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# Business Intelligence 101

## The Basics for Business Professionals



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## The Definition and Goal of Business Intelligence Software

Business Intelligence (BI) software takes the mass of information generated by a company's various operational data sources, integrates it, analyzes it, and presents timely findings in the form of reports, alerts, and dashboards. These reports, alerts, and dashboards provide a more accurate, actionable view of a business than is possible without BI.

The success of a BI solution ultimately is determined by how well it helps both business and technical users throughout an organization meet their mission critical goals such as:

- Achieving or surpassing revenue numbers.
- Finding opportunities to reduce costs throughout the organization.
- Maximizing profitability by identifying the most profitable customers, products, services, or programs.

## Questions Business Intelligence (BI) is Designed to Answer

A BI solution, with the right data and features, should be able to take operational data and enable users to answer specific questions such as:

- Which customers should I target?
- Which are my most profitable and least profitable marketing and sales campaigns per region?
- Where are the delays in my production process?
- How are my company's key financial indicators trending?

## Example of BI in Action - Sales Executive Using salesforce.com

Many operational solutions have some form of reporting in them. However, that reporting functionality is often fairly limited – offering only a few dimensions of inquiry for only the data within that one system. In contrast, a business intelligence solution allows an executive to quickly and easily analyze that system's data across multiple dimensions, as well as supplement that data with information from other key sources, such as marketing and finance. Analysis and reporting is more robust and faster; it is also easier to follow up on interesting data trends. For example, a BI solution for sales data like the information found in salesforce.com might include:

- **Interactive Dashboards** with graphs showing at-a-glance trends and key findings such as: Leads to Pipeline to Revenue.
- **Reports** that cover such key details as: Rep Activities vs. Pipeline Generated.
- **Alerts** that notify the executive on key changes to the pipeline or upcoming events/actions.

## Why Other Solutions Cannot Match BI for Analysis and Insight

Important information may be found in every operational area of an enterprise: sales, finance, customer service, engineering, marketing, and more. Enterprises have traditionally tried to use operational or spreadsheet applications to keep track of the information, analyze the data, and present findings. Examples include:

# **Executive Summary**

- Using an operational software program designed for a specific functional area (e.g., sales automation software, marketing software, or inventory management software).
- Exporting the operational data to Excel or a database for manual analysis.

Operational programs and spreadsheets, however, were not designed to integrate, analyze, or present data in large volumes or from multiple operational sources. As a result, organizations have been struggling with time-consuming and costly analysis approaches that are fundamentally limited and don't answer the full range of critical business questions required to manage a business effectively. This is similar to trying to drive a car at high speeds with only half a headlight working.

## Traditional Enterprise BI Software

Business Intelligence solutions were originally delivered as traditional enterprise software – that is, software solutions that are installed on your company premises, by your IT team or by 3rd party consultants, and managed by your IT team or consultants over time. The software is expensive, often requiring hundreds of thousands or millions of dollars in upfront costs. Implementing the software is also expensive; in addition to the cost of the people, it often requires additional hardware purchases for the software to work. The implementation period could be long and complicated. Maintenance and support costs are lower than upfront costs, but also can be expensive.

In addition to this, a single BI implementation might actually require the purchase and integration of multiple software components -- software for extracting data, integrating data, storing it, analyzing it, and then reporting on it. This complexity is the driver of the time and cost.

Businesses highly valued the analysis that they could get from traditional BI, so they were willing to invest in the time, software, hardware, and human resources required to make it happen. But these high costs also made it difficult for anyone but the largest companies to buy it, and even then, those companies had difficulty expanding the solution to realize more value.

## Software-as-a-Service (SaaS) BI

In order to overcome the high cost, complexity, and time requirements of traditional BI solutions, new Software-as-a-Service (known as SaaS or on-demand) solutions have emerged. Instead of purchasing and implementing software themselves, SaaS BI customers purchase BI capabilities as a "service" from a vendor. The software no longer has to be implemented and maintained on the premises, but instead runs on servers in a remote location maintained by the vendor; the company accesses the service via secure internet connection. Salesforce.com is an example of a successful SaaS solution for salesforce automation.

SaaS solutions offer significant benefits over traditional software. Time to value is reduced, since SaaS requires weeks or months to implement, instead of years. Upfront costs are dramatically reduced, removing a lot of risk from software purchase decision-making – there is no software to buy, no extra hardware to buy, and far less implementation effort involved. SaaS is typically priced on a subscription (usually a monthly fee) or pay-for-use basis.

# **Executive Summary**

## Advantages of SaaS (on-demand) BI include:

- Shorter Time-to-Insight
- Less Time to Recoup costs = Faster ROI
- Lower Upfront Costs
- Lower On-going Costs
- Less Reliance and Drain on IT Resources
- Scalability
- Flexibility

## The 5 Stages of Business Intelligence

Both traditional enterprise BI and SaaS BI involve the same five stages of taking raw data and presenting it as relevant, actionable insight to users. However, traditional enterprise BI software and SaaS BI solutions can differ significantly at each stage in terms of time and effort required. The five stages are:

- 1. The Data:** defining which data will be loaded into the system and analyzed.
- 2. The ETL (Extract, Transform, and Load) Engine:** moving the source data to the Data Warehouse. This can be a complex step involving modifications and calculations on the data itself. If this step doesn't work properly, the BI solution simply cannot be effective.
- 3. Data Warehousing:** connects electronic data from different operational systems so that the data can be queried and analyzed over time for business decision making.
- 4. Analytic Engine:** analyzes multidimensional data sets found in a data warehouse to identify trends, outliers, and patterns.
- 5. Presentation Layer:** the dashboards, reports and alerts that present findings from the analysis.

## Conclusion

Business Intelligence solutions make it possible for groups within organizations to gain actionable insight from business data, and to leverage these insights to meet critical goals. Business intelligence solutions offer business-focused analysis at a scale, complexity, and speed that is not achievable with basic operational systems reporting or spreadsheet analysis, thereby delivering significant value.

