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SAS[®] as SaaS - The Benefits and Challenges of Implementing an Enterprise Scale SAS[®] Data Warehouse and Business Intelligence Shared Service

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ABSTRACT

Many organizations recognize the benefits that can be achieved through the Software as a Service (SaaS) model. Why not apply this model to your SAS[®] data warehousing and business intelligence strategy? Organizations can save money and improve service levels through efficiencies gained by a shared infrastructure and support staff. These and other benefits are common and compelling for any shared service, however, we believe that the greatest value proposition of a shared SAS[®] data warehouse and business intelligence service lies in its ultimate use as an enterprise data integration platform.

This paper will provide a practical look at a successful SAS[®] data warehousing and business intelligence shared service. Valuable lessons learned and strategies for success will be discussed, focusing on the following topics: business case, planning and design, service capabilities, assessment of readiness, vendor management, HR considerations, architecture, application software installation and configuration, infrastructure virtualization, third party software integration, security, cost recovery, service level management practices, and the development of a customer-driven service governance framework.

INTRODUCTION

SAS[®] Data Warehousing and Business Intelligence (DW/BI) deployments are complex and require constant attendance by business and technical specialists within the organization to ensure that the investment continues to deliver value over time. The people, process, and technology dimensions all require a focused stewardship by management to ensure that the information gleaned from the DW/BI application is entirely correct, delivered just-in-time, is actionable, and ends up in the hands of the right people. The question becomes: How can an organization's data warehouse and business intelligence strategy meet departmental as well as enterprise business requirements, maintain satisfied customers, all while driving down operating costs, sustaining continuous business process improvement efforts, and most importantly, deliver tangible and measurable business value? Over the past few decades, the shared services model has met these goals in other application domains, and more recently, we have seen similar success with a SAS[®] DW/BI shared service.

First, let's lay down a foundation of definitions so that we can talk from a common perspective.

- **“Software as a Service” (SaaS)** is defined as a model of software deployment that is provided to customers across the internet. The SaaS model frees the customer from having to install the application software on their own computers, reducing the burden of software maintenance, installation, configuration, and ongoing operations and support.
- **“Shared services”** refers to the provisioning of a service by one part of an organization or group where that service had previously been found in more than one part of the organization or group. Thus, the funding and resourcing of the service is shared, and the group now delivering the service effectively becomes an internal service provider. Shared services are more than just consolidating a function, they can also mean running these service activities as a business and delivering services to internal customers at a cost, quality, and timeliness that is competitive with alternatives. Some examples of shared service applications are: common payment (credit card processing), email, geographic information systems, project collaboration, help/service desk, electronic document management, software quality assurance, identity management, project management/PMO, and application development and support.
- **“Utility computing”** can be thought of as a packaging of computing resources, such as computation, memory, network, and storage as a metered service similar to a traditional public utility (such as water, electricity, natural gas, or a telephone network). This system has the advantage of a low or no initial cost to acquire hardware and software; instead, computing services are essentially rented. Utility computing is further enabled by virtualization of computing resources.

- **“Customers”**, within the context of this paper, refer to any **paying** users of the DW/BI service, typically a participating business unit, department, agency, or geographical division. The term customer does not include any secondary or downstream users of an application that may actually consume the service but in fact are not paying for it.
- **“Multitenancy”** refers to the architectural principle, where a single instance of software runs on a software-as-a-service (SaaS) vendor's servers, serving multiple client organizations (tenants). Multitenancy is contrasted with a multi-instance architecture where separate software instances (or hardware systems) are set up for different client organizations. With a multitenant architecture, a software application is designed to virtually partition its data and configuration so that each client organization works with a customized virtual application instance.

In addition to the examples of shared services mentioned above, organizations can reap significant benefits from a shared service that provides DW/BI capabilities, provided that the organization is ready and willing to invest in and support the shared service over the long-haul. This paper provides practical guidance on factors that are essential to the success of a DW/BI shared service using the SAS® Enterprise Intelligence Platform, and is based on a successful deployment of a Data Warehouse Shared Service.

