



# ***Feeling SaaS-y? Software as a Service – for Data Integration***

Prepared by  
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Software as a service (SaaS) has evolved over the years from the original Application Service Provider (ASP) model. The ASP model delivered software functionality solely as a cost-effective service, for example, the original Salesforce.com offering, but did not focus on adding any value to the business beyond that.

Since those early days, SaaS has evolved significantly to its next version, SaaS 2.0. This new version certainly delivers the same software functionality in a cost-effective manner but, in addition, it is now blended with infrastructure and business services across multiple usage and delivery platforms. And it now supports all forms of business models.

In this white paper, leading industry analyst Claudia Imhoff discusses this new model of software delivery focusing on a particular aspect – data integration as a service. This challenging, complex and usually very costly process is well suited to this new paradigm by delivering reusable integration components that leverage web services standards and SOA principles. Data integration as a service can help all companies garner the expertise and experience of professional data integrators in a less expensive, flexible and more timely fashion.

But what are the basic characteristics of the new SaaS 2.0 model and what role does it have in data integration as a service? Specifically, this paper covers these timely topics as well as the pros and cons of a data integration SaaS 2.0 model, the challenges of adopting such a software model and finally, some points to consider when deciding if data integration as a service is right for your organization.

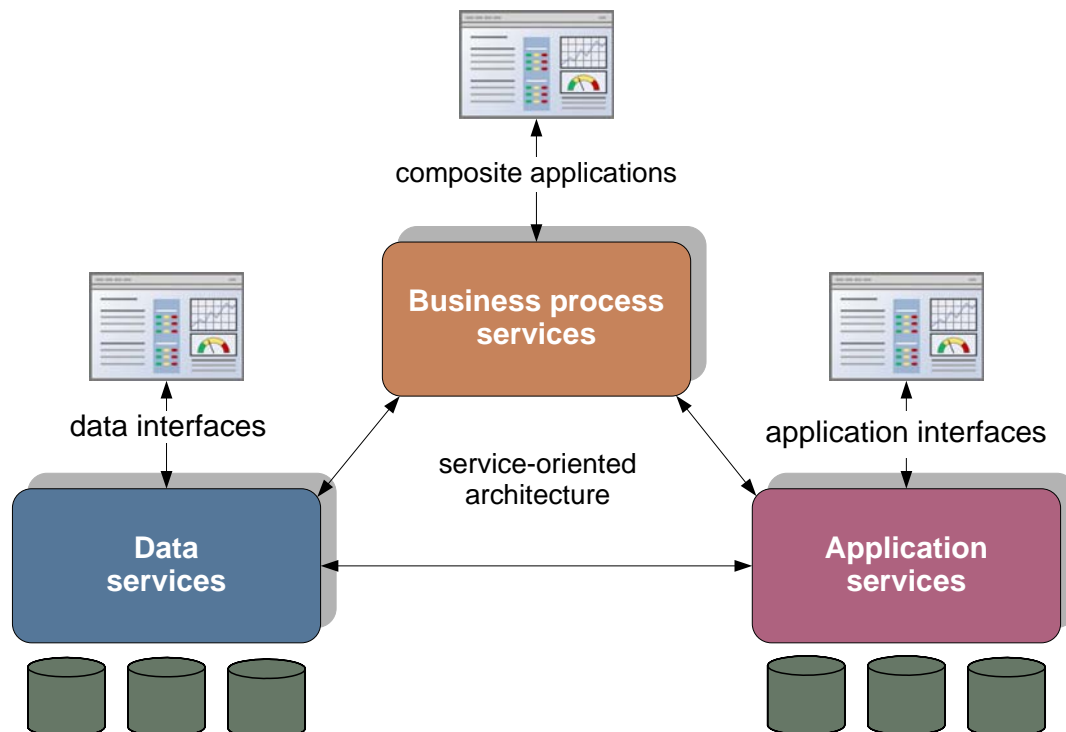


## What is Software as a Service (SaaS)?

Service oriented architecture (SOA) – you've probably read or heard a lot about it. It has had and will continue to have significant influence on our IT architectures. Just consider its impact on the infrastructure vendors struggling for control over who “owns” the customer’s infrastructure. If we reach the stage where vendors adopt codified standards (e.g., XML), a distributed architectural framework of IT components becomes possible and control is no longer an issue.