While traditional approaches to business intelligence can provide great value, they require a very manual, lengthy, and expensive process to implement. In contrast, newer SaaS Business Intelligence solutions can provide equivalent power and capability in faster timeframes and at lower cost, with ease of use benefits for business users. By lowering the hurdles to achieving powerful business intelligence, SaaS solutions make it possible to bring business insight to a greater number of users and to small and medium sized organizations that could not afford BI before.

BI takes information kept in operational data sources, integrates it, analyzes it, and presents timely findings in the form of reports and dashboards.

## Overview of Business Intelligence Solutions

### Turning Data into Insight

Business Intelligence (BI) is the process of taking operational data and putting it to use in making informed business decisions. BI software takes the mass of information kept in a company's operational data sources, integrates it, analyzes it, and presents timely findings in the form of reports, alerts, and dashboards. These reports, alerts and dashboards provide a more accurate, actionable view of a business than is possible without BI. In fact, a BI solution should be able to provide insights that are simply unknowable in a timely manner by any other means.

### The Goals of BI

The success of a BI solution ultimately is determined by how well it helps users throughout an organization meet their mission critical goals, such as:

- Achieving or surpassing revenue numbers;
- Maximizing profitability by identifying the most profitable programs;
- Finding opportunities to reduce costs throughout the organization;
- Preventing overload on IT resources by making business teams more self-reliant.
- Enabling IT to service internal business customers faster and more efficiently; and
- Creating a 360 degree view of customers.

A Business Intelligence solution enables business teams to understand the interrelationship of data generated throughout the organization, synthesize this into comprehensive analysis on results, trends, and likely outcomes, and understand the implications of this insight on business objectives. BI users gain an understanding of what has happened, what is happening and what actions need to be taken next.

### Questions BI is Designed to Answer

A BI solution, with the right data and features, should be able to take operational data and enable users to answer specific questions such as:

- **Sales and marketing questions**
  - Which customers should I target?
  - What has caused the change in my pipeline?
  - Which are my most profitable campaigns per region?

A BI solution helps users answer specific questions and understand what has happened, what is happening and what actions need to be taken.

- Did store sales spike when we advertised in the local paper or launched an email campaign?
- What is the most profitable source of sales leads and how has that changed over time?

- **Operational questions**

- Which vendors are best at delivering on time and on budget?
- How many additional personnel do we need to add per store during the holidays?
- Which order processing processes are most inefficient?

- **Financial questions**

- What is the fully loaded cost of new products?
- What is the expected annual profit/loss based on current marketing and sales forecasts?
- How are forecasts trending against the annual plan?
- What are the current trends in cash flow, accounts payable and accounts receivable and how do they compare with plan?

- **Overall business performance questions**

- What are the most important risk factors impacting the company's ability to meet annual profit goals?
- Should we expand internationally and, if so, which geographic areas should we first target?

#### **Example of BI in Action - Sales Executive Using salesforce.com:**

Many operational solutions have some form of reporting in them. However, that reporting functionality is often fairly limited – offering only a few dimensions of inquiry for only the data within that one system

In contrast, a business intelligence solution allows an executive to quickly and easily analyze that system's data across multiple dimensions, as well as supplement that data with information from other key sources, such as marketing and finance. Analysis and reporting is more robust and faster; it is also easier to follow up on interesting data trends. For example, a BI solution for sales data like the information found in salesforce.com might include:

- **Sales Dashboards** with graphs showing at-a-glance what is happening so that the proper action can be taken. Dashboards can include such crucial

A BI solution for sales data might include, for example:

- Sales Dashboards for at-a-glance insight
- Actionable Sales Reports generated automatically
- Sales Alerts for key changes or upcoming events/actions

data as: Sales to Goal, Sales by Region vs. Plan, Pipeline Trend to Goal, Products Sold by Customer Segment, and Time to Sell by Product Line.

- **Actionable Sales Reports** that are generated automatically and cover such key issues as: Actual vs. Forecast by Product, Rep, and Region; Rep Activities vs. Pipeline Generated; Top 30 Customers (who have not purchased a specific product) by Rep, Demographic Profile of Closed Accounts vs. Accounts with The Most Activity.
- **Sales Alerts** that notify the executive on key changes or upcoming events/actions.

Here is an example of how sales executives might use a Business Intelligence solution to help them meet their goals:

#### 1. The Warning:

A sales executive is alerted to a key change in the pipeline, goes to the dashboard for an at-a-glance understanding of what is causing the change, and notices that a region is suddenly behind on hitting its revenue numbers.

#### 2. The Review:

The sales executive reviews customized reports on the region and finds that the reps who are behind on reaching quota are focusing on products and customer segments that have longer sales cycles and lower probabilities of closing. The executive drills down in the reports to determine the segments and products which have the shortest sales cycles and highest probabilities of closing, to compensate for the shortfall.

#### 3. The Action:

The executive and the regional manager review the data and refocus the reps. This puts the reps in alignment with the more successful reps, as well as places the region in alignment with the more successful regions.

### Why BI is Necessary for Analysis and Insight

In this age of rapidly expanding electronic data, enterprises have found it increasingly difficult to efficiently or effectively leverage their data to meet business goals. Important information may be found in every operational area of a company: sales, finance, customer service, engineering, marketing and more. Companies have traditionally tried to use their operational software programs to both run operations and analyze the resulting data. Enterprises have tried to use

operational software programs designed for a specific functional area (e.g., sales automation, marketing automation, inventory management, ERP, or financial services) or export the data to Excel or a database for manual analysis.

