Qlik Q®

Evaluating governed self-service data visualization

User-driven discovery & exploration - a new paradigm for business intelligence

Over the past several years, there has been growing recognition of the substantial advantages that organizations can enjoy by shifting the focus of their business intelligence (BI) efforts from IT-driven to user-driven visualization, exploration, and discovery. Gartner refers to this type of BI as Data Discovery. In this new user-driven model, IT still plays a critical role as they maintain responsibility for the hallmarks of well run Enterprise IT including performance, scalability, security, and data governance. However, in user-driven BI models, IT delivers an ecosystem for data discovery rather than specific, overly-defined business reports. This more flexible, open model for delivering BI encourages better IT-business partnership and fosters more collaboration and innovation.

Visual data discovery differs from traditional BI

At Qlik®, we've witnessed — in fact, enabled — a sharp change in the BI market during the past few years. This change is an evolution from traditional BI to self-service visual data discovery which is nimble, straightforward, mobile, and for everyone.

The flexibility and interactivity of visual data discovery applications can have a profoundly positive impact on your organization's ability to drive value from your data investments. And, providing this capability within a managed and governed environment allows your organization to maintain control over your data and help ensure that you are able to make the most of your efforts through reuse.

Choosing a vendor to partner with can be difficult as many vendors sound the same on the surface. But they are not.

To assist in your efforts, this document attempts to outline many of the key attributes of an enterprise-class visual data discovery platform necessary to deliver a solution that will serve you for years to come.

Evaluating User-Driven Data Visualization

Enterprises rarely, if ever, replace their technology platforms every year. And we also know that your organization's needs will change dramatically as your BI and analytics maturity level evolves. As such, it is important to ensure that your evaluation considers fundamental capabilities that extend beyond your current business case. At a high level, there are a number of key areas to consider:

- **Application Capability**
  Since detailed feature sets will change over time as vendors attempt to surpass one another with each release, we will not focus on a feature-by-feature comparison of client tools. However, there are some fundamental core capabilities which are critical to user-driven analysis.

- **Data Management**
  The reality is that data environments have never been as simple as the term "Data Warehouse" would imply. Even in the most well managed environments, managing data flow is a complex and ever changing task.

- **Big Data**
  Big Data is a relative term. For some companies, a million records is a huge amount of data and for other companies, this might be considered small data. Either way, discovery tools need to support the new BI architecture with includes Big Data technologies alongside more traditional solutions.

- **Development**
  Most IT budgets are decreasing. However, even in cases where this is not true, there is an increased focus on utilizing a larger portion of the budget on innovation and growth rather than "keep the lights on" activities. Therefore, it is critical that the selected platform have the ability to truly enable innovation.

- **Enterprise Governance**
  Many vendors misuse the term "Enterprise Ready." In general, we are referring to capabilities and tools which support the management of the system across large user populations and with adherence to established policies and guidelines while maintaining performance at scale.

Capability that matters

The remainder of this document focuses on providing you with a list of capabilities that are critical to empower your business users both today and into the future as your organization's analytic capability matures.

Each item includes information about the key business objective as well as an understanding of the testing scenario that is important to verify with any vendor in order to validate that their capability extends beyond the marketing hype.

	Strategic business value	Testing scenario
Application capability		
Support the spectrum of users	It is true that many users are more technical today than ever before. But it is likely also true that there are many users within your organization who are not. In order to gain broad adoption across your organization, the platform will need to meet the needs of each of these types of users as well as everyone in between.	❑ Demonstrate how nontechnical users can explore prebuilt visualization apps without the need for special training. ❑ Demonstrate how knowledgeable workers with even the most basic technical skills can create new visualizations and extend existing visualization apps to answer unforeseen questions. ❑ Demonstrate how more advanced users can build their own applications even when the data model and calculated expression requirements are more complex.
Data visualization	It shouldn't be a surprise that data visualization allows your users to "see" the patterns in their data much more easily. This is because humans have developed incredible visual processing skills over time in order to survive. In fact, some estimates state that 90% of all information transmitted to the brain is visual.	❑ Demonstrate that the platform supports a wide range of charts and visualization types. ❑ Demonstrate that the platform can, not only support, but encourage visualization best practices. ❑ Demonstrate the ability to interact with data combined across a range of data sources in a way which allows the users to see the associations in the data from across the organization. ❑ Demonstrate the ability for visualizations to support data density and context awareness. ❑ Demonstrate the ability to easily create associated visualizations that interact seamlessly with each other. ❑ Demonstrate the ability to extend visualizations to support unforeseen business requirements.

