



Implementing Mobile BI Dashboards

with **Datazen**

Mobility Is the New Normal

"52% of information workers across 17 countries report using three or more devices for work."

(FORRESTER RESEARCH, BT FUTURES REPORT)

"90% of enterprises will have two or more mobile operating systems to support in 2017."

(GARTNER PRESS RELEASE, OCT. 25, 2012,)

"Today's tech-savvy business users want a people-centric approach to BI that allows them to access information across devices and on the go. BI adoption as a percentage of employees remains flat at 22%, but companies that have successfully deployed mobile BI show the highest adoption at 42% of employees."

(WWW.BISCORECARD.COM)

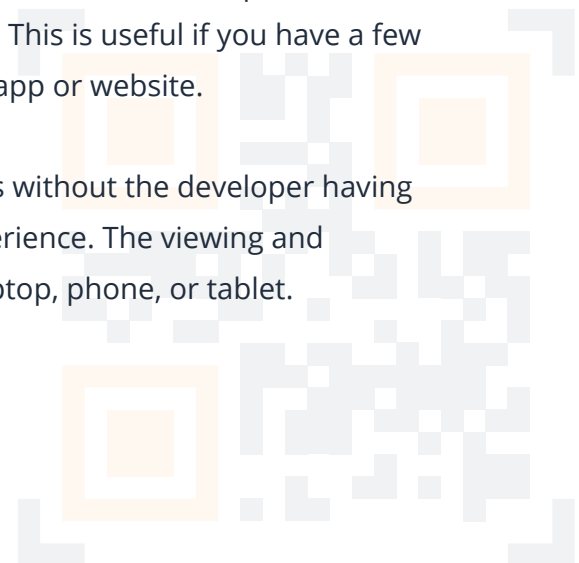
Introducing Datazen

Datazen, now a Microsoft product, creates mobile-friendly, aesthetically effective, dashboards that are also accessible on the web and easily embedded in other applications. Datazen was initially released in 2013 and gained popularity and many positive reviews. [Microsoft announced the acquisition of Datazen](#) on April 14, 2015. SQL Server Enterprise Edition customers with version 2008 or later, as well as Software Assurance, are entitled to download the Datazen Server software for free from <https://www.microsoft.com/en-us/server-cloud/products/sql-server-editions/sql-server-enterprise.aspx#sqlmobilebi>. Microsoft has stated that they will be integrating the Datazen technology into SQL Server 2016 and possibly Power BI in the future. Currently, Datazen can be used to provide the mobile BI capabilities your organization needs, particularly for on-premises deployments.

Datazen is a good fit for dashboards with known use cases, hence defined drill-through paths. This is a similar paradigm to the user experience for SQL Server Reporting Services (SSRS). You create the charts and navigators (filters) and then define the drill-through destination to be accessed when a user touches/clicks on a chart, passing the location of another dashboard or a custom URL along with any parameters previously selected by the user.

Datazen also allows you to create Key Performance Indicators (KPIs) that can be pinned to the start menu in Windows 8+ (phone or desktop) as a live tile. This is useful if you have a few KPIs that you want to monitor at a glance without opening an app or website.

The best part of Datazen is that it just works on mobile devices without the developer having to do expend much extra effort to provide a good mobile experience. The viewing and interactivity capabilities are the same whether you are on a laptop, phone, or tablet.



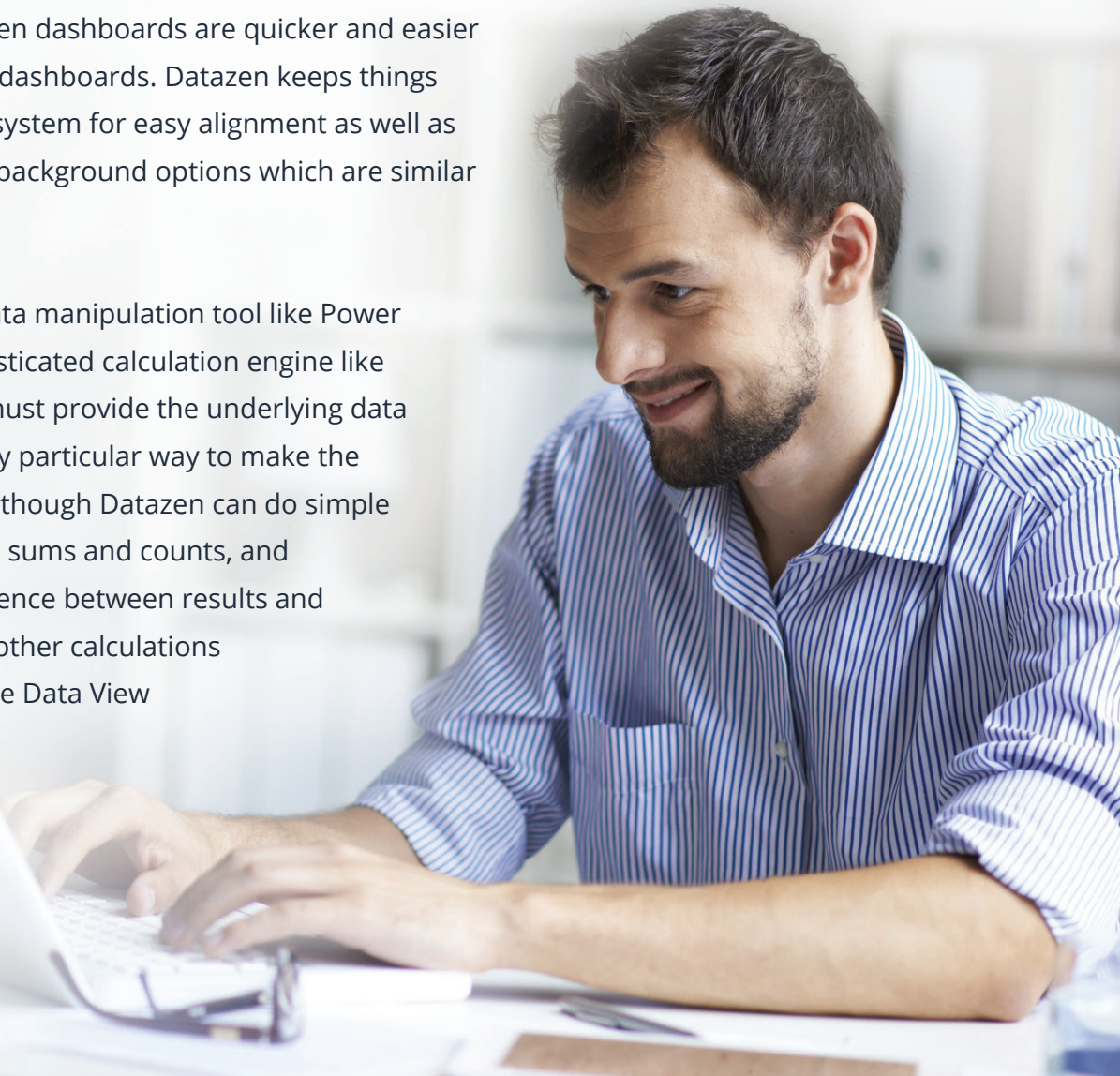
Datazen's Place in the Microsoft BI Stack

