SOA and API Management

Leveraging Your Investment in Service Orientation

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Introduction

By now, you have probably been exposed to a lot of information regarding APIs. However, there's still a significant amount of confusion surrounding what APIs are, how they should be managed and why they are important. In fact, it's easy to become confused as to how managing APIs relates to and differs from SOA.

The concepts of API and SOA are synergistic, as they both support basic patterns of managing consumer/provider relationships. In fact, we've seen service orientation evolve over the past 15 years, from RPC (remote procedure call) and CORBA/IIOP, so API Management should be seen as the next step in the evolution of service orientation.

There are several perspectives to consider regarding SOA and API Management, and this paper will clarify the similarities and differences between the two. Simply put, API Management is focused on monetizing value locked up in existing business functions by exposing those functions (in the service sense) to expand the business.

Describing SOA (Service-Oriented Architecture)

SOA is many things to different people, but can be summarized as three main ideas:

1. Services - A **repeatable business task**, for example: check customer credit; open new account.

2. Service Orientation - A way of thinking about your **business through linked services** and the outcomes that they bring.

3. Service-Oriented Architecture - A business-centric **architectural approach** based on service-oriented principles

Many enterprises will start their SOA journey with SOA Entry points to solve a specific business problem. For example, most organizations have information from the same

data domain in several separate databases and operational data stores. An information service is created to interface to all of these legacy data stores and provide a single source of truth.

Using this or other SOA entry points, organizations gained experience with SOA services, service orientation, and service-oriented principles. As a result, they started to unlock the information available in the back-end legacy systems by creating a set of separate business functions as services with well-defined contracts.

As an organization matures in its use of service orientation, a more top-down version of SOA drives business and IT alignment. Such alignment starts with identifying business objectives, factoring them down into business processes, and then, identifying the business capabilities/functions required to meet those business objectives. At the risk of restating the obvious, SOA is a way of thinking that drives business process and technology enablement together and manages that relationship within a lifecycle of service identification, creation, deployment, management and ultimately, replacement or deprecation.

To apply SOA to align business and IT, you should:

- Identify, document and optimize your business processes.
- Establish processes for business function identification, ownership, funding, analytics, reporting and investment.
- Build business functions in a modular fashion, with the right level of granularity so that the functions can be reused or composed into higher-level business functions.
- Catalog important information about those services, such as: how to access them, what the terms and conditions of usage are, what security requirements exist for the service, etc.
- Establish an integration and mediation framework, so that services can be called dynamically based on then-current policies and business parameters.
- Enforce policies that make your business services secure and reliable.
- Track and analyze usage statistics, access information, performance data, etc., to ensure business functions are readily available, pertinent and returning business value.
- Manage the business functions within portfolios, separating differing business concerns and thereby guiding where to invest and how to maximize business return, as well as how to make your business more agile.

That, in a nutshell, is a service-oriented architecture with the processes to ensure business vitality via continuous analysis, improvement and investment towards business goals.

Describing API Management

As stated before, the value of API Management ultimately is the creation and monetization of business functions. In essence, it means taking carefully chosen business functions and exposing them (internally, externally or to a limited audience) so that others (internal teams, clients, partners, etc.) can use them.

There are several advantages to this approach:

1. It extends your business model by providing core capabilities to partners, allowing them to consume your business functions. This expands your

business by opening up new and different routes to market and helps partners by alleviating the need for them to build those core functions.

2. It provides your business with a potential annuity revenue stream for APIs consumed (depending on the business model you choose for your APIs).
3. It allows you to market your business functions as 'products', thereby driving awareness of your key capabilities.
4. It creates business dependencies for others on your 'platform' of APIs.

