

Platform Reusability to Support Multiple State Agencies, Systems and Programs

About Dawn Technologies

Dawn Technologies™ helps government agencies and commercial payers tackle their most complex healthcare modernization and policy challenges. As experts in systems integration with a deep understanding of public and private health insurance, benefits management, and healthcare IT, we are able to deliver configurable and sustainable solutions that exceed client expectation in less time, at lower cost, and with greater assurance. Our platforms, applications, and integration services are helping state agencies address policy requirements for consumer health insurance access and coverage (ACA) as well as modernization of Medicaid legacy systems.

Introduction

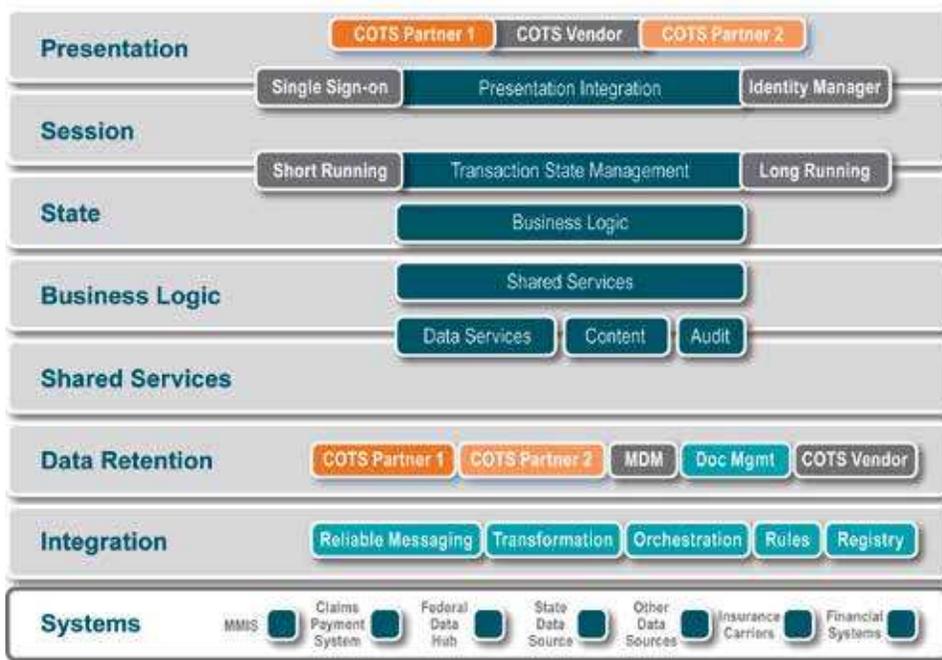
In the current, ever-changing state agency technology environment, state CIOs are being asked to provide systems interoperability between existing, deployed platforms with newly required services and their associated future platforms. Strategic planning is ongoing regarding upgrades of legacy platforms, deployment of new platforms, and the sharing of platforms within agencies, with other agencies, and with other states to support the interoperable exchange of disparate data, systems, and services. Decisions must be made as to how to upgrade and align the legacy platforms with new business requirements and agency objectives.

New, modernized platforms can offer more flexibility in interoperability and connectivity with both legacy platforms and newly deployed platforms using newer technology approaches such as Service Oriented Architecture (SOA). Ideally, these new approaches would include a solution that can be installed once with services that can be used and consumed by other systems in a standards-based manner, solving multiple business problems and objectives. CIOs should therefore consider implementing platforms that offer reusability, thereby delivering significant benefits to state agencies, including the ability to support multiple disparate systems, sources of data, and business processes, as well as multiple state agencies and agency requirements/objectives.

Reusability: What is it?

Reusability can be defined as the ability to use existing functionality without having to replicate or modify this functionality for another environment. Reusability should not be confused with reproducibility, which allows for replication of functionality in another environment. Rather, reusability allows for a functionality (such as a web service) to be published by one platform and then natively consumed by other, disparate platforms, thereby achieving multiple business objectives and goals. A core function of the reusable platform is the ability to offer components that can be leveraged across multiple implementations.

Reusability can be at several levels in a modern, reusable SOA-based platform; at the web services level, at the data model level, at the SOA foundation level, at the interface level, etc. A key element of a reusable platform and system design is the separation of the system into composite layers that allows for the state agency to maximize reuse to the greatest extent possible. As an example, reusing the design architecture and data signatures would be the minimum amount of reuse, while reusing the entire platform could maximize reuse.



Separating system layers into discrete segments allows for easy adoption and reusability of tools and processes.

