TEC INSIGHT

TEC INSIGHT REPORT

FUNCTIONALITY & UX EVALUATION OF BUSINESS SOFTWARE

BUSINESS INTELLIGENCE AND ANALYTICS SOLUTIONS

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2021 TEC INSIGHT REPORT FOR BI AND ANALYTICS SOLUTIONS

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ABOUT TEC INSIGHT

As part of a continuous effort within Technology Evaluation Centers (TEC) to provide our audience with better and wider industry research, we are pleased to launch our newest offering, TEC Insight. By featuring two combined elements, the TEC Insight Report and the TEC Insight Graph, we intend to arm decision makers with accurate data and incisive context to inform their business software choices. Senior TEC analysts undertake comprehensive investigations to form each TEC Insight publication, combining data-driven analyses, methodical user surveys, and their years of expertise to assess solutions and market dynamics.

The intended audience of TEC Insight publications is the decision maker who wants to stay informed about the enterprise software market and better understand the offerings in a given application area. TEC Insight reports and graphs are relevant to both business and information technology (IT) managers—including chief financial officers (CFOs), chief technology officers (CTOs), and chief information officers (CIOs)—and to individual users of specific solutions.

TEC INSIGHT REPORTS

Each TEC Insight Report provides detailed coverage of the major applications available in a specific enterprise software category, as well as an informed interpretation of the overall marketplace. Each report evaluates software solutions in a specific application area from two main angles: functionality and user experience (UX). We provide a unique, data-driven breakdown of these elements, and an overview of software vendors and their applications, including licensing, geographic presence, mobile capabilities, and cloud platform support.

TEC INSIGHT GRAPH

The TEC Insight Graph—embedded in each TEC Insight Report—depicts all the solutions covered in the report in relation to each other. The graph positions each solution along two main axes—functionality and user experience—and within one of four dynamic states: reliable, competitive, strong, or dominant. Each graph is compiled by analyzing three different factors: 1) responses from users in regard to solution functionality and how satisfactory the product is to work with (UX); 2) vendor responses on the functionality and UX of their solutions; and 3) TEC's analysis of where each solution stands in the wider market context, as reflected by user experience, functionality data, and competitor dynamics.

Most enteprise software analyst firms rely on high-level functionality information, marketing angles, and market share data to determine their rankings of products and issue their graphical market depictions.

TEC's approach is different at the baseline in that we are highly data driven, collecting extensive product functionality data and comparing solutions on their level of support for each feature. Thorough, objective functionality data is paramount at TEC and anchors our software selection methodology, in combination with project management and industry expertise.

But over the years, we have sought ways to complement our focus on functionality with consideration of software quality. As quality is subjective, the best way to measure it is through user experience. Indeed, UX has become increasingly important as the "other side" of software efficacy, arguably impacting product development and user return on investment (ROI) as significantly as functionality does.

TEC Insight was born out of this effort to combine functionality scores and user experience analyses, without compromising our commitment to data-driven conclusions. Thus, we developed a way to measure and capture user experience, rather than footnoting it through anecdotal reflections or non-uniform user reviews. We are proud to have developed a unique approach that is distinguished by both its expansiveness and rigor. We launch this effort with the publication of the 2021 TEC Insight Report for BI and Analytics Solutions.

ABOUT THIS REPORT

This report comprises the following components:

- Brief overview of the BI and analytics market landscape
- The TEC Insight Graph, along with a discussion of TEC's findings
- Tips on how to approach the successful selection of a BI and analytics solution
- Overall conclusion on the findings of this report
- Vendor/solution profiles with analyst commentary
- Explanation of the methodology and evaluation criteria used for the generation of the TEC Insight Report and the TEC Insight Graph
- Useful links to other resources from TEC

THE BI AND ANALYTICS MARKET IN 2020: AN OVERVIEW

Over the years, the business intelligence (BI) and analytics market has matured to the point where nearly every organization has taken advantage of one or more of these solutions to grow their business. The market landscape itself has turned into a wide and diverse ecosystem, making it very difficult if not almost impossible to enclose BI solutions and vendors within a single set of functions and features, as was the case 10 or 15 years ago. The landscape continues to expand and diversify, incorporating solutions that are capable of providing single, multiple, or even nearly all the functions and services encompassed under the umbrella of BI and analytics.

From delivering reporting and dashboarding features to incorporating state-of-the-art capabilities based on artificial intelligence (AI) such as in the so-called augmented analytics offerings, the BI and analytics market offers a wide number of solutions, each capable of playing a key role—whether large or small—within the spectrum of BI and analytics functions. These solutions offer capabilities for the different levels and types of data analysis services required by an organization, working with data originating from a wide number of sources, in various formats, and moving at different speeds.

Two of the most interesting and relevant evolutions in BI and analytics can be summed up by two terms: consumerization and verticalization:

- **Consumerization.** The combination of technology and business evolution has enabled vendors, on the one hand, to encapsulate and isolate BI functions and features within analytics tools—enabling typical business users to pursue their own data analysis efforts by offering applications that are easier to use, potentially integrated with office and other types of business applications, and are effortless to deploy and configure.

- **Verticalization.** On the other hand, many BI/analytics software providers, thanks to their accumulated experience working with clients from different industries and lines of business (LoBs), have gained expertise in providing specific configurations and functionalities for particular business niches. This shift is also marked by a recent trend among vendors to acquire other software companies offering specialized analytics software devoted to specific business needs—reinforcing their existing set of analytics tools and providing their users with data analysis functionality for specific industry or business processes.

With the rapid development of the latest technologies and the increasing consumerization and verticalization of the space, new methods and capabilities are being incorporated into every new and existing solution in the BI and analytics market. Such a diverse ecosystem makes it very difficult to take a one-dimensional or one-fits-all approach when analyzing the market and its players.

ALL FOR ONE, AND ONE FOR EVERYTHING?

Over the past 10 years, we've also seen significant changes in the pratice of BI and analytics and how its processes are conducted within organizations. With the increasing speed of generation and movement, the data that is available for analysis has increased in volume and shape, spurring the evolution of practices and processes for data analysis and insight generation. As a result, BI and analytics processes have become increasingly complex and more comprehensive than ever before.

Drivers for these changes include the augmented data volumes generated by all organizations, the increase in complexity of business models and business operations, the availability of computing resources due to technology improvements, and of course, the incorporation of novel technologies such as machine learning and augmented analytics into offerings to analyze and solve more complex problems and address universally difficult economic conditions.

THE DEVIL IS IN THE DETAILS

BI solutions were originally conceived as software tools for information analysis and decision support, with historical data as the source. Extensive sets of historical data were processed, analyzed, and delivered to the user via visualization tools such as reports or dashboards.

The traditional BI approach resembles a batch process in which information follows through a sequential process—from source to target. In general terms, this BI lifecycle approach is a composite of the following components (figure 1):

- **Data connection/collection.** The classical BI lifecycle process collects data directly from the point where it is generated. Data can originate from many types of systems and applications, including relational databases, business software such as enterprise resource planning (ERP) and customer relationship management (CRM) applications, plain text files, and office application files such as spreadsheets.

- **Data integration/preparation process.** The data is moved or copied from its source location to a data warehouse or data mart. During this process, which is called data integration, some subtasks take place:
  - A data quality process ensures that the information remains consistent, accurate, and "clean"—i.e., there is a process to avoid, detect, and correct problems within the data that is being moved to the data warehouse.
  - A data transformation process modifies the structure of the data to satisfy the conditions imposed by the design of the data warehouse, and to ensure the consistency of all information.
- **Analysis and data visualization process.** Once the data is in the data warehouse, the analysis process can begin. Through this analysis, the data is transformed into valuable information for the user. The BI lifecycle process ends when the information is presented to the user in a format that enables improved decision-making.

At first, this appears to be a fairly simple process, as each task follows a straightforward sequence. However, at each stage of the process, a complete set of subtasks must be performed in order to proceed to the next stage of the BI lifecycle.

The sequential nature of this process explains why many vendors offer solutions to perform specific parts of the overall BI lifecycle process.

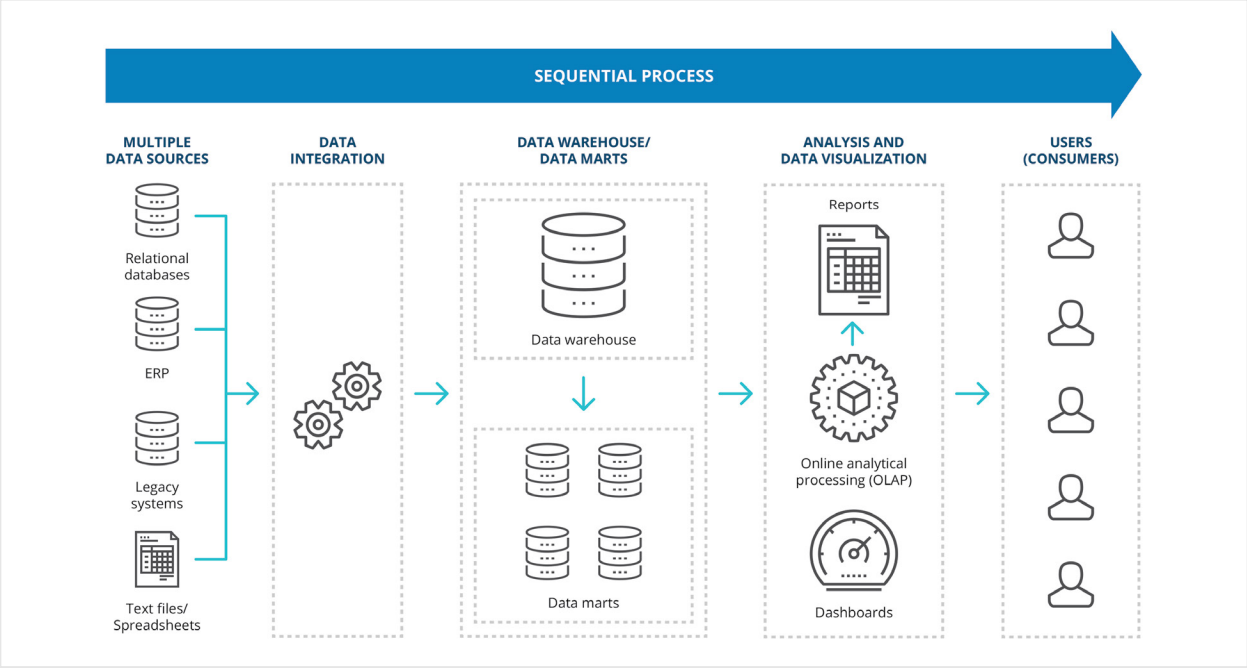


Figure 1. A typical (basic) BI process—from data collection to delivery

Since the early 2000s, many companies have been elaborating progressively on more complex business models. Mergers and acquisitions have increased, and the volume of data being generated has exploded.

The increase in data volumes and the high speed with which this data must be delivered has forced traditional BI applications to radically evolve in order to apply different solutions not only to augment their ability to manage such volumes and speeds, but also to modify the traditional way of performing the data-integration process.

What was originally based on a batch set of processes for moving, transforming, and cleansing thousands of records on a monthly, weekly, or even daily basis has been transformed into a cycle that requires moving smaller quantities of data, but with an important increase in frequency—two, four, eight times a day, every hour, or even in (near) real time.

This requirement alone has triggered technological advances that have added a new dimension to the BI lifecycle: data can be processed and analyzed to deliver insights almost at the moment it is generated—that's to say, at a fully operational pace.

As data comes in from a diverse set of sources and at different speeds, software vendors are challenged with providing the right solutions for enabling organizations to manage the data in various formats and at different rates. In addition, the data visualization process has also increased the number of options that are available to users, making the BI and analytics framework not only more complete but also more complex (figure 2).

