

Owl Demo Project



Revamping Google Sheets with Google App Script



Bringing some context

Where: Marketing organization at a global beauty company

Why: Operations department goal to streamline processes and leverage data

What: Opportunities to revamp existing Google Sheets trackers

When: First semester of 2020

Who/How: Collaboration with team leads and producers

How Much: 20% allocated during 6 months

The starting point

Project Tracking Form									
Project Name: SOFT									
Department Code:									
Project Completion Date:									
Amount of Project:									
Budget				Estimate		Fav/(Unfav)			
\$103,192				\$100,000		\$3,192			
Budget				Actual		Fav/(Unfav)			
\$103,192				\$98,174		\$5,018			
Estimate				Actual		Fav/(Unfav)			
\$103,192				\$98,174		\$5,018			
Type of Expenses	Vendor	Invoice #	Budget	Estimate	Actual	Notes	Code	Expensed to	
Freelancers			\$ 25,000.00			Original budget \$75K			
SOFT related expenses			\$ 50,000.00			R1			
Additional R1			\$ 28,192.00			R2			
Storage									
Storage clean out (3 days)	Wendy	33018		\$ 4,000.00	\$ 3,743.96		SEPK	April	
Total				\$ 4,000.00	\$ 3,743.96				
Intern for creative									
Intern for April and May for Tyler	Name?			\$ 1,500.00	\$ 1,500.00	Per Tyler; her manager will code	SEPK	April	
Total				\$ 1,500.00	\$ 1,500.00				
Yearbook 2016									
Printing + shipping				\$ 5,000.00	\$ 5,000.00		SEPK	April	
Total				\$ 5,000.00	\$ 5,000.00				

Project expense tracker used prior to 2020



Data sources and reports generated manually

The Problem

Overview

- Simple project expense tracker in Google Sheets used by over 10 users
- Used to track expenses, support accounting and budget process

Pain Points

- Large amounts of time dedicated to data manipulation and reporting
- Process prone to errors, lacking data integrity and organized data structure

UI and UX

2

- User runs functions via menu selector

3

- Create new project tracker
- Consolidate data from selected tabs
- Fix broken formulas
- Protect active sheet
- Create backup copy of application

File Edit View Insert Format Data Tools Add-ons Help Tracker Tools Last edit was made 9 minutes ago by Jan Thomas Heineman															
<div> <div> </div> <div> <div>New Projects</div> <div>Data</div> <div>Utils</div> </div> </div>															
Project Info				Actuals by IO				Estimates and Forecast Planning							
Title February Initiatives Initiative Initiative Name Project Key PRC2 Responsible Betsy Dean Notes Random notes 2				Internal Order IO CODE 2 IO CODE 2 8% to Month Total Feb 2020				Estimates Fav Estimates Forecast Fav Forecast Category Estimates Totals Actuals Totals % Fav/(Unfav)							
\$ 60,000.00 \$ 58,100.00 \$ 1,900.00 \$ 58,000.00 \$ 2,000.00 \$ 58,100.00 \$ 1,900.00				Running Total Remaining to Spend \$ 58,100.00 \$ 1,900.00 \$ - \$ - \$ - \$ - \$ 60,000.00 \$ 58,100.00 \$ 1,900.00				\$ 58,000.00 \$ 2,000.00 \$ 58,100.00 \$ 1,900.00 Photography Talent Glam + Styling Retouching Remaining \$ 8,000.00 \$ 7,000.00 \$ 15,000.00 \$ 6,000.00 \$ 22,000.00 \$ 8,200.00 \$ 6,200.00 \$ 14,700.00 \$ 6,600.00 \$ 22,400.00 2% 11% 2% -10% 2%							
Project Key	Type	Category	Type of Expenses	Name	Vendor	Invoice #	Budget	Rate (\$)	Unit	Quantity	Estimate	Actual	Asset Count	Notes	
PRC2	Project	February Initiatives	February Initiatives				\$ 60,000.00								
PRC2	Line Item	Photography	Photographer fee and usage	Jack C		191574		\$ 1,000.00		1	\$ 1,000.00	\$ 900.00			
PRC2	Line Item	Photography	Photog expenses advance	Ben A		191543		\$ 2,000.00		1	\$ 2,000.00	\$ 1,800.00			
PRC2	Line Item	Talent	Model 1	Tracy R		60389		\$ 3,000.00		1	\$ 3,000.00	\$ 3,000.00			
PRC2	Line Item	Glam + Styling	Hair	Tom Z		2083		\$ 4,000.00		1	\$ 4,000.00	\$ 4,000.00	3		
PRC2	Line Item	Glam + Styling	Makeup	Ana Z		105515		\$ 5,000.00		1	\$ 5,000.00	\$ 5,000.00	11		
PRC2	Line Item	Glam + Styling	Manicurist	Jack C		191574		\$ 1,000.00		1	\$ 1,000.00	\$ 1,200.00			
PRC2	Line Item	Glam + Styling	Wardrobe stylist	Ben A		191543		\$ 2,000.00		1	\$ 2,000.00	\$ 1,800.00			
PRC2	Line Item	Glam + Styling	Wardrobe expenses	Tracy R		60389		\$ 3,000.00		1	\$ 3,000.00	\$ 2,700.00			
PRC2	Line Item	Talent	Casting	Tom Z		2083		\$ 4,000.00		1	\$ 4,000.00	\$ 3,200.00	3		
PRC2	Line Item	Music	Music	Ana Z		105515		\$ 5,000.00		1	\$ 5,000.00	\$ 6,000.00	11		
PRC2	Line Item	Video	Motion Post- Editing, Color & VFX	Jack C		191574		\$ 1,000.00		1	\$ 1,000.00	\$ 1,100.00			
PRC2	Line Item	Music	Sound Mix	Ben A		191543		\$ 2,000.00		1	\$ 2,000.00	\$ 2,200.00			
PRC2	Line Item	Video	2nd VO recording	Tracy R		60389		\$ 3,000.00		1	\$ 3,000.00	\$ 2,700.00			
PRC2	Line Item	Art Department	Retouching	Tom Z		2083		\$ 4,000.00		1	\$ 4,000.00	\$ 4,800.00	3		
PRC2	Line Item	Photography	Store Photography	Ana Z		105515		\$ 5,000.00		1	\$ 5,000.00	\$ 5,500.00	11		
PRC2	Line Item	Retouching	Production Expenses	Tom Z		2084		\$ 6,000.00		1	\$ 6,000.00	\$ 6,600.00	19		
PRC2	Line Item	Post	Retouching	Ana Z		105516		\$ 7,000.00		1	\$ 7,000.00	\$ 5,600.00	27		
PRC2	Project Budget		Subtotal				\$ 60,000.00				\$ 58,000.00	\$ 58,100.00			
							\$ -				\$ 58,000.00	\$ 58,100.00			