By clearly defining the stakeholders and specific use cases, a state agency would be able to reuse some, most, or all, of the reusable platform to deliver those use cases. This alignment between the agency stakeholders and the design of the reusable platform is important because it allows the agency to separate the data and the areas of concern to create the greatest value (i.e., separating the presentation layer from the business logic layer). This alignment allows a state agency to reuse layers of the platform without re-implementing the entire platform stack. A diagram of the segmentation of the system layers is presented on the previous page.

Interoperability within and between state agencies and systems is critical in the current state agency environment. For example, a state Health Insurance Exchange (Exchange) platform must interact with other state agencies and systems (and even federal agencies and the Federal Hub) to complete the required functionality, along the way both consuming services and publishing services for consumption by other disparate systems and agencies (Medicaid MMIS/MES, the Medicaid Eligibility and Enrollments System, etc.). This Exchange example demonstrates the necessity of deploying a standards-based platform that is reusable and allows for a service to be published once and then consumed and reused multiple times by multiple, disparate systems across the state as well as with other partners, stakeholders and systems.

Building upon this example, state agencies that want to stand up an Exchange, but also want to minimize risk could look at reusability at the data level. In another model, states could team together, thereby deploying one reusable platform for multiple Health Insurance Exchanges across several states; the reusable platform would have one presentation layer (reused) for multiple states, but the back-end components would be different and fit each state agency's need. In the multiple-state example, implementing the same system from one state to another is not a prudent plan, as every state infrastructure is different. Instead, each state should consider reusing the platform in a layer-by-layer approach, thereby only reusing the layers that fit the specific state and that state's infrastructure and business needs.

A reusable platform allows for state agencies to plan for future integrations and to deploy a flexible, scalable platform that solves multiple business problems. The reusable platform allows the state agency to offer a "publish once—consume many" type of approach, saving time and money in the building of interfaces, customization, and deployment of new platforms.

Stakeholders and the Impact of Reusability on a State Agency

State agencies should consider how to deploy a scalable, standards-based platform that is reusable and not a silo-based approach. The ability to utilize the same platform or services, within a state, between state agencies, systems, and business processes can save significant time, money, and customization.

The ability of a reusable platform to publish a service once and then be consumed and integrated by multiple, disparate systems (across a state agency, across a single state infrastructure, across multiple state infrastructures, and even with federal infrastructures) can offer a state agency significant savings in cost and time, while limiting the amount of traditional customization required by each legacy platform and interface. The reusable platform typically has three benefits: lower costs, reduced deployment schedules, and a lower implementation risk. With the need for integration of multiple state agency systems, interfaces, and data, along with more and more requirements for state and federal data interoperability, state agencies should look to deploying a scalable, standards-based platform that offers reusability to reduce implementation risks.

For example, a state could deploy a reusable platform as the state Exchange, while supporting interoperability and reusable services with the state Medicaid agency (MMIS/MES and Eligibility and Enrollment Systems), as well as other state agencies (Public Health, Social Services, etc.). A state agency could also use such a reusable platform for state-to-state shared services and programs, such as multiple states sharing the reusable platform at several different layers for an Exchange deployment. In this example, even external stakeholders could benefit from a reusable

Exchange platform that publishes and consumes the same shared service, including insurance brokers, insurers, TPAs, other stakeholders, etc.

The impact of a reusable platform on a state agency can be significant, and can allow a CIO to plan, isolate impact, and decide the priority of changes to existing systems, while mitigating implementation risk.

Adherence to Standards

A reusable, standards-based platform should be in compliance with the Medicaid Information Technology Architecture (MITA), as well as other standards (SOA, etc.) to ensure a standards-based deployment and interoperability with other platforms and systems. The reusable platform allows a state agency to publish and consume the same shared services, allowing the SOA foundation and data model to be agnostic to whatever commercial off-the-shelf (COTS) vendor the agency brings in now or in the future. Having a well-defined services structure allows internal systems, as well as other systems in the agency and state, to connect and exchange data in a standards-based methodology. The amount of reuse a state agency decides upon can be broken out into three tiers as shown in the Tiered Approach to Reusability diagram.

These three tiers range from only sharing the documentation and knowledge, all the way to jointly procuring systems or creating a multi-tenancy environment.

The Twelve Elements of a Reusable Platform

Within the three tiers there are twelve considerations, or elements, that have been identified for a fully reusable, standards-based platform. By adhering to these twelve elements, as well as other standards, the reusable platform will not only achieve current agency (or state) objectives, but also will offer scalability and reusability to solve future agency business and technical interoperability needs and use cases.

