Enterprises generate a great deal of useless data in the name of Business Intelligence (BI). Business and IT decision makers need to establish the strategic intent behind BI before even considering tool adoption.
Executive Summary

Business and IT decision makers need to maintain a clear distinction between true BI and gratuitous data. This research note provides that delineation by addressing the following key areas:

- A working definition of BI – what it is and what it is not.
- A summary of common BI tool types, with examples.
- Key considerations prior to adoption.
- Recommendations for high-level BI planning.

IT and business leaders can leverage this information to develop a solid grasp of BI and ensure the initiative does not stray too far from the core principles.
Technology Point

Business Intelligence (BI) is rapidly becoming one of the most overused terms in IT. More and more software vendors are claiming that their products have BI capabilities; a growing number of consulting firms offer BI optimization assessments. Part of the explanation for this trend is that BI as a concept involves both business processes and enabling technologies that can be implemented in a variety of ways with different levels of complexity. Enterprise decision makers need to fully understand what BI is before they can decide what to do about it.

What It Is & How It Works

There is a common tendency to equate BI with the set of proprietary technologies that bear the same name. However, organizations that do not make use of a major vendor toolset can still engage in BI activities. At its core, business intelligence is both a set of processes and technologies aimed at improving strategic and operational decision making by leveraging enterprise data.

Business Intelligence (BI) is…

- A process involving the consolidation, analysis, and communication of business information to assist business decision making.
- A technology which consists of a variety of tools that automate data consolidation, analysis, and the presentation of business information to end users.

Understood this way, even organizations that make use of simple spreadsheets can be engaged in BI. What matters is that enterprise data is being strategically used to provide better insight on the state of the business and/or the marketplace. Although other enterprise applications, such as customer relationship management (CRM) and enterprise resource planning (ERP), provide information for decision support, data is typically fragmented and the systems are not tightly integrated. By bringing together data from disparate sources, BI offers an enterprise view (a single version of the truth) of the state of the business.

Business Intelligence is not…

- A source of business information. BI tools do not create their own raw data – they collect and work with data generated by other enterprise systems.
- Reporting alone. A tool must contribute toward business decision making to be considered BI. Reports generated for strategic analysis are part of the BI process. Routine operational reports are not. The same principle applies to all BI-related technologies. Without strategic intent, a tool is just a tool – not BI.
Content intelligence (CI). BI works with standardized structured data, while CI tools provide insight into unstructured data. There have been attempts to fuse BI and CI together, but none have taken hold in the enterprise market to date.

Component BI Tools

Generally speaking, the component BI tools can be partitioned into three distinct categories:

- Data consolidation tools (back-end technologies).
- Analytical tools (data manipulation tools).
- Presentation tools (front-end technologies).

Figure 1. BI Tool Spectrum

Source: Info-Tech Research Group

Figure 1 describes the most common BI tools that fall under the BI tool categories. It is important to reiterate that the spectrum of BI implementations varies enormously. As a result, the list of tools in Table 1 is not intended to define a standard BI implementation. Organizations will tend to adopt toolsets as they are needed.

Table 1. Business Intelligence Tools/Technologies

Source: Info-Tech Research Group
### Data Transformation and Cleansing Tools

Data transformation tools, such as master data management (MDM) systems and data quality (DQ) solutions, are essential for ensuring that a BI system operates over high quality data. Most large BI vendors offer MDM and DQ tools as do major data integration providers. **Trillium Software** is the market leader in information management solutions.

### Data Integration Tools

Data integration tools, such as extraction and transformation tools (ETL) and enterprise application integration (EAI) are critical for the transport of data into data marts or data warehouses and transformation of various data types into useable formats. Again, most BI vendors offer a data integration toolset. Examples of pure-play data integration providers include, **Informatica, Talend**, and **CloverETL**.

### Data Marts

A data mart is a subject-based database that caters to the operational needs of a particular business unit. A number of data marts are often used to fulfill the needs of different business units. **Microsoft SQL Server** is the most common form of database software used for the creation of data marts.

