Section 3 - Woom onTrax Developer Materials

Table of Contents

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3.1 Developer Materials

3.1.1 Coding I/O Standards

Overview

Our system is developed in Visual Studio Community utilizing a SQL Server database. We are currently hosting the web application on Azure. To create a comprehensive application that meets all the needs of our client, we are using JavaScript, jQuery, C#, Razor, and Bootstrap.

Logic Layer

Technologies: C#

C#

C# will be our language of choice for programming the MVC architecture, under Visual Studio Community. The language is widely used under the .NET framework, and is taught in the MIS program, which makes future iterations of the website easier to implement. A model-first approach is being used to generate database tables with Entity Framework.

1. General
    a. Name variables with camelCase
    b. Use // for single line comments and /* */ for multi-line comments
    c. Dates and Times will be captured in Central Standard Time (CST).
2. Models formatting
    a. Model classes must be saved in the Models folder
    b. Model class names and property names will be camelCase and must be representative of their role
    c. Scalar properties should be separated from navigational properties
3. Controllers formatting
    a. Controller classes must be saved in the Controllers folder
4. ViewModels
    a. use ViewModels to pass data to the views instead of ViewBags
    b. ViewModel formatting should match model formatting

Database Layer

Technologies: SQL, LINQ

SQL/LINQ

SQL and LINQ are two different languages which allow database manipulation. The same rules still apply to both. No calculations should be done in the SQL or LINQ queries or insert statements.

Presentation Layer

Technologies: HTML, Razor, CSS, JavaScript, jQuery, Bootstrap

HTML

HTML will be used to design and structure web pages. HTML code will be written to conform to the Bootstrap grid system.

Razor

With Razor we can embed server code in web pages, allowing us to design a web application that can be dynamically generated.

CSS

1. Class and id names should be descriptive of content or purpose
2. Multi-word class names and id names should be concatenated by a hyphen (-)
3. Custom classes should be written in woom.css and used as infrequently as possible to be consistent with Bootstrap

JavaScript

Custom JavaScript functions should be kept in woom.js used as little as possible to remain consistent with jQuery. Custom JavaScript will be used to provide button functionality and client-side validation.

Dates and Times will be captured in Central Standard Time (CST).

jQuery

jQuery will be used to provide client-side user interface interactivity.

jQuery files will be accessed by Content Delivery Network using this link: https://code.jquery.com/jquery-3.3.1.min.js

Bootstrap

Use the grid system to ensure proper layout on all screen sizes, resolutions, and devices

Bootstrap files will be accessed by Content Delivery Network using this link:
https://maxcdn.bootstrapcdn.com/bootstrap/3.3.7/css/bootstrap.min.css

3.1.2 Environments

Environments & Publish Slots

There are three different environments and publish slots – Production, Development (dev), and Quality Assurance (qa).

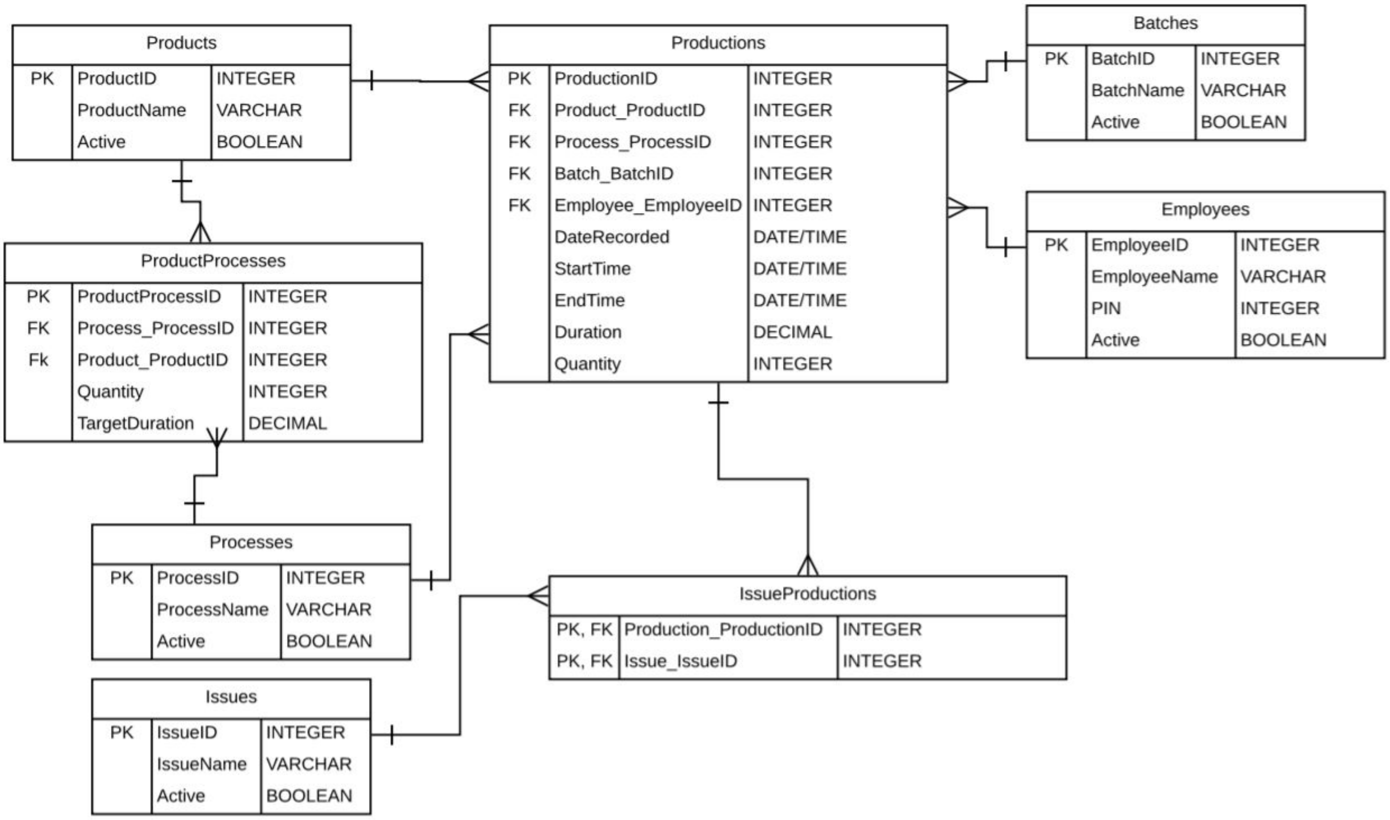
- The Production environment can be accessed at http://woomontrax.azurewebsites.net/
    - This environment is where functionality is deployed after it is done with deployment and has passed all tests. Code in this slot has first been publish to Dev during development and QA during testing.
- The Development environment can be accessed at http://woomontrax-dev.azurewebsites.net/
    - This environment is where functionality is deployed when it is partially completed or currently under development. New user stories and functionalities are deployed here for first-round developer testing and review. Upon completion this code is deployed to QA for testing.
- The Quality Assurance environment can be accessed at http://woomontrax-qa.azurewebsites.net/
    - This environment is where code is tested prior to being deployed to Production. User stories and functionalities deployed here are almost entirely completed but may require some patching or tweaking based on the feedback of the testers. Code is deployed to Production after it has passed all tests and all necessary changes have been made.

Note: These links will direct to the Production Portal. Append /Admin to any of the above URLs to view the Admin Portal in that environment.

To publish to a particular slot follow the steps below.

1. Open the project (onTrax.sln) in Visual Studio
2. Click the **Build** tab in the top ribbon and select **Publish onTrax** in the dropdown menu
3. From the dropdown menu under the Publish header select the appropriate Web Deploy slot
    a. Production: woomontrax – Web Deploy
    b. Development: woomontrax-dev – Web Deploy
    c. Quality Assurance: woomontrax-qa – Web Deploy
4. Refer to the *Publishing Web App from Visual Studio* in the **Installation Instructions** to see how to get the publish profile for the slot you are trying to publish to.
5. Click the Publish button and wait for Visual Studio to finish building and deploying the solution.