Operational programs, however, were not designed to integrate, analyze, or present data in large volumes or from multiple operational sources. Each of these approaches has drawbacks, summarized in the following table:

Approach	Drawbacks for business analysis
<p>Reporting available within operational software programs (CRM, ERP, HR, accounting, etc.)</p>	<ul style="list-style-type: none"> <li>• Primary purpose of operational software is for transactions and conducting operations, not analysis of the resulting data. Reporting capability tends to be very limited in terms of the variables and dimensions of analysis, requiring significant manual work (such as exporting data to a spreadsheet) to do analysis that business users really want.</li> <li>• Reporting functionality within the individual program is only designed for the data captured by that program, so the user gets just a partial picture of:                         <ul style="list-style-type: none"> <li>– How this business function impacts the rest of the business; and</li> <li>– How what is happening in other operational areas, in turn, impacts them.</li> </ul> </li> <li>• Analyzing data in an operational system can slow down the capability for which the system was originally designed – running operations. This problem grows worse as data volume increases.                         <ul style="list-style-type: none"> <li>– Operational applications are designed for simple queries and to make insert/update operations quickly;</li> <li>– Business Intelligence requires complex queries that span many tables and operate on large row sets; and</li> <li>– Making large-scale analysis demands on an operating system can crash the system or slow it significantly.</li> </ul> </li> <li>• May require expensive and time-consuming integration with other operational groups' programs in order to achieve desired cross-functional analysis.</li> </ul>

Continued...

Excel	<ul style="list-style-type: none"><li>• Highly manual. Extremely cumbersome for data analysis, report presentation, and for ongoing data updating and maintenance. Updating an analysis with new data often requires re-running the analysis from scratch. The spreadsheet is often only easily understood by its original owner.</li><li>• Smaller scale data sets only. Does not handle the larger data volumes which BI solutions can easily handle.</li><li>• Insufficient analytic capability:<ul style="list-style-type: none"><li>– Does not provide typical BI capabilities like slice &amp; dice, drill down capabilities, pixel-perfect report layout;</li><li>– Requires an analyst mindset and advanced Excel proficiency; and</li><li>– Not usable for advanced analysis by the typical business user.</li></ul></li><li>• Integrating data from multiple operational sources requires significant time and skill.</li><li>• Prone to error when updated.</li></ul>
Databases	<ul style="list-style-type: none"><li>• Databases such as Oracle or SQL are good places for storing data, but do not provide the breadth of analysis and presentation tools required for business analytics.</li><li>• Presentation tools are lacking:<ul style="list-style-type: none"><li>– Lack charting, pivot table, dashboard functionality;</li><li>– Requires technical knowledge to craft SQL statements and present the results as a plain table; and</li><li>– Doesn't address how insights are shared in the organization.</li></ul></li><li>• Integration of data from multiple systems may require custom work.</li><li>• Significantly slowed down by BI's large cross-functional data sets:<ul style="list-style-type: none"><li>– Can crash the system;</li><li>– As with operational applications, OLTP-type databases are designed for simple queries and to make insert/update operations quickly; and</li><li>– Not well suited for BI type queries.</li></ul></li></ul>

Operational teams need access to data from other departments to see the full picture of what is happening and what to do.

## Examples of the Benefits of Shifting from Operational Application Reporting to BI

Even if all of the technical hurdles of operational system reporting were solved, operational teams simply need access to data from other operational areas in order to fully understand what has happened, what is happening, and what they should do next. Here are some examples of how combining information from multiple applications and functional areas can drive greater overall success.

### Combining Marketing and Sales Automation Data to Increase Sales

A sales team with access only to sales force automation (SFA) application data does not have a clear picture of the visits their customers make to the corporate website; the website data is owned by the marketing team. Adding the website information into the analysis could potentially alert sales to new opportunities or to the possibility that a customer is closer to making a purchase decision.

Using this same example, the sales team may also learn how accounts they close generate sales on the website and whether the multi-channel activities generate more or less revenue from their accounts. The more sources of data with which the sales team integrates their SFA data (e.g., finance, support), the greater the insight they receive into account behavior and potential opportunities.

### Combining Point of Sale (POS) with Email and Website Analytic Data to Maximize Revenue and Profitability

Customers who buy in multiple channels (e.g., retail and online) are worth more than single channel customers, according to The Nielsen Company. By analyzing only online data (e.g., email and website visit statistics), a brick and mortar retailer's marketing team will not be able to understand how to drive multi-channel purchases so as to maximize revenue and profitability. Using only their own data, marketing will not be able to answer such basic questions as:

- What is the optimal mix of online and retail store sales that provide the company with the greatest revenue and profitability?
- Which marketing programs most cost-effectively drive customers into stores?
- After purchasing, do store customers visit the website for add-on purchases? Which programs best incent them to visit the site and purchase?

For example, through using website and email analytics a company may find that low price products are easiest to promote on the website and generate the most completed orders. So the web marketing team is enthusiastic about promoting low cost online deals and petitions the VP of Marketing for more investment along these lines.

Traditional BI solutions are delivered as expensive, on-premise software.

SaaS BI addresses the cost burden, time requirements, and feature limitations of traditional solutions.

However, when looking at a more comprehensive picture by adding in Point of Sale (POS) store data, a Business Intelligence system's dashboards and reports may demonstrate that customers' desire to purchase seems to be satisfied by buying only the promoted low-cost product online. As a result, customers do not visit a store, where they are more likely also to buy higher-price, higher-margin products. The end result: lower enterprise-wide revenue and profit.

Further, analysis of reports may inform marketing that the company maximizes revenue and profit if marketing promotes higher price items on the site and then uses email marketing to promote online add-on products to customers who made their initial purchase in the store. By looking at the entirety of information available with a business intelligence solution, the VP of Marketing can make smarter decisions about the types of promotions and marketing campaigns that boost enterprise-wide sales and profitability.

### Traditional Enterprise BI Software versus Software as a Service (SaaS) BI

The traditional Business Intelligence solutions are delivered as enterprise software. While these solutions can be effective, they require high upfront costs, intensive use of IT resources or 3rd party consulting services, and hardware investment to get started. Maintaining the system is also costly and resource intensive, thereby limiting the solutions only to the largest companies and, even then, only certain groups within those companies. Extending or expanding the solutions is often prohibitively expensive. In recent years, SaaS, or on-demand, Business Intelligence solutions have emerged to address the cost and time requirements, as well as some of the feature limitations, of traditional solutions. For these reasons, SaaS solutions are gaining customers in both enterprises and SMBs alike.

### Traditional Enterprise Software Business Intelligence

Traditional business intelligence solutions are delivered as enterprise software—that is, software solutions that are installed on your company premises, by your IT team or by 3rd party consultants, and managed by your IT team or consultants over time. The software is expensive, often requiring hundreds of thousands or millions of dollars in upfront costs. Implementing the software is also expensive; in addition to the cost of the people, it often requires additional hardware purchases for the software to work, such as hardware servers. The implementation period could be long and complicated. Maintenance and support costs are lower than upfront costs, but also can be expensive.