Microsoft also provides mobile capabilities through Power BI with apps for iOS, Android, and Windows, but the scope and strengths of Power BI are rather different from those of Datazen. One immediate difference is that Datazen offers an on-premises mobile BI solution (although it is possible to host Datazen on a cloud-based virtual machine, such as an Azure VM, if desired).

Datazen also isn't a replacement for SQL Server Reporting Services (SSRS). SSRS has features such as alerts, subscriptions, printing, exporting, etc. that are not available in Datazen. SSRS also allows more fine-grained control of colors and formatting and has a robust expression language for calculations. However, in order to make mobile reports in SSRS, developers would have to create and manage entirely separate versions of reports for each screen size.

Additionally, Datazen dashboards are quicker and easier to build than SSRS dashboards. Datazen keeps things simple with a grid system for easy alignment as well as color palettes and background options which are similar to Power View.

Datazen is not a data manipulation tool like Power Query, nor a sophisticated calculation engine like Power Pivot. You must provide the underlying data to Datazen in a very particular way to make the charts you want. Although Datazen can do simple aggregates such as sums and counts, and calculate the difference between results and goals in a KPI, any other calculations must be done in the Data View (source query).



Although data visualization marketing material focus heavily on data discovery and self-service business intelligence (BI), there is definitely still a place for the kinds of structured reports and dashboards created with Datazen. Predefined dashboards can ensure consistent measurement and analysis, and keep important metrics easily available to those who need them.

While Datazen dashboards could be built by a data savvy analyst/business user, Datazen is not typically thought of as a self-service BI tool. It's more likely that BI developers and analysts will use it (similar to SQL Server Data Tools or SSRS Report Builder) to build static but refreshable dashboards with the ability to filter data and drill-through to more detail. Dashboards must be published to Datazen Server in order to use them or share them with others through a mobile device.

Many organizations need mobile capabilities but are hesitant or unable to move BI to the cloud or take advantage of software as a service (SaaS) offerings.

This is the best use case for Datazen.

Use Cases for Datazen

Datazen creates mobile-friendly, structured dashboards with an appealing user experience. While it isn't the answer for every mobile BI need, it can be a great solution in the following situations:

- Mobile form factor with touch and responsive design is a priority
- Cross-platform mobile use is important
- Mobile workers are frequently offline
- On-premises only (without a cloud element to delivery) is a requirement
- Mapping capabilities are essential
- Delivery of pre-defined, structured content is appropriate
- Prototyping of dashboard layout and design is appealing