3.1.3 Entity Relationship Diagram



Products

PK	ProductID	INTEGER
	ProductName	VARCHAR
	Active	BOOLEAN

Productions

PK	ProductionID	INTEGER
FK	Product_ProductID	INTEGER
FK	Process_ProcessID	INTEGER
FK	Batch_BatchID	INTEGER
FK	Employee_EmployeeID	INTEGER
	DateRecorded	DATE/TIME
	StartTime	DATE/TIME
	EndTime	DATE/TIME
	Duration	DECIMAL
	Quantity	INTEGER

Batches

PK	BatchID	INTEGER
	BatchName	VARCHAR
	Active	BOOLEAN

Employees

PK	EmployeeID	INTEGER
	EmployeeName	VARCHAR
	PIN	INTEGER
	Active	BOOLEAN

ProductProcesses

PK	ProductProcessID	INTEGER
FK	Process_ProcessID	INTEGER
Fk	Product_ProductID	INTEGER
	Quantity	INTEGER
	TargetDuration	DECIMAL

Processes

PK	ProcessID	INTEGER
	ProcessName	VARCHAR
	Active	BOOLEAN

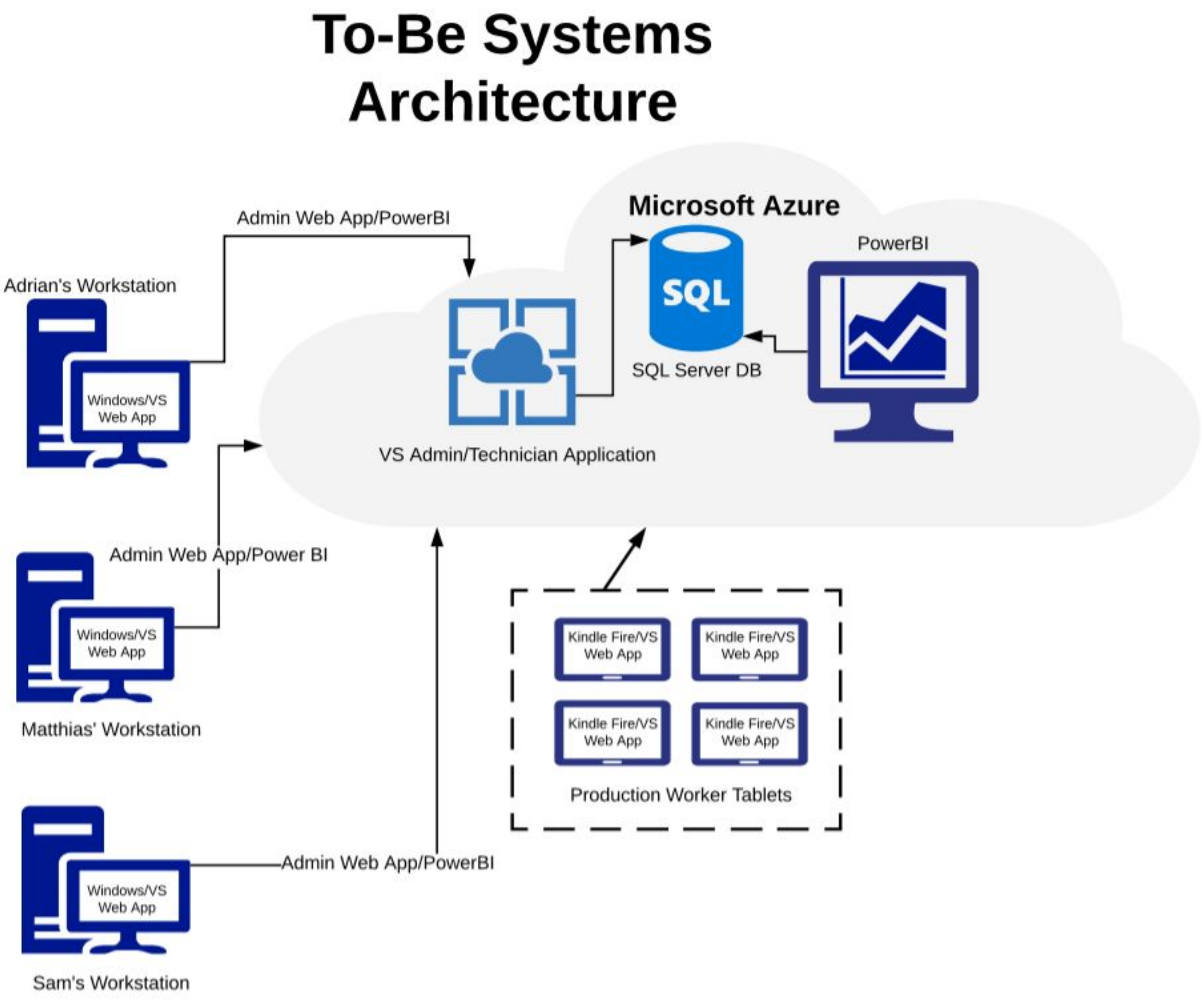
IssueProductions

PK, FK	Production_ProductionID	INTEGER
PK, FK	Issue_IssueID	INTEGER

Issues

PK	IssueID	INTEGER
	IssueName	VARCHAR
	Active	BOOLEAN

3.1.4 System Architecture



3.2 Installation Instructions

3.2.1 Microsoft Azure

OnTrax is dependent on **Microsoft Azure** cloud infrastructure. OnTrax is comprised of an Azure serverless **Web App** to run the logic and presentation as well as an instance of **Azure SQL Server** to store data. Access to onTrax is also dependent on **Web App IP restriction policies** and **SQL Server firewall rule**s within Azure. Both the WebApp and SQL Server instance are **restricted to only allow access for the the explicitly defined IP addresses.** You must have access to a valid Microsoft Azure account and log into https://portal.azure.com to complete any of the below steps.

1 - Set up for new Azure resources

- Create a new Web App
    - Press **App Services** link on *Resources Pane* located on the far left the pane
    - Click **Add** button in the *App Services* pane
    - Click **Web App** button in the *Web + Mobile* pane
    - Click **Create** button in the *Web App* pane
    - Type a unique **App name** in the *Web App create* pane
    - Select the appropriate Azure **Subscription** and **Resource Group**
    - Choose Windows as the **OS**
    - Select appropriate location (i.e. South Central US)
    - Check **"Pin to Dashboard"**
    - Press **Create** button

- Create new Azure SQL Database
    - Press **SQL databases** link on *Resources Pane* located on the far left the pane
    - Click **Add** button in the *SQL Databases* pane
    - Type a unique **Database name** in the *SQL Database* pane
    - Select the appropriate Azure **Subscription** and **Resource Group**
    - If **SQL Server** already exists
        - Select appropriate **SQL Server**
    - If **SQL Server** does not exist
        - Click **Create a new server** from *Server* pane
        - Type unique **Server name**
        - Type a new **admin username**, **password** and **password confirmation**
        - Choose appropriate location (i.e. South Central US)
        - Ensure **"Allow azure services to access server"** is selected
    - Select **"Not now"** for "**Want to use SQL elastic pool?"**
    - Select appropriate **Pricing Tier**
    - Set collation to: **SQL_Latin1_General_CP1_CI_AS**
    - Check **"Pin to Dashboard"**
    - Press **Create** button

2 - Restrict SQL Server and Web App access by IP address

- Make note of your current **external IP address**
    - Your current **external IP address** can be found by searching for “What is my IP” on *Google.com*

- Configure SQL Firewall settings
    - Press **SQL databases** link on *Resources Pane* located on the far left the pane
    - Choose appropriate SQL server **instance name** from *SQL Databases* pane
    - Click **‘Set Server Firewall’** link in *Instance* pane
    - If adding current IP address
        - Click “Add client IP” link within the *Firewall Settings* pane
    - If adding other IP address
        - Type descriptive **Rule Name**
        - Input appropriate **Start IP** and **End IP** range
            - If one IP
                - Start and End IP are the same
            - If range of IPs
                - Start IP is the lower limit of IP range
                - End IP is the upper limit of IP range
    - Click **Save** button

- Enable Web App IP Access Restriction
    - Press **App Services** link on *Resources Pane* located on the far left the pane
    - Choose appropriate App **name** from *App Services pane*
    - Select **Networking** from the *App Resources* pane
    - Select **Configure IP Restrictions** from within the *Networking* pane
    - Click **Add rule** button
    - Input appropriate IP address to restrict app access to
    - Subnet Mask may be ignored
    - Click **Add Rule** button

- Remove Web App IP Access Restriction
    - Press **App Services** link on *Resources Pane* located on the far left the pane
    - Choose appropriate App **name** from *App Services pane*
    - Select **Networking** from the *App Resources* pane
    - Select **Configure IP Restrictions** from within the *Networking* pane
    - Select the ellipsis associated with the IP access you’re removing
    - Click **Remove**
    - Confirm by clicking **Yes**

3 - Deploying onTrax to Azure

- Ensure workstation is within the Firewall rules for Azure SQL Server and IP Restriction policy of the Azure Web App

