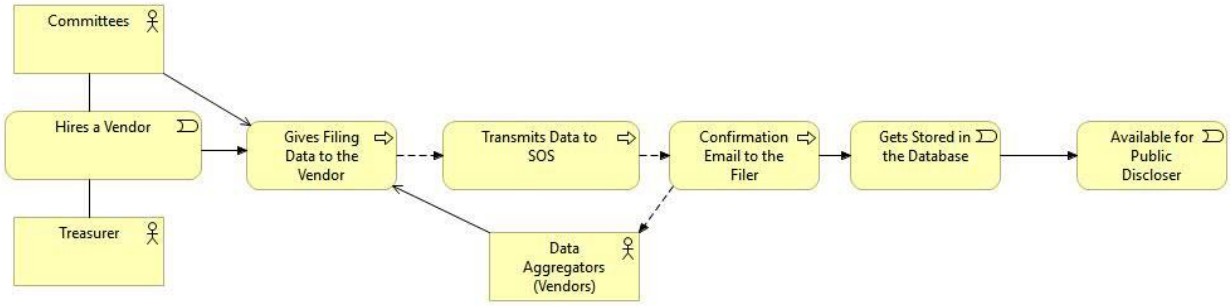


Figure 5: Filing Disclosure by Data Aggregators (Vendor) Function

1.2 CARS Application Architecture for RFO

The diagram below depicts the proposed Application Architecture for CARS without specific software or hardware technologies; this architecture can be implemented on any software and hardware technologies. One of the main features of the architecture is the separation of transactional activities and analytical activities. The new CARS solution architecture has the following components:

- **Security Zone 1 A -** This zone houses the public facing modules of the new CARS application.
    - **Public Facing Analytical –** This component provides interface for analytical functions such as drill down, drill across, summarization, and aggregation of data.
    - **Public Facing Transactional -** This component provides interface for transactional needs such as submitting Filings, registering, submitting Filing amendments.

- **Security Zone 1 B -** This zone houses the public facing modules of the new CARS application that require authentication.
    - **Public Facing Restricted Transactional -** This component provides interface for transactional needs that require authentication.

- **Security Zone 2 –** This zone houses the data stores accessed by public facing applications.
    - **Analytical Storage -** This component houses the data sets in a format that is conducive to analytical functions such as drill down, drill across, summarization, and aggregation of data.
    - **Transactional Storage –** This component houses the data sets in a format that is conducive to transactional needs like submitting Filings, registering, submitting Filing amendments. The format of this kind of data set is highly Normalized.
    - **Zone 2 Transactional** – This application component serves Public Facing Transactional and Public Facing Restricted Transactional components for data and API needs.
    - **ETL –** This component moves data to Analytical Storage and Internal Storage.

- **Security Zone 3 –** This zone houses the internal CARS solution applications.
    - **Internal Applications –** This component comprises of collection of web based applications that SOS staff use to perform the CARS solution system functions.
    - **Workflow Engine –** This component handles the workflow processes concerning Filings and Registration, from submission to approval.
    - **Business Rule Engine –** This component processes inputs and produces output based on the repository of business rules.
    - **Financial Application –** This component is responsible for processing payments and other financial activities.

- **Security Zone 4 –** This zone houses the unified database.
    - **Internal Storage -** This component is the unified database comprised of all data elements in a Normalized form.

- **People Zone -** This zone is comprised of devices used by SOS staff.
- **Partner Network (FTB and FPPC) -** SOS partner agencies like FTB and FPPC belong to this network.

