

Introduction

The QuikMetrix (QM) accelerator (or template, or solution) from Information Builders and RDC, is a rapid and attractively priced Professional Services engagement that delivers a truly configurable, full-function Portal for the display, charting and drilling of the key performance indicators (KPI's) which business managers must attend to on a frequent and routine basis.

Founded on the WebFOCUS 8 business intelligence platform from Information Builders, QuikMetrix is a pre-built Portal tailored for each Client through metadata. In most cases, QuikMetrix compounds savings and efficiencies by avoiding the need to build a data mart to support the application.

QuikMetrix is a powerful, yet incredibly cost effective solution to help organizations move vital operational measures to a visual, inter-active web-based experience in a matter of weeks without requiring any application development.

This Business Intelligence Capabilities Statement quantifies the key features of the QuikMetrix Portal accelerator.

Security Provisions

QuikMetrix is typically integrated into a Client's network security environment thru standard Active Directory (AD) Authentication. Users are a partitioned into User-Groups, with corresponding AD Group established for each group of Users. When Users login to QuikMetrix, they only see the Portals that they are defined to see. Since QuikMetrix is built using the WebFOCUS BI Platform, QuikMetrix inherits all of the robust security provisions of WebFOCUS. Thus, User security can be applied deep inside each Portal to govern what Portal tabs, objects and even data each User is permitted to interact with.

The often-desired "single sign-on" is easily achieved in QuikMetrix. Single sign-on (an additional cost component) allows User to skip the Login screen by having their network security credentials automatically passed directly to QuikMetrix.

Types of Measures

Measures are commonly classified in three forms: Descriptive Measures, Predictive Measures and Prescriptive Measures. QuikMetrix currently has the capability to support two of the three measure-variants (definitions below have been adapted from <http://www.informationweek.com/big-data/big-data-analytics/big-data-analytics-descriptive-vs-predictive-vs-prescriptive/d/d-id/1113279>):

Descriptive Measures – The simplest class of measures; condensing big data into smaller, more useful nuggets of information. Most raw data, especially big data, are not suitable for human consumption, but the information derived from the data is. The purpose of a descriptive measure is to summarize what happened.

The QuikMetrix Operations Dashboard sample application is a Portal for descriptive measures.

Predictive Measures – Predictive measures represent the next step up in data reduction. Predictive measures utilize a variety of statistical, modeling, data mining, and machine learning techniques to study recent and historical data, thereby allowing analysts to make predictions about the future. Predictive

measures can only forecast what might happen in the future, because all predictive analytics are probabilistic in nature.

Prescriptive Measures – The emerging technology of prescriptive measures goes beyond the descriptive and predictive by recommending one or more courses of action - and showing the likely outcome of each decision. Prescriptive analytics is a type of predictive analytics, with the intent of a prescriptive measure to prescribe an action, so the business decision-maker can take this information and act upon it. Interestingly, a predictive measure doesn't predict one possible future, but rather "multiple futures" based on the decision-maker's actions.

Prescriptives are a very complex form of analytics because a prescriptive measure requires a predictive model with two additional components: actionable data and a feedback system that tracks the outcome produced by the action taken.

QuikMetrix currently does not provide for predictive measures because it does not have an interface for actionable data nor does it provide the feedback loop required to deliver a prescriptive solution in adherence to the definition thereof. That said, results from forecasted outcomes in the QuikMetrix sample predictive Patient Volumes application could be used as a conversation starter for prescriptive outcomes. For example, forecasted Patient Visits for the Burn Unit could be judged against staffing and/or budget levels established for any given forecasted time period for the Burn Unit. If a recommendation could be made to maintain, increase, or decrease the current staffing or budget position based on a forecasted value – a prescriptive outcome would be born.

Portal Feature Set

1. Responsive User Interface – The QuikMetrix (QM) user interface (UI) is fully responsive and adapts to varying sizes of browser real estate. The UI is designed for viewing on PC's, laptops and tablets. QM has been certified for the following browsers:
 - a. MS Internet Explorer 9+, and the MS Edge browser
 - b. Chrome
 - c. Safari
2. Reusable metadata-driven Portal accelerator for the deployment of metric-focused applications. Each application deployed is known as an InfoApp (InfoApp is an Information Builders term).
 - a. No Limits:
 - i. The QuikMetrix accelerator has no usage limits, except for those as governed by the WebFOCUS license.
 - ii. Each Client may deploy as many InfoApps as desired and to as many Users as desired, so long as the utilization is consistent with the terms of the WebFOCUS license.