- Install **SQL Server Management Studio** (SSMS) and **Visual Studio Community Edition** onto a Windows workstation that uses an external IP address that is explicitly granted access to the SQL server instance via the firewall rules and Web App IP Restriction Policy
  - Links:coding
  - https://docs.microsoft.com/en-us/sql/ssms/download-sql-server-management-studio-ssms
  - https://www.visualstudio.com/downloads/

- **Connect SSMS to SQL Server**
  - Open SSMS
  - Choose **"Database Engine"** as the *Server Type* in the *Connect to Server* prompt
  - Enter the fully qualified **unique name** that was inputted when creating the database in the *Server Name* field
  - Choose **"SQL Server Authentication"** from the *Authentication* options
  - Type the appropriate SQL Server **Login** and **Password** as they were configured when deploying the database
  - Click the **Connect** button

- **Deploy Database Schema**
  - **Note: Executing these steps will result in the irreversible loss of all production entries. These steps should only be completed if setting up a new database or if you desire to reset all database tables.**
  - Once connected to the appropriate SQL Server instance, expand the **Databases** folder within *Object Explorer* and s**elect the appropriate database from the available options**.
  - Download onTrax SQL Scripts
    - <URL>/Admin/Home/Help
    - Click on "Download SQL Scripts"
    - Extract SQL scripts that are found in onTraxSQLScripts.zip onto your workstation
    - Open appropriate SQL script
      - **Deploy or Reset Schema:** OnTrax - Reset DB Schema.sql
      - **Seed Base Data:** OnTrax - Data.sql
  - Click **"Execute"** button from *SSMS ribbon*
    - You may ignore any error associated with dropping constraints
    - If tables were not created, ensure the appropriate database was selected from the **Databases** folder within *Object Explorer* before the script is opened

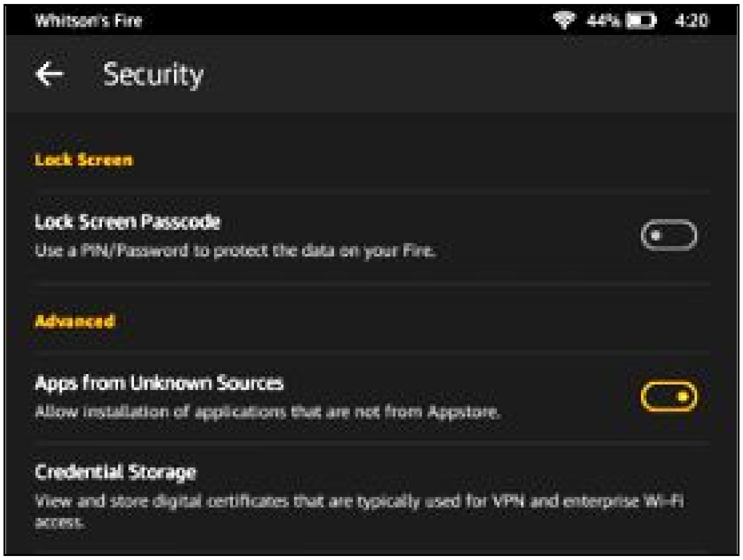
- **Publishing Web App from Visual Studio**
    - From Azure, press **App Services** link on *Resources Pane* located on the far left the pane
    - Select appropriate **instance Name** from the *App Services* pane
    - Click the **Get Publish Profile** link within the *App Service* pane
    - Save the PublishSettings file locally where it can be easily accessed
    - From Visual Studio, open the onTrax solution file
    - Right click on **onTrax** from the *Solution Explorer* and choose the **Publish..** option
    - If not prompted, click on the **Create new profile** link
    - Choose the **Import Profile** option and click **Publish**
    - Browse to the locally stored PublishSettings file, select it and click **Open**
    - Click **Publish** button

- **Assigning Database to Publishing Profile**
    - From Visual Studio, open the onTrax solution file
    - Right click on **onTrax** from the *Solution Explorer* and choose the **Publish..** Option
    - Select appropriate **Publish Profile** from the available options in the *Publish* screen
    - Click on the **Settings** link under *Summary*
    - On the left hand side of the *Publish* pop-up, select **Settings**
    - Under *Databases*, select the ellipsis to show the *Destination Connection String*
    - Enter the appropriate **Server Name**
    - Choose **SQL Server Authentication** as the *Authentication* method under *Log on to the Server*
    - Enter the appropriate **Username** and **Password** inder *Log on to the Server*
    - Select the appropriate **Database** from the available options under *Connect to a Database*
    - Click **Test Connection** button to ensure settings are accurate.
        - If Test Connection **Succeeds**
            - Click **OK** button
        - If Test Connection Fails
            - Check values you have provided within the *Destination Connection String* prompt
    - Click **Save** button

- **Restoring Backups**
    - The production instance of the WebApp as well as the onTrax database are backed up daily. You may restore either to a previous state by logging into the Azure portal (https://portal.azure.com) and following the specific instructions for each backup type.
        - WebApp: https://docs.microsoft.com/en-us/azure/app-service/web-sites-restore
        - DB: https://docs.microsoft.com/en-us/azure/sql-database/sql-database-recovery-using-backups

3.2.2 Tablet Setup

OnTrax **Technician Portal** is device agnostic and will work on any device using a modern browser connected to the Internet. However, all development and the initial deployment of onTrax was completed with the **2018 version of the Amazon Kindle 7**. While onTrax will work as-is with a stock Kindle 7 tablet without additional configuration, we strongly recommend the use of **Google's Chrome browser** and **Nova Launcher** Android app launcher. **Alternatively, any Android tablet that utilizes the Play store or any iOS-based tablet would not have these additional configuration steps.**



Lock Screen

Lock Screen Passcode
Use a PIN/Password to protect the data on your Fire.

Advanced

Apps from Unknown Sources
Allow installation of applications that are not from Appstore.

Credential Storage
View and store digital certificates that are typically used for VPN and enterprise Wi-Fi access.

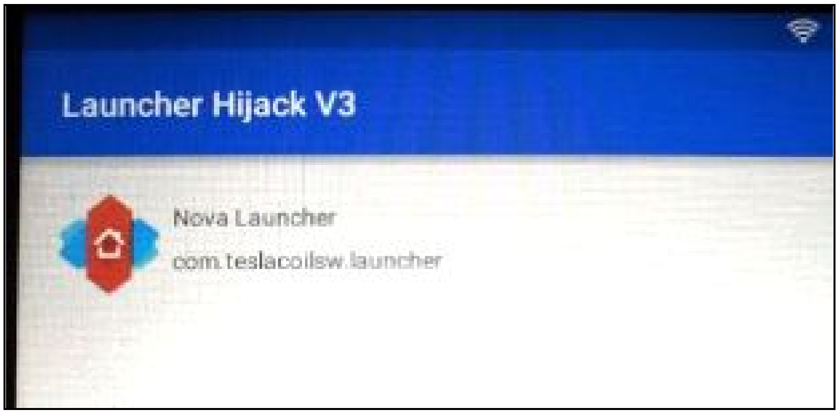
- Open the **Settings** app on your *Fire Tablet*
- Go to the *Security* section and turn "**Apps from Unknown Sources**" on

- Install Google Chrome
  - Download Google Chrome from APK Mirror
    - Link:
    - https://www.apkmirror.com/apk/google-inc/chrome/
  - Open the downloaded APK and click **Install**
  - After installation is completed, click **Done**

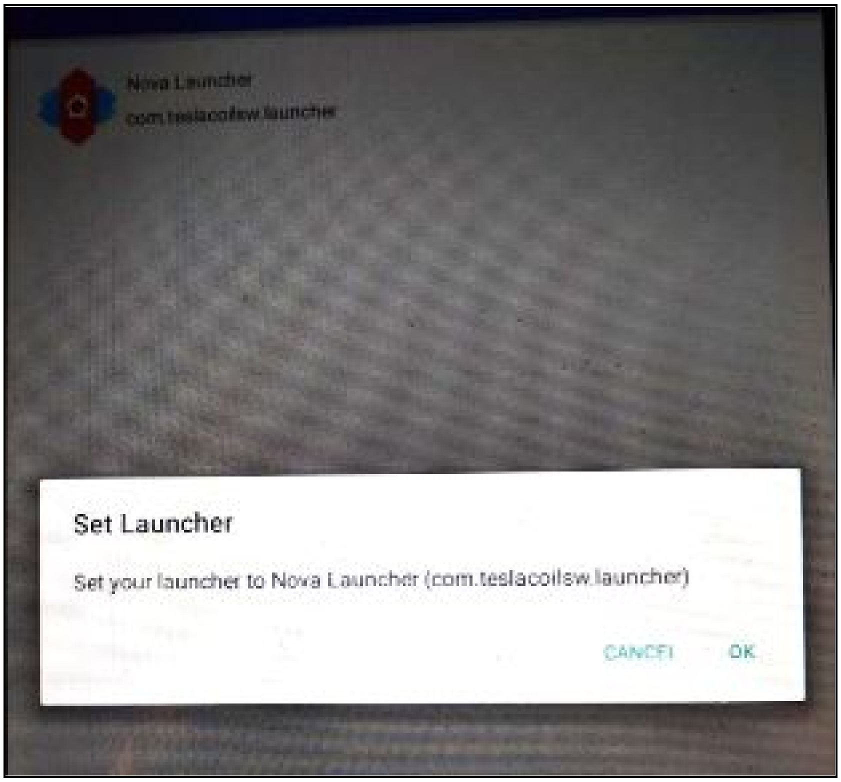
- Install Nova Launcher
  - Download **Nova Launcher** from *APK Mirror* on the tablet
    - Link:
    - https://www.apkmirror.com/apk/teslacoil-software/nova-launcher/nova-launcher-5-5-3-release/nova-launcher-5-5-3-android-apk-download/
  - Open the downloaded APK and click **Install**
  - After installation is completed, click **Done**

