



Data Analytics Portfolio

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Introduction

Excel and Google Sheets provide a broad range of capabilities for organizations to track, analyze and present a broad set of data. I have worked with Excel since 1995 and with Google sheets since 2014. The ethos when using these tools is clarity, simplicity and flexibility. For clarity, I emphasize clear presentation, self explanation and auditability. For simplicity, I make sure that the models focus on purpose, take care that the business user validates the work frequently and wherever possible, use existing libraries. Finally, with flexibility I want to make sure there is control over all reasonable variables and scenarios to produce realistic outcomes.

**** NEW:** I recently strengthened the analytics portfolio with a qualification in R from Johns Hopkins University (through Coursera) in early 2017. I now provide inference regression and machine learning services for complex data analysis.



This document highlights some of the work I have done, which covers a variety of organizational functions, across several verticals, utilizing a broad spectrum of capability. The diagrams, unless marked otherwise are illustrative of work done.

Reports (what happened)

The charting, pivot table and standard presentation set of functions have been used to generate a variety of status and situations reports. These include;

- Competitor analysis tables, with capability filters at a software and a telecoms company
- Simple project reports within several organizations
- Client account status reports on billable hours drawn down from a pool, at a fintech company and at a software company
- Ad-hoc financial reports, in substitute for inflexible accounting system reports



Dashboards and real-time data (what is happening)

Excel provides the ability to import live data on demand from a variety of sources. This has been used to develop a stock analysis and trade signalling system using data feeds from financial sites applied to formulae and circular calculations.



The screenshot shows an Excel dashboard with a table titled "16-Sep Status". The table has columns for "Real Property Role" (Role 1, Role 2, Role 3, Role 4, Role 5, Role 6) and "3rd party ServProv". The rows represent different factors and an overall performance summary.

	Real Property Role						3rd party ServProv
	Role 1	Role 2	Role 3	Role 4	Role 5	Role 6	
Factor 1	71%	73%	83%	71%	83%	88%	
Factor 2	66%	86%	73%	74%	83%	88%	
Factor 3	73%	82%	73%	81%	72%	71%	
Factor 4	87%	84%	88%	77%	82%	82%	
Overall Performance	81%	82%	82%	78%	77%	72%	
Total participation	15	10	9	10	15	8	
Free participation (7 days)	8	8	8	11	10	8	

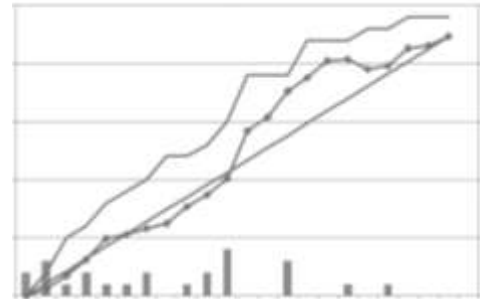
For weekly trends, scroll down for specific role performance charts

I have also applied live data imports in Excel to prototype future functionality for a SaaS platform company. There are certain limitations in the update frequency, but the charts and tables have sufficient scope to produce highly instructive designs that can be rapidly created and modified. A dashboard (see graphic above) was developed for the Government of Canada, as part of an HR performance management proof of concept, using Google Sheets to present charts derived from daily SaaS platform feeds.

Projections (what will happen)

Beyond the descriptive projects just outlined, Excel and Sheets provide comprehensive tools to create projections that are nuanced and repeatable.

I have generated many business cases, for internal and client-project purposes. It is important to start with a set of fundamental truths about the current status and how things change, working with appropriate stakeholders. I also separate operating data from financial as much as possible to enable continuity.



The investment cases have mostly been derived from bottom-up rather than top-down modeling. That is, it is better to start with what is real and progress from that, then make premature assumptions based on an end-point. For instance, revenue growth is better calculated from existing sales patterns than some notion of final end-market share. Either of these approaches can be driven with supply or demand modeling. In other words, is the business better projected by internal operating capacity or by customer demand?

The set of current truths that I have worked with include network models (telecoms), operation models (tech and professional services) and cost of sale models (tech, telecoms and professional services). These have been layered with assumptions about unknowns and the main drivers for change. I have always tried to get the right balance between too little and too much information at the projection stage. Most models can work well with a handful of unknowns, but others required further abstraction and diligence.

For the actual projections, simple derivative formula or regressions have been used in most cases. In others, the use of scenarios has been applied where there is legitimate variance in potential outcomes. I have used these methods for cash flow forecasts, pipeline projections and business cases using discounted cash flows.

Simulations, Risk and Decision Processes (what should happen)

Projections work well where the past reasonably shows a path to the future. Where there is no past behaviour, complexity or unknowns, then simulations and decision processes are required.



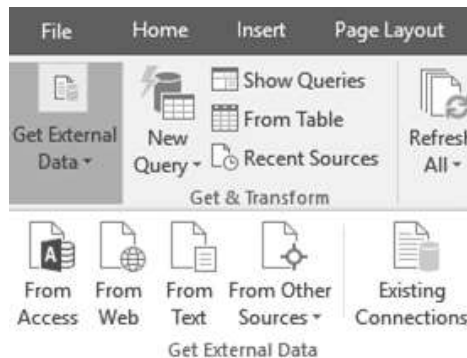
Sometimes described as prescriptive analysis, this set of activities aims to reduce uncertainty by studying the behavior of multiple potential outcomes using simulation or decision science.

In this field, I have used Monte Carlo simulations to model the behaviour of different variables and combine their output statistically to show probable outcomes. Good risk analysis is based on applying optimally the best expertise to known facts. For individual contributors, I have modelled this in Excel.

I have also used the outputs from a standalone decision engine which uses a collaborative, behavioural and combinatorial approach to generate and prioritize outcomes. From those outputs, I have used Excel filtering to enable decision makers to fine-tune for the best potential outcome.

Integration and Data Preparation and Cleaning

Where necessary, I have integrated external protocols for data import and mapped the structure of static data sets using Excel formulae. The data can further be manipulated by arrays or Visual Basic.



It has been necessary to audit, clean and combine large data sets using the inbuilt capabilities of Excel alone. For instance, data merging using linked data items has been possible using look-up functions, whereas data in other instances has been scored for quality. If there is a sufficient quantity and spread of data, it has been possible to apply random sampling techniques where time has been of the essence for simulations or projections.

Functional Competences

This is a condensed list of advanced Excel and sheet competences that have formed part of my project work:

- Statistical
- Lookups & referencing
- Arrays
- Circularity and live data
- Data validation & auditing
- Charting
- Filtering
- Solvers & Scenarios
- Pivot tables
- Macros & Visual basic

Summary

The portfolio described shows a broad set of capabilities and templates that can be applied to a number of business problems. We can help businesses with existing spreadsheets that need to be audited or updated, create new ones as proof of concepts or fully operational systems and derive meaning from complex data with R.