BUILD YOUR BUSINESS CASE

A DW/BI shared service offers several compelling value propositions that can be used to build an excellent business case. The biggest obstacle to getting started will typically be a skeptical senior management team that may have a jaundiced opinion of centralizing IT capabilities. This cautious posture is most likely based on the spotty performance of past IT investments, particularly investments that do not show an acceptable rate of return, contain unacceptable risks, or don't deliver on their promises. The organization may also need education on shared services, data warehousing, business intelligence and analytics. Your job here is to do your homework and build an excellent business case that demonstrates the real, tangible value that a shared DW/BI service can deliver to the organization. The scope of a shared service is large and has a diverse population of stakeholders, requiring a business case that shows significant benefits over the long term, and has something for everybody. Other enterprise level systems, if present, will maximize the benefits of a DW/BI service. Examples of these systems include several value-added service wrappers, or enterprise-wide capabilities that benefit all IT service offerings. These platform services include disaster recovery, business continuity planning, IT Service Management and Governance (i.e. Information Technology Infrastructure Library - ITIL® v3, and Control Objectives for Information and Related Technologies - CoBIT® 4.1). To be more specific, you should consider the following points as input to building your business case for a DW/BI shared service:

VALUE OF STRUCTURING DW/BI AS SOFTWARE AS A SERVICE

There are several value propositions that a DW/BI SaaS could offer to your organization. For example, a DW/BI capability can be prohibitively expensive to an individual department or business unit, and a SaaS strategy has a high probability of reducing those costs while optimizing the organization's investment in DW/BI capabilities. Departments with limited IT budgets can gain access to world-class decision support infrastructure and technology through a shared service. Without access to a service, some departments would be hard-pressed to deploy and maintain those capabilities on their own. From a cost perspective, new customers of a DW/BI service will not incur heavy, up-front investments in the hardware, software, and support personnel that are needed. The service provides the capability from a pool of available resources that are paid for by the each customer through periodic fees that ultimately recover the service's costs across the whole customer base. Customers also save money because there are no long-term costs for maintenance and support of the infrastructure – the shared service team is responsible for this support, not the customer's team. So, as more customers are added to the service, the cost to each customer decreases due to the economies of scale. The economies of scale factor in when the service is able to spread fixed costs across an increasing customer base, diffusing the fixed costs of the infrastructure, software, and personnel across the customer base, thereby lowering the average total cost of the service for each customer.

Value can also be achieved with SaaS by streamlining the infrastructure provisioning process. As each department or business unit contemplates an investment in their own DW/BI capabilities, they must consider the cost and schedule implications of provisioning this infrastructure as well as the challenge of recruiting and building the technical expertise of their own support staff. In the SaaS model, the process of on-boarding a new customer to the service is well defined and repeatable, decreasing the amount of time to provision the software and platform infrastructure. This

is a huge benefit from a scheduling perspective, since the streamlined provisioning process will accelerate the initiation of DW/BI projects, in turn resulting in lower project costs.

With the shared service approach, customers of the service gain tremendous value because they are freed up to focus on applications development, business analysis and decision support tasks applied to their business domain, while the DW/BI service team focuses on optimizing the core infrastructure and the day-to-day operations and support of the service. Each team concentrates on their core competency, effectively specializing horizontally on the IT side and vertically on the business side. Customers can then focus their time and resources on solving business problems, not on IT operations. The IT related risks (obsolescence, skills, etc...) are mitigated by the service's staff.

WHAT DOES THE DW/BI SERVICE PROVIDE?

A DW/BI Shared Service can be structured any number of ways to meet the needs of its customers. Later, we'll discuss the governance process which is the mechanism for gathering ongoing customer input, ultimately providing steering of the service's offerings and capabilities over time. Since the DW/BI service personnel are well steeped in the methodology and best practices of data warehousing, they can provide customers with applications planning and design support. Some customers may only want to prove out an idea or validate a business case, so the service can also provide a proof of concept or pilot service. The service personnel will also have insights into the best training curricula for technical and functional audiences. Some of the more basic services provided are: general and infrastructure software product/platform support, software development lifecycle guidance, operations and service level management. In some cases, depending on business needs, a service could provide time and material consulting.