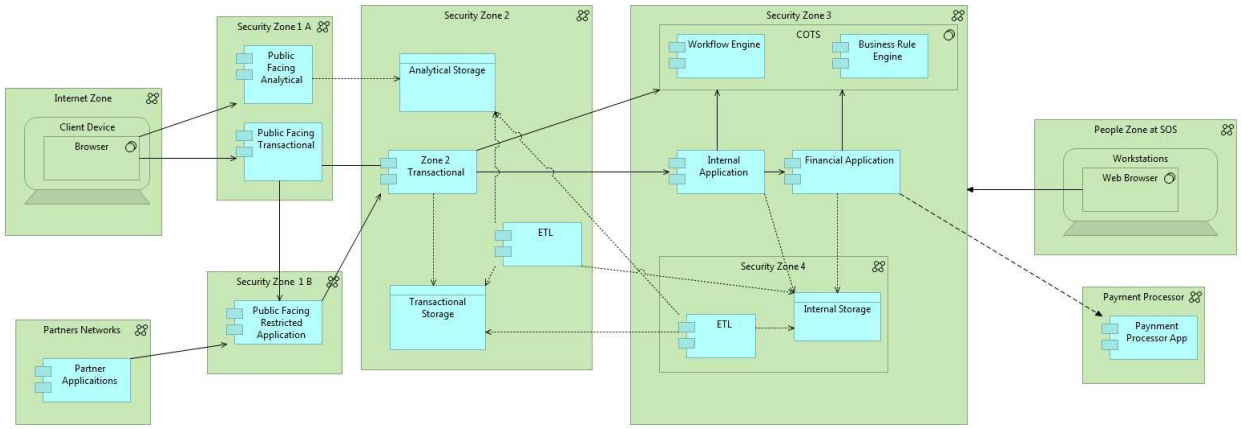


Figure 7: CARS Solution High-level Application Architecture

1.3 CARS Technical Architecture Option

The following diagram depicts a possible option for the CARS Project's Technical Solution Architecture. The diagram illustrates a hybrid architecture with one part of the application hosted on Microsoft's Azure platform and another hosted at the SOS data center. The Azure architecture relies on a PaaS (Platform as a Service) approach for Web, Application, as well as Data management. In this scenario, the future CARS Technical Solution Architecture has the following components.

- **Azure Zone** – This component denotes the Microsoft's Azure cloud infrastructure. SOS's Azure setup will be comprised of several security zones with rules controlling information exchanges among them.
  - **Web Zone –** This security zone or tier houses the services that serve HTTP requests.
  - **Application Zone –** This security zone houses the Application PAAS that implements the Model View Controller (MVC) modules developed in C#.
  - **Data Zone -** This security zone implements the data services for the Online Transaction Processing (OLTP) and Online Analytical Processing (OLAP) data sets.
  - **Infrastructure Zone –** This zone houses the following infrastructure services:
    - Identity Management Services comprised of Active Directory and Active Directory Federation Services
    - Electronic Mail Service
    - Visual Studio Team Services supporting DevOps requirements
- **SOS Data Center –** This zone represents the data center at the SOS office location. For the CARS solution, the zone will support the following categories of virtual or physical servers:
  - Web App
  - Middle tier
  - Data tier implemented on SQL Server
  - Team Foundation Server
  - Active Directory

