BI Tools: PowerBI and Tableau | Introduction

Your Guides: Atul KunKulol, Sankhadeep Dhar

Introductions

- Take 5 Minutes
- Turn to a Person Near You
- Introduce Yourself





- Introduction to Power BI and its components
- Getting Data
- Mockup PM and RM Dashboard
- Publishing and Sharing
- Best practices and its limitations
- Tableau Introduction

Business Intelligence

Business Intelligence



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Introduction to Power BI

Power BI is a dashboard tool from Microsoft that lets you connect to variety of data sources and create visually stunning and interactive dashboards.



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Power BI has 3 main elements:

- Power BI Desktop
- Power BI Service
- Power BI Mobile



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Power BI Service

Let's get started

- Signup for Power BI Service
- Datasources
 - Files
 - Databases
 - Services

Datasources

- SaaS solutions
- Azure services
- Custom content packs
- Custom connections
- On-premise SAS data
- Excel workbooks
- CSV files
- Power BI Desktop files

Content Pack Library My organization Services Files Databases Browse content packs Choose content packs Bring in your reports, Connect to live data in from online services that that other people in your workbooks, or data from Azure SQL Database and organization have Excel, Power BI Desktop you use. more. published. or CSV files. 7 7 7 7 Get Get Get Get

Get Data

Need more guidance? Try this tutorial or watch a video

Import or Connect to Data

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• Excel

• Formatted as table

• CSV

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Power BI Service

• 75 different SaaS Services



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- SQL Server
- Oracle
- And any other databases which you have access

- Power BI layout
- Menu
- Components
- Pages
- Favorites

Components

- Chart Visualizations
 - Bar chart
 - Column chart
 - Line chart
 - Are chart
 - Pie chart
 - Combo chart
 - Bubble chart
 - Scatter chart
 - Donut chart
 - Gauge chart
 - Funnel chart
 - Waterfall chart



- Text Visualizations
 - Single number card
 - Multi-row card
 - Table
 - Matrix
- Other
 - Map
 - Filled map intensity of the color
 - Slicer allows filtering
 - Image add logos or status indicator
- Custom Visualizations

Custom Visualizations

- https://app.powerbi.com/visuals/
- There is an active developer community creating a wide variety of custom visuals. You can download custom visuals and use them in your Power BI reports.
 - Custom Visuals
 - R-powered Visuals





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Let's create Reports

- Reports using Excel Data
- PMO Reports using CA PPM Data
- RM Reports using CA PPM Data
- Reports using SaaS applications Smartsheet, Service Now and Jira Data

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Investment Name	Investment Manager	Investment Type	Goal	Total Planned Cost	Total Planned Capital C
4G Upgrade Readiness	Reed, Henry	Project	Infrastructure Improvement	719,880.00	373,680
AP Architecture Consolidation	Martin, Paul	Idea	Infrastructure Improvement	500,000.00	100,000
Automated Security Enhancements	Berks, Paul	Project	Grow the Business	943,200.00	474,000
BI Analytics	Riviera, Alex	Project	Grow the Business	726,000.00	280,800
BrightStor HSM Hierarchical Storage Manag	Miller, Veronica	Asset	Cost Avoidance	30,000.00	0
BYOD Management	Tanner, Paul	Project	Cost Avoidance	343,020.00	228,600
CA Wily Introscope	Lewis, Paul	Asset	Infrastructure Improvement	20,000.00	0
CA Wily Portal Manager	Lewis, Paul	Asset	Infrastructure Improvement	175,000.00	125,000
Client Services Datamart	Martin, Paul	Project	Infrastructure Improvement	656,400.00	247,200
Cloud Computing Enhancements	Martin Paul	Idea	Grow the Rusiness	500.000.00	50.000
Total				27,126,660.00	13,595,840.
<					>





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Contractor	Employee	Chicago	Hyderabad	New York	B2B Enhancements	CRM Contact Center Development	CRM Enhancements	eCommerce Portal	Marketing Campaign	Minimal Online Shopping Site	Online Order Performance Improvements	>
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Change Request Name	Project Name	Change Request Owner	Change Request Priority	•	Change Request Category	Change Request Stat
Change Request 1	Restructure NA Procurement Process	Thomas, Brian	High		Organizational Culture	Open
Development Phase Extension Request	Web Application Enhancement	Sutherland, Joy	High		Flexibility	Open
Funding for contractors	Online Web Portal Program	Martin, Paul	High		Funding	Open
Additional equipment	Online Web Portal Program	Granger, Paula	Low		Technical	Open
Additional Sales Analytics	eCommerce Portal	Martin, Paul	Low		Objectives	Closed
Change Request 1	A Fantastic Project	Thomas, Brian	Low		Human Interface	Open
Change Request 1	Restructure LatAm Procurement Process	Thomas, Brian	Low		Interdependencies	Open
Funding Issue - request additional funds	Minimal Online Shopping Site	Granger, Paula	Low		Funding	Open
Implementation risk	BI Analytics	Olney, Pam	Low		Implementation	Open
Resource risk	Credit Card Processing Enhancement	Miller, Rosie	Low		Resource Availability	Open
Additional resources	Online Web Portal Program	McCarthy, John	Medium		Resource Availability	Open