FIRST THINGS FIRST – ASSESS YOUR ORGANIZATION'S READINESS

A Shared Service for DW/BI is not necessarily for everyone. Organizations must seriously assess their readiness to invest in, deploy, support, and commit to the ongoing success of a shared DW/BI service. After all, it can be an expensive proposition in the short-term. The business case must be validated within your organization's culture, processes, and strategy. For example, the phrase "build it and they will come" is on every short list as one of the top reasons data warehouses fail. The assumption that customers will beat a path to your door AFTER you deploy a DW/BI service may not pan out. There are some formidable barriers that must be cleared to ensure the successful deployment and adoption of a shared service, most of which are not at all technical. You will need to include in your assessment the following key areas:

POLITICAL CLIMATE CONSIDERATIONS AND QUESTIONS

- Is there a highly placed and respected sponsor that can rally disparate and autonomous groups to support the shared service?
- Are departments within the organization ready and willing to share a centralized infrastructure?
- Are potential customers willing to release platform infrastructure and software support and control to the central team responsible for the DW/BI service?
- Do customers have the ability and willingness to share collective ownership of the service through a governance process?
- Is there a willingness to adhere to over-all organization architecture principles, standards, and practices?
- Do departments accept responsibility for applications development and project management tasks?
- Do departments take full responsibility for the quality and integrity of their data?
- Do departments support enterprise level data sharing and data integration efforts, in other words, a "data mining" attitude is not prevalent? (i.e. "It's MY data, you can't have it")
- Do department sponsors have the ability to separate and subjugate their functional goals and perspectives to the enterprise's goals and priorities?

FINANCIAL CONSIDERATIONS AND QUESTIONS

- Does the financial strategy include managing the shared service as a business?
- Is the return on investment sufficient to justify the costs of standing up the service?
- Do you have up-front commitments from enough customers to ensure full cost recovery in an acceptable timeframe?
- Is your cost recovery model sound? Have you forecasted the cost implications of on-boarding more customers (large and small) while scaling out the infrastructure?
- Are your software vendor's licensing and fees structured in a way that supports your goals for economies of scale and virtualization?

- Do you have an automated charge-back and subscription fee billing process that is transparent to and easily understood by your customers?
- Do you have sufficient details and information about all charges that will be encumbered by the service, enabling you to manage the service's operating costs?
- Do your forecasts demonstrate the expected cost savings from economies of scale?
- Have you modeled financial scenarios that clearly communicate the cost/benefit of the shared service by comparing that approach with the costs required for a non-shared service DW/BI capability? The cost curve of the shared service vs. the non-shared service DW/BI capability should show a clear benefit to be worth pursuing, otherwise, you should table the project until the economic conditions improve.

TECHNICAL CONSIDERATIONS AND QUESTIONS

- Does your technical team have experience with virtualization?
- Do you have enforceable operational level agreements with the technical teams that support you (i.e. storage, network, server, database administrators, middleware, and identity management teams)?
- Can your software be deployed in a multitenancy configuration to support one-to-many deployments of the application (i.e. one set of binaries shared by all)?
- Will the vendor's software run on your organization's supported platform/s?
- Will the vendor's software run in a virtualized environment?

PERSONNEL CONSIDERATIONS AND QUESTIONS

- Do you have a product manager with the skills to grow, mature, and evolve the DW/BI service to meet client needs over time while ensuring financial viability over time?
- Do you have current staff and/or partners with the skills to install, configure, and provide ongoing support to the DW/BI service?
- Do you have supporting teams that can assist with the installation, configuration and support of middleware, security, network, and platform computing services?
- Do your customers have the necessary application development skills and requisite discipline to be successful?

PROCESS CONSIDERATIONS AND QUESTIONS

- Does your organization have mature project management practices?
- Do you have a dedicated help or service desk that can own all customer calls related to your service?
- Is your organization mature enough to ensure excellent customer service levels through performance management good practices (e.g. Information Technology Infrastructure Library - ITIL[®] or other frameworks embedded in your daily workflow and service management process)?
- Are your supporting contracts, operational level agreements (OLAs) and service level agreements (SLAs) tied to meaningful performance metrics that can be used to hold the service, supporting groups, and its vendors accountable?
- Does your incident and problem management process include a clear escalation path to the right resources in your vendor's organization (e.g. technical support, product development, research and development, and consulting), including names, contact info, and levels of urgency/responsiveness?