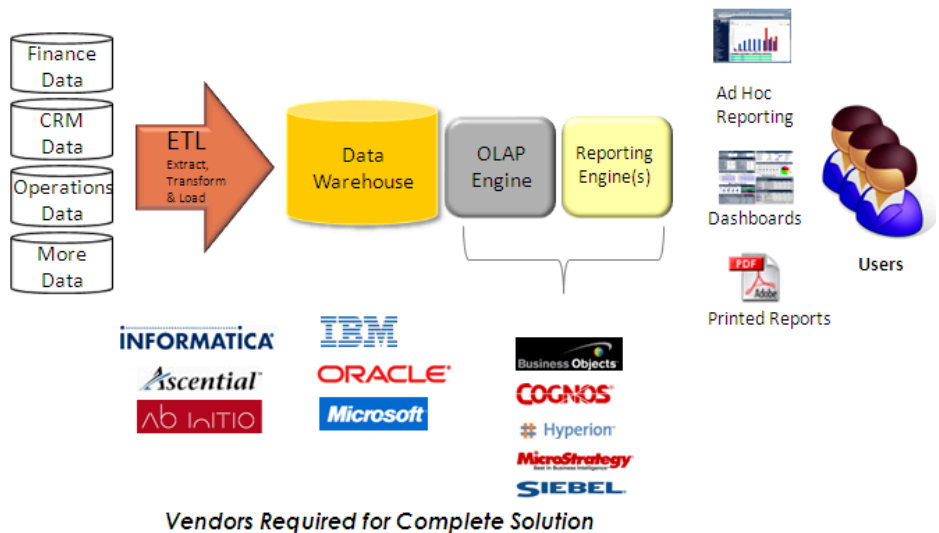
Traditional BI “implementations” may require the purchase and integration of multiple software components.

Traditional BI’s high costs also make it difficult for anyone but the largest companies to purchase.

In addition to this, a single BI “implementation” might actually require the purchase and integration of multiple software components — software for extracting data, integrating data, storing it, analyzing it, and then reporting on it. This complexity is the driver of the time and cost.

Here is a diagram of a typical traditional business intelligence solution implementation:

### Typical Traditional Business Intelligence Solution Requirements



Businesses highly valued the analysis that they could get from traditional BI, so they were willing to invest in the time, software, hardware, and human resources required to make it happen. But these high costs also made it difficult for anyone but the largest companies to buy it, and even then, those companies had difficulty expanding the solution to realize more value.

Some recent analysis conducted by independent analysts shows the challenges faced by traditional enterprise software BI implementation:

- **Average implementation time<sup>1</sup>:**
  - **17 months in total**; 5 months to deploy the first usable analytic application
- **Mean annual expenditure on BI software<sup>2</sup>:**
  - **\$1.1 million** for companies with >1,000 employees

1 DM Review & IDC Business Intelligence Survey, October 2006, 2004 (Material on implementation time not available in 2006 survey)

2 InfoWorld & IDC Business Intelligence Survey, October 2007

SaaS BI customers purchase BI capabilities as a “service” — software is implemented and maintained remotely by the vendor.

SaaS BI’s advantages include:

- Lower upfront costs and resource requirements
- Faster implementation

- **Project success rate<sup>3</sup>:**
  - **31% success rate, at best**
- **Ability to meet needs – getting the right data to the right person<sup>4</sup>:**
  - **Only 36% are confident** that reports and dashboards deliver the right data, to the right person, at the right time

### Software as a Service (SaaS) or On-demand Business Intelligence

Software as a Service business intelligence (known as SaaS BI or on-demand BI) emerged in response to the complexity, resource drain, lengthy timeframes, and prohibitive cost of traditional enterprise software. Instead of purchasing, integrating, and implementing software themselves, SaaS BI customers purchase BI capabilities as a “service” from a vendor. The software no longer has to be implemented and maintained on the premises, but instead runs on servers in a remote location maintained by the vendor; the company accesses the service via secure internet connection. Salesforce.com, NetSuite, and RightNow are examples of successful SaaS solutions for Customer Relationship Management (CRM).

### Lower Upfront Costs and Resource Requirements

SaaS solutions offer significant benefits over traditional software. Time to value is reduced, since SaaS requires weeks or months to implement, instead of years. Upfront costs are dramatically reduced, removing a lot of risk from software purchase decision-making – there is no software to buy, no extra hardware to buy, and far less implementation and ongoing effort involved. SaaS is typically priced on a subscription (usually a monthly fee) or pay-for-use basis. For this reason, SaaS solutions often are paid for as an operating expense instead of a capital expense, making it easier for SaaS BI projects to get approval.

### Integrated, Automated Solutions – Faster and Easier Implementation

One of the keys to the lower cost of SaaS BI is the level of integration and automation that a SaaS BI vendor users. A fully integrated and automated vendor has already done the BI integration for you, and automated some of the most challenging and time consuming components. Here is an example of how an integrated solution would look, in contrast with the traditional diagram from the prior section:

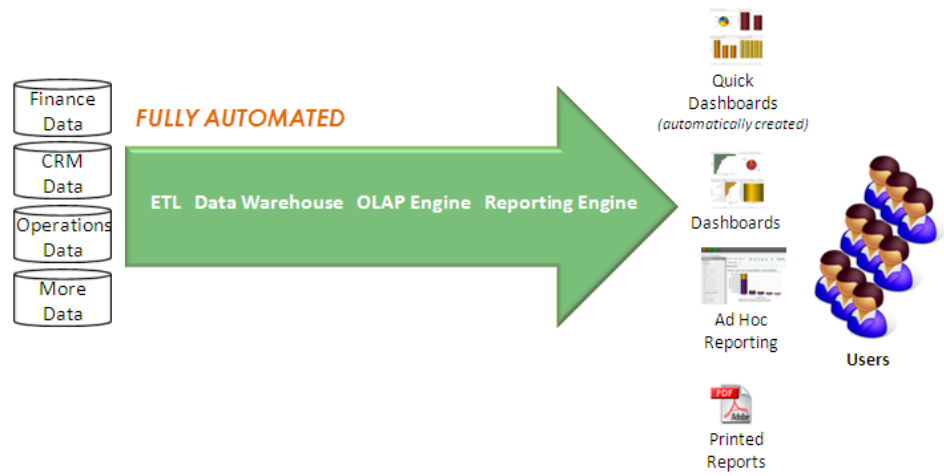
<sup>3</sup> DM Review & IDC Business Intelligence Survey, October 2006, 2004 (Material on implementation time not available in 2006 survey)