- b. Customizable Solution:
 - i. The QuikMetric Portal accelerator is a code-base added to a Client's WebFOCUS libraries. QuikMetric may be extended, customized and further enhanced using the Information Builders tool set.
 - ii. QuikMetric is Not a fixed solution in a container, which would be inherently difficult to change.
- c. Metadata-Driven Solution:
 - i. The QuikMetric accelerator is a fully metadata-driven solution. This means that thru configuration rather than application development, new InfoApps and measures can be quickly and easily deployed by the Client.
 - ii. QuikMetric is currently under enhancement to deliver a formal Configuration Utility to replace the configuration spreadsheet files presently used to define metadata to the system, bringing additional efficiencies to the Client (reduced need for documentation, faster learning curve, etc.).
- d. "ETL-less" Solution:
 - i. This provides great economies because QuikMetric creates and maintains its own aggregate data mart for each InfoApp deployed.
 - ii. There are no ETL (Extract, Transform & Load) jobs and job-streams to build and maintain.
- e. Frequency of QM Repository Updates:
 - i. The QM data mart can be updated on a daily, weekly or monthly basis.
 - ii. More frequent updates are possible but customization is required.
- f. High degree of personalization:
 - i. Almost every action each User takes to tailor their QuikMetric session is saved.
 - ii. When a User returns to QuikMetric after logging-out or timing-out of the system, they are brought back with all of their settings in place.
- g. Bulk-Export
 - i. Everything a User sees within a QuikMetric Portal can be exported to PDF or Excel format.
 - ii. Other export types, such as PowerPoint, can be made available.

3. Auto-generated and auto-maintained QuikMetrix Launch Page

- a. After Users log-in to QuikMetrix, they are greeted with a Launch page that contains the InfoApps they are permitted to see. QuikMetrix security automatically determines what InfoApps to make apparent to each User.
- b. The Launch page allows for any external link to appear as well, so Users have useful reference information at their fingertips during their QuikMetrix experience.
- c. The QuikMetrix Launch page automatically adjusts to new InfoApps as they are deployed.

4. Features for Descriptive Analytics

The Descriptive Analytics accelerator provides for two types of standard Portal tabs for each InfoApp deployed and the descriptive measures they report. They are the KPI Summary tab and one or more Charting tabs:

- a. KPI Summary tab – As the title suggests, the KPI Summary tab displays each metric associated with an InfoApp in a color-coded round-edge box. Default organization is by metric Category, but the User may rearrange the metrics on the page as they see fit.
- b. Charting Tabs – In a typical QuikMetrix InfoApp, one Charting tab is created for each metric category. When a User clicks on a Category Charting tab, they have access to only the metrics associated with that category. Users can create a “mixed” tab that may contain any metric they want and from any metric category, arranged in any order they choose.

KPI Summary Tab

- a. KPI pick-list where Users choose the KPI's they are interested in:
 - i. KPI selection based on categories or BI domains (Operational, Financial, Clinical Quality, Human Capital, Satisfaction Measures, Mixed) as commonly found in healthcare.
 - ii. Hide/show KPI's at will.
- b. User may adjust the time period reported by the KPI Summary tab by selecting month and year. Beyond Time, other measure dimensions known to each InfoApp (such as Service Line) are available for filtering / selection as well.
- c. Trending arrows (color coded) by metric (up arrow / down arrow, red, yellow, green).
- d. Ability to move / arrange KPIs around with drag and drop technology.
- e. Metric Gear or Widget to control display of a metric and its attributes:
 - i. Reveal metric
 - ii. Show / hide Sparkline per metric
 - iii. Export all metrics in view to PDF (with and without Sparkline chart)
 - iv. Export all metrics in view to Excel

- f. Preserve all User preferences described above.