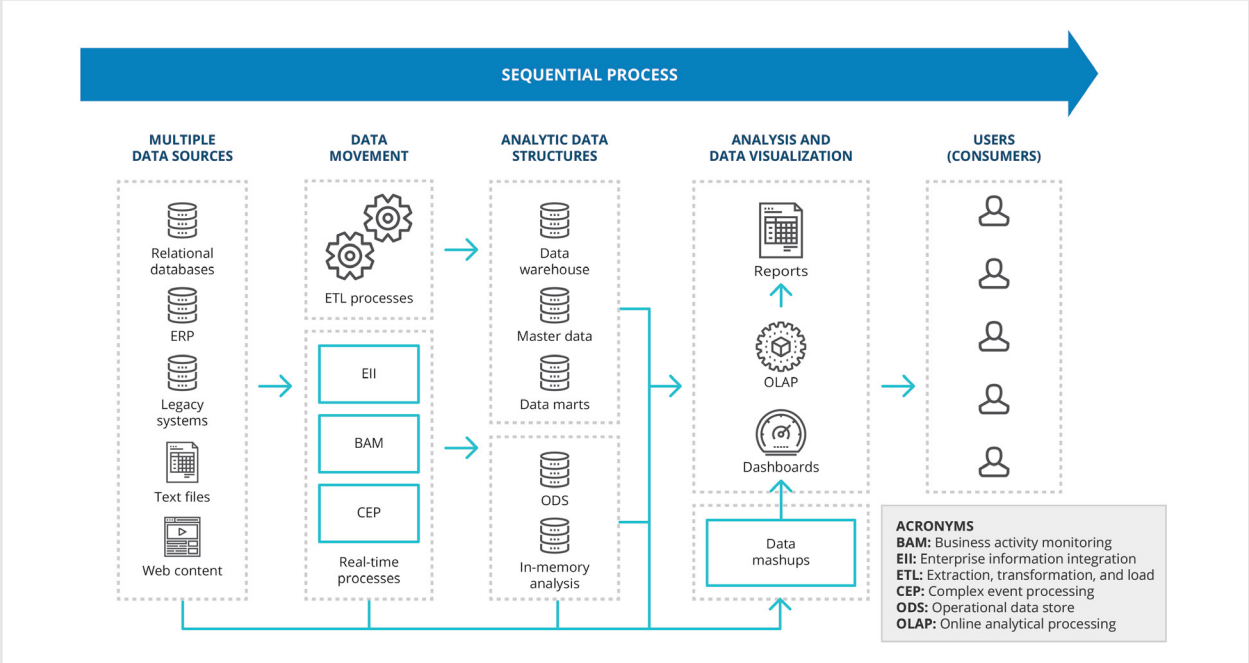


Figure 2. Modern BI and analytics platforms

While these new, modern analytics frameworks most often do not change the basic data collection, processing, and insight-producing cycle itself, they certainly do add many novel components that allow the system to make use of an increasing and diversified number of tools and options at every step of the process.

Moreover, with the increasing reliance on new technologies and methods as well as the constant influx and growth of data that organizations need to grapple with, software providers new and old are now evolving and enriching their BI offerings. They are incorporating their BI solutions into a new, more diverse ecosystem that is not only composed of common BI features but also incorporates other functionality sets, such as business analytics (BA), to greatly extend the reach of BI solutions.

Organizations are now able to use business intelligence and business analytics, as well as many other technologies, within their unified analytics platforms for analyzing information and creating effective, data-based action plans that they can use to gain a competitive advantage.

FUNCTIONALITY: HOW MUCH, HOW WELL?

Today, many solutions offer data analysis capabilities, but they vary in the number and type of sources from which they can receive data, and the size of data they can handle. This complexity can create confusion and conflict in determining the right tool for a specific job, especially as different types of analytics and data solutions keep emerging. We see this with the continual release of improved BI and verticalized analytics offerings, such as for big data analytics, Internet of Things (IoT) analytics, and others.

The sequential BI process falls short of its objective as business models continue to evolve and require faster and more efficient data analysis. New analytics techniques and solutions are now available that have incorporated new statistical and mathematical models into their design. These solutions go beyond reporting, dashboarding, and online analytical processing (OLAP) techniques in order to perform predictive analysis, forecasting, and other advanced analytics functions.

Rather than replacing BI, the role of business analytics solutions appears to be that of enriching existing BI architectural platforms and significantly enhancing existing data analysis software stacks. Business analytics solutions enable the expansion of analysis to larger sets of data, thus encouraging business planning and strategy development and enabling more formal analysis of potential future scenarios, not merely projections based on snapshots of the present (figure 3).

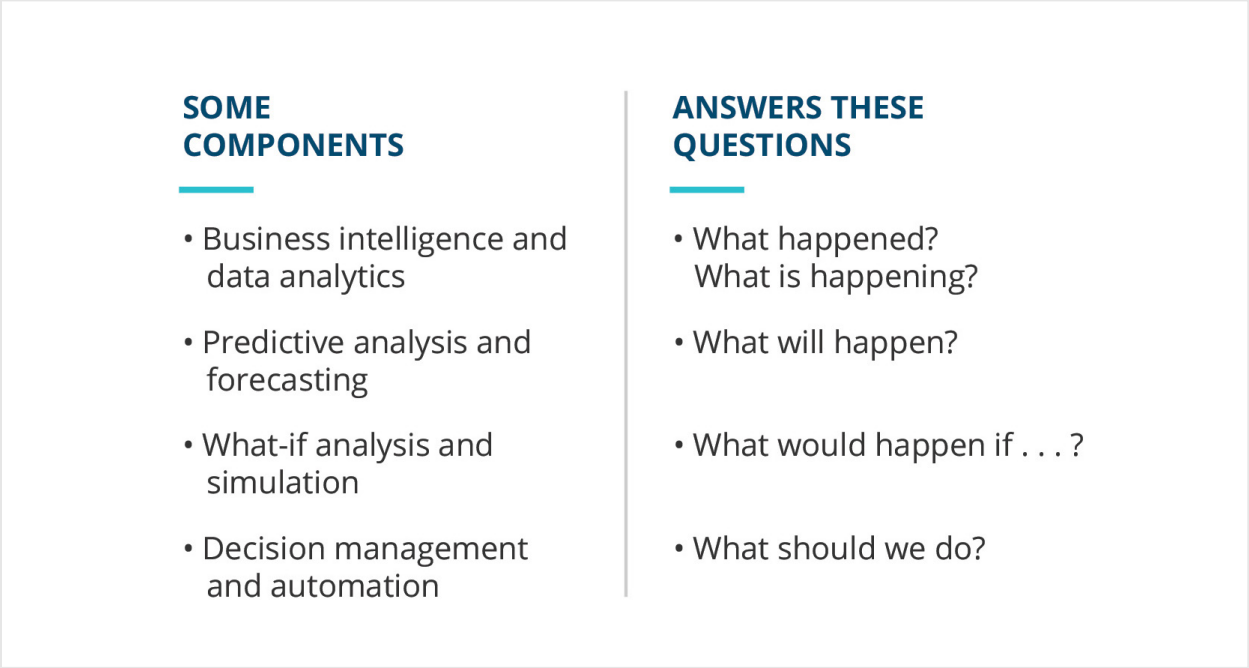


Figure 3. Business analytics—components and purpose

Analytics software solutions can be categorized broadly into four types, according to the business question they can answer (figure 4):

- **Descriptive analytics.** This type of analysis uses historical data to identify patterns, describe trends, and generate reports. It models and interprets past behavior. It answers the question: What happened?
- **Predictive analytics.** This uses present and historical data to predict future scenarios. It answers the question: What will happen?
- **Prescriptive analytics.** This type of analysis aims to provide assistance within the decision-making process by suggesting or determining actions to be taken and their effect on the business. It answers the question: What would happen if . . . ?
- **Augmented and cognitive analytics.** As this is a relatively new term, there is no formal definition as of yet. However, we can establish that augmented analytics refers to a blend of technologies, particularly AI, that aims to enable advanced analysis and insight generation. Cognitive analytics is a term that is often used interchangeably with augmented analytics, and it means the same thing.

Cognitive analytics relates to the broader area of cognitive computing, which aims to use both new software and hardware to emulate the work of humans and moreover work alongside them to extend and enhance human beings' decision-making capabilities.

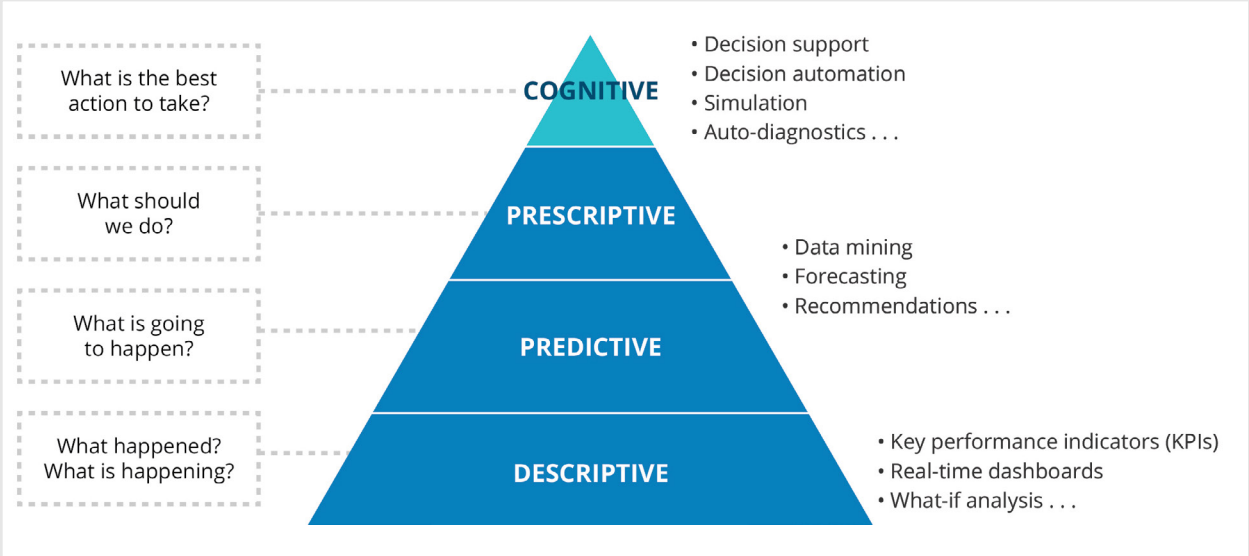


Figure 4. Different types and stages of analytics

As vendor organizations deepen and expand the functional coverage of their BI and analytics offerings, user organizations find increasing use of BI and analytics capabilities in many facets of the business. For the purposes of this report, we cover the core functionality features of BI and analytics offerings that are geared toward addressing the basic analytics needs of an organization (please see Appendix A for the full functionality list criteria):

CORE FUNCTIONALITY	
1	Basic Analysis Functions
2	Self-Service
3	Analysis Services
4	Data Visualization and Discovery
5	Dashboarding, Scorecarding, and Reporting
6	Advanced Analytics
7	Augmented Analytics
8	Security
9	Connectivity, Integration, and Data Sources
10	Social and Collaboration Capabilities
11	Data Management
12	Content Management

USER EXPERIENCE: IT'S ALSO ABOUT ACCEPTANCE

With years of experience conducting enterprise software selection projects, software analysts, consultants, and other experts at TEC have observed that even though functionality is a core criterion for selecting a BI and analytics solution, as well as other business software applications, it is not the only one. Besides functionality, a key aspect of successful enterprise software adoption involves assessing how these solutions are perceived when used and exploited by existing users. This is what is called the user experience (UX).

Within the past 10 or 15 years, evaluating the quality of the software and the user experience has gained increasing importance in all phases of software development. The user experience is measured on a number of criteria, from the quality of the software code to the security features of the software to the usability of the software.

Today, measuring user experience can bring to bear clear benefits to organizations. UX assessment can be seen as one of the criteria for consideration for the selection of a potential solution for the business. It is also one of the factors for measuring or monitoring the real benefit of a particular enterprise software solution or a full platform for an organization. In essence, the easier the solution is to work with, the more it will be used by users to accomplish the intended tasks rather than users finding less-than-efficient workarounds.

So, What Is User Experience or UX?

User experience relates to the emotions and attitudes a user has about the use of a product, system, or service, in this case, a BI and analytics software solution. The definition also includes the practical, experiential, affective, meaningful, and valuable aspects of the individual's interactions with the software system and underlying technology. Simply put, user experience is related to how a user interacts with, and experiences, the BI and analytics software solution and its perceived value.

Although user experience is subjective, it does capture individual perception with respect to a product or system that can vary dynamically or that can be modified over time due to changing usage patterns and circumstances. As such, user experience can certainly help measure and monitor how the use of an enterprise software solution is perceived over time.

Today different methods exist for measuring different facets of the user experience, particularly with respect to software quality, security, management, and services, such as the methods provided by the International Organization for Standardization. However, standards devoted specifically to addressing UX that focus on the usage of enterprise software are scarce.

So, Who's "The User"?

Different types of users can be identified for any type of enterprise software solution. BI and analytics solutions are finding increasing use as a core component within the software stack of many organizations operating in different industries and in different LoBs of a major enterprise. They can involve both "technical" and "nontechnical" users. Technical users are those with experience and expertise in the use of these tools as well as in data management and analysis methods and models, whereas nontechnical users have expertise in other areas of the business but use these tools either for conducting analysis for consumption or for merely consuming what a more technical information worker has already produced.