- Install LauncherHijack
  - Download **LauncherHijack** from *Github*
    - Link:
    - https://github.com/BaronKiko/LauncherHijack/releases
  - Open the downloaded APK and click **Install**

- After installation is completed, click **Open**
- Select **Nova Launcher** from the *list of available apps*



- Confirm setting Nova Launcher as the default launcher by clicking **OK**

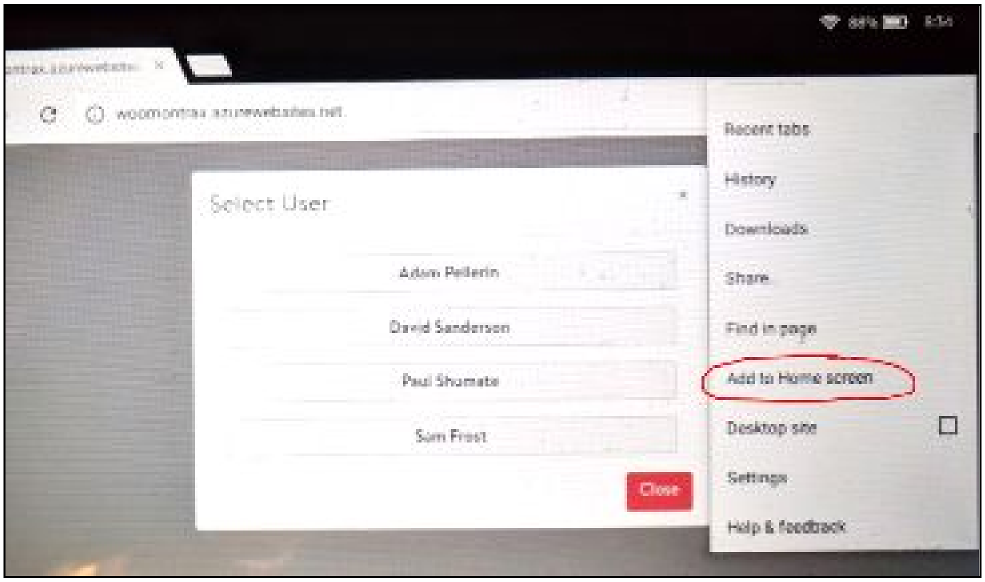


Set Launcher

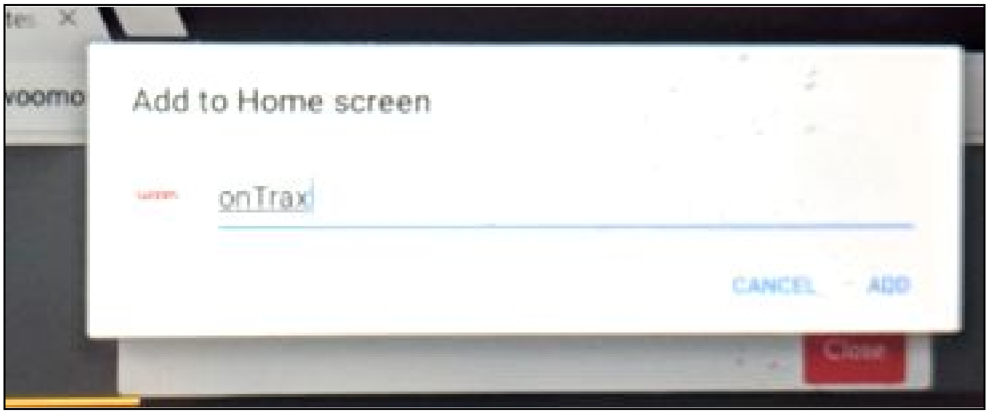
Set your launcher to Nova Launcher (com.teslacoilsw.launcher)

- Go to the *Settings app*, head to the *Accessibility* section, and scroll down to **"To Detect Home Button Press"**. Tap this option to turn it **On**.

- Add Homescreen Shortcut for App
  - Open **Google Chrome**
  - Type the URL For the webapp in the address bar
  - From the Menu ("...") Click **"Add to Home Screen"**



- Type “onTrax” as the name and click OK


Add to Home screen

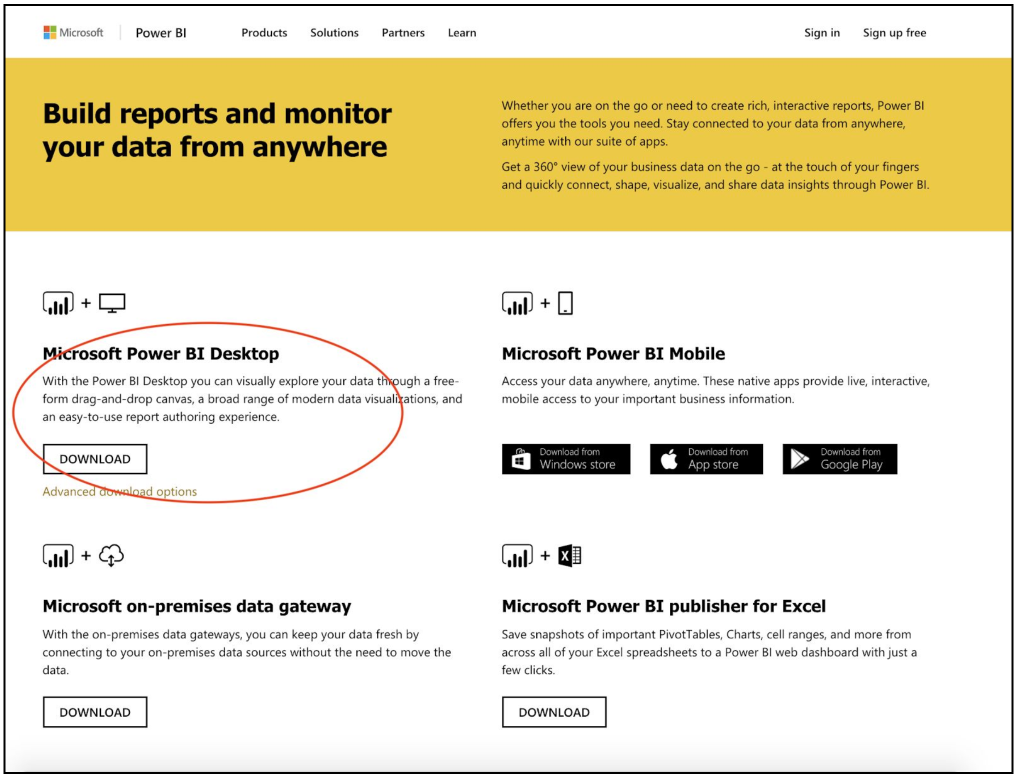
onTrax

- OnTrax will now show up as a web app icon on your Tablet’s home screen

3.2.3 Microsoft Power BI

(1) Download Microsoft Power BI desktop installation package:

Visit https://powerbi.microsoft.com/en-us/downloads/ and click the download button for Microsoft Power BI desktop.



Build reports and monitor your data from anywhere

Whether you are on the go or need to create rich, interactive reports, Power BI offers you the tools you need. Stay connected to your data from anywhere, anytime with our suite of apps.

Get a 360° view of your business data on the go - at the touch of your fingers and quickly connect, shape, visualize, and share data insights through Power BI.

Microsoft Power BI Desktop

With the Power BI Desktop you can visually explore your data through a free-form drag-and-drop canvas, a broad range of modern data visualizations, and an easy-to-use report authoring experience.

