

MIS 573 Documentation for Koffman's

AirTable Product Recommendations



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## Introduction

This final deliverable will aim to cover design, purpose and implementation on subsequent data gathering bases at Koffman. In addition, we will also go over some of the upgraded features coming from the license upgrades to AirTable.

The report will be structured using the proposed scope discussed during the project presentation that took place on December 1st, 2023, presentation at the Koffman conference room to our Koffman mentors and managers: Bandhana Katoch, Nicholas Zwierlein, Emma Smith, and Olga Petrova.

### Proposed Scope:

1. [Tidying current base](#)
2. [More views, less tables](#)
3. [Segmentation of industries](#)
4. [Expand upon use extensions](#)

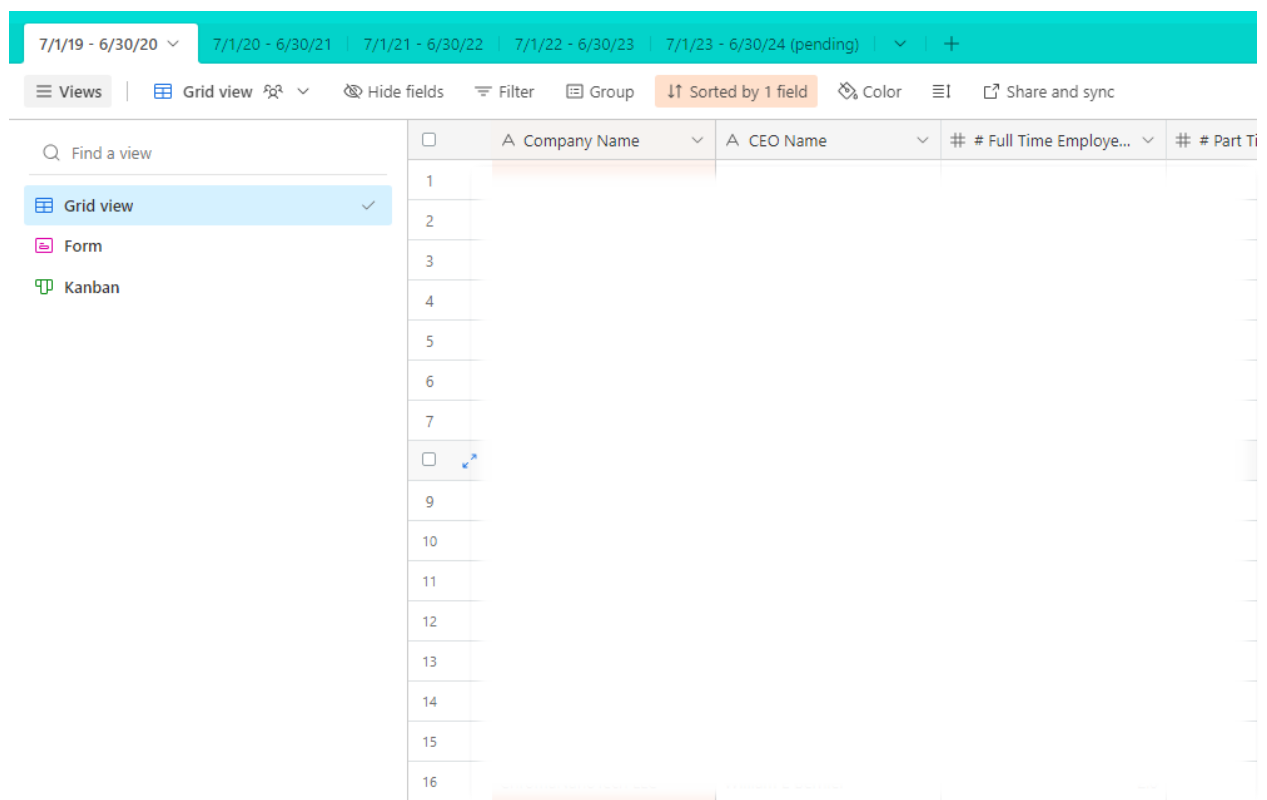
The execution for these tasks is in order of priority since a lot of the features and advantages of following processes of the project depend on being able to work on data relationships that must be enforced by executing the 1<sup>st</sup> step of the project.