PLANNING, DESIGN, AND VENDOR MANAGEMENT

A DW/BI shared service initiative is unique, and some would consider it cutting-edge. Despite thorough research, there are no reference-able examples of a DW/BI shared service in the private or the public sectors. If you end up with no roadmap to steer by, your planning should include additional scope or management reserve to hedge against scope and schedule risks, as well as the need for additional discovery effort. You may also include some buffer for the time necessary to provision the virtualized environment, based on your platform support team's level of experience with virtualization. You should prepare thorough designs using the standard SAS and 3rd party vendor installation and configuration documentation as the starting point, modifying the documentation only where necessary for supporting the business imperative of multitenancy. A major objective should be to build a standard, vendor-supported configuration using as much of the existing documentation as possible, customizing only when necessary to support your unique, multitenancy requirement. It is also important to follow a disciplined project management methodology that will increase your project's visibility across the enterprise. The strategic nature of a shared service requires a near full-time project manager to manage the schedule, costs, and deliverables.

HUMAN RESOURCE CONSIDERATIONS

It is our opinion that the most important element to a DW/BI shared service is the *people* component of the service. The right people need to be hired with the right skills and career goals. I'll describe at a high level, the profiles of an ideal candidate for the positions of product manager, support specialist, and applications developer.

PRODUCT MANAGER

The Product Manager role provides leadership and is the driving force of the service. The product manager's duties are to ensure that the service remains successful now and in the future. She is responsible for the service end-to-end; the "one throat-to-choke", if you will. The product manager is the single face to all of the service's clients. Her career goals are aligned with the management of an IT shared service as a business entity within a corporate structure (P&L responsibility). She manages the strategic and tactical tasks of the service including:

- Marketing, prospect pipeline development, and sales
- Financial management to include cost recovery model development
- Vendor management
- Project management
- Governance process management and stewardship
- Staff performance management
- Thought leadership in the DW/BI domain
- Executive consulting to DW/BI projects and initiatives
- Setting strategic goals and objectives
- Managing the daily operations and support of the service
- Service Level Management

SUPPORT SPECIALIST

The Support Specialist role represents the hands-on technical stewardship and daily support of the DW/BI service. The specialist must be highly skilled at optimizing the technical infrastructure, understands the intricacies of how the software components are integrated, and possesses excellent communications skills when dealing with customers and supporting teams. His or her career goals include technical platform provisioning, performance optimization, and technical support of client application development teams. Primary responsibilities include:

- Resolve customer incident and request tickets
- Install and configure software and manages all the moving parts
- Install patches and hot fixes to the application software
- Provide support for customer promotions from development to QA to Production
- Ensure the stability and performance of the service by coordinating with supporting teams in a matrixed organization
- Ensure the technical integrity of the service, initiate and verify the periodic backup and restore processes
- Plan for and implement continuous improvements to meet emerging customer requirements
- Provide thought leadership in the DW/BI domain
- Train and mentor customers in the service's Software Development Life Cycle (SDLC)

APPLICATION DEVELOPER

Depending on the organization, a DW/BI Service may or may not include a bench of SAS[®] developers that can be contracted out to customer projects to provide application development services. One reason not to include this role is that the time and material cost recovery model is very different and arguably more difficult to manage than a subscription-based cost recovery model. However, if your customer organizations lack the necessary skill sets and commitment to develop and sustain SAS[®] application development expertise, it may make perfect sense to build and sustain a centralized SAS[®] center of excellence or SAS[®] center of competency to augment the subscription-based service. This second option provides the organization with a centralized stable of SAS[®] application developers that can be shared across the customer base. This also is in many respects superior to contracting third party developers from a cost and institutional knowledge perspective. Application developers should possess the following characteristics

- Possess superior, disciplined application development skills
- Have strong business analyst skills to operate in the juncture between the business domain and IT
- Have strong development skills using the shared service's application development toolset
- Understand, follow, and actively contribute to the evolution of the DW/BI development good practices

- Possesses extra-ordinarily strong communication and collaboration skills, with career goals to build DW/BI applications that solve client's business problems.
- Strong data modeling, data integration, and end-user report development skills
- Ability to quickly learn new business processes
- Serve as the customer's trusted advisor

