

Functional Practice Statements - Architectural Approach	
<div><div>Level 1: Initial</div><div><div>1.1An architectural approach that aligns business requirements with IT architecture is established and followed.</div><div>1.2Business and IT stakeholders are identified and involved in architectural decisions.</div><div>1.3Technical capabilities and requirements are defined to guide implementation.</div></div><div>Example Work Products</div><div><ul style="list-style-type: none">Architecture design for implementationBusiness and technical approvals for architectureStakeholder list for architecture approvals</div></div>	
<div><div>Level 2: Managed</div><div><div>2.1The target data architecture aligns with and complements the data management strategy.</div><div><div>The organization's data management strategy is developed collaboratively among lines of business, data management, and IT. Because it is created top-down, the strategy describes a broadly approved vision, goals, objectives, and priorities for the organization's data assets. The target data architecture employs this shared vision as an important input. The high-level requirements addressed in the data management strategy are leveraged to architect and develop blueprints for the future state.</div><div>2.2A governance process is established and followed to ensure that the target data architecture is jointly rationalized and approved by business and IT stakeholders.</div><div><div>Data rationalization is a systematic approach applied for the architectural purposes of discovering, defining, mapping, specifying differences, and comparing elements of the data layer. This activity ensures that the planned data architecture fully addresses the data assets and current issues. Areas of consideration at the logical level typically include multiple data models (which may differ), conflicting business term definitions, similarity and divergence of values, undocumented business logic, multiple ETL mappings with overlapping data content, etc.</div><div>Areas for mapping and evaluation at the physical level include redundant data in multiple data stores, exceptions to common data usage, degree of business dependency on specific data stores, and planned application consolidation efforts.</div><div>Engaging in a data rationalization effort at the architectural level enables the organization to fully describe the current architecture at the level needed to support development of future state blueprints.</div><div>2.3An architectural transition plan is based upon a mapping between the current data layer components and the future-state environment.</div><div>The transition plan includes current data store status, retirement and redesign target dates, the staffing plan, the training plan for new technologies, and target implementation dates for future components.</div><div>Refer to Architectural Standards for information about managing data standards applicable to the architectural approach.</div><div>2.4A process is established and followed to ensure that data interface specifications are documented for shared data, with traceability from creation through consumption (end to end) by all sources within scope.</div><div>Refer to Data Integration for information about integration best practices dealing with interfaces.</div><div>2.5A compliance process is established and followed to ensure that projects refer to and utilize the approved target architecture.</div></div><div>Example Work Products</div><div><ul style="list-style-type: none">Documented approval for architectural designsApproval process for architectural design through governanceDocumentation of approved architecture utilizationShared data interface traceability mapRecords indicating implementation consistent with approved designs* * Review board notes and decisions.</div></div></div></div>	
<div><div>Level 3: Defined</div><div><div>3.1The architectural approach for the target data architecture is followed across the organization.</div><div><div>It is challenging for the organization to enforce consistency of application, as short-term, event-driven priorities may result in exceptions that have long-term consequences that could add complexity, cost, and rework to the evolution toward the target architecture. Strong senior management direction is critical to preempting decisions that may not be conducive to achieving architectural goals.</div><div>This copy is licensed solely to Gary Walker, who agrees not to reproduce, duplicate, copy, sell, resell, assign, transfer or exploit any portion of this document without express written permission by CMMI Institute. Usage by others is prohibited.</div><div>Refer to Architectural Standards for information about standards applicable to the architectural approach.</div><div>3.2A data store rationalization process is performed.</div><div><div>The rationalization process assesses the existing data assets and determines the degree of redundancy, the degree to which they currently satisfy business requirements, and the platforms and technologies utilized. It is based on rigorous criteria and performed systematically to ensure that information needs implying the development of new data components are not already addressed by other data stores within the organization. Existing data stores can be repurposed, or may be satisfactory as a transition step to achieve longer-term architectural goals by adding an abstraction layer (for example, XML) or enhanced data quality processes.</div><div>The organization may develop a decision tree for graduated characteristics that need to be met before a consolidation or build decision can be made. Minimizing impact on core operational business processes is an important objective, as is cost minimization. The results of the rationalization process provide significant input into the architecture transition plan.</div><div>3.3The target architecture is collaboratively developed and jointly approved by business units, IT, and data governance.</div><div><div>It is important for organizations to design the data layer to address business needs and best practices. Organizations should avoid delegating it solely to IT, as that approach may foster resistance from the lines of business and reinforce the status quo. For example, business sponsors who have not been involved may be insufficiently informed to make precise plans to transition their data stores to the target state.</div><div>Additionally, other business implications of which IT is unaware may exist. Finally, involving all relevant stakeholders is the key to adoption and sustaining support over time. It is recommended to follow a collaborative method in development of the architecture. If the architecture effort runs longer than anticipated to ensure collective involvement, it may be a worthwhile trade-off to realize the benefits of higher likelihood of approval and sustained collaborative agreement during implementation. As the transition plan is executed over time, it is likely that one or more data stores owned by each primary business sponsor will eventually be impacted. Strong buy-in can facilitate decisions and reduce obstacles, project by project, as data stores undergo redesign, consolidation, or replacement.</div><div>3.4The organization creates and maintains metrics to evaluate progress on state transition and traceability mapping.