Microsoft Power BI Mobile

Access your data anywhere, anytime. These native apps provide live, interactive, mobile access to your important business information.

Microsoft on-premises data gateway

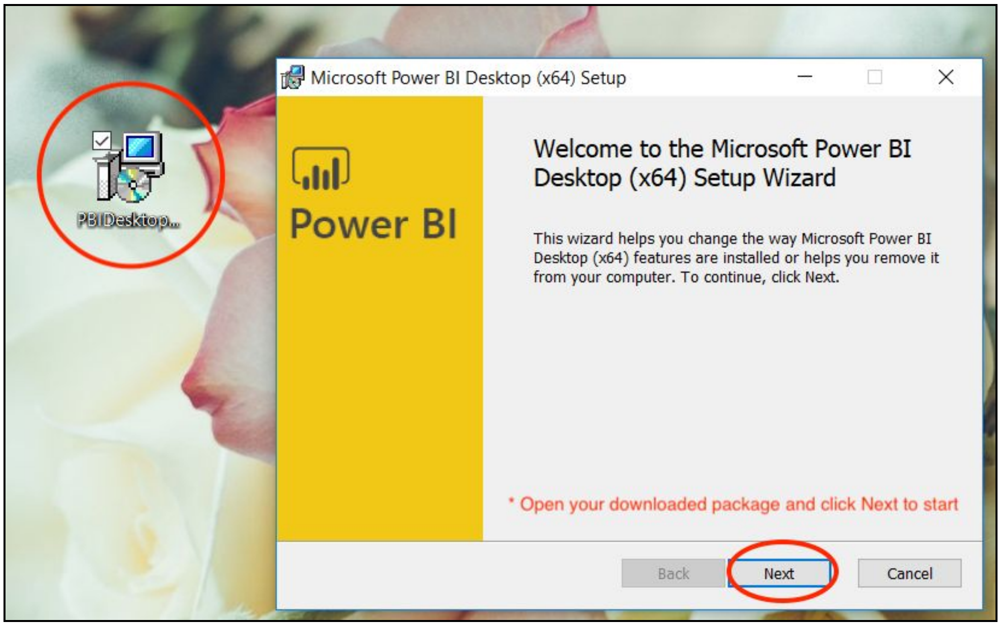
With the on-premises data gateways, you can keep your data fresh by connecting to your on-premises data sources without the need to move the data.

Microsoft Power BI publisher for Excel

Save snapshots of important PivotTables, Charts, cell ranges, and more from across all of your Excel spreadsheets to a Power BI web dashboard with just a few clicks.

(2) Open the downloaded package to install the software:

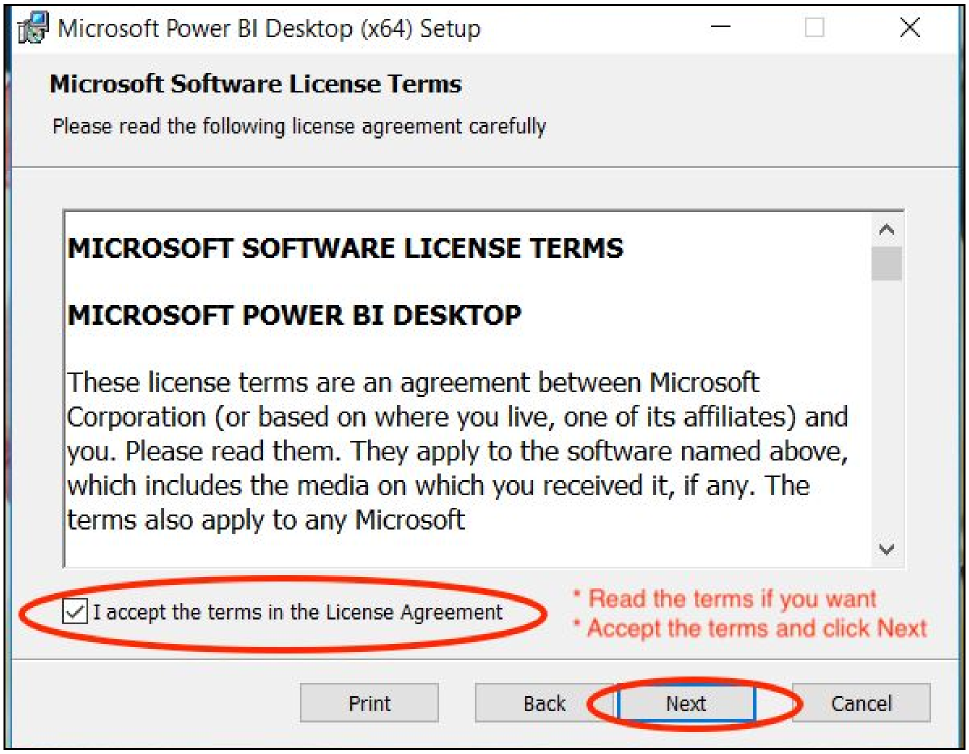
Follow the steps in the following screens to complete the installation of Power BI desktop.



Welcome to the Microsoft Power BI Desktop (x64) Setup Wizard

This wizard helps you change the way Microsoft Power BI Desktop (x64) features are installed or helps you remove it from your computer. To continue, click Next.

* Open your downloaded package and click Next to start



Microsoft Power BI Desktop (x64) Setup

Microsoft Software License Terms

Please read the following license agreement carefully

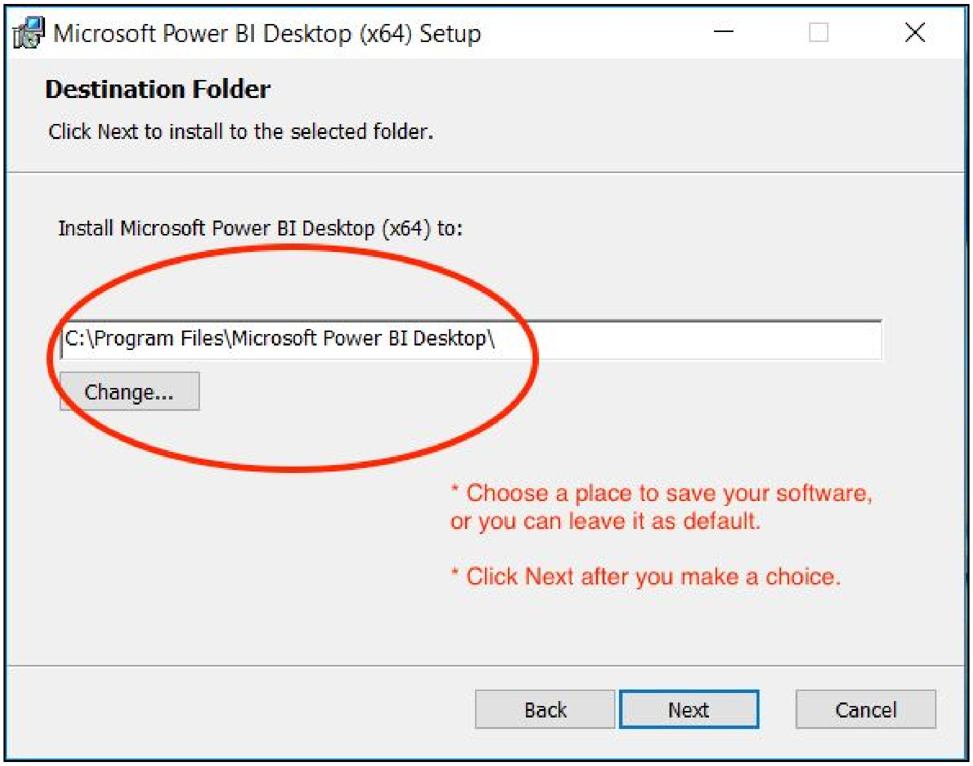
MICROSOFT SOFTWARE LICENSE TERMS

MICROSOFT POWER BI DESKTOP

These license terms are an agreement between Microsoft Corporation (or based on where you live, one of its affiliates) and you. Please read them. They apply to the software named above, which includes the media on which you received it, if any. The terms also apply to any Microsoft