<sup>4</sup> InfoWorld & IDC Business Intelligence Survey, October 2007

SaaS BI's advantages *continued*:

- Removes the financial risk — companies can see value quickly, without a large initial outlay
- Flexible and easy to use, so that business users can serve themselves

Example of a Fully Integrated and Automated SaaS Business Intelligence Solution



**Lower Ongoing Costs and Resource Requirements**

SaaS also offers ongoing cost and value benefits. SaaS can be rolled out to a limited project at first, so that value and effectiveness can be quickly demonstrated. Then, it can be rolled out on an iterative basis, allowing other data sources and users to be added easily later. In this way, companies can prove to themselves the value before making extensive commitments, and high priority projects are easily tackled first, with less additional effort required to scale or extend a deployment. SaaS customers are often upgraded automatically by the vendor, so that individual companies no longer have to concern themselves with the time and cost of rolling out software upgrades themselves.

**Flexible And Easier to Use – Business Users Can Serve Themselves**

SaaS solutions also tend to be more user friendly than traditional BI solutions, which were built expressly for the use of analysis experts within an IT organization. While the traditional approach allowed highly complex analysis to be done, it made IT into a critical bottleneck for achieving business reporting, since the number of trained users were limited in number and reported through the IT organization instead of a business function. SaaS solutions are often created to serve both business users and analysis experts, so that business users can receive the robust reporting and data exploration that they need, while experts can tackle more complex and involved inquiries.

Traditional BI and SaaS BI differ significantly at each stage in regards to time, cost, complexity, and resources required.

The first stage is defining the data to be loaded and analyzed.

## The 5 Stages of Business Intelligence

Both traditional enterprise BI software and SaaS BI solutions involve the same five stages of taking raw data and presenting it as relevant, actionable data to users. However, traditional enterprise BI software and SaaS BI solutions can differ significantly in each of the five stages in regards to time, cost, complexity, and resources required.

The five stages are:

1. The Data
2. The ETL (Extract, Transform, and Load) Engine
3. Data Warehousing
4. Analytic Engine
5. Presentation Layer

The first four stages in the BI process comprise the “back end” processes and are traditionally driven by the technical team(s). Most business users primarily interact with the front end or Presentation Layer.

### The Backend of BI – Inputting, Integrating, and Analyzing The Data

Traditional enterprise software and SaaS solutions take different approaches to the backend processes and require different levels of resources and timeframes.

#### Stage 1: The Data

The first step in the BI process is to define which data will be loaded into the system and analyzed. A key issue to address at this stage is whether to define all of the data upfront or identify it on an iterative basis. Now it is possible for an enterprise or group to start with a subset of their overall data and add more in as they gain access to it or simply decide to include it.

*Traditional method:* The overall data structure must be defined up front, requiring companies to fully define which data they want to use before they can get started with the rest of the backend process.

*Integrated SaaS method:* Companies can start with available data and without defining up front all of the data sources. Then, additional data sources can be added on an on-going basis.

#### Stage 2: The ETL Engine

The ETL (Extract, Transform, and Load) Engine is the stage of moving the source data to the Data Warehouse. If this doesn't work properly, the BI solution simply cannot be effective.

The second stage, which SaaS can automate, is the ETL Engine which moves data to the Data Warehouse.

Next is the Data Warehouse(s) where data is connected and stored for retrieval and analysis.

*Traditional method:* Technical teams manually map source data and create definitions, map to tables, and then map to a data warehouse production environment. This process is repeated for each BI initiative within the organization.

*Integrated SaaS method:* The entire process can be automated to create staging and warehouse tables.

There are two other key issues to address at this stage:

**1. What type of data can be inputted into the system?**

The types of data BI solutions can utilize should encompass any data that can be captured and a user wants to track. A BI solution should enable enterprises or groups to upload files of large size and integrate with any solution that can export data such as:

- Data extracts from operational applications such as CRM or ERP applications,;
- SQL, Oracle, or other relational databases;;
- Flat file databases;
- Comma-delimited files (the standard “generic” file format);
- Excel or other spreadsheets;

**2. Does the solution have automated data refresh?**

Optimally the solution has automated data refresh. Otherwise, the data will need to be uploaded manually. A Business Intelligence vendor should be able to help develop an integration plan and, directly or through partners, offer integrations services.

**Stage 3: Data Warehousing**

Data Warehouses connect and keep electronic data — either in one large system or multiple connected systems — so that the data can be retrieved and analyzed.

*Traditional method:* Traditionally, this is a very frustrating stage for companies because they have been forced to choose between two sub-optimal approaches:

1. Multiple data marts and warehouses fed by multiple ETL processes, limiting the scope of any one application OR
2. One Enterprise Data Warehouse (EDW) that provides scale but severely limits the flexibility of delivering new analytical applications.

*Integrated SaaS method:* Data warehouses created on the fly for each business intelligence project/application. No reliance on a single EDW approach.

The fourth stage is analysis.

SaaS BI solutions can automate this and move it online with an OLAP Engine.

The fifth step is the Presentation Layer where users are provided with dashboards, reports, and alerts.

#### Stage 4: Analytic Engine

Once data is in the system, the next step is to conduct analysis on it.

Traditionally, this stage has required significant engineering resources to make the analysis work for the company's data warehouse. Now, SaaS BI solutions can offer an automated approach to the analysis stage and move it online with an Integrated OLAP (On-Line Analytical Processing) Engine.