Datazen Elements and Architecture

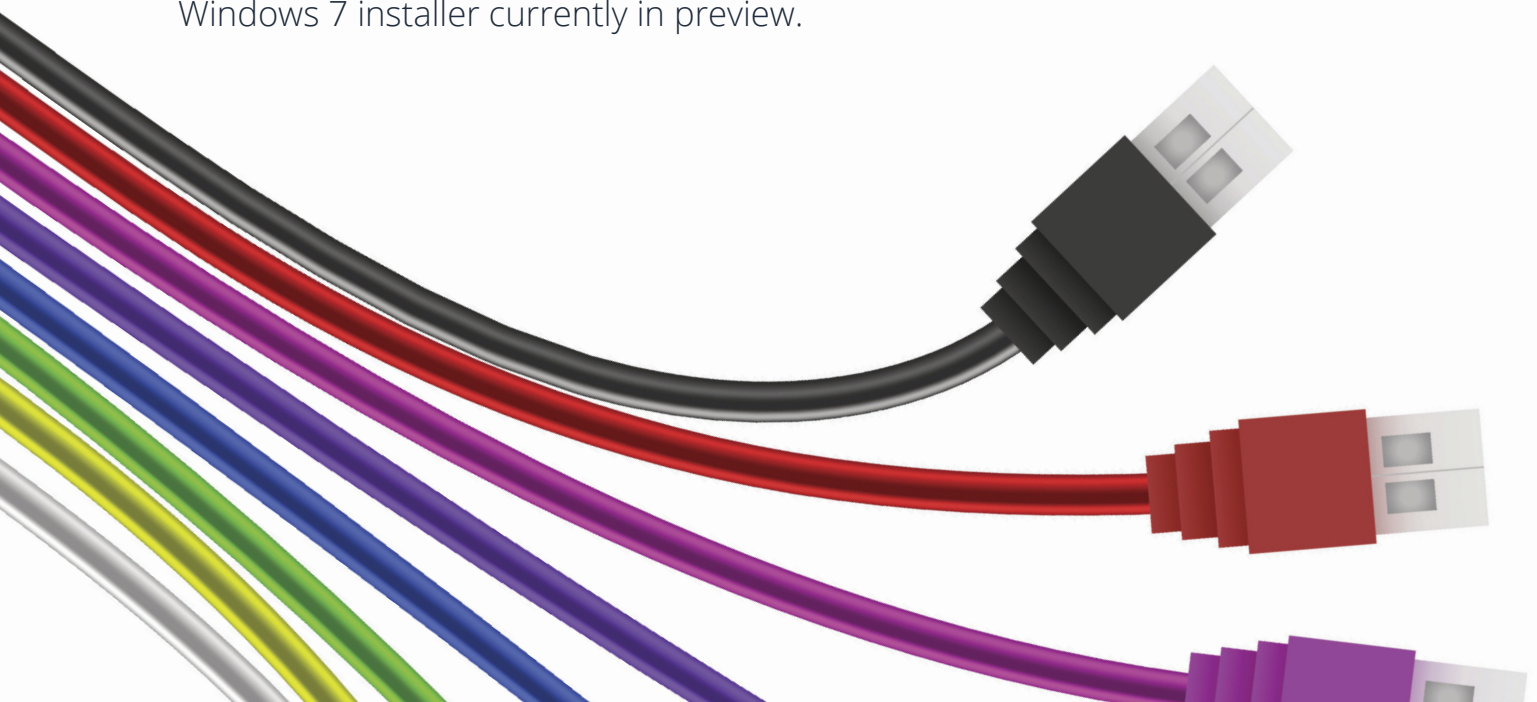
A Datazen solution includes 3 major elements:

VIEWER APPS: A Viewer app is needed for users to be able to consume and view dashboards. Viewer apps are free and available via major app markets (e.g. Google Play store for Android, Apple App Store for Apple, Windows Store for Windows Phone and Desktop). Users will connect within this app to Datazen Enterprise Server where dashboards and KPIs will be deployed. Users can also view dashboards via a web browser, though the experience is not as rich.

Datazen currently supports the following browser versions:

- IE 9+
- Chrome 3+
- Opera 10+
- Firefox 3.5+
- Safari 4+

PUBLISHER APP: The Publisher app is the required tool for creation and design of dashboards. It is a free download from Windows App store. At this time Windows 8+ is the only option for running the Datazen Publisher, but there is a Windows 7 installer currently in preview.

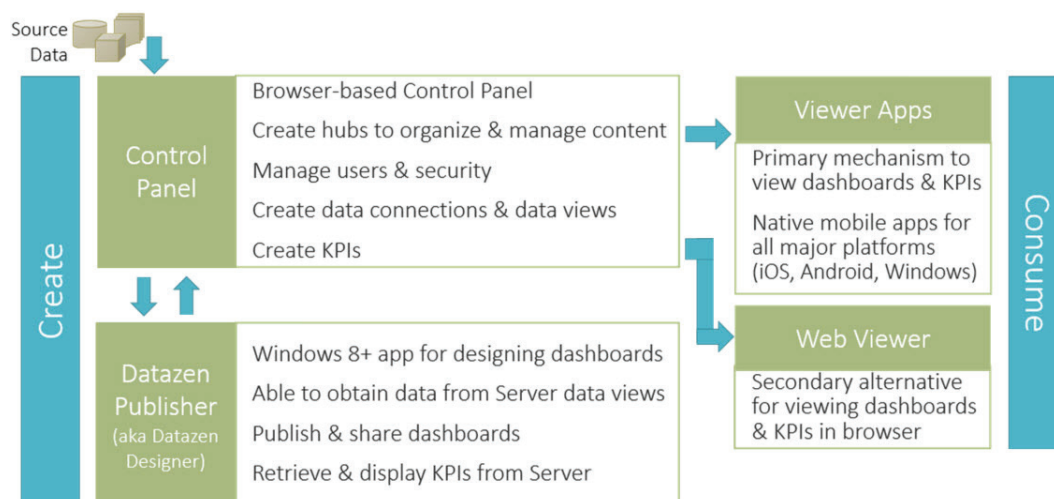


DATAZEN ENTERPRISE SERVER: The Control Panel browser interface for Datazen Server allows you to connect to enterprise data (through Data Sources and Data Views), use Active Directory (AD) or Active Directory Federation Services (ADFS) authentication, store and organize published content, facilitate mobile access, and optimize data caching to improve performance.

Viewer apps have feature parity. Dashboards can also be viewed in a web browser (rendered in HTML5), but offline access and activity streams are not available when accessed through web browser.