1

- User updates information on desired sheets

Data Consolidation

2

- User runs functions via menu selector

Project Budget Management Tool ☆ 📁 ☁

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Column A: SHEET NAME automatic populated with all tab names

1 SHEET NAME Consolidate Trigger Number We

2 Summary

3 Intake

4 ADMIN

5 Template 1

6 Template 2

7 Data

8 Temp Data

9 Param

10 01_Jan Yes 1

11 02_Feb Yes 1

12 03_Mar Yes 1

13 04_Apr Yes 2

14 05_May Yes 2

15 06_Jun Yes 2

16 07_Jul Yes 3

17 08_Aug Yes 3

18 09_Sep Yes 3

19

20

1

- User defines sheets and triggers for consolidation

Consolidate Data

Consolidation Execution 1/4

Consolidation Execution 2/4

Consolidation Execution 3/4

Consolidation Execution 4/4

General Instructions

E automatic populated with all tab names

to consider SHEET on consolidation available in the tab 'Data'.

Column C: Set number from 1 to 3 to distribute execution on daily trigger execution.

Intake ADMIN Data 01_Jan 02_Feb 03

Support Tabs Tracker Tabs

3

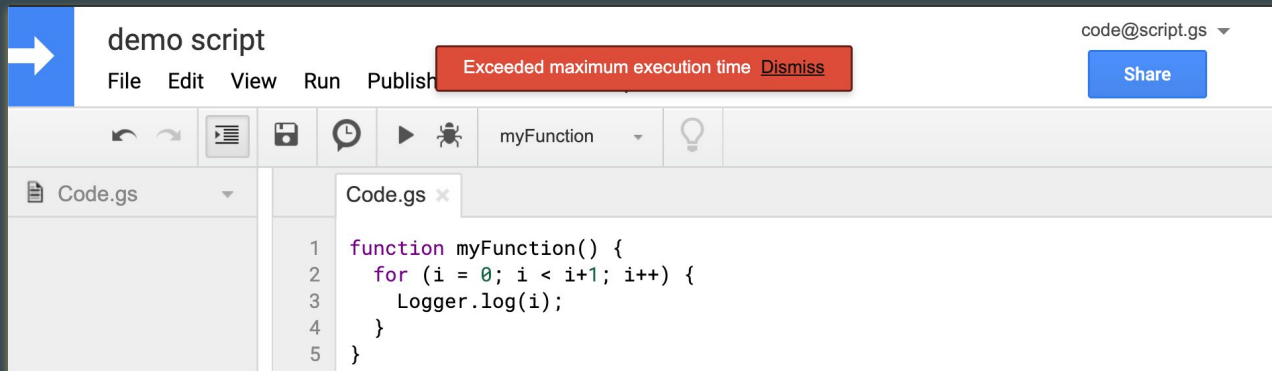
- Output sheet updated after data extraction and transformation