☑ I accept the terms in the License Agreement

* Read the terms if you want
* Accept the terms and click Next



Microsoft Power BI Desktop (x64) Setup

Destination Folder

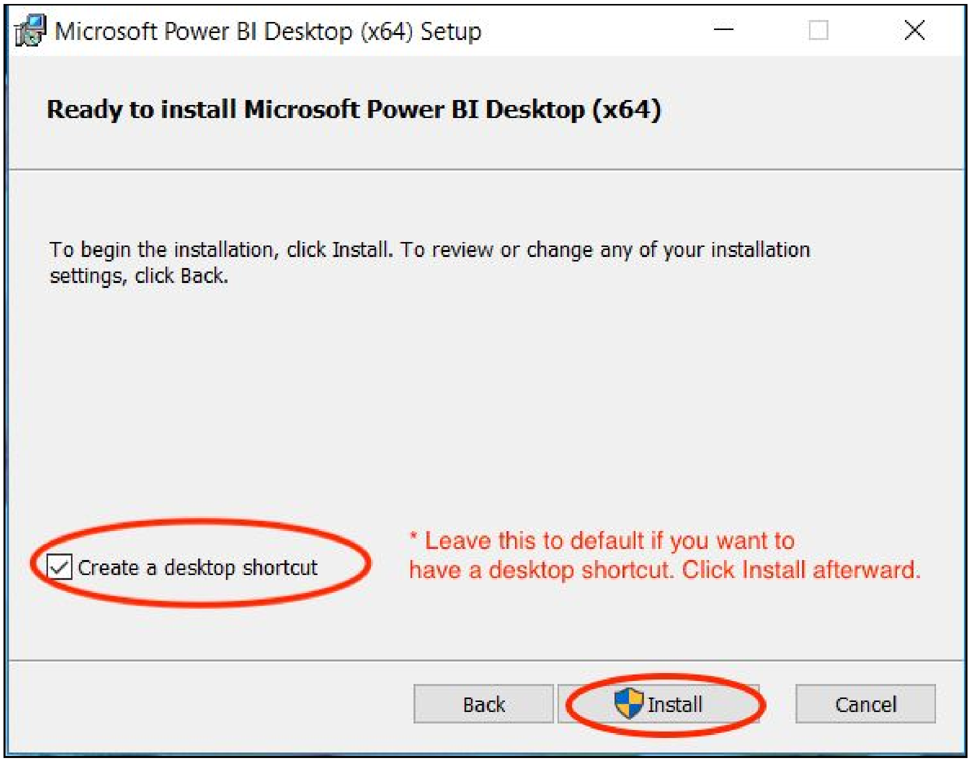
Click Next to install to the selected folder.

Install Microsoft Power BI Desktop (x64) to:

C:\Program Files\Microsoft Power BI Desktop\

* Choose a place to save your software, or you can leave it as default.

* Click Next after you make a choice.

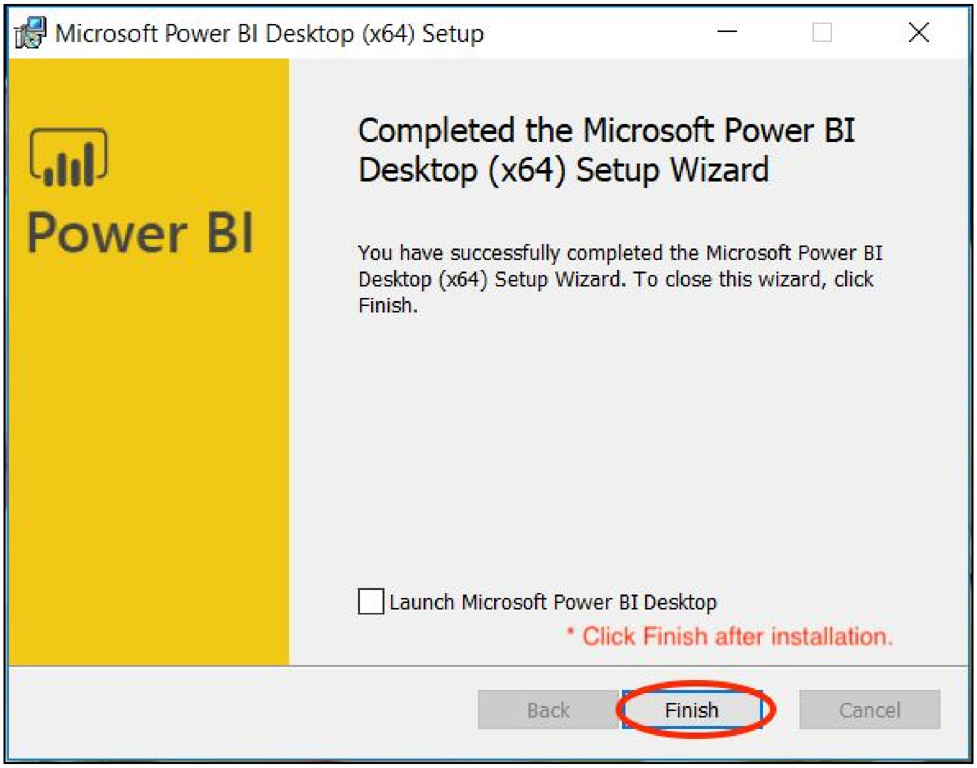


Ready to install Microsoft Power BI Desktop (x64)

To begin the installation, click Install. To review or change any of your installation settings, click Back.

☑ Create a desktop shortcut

* Leave this to default if you want to have a desktop shortcut. Click Install afterward.



Completed the Microsoft Power BI Desktop (x64) Setup Wizard

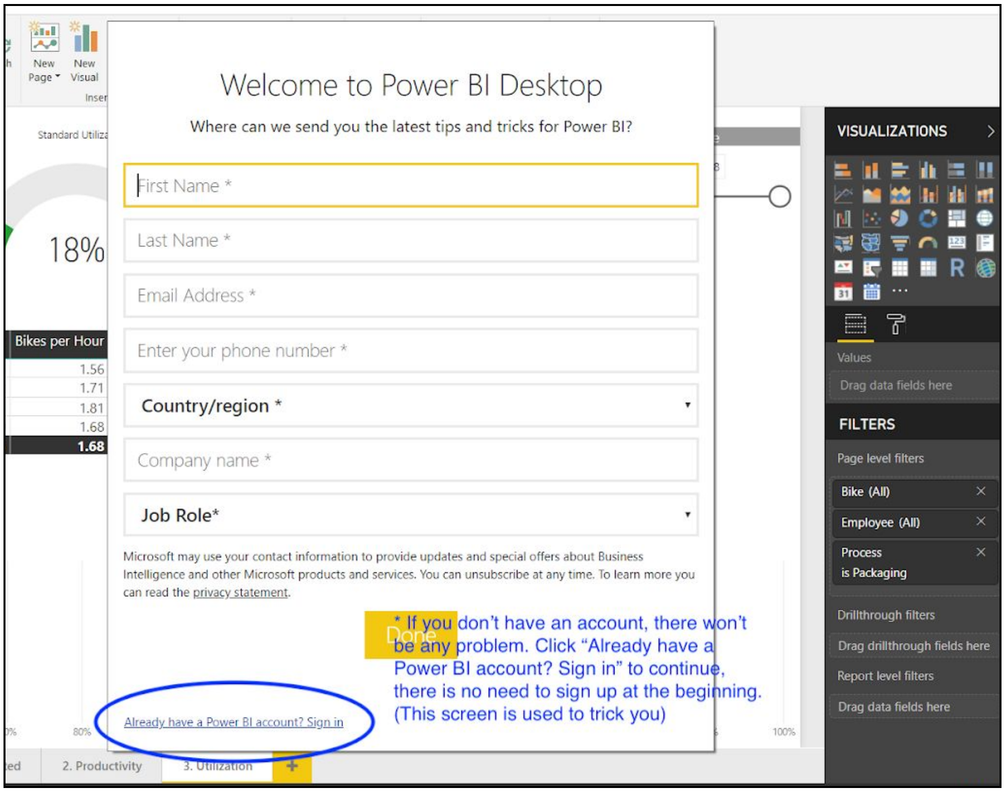
You have successfully completed the Microsoft Power BI Desktop (x64) Setup Wizard. To close this wizard, click Finish.

□ Launch Microsoft Power BI Desktop

* Click Finish after installation.

(3) Open Microsoft Power BI desktop:

There will be a "Sign up" screen once you open the software. Click the bottom left **"Already have a Power BI account? Sign in"** button to skip this step, even though you don't have an account. Afterward, a "Sign in" screen will pop up, you can close this screen to continue to the software. Then you will have full access to the software.



Welcome to Power BI Desktop

Where can we send you the latest tips and tricks for Power BI?

