**Orchestrator Role extracts from 1500-6**

Appendix B Definitions

System Orchestrator: organization or entity that defines and integrates the required data transformations components into an operational vertical system.

Section 2.1: requirements

Orchestrator component maps to the Lifecycle Management use case characterization category.

2.3: taxonomy

The System Orchestrator provides the overarching requirements that the system must fulfill, including policy, governance, architecture, resources, and business requirements, as well as monitoring or auditing activities to ensure that the system complies with those requirements. The System Orchestrator role provides system requirements, high-level design, and monitoring for the data system. While the role predates Big Data systems, some related design activities have changed within the Big Data paradigm. [Vol. 2 sampling is identical].

The Big Data Application Provider executes [a specific set of operations/] the manipulations of the data life cycle to meet the requirements established by the System Orchestrator. The Security and Privacy Fabric interacts with the System Orchestrator for policy, requirements, and auditing and also with both the Big Data Application Provider and the Big Data Framework Provider for development, deployment, and operation. [Vol. 2 is almost identical].

Section 4: functional components

Defines and integrates the required data application activities into an operational vertical system. [Vol. 2 summary is identical].

The System Orchestrator role includes defining and integrating the required data application activities into an operational vertical system. Typically, the System Orchestrator involves a collection of more specific roles, performed by one or more actors, which manage and orchestrate the operation of the Big Data system. These actors may be human components, software components, or some combination of the two. The function of the System Orchestrator is to configure and manage the other components of the Big Data architecture to implement one or more workloads that the architecture is designed to execute. The workloads managed by the System Orchestrator may be assigning/provisioning framework components to individual physical or virtual nodes at the lower level, or providing a graphical user interface that supports the specification of workflows linking together multiple applications and components at the higher level. The System Orchestrator may also, through the Management Fabric, monitor the workloads and system to confirm that specific quality of service requirements are met for each workload, and may actually elastically assign and provision additional physical or virtual resources to meet workload requirements resulting from changes/surges in the data or number of users/transactions.

In an enterprise environment, the System Orchestrator role is typically centralized and can be mapped to the traditional role of system governor that provides the overarching requirements and constraints, which the system must fulfill, including policy, architecture, resources, or business requirements. A system governor works with a collection of other roles (e.g., data manager, data security, and system manager) to implement the requirements and the system’s functionality.

In a loosely coupled vertical system, the System Orchestrator role is typically decentralized. Each independent stakeholder is responsible for its own system management, security, and integration, as well as integration within the Big Data distributed system using the interfaces provided by other stakeholders.

4.3.1 Collection: … may be over a web server configured by the Orchestrator.

4.3.3 Analytics: … higher level business process logic being encoded by the Orchestrator.

4.3.5 Access: … activity may be a generic service such as a web server or application server that is configured by the Orchestrator.

Section 5.2 Lifecycle Mgmt: Orchestrator: BDLM enables data scientists to initiate any combination of processing including accessibility management, data backup/recovery, and preservation management. The process may involve other components of the NBDRA, such as Big Data Application Provider and Big Data Framework Provider. For example, data scientists may want to interact with the Big Data Application Provider for data collection and curation, invoke the Big Data Framework Provider to perform certain analysis, and grant access to certain users to access the analytic results from the Data Consumer.

Section 7 Conclusion: Version 2 activities [include] ID workflow and interactions from the Orchestrator to the rest of the MBDRA components.

**Orchestrator Actor and Activity; unique to 1500-2**

Section 2.2

Actors: business leadership, consultants, data scientists, info architects, software architects, S&P architects, network architects.

Activities:

A. Business Ownership Requirements and Monitoring: As the business owner of the system, the System Orchestrator oversees the business context within which the system operates, including specifying the following:

 Business goals

 Targeted business action

 Data Provider contracts and service-level agreements (SLAs)

 Data Consumer contracts and SLAs

 Negotiation with capabilities provider

 Make/buy cost analysis

B. Governance Requirements and Monitoring: The System Orchestrator establishes all policies and regulations to be followed throughout the data life cycle, including the following:

 Policy compliance requirements and monitoring

 Change management process definition and requirements

 Data stewardship and ownership

C. Data Science Requirements and Monitoring: The System Orchestrator establishes detailed requirements for functional performance of the analytics for the end-to-end system, translating the business goal into data and analytics design, including:

 Data source selection (e.g., identifying descriptions, location, file types, and provenance)

 Data collection and storage requirements and monitoring

 Data preparation requirements and monitoring

 Data analysis requirements and monitoring

 Analytical model choice (e.g., search, aggregation, correlation and statistics, and causal

modeling)

 Data visualization requirements and monitoring

 Application type specification (e.g., streaming, real-time, and batch)

D. System Architecture Requirements and Monitoring: The System Orchestrator establishes detailed architectural requirements for the data system, including the following:

 Data process requirements

 Software requirements

 Hardware requirements

 Logical data modeling and partitioning

 Data import and export requirements

 Scaling requirements