Type	Tab Name	Initiative Name	Project code	Project	Category	Type of Expenses	Name	Vendor	Invoice #	Budget	Rate (\$)	Unit	Quantity	Estimate	Actual
Line Item	01_Jan	Initiative Name	PRC	January Initiatives	Photography	Photographer	Jack C		191574		1000	1	1	\$1,000.00	\$900.00
Line Item	01_Jan	Initiative Name	PRC	January Initiatives	Art Department	Prop Stylist	Ben A		191543		2000	1	1	\$2,000.00	\$1,800.00
Line Item	01_Jan	Initiative Name	PRC	January Initiatives	Illustration	Production Expenses	Tracy R		60389		3000	1	1	\$3,000.00	\$3,000.00
Line Item	01_Jan	Initiative Name	PRC	January Initiatives	Post Production Expenses		Tom Z		2083		4000	1	1	\$4,000.00	\$4,400.00
Line Item	01_Jan	Initiative Name	PRC	January Initiatives							5000	1	1	\$5,000.00	\$4,500.00
Project Budget	01_Jan	Initiative Name	PRC	January Initiatives							\$10,000.00			\$15,000.00	\$14,600.00
Line Item	02_Feb	Initiative Name	PRC	February Initiatives							1000	1	1	\$1,000.00	\$900.00
Line Item	02_Feb	Initiative Name	PRC	February Initiatives							2000	1	1	\$2,000.00	\$1,800.00
Line Item	02_Feb	Initiative Name	PRC	February Initiatives							3000	1	1	\$3,000.00	\$3,000.00
Line Item	02_Feb	Initiative Name	PRC	February Initiatives							4000	1	1	\$4,000.00	\$4,000.00
Line Item	02_Feb	Initiative Name	PRC	February Initiatives							5000	1	1	\$5,000.00	\$5,000.00
Line Item	02_Feb	Initiative Name	PRC	February Initiatives							1000	1	1	\$1,000.00	\$1,200.00
Line Item	02_Feb	Initiative Name	PRC	February Initiatives							2000	1	1	\$2,000.00	\$1,800.00
Line Item	02_Feb	Initiative Name	PRC	February Initiatives							3000	1	1	\$3,000.00	\$2,700.00
Line Item	02_Feb	Initiative Name	PRC	February Initiatives							4000	1	1	\$4,000.00	\$3,200.00
Line Item	02_Feb	Initiative Name	PRC	February Initiatives							5000	1	1	\$5,000.00	\$6,000.00
Line Item	02_Feb	Initiative Name	PRC	February Initiatives	Video	Motion Post-Editing, Color	Jack C		191574		1000	1	1	\$1,000.00	\$1,100.00
Line Item	02_Feb	Initiative Name	PRC	February Initiatives	Music	Sound Mix	Ben A		191543		2000	1	1	\$2,000.00	\$2,200.00

The biggest challenge required some research and creativity to solve

Problem

- Overcome execution time limit of 5 minutes
- Issue started when running consolidation for over 30 trackers



Approach to Solution

Distribute consolidation in parts

```
function CallGetDataFromTab_Trigger_1() {  
  GetDataFromTab_Trigger(1);  
}
```

```
function CallGetDataFromTab_Trigger_2() {  
  GetDataFromTab_Trigger(2);  
}
```

```
function CallGetDataFromTab_Trigger_3() {  
  GetDataFromTab_Trigger(3);  
}
```

```
function CallCopyPaste_Trigger() {  
  //cleaning previous range  
  var DestinationSheet =  
    SpreadsheetApp.getActiveSpreadsheet().getSheetB  
      yName('Data');
```

```
  DestinationSheet.getRange('A1:AE10000').activate  
    ();  
  DestinationSheet.getActiveRangeList().clear({con  
    tentsOnly: true, skipFilteredRows: true});
```

```
  var spreadsheet = SpreadsheetApp.getActive();  
  //tab with all temp data  
  spreadsheet.setActiveSheet(spreadsheet.getSheetB  
    yName('Temp Data'), true);
```

```
  var sheet = SpreadsheetApp.getActiveSheet();  
  var data = sheet.getDataRange().getValues();
```

```
  // write data to sheet  
  DestinationSheet.getRange(1, 1, data.length,  
    data[0].length).setValues(data);
```

```
  spreadsheet.setActiveSheet(spreadsheet.getSheetB  
    yName('Data'), true);  
}
```