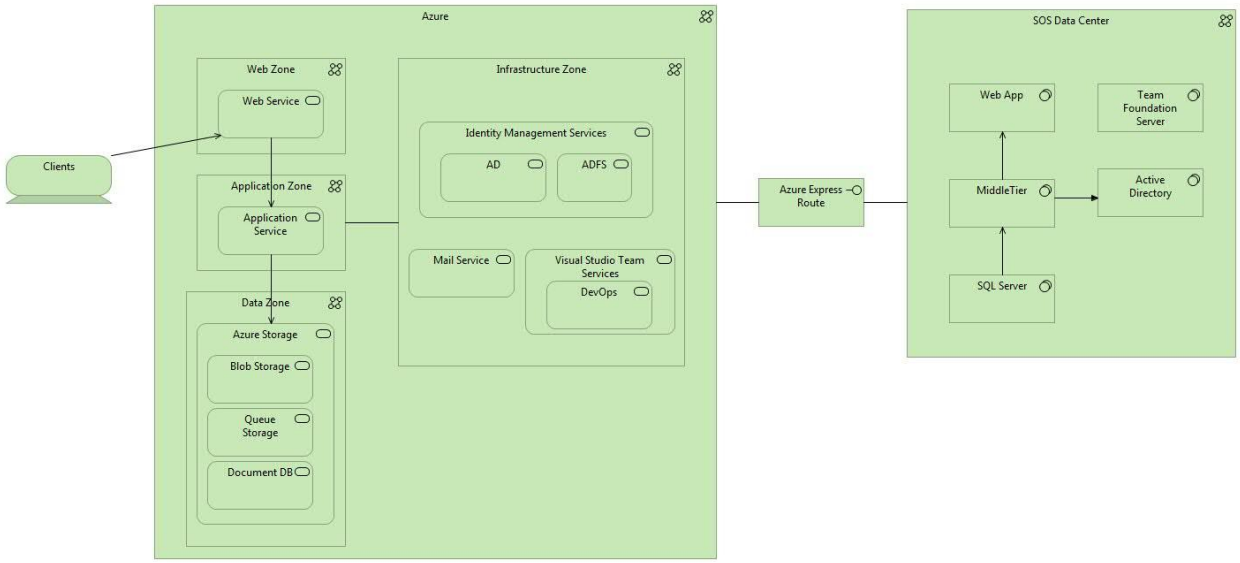


Figure 8: CARS Future Technical Solution Architecture

2 Non-Functional Requirements Categories

The CARS Project's Non-Functional requirements are categorized as follows:

- Performance
- Availability
- Interoperability
- Data Availability
- Scalability
- User Experience / Usability
- Maintainability
- Security

As part of the requirements collection and definition phase of the CARS Project, these non-functional requirements categories can be further elaborated to contain details for what is necessary for the new CARS solution. The following diagram conceptualizes the non-functional requirements categories supporting the new CARS solution.