### Data Warehouses

A data warehouse is an integrated, physically centralized, repository of data that can be accessed by the whole organization and can be classified by subject. Data warehouses offer a “single version of the truth.” Data inconsistencies are identified and resolved prior to loading, so that all data can be compared, manipulated, and analyzed in a standardized manner. The leading data warehouse providers are **Teradata, Oracle, IBM**, and **Netezza**.

### Analytical Tools (Data Manipulation)

### Online Analytical Processing (OLAP) Servers

OLAP cubes are designed to answer multidimensional analytical queries, providing results much more quickly than other methods such as online transaction processing (OLTP). Some enterprises build their own OLAP solutions, while others rely on commercial offerings. OLAP cubes offer a means for representing multidimensional queries against relational databases. There are four
### Data Mining, Modeling and Prediction Tools
Data mining technology runs large quantities of data through specific algorithms to extract meaningful information (e.g. market basket analysis). In a BI context, meaningful information is that which improves decision making. BI data mining is often used to find patterns in past performance data and predict future outcomes. Some BI solutions and add-ons enable sophisticated model building and statistical analysis (e.g. regression and multi-factor analysis) to provide insight on business operations and market dynamics.

### Analysis and Exploration Tools
Data exploration and analysis tools provide alternative ways for exploring and analyzing data, typically through the use of data visualization techniques. Techniques such as what-if analysis and scenario testing are common types of analysis.

### Presentation/Reporting Tools

#### Spreadsheets
These are the simplest and most common BI tools. Business units frequently use spreadsheets to collect, analyze, and share business data. Spreadsheet use is pervasive in enterprises because most users already know how to use applications like Microsoft Excel and already have them installed on their PCs. Even the more complex tools (e.g. OLAP and data mining software) often use spreadsheets as a front-end interface.

#### Reporting and Querying Tools
Tools, such as Crystal Reports, enable users to build and publish relational reports based on business data. Many reporting applications include ad hoc query capability as well, allowing users to generate custom reports beyond the standard set.

#### Data Visualization Tools
Data visualization tools, such as JMP and Corda, enable rich graphical interfaces for the visual representation of data and analysis in a user friendly intuitive manner. Data visualization is a central feature of data exploration tools but can also be used to represent information in dashboards and interactive reports.
Dashboards, Scorecards and Portals

Dashboards and scorecards are executive-oriented reporting tools. Dashboards pull together data from different sources across departments, providing a snapshot of the enterprise’s performance. Scorecards measure operational performance against strategic targets. Both features are often included as components within a larger BI suite, although dedicated tools (e.g. iDashboards, Xcelsius, tableau, LogiXML) are also available.

Alert and Notification Systems

Most major BI suites have the ability to send alerts or notifications when critical changes occur in the business. For example, the system can be set up to send out an automatic e-mail when a metric is outside the normal range (e.g. a sales group is missing its daily quota).

All of the above tool types are available as components within larger software packages. Suites that emphasize executive reporting are often referred to as enterprise performance management (EPM) or corporate performance management software. If a database server or data warehousing component is included, the whole solution is usually marketed as a BI solution or BI platform. The BI software space is dominated by several large vendors: IBM Cognos, SAP/Business Objects, SAS and Oracle. Microsoft has also been making waves in the BI world with its BI product, which has since evolved from its origins in Performance Point Server. Other noteworthy vendors are Information Builders, Actuate, and QlikTech. Products are typically sold as a core BI solution/platform with additional modules sold separately (e.g. dashboards).

BI solutions can be implemented in a variety of ways from the development of simple spreadsheets (or spreadmarts) to the installation of a full BI suite. The resource commitment required for building and maintaining a BI solution is, roughly, proportional to the complexity of the implementation. Figure 2 below provides a simplified representation of the BI tool spectrum.