Now picture the software from these components being converted to business services that are reusable, thus creating a virtual world of software assets. Finally, imagine that there are adapters to support connectivity between the various distributed legacy components. You now have a handle on the world of SOA. See Figure 1 for a depiction of the SOA architecture. The questions become – what does it mean to you and your IT environment and how does it affect the way software is sold and marketed?

Figure 1: SOA Architecture\*



\* Diagram compliments of Colin White of BI Research



The creation of SOA or business services that are independent of databases and use data from anywhere opens the door for a new and better Applications Service Provider (ASP) model—a second generation called Software as a Service (SaaS 2.0). SaaS 2.0 consists of blended software, infrastructure and business services across multiple usage and delivery platforms and business models<sup>1</sup>. SaaS 2.0 is not solely focused on cost-effective software delivery; rather it focuses on helping users transform their business workflow and processes, i.e., the way they do business.

SaaS 2.0 has the following characteristics:

- Secure, flexible and efficient business processes and workflows
- Service level agreements to ensure appropriate deliverables and timeframes
- Value-added business services such as analytics and best practices
- Extensive use of SOA to enable scaling, configurability and integration
- Subscription monitoring and usage-based billing

SOA and SaaS 2.0 level the playing field by allowing new products to emerge that can leverage the SOA work done by the infrastructure leaders. The model allows for the industrialization of software designed to fit into any existing frameworks with ease. These products provide commercialized services for all size companies to address specific problems in specific areas such as data integration software as a service (DiSaaS), the topic of this white paper.

### **Data Integration Software as a Service (DiSaaS)**

For years, large and midsize corporations have struggled to integrate their disparate sources of data to enable business intelligence (BI), to create more efficient, streamlined operations and to ensure alignment of corporate activities with strategic directives. Data integration across the enterprise is a massive process involving substantial time, effort, money, technology and people. It is

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<sup>1</sup> From [www.sandhill.com](http://www.sandhill.com), "Get Ready for SaaS 2.0" by Bill McNee, Saugatuck Technology, May 8, 2006



not for the faint-hearted. And it is not usually a core competency of the enterprise undertaking it.

Until recently, corporations had limited choices in how to approach this process – you could hire a bunch of programmers and hand-code the extraction of data from the operational systems, perform the data quality processes on the extracted data, then proceed with more hand-coded integration and transformation processes and finally load the data into your BI environment, an operational data store, or send it on to another operational application. Or you could purchase an ETL (extraction, transformation, and loading) technology and train your IT personnel on its functions and maintenance.

Both forms of data integration have their drawbacks and, of course, expense. Hand-coding opens up the potential for errors and lacks much of the metadata needed for maintenance and change management. ETL tools are not cheap and may not handle all transformations, requiring some hand-coding. Plus, you have the yearly maintenance fees, ongoing training requirements and versioning updates to deal with. In many cases, you may also need professional services teams to augment missing skills to jump start these complex projects.

DiSaaS or built-to-order connectors are a third alternative that is beginning to gain in popularity. The basic concept is for a corporation to “outsource” its data integration requirements to a SaaS vendor who specializes in this service. The vendor creates custom-made data integration software based on your requirements and best practices for the industry – there is no additional platform software to purchase, no hardware platform to purchase and no maintenance fees. The executable code is delivered to you where it integrates mainframe, legacy and other applications’ data with BI or SOA-based infrastructures. These built-to-order connectors could offer unique value to midsize businesses in particular that choose to focus on immediate business value over leading edge technology.

Let’s discuss the uses of this service, then the pros and cons to the approach, and some final considerations to think about if you are choosing this alternative.