	Strategic business value	Testing scenario
Application capability continued		
Web-based application delivery	While your organization may not be placing everything it owns into the cloud quite yet, delivery of applications through a web-based client provides for manageability of the desktop, especially in environments with disparate access types (e.g. PC, iPhone, tablets).	❑ Demonstrate how the product provides for a wide range of development and client access types. ❑ Evaluate the level of functionality that is available through each to ensure that the appropriate controls will be available to the users who need them. ❑ Demonstrate the ability for the same visualization app to be utilized fully from any device with no additional development costs.
Innovative navigation	Even with significant investment and senior support, BI adoption rates have been stagnant for years. A key factor in this lack of adoption is user frustration with rigid, slow, hierarchical analytics which require too much involvement from IT. Instead, users need the ability to move with agility through their data as they ask and answer new, unforeseen questions without IT/ Power Analyst support.	❑ Demonstrate how the business user has no fixed starting point or pre-defined navigational routes or hierarchical structures that significantly limit their ability to ask and answer questions within the data. ❑ Demonstrate how the platform enables users to make selections across all objects in the applications and to maintain selections/context as they navigate within the application. ❑ Evaluate user performance by making at least 30 successive selections applying more and more context as they go without having to do any workarounds to accommodate slow queries and slow/rigid products/interface design. ❑ Provide guided navigation and support to dashboard and application users.

Flexible and powerful search	Companies like Google have set new expectations for our users when it comes to basic capabilities like search. But more importantly, when talking about data, insight is often found by locating the proverbial needle in a haystack. Integrated, flexible, and powerful search capabilities make it possible for the analytic application to adapt to the specific needs of the user's question.	❑ Demonstrate a wide range of flexible and powerful search capabilities.
		
		  ○ **Full Data Search** - Search across an entire application for data that may exist as part of any field.
		
		  ○ **Variable Filter** - The ability to filter data based on a particular value of a particular field. (e.g. all data within the country Canada)
		
		  ○ **Indirect Search** - The ability to search one field based on the value of another. (e.g. select all stores where sales of item X exceeded $1MM)
		
		  ○ **Invert Search** - Search for all items currently not selected.
		
		❑ Demonstrate how the search function instantly highlights, letter by letter, across all dimensions, the available matches for immediate selection.
		
		❑ Demonstrate how your search capability allows for advanced operators like Google (+, -, "" etc), as well as the ability to search on measures with greater than and less than operators.

Alerting	Email alerting is a mode of analytics that not everyone will necessarily use, but is absolutely required, allowing the analytics app to work for the user proactively, in a push fashion. Users love the time-savings and proactivity of alerting which drives adoption and insight.	❑ Demonstrate how the platform provides not just on-screen visual alerts, but also email alerts to the user when the business rules are broken or when thresholds are met or exceeded in some fashion.

	Strategic business value	Testing scenario
Application capability continued		
User controlled variables	Variables and dynamic, in-context parameters provide the ability for more complex analysis - including *what-if analysis*, *user-defined sets* and *comparative analysis* - and also provide flexibility in application development enabling a single application to deliver a broader capability than otherwise possible.	❏ Demonstrate the ability to use global variables and dynamic, in-context parameters. ❏ Demonstrate that the use of variables within an application that leverages large data sets from heterogeneous data sources does not degrade performance. (e.g. many heterogeneous data sources with 50 million or more rows). ❏ Illustrate support for "What If" scenarios, with various value manipulation techniques, including, but not limited to (1) Input Boxes (2) Slider Bars (3) Direct Entry into Tables and (4) Importing from External Sources. ❏ Show how the platform enables easy comparative and market-basket style analysis including user defined sets. ❏ Illustrate the use of variables to control dynamic data grouping or segmentation across a large data set without degrading performance.
Dynamic calculations	Dynamic calculations are required if users want to achieve maximum agility in analysis. Certainly, we need to be able to apply context during the data prep, but as importantly, the ability to apply context and watching the calculations change instantaneously in real time.	❏ Demonstrate the ability for the tool to perform dynamic context sensitive calculations with data from multiple data sources. ❏ Perform a wide range of calculations including string based calculations. ❏ Validate the performance of calculated results when working with larger and larger data sets. ❏ Validate the results from calculates especially when derived from data across multiple data sets.