*Traditional method:* IT develops another set of metadata to navigate universes, subject areas, and cubes or to build custom cubes for analysis.

*Integrated SaaS method:* Metric and dimensional metadata can be automatically generated and maintained.

#### The front end of BI - tools for acting on data analysis

##### Stage 5: Presentation Layer

BI also includes tools for presenting findings from the analyzed data:

- **Interactive Dashboards.** A dashboard is a set of high-level reports on key metrics, typically for managers. There may be multiple reports on a single dashboard, much the same way that a car's dashboard has multiple gauges and displays on it. With a dashboard, users can gain an at-a-glance understanding of key trends and metrics. Dashboards can be customizable to work for anyone in an organization, from a sales rep or frontline operations manager to a middle manager or senior executive.

An "interactive" dashboard allows users to take those dashboard reports and filter information to more deeply analyze trends and results, or to "drill down" into deeper and more detailed analysis of the data. That is, by clicking on the particular reports or results, they can explore more detailed information to find root causes of results.

- **Customizable Reports** which can present high-level findings as well as enable a user to drill down to find specific details. Most BI systems either come with report templates and/or provide the capability to create and customize reports.
- **Alerts** notifying users to changes selected as key to meeting user goals. Alerts can be set to warn users on an imminent event, changes to data, or that new data needs to be entered into the system.

*Traditional method:* Reporting packages need to be implemented from multiple solutions, since only some of them provide pixel perfect reporting, while another provides banded reporting, and so on. IT needs to build and publish unique dashboards and reports for each different type of user in the organization.

### Benefits of SaaS vs. Traditional

BI Software include:

- Quicker deployment, faster changes, and less ongoing maintenance and customization
- Pricing that is easier on budgets due to far lower upfront costs and subscription pricing

*Integrated SaaS method:* A fully integrated reporting package is ideal, so that IT does not have to integrate multiple systems. Advanced reporting techniques such as banded reporting, drag and drop formatting, and pixel-perfect reporting are all included in one solution.

## The Benefits of Software as a Service versus Traditional Enterprise Software

### • **Less Time to Recoup costs = Faster ROI**

*A faster “time to value” allows for a quicker return on investment.*

SaaS BI solutions offer quick deployment and easy changes. Unlike traditional enterprise BI software implementation, which can take 12 to 18 months or longer, SaaS Business Intelligence solutions can typically be up and running in just a few weeks. This is because there is no additional hardware to install and no database to set up. Also, on-demand solutions can start with just the available data, with other data added in as available. With the solution up and running sooner, companies can start reaping a return on their investment more quickly.

Ongoing maintenance and customization is also faster and easier. Since all of the hardware and infrastructure is maintained by the vendor, all software upgrades and architecture changes are handled by the vendor and delivered to the customer automatically. Customization and changes to the reporting and analysis tools can be handled by end users with limited, if any, use of IT resources.

### • **Lower Upfront Costs**

*On-demand pricing models and lower implementation costs mean dramatically lower upfront costs.*

Pricing is easier on most companies’ budgets because on-demand solutions are usually sold as a monthly subscription. This reduces upfront costs and often allows companies to pay for the solution from the operating budget, which is easier to get approval on, than from the capital expenditures budget.

SaaS BI (also known as on-demand BI) providers manage all of the back-end systems for their service as well as host their applications, so customers are spared the upfront hardware and setup costs associated with having a BI solution deployed - there is no hardware to buy, no software servers to purchase and set up. Low cost also makes these solutions less risky to implement, generating a higher ROI.

SaaS Benefits *continued*:

- Lower on-going costs
- Low risk and high reward thanks to lower costs, limited commitments, and lower resource requirements
- Easier budget approval for a monthly, predictable expense
- Time to insight is shorter

- **Lower On-going Costs**

*No fixed investment, lower maintenance, and fewer hardware requirements.*

The SaaS subscription fee provides an all-in cost for the right to use the solution, ongoing maintenance, and support. This subscription is usually based on the number of users who will interact with the system, the volume of data analyzed, and the level of support required. This pricing approach ensures that customers pay only for what they need, as they need it – so the customer retains financial control of the project and maintains the flexibility to scale up as their needs expand.

Because the customer's solution is running on a shared infrastructure, this increased financial control and flexibility comes with lower ongoing costs. For most organizations, the cost to deploy a SaaS BI solution with subscription licensing will be far lower than the cost of buying a conventional on-premise solution; with SaaS there are no servers to maintain, no patches to install, no ongoing software maintenance to pay and minimal IT resources required, according to IDC. Additionally, ongoing maintenance and upgrades are handled by the vendor, minimizing cost and risk for the customer.

- **Low Risk – High Reward**

*The upside of insight without the risks of traditional enterprise software.*

As a monthly subscription service, SaaS (on-demand) solutions offer a low-risk opportunity to acquire business intelligence without high costs, onerous commitments, or high resource requirements. The rewards of greater business insight, improved efficiency, higher productivity and lower costs make this a winning strategy for businesses of all sizes.

- **Easier Budget Approval**

*Lower entry costs and predictable ongoing expenses.*

On-demand solutions are paid for as subscriptions; their license cost is a monthly, predictable expense and not a large, up-front payment for licenses as with conventional software. Therefore, on-demand solutions can be typically purchased as an ongoing operational expense (OpEx) rather than a capital expense (CapEx). This makes these solutions particularly attractive in years, like this one, where CapEx budgets are under immense scrutiny.

- **Time to Insight is Shorter**

*Faster implementation, built-in templates, and interactive dashboards enable users to reap the benefits much more quickly.*

SaaS benefits *continued*:

- Ease of sharing reports and dashboards
- Less impact on IT resources, so that IT can provide greater and faster service
- Companies can easily scale usage from group to enterprise level

Less time is needed to be operational with a SaaS (on-demand) solution. Not only is it easier to generate templates with on-demand solutions, they may come with automatically generated report and dashboard templates so that users can immediately gain insight before setting up a single report or dashboard; reports and dashboards can then be customized after users have had a chance to use the system. Interactive dashboards and reports can also lower the reliance on technical staff and make business teams more self-reliant without turning them into programmers.