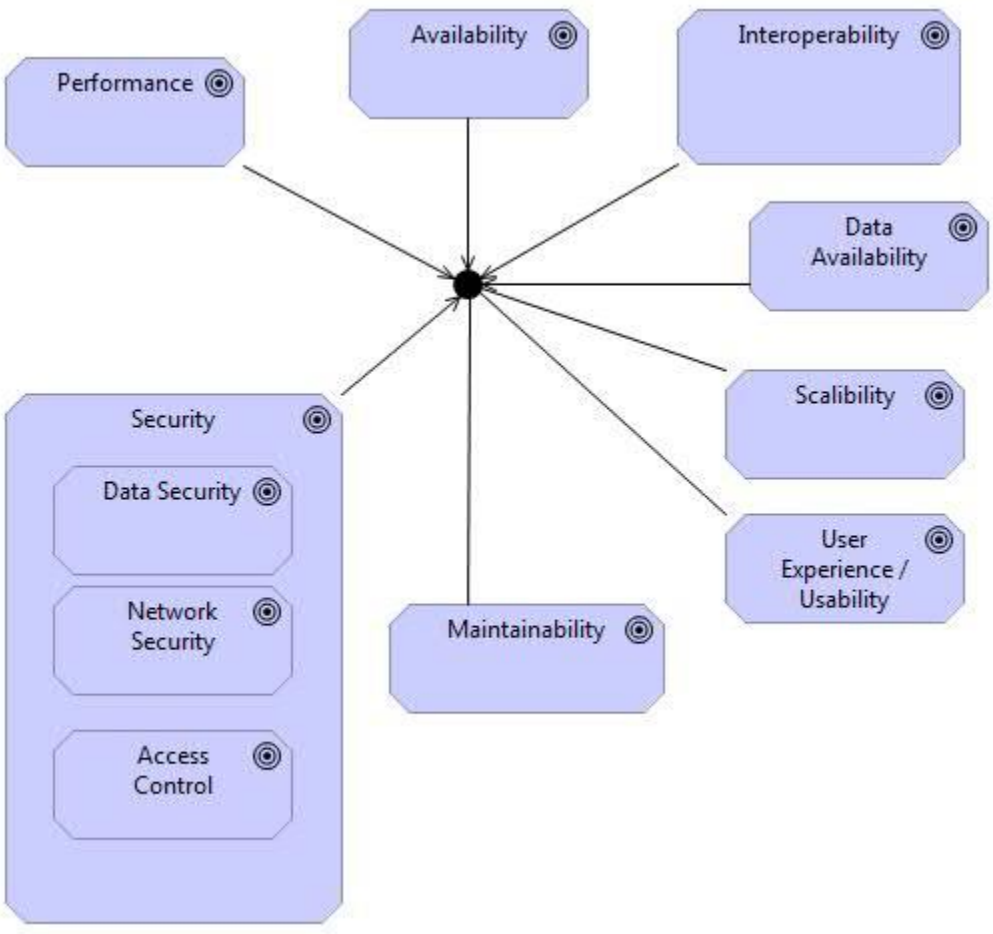
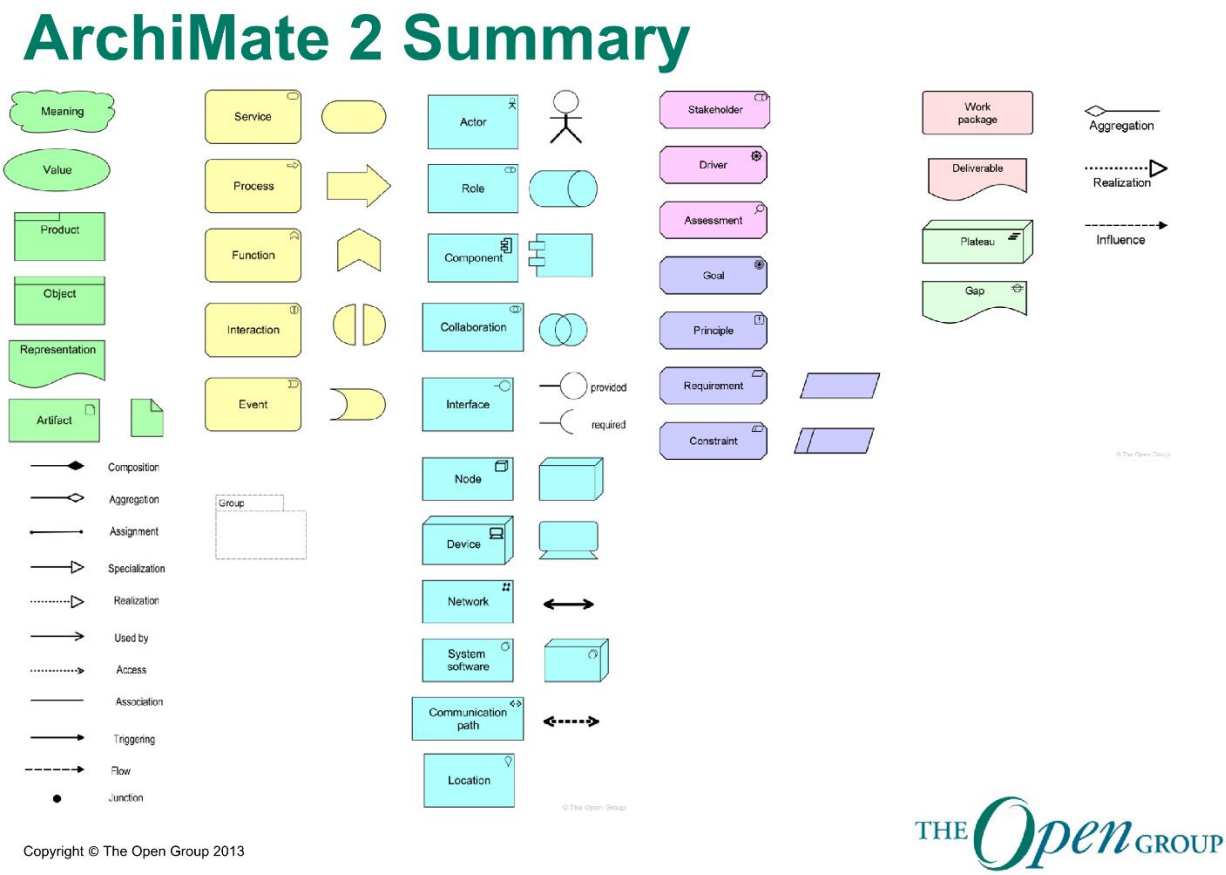