TEC's approach to defining the user experience considers the perspectives of both the operational user and the occasional user of these solutions, and thus includes the individual's perceptions of the system, such as utility, ease of use, and efficiency.

The criteria for evaluating the user experience of software solutions are listed below (please see Appendix B for the full functionality criteria list for BI and analytics solutions):

USER EXPERIENCE	
1	Technical (functionality, reliability, efficiency, compatibility, maintainability)
2	Usability (user satisfaction/experience)
3	Security
4	Productivity
5	Strategy
6	Service
7	Licensing

CURRENT BI AND ANALYTICS SOLUTIONS IN REVIEW

In this section of the report, we present TEC's evaluation of a number of BI and analytics applications from two main perspectives: functionality and user experience (UX). We begin with the report's main graph, the TEC Insight Graph, followed by a more extensive analysis of the solutions considered within the report. While this is by no means a full-blown software evaluation and study, it certainly presents you with a proper perspective on the BI and analytics software market and some of its most important providers and solutions.

THE TEC INSIGHT GRAPH

The TEC Insight Graph provides a general view of each solution from the two perspectives: functionality and user experience, as well as locating it within one of four dynamic states in the overall market: *reliable*, *competitive*, *strong*, or *dominant*.

- **Functionality**: The location of the circle on the horizontal axis of the graph indicates whether the solution offers niche, core, extended, or full functionality.
- **User Experience**: The circle's location on the vertical axis of the graph indicates whether the solution meets, exceeds, delights, or amazes its users when they are using the solution to perform the required tasks.
- **Market Position**: The location of the circle denotes whether the solution is reliable, competitive, strong, or dominant in the market space, according to the research obtained and analyzed for the creation of this report.
- **Midline Reference**: The dotted reference line in the middle of the graph represents an ideal equilibrium between the provision of functionality and user experience. A solution that is located above the line has more focus, according to our results, on providing a better user experience, while a solution positioned below the line has increased capability for meeting the functionality needs of an organization.

How to Read the TEC Insight Graph

Reading the TEC Insight Graph is relatively simple and straightforward. Each BI and analytics solution is positioned within one of the 4 dynamic states (colored areas): reliable, competitive, strong, or dominant—based on the results of the analysis.

The position of a particular BI and analytics solution within one of these 4 areas depends on its functional capabilities or UX coverage. For example, a particular solution can reach the competitive state by offering core functionality, exceeding user expectations, or both. So, the exact position of a BI and Analytics solution reflects its emphasis on functionality, its effort for providing greater user experience (UX), or ideally both. The closer the solution is to the midline, the more it offers a balance between functionality coverage and user experience.

For more information about the TEC Insight Graph, including its category definitions and source data, please refer to the TEC Insight Methodology and Evaluation Criteria section on page 63 of this report.

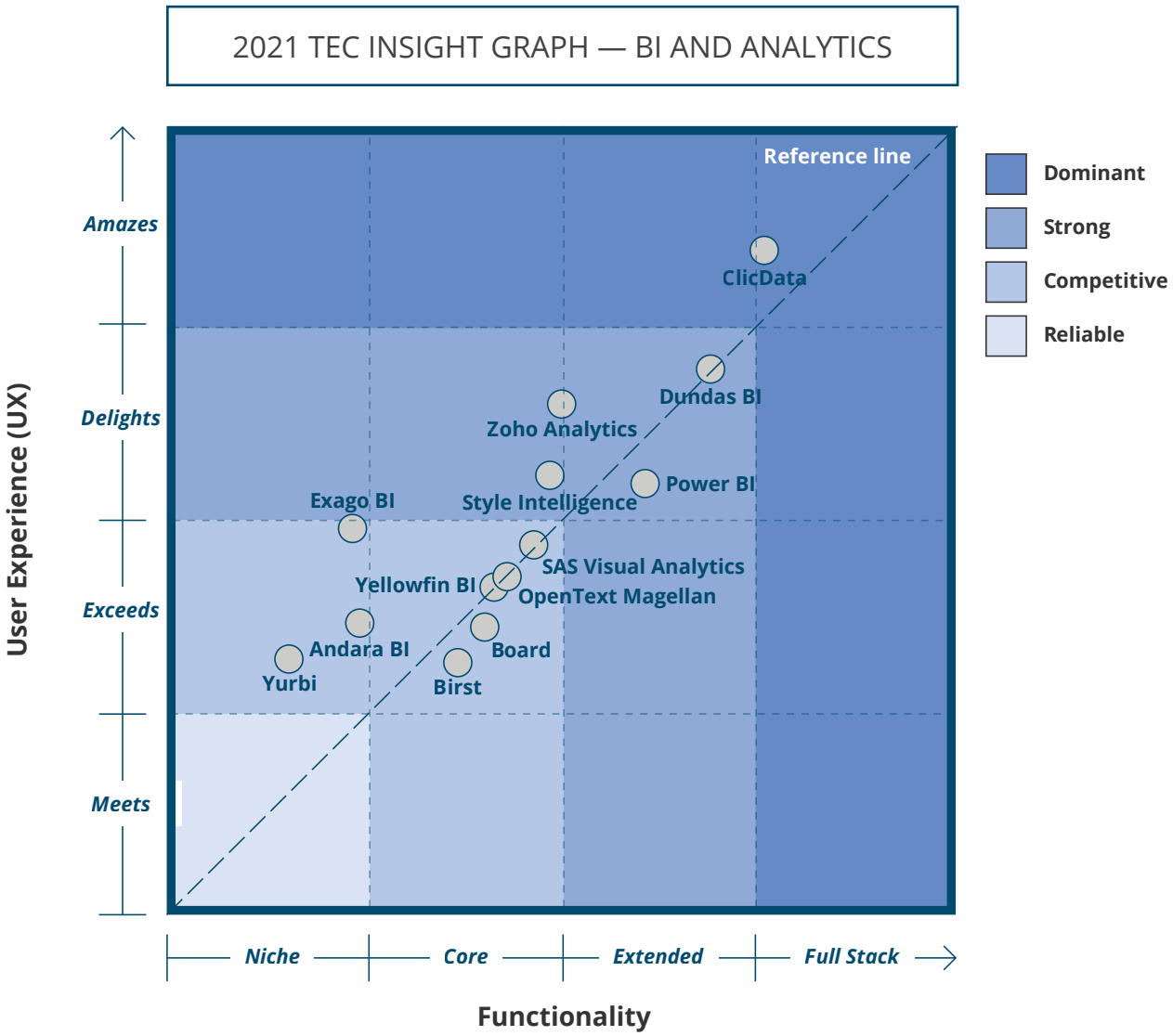


Figure 5. TEC Insight Graph for BI and Analytics Solutions (2021)

DISCUSSION

Some providers in the BI software space aim to design solutions that can provide the maximum level of functionality and UX, while others offer more niche functionality while still aiming to offer increased levels of user experience.

Most vendors offer a relatively balanced perspective. That is, vendors aim to offer a balance between the functionality they offer and the UX they aim to provide for their users. Board, Yellowfin BI, OpenText Magellan, SAS Visual Analytics, Dundas BI, and ClicData are solutions that sit near the functionality-UX reference line. On the other hand, solutions such as Yurbi, Andara BI, and Exago BI focus more on providing niche functionality along with a better UX.

The TEC Insight Graph also indicates how each vendor solution is perceived in general based on this composite measure of functionality and user experience. Each solution can be perceived overall as *reliable, competitive, strong, dominant* in the market.

One vendor takes a stronghold of the dominant zone. ClicData occupies the leading position within the 2021 TEC Insight Graph for BI and Analytics Solutions, by providing an extensive functionality set across the board as well as a high user experience. It is the only vendor solution located within the dominant zone. Dundas BI, Zoho Analytics, Style Intelligence from InetSoft, and Microsoft's Power BI have shown *strong* performance in both functionality and UX, putting these solutions into the higher end of the graph: the strong zone.

GENERAL RANKING ANALYSIS

Figure 6 depicts the general ranking composite score for each vendor's solution. By combining the functionality and UX measures and transforming the results into a scale system from 1 to 100, we arrive at a single score for each solution. This general ranking provides readers with a reference that can be considered alongside the more nuanced TEC Insight findings, to arrive at a complete understanding of the capabilities of each solution, the expected value for the business, and where each solution stands in relation to competitors.

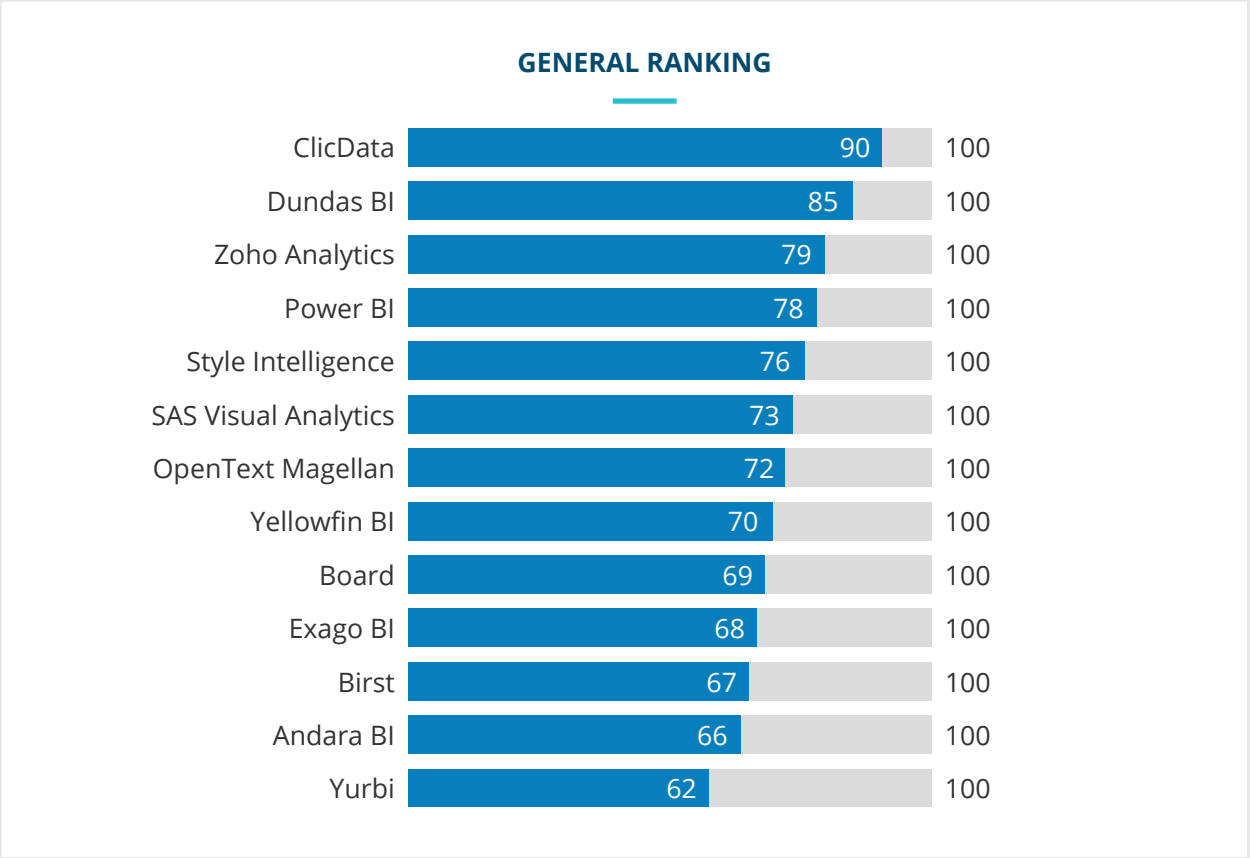


Figure 6. TEC Insight general ranking for BI and analytics solutions

From the general ranking point of view, it is possible to see that ClicData and Dundas BI lead the pack, followed closely by the 3-solution set of Zoho Analytics, MS Power BI, and InetSoft's Style Intelligence.

The third set of solutions (SAS Visual Analytics, Magellan by OpenText, Yellowfin BI, Board, Exago BI, Birst, Andara BI, and Yurbi) are at close distance, all of which rank with at least 60 points out of 100.

The general ranking underscores the closeness among these vendor solutions, showing that all provide solid core and key BI and analytics capabilities. While this makes for a challenging software selection decision from among this set of solutions, it does denote the wide range of possibilities for selecting the right software solution for an organization according to the specific BI and analytics functions needed by the business.

