Empowering Management Through Effective Use Of Dashboards And Metric Reports

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Background

- PHRI:
  - According to Eric, PHRI was one of the first 5-ish DataFax customers
  - DataFax has been a mainstay for more than 20 years
  - More than 50 studies ranging from single site pilot studies to international prospective epidemiology study of over 150,000 subjects and multinational clinical trials with over 600 sites and 25,000 participants have used DataFax as the data management system
  - Data from these studies ultimately supported several regulatory drug approvals and many more high impact publications in scientific journals

- Myself:
  - I’ve been involved with computers since 1980
  - I’ve been with PHRI since 2000 in various system administrative roles
Objectives

- As Darryl mentioned in his opening address, reporting is a desired goal for managers.
- They have decided that the metrics need to be made available.
- Determining what needs to be identified is a challenge in many organizations.
- The ultimate goal is to identify achievable goals by seeing trends that affect business decisions.
Why measure KPIs?

- Companies need to be well-informed about their own business
- This is accomplished by measuring business KPIs (Key Performance Indicators)
- With identified goals, the trending of the metrics with an eye to the identified goals allows the organization to improve
- Employees need to understand the metric, and how they can influence it to ensure processes are functioning well, or if they need involvement if they are underperforming
A "measure" is a number that is derived from taking a measurement

In contrast, a "metric" is a calculation between two measures

The metric shows trends, which is typically the information that influences any course of action
Goal of measuring metrics

- Set targets that challenge the company in order to improve the business
- This provides more value than focusing on goals that are easily achievable, or are already being achieved
What will good metrics do?

- Drive the strategy and direction of the organization
- Provide focus for an organization, department or employee; Metrics highlight to employees what is expected of them
- Help justify infrastructure or business decisions
- Drive performance by having identified goals
- Change and evolve with the organization
- Follow the SMART model (Specific, Measurable, Achievable, Relevant, Time-based)
What can metrics show?

- Is disk usage going up?
  - Does more disk space need to be purchased? When? How much?

- Are more faxes coming in and getting busy signals?
  - Phone lines need to be purchased to avoid busy signals and frustration

- Are there less faxes coming in?
  - Phone lines can be terminated saving the organization money

- What are the peak access times?
  - Schedule maintenance, support staff

- Audit reports
  - Access by accounts during a study life cycle
Challenge for DF Administrators

- DataFax has a dashboard for Study Teams showing many measures and metrics
- The DFSystem tool does not have this functionality for System Administrator to monitor their systems
  - How many accounts are logging in to each study?
  - How many active users are using the system?
  - How many accounts are assigned to the various roles?
  - Are roles not being utilized?
SysAdmin Metrics Goals

- Fax vs EDC pages
- Disk Usage
- CRF reception: CRF and QC report pages that arrive by fax or EDC during a specified time period
- study start and stop dates
- multiple concurrent logins
- logins from unexpected locations
Tools

- DataFax reports
- Perl scripts
- Shell scripts
- Excel
- Power BI
Getting the raw information

- Files
  - Log files
  - DFstudies.db

- Commands
  - DFFormat.rpc
  - DFListplates.rpc
  - awk

- Reports
  - DF_WFcrfsperwk
  - DF_WFdiskusage

- Programming
  - Perl
  - Shell
  - Cron
Providing the results

- Once the perl script has been approved, it must be run from a shell script scheduled through a cron job.
- This is because when logged in with a user account, the DataFax environment variables are configured.
- When executed as a cron job, there is no user context so it must be added through a shell script where the environment variables are declared and then exported.
Analyzing the results

- In this presentation we will use Excel to analyze the measures and metrics, and then present it graphically.
- There will usually be 3 tabs on this reusable document:
  - Imported data
  - Look up tables and other analyses
  - Metrics (usually tables or charts)
- Using the “Import from text” action, the data can be brought in from the automatically updated results file as desired.
Excel tools

- Custom Sorting
- Slicers
  - Interconnected filters
- Functions
  - Index, match, large, vlookup, concatenate, countif
Configuring cron job to run shell script with DF vars

#!/bin/sh
DATAFAX_DIR=/datafax
export DATAFAX_DIR
/usr/local/datafax/Metrics.DF.EDCvsFAX.pl
Perl script (1)

- Create output files
- Get list of studies
  - `sort -n /datafax/lib/DFstudies.db > $file_Sorted_Studies`
- If `$file_Sorted_Studies` has content, loop through them
  - Get study number using `awk $1`
  - Get Study name using `awk $NF`
  - Output to `$file_Active_Studies`
Perl script (2)

- If $file_Studies_Active has content, loop through them
  - Get plate info using DFlistplates.rpc –s {study_num} > $file_Study_Plates
  - This creates a space delimited file (001 002 005 …)
  - Put this information into an array using the split command
Perl script (3)

- Loop through each plate number using DFexport.rpc –s all … > $file_Plate_Info
  - Loop through each record in $file_Plate_Info
    - Assign image_id from array[2]
    - Assign study # from array[3]
    - Assign plate # from array[4]
    - Check if image_id[4] is “R” or “/”
      - Write to output file
      - Increment appropriate counter “EDC”, “FAX”, or “Unknown”

- Close all files and unlink them
Using Excel for Analysis

- Text file exists in a known location
- Get data from an external text source
Import Wizard (1 of 3)

- Select the network location
- Configure delimitation method
- Check if info has headers
  - In this example, there are no headers
Import Wizard (2 of 3)

- Configure delimiter as “pipe”
Import Wizard (3 of 3)

- Configure special columns

![Image of the Import Wizard - Step 3 of 3]
Identify how to import the data

- Identify import method
- Add to data model
Data is displayed

- Data is imported
- Table is automatically created
- Generic headings are added automatically
Using Slicers (filters)

- Add slicers (filters)
- Select the columns to be used
Modify the Slicer’s appearance

- Resize the slicers
- Adjust the Number of columns
By selecting various slicer values, the display is automatically filtered.

Renaming the columns automatically renames the slicers.
Add functional columns

- Because the information is “Configured as a table”, Excel auto fills the column
Add additional features

- Rename the columns
- Create lookup and calculation tables
Create functional columns with ranges and formulae

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Create lookup tables

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Create appropriate charts
Charting

|   | Num records |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 1 | 31742       |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 2 | youngest age | 5.00 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 3 | median age | 118.00 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 4 | average age | 72.95 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |

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Participants

Participants by Ethnicity

- Aboriginal: 3094
- Black: 889
- ...
Power BI Dashboard

- http://ripwrbit1.phri.ca/Reports/powerbi/Infrastructure/Datafax%20Studies

- http://ripwrbit1.phri.ca/Reports/powerbi/Infrastructure/Datafax%20Max%20Licenses%20Used
The Impact of DFws

- Using the API, this information can be retrieved without the need for programs and scripts, or creating temporary files.
- DFdiscover now reports data and formatting so the data can be obtained and manipulated.
Conclusions

- Whatever the means used to obtain the measures and creating metrics, the end result is to provide information to decision makers (managers and staff).
- The information can be made available in whatever format works for the organization (Excel, Power BI, SQL, SAS).
- The tables and charts can be linked within reporting documents (Word documents) or web sites.
- Identified goals can be monitored and appropriate actions taken.
Thank you!

Questions?

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