## Tidying the current base

This is the cornerstone of the project, following sections will take advantage of the groundwork set by recommendations and best practices set within this section of the project.

### Current base

As of December 5, 2023, the current state of the bases that our MIS team had access to were as tables separated by fiscal year for data collection of forms sent to companies within the Koffman programs. Most of the tables and bases consists of period of submission, grid view, form shared to companies and some data transformation within the default grid view as seen in Figure 1



The screenshot displays a data collection interface with a teal header bar containing date filters: 7/1/19 - 6/30/20, 7/1/20 - 6/30/21, 7/1/21 - 6/30/22, 7/1/22 - 6/30/23, and 7/1/23 - 6/30/24 (pending). Below the header is a toolbar with options: Views, Grid view (selected), Hide fields, Filter, Group, Sorted by 1 field, Color, and Share and sync. On the left, a sidebar shows view options: Grid view (selected), Form, and Kanban. The main area is a grid with 16 rows and 4 columns. The columns are labeled: Company Name, CEO Name, # Full Time Employee..., and # Part Time Employee... The rows are numbered 1 through 16. Row 8 is highlighted with a blue selection bar.

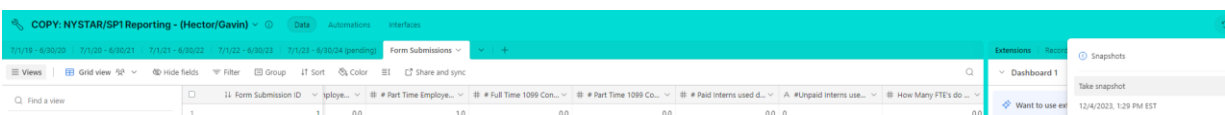
	A Company Name	A CEO Name	# # Full Time Employee...	# # Part Ti
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				

Figure 1 Data collection base

## Snapshots

One of the main changes that need to be mainstreamed as part of operations that involved big changes within the Koffman base are “snapshots.” Snapshots are essentially backups to the hole base that allow users to restore to a previous version of the base; these should act as emergency backups. In addition, restoring a snapshot creates a copy of the older base (that can be renamed) while specifying the month when the snapshot was created as seen in Figure 2

(a)



(b)