Approach to Solution

Consolidation function (1/2)

```
function GetDataFromTab_Trigger(runNumber) {  
  
  var CallnumRun = runNumber  
  var PasteSheet = SpreadsheetApp.getActiveSpreadsheet().getSheetByName('Temp Data');  
  var rowPaste;  
  //call function to get last row to paste  
  var lastRow = goToFirstRowAfterLastRowWithData(PasteSheet,1)  
  
  if(CallnumRun === 1){  
    //cleaning previous range on first run  
    rowPaste = 2;  
    PasteSheet.getRange('A2:AE10000').activate();  
    PasteSheet.getActiveRangeList().clear({contentsOnly: true, skipFilteredRows: true});  
  
  }else{  
    rowPaste = lastRow;  
  }  
  var spreadsheet = SpreadsheetApp.getActive();  
  //tab with all sheet names, sheet names generate by custom cell function  
  spreadsheet.setActiveSheet(spreadsheet.getSheetByName('ADMIN'), true)  
  var sheet = SpreadsheetApp.getActiveSheet();  
  var data = sheet.getDataRange().getValues();  
  ...  
}
```

Approach to Solution

Consolidation function (2/2)

```
...

//getting tab names to pass next
for (var i = 0; i < data.length; i++) {

    var StrSheetName = data[i][0];

    //check if tab is needed, function argument used here to get Sheet Name
    if(data[i][2] === runNumber && data[i][0] != ''){

        GetDataFromTab(StrSheetName);

    }

}

// write data to sheet
PasteSheet.getRange(rowPaste, 1, values.length, values[0].length).setValues(values);

//activate sheet
spreadsheet.setActiveSheet(spreadsheet.getSheetByName('Temp Data'), true);
}
```

Approach to Solution

Extract and Transform data from Sheet (1/2)

```
function GetDataFromTab(ShName) {  
  //return updates on global array  
  
  var spreadsheet = SpreadsheetApp.getActive();  
  spreadsheet.setActiveSheet(spreadsheet.getSheetByName(ShName), true);  
  var sheet = SpreadsheetApp.getActiveSheet();  
  var data = sheet.getDataRange().getValues();  
  //define variables  
  var strType;  
  var strCategory;  
  ...  
  //loop to get data from tab  
  for (var i = 9; i < data.length; i++) {  
    if(data[i][1]=== 'Project'){  
      strProject=data[i][3];  
    }  
    if(data[i][1]=== 'Line Item' || data[i][1]=== 'Project Budget'){  
      strType = data[i][1];  
      strCategory = data[i][2];  
      ...  
    };  
    // push a row of data as 2d array
```

Approach to Solution

Extract and Transform data from Sheet (2/2)

```
...    // push a row of data as 2d array, values[] is the global array

values.push([strType,ShName,strInitiative,'PRC',strProject,strCategory,strExpenseType,strName,strVendor,str
InvoiceNum,strBudget,strUnit,strRate,strQuantity,strEstimate,strActuals,strAssetCount,strNotes,strGLCode,st
rCostCenter,strCode,StrExpenseMonth,strBillTo,strForecast,strFUP,strSavingsCheck,strDateNum,i]);


    }


}


}
```



Approach to Solution


Create time driven triggers in sequence


Google Apps Script


 Search Project Name





New project


 Starred Projects


 My Projects



 All Projects

 Shared with me


 Trash

 My Executions

 My Triggers

 Project Budget Tracker  Triggers

Showing 4 triggers

Owned by: Me 

CLEAR FILTERS

Owned by	Last run	Deployment	Event	Function	Error rate
Me	-	Head	Time-based	CallGetDataFromTab_Trigger_1	-
Me	-	Head	Time-based	CallGetDataFromTab_Trigger_2	-
Me	-	Head	Time-based	CallGetDataFromTab_Trigger_3	-

What could be better

- Improve error and exception handling
- Check for mandatory fields on intake process
- Overcome slow down using big spreadsheets
- Try alternatives to increase speed in data consolidation

New Features

- Develop functionality to systematically use sheet templates
- Develop functionality to check and report data inconsistencies
- Develop functionality to manage lists and enable update on dropdowns
- Develop functionality to manage email notification

