Key Performance Indicator Tracking

Using Google Forms

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2018-11-02
Outline - KPI Tracking Using Google Forms

1. Administrative Discussions
2. Implementation Goals
3. Implementation Reality
4. Implementation Description
5. Institutional Buy-in

Implementation Description
- Google Forms
- KPI Spreadsheets
- KPI Compilation Spreadsheets
Administrative Discussions - KPI Tracking

- What is a Key Performance Indicator?
  - An indicator of an organization's performance
  - Must be measurable

- Examples

- How are they used?

- MSU’s KPIs
Implementation Goals - KPI Tracking

- Minimize labor
- Use forms to eliminate the middleman
- Make submitted data instantaneously available
- Automate the data presentation so it also instantaneously updates
Implementation Reality - KPI Tracking

- What should be collected?

- Who should collect it?

- Why use Google Forms and Spreadsheets?
  - Advantages
  - Disadvantages

- Setup time

- Adoption rate
Google Forms Principles

- Simple forms
- Minimal data entry
- Require people to use as few forms as possible

Library KPI - Gate Count

* Required

Your Name *
Choose

Entries counted *
This should be the gate count at the end of the month subtracted from the gate count at the beginning of the month. That number should be divided by two.

Your answer

Submit

Never submit passwords through Google Forms.
Google Forms Practice

- Name always required
- Dates never required
- Data collected by one person in the same process should require only one form.

Library KPI - Circulation

* Required

Your Name *
Choose

Circulation Location *
This is by location code in the item record.
- General
- Music
- Media
- Maps
- Greenwood
- IG12

Circulations *
Your answer

SUBMIT

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Library KPI - Circulation

* Required

Your Name *
Choose

Circulation Location *
This is by location code in the item record:

- General
- Music
- Media
- Maps
- Greenwood
- IG12

Circulations *
Your answer

Submit

Never submit passwords through Google Forms.

Library KPI 2 - Catalog usage

* Required

Your Name *
Choose

Desktop page views
Your answer

Mobile page views
Your answer

Tablet page views
Your answer

Desktop sessions
Your answer

Mobile sessions
Your answer

Tablet sessions
Your answer

Submit

Multiple data fields in one form submission

Requires multiple submissions of one form
Key Performance Indicator Spreadsheet Links

Data → KPI 1 - Form → KPI 1 - Spreadsheet → KPIs Compiled 2015-16 - Spreadsheet
Data → KPI 2 - Form → KPI 2 - Spreadsheet → KPIs Compiled 2016-17 - Spreadsheet
Data → KPI 3 - Form → KPI 3 - Spreadsheet → KPIs Compiled 2017-18 - Spreadsheet
Data → KPI 4 - Form → KPI 4 - Spreadsheet → KPIs Compiled 2018-19 - Spreadsheet
Data → KPI 5 - Form → KPI 5 - Spreadsheet
Data → KPI 6 - Form → KPI 6 - Spreadsheet
Data → KPI 7 - Form → KPI 7 - Spreadsheet
Data → KPI 8 - Form → KPI 8 - Spreadsheet
Data → KPI 9 - Form → KPI 9 - Spreadsheet
Data → KPI 10 - Form → KPI 10 - Spreadsheet
Data → KPI 12 - Form → KPI 12 - Spreadsheet
Individual KPI Spreadsheet

- “Form Responses 1” sheet
  - Don’t touch it
  - Except...to add or change data
“Calculations” sheet

- Referring to ever expanding data sets from “Form Responses 1”
  - `'Form Responses 1'!A1`  
    - Requires a similar formula in every cell with data.
  - `'Form Responses 1'!A1:A`  
    - Looks at all the data in column A but only returns one cell of results.
  - `=Arrayformula('Form Responses 1'!A1:A)`  
    - Shows all the data in column A.
What is an array formula?

- A formula that returns an array of data rather than one cell of data.

- Simplest:
  - `{1,2,3,4}` or `{1;2;3;4}`

- `{A1:B2}`
  - Only shows one cell

- `=arrayformula(A1:B2)`
  - Shows all cells in the specified array
In praise of array formulas

- Arrayformula is a proper function in Google Sheets
  - Excel's implementation seems like an afterthought
- Useful for ever-expanding data situation
- One central point of failure...is a good thing
- It will change your view of data
Calculations sheet - added columns

- Extract useful data points
- Most are date related
- Names mapped to library units using vlookup table.
Array formulas will copy empty cells. Use a conditional to stop this.