## Uses of DiSaaS

The first usage for DiSaaS is to create reusable data integration components. Data can be integrated once and the components used to support all manner of applications needing integrated data – from BI to master data to operational integration. The cost reductions by reusing these components are significant, as are the additional benefits of consistency in the integration, reliability in the integration process and enhanced maintainability of the components. For the company struggling to become SOA compliant (see third usage below), these SOA-based services become quite appealing.

A second use for DiSaaS is for data integration, migration and synchronization services. Today, we can use one of three types of techniques – *data consolidation* using extraction, transformation and load (ETL) technology, *data propagation* using enterprise application integration (EAI) technology, and *data federation* using enterprise information integration (EII) technology:

1. ETL – Long heralded as the backbone technology for creating physical data warehouses and data marts, ETL technologies are responsible for the heavy lifting processes that capture operational data, invoke the data quality processes, perform the integration and transformation procedures and finally load the data to be used for analytics. The target for ETL technologies is a database such as a warehouse, data mart or operational data store.
2. EAI – EAI technologies use a strategy or framework by which an organization centralizes and optimizes its application integration or process automation, usually through some form of data replication or message brokering mechanisms. The ultimate target for the EAI technology is an application. By using new DiSaaS-based connectors for extending integrations to heterogeneous sources, e.g., mainframe legacy environments, cross-platform operational applications and BI environments, corporations and governmental agencies should be able to move all data efficiently and effectively.
3. EII – When an enterprise requires a framework for real-time integration of disparate data types from multiple sources inside and outside the enterprise, EII technology best fits the bill. This technology empowers developers to establish an environment in which to “pull” data from anywhere bringing it together in a virtual fashion. The ultimate target is an end user who uses the technology to request specific pieces of information.



Creating these data manipulation processes as DiSaaS offerings reduces the cost and timeframe for their implementation and maintenance.

Implementing a SOA-compliant architecture constitutes a third use for DiSaaS products. To become completely SOA-compliant requires many years of effort, can cost a great deal of money and may potentially require the replacement of older legacy systems, particularly mainframe applications. The inclusion of these important sources of business services and data must be accommodated in a fashion that does not disrupt the overall business viability, at a price that is reasonable and within a practical timeframe. With DiSaaS, SOA-based data services can be quickly and inexpensively created that connect, aggregate and transform data from new and old sources and deliver it as reusable components for use by web services.

### **DiSaaS Pros**

As you can see, there are many uses for DiSaaS and, consequently, a number of benefits have been discovered. Just to list a few of these:

1. On demand data integration and built-to-order integration – As SaaS gains wider acceptance, vendors offering simple and inexpensive DiSaaS will become more prevalent and “in demand.” The services offered by these vendors perform their functions “behind the scenes” so that IT and end users alike simply get access to the right data and functionality at the right time – without having to know that the data integration services are in place. These connectors simply pull data automatically from any multitude of systems and present it to the requesting user or application. This “integration on demand” provides the benefits of integrating heterogeneous data sources as well as establishing a common administration and development environment.
2. Fixed cost of DiSaaS development – By leveraging the expertise garnered from years of producing data integration programs for all industries and governmental agencies, DiSaaS providers have gotten to the point where they can now offer their products at a fixed cost.
3. Reduced cost of DiSaaS environment – Not only can the costs be fixed but they are often less expensive than performing the data integration in-house. There are several reasons for the reduction in cost – e.g., the enterprise does not have to buy any new hardware or software, there are no maintenance fees on new hardware or software and IT personnel do not have to be trained on the new technology. In addition, there are no additional costs from upgrades, new versions, or other enhancements.