But as always, the devil is in the details. If we break down the overall ranking into each individual component and present the level of coverage for functionality and the level of coverage for UX, we arrive at the table below.

Consistent with the ranking graph, table 1 shows the level of coverage for both functionality and UX for each solution, with the list ordered alphabetically. The table shows ClicData, Dundas BI, MS Power BI, and Zoho Analytics with a strong performance in both areas, with ClicData and Dundas BI leading the pack.

Other solutions such as Exago BI and SAS Visual Analytics are also quite mature and complete BI and analytics arsenals. Board, while also competitive in BI and analytics, presents an attractive combination of BI and enterprise performance management (EPM) functionality sets.

SOLUTION	FUNCTIONALITY	UX	RANKING
Andara BI			
Birst			
Board			
ClicData			
Dundas BI			
Exago BI			
Style Intelligence			
Power BI			
OpenText Magellan			
SAS Visual Analytics			
Yellowfin BI			
Yurbi			
Zoho Analytics			

LEVEL OF SUPPORT OR SATISFACTION				
No Support	Basic	Intermediate	Strong	Full
				

Table 1. Level of support for functionality and UX for each BI and analytics solution

Functionality

Table 2 allows readers to compare—at a glance—the specific functionality features of main offerings on the market.

The table shows that among the group of contenders, Board, ClicData, and SAS Visual Analytics showed very strong coverage. This is particularly true regarding self-service, and data visualization and discovery capabilities. Of note, advanced analytics and augmented analytics are areas to be developed or incorporated into BI and analytics solutions by many vendors, but here SAS Visual Analytics clearly stands out above the rest.

	FUNCTIONALITY	Andara BI	Birst	Board	ClicData	Dundas BI	Exago BI	Style Intelligence	Power BI	OpenText Magellan	SAS Visual Analytics	Yellowfin BI	Yurbi	Zoho Analytics
1	Basic Analysis Functions	◕	◕	●	●	●	●	●	●	◕	●	●	◕	●
2	Self-Service	◕	◕	●	●	●	◕	●	●	◕	●	◕	◕	●
3	Analysis Services	◕	◕	●	●	●	◕	●	●	◕	●	◕	◕	◕
4	Data Visualization and Discovery	◕	◕	◕	●	●	◕	◕	●	◕	●	◕	◕	●
5	Dashboarding, Scorecarding, and Reporting	◕	◕	◕	●	●	◕	●	●	◕	●	◕	◕	●
6	Advanced Analytics	◑	◕	◕	●	◕	◕	◕	◕	◕	◕	◕	◑	◕
7	Augmented Analytics	◕	◕	◕	◕	◕	◕	◑	◕	◑	●	◕	◑	◕
8	Security	◕	◕	●	●	●	◕	●	●	◕	●	◕	◕	●
9	Connectivity, Integration, and Data Sources	◕	◕	◕	●	●	◕	◕	●	◕	◕	◕	◑	◕
10	Social and Collaboration Capabilities	◕	◕	◕	●	●	◕	◕	◕	◕	●	◕	◕	◕
11	Data Management	◕	◕	◕	●	●	◕	◕	●	◕	◕	◕	◑	◕
12	Content Management	◕	◕	◕	●	●	◑	◕	◕	◕	◕	◕	◑	◕
	Average	69	73	77	89	85	70	77	81	68	82	77	62	76

LEVEL OF SUPPORT OR SATISFACTION				
No Support	Basic	Intermediate	Strong	Full
○	◔	◑	◕	●

Table 2. Level of support for functionality for each BI and analytics solution

User Experience (UX)

Table 3 provides a more detailed view of each solution's UX satisfaction level, covering different aspects or perspectives of UX, from users' appreciation for technical capabilities, usability, and security to the way users perceive advantages from the solution's licensing options.

From a UX perspective, we can see that ClicData, Dundas BI, and Zoho Analytics show a full level of support across all aspects of user experience examined in this survey, from technical to licensing. SAS Visual Analytics and others such as OpenText Magellan, InetSoft's Style Intelligence, and Exago BI are also regarded highly by users and the community with respect to the features of productivity and service.

	UX	Andara BI	Birst	Board	ClicData	Dundas BI	Exago BI	Style Intelligence	Power BI	OpenText Magellan	SAS Visual Analytics	Yellowfin BI	Yurbi	Zoho Analytics
1	Technical	◕	◕	◕	●	●	●	◕	◕	◕	◕	◕	◕	●
2	Usability	◕	◕	◕	●	●	◕	◕	◕	●	◕	◕	◕	●
3	Security	◕	◕	◕	●	●	●	●	●	●	●	◕	◕	●
4	Productivity	◕	◕	◕	●	●	●	●	◕	●	◕	◕	◕	●
5	Strategy	◕	◕	◕	●	●	●	●	●	◕	●	◕	◑	●
6	Service	◕	◕	◕	●	●	●	◕	◕	●	●	◕	◕	●
7	Licensing	◕	◕	◕	●	●	◕	●	◕	◕	●	◕	◕	●
	Average	75	69	73	92	83	81	79	77	81	80	74	70	83

LEVEL OF SUPPORT OR SATISFACTION				
No Support	Basic	Intermediate	Strong	Full
○	◔	◑	◕	●

Table 3. Level of support for UX for each BI and analytics solution

BI AND ANALYTICS SOLUTIONS: SELECTING THE RIGHT OPTION

Today, organizations of all sizes can deploy and use BI and analytics solutions to carry out analytics at a reduced cost and over large and complex data sets. But the evaluation of enterprise software solutions requires a balancing act between business needs and user needs or preferences in process execution. The former is a question of functionality fit between the software solution and the organization's business processes and strategic goals, while the latter is concerned with user experience criteria. Both sides of this equation are essential considerations.

Companies are eager to consume information, but they recognize that they have to make sense of it in order to gain value and increase their profit margins, as well as to increase the quality of their products and services and boost the customer experience. It can't be overstated that a BI and analytics solution is one important aspect of a complete data lifecycle strategy, from data collection and analysis to data visual representation, culminating in extended capabilities for effective business decision-making.

Below are a few basic factors to consider when selecting a provider/solution:

- **Identify your needs.** Before exploring solutions and vendors, take the time to evaluate the type of information that you require—and then determine the technology that can provide it for you. You need to first understand your data problem to be able to find a system to help you solve it.

- **Calculate the challenges and opportunities buried within your data.** Determine the most important problem in terms of the management and analysis of the vast amount of data available to you, and focus on it. Subsequently, look for those solutions that can provide the support you need to solve your issues or needs.

- **Develop a plan.** Make sure your big data initiative aligns with your corporate goals. The benefits and risks must be clear.

Once you are in the process of evaluating a list of BI and analytics solutions, keep the following features in mind:

- Ease of deployment and use of the software to reduce efforts and costs
- Self-service and user-centric approaches to enable the business to take ownership of data analysis and leverage these efforts on their own
- Industry and LoB verticalization to provide specific functionality for user groups—hastening and increasing the ROI
- Incorporation of new technologies into the vendor's BI product stack—enabling high consumerization of these types of tools

Finally, any enterprise software selection endeavor should include the following key steps:

- Definition of goals for a BI and analytics platform
- Analysis of key functional requirements for the business
- Analysis of functional and UX features of solutions available on the market
- Evaluation of solutions in a shortlist including demos and proof-of-concept studies
- Analysis of other services and technical criteria such as security, support, and licensing options

With these considerations in mind, the TEC Insight Graph and related tables, as well as additional TEC research resources, can be used to arrive at a good good starting point for your BI and analytics software evaluation and selection endeavor. As always, TEC's team of experts is available to help, from high-level consultation to in-depth project management.

CONCLUSION

More than ever, organizations know that to add value to the wealth of information they have at their disposal regarding all aspects of their business—activities and processes, their employees, and even their customers and prospects—they need to rely on a BI and analytics system that best fits their business needs.

With the abundance of data, many organizations find themselves immersed in a world of data overload. Specific BI and analytics solutions help organizations make sense of all this data and use it to achieve profitability and growth. When combined with data science, BI and analytics solutions allow companies to improve their data analysis capabilities and answer various types of questions, resulting in not only an increase in data usage but also sharper insights for better decision management. Software vendors have tapped into these needs and goals and continue to develop different types of business intelligence and business analytics software solutions, with no end in sight to the innovation.

The TEC Insight Report and the TEC Insight Graph show that the current state of maturity of BI and analytics technologies allows not only the coexistence but also the integration of many other applications from various providers. With the increasing adoption of new features for collaboration embedded within third-party systems, new BI and analytics solutions are increasingly assuming a more central position within an organization's enterprise software stack.

This study, and especially the TEC Insight Graph, also shows how solutions such as Dundas BI, Microsoft's Power BI, SAS Visual Analytics, and Board are offered by vendors who clearly have a grip on this software area and provide the needed functionality with a satisfactory user experience.

Innovative solutions such as Birst, InetSoft's Style Intelligence, Yellowfin BI, and OpenText Magellan take advantage of the cloud and software innovations such as AI, mobility, and automation to provide effective BI capabilities.

Others such as Yurbi and Andara BI, with a more lean approach, address specific pieces of the BI puzzle. These offerings cater to core BI activities such as reporting, dashboarding, and visualization in an easy and effective manner for small-to-midsize companies.

TEC's research also indicates that the new wave of BI and analytics applications will assume an increasingly important role in boosting the pervasiveness of business intelligence across the enterprise milieu and the horizontal adoption of these systems across lines of business within organizations.

Thus, it is likely that these solutions will soon be technologically transparent and completely assimilated within other enterprise business software solutions—enabling users to have access to them and a seamless, easier, faster, and more efficient method for analyzing data for insight generation and ultimately improved decision-making.

VENDOR/SOLUTION PROFILES

5000FISH, INC

Company/Product Information

Product Name	Yurbi	**Version (if applicable)**	11	**Headquarters Location**	United States
Product Description					
Yurbi is an enterprise business intelligence platform that allows organizations to access, integrate, and deliver data from multiple systems securely to users who need it in real time, without requiring programming or database expertise.					
Regional Presence	North America				✔
	Central America and South America				✔
	Asia-Pacific				✔
	Europe, Middle East, and Africa (EMEA)				✔

Delivery Mode	SaaS (multitenant/virtual)	✔
	PaaS (hosted via a public cloud provider)	
	Amazon Web Services (AWS)	-
	Google Cloud Platform	-
	IBM Cloud	-
	Oracle Cloud	-
	Red Hat OpenShift	-
	Rackspace	-
	Salesforce AppExchange	-
	Microsoft Azure	✔
	Other (please specify below)	-
	On premises	
	Windows	✔
	Linux	-

Delivery Mode	*Apple iOS*	-
	Solaris	-
	Other (please specify below)	-

Mobile Access	Apple iOS	✔
	Android	✔
	Windows	✔
	Other (please specify below)	-

Licensing Option	Proprietary license	✔
	GNU General Public License	-
	End User License Agreement (EULA)	-
	Specific use license	✔
	Workstation license	-
	Concurrent use license	✔
	Site license	-
	Perpetual license	✔
	Non-perpetual license	✔
	Subscription	✔
	Other (please specify below)	-

YURBI

TEC Insight Graph Position: **Competitive**

- Functionality: **Niche**
- UX: **Exceeds**

KEY FEATURES

- Embedded BI
- Dashboards, scorecards, and reporting
- Interactive visualization
- Security
- Self-service BI

KEY ADVANTAGES

Part of a new generation of BI and analytics solutions, Yurbi by 5000fish was born with the word "agile" in mind. The solution appears to be well designed for companies, whether they are dealing with small or large amounts of data. Its flexible licensing model allows Yurbi to adapt to different licensing scenarios and needs.

On the functional side, Yurbi offers a stable set of core BI capabilities for basic and self-service BI and analytics functions, including reporting and dashboarding, visual data drill downs and filtering, and easy navigation and connection with data sources, along with storytelling and guided discovery features.

Yurbi, as conveyed by 5000fish, aims to be transparent and honest with pricing so that there are no hidden costs and surprises, enabling potential customers to accurately perform a price vs. budget analysis.

Companies, especially those with specific but flexible and complete BI and analytics needs, as well as those with small and non-technical teams, might want to consider Yurbi as one of their key BI and analytics selection options.

KEY CHALLENGES

When several vendors are already heading to the cloud, 5000fish maintains Yurbi as an on-premises option with hosting capabilities on Azure. Yurbi by 5000fish might not be the right solution for those companies looking for cloud options, especially SaaS.