First Name *

Last Name *

Email Address *

Enter your phone number *

Country/region *

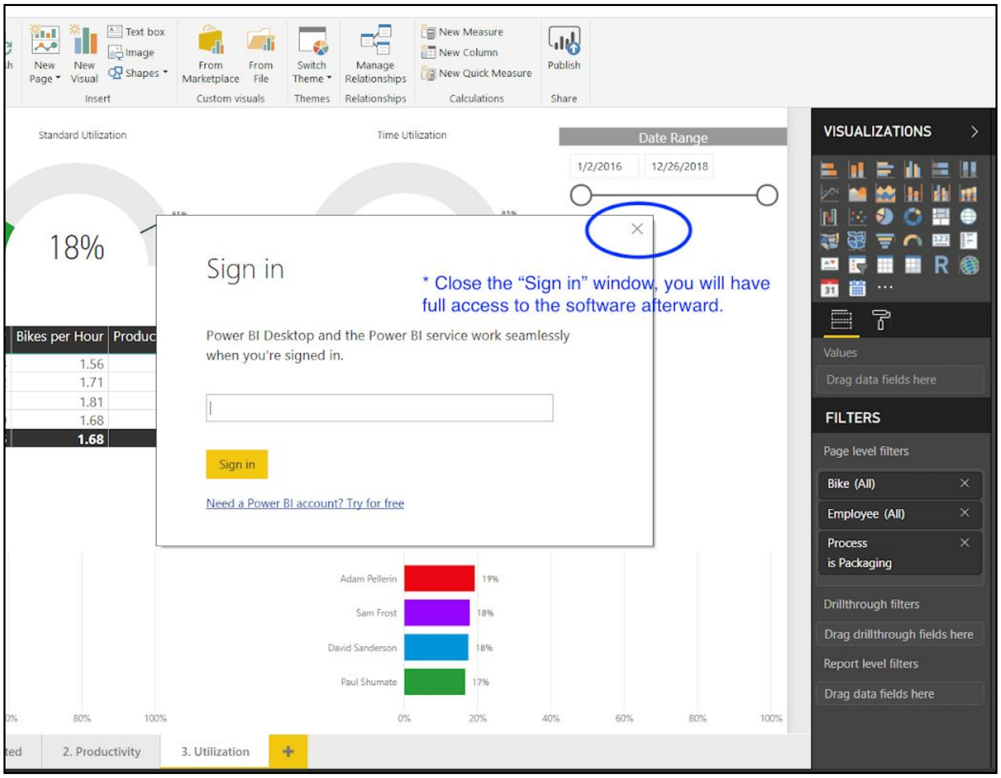
Company name *

Job Role*

Microsoft may use your contact information to provide updates and special offers about Business Intelligence and other Microsoft products and services. You can unsubscribe at any time. To learn more you can read the privacy statement.

Already have a Power BI account? Sign in

* If you don't have an account, there won't be any problem. Click "Already have a Power BI account? Sign in" to continue, there is no need to sign up at the beginning. (This screen is used to trick you)



Sign in

Power BI Desktop and the Power BI service work seamlessly when you're signed in.

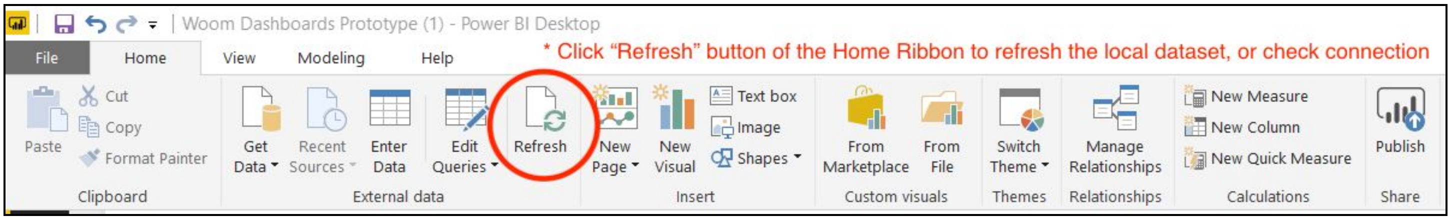
Sign in

Need a Power BI account? Try for free

* Close the "Sign in" window, you will have full access to the software afterward.

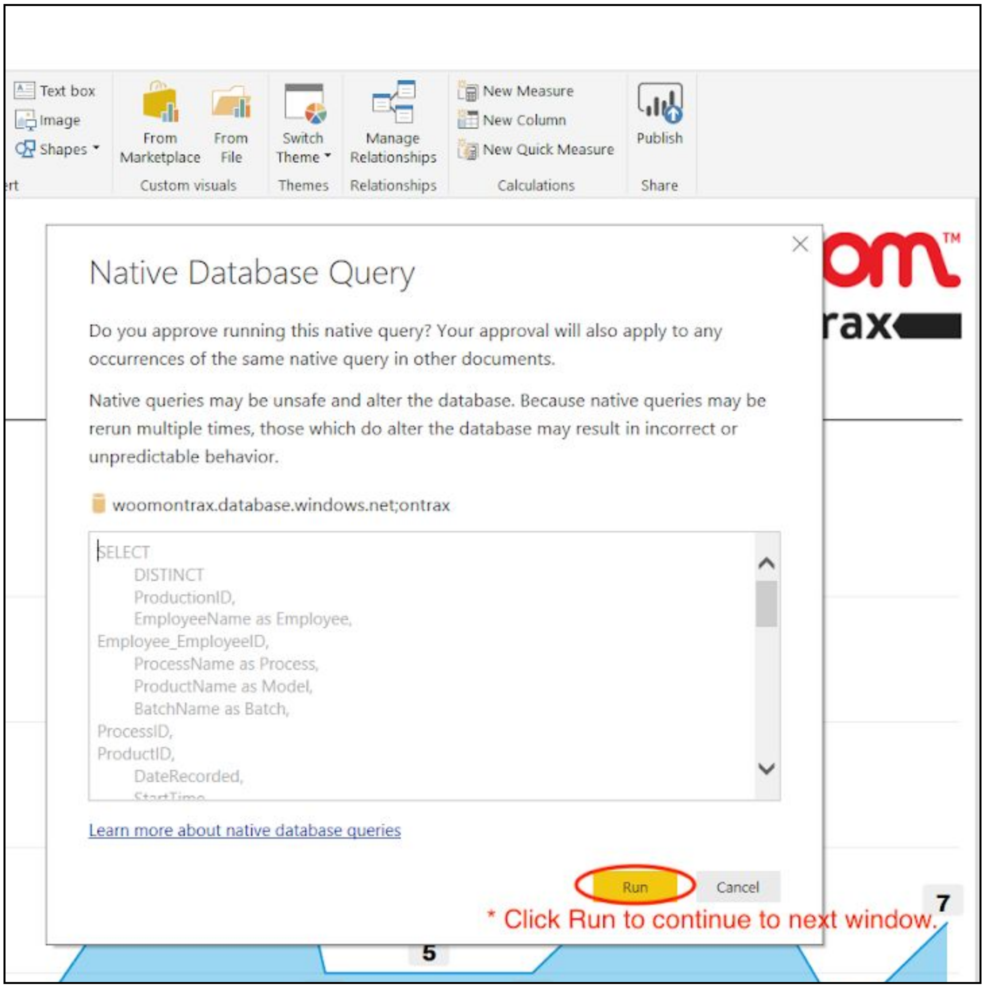
(4) Database connection in Microsoft Power BI desktop:

The **Refresh** button of the **Home** Ribbon is used to download the newest data from the database to your local Power BI file. It is a way to refresh the visualizations so that they can reflect your newest data. Click this **Refresh** button every time you open the file, or when you know there is new data recorded in the database.



* Click "Refresh" button of the Home Ribbon to refresh the local dataset, or check connection

After you click Refresh, Multiple windows will pop up, asking you to confirm whether you want to run the **Native Database Query**. Query is essentially computer code or command that is used to pull data from the database. Click **Run** for each of them so that each query can run. Your data will be refreshed by these queries.



Native Database Query

Do you approve running this native query? Your approval will also apply to any occurrences of the same native query in other documents.