- If there is length in cell A2, then do something, otherwise, do nothing.
Array formulas will copy empty cells. Use a conditional to stop this.
  ○ If there is length in cell A2, then do something, otherwise, do nothing.

Find the month before the timestamp's month.
  ○ Return this as text.
Array formulas will copy empty cells. Use a conditional to stop this.
  ● If there is length in cell A2, then do something, otherwise, do nothing.
● Find the month before the timestamp's month.
  ○ Return this as text.
● Creates an array using {...}
  ○ "Year" is the heading of the column.
  ○ The semicolon tells it to start a new row.
  ○ Why include a heading? It seems more "elegant" to a computer nerd.
Calculations sheet - array formula example, pt. 4

- Note that if the formula above used A2:A and then A1:A, it would not work.
- A2:A and then B2:B would work.

When doing math operations, array formulas work like matrices.
Summary sheet

- More human readable tables
- Organizes data so spreadsheets can make charts
- Information comes from the "Calculations" sheet.
Summary sheet data organization

- How can I organize the data like this?
  - No pivot tables in Google Sheets when I created this.
  - Answer: "query" function

- MS Excel does not have a function equivalent to "query"

- "Query" actually comes from Google's visualization API used for other Google tools. They built the functionality into Google Sheets also.
Summary sheet - query function

Example:

=query(Calculations!C1:F, "select E, sum(C) where E <>" group by E pivot F",1)
Summary sheet - query function

Example:

=query(Calculations!C1:F,"select E, sum(C) where E <>" group by E pivot F"[1])

- Data source
- Query
- Headers

If anybody has written SQL queries, you will recognize the query section.
Summary sheet - query function explanation

| select F, sum(D) where F <>"" group by F pivot C |

Data source:

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timestamp</td>
<td>Your Name</td>
<td>Circulation Loc</td>
<td>Circulations</td>
<td>-</td>
<td>Month</td>
</tr>
</tbody>
</table>

Query result:

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
</tr>
</thead>
<tbody>
<tr>
<td>Month</td>
<td>General</td>
<td>Greenwood</td>
<td>IG12</td>
<td>Maps</td>
<td>Media</td>
<td>Music</td>
</tr>
<tr>
<td>2015-07</td>
<td>2,335</td>
<td>80</td>
<td>318</td>
<td>3</td>
<td>168</td>
<td>272</td>
</tr>
<tr>
<td>2015-08</td>
<td>3,257</td>
<td>708</td>
<td>471</td>
<td>15</td>
<td>183</td>
<td>442</td>
</tr>
<tr>
<td>2015-09</td>
<td>4,090</td>
<td>1,459</td>
<td>643</td>
<td>18</td>
<td>320</td>
<td>530</td>
</tr>
<tr>
<td>2015-10</td>
<td>4,590</td>
<td>1,279</td>
<td>942</td>
<td>16</td>
<td>366</td>
<td>450</td>
</tr>
</tbody>
</table>
LongTrends sheet

- Longitudinal data
- Reformatted for different charts
Analysis sheet

- More statistics
- Not well utilized

<table>
<thead>
<tr>
<th></th>
<th>General</th>
<th>Greenwood</th>
<th>IG12</th>
<th>Maps</th>
<th>Media</th>
<th>Music</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Count</td>
<td>39.00</td>
<td>39.00</td>
<td>39.00</td>
<td>39.00</td>
<td>39.00</td>
<td>39.00</td>
<td>39.00</td>
</tr>
<tr>
<td>Min</td>
<td>1,645.00</td>
<td>59.00</td>
<td>109.00</td>
<td>1.00</td>
<td>104.00</td>
<td>211.00</td>
<td>2,296.00</td>
</tr>
<tr>
<td>Max</td>
<td>4,590.00</td>
<td>1,526.00</td>
<td>942.00</td>
<td>29.00</td>
<td>749.00</td>
<td>530.00</td>
<td>7,643.00</td>
</tr>
<tr>
<td>Median</td>
<td>3,257.00</td>
<td>1,067.00</td>
<td>413.00</td>
<td>6.00</td>
<td>320.00</td>
<td>316.00</td>
<td>5,376.00</td>
</tr>
<tr>
<td>Mean/Avg</td>
<td>3,131.16</td>
<td>930.26</td>
<td>495.51</td>
<td>7.21</td>
<td>323.10</td>
<td>333.08</td>
<td>5,134.33</td>
</tr>
<tr>
<td>Std Dev</td>
<td>822.25</td>
<td>474.39</td>
<td>181.60</td>
<td>5.73</td>
<td>129.78</td>
<td>74.79</td>
<td>1,523.73</td>
</tr>
<tr>
<td>Coefficient of variation</td>
<td>26.26%</td>
<td>51.00%</td>
<td>44.34%</td>
<td>79.52%</td>
<td>40.17%</td>
<td>22.45%</td>
<td>29.68%</td>
</tr>
<tr>
<td>Correlation with Gen</td>
<td>0.758</td>
<td>0.831</td>
<td>0.427</td>
<td>0.602</td>
<td>0.754</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
“Library KPI 01 – Gate Count” Spreadsheet