Due to its approach to providing BI and analytics services in (near) real time, Yurbi will need to be combined with and is dependent on an underlying existing data management platform or framework for more complex BI and analytics scenarios.

ANDARA

Company/Product Information

Product Name	Andara BI	**Version (if applicable)**	N/A	**Headquarters Location**	United States
Product Description					
Andara BI balanced scorecard is suited for every company, agency, and government. The BI product is available in both English and Spanish on an integrated web and mobile app platform.					
Regional Presence	North America				✔
	Central America and South America				✔
	Asia-Pacific				✔
	Europe, Middle East, and Africa (EMEA)				✔

Delivery Mode	SaaS (multitenant/virtual)	✔
	PaaS (hosted via a public cloud provider)	
	Amazon Web Services (AWS)	-
	Google Cloud Platform	-
	IBM Cloud	-
	Oracle Cloud	-
	Red Hat OpenShift	-
	Rackspace	-
	Salesforce AppExchange	-
	Microsoft Azure	-
	Other (please specify below)	-
	On premises	
	Windows	-
	Linux	-
	Apple iOS	-
	Solaris	-
	Other (please specify below)	-

Mobile Access	Apple iOS	✔
	Android	✔
	Windows	-
	Other (please specify below)	-

Licensing Option	Proprietary license	-
	GNU General Public License	-
	End User License Agreement (EULA)	✔
	Specific use license	-
	Workstation license *(Only for Magellan Analytics Designer)*	-
	Concurrent use license	-
	Site license	-
	Perpetual license	-
	Non-perpetual license	-
	Subscription	-
	Other (please specify below)	-

ANDARA BI

TEC Insight Graph Position: **Competitive**

- Functionality: **Niche**
- UX: **Exceeds**

KEY FEATURES

- Data visualization and discovery
- Self-service BI
- Sharing and collaboration
- Analysis services
- Embedded BI

KEY ADVANTAGES

Andara BI presents users with an appealing offering for analytics and balanced scorecard functionality, especially for users under the small to midsize business (SMB) realm. Focused functionality and an attractive pricing model based on being in the cloud give Andara BI a nice combination of features for users and organizations that do not have the technical, budgetary, and more importantly, the need for larger BI and analytics deployments.

Andara BI includes the necessary functionality for SMB organizations, including balanced scorecards, interactive visualizations, as well as visual drilldown/-up/-across functionality, making it a neat offering for a specific business type of user to take advantage of the solution's ability to combine data visualization and balanced scorecard functionality.

KEY CHALLENGES

From a business point of view, as with all new and small cloud software providers, one key challenge is and will be to compete and thrive among the bigger, tougher, and more well-known software providers in the market. The company needs to overcome this challenge, so that users can identify and recognize the benefits and capabilities of Andara BI.

From a functional point of view, the Andara BI niche-functionality approach brings forth both opportunities and challenges for users who need to clearly identify the capabilities and potential of Andara BI and, in some cases, make Andara BI part of a bigger BI and analytics stack if they deem more capabilities to be necessary.

BOARD INTERNATIONAL

Company/Product Information

Product Name	Board	**Version (if applicable)**	11.2	**Headquarters Location**	Switzerland; United States
Product Description					
Board is a decision-making platform that unifies analytics, simulation, planning, and predictive and data modeling capabilities in a single environment.					
Regional Presence	North America				✔
	Central America and South America				✔
	Asia-Pacific				✔
	Europe, Middle East, and Africa (EMEA)				✔

Delivery Mode	SaaS (multitenant/virtual)	✔
	PaaS (hosted via a public cloud provider)	
	Amazon Web Services (AWS)	✔
	Google Cloud Platform	✔
	IBM Cloud	✔
	Oracle Cloud	✔
	Red Hat OpenShift	✔
	Rackspace	✔
	Salesforce AppExchange	✔
	Microsoft Azure	✔
	Other (please specify below)	-
	On premises	
	Windows	✔
	Linux	-
	Apple iOS	✔
	Solaris	-
	Other (please specify below)	-

Mobile Access	Apple iOS	✔
	Android	✔
	Windows	✔
	Other (please specify below)	-

Licensing Option	Proprietary license	✔
	GNU General Public License	-
	End User License Agreement (EULA)	✔
	Specific use license	✔
	Workstation license	-
	Concurrent use license	-
	Site license	✔
	Perpetual license	-
	Non-perpetual license	✔
	Subscription	✔
	Other (please specify below)	-

BOARD

TEC Insight Graph Position: **Competitive**

- Functionality: **Core**
- UX: **Exceeds**

KEY FEATURES

- BI, analytics, and EPM combo functionality
- OLAP-like services
- Interactive visualization
- What-if analysis and simulation
- Dashboards, scorecards, and reporting

KEY ADVANTAGES

A unique feature of Board International is its ability to develop a solution that has combined business intelligence (BI) and enterprise performance management (EPM) functionality within a single solution.

In addition to offering solid BI functional features, such as basic and advanced analytics, reporting, and dashboarding, Board includes planning and budgeting and writeback capabilities into the mix.

Solid security features and a neat web-based interface give Board a stable and secure environment to work with for both medium and large organizations that require stable BI and analytics software deployments.

KEY CHALLENGES

As Board International is getting more and more traction on the enterprise market, it faces new challenges, particularly as it enters a competitive landscape against the historically big players in the software market of BI and analytics for large corporations. Board needs to ensure that it has not only the technical capability but also the necessary support infrastructure to attend to these large organizations. It also needs to keep reinforcing capabilities for collaboration and advanced integration with third-party systems.

CLICDATA

Company/Product Information

Product Name	ClicData	**Version (if applicable)**	i4	**Headquarters Location**	Lille, France

Product Description

The ClicData platform is a comprehensive business intelligence suite with native connectors to hundreds of applications and databases, a built-in data warehouse, ETL features, and a data visualization engine.

It's 100% cloud based and allows users to clone their data into ClicData's data warehouse to prep it for their reporting needs.

Users can do advanced data processing within ClicData: cleansing, normalizations, merges, joints, fusions, add calculated columns, etc. They can also automate their data refresh schedules and alerts in order to make faster decisions. ClicData also comes with publication features (reports by emails, exports to several formats, dynamic links, and embeddable dashboards) as well as advanced security features to protect customers' data.

Regional Presence	North America	✔
	Central America and South America	✔
	Asia-Pacific	-
	Europe, Middle East, and Africa (EMEA)	✔

Delivery Mode	SaaS (multitenant/virtual)	✔
	PaaS (hosted via a public cloud provider)	
	Amazon Web Services (AWS)	-
	Google Cloud Platform	-
	IBM Cloud	-
	Oracle Cloud	-
	Red Hat OpenShift	-
	Rackspace	-
	Salesforce AppExchange	-
	Microsoft Azure	-
	Other (please specify below)	-

Delivery Mode	On premises	
	Windows	-
	Linux	-
	Apple iOS	-
	Solaris	-
	Other (please specify below)	-

Mobile Access	Apple iOS	✔
	Android	✔
	Windows	-
	Other (please specify below)	-

Licensing Option	Proprietary license	✔
	GNU General Public License	-
	End User License Agreement (EULA)	-
	Specific use license	-
	Workstation license	-
	Concurrent use license	-
	Site license	-
	Perpetual license	-
	Non-perpetual license	-
	Subscription	✔
	Other (please specify below)	-

CLICDATA

TEC Insight Graph Position: **Dominant**

- Functionality: **Full Stack**
- UX: **Amazes**

KEY FEATURES

- Connectivity, integration, and data sources
- Dashboarding, scorecarding, and reporting
- Data integration, transformation, and movement
- Security
- Social and collaboration capabilities

KEY ADVANTAGES

ClicData offers an innovative BI solution in the cloud. The flexibility of the solution for both simple and more complex analytics processes enables users to perform a different set of actions for achieving personalized dashboards and analytics.

A fair number of native connectors enable fast connectivity with data sources. As these connectors are built and tested in-house, they reliably and consistently operate with the solution to collect data from different sources, such as social media platforms, cloud storage applications, CRM or accounting systems, and database sources.

With its built-in data warehouse, ClicData addresses organizations' data management needs for data persistency, movement, and integration, making for a complete BI setup that permits or performs all data management operations—from data collection to analytics and data visualization.

KEY CHALLENGES

One of the challenges that companies face today is the need to grow organically in order to face off the fierce competition. Competing with traditional software giants and heavily investor–baked BI and analytics companies makes it difficult for ClicData and other small vendors to thrive through their offerings. ClicData needs to be able to position themselves as a full BI and analytics solution, rather than a niche solution, for the user community to be able to realize the offering's true potential.

From a product functionality perspective, ClicData offers support for advanced analytics via a third party, yet it lacks support for some capabilities, including stream and sentiment analysis, which might make it difficult for those companies in strong need for advanced analytics services to choose ClicData from among other BI and analytics offerings.

DUNDAS DATA VISUALIZATION

Company/Product Information

Product Name	Dundas BI	**Version (if applicable)**	8	**Headquarters Location**	Canada

Product Description

Dundas BI is an end-to-end, modern BI platform for dashboarding, reporting, and analytics that empowers everyone to visualize and analyze any type of data to make real-time, data-driven decisions that produce results. With limitless customization, Dundas BI allows any user to tailor the software to meet any design requirement. The software has an unprecedented level of flexibility—allowing users to connect to any data source, work with data in real time, warehouse the data, or store the data in the system's in-memory engine.

It is an open, fully programmable BI platform that was designed to be embedded into and to easily work with existing programs, systems, and administration an organization has in place. Dundas Data Visualization is a global leader in innovative analytics and smart, interactive visualizations gained through 25+ years of experience.

Regional Presence	North America	✔
	Central America and South America	✔
	Asia-Pacific	✔
	Europe, Middle East, and Africa (EMEA)	✔

Delivery Mode	SaaS (multitenant/virtual)	✔
	PaaS (hosted via a public cloud provider)	
	Amazon Web Services (AWS)	✔
	Google Cloud Platform	✔
	IBM Cloud	✔
	Oracle Cloud	✔
	Red Hat OpenShift	✔
	Rackspace	✔
	Salesforce AppExchange	-
	Microsoft Azure	✔
	Other (please specify below)	-

Delivery Mode	On premises	
	Windows	✔
	Linux	✔
	Apple iOS	-
	Solaris	-
	Other (please specify below)	-

Mobile Access	Apple iOS	✔
	Android	✔
	Windows	✔
	Other (please specify below)	-

Licensing Option	Proprietary license	✔
	GNU General Public License	-
	End User License Agreement (EULA)	✔
	Specific use license	✔
	Workstation license	✔
	Concurrent use license	✔
	Site license	✔
	Perpetual license	-
	Non-perpetual license	✔
	Subscription	✔
	Other (please specify below)	-

DUNDAS BI

TEC Insight Graph Position: **Strong**

- Functionality: **Extended**
- UX: **Delights**

KEY FEATURES

- Embedded BI
- Self-service BI
- Analysis services
- Dashboards, scorecards, and reporting
- Security

KEY ADVANTAGES

With more than 25 years of experience that includes selling and providing data visualization technology for one of the largest software companies in the world, Dundas Data Visualization has been continuously innovating in the BI and analytics arena. Some key aspects of Dundas BI include:

- Its wide platform availability allows the solution to be deployed under several cloud and on-premise settings—Windows, Linux, AWS, and Azure, among others.
- A flexible set of options for licensing enable users and organizations to deploy Dundas BI under different licensing models.
- A robust set of features enable users to extend the capabilities offered by Dundas BI outside-the-box.

Dundas BI offers a robust BI solution, which is particularly useful for growing midsize companies that need the combination of simplicity and extensibility.

KEY CHALLENGES

While Dundas BI is a robust solution that can address the extended BI and analytics needs of an organization, it provides only basic functionality for data preparation. Therefore, organizations that need to deal with unstructured data natively might find themselves needing to do a fair bit of extra work to format the data in a tabular-like structure in order to enable Dundas BI to work.other BI and analytics offerings.

EXAGO, INC.

Company/Product Information

Product Name	Exago BI	**Version (if applicable)**	2019.2	**Headquarters Location**	United States

Product Description

Exago BI is a 100% web-based, seamlessly embedded, no plugins required, white-labeled solution for software companies looking to provide ad hoc reporting, dashboards, and analytics to their internal and external customers.

The full-featured BI solution tightly integrates with a web-based SaaS or on-premise application and allows non-technical users to easily create reports pixel-perfect and interactive dashboards without help from IT.