Category Charting Tabs

a. Chart Area:

- i. The chart area is configurable real estate, which may be different for each InfoApp depending on viewing needs of the application. For example, The Operations Dashboard now houses six chart containers (expanded from the original three charts), while the Patient Volumes InfoApp only shows one chart due to the amount of information that needs to be viewed in a single large graph.
- ii. “Hover-over” shows values and/or description behind any graph plot-point.
- iii. Expand any metric chart to full-screen view.
- iv. Export all metrics in view to PDF or EXCEL.

b. Chart Gear or Widget to control display of a metric chart and its attributes:

- i. Show / hide switch for trend-line show/hide in chart as well as the comparison of actual to budget where trend & budget info is available.
- ii. Y-Axis Minimum (Auto Calculate) – Allows narrow ranges to start charting at the low end of the range, rather than X/Y axis of 0 (e.g. If values always fall between 96 and 100, start the Y Axis at 96 rather than 0). Produces a much more useful graph.
- iii. Graph Series / X-Axis (time slice)
 - Fiscal Year, Fiscal Quarter
 - Calendar Year, Calendar Quarter
 - Month
 - Day
- iv. Dimensional Awareness
 - Time Dimension – Rolling averages (where User doesn’t have to “reset” to the current month)
 - Time Dimension – Range (drop down date ranges based on metric values)
 - Facility Dimension – slice by facility type (MMC, ALMH, TMH etc.)
 - Service Line Dimension – slice by Service Line (Burn, Cardiovascular, ENT, Gynecology, Hematology / Oncology, Medical, Nephrology, Neurology, Newborn, Obstetrics, Ophthalmology, Orthopedics, Unknown)
 - More dimensions can be added via metadata.
- v. Variety of Graph Types (visual display)
 - VLINE – Vertical absolute connected point plot graph
 - HLINE - Horizontal absolute connected point plot graph
 - VBAR – Bar graph with side-by-side bars
 - HBAR – Bar graph with horizontal bars
 - VBRSTK1 – Stacked vertical bar graph
 - VBRSTKPC - Stacked vertical bar graph with percentages
 - HBRSTK1 – Stacked horizontal bar graph
 - HBRSTKPC - Stacked horizontal bar graph with percentages

- PIE – Pie graph
- VAREA – Vertical area graph
- HAREA – Horizontal area graph
- More chart types can be added via metadata

vi. Other:

- Graph “Preview” display to obtain quick view of graph based on settings
- Ability to change graph title
- Ability to export User-selected columns
- Drill-down capability enabled for all graphs (see next section)

c. Preserve all User preferences described above.

d. Drill Down Capabilities

Each and every QuikMetrix chart is interactive and contains a drill function for the User behind each plot-point on the chart. QuikMetrix currently supports three drill actions for each plot-point:

- i. Drill to Chart – Pops the same chart the User is viewing into a new window which overlays the portal. This behavior is important so the User may drag the new window to a second or third monitor to work with the new object independently. The chart in the new window is oriented to the next level of data available (e.g. drill from Year, to Quarter, to Month, to Day all the way to detail transaction level). Each drill action will produce a new chart in a new window.
- ii. Drill to Active Report - An Active Report is a feature of the WebFOCUS BI platform. As the name implies, and Active Report responds to and proved for a great deal of User interaction. Like the chart drill, the behavior is to route the Active Report to a new window above the Portal. Some of features of an Active Report:
 - Each column can be sorted ascending / descending
 - Filter
 - Calculate values
 - Chart on drill
 - Rollup (by value, i.e. rollup days to months, months to quarters etc.)
 - Pivot tab
 - Visualize output in active report (displays contents visually)
 - Send as email
 - Export to HTML, CSV, XML
- iii. Dump to Excel – The Excel drill dumps the data behind the chart in view to an Excel file.

5. Features for Predictive Analytics

Like Descriptive Analytics, the Portal accelerator for Predictive Analytics provides for the same two types of standard Portal tabs for each InfoApp deployed and the predictive measures they report. In fact, the feature set for Predictive Analytics is an expansion of the original accelerator for Descriptive Analytics. As such, each Predictive InfoApp inherits all of the features highlighted above for Descriptive InfoApps.

