

Data Analysis in SharePoint Pilot Report

1 Aim

The purpose of this experiment is to explore the data analysis features of SharePoint 2013 and how it can be used to visualize information in the university and give trustworthy insights to the data.

There are two major business intelligence tools currently used in the university including BOXI and Tableau. However, BOXI tends to be more specialists targeted and is not great at data visualization; whereas Tableau is good at data visualization but we don't have a tableau server which is quite expensive for license.

Based on SharePoint 2013, SQL server 2012, and end user tools including PowerPivot, Power View, Dashboard Builder, Microsoft SharePoint 2013 potentially provides a new solution for self-service Business Intelligence.

2 Background Research

2.1 Background Research on BCS and BI in SharePoint 2013

The amount of data in our world has been exploding. Data have swept into every industry and business function and are now an important factor of production. Analysing data sets is becoming a key basis of competition, underpinning new waves of productivity growth.

As a novice user of SharePoint, this experiment begins from how to connect SharePoint to external data sources, then gradually refined to Business Intelligence in SharePoint. Business Connectivity Services is a centralized infrastructure in SharePoint 2013 and Office 2013 that supports integrated data solutions. With Business Connectivity Services, you can use SharePoint 2013 and Office 2013 clients as interfaces into data that doesn't live in SharePoint 2013 itself. Business Intelligence (BI) is a set of methodologies, processes, architectures, and technologies that transform raw data into meaningful and useful information.

Therefore BCS is focused on how to connect external data to SharePoint, while Business Intelligence in SharePoint is more focused on how to present and visualize the data. Visualizing the data appropriately can help to communicate trustworthy insights or make key points. Data visualization is not only a way to present the data, but a way to explore and understand the data. People comprehend data better through pictures than by reading numbers in rows and columns.

2.2 BI tools and features

The diagram below is a technology view of Microsoft's Business Intelligence Platform.

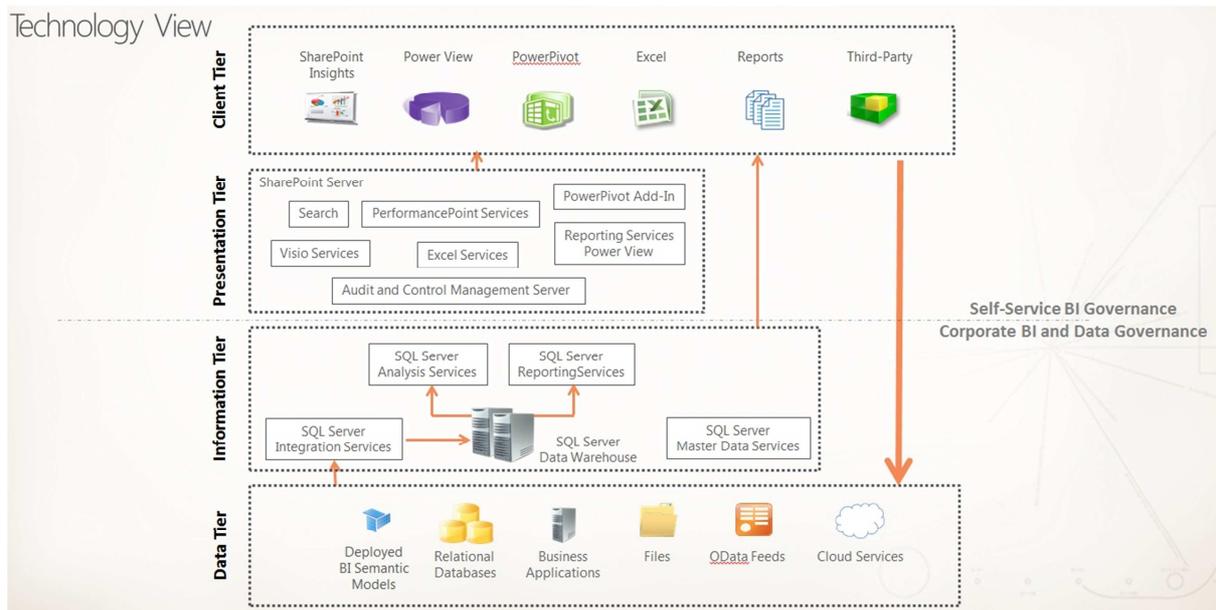


Figure1. Technology view of Microsoft's Business Intelligence Platform

Key BI Components in SharePoint:

- Excel Service: BI tool for SharePoint, "Excel Web App"

Excel service is a business intelligence tool that allows users to share data-connected workbooks across an organization. Excel workbooks can be connected to external data sources, reports created, and then the workbook can be published to a SharePoint document library. When a user opens the workbook from the document library, it is rendered in the browser by using Excel Services. The external data connection is maintained and the data is refreshed if necessary. This allows broad sharing of reports throughout an organization. Specific scenarios of using Excel Services includes: Sharing workbooks, building business intelligence (BI) dashboards, report building etc.

- PerformancePoint Services:

PerformancePoint Services in SharePoint Server 2013 is a performance management service that user can use to monitor and analyse business. By providing flexible, easy-to-use tools for building dashboards, scorecards, and key performance indicators (KPIs), PerformancePoint Services can help individuals across an organization make informed business decisions that align with companywide objectives and strategy.

- Visio Services:

Visio Services in SharePoint Server 2013 is a service application that allows users to collaborate on and view Visio diagrams. The service also enables data-connected Visio 2013 diagrams to be refreshed and updated from a variety of data sources.

Key BI tools for End user:

- Excel: Familiar Microsoft office tools, empower users with new insights
- PowerPivot: free add-in to Excel 2010 and built-in functionality of Excel 2013, a powerful data mashup and exploration tool.
- PowerView: new for Excel 2013, an interactive tool to display charts, tables, maps and slicers in one dashboard window, encouraging ad-hoc reporting.

2.3 Software requirements identification

The business intelligence tools for SharePoint Server 2013 include Power View for SharePoint, SQL Server 2012 Reporting Services for SharePoint, PowerPivot for SharePoint, Excel Services, PerformancePoint Services, and Visio Services. Depend on what services is required, there are different configuration requirements. For details, it can be found at [Software requirements for business Intelligence in SharePoint Server 2013](#).

Our in-house SharePoint Server 2013 was not configured for BI features. And because the SharePoint team was busy with other projects and we have a tight timeline too, we were seeking other possible solutions.

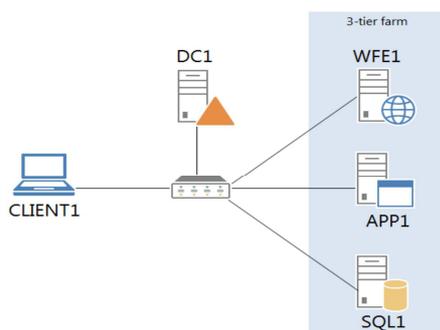
3 Testing environment installation and configuration

3.1 Cloud Service Identification

Amazon web service offers a complete set of infrastructure and application services that enable users to run virtually everything including enterprise application in the cloud. Its fully configurable servers provide the flexibility we need, so we decided to move the experiment to the cloud.

3.2 Three tier server farm installation and configuration

Setting up the testing environment in the cloud begins with the installation of three tier server farm. The following diagram describes its architecture. The server farm includes DC server (domain controller), database server (SQL server 2012), SharePoint application server (SharePoint 2013) and SharePoint Web front-end server (SharePoint 2013).



3.3 BI features configurations

Some of the BI features are then further configured based on the SharePoint 3 tier server farm; these include Excel and Excel Services, PowerPivot and Analysis Service.

A standard team site was created but with business intelligence features enabled, which include:

- It has a PowerPivot gallery which is not only a document library but also visualize the content of the excel workbook;
- Web pages embedded with excel web access part which enable user to display all or part of the excel workbook that was published to SharePoint server;
- It can support data connection to SQL server, SQL server analysis and ole DB/ODBC data sources using excel services;
- Reports, scorecards and dashboards that were created by Excel are supported. Users can view, sort, filter and interact with PivotTable reports and PivotChart reports in a browser window.

Another site is created using the Business Intelligence Centre template; this is the central location to use Performance Point service. Performance Point Services provides flexible, easy-to-use tools to build dashboards, scorecards and key performance indicators (KPIs). The Business Intelligence Centre gives a central location to store items such as reports and dashboards.

4 University Admission Data Analysis

4.1 Finding Data Source

After configuring the testing environment, the next thing is to find the data source and doing analysis. The initial data analysis was using Microsoft Sample database. There are two reasons behind it, one is that the data set is easy to get hold of; the other reason is to get familiar with the data analysis tools in SharePoint.

After a few meetings and discussions with BI team, the experiment moves on with the university admission data. This is also the dataset which is used by the Planning office for admission data analysis in Tableau. As one of the aims of the experiment is to compare the business intelligence features in SharePoint with Tableau, so it comes to a natural point to use SharePoint to produce a comparable report with Tableau using the same data set.

4.2 Tableau Comparison

Screen shots of the Tableaus report and the SharePoint report

In principle, SharePoint produces very similar functions as Tableau. In the reports above, both of them can filter data and display the corresponding changes, users can have a clear and high level overview of the admission data.

In terms of difference, because SharePoint business Intelligence is integrated with SharePoint server, it provides a more seamless user experience. From analysis of data, sharing documents and publishing dashboard, it is based on SharePoint and there is no switching between tools. Whereas, we don't have tableau server, using SharePoint as a document repository limits the potentials of tableau and limits the functions.

5 Findings

- Easy to share data: no need to email files
- Easy to maintain data: live updates and connection to external data source
- Enables Collaboration
- Empowers users: Excel/PowerPivot/PowerView Self-analysis and sharing with others
- Visualisation: Dashboards - data easier to understand – performance of business processes at a glance
- Benchmarking: Key Performance Indicator

6 Recommendations

BI / SharePoint teams:

- Configure BI features in University platform
- Use Business Connectivity Service to connect to external data source to do updates with live data
- Test it with live data

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