Portfolio Business Unit 1 Business Unit 2

- Business Unit 4
- Business Unit 6
 Business Unit 7

Goal

Cost Avoidance Cost Reduction Grow the Business Infrastructure Improvement Maintain the Business

External Labor

- 2018 2017
- February
 March
 April
 May
 June
 July
- August September

November

Total Spend



Plan Cost Type Capital Coperating



Plan vs. Actual by Fiscal Period





Total Operating Cost

11.28M

Grow the Business Cost Reduction

Effort by Stage and CapEx / OpEx



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Total Capital Cost

15.94M

RM Dashboard

	Overtime Heatmap		Task List			
Resource OBS Filter	Resource Name	Week41 Week42 Week43 Week44	Investment Task Name	Assigned To Days	Due Date	
~ ~	Dhar, Sankhadeep	40 40 44 40	CRM Enhancements Deployment Phase C	i Evans, Nick 34	7/1/16	
	Evans, Nick	40 50 55 64	eCommerce Portal Planning Phase Gate	Evans, Nick 32	5/9/16	roanconsulting
	Hayes, Justin	40 35 30 30	eCommerce Portal Initiating Process Co	Dhar, Sankhadeep 29	3/1/16	regoconsulting
	Unfilled Demand		Risk List			Clarity Expertise On Demand
	Investment Name Pole Name Staffing OPC	December Neumber October	Investment Risk	 Assigned To 	Due Date Is Late	
	Automated Security Enhancements Architect	50 45 10	eCommerce Portal Objectives	Risk Dhar, Sankhadee	p 12/10/16 0	
	Automated security enhancements Automated	10 20 50	CRM Enhancements New enhan	ements req Dhar, Sankhadee	p 7/20/16 1	
	CDM Exhancements Architect	60 50 40	eCommerce Portal Focal point	for changes Evans, Nick	12/1/16 0	
Alle entire by Dusing theme	-Commenteries Architect	20 24 40	CRM Enhancements Enhanceme	nts could af Hayes, Justin	7/13/16 1	Persona: Resource Manager
Allocation by Project Type	eCommerce Portal Business Ana	20 31 10	Automated Security Enhancements Base Archite	ecture Evans, Nick	10/20/16 1	
	lest Engineer	20 10 11				5 114
		F 2				Filter:
1.4		E	leque List			Allows you to filter based on Resource OBS
- 32	My Resource Count by Project		ISSUE LIST			and see different levels of the organization
	Project Name 🔺 Project Manager Project Project S	Project Fi Tea Mana % Ma	Investment Issue	Assigned To	Due Date Is Late	(Include units and decedents)
Application Change	Clean Waterhouse 1 Dhar, Sankhadeep Approved 8/21/2015	11/20/2018 5 1 20	eCommerce Portal More RAM	required Dhar, Sankhadee	ep 11/1/16 1	
Infrastructure Dep	Consumer Revie Project Active pproved 4/7/2016	9/4/2020 6 3 50	CRM Enhancements Java script	s running on Evans, Nick	12/10/16 0	
- 1.2 Major Project	Create Webcam 1 Hayes, Justin Approved 4/7/2016	10/17/208 2 1 50	Automated Security Enhancements Enhancem	ents could af Hayes, Justin	1/1/17 0	KPIs/Metrics Tracked:
• Undefined	Fitness Program 1 Dhar, Sankhadeep Approved 6/27/2015	9/28/2017 4 3 75				1. Total Headcount - Employee, Consultant,
						Contractor Ratio
8.2			100%			2. Assigned Labor vs. Unfilled Roles by
	Capacity Graph		20.00% 22.22%	14.29%		project
	2200		80%			2. Conscitu (available, allocation
	2060 2060 2060 2060 2060 2060 2060	2060 2060	60%			5. Capacity (available, allocation,
	2000			100.00%	Antipued Labor	assignment, actuals)
	1830 1830		40% 80.00% 77.78%	85.71%	Labor Shortage	4. Assigned Risks/Issues
Actuals by Project Type	1800		200		Cable Shorage	Late Tasks
	1800		20%			5. Upcoming Unfilled Demand (next 3-6
	1600		0%			months)
	1400 1500		WorkPackage WorkPackage W	/orkPackage WorkPackage		6. Allocation distribution vs Actuals by
3.2	1400	Available Hours	#1 #2	#3 #4		project type
-6	1200	Assignment Hours				7. Quartima Tranding Depart (who is
Application Change	1006 1004 1001 005 993	Allocation Hours	600 590 600			7. Overtime Trending Report (who is
Infrastructure Den	1000	Actual Hours		500		consistently working overtime)
Maior Project	993	985		390		8. Resource count by investment
Undefined	008		400		Overtime Hours	
5	600		- to the second s		Regular Time Hours	
	425 (10	(10 (10	200 150 200		Unstaffed Hours	
	400 418	410 418	90 110	100 90 80	-	
— 4	418		50			