Performance	Google returns results before you even finish typing. Business users simply will not use a tool that takes even seconds to return a result.	❑ Create a test application using a subset of data and then load the full data set to illustrate the consistency of user response times. ❑ Ask the vendor to provide you with recent documented/proven scalability tests utilizing real world scenarios.

Extensibility	Many users have very basic analytic needs and will be perfectly content clicking through a pre-built application. However, more advanced users and business analysts may need the ability to extend existing applications to meet their specific needs.	❑ Demonstrate how a user can extend an existing application with:
		  ○ New objects
		  ○ New sheets
		  ○ New calculations

Mobility	Mobile apps need to be more than just static reports. Users want the same experience away from their desk. And, touch enabled devices require controls that make sense. Additionally, users need to be able to transition seamlessly between their desktop and mobile device so that they can continue their analysis wherever they go.	❑ Demonstrate how a user performs analysis from a touch-enabled mobile device. ❑ Demonstrate the ability to take information offline for situations which have poor/no connectivity. ❑ Demonstrate the ability to move seamlessly between mobile and desktop with the same analysis and experience.

	Strategic business value	Testing scenario
Data management		
Multi-source data integration	The reality within every organization is that it's almost impossible to rely on a single, perfect data source. Being able to quickly and easily join disparate data sources and platforms is invaluable. This ability also becomes a key factor in innovation, allowing you to quickly merge in and evaluate new sources of information prior to investing in expensive and time consuming data integration projects.	❏ Quickly integrate data from five or more data sources into one single visualization app. ❏ Ensure that data sources are identified from as broad a range as possible including at least one of each category: desktop (e.g. XLS, CSV, Access), traditional (e.g. SQL Server, Oracle), and analytics (e.g. Teradata, HP Vertica). ❏ Ensure that no pre-aggregation and up-stream data work is necessary to bring disparate data sources together.
Complex data integration – no data loss	Analysis is most powerful when it is able to make connections across multiple aspects of your business. However, when bringing together data from a variety of data sources, one common problem is data loss and miscalculation as tables are joined together. The complexity of managing this can be quite expensive and prone to calculation errors.	❏ Validate that data sources can be easily brought together without any loss of data, dimensions, and without any calculation errors. ❏ Ensure that there are no complex "joins" necessary to perform the task of bringing the data together.

Data transformation	When trying to bring together data from across your organization, it is more than likely that data issues will be uncovered. Integrated ETL capability provides the ability to continue forward with the delivery of analytic applications without having to wait for all upstream systems to agree and change. This allows your business users to keep moving forward no matter what is going on behind the scenes.	❑ Validate that the platform has robust built in ETL capability. ❑ Demonstrate that the ETL capability can support calculations. ❑ Ability to enrich data for example with groups or flags prior to display.
Data APIs	Having the ability to map to any data source (however arcane) is critically important. Despite a robust library of connectors from any vendor, the requirement to integrate data for which there is no connector can stop an implementation in its tracks. Having an API to leverage in these times means that development can move ahead no matter what you encounter down the road.	❑ Show how the platform has a full open data API to facilitate future unforeseen integration requirements.

	Strategic business value	Testing scenario
Big data		
"Big" data sets	Even if your business does not have a big data problem today, it is critical to evaluate the ability of the platform to manage large data sets without pre-aggregation. Here, we are interested in the ability for the system to maintain response times and agility as data volumes grow over time.	❑ Load at least 100 million rows of data directly into an application. ❑ Show how the platform facilitates the storage and aggregation of the most granular level of data to ensure that discovery is not limited by pre-aggregated results. ❑ For extremely large data sets, validate: ○ Ability to create subsets of the data which can each maintain performance. ○ Ability to link subsets together in a meaningful way to enable users to dive into different areas of the data while maintaining context. ○ Ability to get to detailed big data store when needed.
Analytic platform integration	In-memory platforms provide lightning fast response times for business users. However, despite Moore's Law, some companies may never be able to load all necessary data into memory. Therefore you will need the agility to not only offer in-memory capability but also the ability to directly access data as well when necessary.	❑ Show how the solution can utilize server-based memory and directly access sources simultaneously, in the same application. ❑ Show how this is also possible sourcing from MPP (e.g. Teradata, Netezza etc.) and true big data sources (e.g. Hadoop etc.).