New features added for Predictive Analytics:

a. Forecasting Engine

- i. The “metric type” attribute of the QuikMetrix data model was enabled so the InfoApps can distinguish a descriptive metric from a predictive metric. Throughout the InfoApps under QuikMetrix predictive measures are visually distinguished from the standard Descriptive measures.
- ii. Future values for predictive measures can be forecasted; Descriptive measures of course have no future values.
- iii. Five (5) out-of-the-box time-series forecasting models were delivered via WebFOCUS, they are:
 - Single Exponential Smoothing
 - Double Exponential Smoothing
 - Linear Regression
 - Simple Moving Average
 - Seasonality
- iv. Three (3) custom time-series forecasting models were delivered via WebFOCUS, they are:
 - Same Period Last Year – Provides a forecasted value, which is the actual value from the same period last year. Provides for an excellent base-line forecast because the values are not adjusted in any way. The model offers a simple presentation of how the metric performed in the same period one year ago.
 - Same Period Prior Years Average – Provides a forecasted value based on the 5 year average of the actuals from the same time period over the prior years selected by the User.
 - Same Period Prior Years Trend – Provides a forecasted value which is the actual value from the same period last year, subsequently adjusted up or down based on the trend as derived from the prior years selected by the User.
 - Additional custom models can be developed by Client.
- v. QuikMetrix has the capability to be enhanced to include the use of R statistical models within its forecasting engine. This future capability may be of great interest and value to Clients whose staff are familiar with the R statistical analysis software, libraries and models.
- vi. Forecasted values may be saved to the system by the User. This capability will provide for great insight down the road because as the calendar moves on, a comparison of actual to the forecasted values can be performed.
- vii. The Chart tab for Predictives has been adjusted and is now different than the Chart tab for Descriptives:
 - The Prescriptives Chart tab offers a three-tab inner container. Users will now find a tab for the metric forecast chart, a tab for the history data report, and a tab for the forecasted values report.
 - Only one measure is shown at a time so the maximum amount of screen real estate can be used for viewing the forecast chart.

b. Forecast Administration Tab

The Forecast Administration tab is restricted to a select number of Users, and the functions of this panel control the variables that are input to the forecasting engine:

- i. Predictive measure, metrics category and dimension (e.g. Service Line) the forecast should be generated for.
 - ii. The start date of the historical data to be used for the forecast (default is 5 years of history).
 - iii. The end date of the historical data to be used for the forecast (default is the last full month of data posted to the EDW).
 - iv. Save the forecasted values (Yes or No).
 - v. The model type(s) to be used to generate the forecast. The system does allow for more than one model type to be applied with forecasted values saved.
 - vi. Delete an unwanted forecast.
- c. Model Administration Tab

Like the Forecast Administration tab, the Model Administration tab is restricted to a select number of Users. The functions of this panel control the variables that are input to each model used by the forecasting engine.

In this panel the Administrator creates, from the 8 base forecasting models, new model-types that can be applied to any metric during the forecasting process:

- i. Select a base model
- ii. Add a descriptive name
- iii. Add the parameters accepted by the base model
- iv. Save the new model-type to the system

Value Beyond the Accelerator

Is there value beyond the accelerator? Yes, there is . . .

Each QuikMetrix Client may participate in a “collaborative community” of application Users. The value to members of the collaborative community is that maintenance and enhancement of the solution becomes funded from each new subscriber – so each individual Client is relieved of the financial burden of maintaining and upgrading the core software, known as the “kernel”.

The aspect of collaboration with industry peers though, is likely the most exciting benefit of entering a community of organizations using the same software, because collaboration breeds good ideas from differing perspectives. And those good ideas are generated and cycled back in to the solution in a way that can’t be done in a single participant environment.

Members of the QuikMetrix Collaborative Application Community can expect:

- ✓ Enhancement requests can be emailed to the QuikMetrix team. Selected features are worked into QuikMetrix with each new Client implementation.
- ✓ The QuikMetrix application gets better and better with each Client’s input!
- ✓ New versions of the QuikMetrix Kernel posted to the cloud after each new Client install.
- ✓ Download from the cloud to upgrade your QuikMetrix install, or contract IBI/RDC to perform the upgrade.
- ✓ Free one-year subscription to the QuikMetrix cloud for application downloads (light subscription fee required thereafter).