

Power Bl, Data Visualization, & Data Analysis

Featured Courses

2021-2023

DATA ACTION LAB | FEATURED COURSES (2021-2023)

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1. Overview of Data Action Lab Expertise and Capacity

Idlewyld Analytics and Consulting Services, in joint venture with **Sysabee** and the **DAVHILL Group**, provides digital training under the broader **Data Action Lab** (**DAL**) umbrella (joint venture qualified for the GoC A.I. Source List – EN578-180001/A Band 1).

With a combined experience of 60+ corporate workshops given (ranging from a few hours to 20 weekly sessions), 75+ university courses taught, 60+ data and A.I. projects completed, and 40+ years working with data in all its forms, **DAL** members have extensive experience in providing training to public servants in the areas of:

- data analysis and visualization;
- business intelligence;
- data science;
- machine learning, and artificial intelligence.

Through the provision of a mix of conceptual and hands-on learning experiences, **DAL** training is designed to help participants:

- increase their **digital literacy**;
- explore new work roles, and
- enable **future self-learning**.

2. Training Course Description

DAL has three featured 20-hour training courses:

- 1. Getting to Know Power BI and Best Practices in Data Visualization
- 2. Intermediate Power BI and Introduction to Modern Business Intelligence
- 3. Advanced Power BI and Layering Charts with R/ggplot2

Getting to Know Power BI and Best Practices in Data Visualization

This course is open to all participants.

Component 1 – Data Visualization Concepts, Notions, and Best Practices (8 hours)

Poorly designed visualizations (graphs, reports, charts, slides etc.) can lead to confusion and, in the worst case, erroneous business decisions. This module takes participants through the basic principles of data visualization and design, whether they are creating Power BI interactive reports, programming in R or Python, generating charts in Excel or management presentations in PowerPoint.

In this component, participants will:

- learn to understand the importance of narrative and storyboarding as part of the design process,
- match visualizations to data, including best practices for a variety of charts contained in standard software packages and scripting libraries,
- understand what charts and visualizations to avoid,
- introduced to the basic rules of design and layout including the Gestalt principles, pre-attentive attributes, decluttering charts, dashboards and reports,
- learn about the different roles of data visualization in the data analysis process,
- improve their judgment about the quality of data visualizations,
- study the fundamental principles of analytical design, and
- study the grammar of graphics.

Topics include:

- 1. Introduction
- 2. Visualization and Data Exploration
- 3. Basics of Dashboarding
- 4. Storytelling with Data
- 5. Fundamental Principles of Data Viz
- 6. Hall-of-Fame/Hall-of-Shame

- 7. Matching Visualization to Data
- 8. Visualization Catalogue
- 9. Interactive Visualizations
- 10. Gestalt Principles
- 11. Decluttering Charts
- 12. Size, Colour, and Position
- 13. Accessibility

Component 2 – Getting to Know Power BI (8 hours)

This module takes participants through the initial stages of inputting data and creating their first interactive charts, reports and visualizations, and shows them how to prepare relatively sophisticated visualizations (which are nonetheless not technically difficult to create).

This module will help participants to:

- understand how to import data from single and multiple data sources,
- understand the importance of clean data,
- manipulate the data as it is imported into Power BI,
- create their first calculations,
- create their first custom columns,
- create their first charts,
- understand basic interactive filtering,
- understand the basics of organizing data,
- and understand the basics of data wrangling.

1. Introduction

- background and environmental drivers
- 2. Getting Things Ready
 - preparation & importance of clean data
- 3. Importing and Modeling Data
 - importing, refining and linking data sets
- 4. Creating Calculations and Charts
 - calculated columns, measures (and measure tables), mathematical operations, filtering, logical operations and slicing

5. Organizing Data

 hierarchies, groups (numerical & text), custom sorting

6. Data Wrangling

 removing rows, replacing values, splitting columns, trimming and cleaning, appending tables, choosing what data gets loaded

Component 3 – Data Lab (4 hours)

The Data Lab is designed for participants to cement their data visualization skills and to develop competencies. In a collaborative environment, participants can bring along their own data set or use an example data set provided by Data Action Lab. Visualizations will be created and constructively criticized by all attendees.