	Strategic business value	**Testing scenario**
Development		
Collaborative rapid application development	Historically, there has been a gap between requirements and solutions delivered by IT. In order to combat this problem, many IT organizations have migrated to more agile methods of development. One key tenet of agile development is increased involvement from the business to ensure that solutions better meet the ever changing and growing needs of the business. Time to implement is critical but only if the business users find the solution valuable and choose to adopt the new technology.	❑ Using a well understood data source, build a basic analytic application within hours. ❑ Sit with a typical user of the data and make changes on-the-fly as you discuss how the information will be utilized to support business decisions. ❑ Allow the user to add new content of their own creation and share it with other users of the visualization app.
Information density	Providing more analytic capability in a single application allows users to spend more time analyzing their business and less time navigating from place to place. This provides more value to the users and drives up user adoption.	❑ Ask the vendor to provide examples of dashboards with analytic depth. ❑ Demonstrate how advanced visualization capabilities can be used to improve information density. ❑ Demonstrate the ability for visualizations and other objects to dynamically respond to the amount of available space providing more or less information as needed.

	Strategic business value	Testing scenario
Development continued		
Sample applications	Nobody likes to reinvent the wheel. Assuming that they are easy to modify, the availability of demo/starter applications allows developers to hit the ground running.	❑ Evaluate the pool of available demo and starter applications from which applications can be built from. ❑ Evaluate the level of effort required to reuse these applications with alternate data sources. ❑ Evaluate the availability of starter applications for key systems such as SAP and Salesforce.com.
Extensibility	Regardless of your selected vendor, it is likely that you will encounter unforeseen requirements down the road. And, despite the breadth of capability embedded within your selected platform, it may be lacking just the thing you need. Choosing a platform which provides the mechanism to extend beyond the "in the box" experience ensure that you will be able to keep your BI and Analytics efforts moving forward.	❑ Demonstrate that the tool supports APIs for application extensibility. ❑ Demonstrate vendor and market support for the extension of the platform. ❑ Show how the platform enables 3rd party web-developed objects, such as charts and graphs, to extend and enhance its visualization and functional capabilities.

	Strategic business value	Testing scenario
Enterprise governance		
Security	In order to ensure that applications can be leveraged across as broad of a user base as possible, a single application should be able to serve users with different data security profiles. For example, users with access to data from different departments should not need separate applications built for each department. This can be extended to ensure that users who do not have access to specific details within the data should not need a separate application either.	❑ Illustrate that the platform can integrate easily into the company standard authentication methodology. ❑ Show how the platform enables multiple levels of security including (1) row, (2) column, and (3) application. ❑ Demonstrate the flexibility of the security model to conform to any business scenario (rather than the other way around). ❑ Ask vendors to show that low-performing security filtering is not required, and if it is required in a particular platform, how that impacts caching. ❑ Show how the platform is able to efficiently deliver different results to different users depending upon their security profiles, based on single master apps.

	Strategic business value	Testing scenario
Enterprise governance continued		
Data management	When evaluating platforms, remember the needs of IT. It is important to consider the time and cost to manage the platform as well.	❑ Show how the platform provides an out-of-the-box capability for governance and monitoring of the software itself, including the applications and their usage. ❑ Demonstrate the platform's ability to support a data abstraction layer, allowing IT to manage a certified data layer. ❑ Demonstrate the ability to provide users with a way to ensure consistency in calculated expressions.
License management	Any Enterprise deployment will involve the need to manage licenses and access within the application. Additionally, it will be important to assure that you can monitor the usage within the application to ensure that you are gaining maximum value from your investment.	❑ Demonstrate the ability to manage licenses within the provided management tools including the ability to reallocate licenses to new users as necessary. ❑ Demonstrate the ability to report on license usage.

Publication administration	Providing rich automation and scheduling of analytics gives users what they want when they require it. With this capability, administrators are able to effectively manage a massive enterprise implementation with ease.	❑ Show how the solution provides the ability to automate and schedule tasks, as well as their related dependent tasks such as data loads, reloads, report bursting, and report distribution. ❑ Review the server side management tools associated with the product. Ensure that the tools scale to meet your needs without requiring you to scale your staffing along with it.
Scalability & high availability	It is one thing to support a small application on a small departmental server but it is quite another to deliver an analytic application to tens of thousands of users in a fault tolerant way.	❑ Ensure that the solution has clustering and load balancing capability. ❑ Ensure that the solution provides management tools supporting ongoing capacity planning. ❑ Ensure that the solution simplifies the management of large geographically disperse deployments.

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