Dashboards

- Pin Reports
- Pin Live Tiles
- Add Text Box
- Add Image
- Add Video content
- Add Web content
- Quick Insights
- Ask a question
- Featured Dashboards

Power BI Q&A

- Entities
 - Table names
 - Column names
 - Calculated field names
- Functions
 - Sort
 - Filter
 - Aggregate
 - Group
 - Visualize

- Best Practices
 - Format as Table
 - Name Table
 - User-friendly name

Power BI with Cortana

- Requirements
 - Windows 10.x
 - Enable Cortana in Windows
 - Use the Office 365 account used in Power BI
 - Enable Cortana for the dataset

- Publish reports to the web
- Share dashboards
- Duplicate and modify shared dashboards (personal versions)
- Publish a content pack
- Export to multiple formats
- Print
- QR code

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- Publish to web
 - Do not use this option as it will allow access to dashboard to public
- Share
 - Grant/Revoke access to colleagues in the organization
 - It will warn you if you have entered an email address outside the organization
- Create Groups (Pro only)
 - Public or Private groups
 - Edit or View only groups

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Data Refresh

Data refresh by subscription type

Before we go any further, it's important to know how data refresh works depending on your Power BI subscription type. There are two different types of user subscriptions, Power BI (free) and Power BI Pro. Power BI Pro provides additional refresh frequency and capacity.

Data Refresh	Power Bl (free)	Power Bl Pro
Datasets scheduled to refresh	Daily	Hourly*
Streaming data in your dashboards and reports using Microsoft Power BI REST API or Microsoft Stream Analytics.	10k rows/hour	1M rows/hour
Live/DirectQuery on-premises data sources with full interactivity via the On-premises Data Gateway		\checkmark
Live cloud data sources with full interactivity (Azure SQL Database, Azure SQL Data Warehouse, Spark on HDInsight)		~
On-premises data sources requiring a Power Bl Gateway - Personal and/or the On-premises Data Gateway.		~
* Line the similar time of the sumplement of the second second second second second second second second second		

* Up to eight times (hours) per day.



Power BI Desktop

Power BI Desktop

- Model data
 - Transform
 - Shape
 - Merge or append
- Relate data
 - Join two data sets
- Work offline

Getting Data

The following shows the different data sources currently available in the most recent version of Power BI



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Click on the data tab and click on the Edit Queries

- remove columns
- filter rows





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Transform Data

- Use first row as header
- Split the field or concatenate fields
- Replace values null with blanks
- Group data
- Pivot/unpivot columns
- Aggregate functions
- Format columns



Create relationships between tables

- Import multiple tab from Excel or Create multiple queries
- Join the tables





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• Import the PBI desktop file to Power BI app service

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Power BI Mobile

- Download app to your mobile device
- Access Reports and Dashboards
- No edit capability
- Annotate on Reports/Dashboard
- Share Dashboards with others
- Keeps track of recently used Reports/Dashboards
- Search capability
- Demo Power BI Mobile

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Tools

• Power BI Publisher for Excel

- PivotTables
- PivotCharts
- Charts
- Ranges
- Demo Power PI Publisher for Excel



- Data refresh schedule
- Pricing
- Printing

Tableau

Another equally powerful dashboard/data analysis tool. For comparison between Power BI and Tableau, please visit:

https://www.tableau.com/compare-tableau-power-bi

The high level steps in creating a dashboard remains the same in Tableau. Below are the Tableau Components.