4. Fixed time of DiSaaS development – By virtue of the advanced technologies, it has become possible to fix the timeframe for data integration development as well. This becomes especially true when the sources for the data integration are commercially available applications like ERP or CRM packages.
5. Time to value – by streamlining the mapping requirements and the development of the data integration services, the timeline from start to finish is usually faster than creating the same services in house. This means that the customer receives the value from these services faster with a better ROI.
6. More focused requirements gathering – Because the DiSaaS vendors have many years of experience in data integration and employ best practices, they are also very efficient and practiced in gathering data integration requirements. For example, ETI ([www.eti.com](http://www.eti.com)), a provider of data integration solutions since 1991, has its own advanced rapid integration methodology that includes automated gathering of specifications and business rules requirements via an online portal. This helps customers automate the capture and communication of data mapping specifications. These specifications are then transferred to the ETI integration engineer where he or she quickly creates the appropriate data integration service.

### DiSaaS Cons

As with any new paradigm or model shift for IT development, there are some drawbacks that must be considered as well.

1. It is a very new and different paradigm – It may generate a level of nervousness and concern for its viability. This is a natural reaction to a change in dynamics such as DiSaaS presents. You may question the credibility of approach, the credibility of vendor and the acceptance of the DiSaaS product by other ISVs. To mitigate this potentially negative aspect, the DiSaaS vendor must have a proven track record – not only having a solid record of creating quality software but also having the financial wherewithal to remain in business over the long haul. It is mandatory that the vendor have a solid list of references. If it is an option, you may also request that the vendor deliver not just the executable code but also the source code.
2. Build versus buy mentality for complex components – For many enterprises, it may seem impossible that a DiSaaS offering could capture



all of the complexities and intricacies involved in the integration of their data. It is incumbent upon the vendor to produce documentation demonstrating that they do understand the complexities, have created DiSaaS products with comparable functionality and are capable of quickly adjusting and enhancing the product when new complications or requirements arise. Ensure that the vendors offering code generation provide well structured and well formed components.

3. Custom fit – As a follow-on to the previous concern, obviously one size DiSaaS cannot possibly fit all enterprises for a number of reasons. A custom fit involves enhancements, maintenance, new upgrades and versions. If the metadata, business logic, and schemas are stored in an easily accessible repository, then enhancements and maintenance can be affected more easily than if the repository does not exist or dynamic access to these elements is not included. The DiSaaS vendor must enable smooth upgrade paths for customized installations and be held accountable through service level agreements for these.
4. Loss of “control” over data interfaces – Perhaps the biggest DiSaaS fear for IT shops is that they will no longer manage their data integration interfaces, that is, they will lose command of their technological environment. This comes down to a matter of trust and partnership. The DiSaaS vendor must become IT’s credible partner and an extension of the IT department’s resources. The vendor’s products must be well documented, easily understood and open for examination by the customer’s IT resources. Having a reporting dashboard that can register call logs, track metadata changes and monitor overall performance of the data integration implementation gives the customer (and IT) a better sense of control.
5. Vendor’s responsiveness and timeliness to requests and changes – A significant part of the trust and partnership develops through experience with your DiSaaS vendor. A DiSaaS vendor that consistently delivers data integration capabilities on time and on budget is unquestionably a valued partner for IT. Service level agreements, customer references, proven knowledge of your industry and data integration expertise all contribute to mitigate the fear that a DiSaaS vendor will not be timely in the response to your needs.
6. Vendor’s application and industry knowledge – This last worry is of course negated if the previous concerns dissipate. You can also mitigate it by interviewing the DiSaaS development personnel, obtain their previous implementation histories, examine similar clients’ projects and deliverables, and work with the vendor on project deadlines, milestones and deliverable documentation.



## Technological Challenges to DiSaaS

There are some technological aspects to the DiSaaS model that should be considered as well. While most data integration projects do start with small, relatively simple increments, they inevitably become quite large and complex. Planning for large scale integration will ensure that the DiSaaS vendor is not caught by surprise and that the enterprise will receive the appropriate environment that has room to expand.