Start → !Form Responses 1 → !Calculations → !Summary → !Analysis

!LongTrends

!YearByYear

“Library KPIs – 2018-19” Spreadsheet

!Sheet1 → !KPI1Charts → Stop
YearByYear sheet

- **Purpose**
  - Prepare data for the yearly compilation spreadsheets
  - Source of ACRL and IPEDS survey data
  - Provides tables with unlinked data
    - If revisions needed, these will not reflect the revisions
    - Gives a snapshot at a certain point and time
Yearly Compilations

● What are they?
  ○ One spreadsheet for each fiscal year.
  ○ One sheet of tables.
  ○ One sheet for each KPI with charts.

● How are they used?
  ○ Primary place people look for information.
  ○ Quick view of progress for the year.
    ■ Automatically updated
  ○ Quick way to access more details.
# Library KPIs - 2017-18

Please see the KPI Table of Contents page for further information.

## KPI 1 - Gate counts

<table>
<thead>
<tr>
<th>Month</th>
<th>Haseltine</th>
<th>Meyer</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017-07</td>
<td>868</td>
<td>18,776</td>
</tr>
<tr>
<td>2017-08</td>
<td>3,317</td>
<td>41,496</td>
</tr>
<tr>
<td>2017-09</td>
<td>5,509</td>
<td>90,590</td>
</tr>
<tr>
<td>2017-10</td>
<td>5,893</td>
<td>90,515</td>
</tr>
<tr>
<td>2017-11</td>
<td>5,294</td>
<td>74,382</td>
</tr>
<tr>
<td>2017-12</td>
<td>2,670</td>
<td>52,253</td>
</tr>
<tr>
<td>2018-01</td>
<td>3,791</td>
<td>32,708</td>
</tr>
<tr>
<td>2018-02</td>
<td>4,856</td>
<td>56,523</td>
</tr>
<tr>
<td>2018-03</td>
<td>4,456</td>
<td>47,938</td>
</tr>
<tr>
<td>2018-04</td>
<td>5,859</td>
<td>65,411</td>
</tr>
<tr>
<td>2018-05</td>
<td>4,767</td>
<td>56,360</td>
</tr>
<tr>
<td>2018-06</td>
<td>1,036</td>
<td>14,065</td>
</tr>
</tbody>
</table>

## KPI 2 - Online catalog hits

<table>
<thead>
<tr>
<th>Month</th>
<th>Desktop page view</th>
<th>Mobile page view</th>
<th>Tablet page view</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017-07</td>
<td>28829</td>
<td>3771</td>
<td>3617</td>
<td>36217</td>
</tr>
<tr>
<td>2017-08</td>
<td>41880</td>
<td>2393</td>
<td>4776</td>
<td>49049</td>
</tr>
<tr>
<td>2017-09</td>
<td>70549</td>
<td>4145</td>
<td>3040</td>
<td>77734</td>
</tr>
</tbody>
</table>
Yearly Compilations - Importing ranges

- Google Sheets provides a function to import ranges from other spreadsheets.
  
  =IMPORTRANGE(spreadsheet_url, range_string)

- Actual example
  
  =IMPORTRANGE(B4,"YearByYear!A53:C65")
  
  =IMPORTRANGE(https://docs.google.com/spreadsheets/d/17cacYRj41jxE0en5NTGbxz8VjIW-YuCD0Tv1HFr_vRo/edit#gid=1354460272,"YearByYear!A53:C65")
**Library KPIs - 2017-18**

Please see the KPI Table of Contents page for further information.

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Yearly Compilations - KPI Charts

Meyer Library Gate Count

MSU Libraries Springfield YouTube Video Views
Key Performance Indicator Buy-in

- Buy-in means interest from others, useful results, and less work for me.
- How to get buy-in
  - Top down mandate
  - Collect what people are already doing
  - Make data submission easy and regular
  - Instant response to submissions
  - Add value for the data submitters
    - They don't have to keep long term records
    - Tables and charts created without extra work