Intermediate Power BI and Introduction to Modern Analysis

This course is open to all participants who have completed Getting to Know Power BI and Best Practices in Data Visualization. It is a pre-requisite for Advanced Power BI and Layering Charts with R/ggplot2.

This course is intended for:

- audiences interested in learning more about data analysis, data engineering, data preparation, and data presentation;
- individuals who will be leading teams involved with these activities, and
- analysts with a technical background in one area (e.g. statistics, database management) who wish to move into another (e.g. machine learning, data preparation).

Component 1 – Introduction to Modern Business Intelligence (8 hours)

This component is divided into three sections:

1. Business Intelligence Fundamentals

What does it mean to analyse data? This section explores the fundamentals of data analysis, including how data is structured, how to prepare it for analysis, and how even simple analyses can be powerful tools to improve the decision-making process. This section also discusses issues that can arise during the data analysis and how to 'let the data speak' during analysis. Data analysis fundamentals will be illustrated and supported through the use of data visualizations.

2. The Modern Business Intelligence Environment

Data analysis rarely occurs in a vacuum, and modern data analysis relies on a technical support infrastructure. This section discusses the different elements of a data pipeline and how they combine to enable modern data analysis. It will also discuss how different types of infrastructure choices (e.g. database vs data lake) can influence analysis capabilities.

3. A Survey of New Analysis Techniques

There are many exciting 'new kids on the block' in the data analysis world, including machine learning and other artificial intelligence techniques. This section reviews some of these new analysis techniques, with a focus on their functionality. It also includes a discussion of interesting uses cases for these techniques, the tools available to support these techniques, and the type of data and infrastructure required to make maximum use of these techniques.

Component 2 – Intermediate Power BI (8 hours)

This module takes participants through the more advanced concepts in using Power BI. With a focus on Government of Canada specific requirements, this course introduces key ideas to both optimize data manipulation and to create more complex, sophisticated visualizations and dashboards.

This module will cover:

- best practices in data modeling
- optimizing data models
- advanced data wrangling in Power Query
- introducing and using parameters
- complex DAX operations
- aggregating and merging data
- working with time periods
- GoC Power BI use cases (such as fiscal year conversion, etc.)

Component 3 – Data Lab (4 hours)

The Data Lab is designed for participants to cement their data analysis skills and to develop competencies. In a collaborative environment, participants can bring along their own data set or use an example data set provided by Data Action Lab. Visualizations and analyses will be created and constructively criticized by all attendees.

Advanced Power BI and Layering Charts with R/ggplot2

This course is open to all participants who have completed Intermediate Power BI and Introduction to Modern Data Analysis.

This course is a continuation of *Getting to Know Power BI and Best Practices in Data Visualization*, and of *Intermediate Power BI and Introduction to Modern Data Analysis*.

Participants will learn how to create charts using R/ggplot2, a popular open-source package which gives users full control over chart customizations.

Participants will also be introduced to the tidyverse (a framework that makes data manipulation and data analysis more intuitive) and will learn how to integrate their charts in Power BI dashboards.

Component 1 – Layering Charts with R/ggplot2 (10 hours)

This component is divided into four sections:

- 1. Simple Plots in R
- 2. The tidyverse
- 3. The Grammar of Graphics and ggplot2
- 4. Integrating R and ggplot2 in Power BI

Component 2 – Data Lab (10 hours)

The Data Lab is designed for participants to cement their data visualization and data analysis skills and to develop competencies. In a collaborative environment, participants can bring along their own data set or use an example data set provided by Data Action Lab. Visualizations and analyses will be created and constructively criticized by all attendees.

3. Costs, Logistics, Dates, and Responsibilities

Courses are offered either virtually or in-person; in either case, sessions are limited to 16 participants.