Regional Presence	North America	✔
	Central America and South America	✔
	Asia-Pacific	✔
	Europe, Middle East, and Africa (EMEA)	✔

Delivery Mode	SaaS (multitenant/virtual)	✔
	PaaS (hosted via a public cloud provider)	
	Amazon Web Services (AWS)	✔
	Google Cloud Platform	-
	IBM Cloud	-
	Oracle Cloud	-
	Red Hat OpenShift	-
	Rackspace	-
	Salesforce AppExchange	-
	Microsoft Azure	✔
	Other (Exago BI can run on any Linux-based cloud provider.)	✔

Delivery Mode	On premises	
	Windows	✔
	Linux	✔
	Apple iOS	-
	Solaris	-
	Other (Any mobile browser that supports HTML5)	✔

Mobile Access	Apple iOS	✔
	Android	✔
	Windows	✔
	Other (please specify below)	-

Licensing Option	Proprietary license	-
	GNU General Public License	-
	End User License Agreement (EULA)	-
	Specific use license	-
	Workstation license	-
	Concurrent use license	-
	Site license	-
	Perpetual license	-
	Non-perpetual license	-
	Subscription	✔
	Other *(Annual per application pricing with unlimited everything)*	✔

EXAGO BI

TEC Insight Graph Position: **Competitive**

- Functionality: **Niche**
- UX: **Exceeds**

KEY FEATURES

- Embedded BI
- Dashboards, scorecards, and reporting
- Security

KEY ADVANTAGES

Without a doubt, Exago's BI and analytics proposal with its BI and analytics offering is attention-grabbing. With a cut-to-the-chase approach, Exago keeps BI and analytics at the core of its solution, offering effective and powerful reporting and dashboarding capabilities without the bells and whistles.

Users can rely on having a solution that offers solid features for providing essential BI and analytics services, from reporting to dashboarding and data visualization, all with an important embedding feature component, enabling these tools to neatly coexist with many third-party components of an enterprise software business platform.

Focused functionality and embedding capabilities enable Exago to offer an effective BI and analytics solution for a wide spectrum of users and organizations.

KEY CHALLENGES

While Exago's direct and simple approach to BI and analytics can be an asset for many organizations, the solution does not offer support for advanced analysis services such as predictive analytics and forecasting. Those companies requiring these types of services will need to look and have another solution in place to gain these more complex capabilities.

INETSOFT TECHNOLOGY

Company/Product Information

Product Name	Style Intelligence	**Version (if applicable)**	2018	**Headquarters Location**	United States

Product Description

InetSoft is a BI platform for dashboarding, reporting, and analytics with built-in support for machine learning.

InetSoft's data intelligence unites business intelligence and machine learning to extract maximum value from an organization's data. InetSoft's solution is foremost a BI app powered by highly flexible data mashup technology. With integrated machine learning capability, data mashup further enables human-designed dashboards and reports to be mashed up with machine-generated intelligence.

Regional Presence	North America	✔
	Central America and South America	-
	Asia-Pacific	✔
	Europe, Middle East, and Africa (EMEA)	-

Delivery Mode	SaaS (multitenant/virtual)	✔
	PaaS (hosted via a public cloud provider)	
	Amazon Web Services (AWS)	✔
	Google Cloud Platform	-
	IBM Cloud	-
	Oracle Cloud	-
	Red Hat OpenShift	-
	Rackspace	-
	Salesforce AppExchange	-
	Microsoft Azure	-
	Other (please specify below)	-

Delivery Mode	On premises	
	Windows	✔
	Linux	✔
	Apple iOS	✔
	Solaris	✔
	Other (please specify below)	-

Mobile Access	Apple iOS	✔
	Android	✔
	Windows	✔
	Other (please specify below)	-

Licensing Option	Proprietary license	✔
	GNU General Public License	-
	End User License Agreement (EULA)	✔
	Specific use license	-
	Workstation license	-
	Concurrent use license	✔
	Site license	✔
	Perpetual license	✔
	Non-perpetual license	-
	Subscription	✔
	Other (please specify below)	-

STYLE INTELLIGENCE

TEC Insight Graph Position: **Strong**

- Functionality: **Core**
- UX: **Delights**

KEY FEATURES

- Big data integration
- Dashboards, scorecards, and reporting
- Data mashups
- Security
- Self-service BI

KEY ADVANTAGES

Open for business since 1996, InetSoft is not new to the BI and analytics space. The company has grown organically to more than 5,000 customers, and it has received a good customer ranking.

Its Style Intelligence solution has evolved to be a reliable and robust BI application designed for providing rapid drag-and-drop BI solution design functionality as well as data transformations and mashups.

Along the growth trajectory, the company has been careful and keen to hear from its customers around those features they need the most, enabling it to incorporate those features that their customers need.

Style Intelligence's flexible licensing model allows the solution to adapt to many customer settings and configurations. It also allows for promoting and enabling easy integration with third-party enterprise software.

InetSoft Style Intelligence could prove to be a strong solution for those organizations that need easy and rapid data integration and mashup as well as the availability of advanced analytics such as machine learning.

KEY CHALLENGES

While InetSoft's coverage includes the huge markets North America and Asia-Pacific, it lacks a presence in Europe, the Middle East, and Africa (EMEA). The emerging markets of Central America and South America could be challenging to penetrate, especially in those companies looking to deploy central BI strategies that include support for those regions.

On the functional side, InetSoft has been careful to deploy those functional features most users care about, yet its lack of features for story telling and guided discovery might make it challenging for InetSoft to serve those customers looking for innovative ways to explore and deliver information.

INFOR

Company/Product Information

Product Name	Birst	**Version (if applicable)**	7.2	**Headquarters Location**	United States

Product Description

Birst is a market leader in next-generation BI and analytics, offering automation for the entire BI process—ETL/data preparation, operational reporting, visual data discovery, interactive dashboards, mobile access, advanced analytics, and AI-driven insights.

Birst's unique networked BI approach connects every type of user to a shared analytical fabric that is easily accessed and extended in a self-service manner, while still maintaining a common or governed set of KPIs. Birst delivers all of this, and much more, with the low total cost of ownership (TCO) via public or private cloud configurations.

Regional Presence	North America	✔
	Central America and South America	✔
	Asia-Pacific	✔
	Europe, Middle East, and Africa (EMEA)	✔

Delivery Mode	SaaS (multitenant/virtual)	✔
	PaaS (hosted via a public cloud provider)	
	Amazon Web Services (AWS)	✔
	Google Cloud Platform	✔
	IBM Cloud	✔
	Oracle Cloud	✔
	Red Hat OpenShift	✔
	Rackspace	✔
	Salesforce AppExchange	-
	Microsoft Azure	✔
	Other (please specify below)	✔

Delivery Mode	On premises	
	Windows	✔
	Linux	✔
	Apple iOS	-
	Solaris	-
	Other (please specify below)	-

Mobile Access	Apple iOS	✔
	Android	✔
	Windows	-
	Other (please specify below)	✔

Licensing Option	Proprietary license	-
	GNU General Public License	-
	End User License Agreement (EULA)	✔
	Specific use license	✔
	Workstation license	-
	Concurrent use license	-
	Site license	✔
	Perpetual license	✔
	Non-perpetual license	-
	Subscription	✔
	Other (please specify below)	-

BIRST

TEC Insight Graph Position: **Competitive**

- Functionality: **Core**
- UX: **Exceeds**

KEY FEATURES

- Automatic data refinement (ADR)
- Networked BI
- Smart analytics
- Embedded BI
- OLAP and SQL data services

KEY ADVANTAGES

Birst was acquired not long ago by Infor, one of the top enterprise software providers in the world. The cloud-based BI and analytics solution had already built a name for itself, and the acquisition just acts to strengthen the product, enabling the vendor to offer a core enterprise BI solution.

For Infor, adding Birst to its portfolio gives the company reliance on having a solid and robust BI solution to complete its enterprise software offering. For Birst, the merger or acquisition enables the company to enter larger markets and prove its value in both small and large deployments.

Birst offers a reliable enterprise BI solution born natively in the cloud, with a functional set of capabilities that range from reporting and dashboarding to capabilities including ETL, data warehousing, operational reporting, interactive dashboards, data discovery, and advanced analytics.

KEY CHALLENGES

From a product point of view and from being considered a big player in the market, both independently and now alongside Infor, Birst may be expected to engage with larger prospects and more complex BI and analytics deployments as well as to confront the increasing competition from the rest of the large and influential BI and analytics software providers in the market, making it increasingly challenging for Birst to compete with longstanding and big players.

On the functional side, while it would be difficult to consider challenges of lack of functionality due to Birst's full-fledged BI and analytics approach, by taking information from users both internal and external to the organization, a point of agreement is the learning curve, which might make it more difficult for non-technical users to take better advantage of the solution, especially for more complex data handling and presentation projects.

MICROSOFT

Company/Product Information

Product Name	Power BI	**Version (if applicable)**	NA	**Headquarters Location**	United States
Product Description					
Power BI is a business analytics solution that lets you visualize your data and share insights across the organization or embed them in an app or website. Connect to hundreds of data sources and bring data to life with live, interactive dashboards and reports.					
Regional Presence	North America				✔
	Central America and South America				✔
	Asia-Pacific				✔
	Europe, Middle East, and Africa (EMEA)				✔

Delivery Mode	SaaS (multitenant/virtual)	✔
	PaaS (hosted via a public cloud provider)	
	Amazon Web Services (AWS)	-
	Google Cloud Platform	-
	IBM Cloud	-
	Oracle Cloud	-
	Red Hat OpenShift	-
	Rackspace	-
	Salesforce AppExchange	-
	Microsoft Azure	-
	Other (please specify below)	-
	On premises	
	Windows (Power BI Report Server)	✔
	Linux	-
	Apple iOS	-
	Solaris	-
	Other (please specify below)	-

Mobile Access	Apple iOS	✔
	Android	✔
	Windows	✔
	Other (please specify below)	-

Licensing Option	Proprietary license	-
	GNU General Public License	-
	End User License Agreement (EULA)	-
	Specific use license	-
	Workstation license	-
	Concurrent use license	-
	Site license	-
	Perpetual license	-
	Non-perpetual license	-
	Subscription	✔
	Other (please specify below) *Power BI Premium is priced per dedicated cloud compute and storage resource.*	✔

POWER BI

TEC Insight Graph Position: **Strong**

- Functionality: **Extended**
- UX: **Delights**

KEY FEATURES

- Connectivity, integration, and data sources
- Dashboarding, scorecarding, and reporting
- Data integration, transformation, and movement
- Data modeling and advanced analytics capabilities (DAX, AutoML, R, and Python support)
- Security
- Social and collaboration capabilities

KEY ADVANTAGES

As a product from one of the largest software providers on the globe and today's BI and analytics flagship product, Power BI comes with wide support from the software giant as well as neat integration with the rest of Microsoft's software stack, especially the business and office software front-runners such as Office 365 and Dynamics 365.

A diverse set of versions could mean an advantage for users, as it is possible to rely on Power BI over various platforms that have BI and analytics products with similar, if not identical capabilities, and those platforms that are associated with different configurations and pricing models.

The availability of Power BI both in the cloud and on premises offers deployment flexibility, especially for those organizations that have hybrid deployment scenarios where the use of the cloud is still well mixed with on-premise systems.

KEY CHALLENGES & MICROSOFT'S APPROACH

As part of a trend to simplify licensing options, Microsoft offers two licensing models: Microsoft Power BI under subscription basis and Power BI Premium priced per dedicated cloud compute and storage resource. Power BI's licensing models are modern and serve the needs of more and more organizations that rely increasingly on cloud-based offerings to run their business. However, some organizations, particularly those that configure heavily on hybrid (on-premises and cloud) infrastructures might find these two licensing models somewhat limited.

From a product perspective, some feedback from users suggests that Power BI is a tool that can be complex and hard to understand for going beyond simple data import and report creation, especially as it is part of a suite that has other interrelated tools and software solutions such as Gateways, Power BI Report Server, and Power BI Services. However, Microsoft is committed to working on making the creator tool, the service, and the UI tailored toward ease of use. In fact, Microsoft's investment pillars for innovation include ease of use and specifically, among other things, the provisioning of AI visuals that allow users with no data science background or expertise to perform advanced analytics.