ARCHITECTURE

The high-level conceptual architecture for a DW/BI shared service is surprisingly simple. The logical and physical architecture is, not surprisingly, quite complex when the network, firewalls, ports, server tiers, server software, client software, third-party software, security, managed file transfer, storage, backup/recovery, business continuity, and all the requisite dependent software and operating system (OS) versions are considered. Special care must be taken for the architecture to balance resource sharing where it makes sense while minimizing the risk of one customer's activity impacting another customer (which is THE ultimate test of multitenancy for a DW/BI shared service). The architecture must support a one-to-many instance of the application software (binaries). Having one set of software used by all customer environments ensures that the shared service maintenance workload is minimized, which results in reduced labor costs. This also ensures that all customers share the same version of the software which is important to configuration management and keeps the software library in synch across all deployments. Each environment (i.e. development, test, and production) should have its own separate set of application software code to support change, release, and configuration management. This will also support the testing that is required when supporting teams make changes that directly impact the service (e.g. 3rd party application software upgrades, OS patches and upgrades, hardware replacement, etc.). In short, the architecture must be resilient to changes that continually roll out across the enterprise. A robust change management process will mitigate risks by ensuring that all required changes are justified, planned, and communicated early enough to determine their impact to the service (refer to the ITIL[®] Change Management process). The architecture must also support disaster recovery/business continuity plans and be validated on an annual or semi-annual basis.

VIRTUALIZATION

Shared services are further enabled by virtualization of the platform. The service can leverage virtualization software such as the Solaris[®] 10 OS or VMware[®] to implement virtual SAS[®] server tiers. Once a reference or template virtual server is defined in a virtual environment (application, database, LDAP, web application, and web server), it is very simple to use the referenced servers or "containers" as a template to create new virtual servers quickly when necessary. This approach cuts down on the rather lengthy and unpredictable hardware and platform provisioning cycle, which also accelerates the start of application development projects. Virtualization allows the team to dynamically configure how much CPU and memory resources to allocate to the virtual servers based on the server resource profile, application demand, and the customer's service level agreements. Resources can be structured to have a minimum level guarantee of resource availability within the virtual tiers, and if there are idle resources available on the physical machine, the virtual application servers could grab additional resources from the idle resource pool. Virtualized environments enable your team to optimize the hardware resources with minimum effort. The big catch in any virtualized platform is whether the DW/BI vendor supports virtualization of your desired OS.

DW/BI APPLICATION SOFTWARE

One school of thought is to limit the DW/BI service to a single best-in-class data integration and ETL platform that is open enough to allow customers to deploy their own favorite BI applications from any vendor. This makes sense in some cases, however, another option is to go with the same vendor end-to-end, thus, minimizing the amount of skill sets that the service support team needs to sustain (read "headcount required") and to consolidate on one preferred skill set across the enterprise. An enterprise license agreement with software vendors may be beneficial in order to allow the service to provision the full suite of application software to provide the needed data integration, BI, and analytics capabilities. Again, the key is that the application software must support the one-to-many deployment, meaning that many separate application servers use one set of application software installed in one location.

3RD PARTY SOFTWARE INTEGRATION

As you may know, SAS[®] requires third party software including: a Web-based Distributed Authoring and Versioning (WebDAV), a database management system for WebDAV metadata, a web application server, and web server software. The deployment of these 3rd party tools also requires some thought, since the out of the box deployment of these components do not support the multitenancy model. This integration is definitely the most time-consuming and poses the most schedule risk to the project. There are very specific parameter settings that are necessary to get the

configuration to work, which may require a large, cross-functional team to trouble-shoot and resolve issues. Internal teams, application software vendor support, and 3rd party vendor support may need to be consulted or brought onsite to help resolve issues. This can be a learning experience for all concerned, including the OS vendor. In any case, all resolutions to configuration issues should be documented so that the service team has clear, predictable instructions for configuring the third party software successfully the next time it is needed for a new environment or install.