**Figure 2. Data Consumption Hierarchy**

Source: Info-Tech Research Group
Key Considerations

Given the broad range of BI technologies available, it is often challenging for enterprises to identify the most appropriate set of tools. However, IT managers must remember that successful BI projects are as much about business process change and business strategy as they about technology. BI technology is intended to serve business processes. Before a decision about toolsets can be made, the enterprise must first understand itself. From a BI perspective, self-knowledge means three things:

1. **Know the data.** Identify the types of business information that are currently being created and collected. Consider the following questions:
   - Which operational systems generate records and reports that can contribute to decision making?
   - Does the enterprise standardize data across sources in any way?
   - Who owns the data? Data owners or data stewards are important stakeholders in the BI process, even though they are not directly involved in tool-based analysis. For more on data stewards, refer to the ITA Premium research note, “Data Stewards: Saviors of Enterprise Data Quality.”

2. **Know the business strategy.** What are the ultimate strategic goals behind the BI initiative? Decision makers must define desired outcomes in order to determine the inputs required to
produce them. It is essential that data collection and analysis is aimed at answering actionable business questions. Some examples include:

- Who are our profitable customers?
- What makes these customers profitable?
- What market segments should we target?

3. **Know the users.** BI users do not all have the same needs. They have different roles in the organization and different degrees of influence over its operations. Info-Tech recognizes three distinct groups of information consumers for BI projects. Figure 2 identifies the key knowledge consumers, the kind of information they consume and the types of decisions they are likely to make on the basis of that information.

### The Benefits of Business Intelligence

The success of BI will be determined by whether it provides business value. A well-implemented BI program leads to the following business benefits:

- **Transformation of data into information:** Gigabytes – even terabytes – of raw data are available to many organizations, but to make this useful it has to be translated into meaningful and actionable information. Transforming data into information occurs in one of two ways: (i) when data is presented in a useable format and (ii) it has been analyzed to produce actionable information. This transformation is the key to improved decision-making.

- **Use of information for rapid and improved decision-making:** To aid in superior decision-making capability, it is essential to sort and identify the information that leads to strategic and competitive advantage to a business. This is what BI helps to achieve by providing selected trends and analysis of useful information.

- **Rationalized approach to management:** Use of analysis tools to see the cause and effect relationship between decisions leads to better results. The methods and technologies that help make decisions based on facts, and reduce dependence on experience or gut feeling, help to create a more rational approach.

### Key Takeaways

1. **Identify existing BI measures.** Nearly every enterprise already uses some form of BI, but many do not employ dedicated BI tools. Depending on the requirements of the enterprise, enhancing BI may not require the adoption of new technology. Significant improvements can be achieved by optimizing and standardizing use of existing tools such as spreadsheets.

2. **Define business needs.** Before investigating adoption of new BI tools, the enterprise must be able to identify specific needs that cannot be fulfilled with existing technology. Improving
business insight is not a specific need. Instead, focus on needs such as leveraging customer behavior analysis to increase wallet share.

3. **Understand the target user base.** BI provides the most value when applied at the business unit level, where it can directly impact immediate decisions. The core user base should therefore be the knowledge consumer and knowledge producer user groups.
   - Target the strategists within the business units. Licenses should go to people who can use them to effect change – users must have some level of decision making authority or direct input into decisions.
   - The executive level is generally too far removed from operations to make an immediate difference at the operational level. Strategic, big picture decision making should not be ignored, but it should not be the main focus of the BI initiative.

4. **Match the tool types to the user groups.** Each of the user groups defined in Figure 2 has distinct preferences and needs in terms of tool functionality. Factor these differences into feature prioritization during the tool selection process.
   - Knowledge consumers and knowledge producers will look for detailed drill-down reporting with the ability to customize and export reports. They will also need the ability to apply business rules and heuristics to bring out patterns and correlations in the data.
   - Knowledge producers may want to be able to work with atomic-level data. Other user groups will have little need for such granularity.
   - Executive decision makers will rely heavily on dashboards and scorecards – presentation formats that provide rapid and succinct results.

5. **Prioritize custom functionality based on business value.** Enterprises that are over-eager in their tool adoption run the risk of adding features that do nothing for decision making. This problem leads to the accumulation of gratuitous data – data that provides no new value to the organization. Treat added functionality like technology adoption. Establish a well-defined decision making need before investing resources into it.

**Bottom Line**

Enterprises generate a great deal of useless data in the name of BI. Business and IT decision makers need to establish the strategic intent behind BI before even considering tool adoption.