1. Scalability of environment – A robust data integration environment requires planning for the current and projected volumes of data, number of users and amount of interfaces. For example, the first few projects may require only a few connectors or interfaces but it is guaranteed that this will change as more and more data integration needs are discovered and developed. Most large enterprises have dozens if not hundreds of sources of data stored in all kinds of technologies from proprietary to legacy to open systems, from mainframes to servers to PCs, from DOS to Unix to any other flavor of operating system, from flat files to relational databases. Secondly, the number of users will grow from a handful at first to hundreds if not thousands as the environment begins to encompass more of the SOA environment. Thirdly, the amount of data being integrated will expand from a few gigabytes to potentially hundreds of terabytes. The DiSaaS vendor must plan for these ahead of time to ensure a smooth transition as each one grows to its fullest potential.
2. Performance – Data integration products are used in environments that span the very simple to exceedingly complex. The data integration products must be developed to handle these extremes in performance with ease and efficiency. An experienced DiSaaS vendor recognizes these and can demonstrate their ability to handle them.
3. Response times – BI data integration is used not only to create a BI environment; it is used extensively in the operational environment as well. Due to this enterprise-wide expanse of data integration needs, response times range from sub-second for operations to a few seconds to minutes for the analytic capabilities. The DiSaaS vendors must ensure their understanding of these requirements so that their products will deliver the appropriate response times for each environment. It must be a mandatory service level agreement to get the right data to the right people at the right time.
4. Open Architecture – Because most enterprises are not fully SOA compliant and they have a mishmash of technologies, the DiSaaS capabilities must be able to handle the existing situations as well as



handle changes to them as they occur. For example, most companies have already implemented some BI capabilities – they have existing BI technologies and components. The new DiSaaS products must be able to support these existing technologies easily and without interruption. Secondly, these products must have the ability to support any new technologies you may bring in. They cannot limit your options – data integration products should pull data together, not dictate your infrastructure.

### **Considerations in choosing DiSaaS as your data integration model**

As a wrap-up to this white paper, this section discusses a few considerations for you to reflect upon when choosing a DiSaaS vendor. First and foremost, make sure you have a mechanism to ensure the quality of the delivered environment. You must be able to determine if the correct mappings have been created so your DiSaaS vendor should have a way to verify data lineage and data transformations in a clear and easily understood fashion. Ensure that the vendor can perform sufficient data quality processing. What guarantees will you get that the data is monitored and reaches a consistent level of quality? Also, how can you be certain that the data is represented in an analytic engine correctly?

Second, understand what the DiSaaS vendor brings to the table. At a minimum, they should have extensive and documented best practices and product expertise for your industry and/or business knowledge of the data integration requirements. The DiSaaS vendor should have quick start BI components like a library of reports, analytic calculations, KPIs, etc., ready and demonstrable. Finally, they should be able to support all employees in all levels of the enterprise – from naïve new users to experienced analysts.

Don't forget about your environment when choosing a DiSaaS vendor. Make sure their solutions are easily extensible, that they integrate easily and seamlessly with existing technologies and that their products are flexible and easily changeable. Also determine if their solutions permit self-service by the business users. In other words, can the business users efficiently and quickly select the data they need from any source or technology? Finally, make sure you leave your future options open for taking over your own maintenance, should you decide to do that.



Lastly, make sure your DiSaaS vendor does not have the mentality that one-size-fits-all for its deployment and licensing model. This is especially true for large and complex enterprises. Ensure a custom fit for use, payment and licensing fees, upgrades and versioning, integration techniques and technologies, customization capabilities and knowledge, and growth path of the environment.

### Summary

The advent of a service-oriented architecture has created the opportunity for vendors to develop software as a service. Within that new paradigm, data integration software as a service is starting to make inroads. The benefits can be great but it will take foresight and planning on the part of both the DiSaaS vendor and the customer who chooses that paradigm.

The costs of data integration have become almost prohibitive for many enterprises today, limiting their abilities to compete, hindering their decision-making capabilities and constraining their abilities to implement a more efficient SOA framework. With DiSaaS, an enterprise – large or small – can create a world class IT environment without breaking its allotted technology budget. The promise of on time, on budget, fixed price data integration is compelling but must be tempered with proper due diligence from the enterprise and appropriate service level agreements from the DiSaaS vendor. With these in place, DiSaaS becomes a viable – and enviable – alternative.