- **360-degree Communication**

*Easily share data and reports, even with customers and partners.*

SaaS solutions are deployed over the internet, so that users can easily share data with others, both inside and outside the customer organizations. This makes it easy for users to share insight with remote offices, suppliers, field sales organizations, partners, and customers.

In addition, since SaaS solutions can leverage data from anywhere in the world, users can integrate data from multiple sources in different parts of the world, from other internal business units, and also from suppliers and partners in any company's extended value chain. This is especially important for any firm with multiple sites in different physical locations.

- **Less Reliance and Drain on IT Resources**

*Everyone wins when business teams can conduct most of their own analysis.*

Business teams require far fewer IT resources to integrate data, configure the system, or generate templates. IT can, in turn, provide greater service to business teams by being able to help them faster without significantly impacting IT resources. Because SaaS BI solutions can be set up in a fraction of the time of traditional solutions, the time and resources required by IT to deploy a finished solution are dramatically reduced. Since SaaS BI vendors maintain and upgrade the system and hosting servers, IT is also freed from much of the normal on-going workload associated with traditional enterprise software.

- **Scalability**

*Easily scale from group to enterprise level solutions.*

Software as a Service (SaaS) solutions are designed to support a large number of customers simultaneously, with capacity to spare. This means that any individual customer can quickly expand their on-demand solution by simply requesting a larger account size or more users.

SaaS benefits *continued*:

- Greater flexibility for business users and IT

SaaS BI solutions usually require a few weeks to get started rather than traditional BI software's many months to years.

Unlike on-premise solutions, customers can expand their on-demand solution without having to buy and deploy more hardware or install different, larger software servers. Since the vendor is the one responsible for capacity, organizations can begin with a small number of users and a small set of data, easily scaling to an enterprise level platform, or anything in between.

- **Flexibility**

*Quickly adapt to changing business needs.*

Unlike traditional solutions, SaaS BI solutions can be changed easily, so non-technical users can quickly add new reports and dashboards, new data sources, and new analyses. With traditional BI solutions, such changes could take weeks or months, and involve significant IT resources.

## Time to Insight

A SaaS BI solution will usually require just a few weeks to get started, rather than the many months to years involved with getting traditional BI software live.

Key factors that determine how long it will take a Business Intelligence solution to become operational include:

- **Access to the data**

With SaaS, any size of entity can start analyzing its available data and, over time, input data from additional sources. However, if specific data is needed and there is simply not ready access to it, the implementation period will be lengthened.

Most business teams, fortunately, find that they have ready access to enough data for a SaaS solution to give them meaningful insight. Solution providers should be able to help enterprises prioritize their data needs to determine whether the readily available data is sufficient for business purposes.

- **The amount of automation of back-end processes**

Much of the back-end processes (ETL, OLAP, and Data Warehousing) can be automated to significantly reduce implementation time, costs, and resource drain.

- **The solution's Extract, Transform and Load (ETL) capabilities**

Advanced ETL solutions make it easier to pull multiple types of data into the system and run the necessary pre-calculations (transformations) that might be required. If the solution does not readily accept all necessary data formats, then expensive and time-consuming customization may be required.

Key factors that determine time to insight *continued*:

- The ease of generating and customizing reports and dashboards
- Responsiveness of the solution provider

Please see “The criteria to use in evaluating SaaS BI vendors”.

- **The ease of generating and customizing reports and dashboards.**  
Reports and dashboards that are automatically created can save significant time and enable users to start gaining insight immediately; over time, dashboards and reports can be customized to better fit needs. Also, some solutions provide the ability to create templates, which are easily reused and shared, dramatically reducing report and dashboard creation time.

With traditional enterprise software applications, customized dashboards and reports have required significant IT resources to produce.

- **Responsiveness of the solution provider.**  
As with any other product or service, the responsiveness of the vendor is crucial to decreasing time to insight, as well as helping an enterprise optimize its use of BI. A series of factors have to be considered such as: planning capabilities; timeliness of response to fixes and requests; and quality of work. Please see “The criteria to use in evaluating SaaS BI vendors” for more information.

## Summary

Business Intelligence solutions help organizations gain actionable insight from their business data in order to meet business goals. Most operational groups already have some way to utilize some information within their domain, typically through spreadsheets, databases, or the limited reporting available in an operational solution like a CRM solution. However, business intelligence solutions help to provide the greatest business insight, since they can easily analyze larger amounts of data, can integrate data from multiple areas of the business, are easier to use and update for complex calculations, and have a way of easily distributing compelling reports and dashboards.

Business intelligence solutions are available either in the traditional manner, as an on-premise software solution, or as an integrated SaaS (or on-demand) solution. While powerful, traditional business intelligence can require significant upfront costs, lengthy implementations, and high resource demands for hardware and IT services. SaaS Business Intelligence solutions are a more modern and flexible approach, with significant value benefits. SaaS BI can be implemented quickly, in weeks rather than months, has lower upfront costs, and significantly lower resource requirements.

Business intelligence solutions are only growing in demand as available data rapidly expands and companies seek analysis and insight that can give them a competitive edge in a difficult economic environment. SaaS BI in particular is seeing significant traction among SMBs and enterprises alike, due to their dramatically improved value proposition.

## Evaluating Business Intelligence Solutions and Vendors

### The Criteria to Use in Evaluating a BI Solution

There are many offerings that fall under the banner of business intelligence, and so it can be confusing for a company to determine which particular solution will best meet their needs, whether that solution is a traditional, on-premise one or a SaaS BI solution.

Here are some questions to ask in evaluating BI solutions:

#### Back-End Process Automation

- Does the solution automate much of the back-end processes (ETL, OLAP, and Data Warehousing) to reduce time-to-insight, costs and resource drain?

#### Data Upload and Integration

- From which types of data sources can you analyze information: flat files, Excel documents, SQL databases, operational application data from CRM and web analytic solutions, etc?
- Are there connectors to popular business applications - such as salesforce.com and Google Analytics – that make it easier to connect to data sources and control which types of data get included in analysis?
- How easy is it to connect the SaaS or on-demand solution with your data sources? How easy is it to combine data from multiple sources together?