INSTALLATION AND CONFIGURATION

The out-of-the-box installation and configuration documentation for the SAS® DW/BI application software is not adequate to implement the multitenant instance of the software, therefore, a sub-project may need to be initiated to bring in the vendor to assist with designing and implementing standard install and configuration steps to meet the business needs of the shared service. This is very beneficial to the project schedule as the team will have more expertise to draw from when designing, installing, configuring, testing and documenting the software install. The install documents would be used as a baseline set of standard install instructions for new customers of the shared service. The team must be careful to reference the vendor's original install instructions where they make sense and only create new documentation when it was absolutely necessary. At a high level, each tier should need only one installation step in order to install the shared set of application software. The subsequent configuration step is then followed to deploy each new customer's slice of the service, effectively creating a separate set of configuration files that are specific to that customer's needs. This approach ensures that each customer, while sharing the same core application software, has a customized application server and associated processes that are independent of the other customers of the service. The configuration also allows for server process restarts, software promotions, shutdowns, and other maintenance actions to take place without disturbing or impacting other tenant applications and processes. The separate configuration process is straightforward and fast, as well as standardizes the deployments of all customers for ease of support, maintenance, and problem resolution.

SECURITY

DW/BI shared services have several security related configuration items to account for in the design and implementation phases. The service may have to be integrated with an enterprise identity management service so that it can support the enterprise's strategy of single sign-on. In this scenario, each enterprise user has a master identity account which is used to authenticate to all enterprise applications. Once the user is authenticated to the enterprise identity management system, the DW/BI application authorizes the user with appropriate rights to access application resources according to their metadata group membership. Authorization is subsequently managed via the security model of each customer's SAS® metadata server. The DW/BI application security model handles all user authorizations and is maintained by a customer security administrator using the SAS® Management Console. The DW/BI Service Support Specialist provisions access rights to each customer's security administrator so they can in turn manage the provisioning of security access rights to their own users and groups. Overall, care must be taken when designing and implementing security to keep it as simple and straightforward as possible. Most of the incident tickets that a shared service team receives are related to security and application access issues, so a simple group and role-based security design is highly recommended.

ENSURING LONG-TERM VIABILITY – THE COST RECOVERY MODEL

Recovering the costs of an enterprise shared service is essential to providing the right resources in a timely manner to match the growth and increased utilization of the service over the long-term. Funding a shared service is best accomplished by instituting a fair and equitable charge-back mechanism to customers based on their utilization and business requirements. Be very careful when you devise a cost recovery model for your DW/BI shared service. You don't want to penalize your customers for heavy use of their applications. Data warehouses need to be exploited so that their value is maximized. Design a recovery model that is neutral to usage and is based more on the resource capacity that is required. Another imperative for the long-term is to drive down fees on a per customer basis, factoring in economies of scale as more customers are on-boarded to the service. It is the job of the service's product manager to consistently seize opportunities to achieve cost savings. Cost savings can be achieved by migrating to less expensive hardware, re-negotiating software licensing, seeking reductions in storage rates, optimizing the service support team headcount, and implementing incremental labor-saving improvements. The customer's cost for the service should always be trending down, making the service more affordable to departments with smaller IT budgets and increasing the value to existing customers.

COST RECOVERY MODEL COMPONENTS

Developing your cost recovery model may be the toughest task. Several shared services are based on subscription fees, whereas others are charged on a per-seat basis. There are other models that are federated, pay-as-you-go, or

hybrids. Regardless, your model should be designed to recover all costs and either break even or generate surpluses that can be either refunded or invested back into the service. While there are many ways to fund shared services, we believe a subscription based funding model is most successful. A subscription fee can be estimated by accounting for all of the service's operating costs and spreading those costs equally among a baseline number of customers.

The following cost items are examples that may be included in your cost recovery model:

- Shared services staff (regular pay, bonuses, vacation, holiday, sick, etc.)
- Professional services and consulting support
- Computing platform charges (servers, hosting, and support)
- Enterprise management fees
- Software licensing fees
- Software maintenance fees
- Other costs (training, travel, supplies, etc.)