Native queries may be unsafe and alter the database. Because native queries may be rerun multiple times, those which do alter the database may result in incorrect or unpredictable behavior.

woomontrax.database.windows.net;ontrax

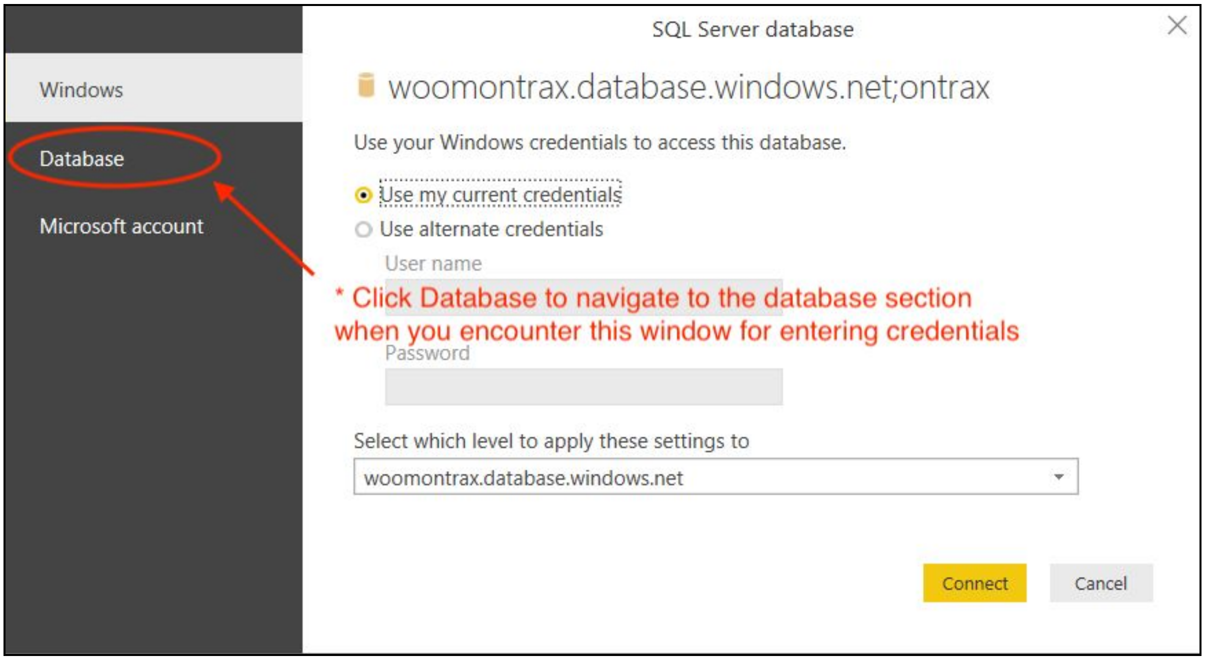
```
SELECT
        DISTINCT
        ProductionID,
        EmployeeName as Employee,
Employee_EmployeeID,
        ProcessName as Process,
        ProductName as Model,
        BatchName as Batch,
ProcessID,
ProductID,
        DateRecorded,
        StartTime
```

Learn more about native database queries

* Click Run to continue to next window.

During the first time you refresh your data:

You will be asked to input **credential** of the database during the first time you refresh your data. Your credential will be saved on your machine and you won't need to enter it again next time. When you are asked for credential, you should first navigate to the **Database** section, then you can enter the **User name** - ontrax, enter the **Password** - Woom2018, and click **Connect**. After the database was connected, just follow the steps to finish refreshing your data.



SQL Server database

woomontrax.database.windows.net;ontrax

Use your Windows credentials to access this database.

● Use my current credentials

○ Use alternate credentials

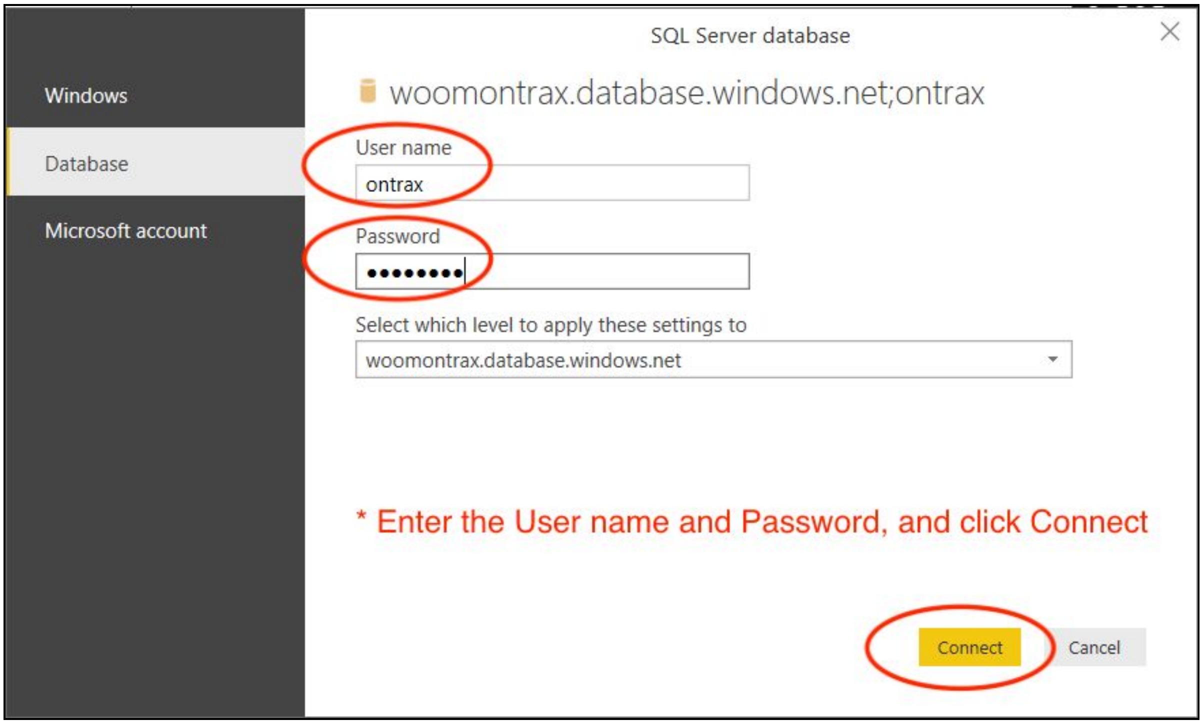
User name

Password

Select which level to apply these settings to

woomontrax.database.windows.net

* Click Database to navigate to the database section when you encounter this window for entering credentials



SQL Server database

woomontrax.database.windows.net;ontrax

User name: ontrax

Password: ••••••••

Select which level to apply these settings to

woomontrax.database.windows.net

* Enter the User name and Password, and click Connect

3.3 Operational Steps

1 - Batches management

When batches are complete and need to be removed from the technician portal, **archive** the batch.

- Click on the ***Batches* tab** to open up the accordion
- Press the **Archive** button next to a batch number to archive an existing batch ID
- You will be alerted by the system if the Archive is successful

To add a **new batch**:

- Press the **Add** button on the *Batches* tab
- **Enter** the new batch number into the text field
- If the batch number exists or has already existed, you will be alerted.
- Press the **Create** button to save the new batch number to the system
- Press the **Back** button if you don't want to add anything.

For more detail on batch management, see pages 29 – 30 in the Production Manager QRG.

2 - Employees account management

To add a **new employee**:

- Press the **Add** button on the *Employees* tab
- Enter the new employee's **name** in the first textfield and a **unique PIN** number in the second textfield
- If the PIN has been used by another employee, you will be asked to enter a unique PIN
- Press the **Create** button to save the new employee to the system

Press the **Back** button if you do not want to add a new employee

To **remove** an **existing employee** from the technician sign-in options, archive the employee:

- Press the ***Employees* tab** to open up the accordion
- Press the **Archive** button next to an employee name to archive an existing employee account
- You will be **alerted** by the system if the Archive was successful.

For more detail on employees account management, see pages 18 – 19 in the Production Manager QRG.

3 - Issues management

To **add** a **new issue** to the technician portal:

- Press the **Add** button on the *Issues* tab
- **Enter** the name for the new issue into the textfield
- If the issue option exists or has already existed, you will be alerted
- Press the **Create** button to save the new issue to the system
- Press the **Back** button if you don't want to add anything

To remove an issue from the technician portal, archive it. To **archive** an **issue**:

- Click on the ***Issues* tab** to open up the accordion
- Press the **Archive** button next to an issue to archive an existing issue
- You will be alerted by the system if the Archive is successful

For more detail on issues management, see pages 27 – 28 in the Production Manager QRG.

4 - Issues to process

Issues are linked to processes, i.e. different processes (e.g. Pre-Assembly) have different issues you can flag. To **link issues** to **processes**:

- Click on the ***Processes* tab** to open up the accordion
- Click the **Edit** button next to a process to manage the issues **for this process**
- **Select** the issues you wish to be shown on the technician portal when they are working on the process selected by clicking on all that apply
- Once you click on all the necessary issues press **Save** button
- These issues will now be the only ones shown in onTrax when that process is selected. For **example**, if you only select Handle bars and Stripped screws, and save them for Pre-Assembly, the technicians can only select Handle bars and Stripped screws as potential issues when working on the Pre-Assembly process.

Similarly, **delinking** an **issue** from a process requires that you **de-select** it in the process and press the **Save** button.

For more detail on linking issues to processes, see page 26 in the Production Manager QRG.