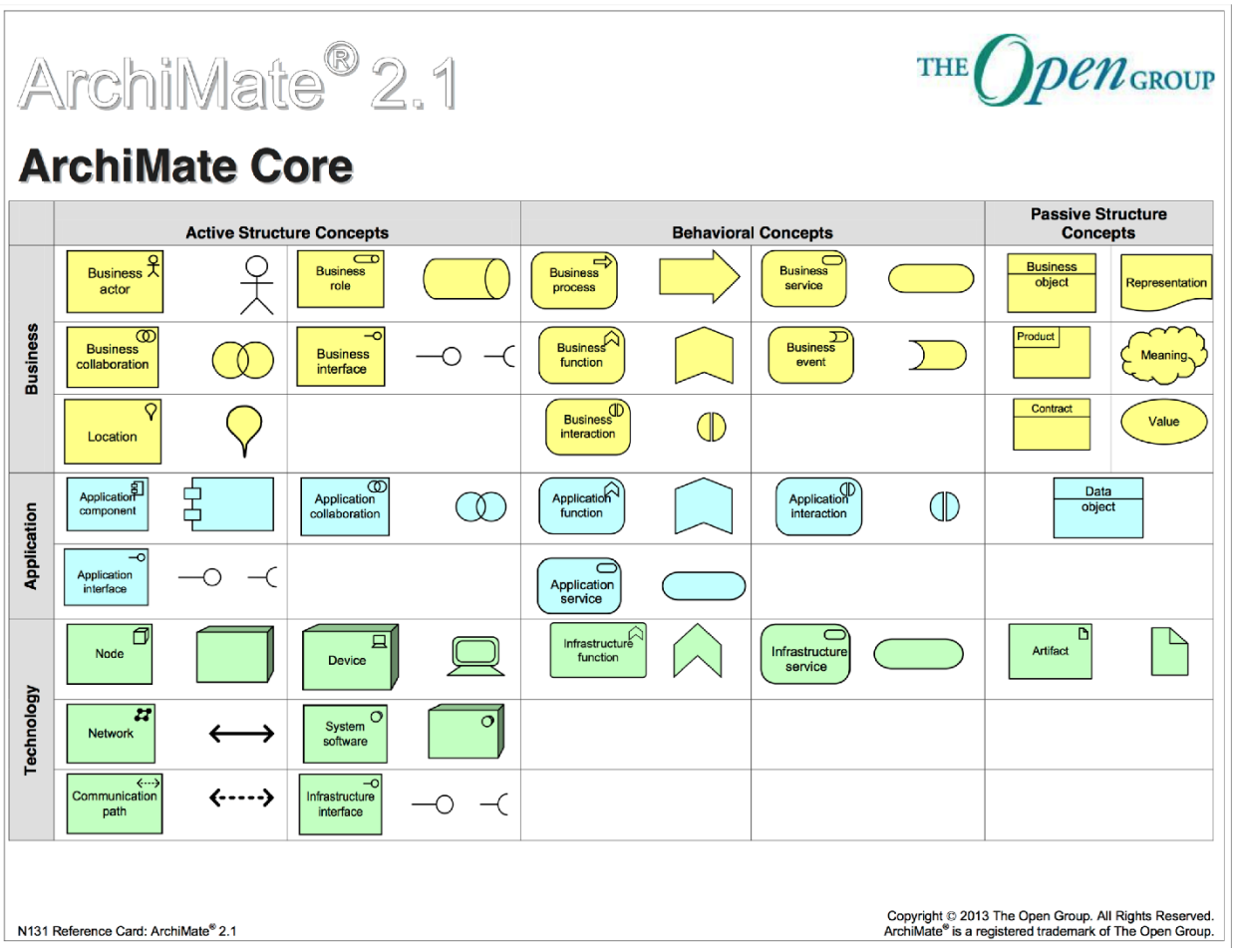
Figure 12: CARS Project Non-functional Requirement Support Concept

The following are examples of non-functional requirements in each category.