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**Intelligent Solutions, Inc.** (ISI) is a professional services firm dedicated to assessing, planning, and guiding business intelligence (BI) and customer relationship management (CRM) efforts. ISI offers both consulting and education services, built around two conceptual architectures:

- **Corporate Information Factory** – an industry icon, used by hundred of organizations to plan, architect, and deliver their BI capabilities, and
- **Customer Life Cycle** – a framework for using technology to support CRM and other customer-facing initiatives

ISI's continued success at leveraging these architectures and maximizing their value for its clients has earned ISI the reputation of being leaders and experts in this field.

Intelligent Solutions' mission is simple: help our clients help themselves. ISI's offerings are designed to help our clients plan, design, and execute their BI and CRM initiatives, using their own resources wherever possible. ISI's services are based on the three primary keys to success: architecture, strategy, and education.

By adding the right expertise at key points and by providing appropriate education, ISI offers organizations in a host of industries the opportunity to realize the benefits of BI and CRM. For clients who wish to team with third party providers, we deliver crucial architecture and strategy direction, and assist in selecting the right vendors.

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Intelligent Solutions' consulting services focus on architecture and strategy. We offer a broad range of services, tailored to each organization's characteristics and goals:

- **Assessment** offerings, to identify areas of risk and provide recommendations for launching programs,
- **Strategy** offerings, to help create actionable approaches for data acquisition, meta data management, and other key processes,
- **Technical Architecture** offerings, to address data movement and access issues across the architecture,
- **Business Analysis** offerings, to identify and prioritize business requirements and address business sponsorship and governance issues, and
- **Infrastructure** offerings, to define sustainable processes and infrastructure components, including program management, operations, and administration.

# ETI High Performance Data Integration

## Value Faster Through Transparency

ETI products provide high performance data integration capabilities for data synchronization, migration and composite data services for SOA initiatives. As a complement to ETL, EAI, SOA and data warehousing technologies, ETI's data integration platform extends the value of IT investments by providing high performance connectivity and transformations as organizations combine legacy and proprietary data sources with current technologies.

Using ETI products, you gain a transparent enterprise where all of your data architectures, both legacy and state-of-the-art, work hand-in-hand to provide visibility into every aspect of the organization. By complementing and extending your existing technologies, ETI remove the technology barriers, allowing you to see deeper into your business. The results are clearer thinking, more inspired decision-making, regulatory compliance and faster time to value.

ETI's suite of award-winning software products can solve your immediate point-to-point integration needs as well as provide an enterprise-level platform on which you can manage the most complex of integration efforts.

**ETI Solution® Version 5** platform dramatically reduces the costs, complexity and risk of major integration efforts by creating efficient, high performance interfaces to connect and transform data from different systems and architectures.

### ETI Built-to-Order Integration (BTO)

No training. No configuration skills required. No platform software to install. No on-going maintenance burden. BTO integration software can be deployed in as little as two weeks. Leveraging the power of ETI Solution, ETI provides built-to-order connectors that integrate mainframe, legacy and proprietary applications with your current business intelligence, data warehousing and SOA-based infrastructures.

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ETI Data Profiler provides sophisticated analysis to discover the content, structure and quality of data sources before you start your IT project. Once profiling is complete, data quality remediation processes can be built using ETI Data Cleanser. Both are designed to work in conjunction with ETI High Performance Connectors to provide ubiquitous accuracy and connectivity.

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ETI's line of High Performance Connectors (HPCs) for SQL Server 2005 provides you the ability to load Teradata, Oracle, DB2 and other complex data sources up to 20 times faster than standard connectors.

For over fifteen years, ETI has been recognized as an innovator in the data integration field. Their products have been delivering up to 40 times increase in productivity for many of the world's largest corporations and government agencies. ETI builds on this heritage to help companies around the globe extend and complement existing technologies to maximize the efficiency and effectiveness of their data integration efforts.



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