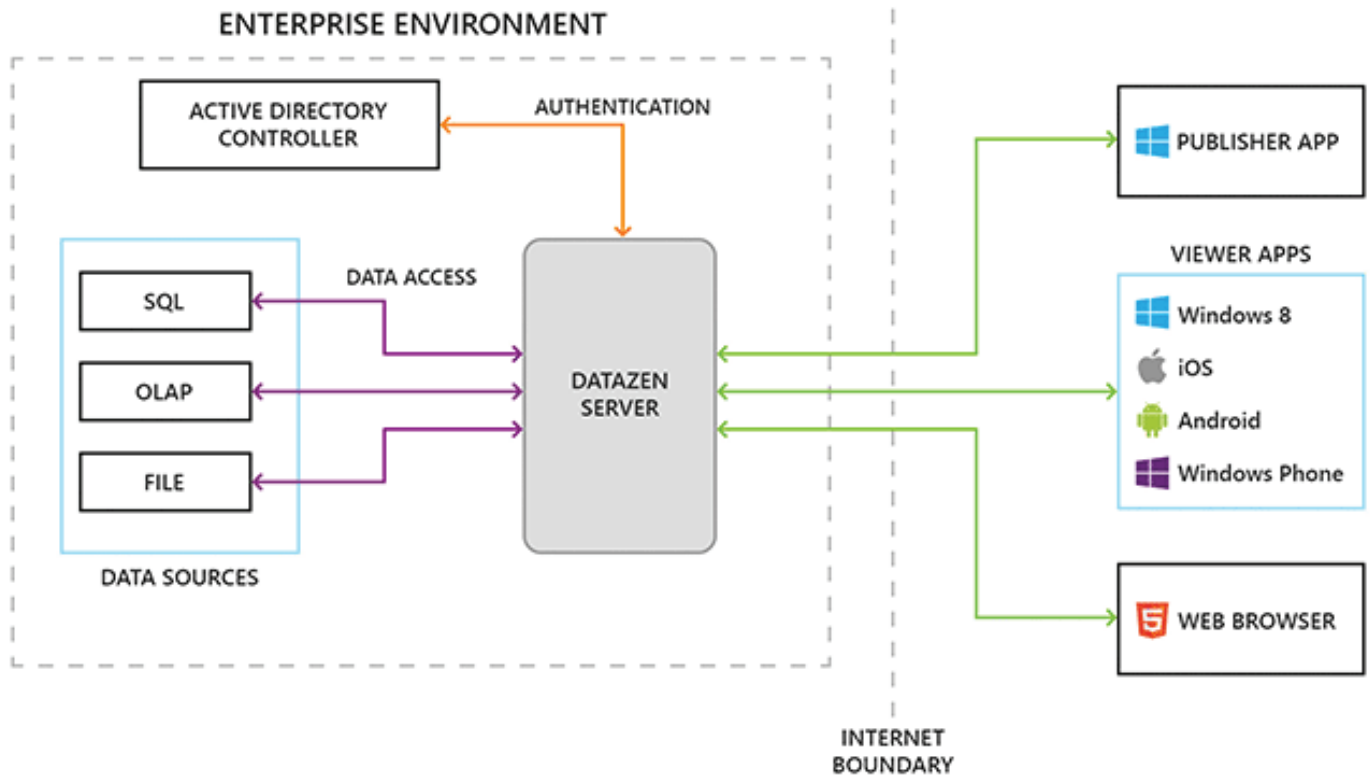
Datazen Client Feature Highlights	Windows 8 App	Windows Phone App	iOS App	Android App	Browser App
Connect to Datazen Server securely	✓	✓	✓	✓	✓
Access published dashboards and KPIs	✓	✓	✓	✓	✓
Collaborate with team members in your BI hub	✓	✓	✓	✓	
Manage multiple Datazen Server connections	✓	✓	✓	✓	
Store KPI summary data on the device for offline access	✓	✓	✓	✓	
Store dashboard data on the device for offline access	✓	✓	✓	✓	
Create and publish dashboards	✓				

The following diagram illustrates how the three elements of Datazen work together: **DATAZEN CONNECTIONS & DATA VIEWS**



Datazen Architecture

The following diagram shows the high-level architecture of a typical Datazen deployment: **DATAZEN DEPLOYMENT OVERVIEW**



Datazen Enterprise Server is typically deployed within an enterprise IT environment, integrated with Active Directory for user authentication, and connected to internal organizational data sources for data access. Client applications communicate only with Datazen Enterprise Server rather than directly with data sources.