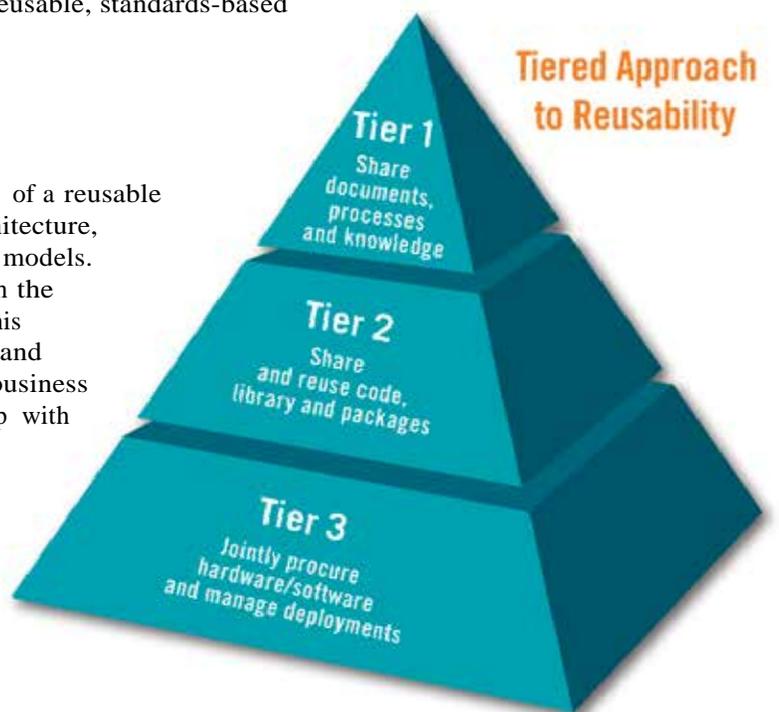
The twelve elements that have been identified for a reusable, standards-based platform include:

Tier One Reusability

1. Business Process Architecture and Models: The Business Process Architecture element of a reusable platform should allow for MITA-aligned business supporting business process models. Modularity is an important factor, as is alignment with published SC. This element should also support business service design and application services design. MITA alignment for architecture will ensure the Platform can move MITA, as MITA evolves.

2. Presentation Layer:

In the Presentation Layer element of a reusable platform, reusability of design and style sheets the most likely place to see a system maximize reuse. Reusable modular parts and UI, along with compliance with industry standards, are all important. UX2014 design compliance, CSS style sheet reusability, and XML DTD reusability are all considerations within this area.



Source: Michael Tutty, MHA, PhD—New

England States Collaborative for Insurance
Exchange Systems (NESCIES) and University
of Massachusetts Medical School

3. Quality of Service and Protection:

In the **Quality of Service and Protection** element of a reusable platform, Service Management, Service Network Security, Privacy and Integrity, and Authentication and Authorization are critical components. Compliance with standards for security and privacy, and associated rules, laws and governance are important to this element.

4. Service Oriented Architecture and Technical Design:

In the **Service Oriented Architecture (SOA) and Technical Design** element of a reusable platform, it is key to have a SOA that is in step with MITA to ensure high reusability. As a SOA platform meets reusability and interoperability objectives, complying with the SOA principles as well as the MITA guidelines will ensure high reusability in a platform. SOA will also help interoperability and data sharing across state agencies, including the Exchange deployment and the state Medicaid agency (SMA). In this element, the SOA should have an abstraction of data sources and business and technical services, and should have no point-to-point interfaces. The SOA should also allow for transaction state management, shared-service-driven data exchange, and separation of the presentation layer from the logic.

Tier Two Reusability

5. Sustainable Solution Architecture:

In the **Sustainable Solution Architecture** element of a reusable platform, shared services should be maximized for inter- system integration. A sustainable solution architecture is also an outcome of utilization of a reusable platform. As noted in MITA, "Identifying common business processes enables the definition and reuse of common solutions, which in turn enables states to share development costs."

Coarse-grained business services should be designed that are configurable, along with fine grained technical services for maximum reusability. The presentation layer should be separated from business logic, along with orchestration (BPEL) and mediation. Separation of the payload from data interfaces, separation of data interfaces from transformation, and transaction management and bundling should be completed.