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Tableau File Types

Tableau workbook (.twb)

Stores a visualization without source data

Tableau data source (.tds)

Stores the server address, password, and other information required to access a data source

Tableau bookmark (.tbm)

Stores a connection to a worksheet in another Tableau workbook

Tableau data extract (.tde)

Stores Tableau data as a filtered and aggregated extract

Tableau packaged workbook (.twbx)

Stores extracted data and visualizations for viewing in Tableau or Tableau Reader

Tableau Navigation

1

Tableau - Book1 - Tableau licer	use expires in 14 days			×	File Data Wor
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*					Data A
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			Open a Workbook		Dimensions
Excel				① Training	
Text file				Getting Started	
Access JSON file				Connecting to Data	
Spatial file				Visual Analytics	
Statistical file				Understanding Tableau	
More				More training videos	
Tableau Server				Viz of the Week	
Microsoft SQL Server				The History of the US	
MySQL					
Amazon Redshift				Resources	Measures
More	>			Blog - Data skills are so hot right now	
	Sample Workb	ooks	More Samples	Tableau Conference 2017	
		2356		Forums	
Sample - Superstore World Indicators		171			

$\Box \times$ rksheet Dashboard Story Analysis Map Format Server Window Help Standard 🝷 ili - 🖵 Show Me Pages iii Columns Analytics - 10 M M M 1234 545 168 910 1889 53890 ect to Data Filters $C_{i}^{(n)}(\eta)$ Sheet 1 Drop field here 111 all. Marks I Automatic . •• 6 Т Color Size Text \Box 000 $\sim \sim$ Detail Tooltip III Drop field here field here For a Gantt view try 1 date ≞ 1 or more Dimensions 0 to 2 Measures

Tableau - Book2 - Tableau license expires in 14 days

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Data Connections

File Connections

Other Files (*.twb *.twbx *.tbm *.tds *.tdsx *.tde *.xls *.xlsx *.xlsx *.xlsb *.mdb *.accdb *.cub *.cub *.csv *.txt *.tab *.tsv *.sas7bdat *.sav *.rda *.rdata *.json *.km
Tableau Workbooks (*.twb)
Tableau Packaged Workbooks (*.twbx)
Tableau Data Sources (*.tds)
Tableau Packaged Data Sources (*.tdsx)
Tableau Data Extracts (*.tde)
Excel Workbooks (*.xls *.xlsx *.xlsm)
Microsoft Access Databases (*.mdb *.accdb)
Local Cube Files (*.cub)
Character Delimited Files (*.csv)
Text Files (*.txt)
Statistical Files (*.sav *.sas7bdat *.rda *.rdata)
Tab Delimited Files (*.tab *.tsv)
Spatial Files (*.kml *.shp *.tab *.mif *.geojson)
JSON File (*.ison)

Server Connections

Search IBM DB2 Salesforce Actian Matrix IBM PDA (Netezza) SAP HANA Actian Vector SAP NetWeaver Business Warehouse MapR Hadoop Hive SAP Sybase ASE SAP Sybase IQ Marketo Amazon Redshift SharePoint Lists Snowflake Microsoft PowerPivot Aster Database Microsoft SQL Server MonetDB Teradata OLAP Connector DataStax Enterprise MySQL OData Other Databases (ODBC) Oracle Eloqua Google BigQuery Google Cloud SQL Pivotal Greenplum Database Google Sheets PostgreSQL Hortonworks Hadoop Hive HP Vertica Progress OpenEdge IBM BigInsights

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Demo – Connecting to a Live Data Source

Oracl	е			×
Server:	localh	ost		
Service:	CLAR	ΠΥ	Po <u>r</u> t:	1521
Enter infor	mation t	o sign in to the server:		
🔘 Integra	ted Aut	hentication		
) Us <u>e</u> a s	pecific	username and password:		
<u>U</u> sern	ame:	ppm_dwh		
<u>P</u> assv	vord:	•••••		
Initial SQL.				Sign In

☆ Tableau - Book1 - Tableau license expires in Eile Data Server Window Help	14 days					- 0	×
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Table							
Enter table name 🛛 🖉 🕂							
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DWH_INV_PROGRAM_V	Investment Key	s Program	As of Date	RISK Objective	RISK Sponsors	Risk Funding	RISKR
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DWH_INV_SERVICE_LN			Auto	matically Undate			
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🖽 New Custom SQL							
🖽 New Union							
Data Source Sheet 1							

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Connections – Live vs Extract

Live: Data source that provides real time or near real time data to Tableau. Directly connects to database or other sources. Extract: A snapshot of data. Extracts that are shared on the tableau Server can be refreshed according to a schedule.

Decide based on Performance, Data Security and Data Consistency considerations.