OPENTEXT

Company/Product Information

Product Name	OpenText Magellan	**Version (if applicable)**	16.7	**Headquarters Location**	Waterloo, ON, Canada
Product Description					
OpenText™ Magellan™ is a scalable, world-class platform for advanced analytics, data science, and data visualization that enables IT and business leaders and their teams to design, deploy, and manage secure, interactive web applications, reports, and dashboards fed by big data and big content to 100% of an organization's users, customers, and partners.					
Regional Presence	North America				✔
	Central America and South America				✔
	Asia-Pacific				✔
	Europe, Middle East, and Africa (EMEA)				✔
Delivery Mode	SaaS (multitenant/virtual)				✔
	PaaS (hosted via a public cloud provider)				
	Amazon Web Services (AWS)				✔
	Google Cloud Platform				✔
	IBM Cloud				-
	Oracle Cloud				-
	Red Hat OpenShift				-
	Rackspace				-
	Salesforce AppExchange				-
	Microsoft Azure				✔
	Other (please specify below)				✔
	On premises				
	Windows (Power BI Report Server)				✔
	Linux				✔
	Apple iOS				-
	Solaris				-
	Other (please specify below)				-

Mobile Access	Apple iOS *(via REST API and JS API and browser)*	✔
	Android *(via REST API and JS API and browser)*	✔
	Windows *(via REST API and JS API and browser)*	✔
	Other (please specify below)	-

Licensing Option	Proprietary license	-
	GNU General Public License	-
	End User License Agreement (EULA)	✔
	Specific use license	✔
	Workstation license *(only for Magellan Analytics Designer)*	-
	Concurrent use license	-
	Site license	✔
	Perpetual license	✔
	Non-perpetual license	-
	Subscription	✔
	Other (please specify below)	-

OPENTEXT MAGELLAN

TEC Insight Graph Position: **Competitive**

- Functionality: **Core**
- UX: **Exceeds**

KEY FEATURES

- Data visualization
- Artificial intelligence (AI)
- Machine learning
- Text analytics
- Data mining

KEY ADVANTAGES

OpenText Magellan is a robust data science and analytics platform and, as such, presents several key functional advantages for users, including features for performing advanced analytics such as predictive analytics (data mining and pattern recognition) as well as machine learning capabilities.

Neat integration and connection with open sourced Jupyter, Spark, and other open source projects such as NiFi enable OpenText Magellan users to further develop customized and more complex analytics-based solutions with an agnostic view—all with a user friendly and flexible interface.

KEY CHALLENGES

Due to its enterprise-grade configuration for OpenText Magellan, OpenText will face key challenges in competing alongside the other big players on the market trying to serve enterprise-grade solutions. OpenText will need to see this as an opportunity to offer competitive prices and services at the same or superior level to those software powerhouses.

While a core and reliable solution, OpenText Magellan still provides minimal coverage for some new BI and analytics functions such as storytelling and guided discovery functions as well as for specific augmented analytics functions such as auto data modeling and data flows.

SAS

Company/Product Information

Product Name	SAS Visual Analytics	**Version (if applicable)**	8.5	**Headquarters Location**	United States
Product Description					
The SAS BI and analytics offering provides interactive reporting, visual discovery, self-service analytics, and scalability and governance—all from a single, powerful in-memory environment. It is a single application for reporting, data exploration, and analytics.					
Regional Presence	North America				✔
	Central America and South America				✔
	Asia-Pacific				✔
	Europe, Middle East, and Africa (EMEA)				✔

Delivery Mode	SaaS (multitenant/virtual)	✔
	PaaS (hosted via a public cloud provider)	
	Amazon Web Services (AWS)	✔
	Google Cloud Platform	✔
	IBM Cloud	✔
	Oracle Cloud	✔
	Red Hat OpenShift	✔
	Rackspace	✔
	Salesforce AppExchange	✔
	Microsoft Azure	✔
	Other (please specify below)	-
	On premises	
	Windows (Power BI Report Server)	✔
	Linux	✔
	Apple iOS	-
	Solaris	-
	Other (please specify below)	-

Mobile Access	Apple iOS	✔
	Android	✔
	Windows	✔
	Other (please specify below)	-

Licensing Option	Proprietary license	✔
	GNU General Public License	-
	End User License Agreement (EULA)	✔
	Specific use license	✔
	Workstation license *(only for Magellan Analytics Designer)*	✔
	Concurrent use license	✔
	Site license	✔
	Perpetual license	✔
	Non-perpetual license	✔
	Subscription	✔
	Other (please specify below)	-

SAS VISUAL ANALYTICS

TEC Insight Graph Position: **Competitive**

- Functionality: **Core**
- UX: **Exceeds**

KEY FEATURES

- Basic and advanced analytics
- Data visualization and discovery
- Augmented analytics
- Analysis services
- Security and data connectivity

KEY ADVANTAGES

As a leader on the BI and analytics market, SAS offers a set of analytics solutions that are mature and reliable. Yet the company continues to improve and evolve its offerings to incorporate new functionality across the full SAS analytics portfolio.

The inclusion of advanced features such as augmented analytics can prove to be of great advantage, especially for those organizations with already mature analytics systems that require a more advanced analytics software stack to remain competitive.

KEY CHALLENGES

As with other big players on the market, SAS has the means and the impetus to avoid technical challenges as much as possible. But with respect to business challenges, it certainly faces tremendous competition from other big software providers both in gaining customers in this segment and particularly in opening new markets within the enterprise landscape.

From the solution side, some comments from users include aspects related to complexity and ease of use, and of course pricing relative to other solutions. These considerations make it more challenging for some organizations, especially small to midsize businesses (SMBs), to adopt SAS offerings within their BI and analytics platforms.

YELLOWFIN

Company/Product Information

Product Name	Yellowfin BI	**Version (if applicable)**	V9	**Headquarters Location**	Australia
Product Description					
Yellowfin provides the only analytics suite that combines industry-leading automated analysis, storytelling, and collaboration features to deliver transformational value from an organization's data. The Yellowfin Analytics Suite comprises the Yellowfin Signals, Stories, Data Discovery, Dashboards, and Data Preparation modules.					
Regional Presence	North America				✔
	Central America and South America				✔
	Asia-Pacific				✔
	Europe, Middle East, and Africa (EMEA)				✔

Delivery Mode	SaaS (multitenant/virtual)	✔
	PaaS (hosted via a public cloud provider)	
	Amazon Web Services (AWS)	✔
	Google Cloud Platform	✔
	IBM Cloud	-
	Oracle Cloud	-
	Red Hat OpenShift	-
	Rackspace	✔
	Salesforce AppExchange	-
	Microsoft Azure	✔
	Other (please specify below)	-
	On premises	
	Windows (Power BI Report Server)	✔
	Linux	✔
	Apple iOS	✔
	Solaris	✔
	Other (please specify below)	-

Mobile Access	Apple iOS	✔
	Android	✔
	Windows	✔
	Other (please specify below)	-

Licensing Option	Proprietary license	✔
	GNU General Public License	-
	End User License Agreement (EULA)	-
	Specific use license	-
	Workstation license *(only for Magellan Analytics Designer)*	-
	Concurrent use license	✔
	Site license	-
	Perpetual license	-
	Non-perpetual license	-
	Subscription	✔
	Other (please specify below)	-

YELLOWFIN BI

TEC Insight Graph Position: **Competitive**

- Functionality: **Core**
- UX: **Exceeds**

KEY FEATURES

- Automated discovery
- Data visualization and discovery
- Data storytelling
- Self-service analytics
- Security

KEY ADVANTAGES

Since its entry into the market in 2003, this Australian company has been constantly evolving its analytics offering and adding key functional elements to its BI and analytics arsenal. Today Yellowfin offers a comprehensive BI and analytics platform with functionality ranging across the entire BI spectrum—from data source to information delivery with reliability and security.

Worth mentioning are Yellowfin's continual improvements to its storytelling and data presentation capabilities as well as its automated discovery capabilities.

A stable version offers direct connection to most on-premise and cloud data sources and a bulk of data preparation capabilities to enhance the services provided during the analysis and information delivery phases.

KEY CHALLENGES

Despite having plenty of connectors for external sources, Yellowfin has not put special emphasis on integration with Microsoft Office. Instead, Yellowfin offers its own application for presentations.

While a lack of integration with MS Office might not necessarily be a deal breaker, it could be a key consideration for some organizations looking for a BI and analytics suite. Those companies that are greatly dependent on MS Office, particularly Excel, for portions of their BI and analytics operations might be resistant to change to another offering for these capabilities.

ZOHO CORPORATION

Company/Product Information

Product Name	Zoho Analytics	**Version (if applicable)**	4	**Headquarters Location**	India; United States
Product Description					
Zoho Analytics is a self-service BI and analytics platform, available both in the cloud and on premises. Zoho Analytics allows users to create visually stunning reports and dashboards through its drag-and-drop interface. Users can also ask questions in natural language to its intelligent assistant Zia—which is powered by AI and ML technologies—and get relevant answers in the form of reports. Zoho Analytics offers connectors for popular business apps and provides users unified business insights across departments.					
Regional Presence	North America				✔
	Central America and South America				✔
	Asia-Pacific				✔
	Europe, Middle East, and Africa (EMEA)				✔

Delivery Mode	SaaS (multitenant/virtual)	✔
	PaaS (hosted via a public cloud provider)	
	Amazon Web Services (AWS) *Distribution for AWS is available in the Amazon marketplace.*	✔
	Google Cloud Platform *Cloud SQL & Google Drive, Google Big Query*	✔
	IBM Cloud	✔
	Oracle Cloud	✔
	Red Hat OpenShift	-
	Rackspace	✔
	Salesforce AppExchange	-
	Microsoft Azure	✔
	Other (please specify below)	-

	On premises	
	Windows (Power BI Report Server)	✔
	Linux	✔
	Apple iOS	✔
	Solaris	-
	Other (please specify below)	-

Mobile Access	Apple iOS	✔
	Android	✔
	Windows	-
	Other (please specify below)	-

Licensing Option	Proprietary license	✔
	GNU General Public License	-
	End User License Agreement (EULA)	✔
	Specific use license	-
	Workstation license *(only for Magellan Analytics Designer)*	-
	Concurrent use license	✔
	Site license	-
	Perpetual license	-
	Non-perpetual license	✔
	Subscription	✔
	Other (please specify below)	-

ZOHO ANALYTICS

TEC Insight Graph Position: **Strong**

- Functionality: **Extended**
- UX: **Delights**

KEY FEATURES

- Data visualization and discovery
- Self-service BI
- Sharing and collaboration
- Analysis services
- Embedded BI

KEY ADVANTAGES

Being a native cloud software provider, Zoho has now accumulated enormous experience in this type of software delivery, giving it an edge in delivering BI and analytics services to users. A robust platform with scalable capabilities enables Zoho, and specifically Zoho Analytics, to provide stable and robust analytics offerings.

Extensibility, collaboration, and the presence of a great number of data source connectors are features to consider within Zoho Analytics. These features are particularly relevant in the context of the current tech industry, which contains both hybrid cloud and on-premise infrastructures.

Today Zoho, and many other cloud native software vendors, have transcended the small to midsize business (SMB) market to look for the largest set of customers seeking to acquire BI and analytics services from mature cloud providers.

KEY CHALLENGES

Like with other cloud-based providers, Zoho deals with common challenges from a market industry perspective. These challenges range from connecting effectively with on-premises applications to ensuring infrastructure security and compliance. So, as Zoho enters the realm of gaining new customers and organizations, it is key for the vendor to ensure that growth comes along with controlling cloud costs and effectively managing cloud implementation challenges.

From a feature and functionality perspective, Zoho Analytics might face a challenge when customers require the incorporation of more advanced data management features such as, for example, data preparation, data quality, and governance. This is because Zoho needs to incorporate more of these elements into its platform.

TEC INSIGHT METHODOLOGY AND EVALUATION CRITERIA

The TEC Insight Report on BI and Analytics Solutions portrays the results of an extensive analysis of data gathered from different sources with the purpose of evaluating vendors participating in this research regarding two main criteria:

- **Functional capabilities (functionality).** By evaluating the level of coverage of the most important capabilities a solution within the area of BI and analytics needs to have according to TEC's criteria list.

- **User experience (UX).** By evaluating the level of satisfaction of customers or users with working with the solution to perform their work activities.

Once data was collected, TEC evaluated the level of coverage and/or satisfaction of each vendor solution according to the established functionality and user experience criteria. Further research was involved to produce an accurate profile and an analyst perspective on each solution featured in the report.

DATA COLLECTION

TEC collected data about each solution featured in the report by conducting surveys and researching available information online. The data for this report was collected in 2020. The main sources of information were the providers of the solutions (the vendors) and users of each solution.

Vendor/Solution Data

Vendors offering a BI and analytics solution were invited to participate in TEC's research. Those vendors that agreed to participate were required to do the following:

- Fill in a functionality questionnaire (functionality matrix) to indicate the level of coverage of their solution for each requested functionality, and review TEC's profile of the solution.