6. Data Model and Semantic Layer:

In the **Data Model and Semantic Layer** element of a reusable platform, the data model can be reused at the solution level, even with different environments, operating systems, databases, and functional modules. Representing data in a reusable manner is a key element, as this provides a basis for various business workflows and applications. In this element, the data model can be separated into functional, transactional, and data aggregation models, allowing for functional data model reusability (including business logic) and transaction data model reusability.

In this element, data aggregation should be reusable, including reusability in the universal semantic layer, external data source interfaces, data hierarchy (i.e., state versus federal), and data deduplication scripts and tools. Business Intelligence (BI) should support common report requirements, as well as BI tools and reporting tools, and big data handling and mining tools.

7. Functional Modules:

In the **Functional Module** element of a reusable platform, commercial off-the-shelf (COTS) Functional Modules are highly reusable. The reusable platform offers pluggable and replaceable functional models, as described in MITA. State agencies can be agnostic, and not tied to a specific COTS solution, as these solutions can be plugged and unplugged into the platform. There are several vendor solutions that can be implemented and integrated in a COTS setting, including solutions for an eligibility engine with rule sets and case management, plan management with plan comparison and selection, and financial management, including billing, payments, reconciliation and interfaces. Additionally, COTS solutions exist for transaction management, audit, notification, and SOA integration.

8. Integration and Orchestration:

In the **Integration and Orchestration** element of a reusable platform, the integration layer should support ESB usage, orchestration, and mediation best practices (i.e., ESB, BPM, and BAM). Deep expertise should be deployed in structural, behavioral and performance mediations, along with integration with other external systems (i.e., the Federal Hub and others).

In this element, transaction state management should be supported, since loosely coupled SOA systems require state management, and can be a highly reusable independent component. Complex solutions require event and transaction auditing, and these auditing services can be implemented as a reusable module, along with event and state notification.

9. Interface Reusability:

In the **Interface Reusability** element of a reusable platform, interfaces can be reused at the data or process level. Of note, a key factor in the reusable interface is the adoption of standards and achieving interoperability. Interfaces

to support the Federal Data Hub data, the Federal Exchange data, and the Federal Exchange process should all be reusable between these systems and services. Other systems and interfaces should be reusable to support the carrier system and process interface, CRM system interface, document and content management interface, and identity management system interface.

10. Shared Services:

In the **Shared Services** element of a reusable platform, the Shared Services, Business Services, Technical Services, and Information Services should all be reusable, thereby allowing these services to be shared and used by various business and functional areas within (or outside of) the state agency. The Shared Services should reuse identity, content, audit, notification, and data, as well as service orchestration scripts and the services registry. The Business Services, Technical Services, and Information Services should all be reusable at the application level, and the reuse of provider directories, Single Sign-On (SSO), authentication services, etc., should be supported.

Tier Three Reusability

11. Environment and System Infrastructure:

In the **Environment and System Infrastructure** element of a reusable platform, the hardware environment must be reusable, along with the database environment. The hardware environment should be a multi-tenant environment to allow for testing, development and production environments, requiring systems to share the same operating system but not the same functional components. Cloud computing and virtualization should be considered in this element. The database environment should also be reusable without consideration for data model, functional modules, or applications, while allowing for data tools to be reusable in terms of Extract Transform Load (ETL), deduplication, reporting, and Business Intelligence (BI).

12. Solution Compliance and Availability:

In the **Solution Compliance and Availability** element of a reusable platform, Compliance and High Availability and Scalability are important components. This element is related to Quality of Service (QoS). Compliance with CMS, ADA, and HHS compliance reports is key, along with reusing the data model and USL, allowing for standardized reporting. In this element, high availability and scalability should include a clustered deployment, a redundancy designed with robust error handling, and the ability to handle a large amount of unstructured data.

Conclusion

The ability of a reusable platform to publish a service once and then be consumed and integrated by multiple, disparate systems (across a state agency, across a single state infrastructure, across multiple state infrastructures, and even with federal infrastructures) can offer significant time and cost savings for a state agency, while limiting the implementation risks. By utilizing a reusable platform, CIOs can utilize shared services, thereby taking code and turning it into reusable building blocks, versus silo-based deployments. A reusable, standards-based platform can

limit the point-to-point connections, and allow CIOs to maintain vendor neutrality and mitigate risk by tier separation of the infrastructure. COTS vendors maintain a role in the infrastructure, but are now interchangeable components of the infrastructure.

With the need for integration of multiple state agency systems, interfaces, and data, along with increasing interoperability requirements for state and federal data, including Exchanges, state agencies and CIOs should look to deploying a scalable, standards-based platform that offers reusability, thereby lowering costs, reducing development time, and mitigating implementation risks.