To implement APIs successfully, you should follow a path similar to the more mature top-down approach of SOA:

- Identify, document and optimize your business processes (hopefully already accomplished through your existing SOA infrastructure – see above).
- Establish processes for business function identification, ownership, funding, analytics, reporting and investment processes (hopefully already accomplished through your organizational focus on SOA - see above).
- Build business APIs in a modular fashion, with the right level of granularity, so that the functions can be reused or composed into higher-level business functions.
- Catalog important information about those APIs, such as: how to access them, what the terms and conditions of usage are, what security requirements exist for the API, etc.
- Establish an integration and mediation framework, so that APIs can be called dynamically based on policies and business parameters.
- Enforce policies that make your APIs secure and reliable.
- Track and analyze usage statistics, access information, performance data, etc., to ensure APIs are readily available, pertinent and return business value.
- Manage the APIs within portfolios, thereby distributing business decision-making responsibility, as well as guiding where to invest, how to maximize business return and how to make your business more agile.
- Market your APIs to the correct audiences (developers, business partners, customers, etc.).

Now let's explore the similarities and differences between SOA and API Management.

SOA and API Management - Similarities and Differences

As you can see from the above, there are many similarities between SOA and API Management. Each manages a consumer/provider relationship. Each requires a catalog. Each requires the programmable exposure of an interface to consume a business function. Each requires lifecycle management, etc.

The fundamental difference between the two involves the community approach that API Management takes to onboard new consumers. There's much more focus on positioning business functionality (APIs) as consumable 'products' that need to be marketed, promoted and managed. Services in a SOA context are traditionally treated as 'free'(and possibly centrally governed and managed) business services that are easily composable with little-to-no entitlement requirements, other than perhaps SLAs.

A key differentiator that API Management provides out of the box is business analytics. With SOA, robust service analytics took a considerable amount of engineering, to

capture, aggregate and analyze the data, and then drive changes through empirical information. With API Management, that functionality is included with the product.

There are also additional capabilities provided in API Management towards the automation of onboarding consumers, as well as additional requirements for access control and authorization.

If we look, for example, at onboarding (provisioning) developers to register applications they own by consuming APIs registered on a portal, we see that API Management provides more functionality to:

- Sign up for an account on an API portal to consume APIs.
- Browse a catalog of available APIs and determine what the access requirements are.
- Review usage and SLA information about available APIs.
- Request permission to consume APIs by agreeing to the terms and conditions of usage.
- Receive credentials and access mechanisms to consume that API.

To reiterate, SOA portfolio management and service consumption assume a certain level of 'free' service availability where more stringent registration and access were usually not required because of a centrally governed and managed corporate environment.

API Management, due to its external exposure, requires more functionality and automation around registration, provisioning, entitlement, access control and consumption of those business services exposed as APIs.

API Management and Mobile

SOA could not foresee the explosive growth in mobile computing. Although a strong SOA architecture provides the foundation for governing and managing the lifecycles of business functions including APIs, SOA lacked the 'portal' approach to registration, onboarding and managing the multi-tenant nature of APIs.

Also, SOA-based integration environments are usually designed to handle a managed, predictable set of workloads that an organization controls. These environments are usually well managed, with oversight into transaction traffic and ability to predict overall load requirements.

With APIs, external loads can vary greatly, and a more granular capability to manage traffic by individual API becomes ever more important. That's why metering and analytics play such a crucial role with APIs; they allow API administrators and owners to regulate API usage and ensure availability of critical business functions via policy-based failover, redirection, and in some cases, rejection, of application traffic that has exhausted its quota of requests.

Mobile traffic is often unpredictable or "spiky". Furthermore, mobile is often a separately managed business unit, almost as if it was an external partner organization. Finally, mobile applications evolved far more quickly than traditional enterprise applications. With API's, the enterprise can use the API infrastructure as the gateway for mobile traffic managed as one of many enterprise API portfolios.

Let's not forget the value of cloud for APIs. Since traffic can be unpredictable, offloading API proxy and gateway capabilities onto a cloud provider shifts the burden

of response time and availability to the cloud provider, giving organizations one less thing to worry about.

How to Exploit SOA Capabilities for API Management

Now we can identify how to exploit existing SOA capabilities to drive business value with API Management. There are several SOA-related capabilities that can serve as foundational accelerators (aka "quick starts") and supporting capabilities for API Management:

Design governance – Leverage your existing application architecture standards and guidelines to produce APIs.