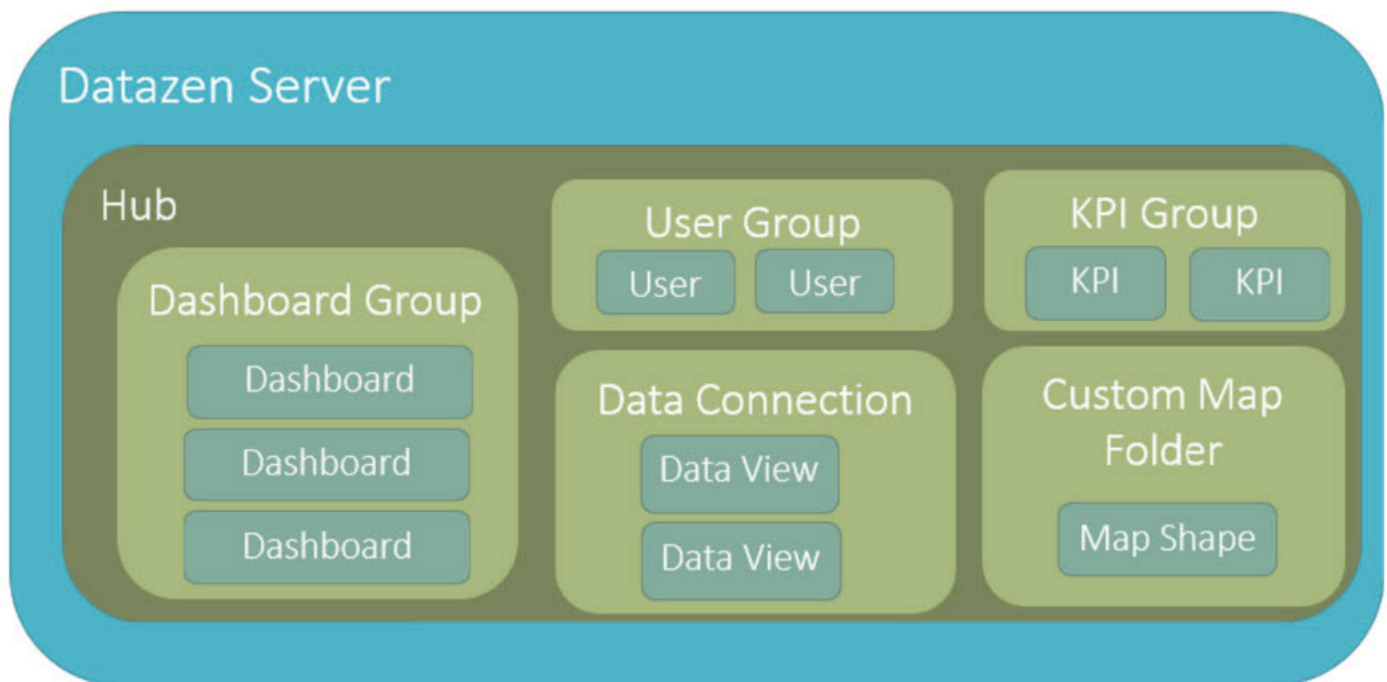
Datazen can integrate with Active Directory or Active Directory Federation Services. It also has a built-in security mechanism for authentication if AD and ADFS are not available.

Datazen Concepts and Terminology

Hubs

A Hub is a container. Datazen Server can have multiple Hubs set up to group the following into logical units:

- Dashboards
- KPIs
- User
- Data Connections
- Data Views



Dashboard Groups

Dashboard Groups are useful for creating a security boundary for a group of dashboards and/or creating a sub-grouping under the Hub for organizing related dashboards.

Permissions

Permissions can be set for the following objects within a single Hub:

- Dashboards & Dashboard Groups
- Data Source
- Permissions can be assigned to user groups or individual users
- KPI
- Activity Feed

Users

There are four types of users in Datazen:

- The Datazen Administrator has full control of all Hubs and users on the server. (Note there is only one administrator account currently available in Datazen.)
- The Hub Owner (at least one required per Hub) can add new hub members and assign permissions to view/publish to the Hub.
- The Hub Publisher can publish and view dashboards and KPIs in the Hub.
- Standard users are consumers of dashboards and KPIs and have no publishing permissions.

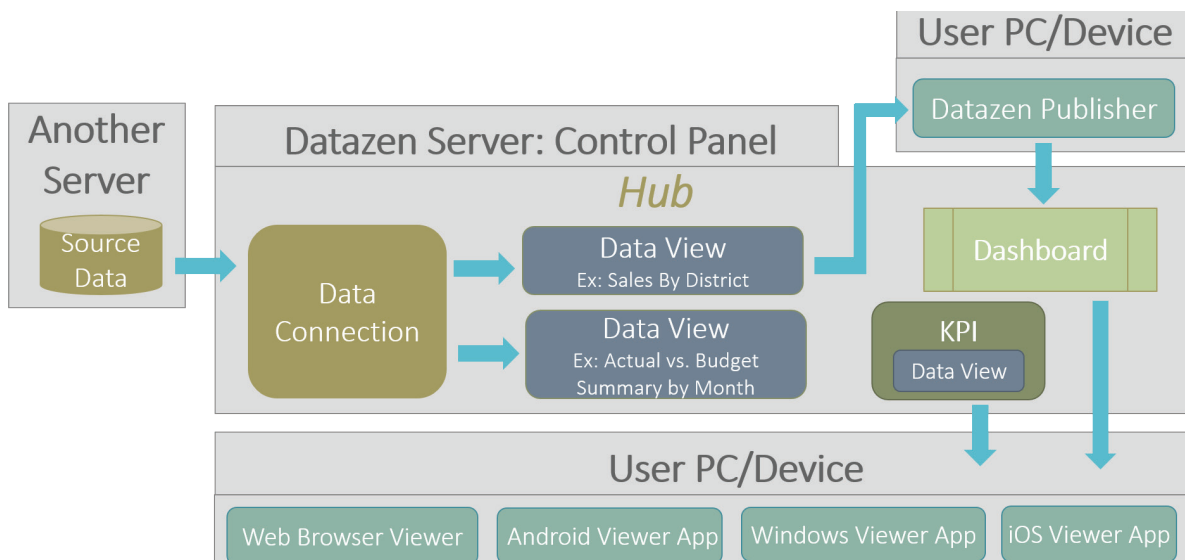
Data Sources and Data Views

Dashboards published to Datazen Server can connect to the following sources of data:

- Microsoft SQL Server
- Microsoft SQL Server Analysis Services (Tabular and Multidimensional)
- Microsoft SQL Azure
- Microsoft SharePoint lists (URL of the REST service)
- OData web service
- XML web service
- OLE DB (Oracle, PostgreSQL)
- Excel documents on network shares
- Generic ODBC data sources



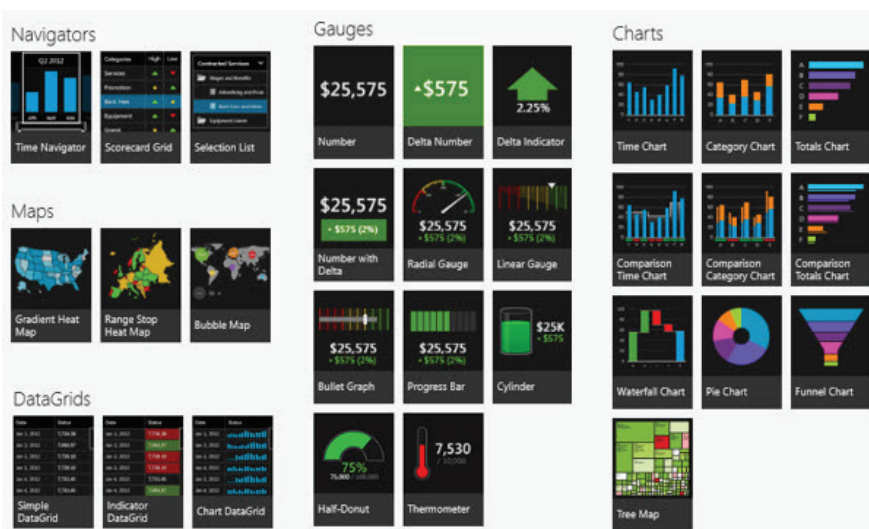
A Data View is the query which is underlying the presentation on the dashboard. Dashboards can use one or more Data Views. Data Views can be set up to retrieve data real-time, or cached with scheduled refresh. They can also be parameterized and personalized, and they can use row-level security defined in SSAS Data Sources. **DATA CONNECTIONS & DATA VIEWS**



Data Sources and Data Views are created and configured in the Control Panel.

Visual Controls

Datazen offers the following visual controls:



Visual Controls are added to a dashboard in the Publisher app. Each control provides various properties to configure presentation and layout.

Planning Your Datazen Implementation

As with any new software implementation, understanding goals, success criteria, and required resources is essential. You can start your Datazen implementation by asking these questions.

- What data is a priority to make available via mobile dashboards?
- What data sources will be used with Datazen?
- How many users do you anticipate?
- How should dashboards and users be organized and secured?
- Who will be involved in the rollout and support of Datazen going forward?
- What will be the plan to publicize the dashboards to the users to help adoption?
- What is the deadline and budget for rollout of the dashboards?
- Who will be responsible for metrics to be shown in dashboards and will confirm accuracy of data presented in Datazen?
- Who is responsible for the Datazen implementation?
- What criteria need to be met to make this implementation of Datazen a success?

Technology Requirements

All consumers of dashboards must install the Viewer applications on devices to be used to view dashboards.

Any user who will create, alter, or publish dashboards will need the Publisher app. The Publisher app is only available for Windows 8+ (with a Windows 7 installer coming soon).

Datazen Server Components

Datazen Enterprise Server is made up of web applications and Windows services. The components of Datazen Server are:

CORE SERVICE: Contains the repository (users, KPIs, permissions, etc.).

DATA ACQUISITION SERVICE: Windows service that periodically queries external sources and caches data in the Core Service Repository.

RENDERING SERVICE: Windows service for processing and rendering dashboard thumbnails.

WEB APPLICATIONS: Web API, Control Panel, and Viewer.

Outside shared cache services such as Azure Cache and Redis can be utilized with Datazen. A front-end load balancer can be used to distribute traffic to Web applications.

Depending on the number of users, the Data Acquisition Service, Web applications, and shared cache instances may need to be distributed onto separate servers.

Hardware recommendations

The estimated number of users will determine hardware needs for the Datazen Enterprise Server. First, determine the number of servers needed. If you are configuring a non-production server or you have less than 500 registered users or 50 concurrent users, you can consider setting up all components of Datazen Server on one server, though the Datazen documentation advises against a single server deployment.

There are multiple ways to split Datazen components across multiple servers. Datazen documentation assumes a concurrent user amount of 10% of the total registered user count. Below are some of the guidelines for the hardware required for the components in a scale-out implementation.

Total Registered Users	Component	CPU	Available Disk Space
Up to 650 users	Web Applications	16 GB	5 GB
Up to 1,000 users	Web Applications	16 GB	5 GB
Up to 10,000 users	Web Applications	16 GB	5 GB
Up to 7,500 users	Core Service	16 GB	250 GB+
Up to 10,000 users	Core Service	32 GB	500 GB+

If your expectations of concurrent users is much higher, the recommendation for an environment with 1,000 concurrent users is:

- 1 Datazen Server Core machine (8 CPU Cores)
- 1 Datazen Server Data Acquisition Service machine (8 CPU Cores)
- 5 Datazen Server Web API machines (8 CPU cores each, 40 total)

A rule of thumb for Web application servers is 1 CPU core per 25 concurrent users.

Team/Skills Required

Software implementation projects require both technologies and team members with the appropriate skills. Below we list roles and skills typically required to implement Datazen. Multiple roles may be filled by a single person or multiple people depending on the size of your organization and the size of the project.

Team Datazen



BI DEVELOPER: One of the hardest parts of Datazen, or any reporting tool, is to get the data prepared. A BI developer may be needed to write the SQL, MDX, or other language required to populate a Data View (i.e., the query provided to the Datazen dashboard). For example, to use SQL Server Analysis Services as a source, you will need someone with the ability to write or generate MDX. There is no interface within Datazen to assist with writing MDX or SQL. This role will need access to the Datazen Server Control Panel in order to create Data Sources and Data Views.

SYSTEM ADMINISTRATOR: The installation and configuration of Datazen may require system administrator assistance for tasks such as configuring service accounts and updating firewall settings between Datazen servers.

ACTIVE DIRECTORY ADMINISTRATOR: Configuring AD or ADFS authentication will require information (including certificate information) and assistance from someone who administers Active Directory within your organization.

DATAZEN ADMINISTRATOR: There will be a new role created after the implementation of Datazen for someone to manage security, log monitoring, and backups.

DASHBOARD AND/OR KPI CREATOR: The dashboard creator may be the same person as the BI developer but could also be designated as a separate role for an analyst. Dashboard creators will need to install the Datazen Publisher app, whereas key performance indicators are created in the Datazen Server Control Panel.

DEVELOPER: Embedding a Datazen dashboard or KPI into custom applications and SharePoint may require a developer and/or application administrator.

BUSINESS ANALYST: Someone on the project team needs to identify and define business logic, rules, and data. The best designed dashboard is of little value if it doesn't provide the relevant and accurate information that consumers need. A business analyst will also help define success criteria for dashboards.



Creating Dashboards in Datazen

Dashboards are created in the Publisher app and then published to Datazen Server to be secured and shared with other users. Data Sources and Data Views are created in the browser-based Control Panel and made available to Hub Publishers to use in creating dashboards in the Publisher app.

A Tour of the Publisher App

The Publisher app has 3 main areas: My Dashboards, Key Metrics, and Server Dashboards.

When creating a dashboard, there are 4 views available along the top left: Layout View, Data View, Dashboard Settings, and Run Preview.

Settings near the top right allow you to control the number of rows and columns displayed in each of the master, phone, and tablet views of the dashboard.

PUBLISHER APP



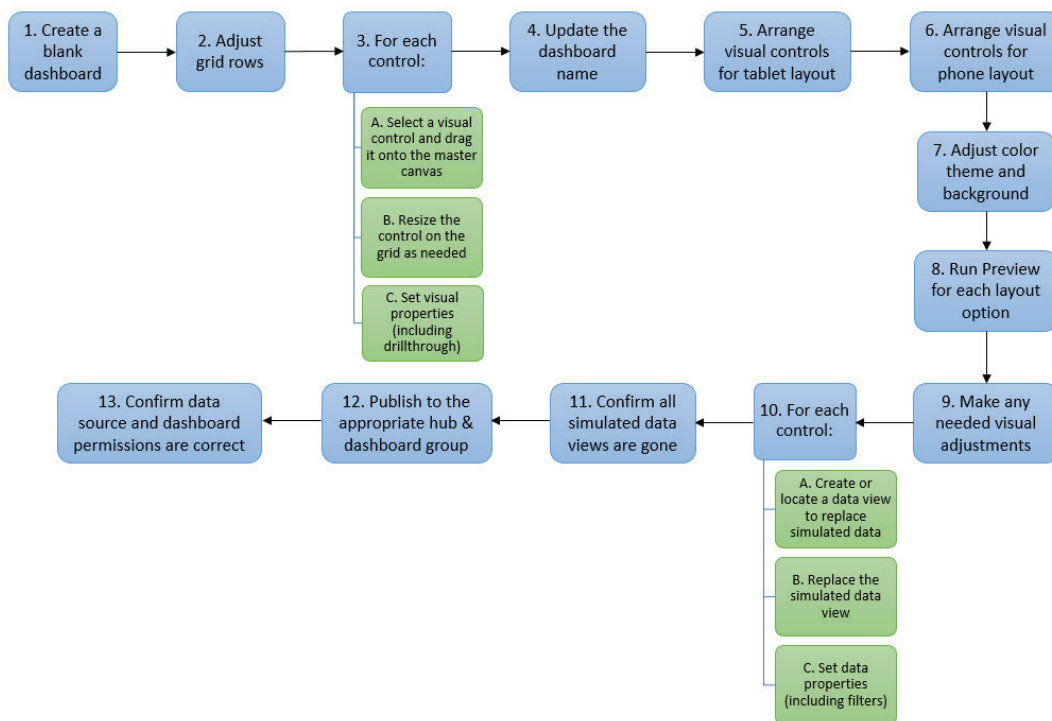
When you build a dashboard, you build the master view first. This is the view you see from your desktop in the Viewer app or on the website. Then you build the tablet and phone views by placing the existing charts onto the grid in potentially a different configuration to best fit the format. You reuse charts built on the master view in the phone or tablet view (i.e., any chart you want to use must be built on the master view).

Color palettes and background options are also found at the top right. Colors and backgrounds apply to master, tablet and phone views for a dashboard.

Dashboards can be saved locally or published to Datazen Server. Publishing to the Datazen Server is required to view a dashboard on a mobile device.

The Workflow of Creating a Dashboard

After a project plan has been created, Datazen Server has been installed and configured, and all users and Hubs have been created, then users may begin building dashboards. A typical workflow for building a dashboard in the Publisher app is shown below.



Creation of Data Sources and Data Views are a separate workflow performed in the Control Panel.

Datazen FAQ

Below is a brief list of frequently asked questions and solutions.

Publisher App

How do I access the menu options on a non-touch device? Right-click in an open space to access the Datazen menu options from the charm bar.

In the Data View I see simulated data tables. What are these and how can I get rid of them? When you drag a design element onto the canvas, Datazen automatically adds simulated data behind it. This is their Design-First approach. It allows you to design the layout of the dashboard and get consensus on its requirements before addressing the underlying queries. If you do not like that approach, that's OK. Just bring in the Data View first. As soon as the design element (like a chart or gauge) is added to the canvas, hook it up to your real data. As soon as no elements are associated to simulated data, the simulated Data Views disappear.

Why isn't the Selection List returning my data as expected when I set the data structure to Tree? The tree structure is expecting data to use a true parent-child hierarchy that uses a key to match child items to parent items. The key must be present in all other Data Views that are filtered by the selection list.

The datetime-oriented navigator filters are not working. Datazen must detect at least one datetime column in your Data View in order for related visuals and filters to work as expected. In this case, review the data type coming from the Data View.

I'm having difficulties figuring out how to set up drill-down for my dashboard. That's because Datazen does not support drill-down functionality (i.e., showing more data on the same dashboard). However, you can set up drill-through (i.e., showing more data on a different dashboard).

Mobile App Viewing

I imported an Excel file as a Data Source and created a dashboard in the Publisher app. Now I cannot seem to be able to view it on a mobile device. There are a few related things going on here. First, if you import an Excel file into the Publisher app, this is referred to working in 'standalone' mode (as opposed to being in 'server connected' mode). To view a dashboard on a mobile device, the dashboard needs to be published to the Datazen Server. Only Excel sources which are on a file share are supported in server connected mode.

The data in my mobile app appears old. Check the background sync settings in your mobile app. By default, your mobile app will do a background sync once a day. You may also wish to verify the sync network conditions setting which specifies if your device is permitted to sync on the cellular network, or Wi-Fi only.



Web App Viewing

Viewing the dashboard via a web browser does not appear to be working correctly. Make sure both cookies and JavaScript are enabled in your browser settings.



Maps

Why doesn't my data show up when I use a built-in USA map to show data by state? When using built-in maps you must spell out the state or country name in your data rather than use the abbreviation (e.g. Texas instead of TX) in order for it to match to a location on the map.

When I try to upload a custom map, Datazen Publisher hangs and never displays the map. What is causing this issue? There are a few reasons this situation can occur:

- Shapefiles cannot be larger than 500 KB in size (per file).
- Shapefile names cannot have any spaces or underscores, and both files must be named exactly the same (with the exception of the file extension). For example, you cannot have a shp file named "CustomMap_Edited.shp" and a dbf file called "CustomMap.dbf."
- There is a defect that can cause issues when developing custom maps that are uploaded to Datazen Enterprise Server. You may need to upload from a file if you encounter issues displaying your maps while using custom maps uploaded to Datazen Enterprise Server.

Why does my custom map display a blank page instead of visuals based on the data as expected?

You need to have a key in your shp file to associate your data in custom maps. This key will need to correlate to a key column in the dbf file. The key must be the first column in the dbf file or it will not find a match to your data and you will not see your data displayed correctly on the map.

Why is my data shown in incorrect locations on my custom map?

You cannot change the sort order in the dbf file when creating custom maps in Datazen. It doesn't use an shx file (an indexing file to relate data in a dbf file to the shp file that contains shape information). You must keep the dbf file sorted in the same order as the shp file as Datazen assumes the shapes and data are in the same order. Sort order is often inadvertently changed in many applications used for editing dbf files.

When I view my dashboard containing a customer map anywhere except in the Publisher app I see no data, but I can see data on the map in the Publisher app. What is causing this?

There are two potential causes:

- Adding any extra columns in the dbf file can cause issues with displaying data in reports viewed anywhere except in the Datazen Publisher. This may be resolved with a recent Datazen Enterprise Server update (version 3.0.3327). If updating to the most current version of Datazen does not resolve the issue, you can remove the extra columns and save the dbf file.
- Due to the small size requirement of shapefiles in Datazen, minimization is often required using a tool such as www.mapshaper.org. When performing the minimization, you will need to select options to repair intersections, and prevent shape removal.

Branding



When I try to implement custom branding I can't get anything to display except the background image. Am I doing something wrong?

The procedure for custom branding includes creating what is called a brand package. This brand package is a zip file that contains many icons/images for visuals in Datazen. The background image is only image that can be exposed to dashboards for custom branding at this time.

Connection Issues

Why am I receiving the error "The reason phrase must not contain new-line characters."?

We received the error "The reason phrase must not contain new-line characters." when setting up a connection to Azure Data Source. This error can occur when there is no opening set up in Azure to accept connections from Datazen server. If you received this error, check connectivity from Datazen Enterprise Server and the Data Source.



**Want to
implement
Datazen in your
organization?**

BlueGranite
can help.

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