- Provide TEC with a product demo or briefing where TEC could evaluate their BI and analytics offering with respect to functionality and UX.

User Data

To assemble the user perspective, TEC:

- Gathered information from a set of the most important online software rating tools regarding each solution's functional and UX capabilities.

- Launched a public survey that enabled users to evaluate each BI and analytics solution participating in the report regarding their functional and UX capabilities. Demographic information for the survey conducted in late 2019 and early 2020 is as follows:

    - 138 user responses: 38% in companies operating with 1 to 50 employees, 18% from companies of 251 to 1,000 employees, 38% in companies of 1,001 to 9,999 employees, and 6% represented organizations of 10,000 or more employees.

    - Respondents represented companies across a wide array of industries, including: computer, IT, and software (19%); business and consulting services (10%); and manufacturing (8%). Many other industries were also represented, ranging from 4% to 6%, including: retail (5%), education (5%), banking (5%), real estate (5%), transportation (4%), and construction (4%).

    - Regarding experience, a large majority (73%) of people surveyed had between 1 and 10 years of experience using BI and/or analytics applications as part of their daily work activities, making for a wide range of users, from novices to experienced users.

    - In terms of roles, the most prominent segments were IT managers and IT staff (36%), followed by CEOs (22%), and then operational staff (~18%). The rest were divided among diverse positions such as business managers (10%) and staff (5%) as well as chief information officers (CIOs, 7%), among others.

TEC Data

In addition to issuing functionality questionnaires to vendors, TEC collected data mainly by evaluating the product during briefings and demos, and conducting further research.

DATA SOURCE	METHOD OF DATA GATHERING	FUNCTIONALITY	USER EXPERIENCE (UX)
Vendor	Functional matrix	✖	
	Product briefing/demo with TEC	✖	✖
User	Public survey	✖	✖
	Main software rating pages (online)	✖	✖
TEC	Internal research and evaluation efforts	✖	✖

DATA ANALYSIS METHODOLOGY

Once all the necessary data was gathered, the results from each perspective (the vendor, the user, and TEC) regarding the functionality and UX dimensions were assigned a weight by the analyst to obtain a measurement of both the level of functionality coverage and the level of quality for UX to do the following: (1) represent the results in the form of the 2021TEC Insight Graph and (2) analyze the results in various other ways for further analysis and commentary.

Functionality

For this inaugural edition of the report, the 2021 TEC Insight Report for BI and Analytics Solutions, the core functionality criteria measured include the following (see Appendix A for the full functionality criteria list included in this report):

	FUNCTIONALITY SECTION
1	Basic Analysis Functions
2	Self-Service
3	Analysis Services
4	Data Visualization and Discovery
5	Dashboarding, Scorecarding, and Reporting
6	Advanced Analytics
7	Augmented Analytics
8	Security
9	Connectivity, Integration, and Data Sources
10	Social and Collaboration Capabilities
11	Data Management
12	Content Management

These functional categories include the ability to support organizations of all sizes (small, medium, and large enterprises), implementations within different complexity use cases, and different technical architectures.

User Experience (UX)

The UX assessment involves users' experience with vendor/product capability to ensure successful delivery of the BI and analytics solution, which enables clients to be successful with these solutions.

For this edition of the TEC Insight Report series, focusing on BI and analytics solutions, the core user experience criteria measured include the following (see Appendix B for the full user experience criteria list included in this report):

USER EXPERIENCE		
1	Technical	The technical perspective refers to product quality; it relates to the static and dynamic properties of the software proper.
2	Usability	Usability includes the attitude of a user toward the computer system as well as how well the software can be understood, learned, used, and liked by the user.
3	Security	Security refers to the protection of system items from accidental or malicious access, use, modification, destruction, or disclosure.
4	Productivity	Productivity refers to the ratio between the value produced by the system versus the labor and expense of producing it.
5	Strategy	Strategy refers to the degree to which the system is important or useful as well as supports risk mitigation, planning, and managing.
6	Service	Service refers to the degree to which the system provider delivers reliable support, training, and product delivery.
7	Licensing	Licensing refers to the degree to which the system provider delivers comprehensive, flexible, and reliable licensing models to fit customer demands.

MORE INFORMATION ON THE TEC INSIGHT GRAPH

The TEC Insight Graph is intended to provide users with a straighforward view of each solution's position and capabilities. Below, we define the individual components of the TEC Insight Graph to enable readers to gain a full understanding of the results depicted in the graph.

Functionality Axis

The functionality axis shows whether a specific solution aims to provide wide or narrow functionality coverage of features and capabilities, and is divided into four categories that range from offering niche to full stack capabilities. Briefly, the ranges are described as follows:

- A **niche** solution is one that shows strong functionality leaning toward solving specific business needs within its particular software market (workflow management, reporting and dashboarding, scorecarding, for example) rather than addressing horizontal functionality across the type of software considered.

- A **core** solution offers additional features to those of a niche solution in the form of more tools or data and system connectors.

- Solutions with **extended** functionality offer more functionality than core and niche types of solutions without being a full enterprise platform in their software markets.

- A **full stack** solution is a solution that aims to offer the complete set of capabilities from its enterprise software category in order to fulfill all the needs users may have for performing their duties.

User Experience (UX) Axis

The UX axis reflects the collective results of user ratings on the solution's ability to provide satisfying user experiences and valuable results to their organizations. The scale is divided into four main user experience or satisfaction level values, ranging from meeting expectations to providing users with an amazing user experience. Briefly, the ranges are described as follows:

- The first category indicates that the solution **meets** user expectations, so that users can perform their tasks with reliability.

- The second category goes further and indicates a solution **exceeds** to some degree the expectations of most users and provides an enhanced UX as a result.

- The third category denotes that the solution not only exceeds but also **delights** a number of users in terms of its UX.

- The final category indicates the solution **amazes** users by greatly surpassing expectations and by providing a perception of great value and user experience to their users and organizations.

Service Levels

From the combination of both measures (functionality and UX), a position within the graph is generated for each vendor solution. This position will be located within one of four identified areas, and is divided by a reference line representing an ideal solution providing a balance between functional coverage and UX levels. Looking at each area, from bottom to top of the graph, we can see that vendors are divided into four levels, defined as follows:

- **Reliable.** The vendor offers a solution that can be used with confidence; it is trusted or believed to perform tasks well or in the way users expect.

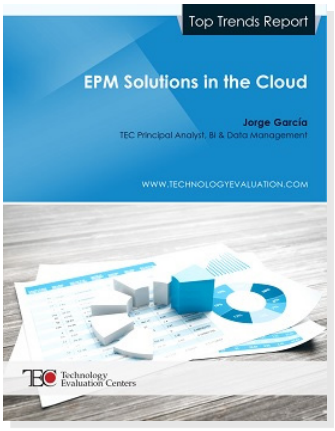
- **Competitive.** The solution is able to compete well within the market; it shows maturity and ability to deliver reliable functionality and more than basic user experience.

- **Strong.** The solution has distinguishable power and advantages within the market; it offers strong functional cababilities and more-than-moderate user experiences.

- **Dominant.** The solution is in a position of power; it exhibits powerful and clear functional and/or user experience advantages within its market.

OTHER TEC RESOURCES

Top Trends Report: Analytics and BI Solutions in the Cloud



Top Trends Report: EPM Solutions in the Cloud

Artificial Intelligence in Manufacturing: Enabling the Fourth Industrial Revolution

APPENDIX A: FULL FUNCTIONALITY CRITERIA LIST

1	BASIC ANALYSIS FUNCTIONS
	Slice and dice
	Drill up/down
	Drill across
	Formulas
	Exceptions
	Sort and rank
	Execute large queries
	Cancel queries
	Search
	Filter data

2	Self-Service
	Level of operational involvement
	Add unstructured data
	Add easy navigation content
	Add images
	Share components between dashboards
	Connect between a control and exceptions/formulas
	Connectivity to an unstructured data source
	Metrics and key performance indicator (KPI) creation on the fly

3	ANALYSIS SERVICES
	Online analytical processing (OLAP)-like services
	Structured Query Language (SQL)-like services
	Real-time analytics services

4	DATA VISUALIZATION AND DISCOVERY
	Interactive visualization
	Visual drill down/up/across
	Chart and visual recommendations
	Addition of unstructured data
	Enterprise data search
	Geospatial capabilities
	Storytelling features
	Guided discovery

5	DASHBOARDING, SCORECARDING, AND REPORTING
	Free dashboard design
	Manage folders; create dimensions, hierarchies, and aggregations
	Embed tool components
	Global dashboard filters
	Display filter values
	Global style options
	Design a personal theme
	Multiple charting options
	Multiple sharing options

5	DASHBOARDING, SCORECARDING, AND REPORTING
	Data persistence
	Cascading slicers
	Automated design mode
	Public links
	Embedded analytics
	Dashboard tabs
	Tab rotation
	Animation options
	Flexible printing options
	Mobile services

6	ADVANCED ANALYTICS
	Predictive analytics
	Forecasting
	Data mining
	Machine learning
	Text/Sentiment analytics
	Streaming analytics
	Video analytics
	Operational analytics

7	AUGMENTED ANALYTICS
	Reporting and Dashboarding
	Auto charting
	Auto dashboarding
	Natural language processing
	Chatbot integration
	Automatic portal personalization

	Analysis Services
	Natural language search
	Auto insights
	Root-cause analysis
	"What-if" analysis
	Next-step recommendation

	Data Preparation
	Auto data typing
	Auto data joins
	Auto data modeling
	Auto formatting
	Model library
	Rank models
	Auto model deployment
	Auto creation of analytics data flows
	Auto creation of models and scripts
	Auto model documentation
	Model monitoring and management

8	SECURITY
	Encryption of data at rest and data in transit
	Role/User-based security
	Single sign-on integration

9	CONNECTIVITY, INTEGRATION, AND DATA SOURCES
	Basic Integration
	Integration with Microsoft Office
	Integration with other office suites (Google, Apache Open Office, LibreOffice, etc.)
	Extensive native data source connectors

	Big Data Integration
	Hadoop
	Hive
	HBase
	Cassandra

	Process Engine Integration
	Hadoop MapReduce
	Flink
	Spark
	Storm
	Samsa

10	SOCIAL AND COLLABORATION CAPABILITIES
	Collaboration over data
	Notes and annotations
	Public repository
	Private repository
	Subscriptions
	Mutual development of dashboards
	Export
	Scheduled delivery
	Internet sharing
	Ad-hoc teams creation

11	DATA MANAGEMENT
	Data quality
	Data integration, transformation, and movement
	Data warehousing
	Metadata management
	Data catalogs
	Master data management
	Data governance

12	CONTENT MANAGEMENT
	Content pushing
	Content sharing
	Integration with other content management and storage systems

APPENDIX B: FULL USER EXPERIENCE CRITERIA LIST

USER EXPERIENCE QUESTIONS
Technical (Functionality, reliability, efficiency, compatibility, maintainability)
How well does the software provide all the desired functions for your organization?
How well does the software maintain the level of system performance when used under your organization's desired conditions?
How well does the software provide the required performance relative to the amount of resources used within your organization?
How well can your organization rely on the software's ability to interact with specified systems?
How well can the software system be maintained?
How well can the system be ported from one environment to another?
Usability (User satisfaction/experience, usability)
How good is the attitude of users toward the system in the context of their work environment?
How well can the system be understood, learned, used, and liked by users within your organization?
Security
How well does the system provide protection from accidental or malicious access, use, modification, destruction, or disclosure?
Productivity
How well do you feel about the relation between the value produced by the system versus the labor and expense of producing it?

USER EXPERIENCE QUESTIONS
Strategy
How important or useful is the system for your organization's long-term key objectives?
How important or useful is the system for your organization's economical and operational risk mitigation initiatives?
Service
How well would your qualify your level of satisfaction regarding service and support from the system's software provider?
Licensing
How well does the system provider deliver comprehensive, reliable, and flexible licensing models to fit your organization's demands?

ABOUT THE AUTHOR

Jorge García is TEC's Principal Analyst, Business Intelligence (BI) and Data Management. He has more than 20 years of experience in all phases of application development, database and data warehouse (DWH) design, as well as 9 years in project management, covering best practices and new technologies in the BI/DWH space.

Prior to joining TEC, García was a senior project manager and senior analyst developing BI, DWH, and data integration applications with Oracle, SAP Business Objects, and data integration. He has also worked on projects related to the implementation of BI solutions for the private sector, including the banking and services sectors. He has had the opportunity to work with some of the most important BI and DWH tools on the market.

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