Portfolio planning – Use your existing portfolio planning capabilities to embrace APIs as another way of exposing business 'endpoints' either within or outside of your organization.

Extending the SOA service lifecycle to embrace APIs – It's likely that you have been managing service selection, investment and management for internal services for quite some time. Leverage those time-tested processes for APIs as well. APIs essentially are just different technical representations of exposed business functions, with a more robust registration, entitlement and metering capability. There's a good chance you already have a service registry & repository, such as IBM WebSphere Registry & Repository®, driving some aspects of your service runtime governance and management. It makes sense to manage API metadata within that context as well.

Leveraging business analytics of APIs to govern future IT investments – Since API Management engines usually come with built-in analytics, utilize that capability to track API usage, frequency, consumption, etc., to make better investment and architectural platform decisions moving forward. Facebook, Google, Amazon and Twitter did not become the fastest-growing companies without a very robust API strategy and analytics capability.

Leveraging existing Gateway and assembly appliances for APIs – Most likely you already have service and security Gateways, such as IBM DataPower®, that can be re-factored to provide gateway capabilities for APIs.

How Haddon Hill Group can Help

Haddon Hill Group (HHG) was founded to address the ongoing need to link IT investment to business value in enterprises that rely on complex computer systems. Typical clients include large financial services, healthcare, insurance, retail, distribution and manufacturing companies. For the managers of such high-volume, high-complexity, business-critical IT infrastructures, HHG can help improve business alignment, financial control and performance, governance, reliability, and service support. Through consulting, analysis, hands-on engineering and facilitation methodologies, HHG provides comprehensive technical expertise to help our clients configure, integrate, implement and extend vendor products to create IT and business service management capabilities not possible with simple tool configurations.

As an IBM Premier Business Partner, HHG has deep experience working with and integrating IBM products to provide value to business enterprises. HHG consultants are trained and certified across the IBM Software Group's entire Brand Portfolio, and

can integrate all these products into a coherent and efficient business-focused IT infrastructure for clients. HHG has become the go-to boutique IBM business partner for technically challenging SOA integrations.

Haddon Hill can help define API modeling and architecture guidelines that ensure your APIs align with your existing architectural standards and provide the necessary building blocks to extend your business model externally.

Haddon Hill Group provides the following services to partner with you in advancing your API Management capabilities:

API Management Readiness Assessment	• A focused workshop to determine readiness to implement API Management capability within your organization. • Typically takes one full business day, after one half day of client preparation (complete preliminary readiness questionnaire). • HHG consultants work with your team to understand your business drivers, technology infrastructure, organization, current IT processes and constraints (e.g., regulations). • From this understanding, HHG provides recommendations for implementation of API Management within your enterprise.
API Management Quick Win Pilot	• Based on the assets produced in the API Management Readiness Assessment workshop, HHG consultants will help build a pilot project to address one of your use cases for API Management.
DataPower Migration & Operational Excellence Workshop	• A focused workshop to determine your readiness to migrate from XI50's to XI52's. This workshop can also be performed as a prerequisite to the API Management Readiness Assessment. • During the process, HHG consultants will help identify the optimal topology, architecture, patterns, etc ., to maximize your DataPower investments.

Conclusion

API Management is a natural extension of SOA. Compared to traditional SOA, API Management focuses on the business aspects of human interactions for e-commerce, with a more 'build-upon-a-platform' approach. Focus on APIs allows us to separate the business goal of making an API a successful product and business asset from the IT goal of providing the service that implements the API.

The evolving journey from IT-centric web services to APIs is necessary for enterprises that see the need and opportunity to extend their business models to interact outside of their traditional markets. A good API Management program can help companies drive forth into the API economy and leverage an ever-growing ecosystem of available business functionality. With a focus on developer innovation, API Management helps quickly grow hybrid and composite business capabilities that drive real value.