The cost per participant is \$1200.00 + HST (400\$/participant/day; discounts available for long-term commitments). **DAL** assumes that any in-house training costs will be defrayed by the client. Participant registration will be managed by the client; a decision as to whether a session will be offered will be made jointly by **DAL** and the client at least 10 days before the scheduled start (a minimum of 14 participants is required for a session to be offered; sessions are capped at 18 participants).

Participants are encouraged to bring their own data sets to work with Power BI, especially for the Data Lab component. Datasets can be provided, as necessary. Participants are also expected to bring along laptop computers loaded with the required software (Microsoft Power BI, R/RStudio, etc.). Technical requirements will be communicated to the participants prior to each session start.

Virtual sessions are given *via* Zoom/Webex. In-person sessions will be held at a location agreed upon by the client and **DAL**. **DAL** assumes that standard presentation IT fare will be available for the presenters: projector/screens, slide clicker, internet access, and HDMI/VGA connector cables.

Presentations may not be recorded for future use.

DAL will make all learning materials (slide decks, learning maps, datasets, etc.) available to the participants before the session starts.

Customized courses are also available upon client request. Training dates are dependent on **DAL** availability and are to be determined in consultation with client.

Additional dates/courses can also be added to the schedule by prior consent of both parties.

4. DAL Founders / Lead Instructors



Jennifer Schellinck is passionate about bringing cutting-edge data technology to organizations wanting to develop the best analysis and decisions. She applies the latest machine-learning and systems-modelling techniques to help organizations achieve their greater potential.

Jennifer's machine learning and simulation expertise comes from her background in Cognitive Science, earning a Ph.D. in 2009. As an Adjunct Professor at Carleton University, she remains active in academia and keeps up-to-date on current research. She has been offering data-based workshops since 2015.

She founded **Sysabee** in 2012 and is dedicated to supporting her client organizations in all aspects of their data-focused projects.



Patrick Boily is interested in the application of mathematics/statistics to evidencebased decision support. He has worked on 25+ such projects since 2008, first as a public servant, then as a quantitative consultant for Carleton University, and later through Idlewyld Analytics and Consulting Services.

Patrick is fully bilingual and has taught over 60 university courses in mathematics, statistics, data analysis, machine learning, and quantitative consulting. He has been leading workshops and training on data analysis/machine learning since 2015.

He has extensive experience in data science, machine learning, A.I. and predictive analytics, data cleaning, data visualization, queueing systems, stochastic modelling, and simulations - managing and being involved in numerous projects in these subject areas.



Stephen Davies is the CEO of DAVHILL Group, a business intelligence and data analytics company based in Ottawa, Ontario, specializing in the implementation of Business Intelligence, Artificial Intelligence, and Machine Learning Systems. At DAVHILL, Stephen's main focus is to make data real and useable for everybody.

Steven has more than 25 years of experience working in both public and private sectors. With an academic background in Physics and Engineering, he has worked in semiconductor and OEM manufacturing as an engineer and supply chain director.

Early in his career in operations management, he started to do data analysis and never quite escaped. As a Business Intelligence and Process Transformation consultant he is delighted to provide training courses to the Data Action Lab.







DAL instructors have consulted for (and taught to participants from) a variety of groups, including

- Association of Canadian Financial Officers
- Bank of Canada
- Canada Revenue Agency
- Canada School of Public Service's Digital Academy
- Canadian Air Transport Security Authority
- Canadian Coast Guard
- Canadian Food Inspection Agency
- Canadian Institute for Health
 Information
- The Children's Hospital of Eastern Ontario
- Communications Research Centre Canada
- Department of National Defence
- Environment and Climate Change Canada
- Fisheries and Ocean Canada
- Health Canada
- Immigration, Refugees and Citizenship Canada
- Indigenous and Northern Affairs Canada
- Natural Resources Canada
- Natural Sciences and Engineering Research Council of Canada
- Nuclear Waste Management Organization
- Office of the Privacy Commissioner of Canada
- Privy Council Office
- Public Services and Procurement Canada
- Royal Canadian Mounted Police
- Transport Canada
- Treasury Board Secretariat

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