#### Usability and Manageability

- Is the solution a fully integrated solution or a patchwork quilt of legacy and newer solutions?
- How much configuration does the system require to publish complete, accurate, and current reports?
- Is the overall interface intuitive and easily usable - with training - by non-technical members of the business team? A well-designed BI solution will provide left brain understanding to right brained users.
- Can you control with whom you share your information and what they can see?
- Once you've uploaded data, does the system automatically generate some reports to get you started?
- Can you invite your colleagues to have access to your most recent reports whenever they want; can they monitor data trends over time without having to locate old emailed reports?

### Reporting and Dashboards

- Does the solution offer a full range of analysis and reporting such as: operational reporting/banded reporting, dashboards, OLAP/slice-dice/pivot, and alerts?
- How customizable are reports and are there report templates to help you get started?
- How easily can dashboards be customized? If so, do the dashboards display at-a-glance the information you need to track?
- How actionable is the data? Another way to look at this is – Is the analysis easily understandable and do you readily understand what action you need to take based on the findings?

### Data and Application Security

- Are the applications providing access to your data secure? Make sure they are designed from the ground up to protect the security of your information.

*Please go to [www.birst.com](http://www.birst.com) and download the **Birst Security Whitepaper** for more help in judging the security of vendors, your data, and application solutions.*

## The Criteria to Use in Evaluating the BI Vendors Themselves

Besides evaluating a vendor's solution(s), research the vendor's:

### References

- Are there reference customers who are willing to talk with you? If so, ask them about the vendor's responsiveness and commitment to customer service.

### Professional Services

- Can the vendor understand your specific situation?
- Does the vendor offer a full-range of services to help you optimize your use of Business Intelligence? Services can include: strategic planning; project management; data integration; and analytic guidance.
- Does the vendor provide training that enables you and your team to use the solution as a knowledgeable user who can use it to achieve the goals for which you purchased the system?

### Pricing

- What pricing plans does the vendor offer?
- Are there any upfront fees?
- What are the ongoing costs? Is it an all-in cost for the right to use the application service, maintenance, and support? If not, what are the outlying costs?
- How do changes in data volume or number of users impact the cost?

### Security

- Physical Security: How secure is the hardware containing the customer data?
- System Security: How secure are the networks and hardware containing the data? Are they hardened and tested against attack?
- Operational Security: Are the physical security and network environments operated in a secure manner?
- Reliability: Is the data available when you need it?
- Please go to [www.birst.com](http://www.birst.com) and download the Birst Security Whitepaper for more help in judging the security of vendors, your data, and application solutions.

## The Business Intelligence Glossary

### Alerts

Automatic notifications and/or reports that are triggered by the data itself, such as a sudden shortfall in a sales forecast or an inventory stockout. Alerts can be set to warn users on an imminent event, changes to data, or that new data needs to be entered into the system.

### ASP

ASP stands for Application Service Provider— an approach to software rental that gained in initial popularity in the 1990's and has faltered since then, due to inherent limitations. ASPs may be thought of as a vendor that hosts a particular implementation of software for you. While this may sound like SaaS, it is in fact dramatically different, since it does not take away the issues with upfront costs, lack of integration, time intensive customization, and other issues associated with implementing your own software. SaaS has significant cost and feature benefits over ASPs.

### Cloud Computing

The use of the web to access technology-enabled services of any type. A key requirement, according to research and analysis giant Gartner, is that it be "massively scalable." A cloud computing customer can easily scale up (or down) and change its monthly costs to meet changes in demand without having to invest in or manage new servers (or sell excess servers.)

A SaaS/on-demand solution is one of the types of cloud computing providers.

### Dashboards

Graphical presentations of data analysis that give users an at-a-glance understanding of key trends and metrics. These usually take the form of multiple reports and charts on a single web page or series of web pages.

### Data Warehousing

A repository of a group or organization's electronically stored data, typically designed to facilitate reporting and analysis.

### Dimensions

The natural groupings for measurements such as: Years, Months, Product Categories, Sales Regions, etc. For example, one might want to know the monthly sales by product.

### ETL Engine

ETL stands for Extract, Transform, and Load. The ETL Engine moves the source data to the Data Warehouse, sometimes performing calculations or "transformations" on the way.

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### **Hierarchies**

Inherent in dimensions is the notion of hierarchy. Consider Time for example. There are many units of Time that one can be used to measure sales. One could look at yearly sales, quarterly sales, monthly sales, weekly sales, daily sales or even hourly sales. It is convenient, therefore, to think of all of these units as levels in a hierarchy of Time.

### **Integrated OLAP (On-Line Analytical Processing) Engine**

The solution component that analyzes data across multiple dimensions, allowing users to ask complex business questions and get rapid answers.

### **Interactive Reports**

Interactive reports enable users to customize the presentation data. Interactive features include the abilities to sort, apply filters, define computations, create charts and select columns and rows. Interactive reports can also enable users to control file formats.

### **Measures/Facts**

Measures or facts are measurements of business data. Measures can include things like Revenue, Sales, Assets, Number of Orders, etc. Measures, in turn, can be analyzed across Dimensions.

**OLAP** See “Integrated OLAP (On-Line Analytical Processing) Engine”

**On-demand** See “Software as a Service”

### **Presentation Layer**

Business Intelligence solutions provide users with a set of tools that present findings from the mass of cross-functional data loaded into and analyzed by the BI system. The tools include: interactive dashboards, customizable reports, and alerts.

### **Software as a Service (SaaS)**

Software as a Service normally is referred to by its acronym, SaaS. The terms SaaS and “on-demand” are normally used interchangeably. Either term, SaaS or on-demand, refers to a solution built to be hosted and delivered to customers securely over the internet, removing the burdens of on-premise software implementation and maintenance expense. Customers securely access their solution and information from their internet browsers. Salesforce.com, NetSuite, and RightNow are examples of well-known SaaS solution providers.

This approach enables the sharing of application processing and storage resources in a “one-to-many” model where a variety of customers can share the processing and storage, thus reducing the cost. SaaS or on-demand solutions are typically paid for on a subscription basis.