CUSTOMIZING YOUR COST RECOVERY MODEL

The model can be further enhanced to allocate server infrastructure costs based on the guaranteed CPU capacity that a client's application requires, since the major cost related to the infrastructure is the physical hardware. The staffing costs for the DW/BI service are spread equally among the client base. This assumes that each client requires the same level of support from the shared service team. Another method to allocate staffing costs is to base it on how many named users the client sets up in their application. The logic for this allocation method assumes that the more users that an application has, the higher the probability that users will open incident and request tickets, which may require more service support staff. This seems fairer, but further complicates the cost recovery model. Also, an optional time and material rate may be made available to clients that need consulting services, however, a "pure" DW/BI shared service is not set up for the time and material business since the cost recovery methods are so different and the goals and challenges of each type of business (shared service vs. professional services) are not complimentary. The shared service is focused on optimizing the infrastructure as a utility in order to meet or exceed service levels, whereas, the professional services model is all about maximizing consulting utilization rates. Maintaining a professional services bench is also complicated due to the diverse amount of business domains that are possible across the client base. In our opinion, it is more appropriate in most cases to have the application development resources live and be owned by the customer organization, not the shared service. An argument for including an application development capability as part of your service would be defensible if your customers are having a difficult time hiring, retaining, and growing application development expertise. A bench of developers managed by the DW/BI shared service would serve to "institutionalize" that skill set and the service would become a steward of that knowledge instead of having it walk out the door with every consultant or departing employee.

SERVICE LEVEL MANAGEMENT

Ok, now you have your service infrastructure in place, your support staff hired and you are ready to hang out your shingle to start your business. Let's back up just a bit. Arguably, we skipped over an entire body of knowledge that frames the elements that you must have in place for your DW/BI service, make that ANY of your IT services, to thrive and ultimately be a success in your customer's eyes. You need a service delivery framework to manage your new service's lifecycle! Publicly available frameworks and standards such as ITIL[®], COBIT[®], CMMI[®], and ISO 9000[®] are validated across a diverse set of environments and situations and are valuable as guidance for all aspects of the delivery and support of not only your DW/BI shared service, but for all of your IT services. In this current competitive environment, the delivery of IT services needs to be articulated around standard management frameworks and good practices. IT Service Management or "ITSM" is a set of specialized organizational capabilities for providing value to customers in the form of technology-based services. We recommend that organizations invest in the adoption of ITIL[®] or other public frameworks and standards to develop their skills around IT Service Management good practices.

SERVICE GOVERNANCE

In addition to your operational management framework, you need a framework to provide strategic steerage for the service. This can be in the form of a governance model, which is the decision making mechanism for future enhancements and changes. Governance of the shared service is essential to its long-term success. It implements a customer-focused and customer-driven process that determines how a service evolves over time. The discipline of IT governance derives from corporate governance and deals primarily with the connection between business focus and the IT management of an organization or any given individual system within that organization as well as the decision rights associated with the governance process. In the end, the primary goals of any IT governance process should be to assure that the investments in IT generate business value and also mitigate the risks that are associated with IT

This can be done by implementing an organizational structure with well-defined roles and responsibilities for information ownership, business processes, applications, and infrastructure. Peter Weill of MIT said this about governance: "Governance is about getting people to do the right things at the right times in the right way."

One very good governance methodology that should be considered is the Common Objectives for Information and Related Technology (CobiT[®]) version 4.1 specification. The CobiT[®] specification was originally developed and is currently maintained by the IT Governance Institute. It is a mature and well established set of best practices and guidelines for Enterprise level IT governance.

CONCLUSION

Software as service deployments of data warehousing and business intelligence applications make a lot of sense when you consider the extra costs, inefficiencies and duplication of effort in standing up separate department-level data warehouse infrastructures and applications. Many benefits can be realized by sharing infrastructure and technical resources within a service delivery framework. By considering the practical guidance presented in this paper, you will have a good start as you formulate your own strategies and plans for realizing the benefits of a shared service for data warehousing and business intelligence. The best news is, as your shared service matures and meets the information needs of individual departments, the enterprise will have a growing pool of quality departmental data collected in a central location that is available to share across the enterprise when and where it is appropriate and necessary to do so. The subsequent enterprise data integration efforts will provide the enterprise with a unified view of cross-functional information, perhaps for the first time ever, which is the ultimate value that a shared DW/BI service can provide to the organization.

REFERENCES

- Software as a Service Defined - <http://en.wikipedia.org/wiki/SaaS>

RECOMMENDED READING

- Information Technology Infrastructure Library - <http://www.itil-officialsite.com/home/home.asp>
- Control Objectives for Information and Related Technology version 4.1 - <http://www.isaca.org/>

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