- **Performance**
  - The solution shall support fifty (50) concurrent internal users while meeting all documented requirements of the system.
  - The solution shall allow storage of up to ten (10) images for each campaign entity or lobbying entity while meeting all documented requirements of the system.
  - The solution shall complete submission and validation of all campaign and lobbying registration activity reports within two (2) seconds.
  - The solution shall complete upload of all campaign and lobbying registration activity reports within 5 seconds while meeting all documented requirements.
  - The solution shall complete searches and data retrieval requests at the rate of 1000 entity or transaction records per second while meeting all documented requirements.
  - The solution shall return all results for query and ad hoc standard report requests at the minimum rate of one thousand (1,000) records every five (5) seconds while meeting all documented requirements.
  - The solution shall support five thousand (5000) concurrent users entering data online and performing other documented functions.
  - The solution shall support registration data for two hundred fifty thousand (250,000) entities, including twenty (20) rolling years of report data associated with those entities.
  - The solution shall allow storage of up to twenty (20) images for each lobbyist or placement agent while meeting all documented requirements.
- **Availability**
  - The system will be available during the hours specified in the business requirements.
- **Interoperability**
  - The solution shall provide service points for integration with external systems.
  - The solution shall utilize XML for communication with third-party vendor solutions.
- **Data Availability**
  - The solution shall support SOS's document data archival needs for CARS. See the non-functional requirement document for specific data archive requirements details.
- **Scalability**
  - It will be possible to add resources to the solution to be able support increased load in the future.
- **User Experience / Usability**
  - The application interfaces will be designed with the user and consumer in mind so that they are intuitive to use, can be localized and globalized, provide access for disabled users, and provide a good overall user experience.
- **Maintainability**
  - The solution shall meet SOS documented supportability requirements if the solution is hosted at the SOS Data Center.
- **Security**
  - The solution shall enforce security of all data in accordance with the SOS Information Security Office Data Security Categorization Standards.
  - The solution shall maintain a log of all system processing errors, capturing all designated relevant information for each error.

3 Appendix A – ArchiMate Core and Relationships Notation Summary

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ArchiMate Core
Active Structure Concepts
Behavioral Concepts
Passive Structure Concepts
Business
Application
Technology
Business actor
Business role
Business process
Business service
Business object
Representation
Business collaboration
Business interface
Business function
Business event
Product
Meaning
Location
Business interaction
Contract
Value
Application component
Application collaboration
Application function
Application interaction
Data object
Application interface
Application service
Node
Device
Infrastructure function
Infrastructure service
Artifact
Network
System software
Communication path
Infrastructure interface
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Relationships

Structural Relationships		Notation
Association	Association models a relationship between objects that is not covered by another, more specific relationship.	
Access	The access relationship models the access of behavioral concepts to business or data objects.	
Used by	The used by relationship models the use of services by processes, functions, or interactions and the access to interfaces by roles, components, or collaborations.	
Realization	The realization relationship links a logical entity with a more concrete entity that realizes it.	
Assignment	The assignment relationship links units of behavior with active elements (e.g., roles, components) that perform them, or roles with actors that fulfill them.	
Aggregation	The aggregation relationship indicates that an object groups a number of other objects.	
Composition	The composition relationship indicates that an object is composed of one or more other objects.	
Dynamic Relationships		**Notation**
Flow	The flow relationship describes the exchange or transfer of, for example, information or value between processes, function, interactions, and events.	
Triggering	The triggering relationship describes the temporal or causal relationships between processes, functions, interactions, and events.	
Other Relationships		**Notation**
Grouping	The grouping relationship indicates that objects, of the same type or different types, belong together based on some common characteristic.	
Junction	A junction is used to connect relationships of the same type.	
Specialization	The specialization relationship indicates that an object is a specialization of another object.	

N131 Reference Card: ArchiMate® 2.1