</div><div><div>Metrics for the architecture transition can enable accurate reporting on milestone achievements for major projects, show progress of the architecture in terms of adoption, and highlight capability improvements realized from the new and modified components.</div><div>For example, business feedback on improvements can be expressed as a data confidence index that correlates with meeting the business objectives for the target architecture. Traceability maps can be developed and monitored to evaluate the extent to which business requirements are met by the evolving implementation, and to validate that existing data sources have been successfully transitioned as planned.</div><div>3.5Both internal and selected external data standards are evaluated and applied to the development of architectural blueprints and component designs.</div><div><div>Although the transition to the target data layer is a long-term activity, adhering to standards from the beginning prevents rework and its associated costs. In many organizations, data standards and integration data models (e.g., enterprise data models, shared repository data models, etc.) already exist and are subject to a compliance process prior to the development of the target data architecture. If such artifacts do not exist, are not complete, or are not followed, undertaking the architecting of the target data layer is an occasion to create them and institute a compliance process.</div><div>Evolving technology capabilities and industry-wide external exchange efforts create the need for new standards.</div><div>3.6The architecture, technical requirements, and supporting infrastructure capabilities are aligned.</div><div>The architecture and designs should align with the organization's intended target infrastructure.</div><div>The organization may have an Enterprise Architecture in place, and decisions about platforms, technical capabilities, and corresponding products may have been approved. If lacking, development of the architectural approach for the data layer is an opportunity to further organization-wide progress. The organization needs to determine how it will manage data movement, data integration, data quality, and security, to meet the goals of extensibility, performance, reliability, resilience, etc</div><div>3.7The architecture includes the target integration layer, also known as common interface design.</div><div><div>Some organizations experience high complexity and cost burdens from the proliferation of interfaces over many decades. While it is challenging to derive a precise figure for the aggregate cost of maintaining existing interfaces, reflection on typical scenarios—such as the number of integration tests conducted per major application release and the number of new point to point interfaces created annually—outlines the suboptimal situation. Many organizations pay relatively little attention to this steady-state burden, as costs are usually allocated within the schedule and budget of the projects.</div><div>Within the context of the architectural approach, it is very beneficial to define objectives and identify interfaces for consolidation, abstraction, elimination, or replacement over time. Considerations include data movement, uniform import mechanisms, standardization of data representations, publish [producer] and subscribe [consumer] methods, consolidated views, candidate common data services, etc.</div><div>Large organizations, or organizations that have been in business for many years, may suffer from a lack of overall knowledge about the data they are ingesting, its sources, and its quality. For example, an organization may find that some data feeds are purchased more than once for separate lines of business, and that sets of the same internal data are procured through multiple mechanisms. Creating a data asset library, accessible to all stakeholders, is a useful mechanism to facilitate discovery of what external and internal sources are already available, what they contain, and how access may be accomplished.</div><div>3.8Data profiling is performed prior to finalizing the design of a data store component that will contain existing data.</div><div>When an organization commits to a major redesign or consolidation, it is advisable to undertake data quality profiling as a preliminary activity.</div><div>Because roughly half of data quality issues are structural, comprehensive profiling frequently reveals design flaws that can be remediated in the new data store. The organization should have criteria defined to guide decisions on when profiling is required before these architectural changes.</div><div>Refer to Data Profiling for more information related to profiling activities.</div></div><div>Example Work Products</div><div><ul style="list-style-type: none">Rationalization reports and matrix depicting decision criteriaStandards documentation on data-related architectural approachProject implementation checklists aligned with transition planMetrics for transition progressEvaluation of external and internal standardsList of architecture adoption stakeholders and business unitsTechnical requirements capabilities and specificationsArchitecture blueprint compared to the As-Is architectureData quality profiling reports applied to design</div></div></div></div></div></div></div></div>	
<div><div>Level 4: Measured</div><div><div>4.1Statistical analysis of performance and data quality improvements are used as input to the architectural design process.</div><div><div>Metrics for the performance of new architecture components against defined business objectives, coupled with cost-benefit analyses, are input to architectural design decisions. Limitations of the existing architecture are identified, tracked, and used as input for future architectural plans. Similarly, refinement of the architectural approach over time includes forward planning to ensure an effective data migration to next-generation capabilities.</div><div>Metrics for the new architecture component are also used to assess if business objectives and data quality targets are being met. This may include business impact KPI criteria that typically include the following:</div><div><ul style="list-style-type: none">TimeMoney saved due to less data repairIncreased revenuesImproved customer satisfactionFreed timeImproved dataEnhanced analysis</div></div><div>Example Work Products</div><div><ul style="list-style-type: none">Cost-benefit analysesQuantitative performance criteria for designed componentsQuantifiable architecture evaluation targetsQuantifiable data quality improvements correlated with new or changed componentsStatistical models employed to guide architecture decisionsDocumented limitations of current target architectural approach</div></div></div>	
<div><div>Level 5: Optimized</div><div><div>5.1Prediction models are evaluated against architectural changes and adjusted as needed.</div><div>5.2The organization shares architecture and platform lessons learned through publications and conferences.</div></div><div>Example Work Products</div><div><ul style="list-style-type: none">Proposals for modifications to architectural approachPrediction model comparison report against business objectivesStakeholder feedback traced to proposed modificationsPresentations or publications about the organization's architectural approachAnalysis of data sets showing correlation between actual performance and predicted performanceIdentified enhanced business capabilities due to enhanced data analysis</div></div>	