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Components

• Rich set of graphical components

- Column and Stacked Charts
- Line charts and area fill charts
- Pie Charts
- Scatter plots
- Data Clusters
- Histograms
- Smart Histograms
- Treemap
- Text box
- Format chart elements

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Sorting and Filtering

- Sorting
 - Sorting based on field's values
 - Combining fields to sort by more than one criteria
- Filtering
 - Selection filter
 - Wildcard filter
 - Condition filter
 - Top filter
 - Filter using parameters

Groups and Sets

• Groups

- Define a group
- Define a group for "other" values

• Sets

- Define a set
- Summaries using sets
- Combining sets

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- Create a crosstab
- Unpivoting a crosstab
- Add total and subtotals

Live Demo

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Data Blending

Method for combining data from different data sources and is not the same as a table join!! Example: data from Clarity and rolled up cost data from SAP.

Use Data Blending when:

- a. Data needs Cleaning
- b. Join causes duplicate data: this means, data is at different levels of details
- c. High Data Volume

Steps:

- a. Set up Data Sources.
- b. Define the Primary and then the Secondary Data Sources
- c. Define or Edit Relationships

Analyzing Data using Statistical Tools

- Calculated fields and Built-in Functions
- Calculate Averages, Medians, Minimums and Maximums
- Display Summary card
- Calculate percentages of a table total
- Forecasting future values

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- Data Cleanup
- Split text columns into multiple
- Recommends visualization based on data selected
- Stories
- Captions

- Arranging and formatting dashboard elements
- Define a filter action
- Define a highlight action
- Define a URL action

Benefits of Dashboards

Benefits of Dashboards

• BUY-IN

- Dashboards provide a convenient way for management to start looking at CA PPM data first hand
- Once the rest of the organization realizes executives are using dashboards, they start maintaining the CA PPM Data (instead of managing in their own spreadsheets)
- This automatically creates better quality data
- Over time, CA PPM becomes the "one source of truth"

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Benefits of Dashboards

• Consistency in KPI reporting

- Some large organizations have multiple PMO's that result in multiple different processes
- KPI's are a result of the process developed by each PMO and could mean different things to different people
- Dashboards bring consistency in reporting KPI's, encouraging consistent processes

H E L L O my name is **CONSISTENCY** MAKE IT HAPPEN DAY IN AND DAY OUT. YOU MIGHT KNOW MY GOOD FRIEND, SUCCESS... WE'RE ALWAYS HANGING OUT!

Dashboard Levels

- Not all Dashboards are for all audiences
- When creating dashboards it is critical to understand the consumers of the information being reported

- Common audiences that will be viewing dashboards include
 - CEO/board level
 - Corporate vice president/director level
 - IT/Bus strategic level, similar to above, but focused on IT or Bus
 - IT/Bus operational dashboards

5 P's of Effective Dashboard Delivery

- Purpose
 - Clear objective
 - Should deliver actionable insight

- Information relevant to the purpose and audience less is more
- Draw attention to relevant trends, pain points, comparisons
- Balance the content good and bad news; bad news only may be demotivating
- Process
 - Agile methodology (2 week sprints)
 - Prototype to demonstrate the "Art of the Possible"
 - Align requirements with the available technology
 - User involvement

5 P's of Effective Dashboard Delivery, cont.

- Participants
 - Target select groups as audience, not the whole organization
 - Data is not "nice to have" if it doesn't help the user arrive at actionable insight
 - Predefined conclusions relieves users from performing their own analysis

Pull

- User friendly, engaging, and easy to use interface will make the user want to consult the dashboard frequently
- Encourage interaction, drill down capability
- A good dashboard needs little or no training

5 P's of Effective Dashboard Delivery, cont.

• Principles

- Trust and integrity data should be secure and validated against the source system
- Test the functionality of the dashboard; should be error free.

 5 minute principle – Within 5 minutes, users should be able to review the dashboard, understand the metrics and trends, and be on their way...

Questions?

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Instructions for PMI credits

- Access your account at pmi.org
- Click on **Certification**
- Click on Maintain My Certification ۲
- Scroll down to **Report PDU's**
- Click on Course Training (or other appropriate category) ۲
- Enter Rego Consulting •
- Enter Activity- Enter Name of Course ۲
- Enter **Description**
- Enter Date Started •
- Enter Date Completed
- Provide Contact Person Name of Person to Contact •
- Provide Contact E-Mail E-Mail of Person to Contact •
- Enter Number of **PDU's Claimed** (1 PDU per course hour) •
- Click on the I agree this claim is accurate box
- Click **Submit** button

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