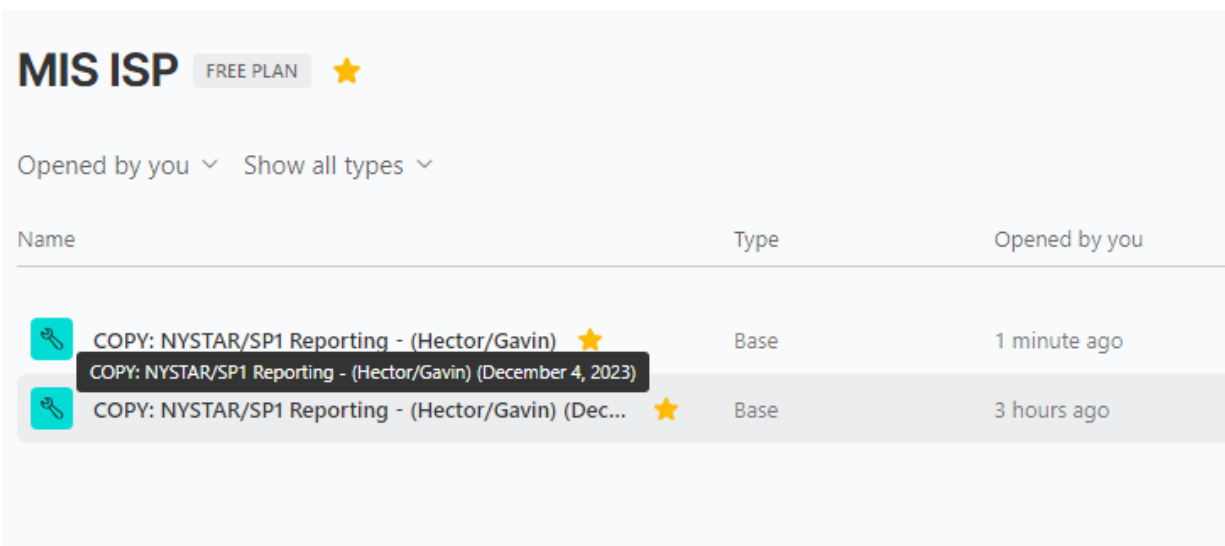


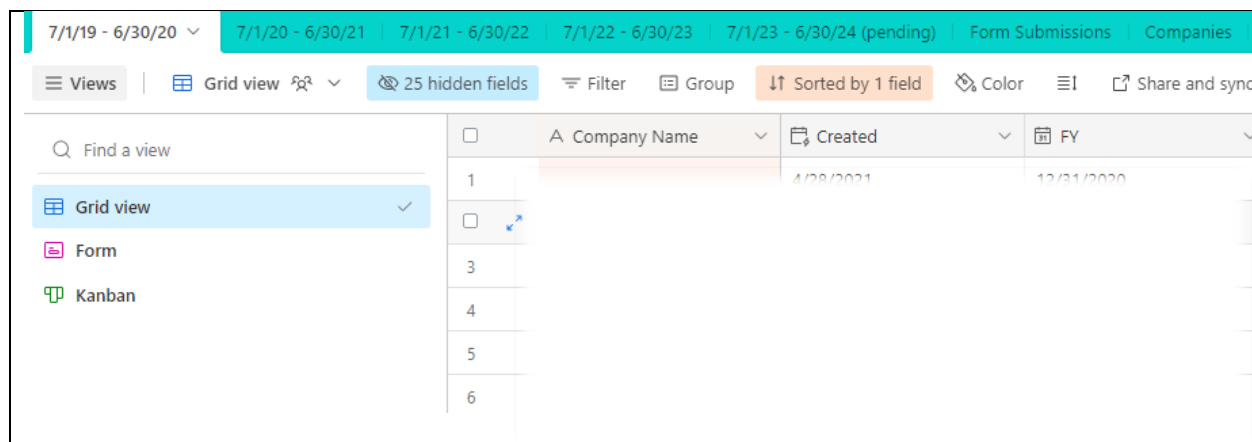
Figure 2 (a) Snapshot menu, (b) snapshot restoration

More details about the limitations of the snapshot’s history are available on AirTable’s [support page](#). Backups should be done **before** making any meaningful changes to the base, like the ones we are about to cover.

## Consistency

Given that there have been many iterations of data collection forms within the different Koffman's bases, it is important that we make sure that data fields within those tables are renamed to be the same across different tables. For example, Advanced Technology vs Advanced Tech are both values of fields that (seem to belong) to the same category; Industry Sector vs Company Sector.

Once that's achieved, we can add additional fields that will be useful to identify these historical forms and to what fiscal year they pertain to. For this we would add an additional field and specify the formula to parse the particular year. If we had to manually add records like just setting the end of Koffman's fiscal year for the reporting of those submissions (as a date field, which is copied to the rest of the submissions that are blank) like Figure 3



	A Company Name	Created	FY
1		1/28/2021	12/31/2020
2			
3			
4			
5			
6			

Figure 3 Manually set fiscal year (FY) to match Koffman's fiscal year when accurate date was not available

Once our tables are consistent, we can start working on aggregating these records into a single table. It's also important to note we don't need to update older records within the newer fields of the form unless needed to meet a business goal.

## Primary Identification Fields

After we are done aggregating all the submissions to a single **new** table, we can start working towards identifying unique records across our tables and bases. There's a couple of options for these, the

simplest solution is to add a new column (as an AutoNumber field) and change the primary field (by right clicking on the current primary field usually the leftmost one) to it as shown here in Figure 4

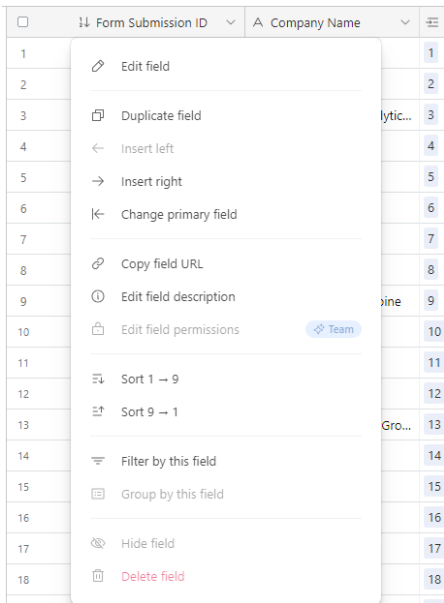


Figure 4 Changing primary keys

## Linked Records

The final subsection on this stage of the project will cover the beginning of the first steps to fully transform a base closer to a relational database by establishing relationships across our tables. There are multiple ways of doing this and they depend on the structure that we want our bases to have. For this we'll refer to an ERD diagram using PlantUML [1], that we developed at the beginning of the project on September 29<sup>th</sup> to illustrate the point shown in Figure 5

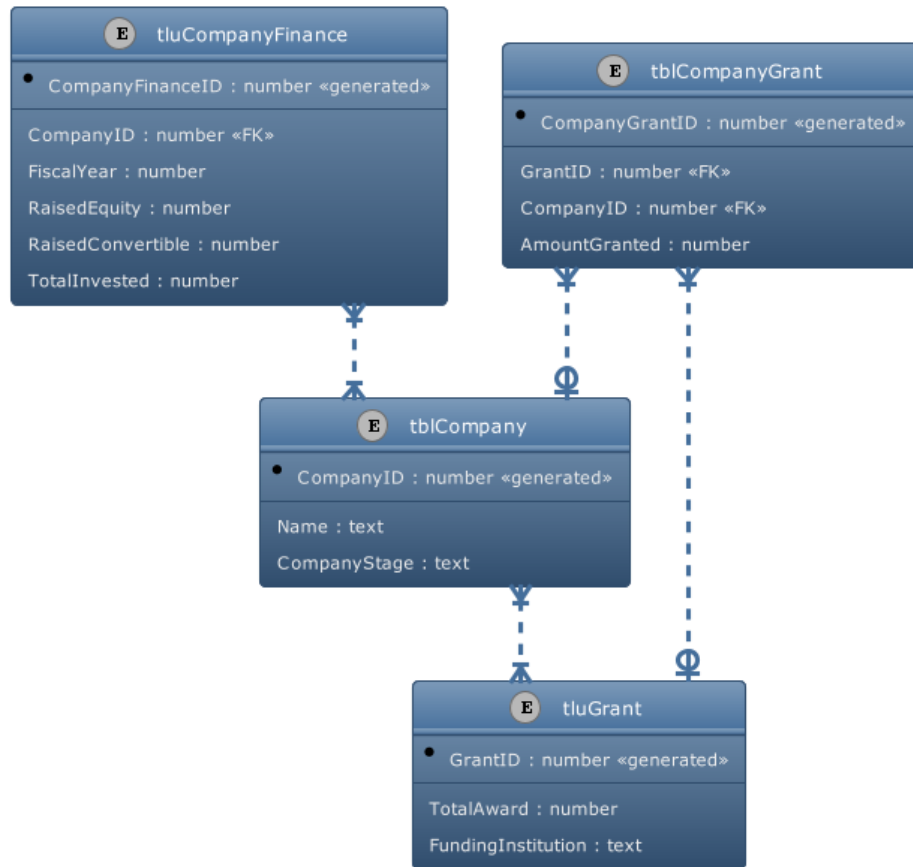


Figure 5 Entity relationship diagram presented

From Figure 5 we can identify the relationships that these tables have to each other, and that once we progress further adjusting our bases we'll be able to see explicitly through the use of the [schema extension](#) by AirTable. For now, let's focus on being able to derive some of those relationships from within our tables. We have grants, companies, and form submissions. The example we'll work with for this documentation will be form submissions. For each unique submission, there will be individual companies that map on to that submission, that will make the relationship, many (submissions) to one company. To enforce that relationship, we need to declare a linked record that binds these tables together. After adding unique identifiers to our form submissions after aggregating, our aggregate table should look something like Figure 6



Form Submission ID	Company Name
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	

311 submissions

Figure 6 Form submission id, company names and total submission count

Next, the following part requires some tinkering with formulas. