

WE VOTE PHASE II PREPARATION DOCUMENT

TECHSKILLS PROGRAM, BOW VALLEY COLLEGE

Phase II Preparation Document

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Summary

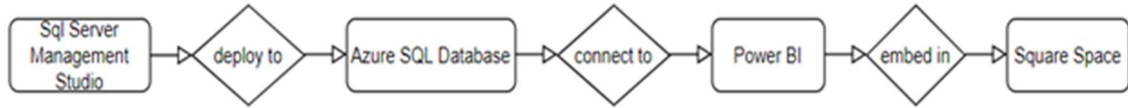
The “We Vote” industry project is designed in two phases. Phase I is to gather data and develop a functional database whereas Phase II involves building an interactive dashboard as per the client’s requirements. After completing Phase I, a subgroup of the team members worked on summarizing the requirements for Phase II and listing recommendations to ensure a smooth transition from phase 1 to phase 2.

This document is a summary of the recommendations for building and deploying the We Vote project phase 2 items. Information detailed here is categorized into 3 sections:

- Section 1: Transition Database to Azure and The Hosting Website
- Section 2: Update Database Tables
- Section 3: Dashboard Wireframe

SECTION 1: Transition Database to Azure and The Hosting Website

The following outlines the workflow process from Phase 1 of the We Vote Project to Phase 2.



Upon completion of Phase I, the “WeVote” database will be deployed from SQL Server Management Studio to the Azure SQL Data Platform.

Azure

“Azure is a family of fully managed, secure, and intelligent products that use the SQL Server database engine in the Azure cloud.” (Microsoft, 2020).

There are three options available within the Azure SQL Data Platform. The chart below provides a high-level overview of some of the different features between the three choices.

Azure SQL Database	Azure SQL Managed Instance	SQL Server on Azure VMs
Platform as a service (Paas) therefore the user is not required to schedule/handle several administration tasks for the database	Platform as a service (Paas) therefore the user is not required to schedule/handle several administration tasks for the database	Infrastructure as a service (IaaS) that allows full control over the database engine.
Different service tiers available depending on the user's business needs	Different service tiers available depending on the user's business needs	Allows the user to run SQL Server inside of a fully managed Virtual Machine (VM).
Ideal for hosting a single database	Allows the use of instance and database level features (cross-database access, SQL Agent, file stream).	User can run SQL server in addition to other applications on the same server
Downtime out of the user's control	Downtime out of the user's control	User must maintain OS and schedule downtime
Less customization for administration duties	Less customization for administration duties	Provides flexibility for administration duties
(Microsoft, 2020)	(Microsoft, 2020)	(Microsoft, 2019)

FOR THE PURPOSES OF THIS PROJECT, WE RECOMMEND PROVISIONING THE AZURE SQL DATABASE SUBSCRIPTION AS THIS WILL BE A SINGLE DATABASE WITHIN A MULTI-USER ENVIRONMENT.

The following image shows the path to initiate the migration from SQL Server. For further instruction, please refer to the “We Vote Database Training Document”.

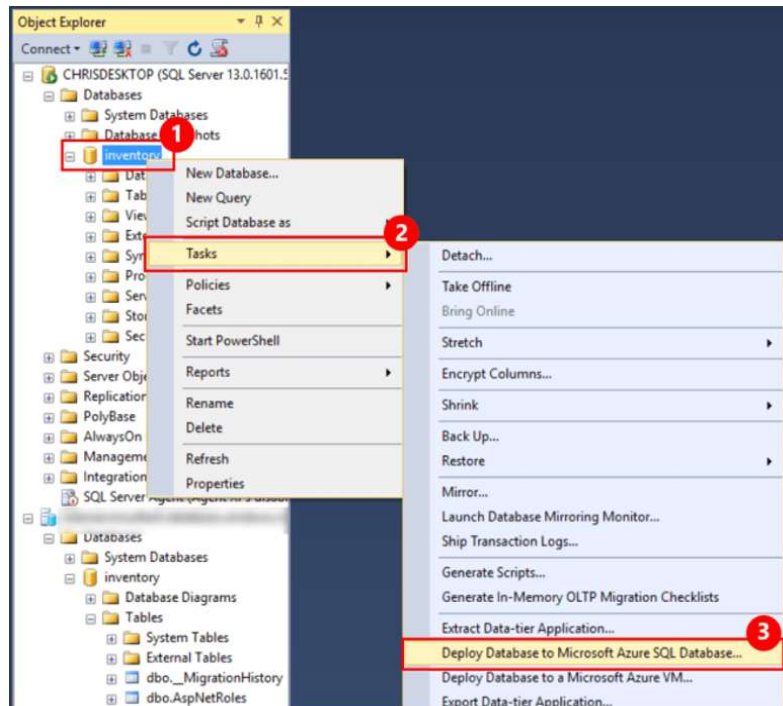


Image obtained from [Migrate Between Azure SQL Database And SQL Server | Build5Nines \(Pietschmann, 2016\)](#).

An alternative method can be used for deployment if the above migration method fails. It will require downloading the Data Migration Assistant (DMA) from the Microsoft website.

[Download Microsoft® Data Migration Assistant v5.2 from Official Microsoft Download Center \(Microsoft, n.d.\)](#)

Cost estimate for Azure SQL Database

Azure offers a free trial for 12 months with the 25 always free Azure Services, as well as 25 additional services that are free for the duration of the trial. [Create your Azure free account today | Microsoft Azure](#) The subscription comes with \$200 in Azure Credit to be used within the first 30 days of the trial. Any unused credit will expire after 30 days. Any services that have a cost associated with them, that are not included in the 50 free services for the trial, are then charged at their regular pay-as-you-go rate. There are a lot of options that will affect the cost, and the Pricing Calculator tool would help to estimate the cost of various options: [Pricing Calculator | Microsoft Azure](#)

Sales representative: Cambell Rasmusson, Email: v-carasm@microsoft.com

Power BI

After successful migration to the Azure platform, the database can connect directly to Power BI (via a live connection) to build reports and dashboards. One of the advantages of Power BI is its ability to support several browsers including:

- Microsoft Edge
- Internet Explorer 11. Some advanced features, such as lineage view, are not supported in Internet Explorer.
- Chrome desktop latest version
- Safari Mac latest version
- Firefox desktop latest version. Firefox may change the fonts used in Power BI
- (Microsoft, 2020)

Generally, what separates the Power BI desktop, which is the free version, from the Power BI pro are the features users have access to.

For the Power BI desktop you have access to the following:

- Ability to connect to 70+ data sources
- Publish to web
- Export to PowerPoint, Excel, CSV
- **Power App Visuals**

Power BI Pro can grant you the same access as a desktop version and more such as:

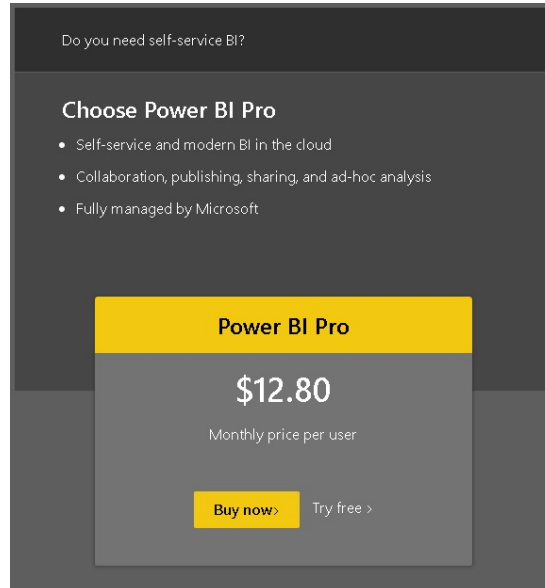
- Peer to Peer sharing
- Email Subscriptions
- Embed APIs and controls
- App Workspaces are also available where content collaboration can be done by a team or a group. Power Apps visuals can be created from this platform. What differentiates the power app created under the pro license is that multiple workers can collaborate on the same project at the same time provided they have a pro license.
- Analyze in Excel analyze in Power BI Desktop

WE RECOMMEND ACQUIRING A POWER BI PRO LICENSE.

Cost estimate for Power BI Pro

Microsoft offers the Power BI Pro License for \$12.80 per month for each user.

The license can be purchased directly from <https://powerbi.microsoft.com/en-us/pricing/>



Do you need self-service BI?

Choose Power BI Pro

- Self-service and modern BI in the cloud
- Collaboration, publishing, sharing, and ad-hoc analysis
- Fully managed by Microsoft

Power BI Pro

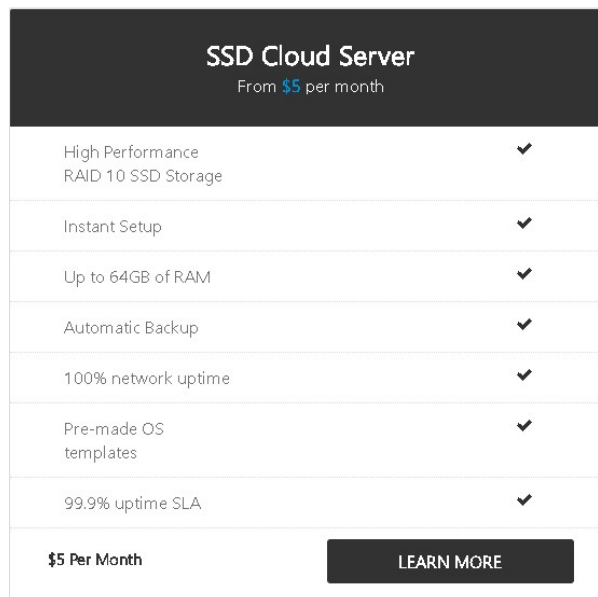
\$12.80

Monthly price per user

[Buy now >](#) [Try free >](#)

Cost estimate for Cloud Server Hosting

Use of Cloud Server Hosting is an optional recommendation to use for saving the database backup. This service can be purchased from <https://www.caccloud.com/>



SSD Cloud Server	
From \$5 per month	
High Performance RAID 10 SSD Storage	✓
Instant Setup	✓
Up to 64GB of RAM	✓
Automatic Backup	✓
100% network uptime	✓
Pre-made OS templates	✓
99.9% uptime SLA	✓
\$5 Per Month	LEARN MORE

Integration with Square Space

Once the dashboard is designed, use the “Embed report” option within Power BI to create an embed code to load the dashboard into the Square Space web page. The following two options should be considered for embedding:

Embed Report in a Secure Portal or Website

Pros:

- Information is securely located on the webpage using row-level security (RLS)
- “No code” embedding for any URL or IFRAME portal

Cons:

- Viewers need to have a Power BI Pro license, or the workspace needs to be licensed under Power BI Premium.

Please refer to the following Microsoft website for further information:

[Embed a report in a secure portal or website - Power BI | Microsoft Docs \(Microsoft, 2021\)](#)

Publish to Web Option

Pros:

- “No code” embedding
- Report updates and data refreshes will automatically be visible on the webpage once the embed code is published.
- Viewers do not require a Power BI License to view the dashboard
- Embed codes can be easily managed within the “Settings” menu of Power BI

Cons:

- Not recommended for proprietary information. Information can be viewed by anyone without authentication.
- Heavy traffic can hinder the ability of the dashboard to process queries efficiently thereby hindering the viewer’s experience. The webpage below provides options to limit this possibility under the “Heavy Usage” section.

Please refer to the following Microsoft website for further information:

[Publish to web from Power BI - Power BI | Microsoft Docs \(Microsoft, 2021\)](#)

WE RECOMMEND USING THE “PUBLISH TO WEB” OPTION TO EMBED THE DASHBOARD BEHIND THE PAY WALL.

Square Space provides several embedment options to integrate external data into the webpage.

WE RECOMMEND PASTING THE POWER BI GENERATED EMBEDMENT CODE INTO EITHER A “CODE BLOCK” OR “EMBED BLOCK” FEATURE TO POST THE DASHBOARD.

Embed blocks support HTML and JavaScript code while Code Blocks support CSS, HTML, and Markdown code and are preferred when the user would like the option to customize the code. The Code Block (advanced option) supports CSS, HTML, Iframes, JavaScript, and Markdown code and is only available for Square Space customers on the Business and Commerce plans. (Square Space, 2020)

SECTION 2: Update Database Tables

The “WeVote” database was developed using the 2017 City of Calgary’s election results (static data) along with the city’s current ward and community demographic. The demographic data would be updated once the new census information is published. Therefore, taking into matter any possible demographic changes in the future, the following table update options are set out for development consideration.

Power Apps in Power BI

Development: Build custom table update app (app form) in Power Apps to connect data stored in the database to data visualization in Power BI.

Update Process: In Power BI, import app form from Power apps to enter data, power app connects to the database to complete update, data gets updated in the database, and data is synced up in Power BI.

A step by step instruction on “How to write back into SQL database using power BI in power apps” can be found in this link: <https://www.linkedin.com/pulse/write-back-azure-sql-database-using-power-bi-apps-aneek-arora/>

Pros:

- Low code/no code service
- Able to customize forms and integrate with database
- Customized forms could also be interactive
- Power Apps visual is available by default in the Power BI service
- App users can derive business insights and take actions from right within their Power BI reports and dashboards

Cons:

- The service fee, included in Power BI service pricing
- Not ideal for bulk insert or update

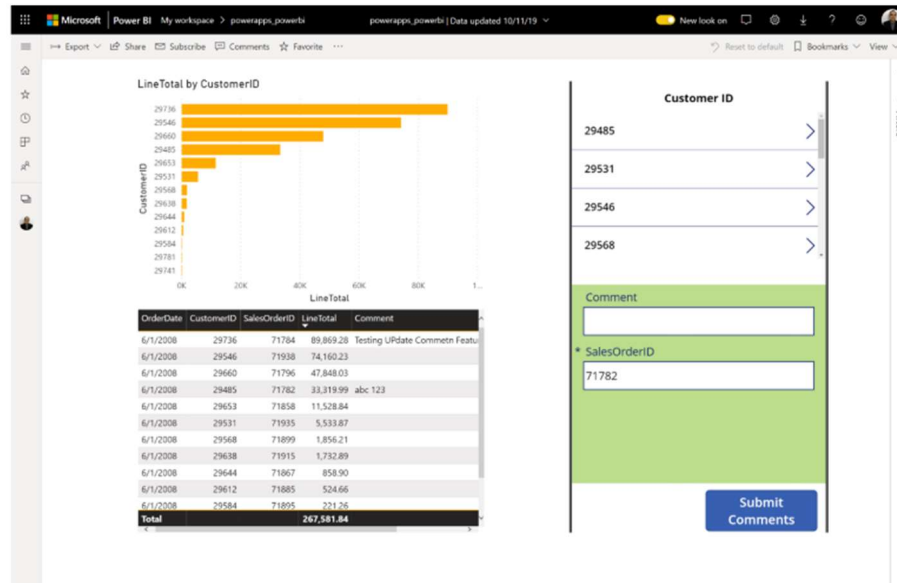


Image obtained from (Arora, 2019)

Microsoft Forms

Development: Build a custom form in Microsoft Forms, connect to the database through Power Automate for an update, and schedule weekly/monthly updates (optional).

Update Process: Answer questions in forms and submit (data entry). The response gets collected and saved in an excel file. Logic apps or power automate connects to the database to complete table update.

A step by step instruction on how an automated workflow like updating a database after MS form response is submitted can be followed on the following link. <https://support.microsoft.com/en-us/office/create-an-automated-workflow-for-microsoft-forms-dee28c00-503a-48b3-89df-91a5084e6e43> (Microsoft, n.d.)

Pros:

- No code needed
- Allows to create of customized forms for each information and table to update
- Able to integrate with Logic Apps or Power Automate to handle database update

Cons:

- The service fee, both for MS Forms and Power Automate
- Not available for everyone, only Business and Education users get free access to Microsoft Forms, and it cannot be purchase separately
- Not ideal for bulk insert or update

When a new response is submitted

Form Id

S27testForm

Get response details

Form Id

S27testForm

Response Id

List of responses... X

Get rows (V2)

Server name

Name of SQL server

Database name

Database name

Table name

Name of SQL table

Aggregation transformation

A sequence of OData aggregation transformations

Filter Query

ID eq ID X

Order By

An OData orderby query for specifying the order of entries.

Skip Count

The number of entries to skip (default = 0).

Top Count

Total number of entries to retrieve (default = all).

Select Query

Specific fields to retrieve from entries (default = all).

Hide advanced options

Table Update

Enter new demographics data to update

16. Beverly, when you submit this form, the owner will be able to see your name and email address.

Required

1. CommunityNames *

Enter your answer

2. CommunityPopulations

The value must be a number

3. Ward *

Images obtained from (Microsoft, n.d.)

SECTION 3: Dashboard Wireframe

It is critical to first understand the dashboard objectives, business goals, and success measures. (Visual BI Solutions, n.d.) Similar to any other project, building a dashboard requires a planning and preparation phase. Therefore, it is important to design a wireframe that meets the dashboard's objective.

Dashboard Objectives

The first step is to make a list of project objectives. Based on the client's requirements, the "We Vote" project dashboard has the following objectives:

- View vote counts and voter turnout for a candidate in a certain ward/voting station/community
- View community demographics such as the number (or percentages) of families with children
- View voting results in senior homes
- Assign political scale to candidates
- Based on the candidate's voting results, divide communities into left, right, or center leaning category

Dashboard Layout

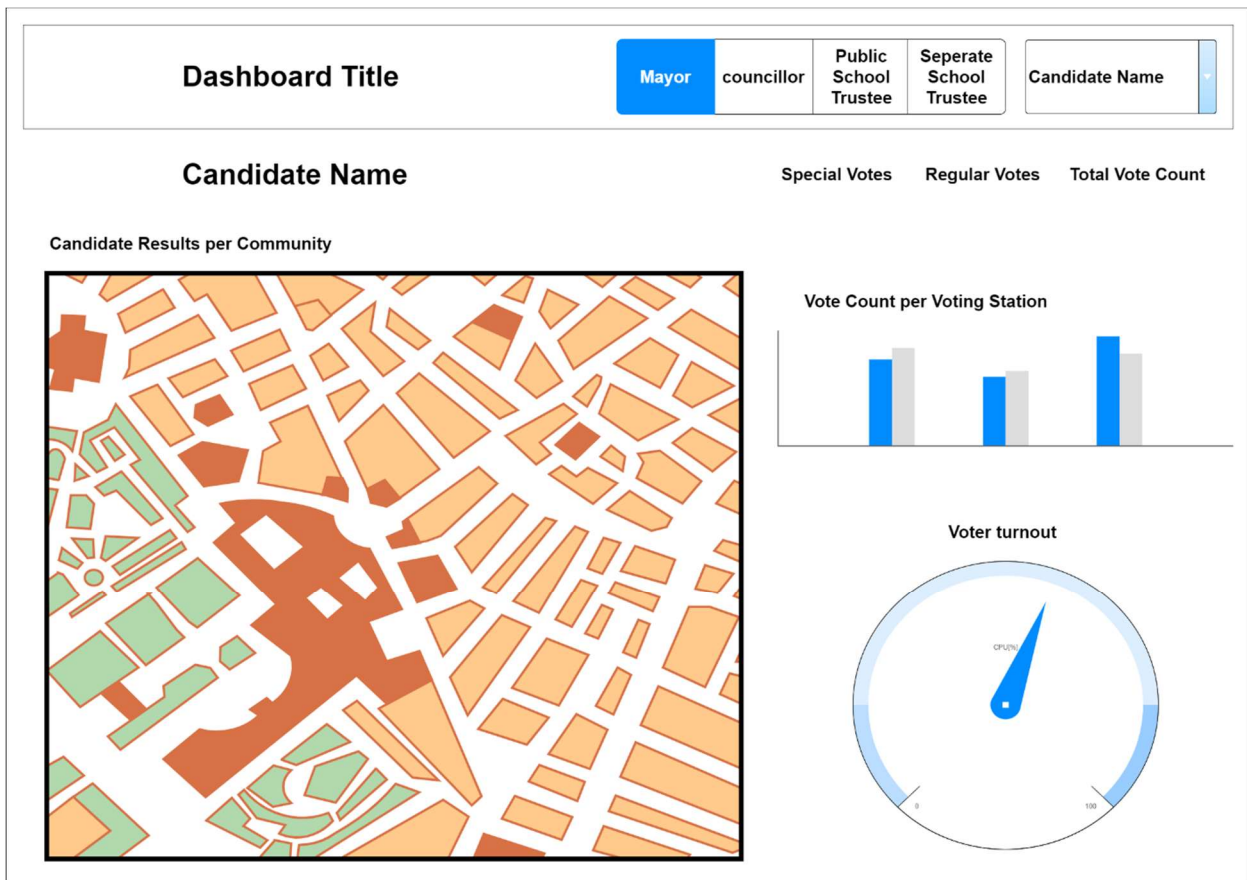
The dashboard title provides an overview of the information provided in the dashboard. It is the first impression of your dashboard and should be selected carefully. The layout of the dashboard shows the structure of the information presented. All the elements must be sized proportionally based on their level of importance. The use of Filters and slicers in the dashboard helps to focus on the objectives.

To generate a map visual, the longitude and latitude coordinates of the communities in Calgary need to be acquired. Having a map would make the dashboard more attractive and is easier to convey a message.

Use of slicers to choose certain offices and candidates are recommended. To keep the dashboard consistent, clean, and simple; the use of few colors is recommended. This helps to draw the necessary focus and contrast to the content where necessary.

Adding a layer to drill down into the community demographics could potentially make the dashboard more robust.

The following wireframe summarizes the information requested by the client. Please note, that this is just a suggestion and the final decision is made by those assigned to the second phase of the project.



The client is interested in having another dashboard where the user has an opportunity to select multiple candidates, assign political scales, and review the communities' political leaning based on the vote results.

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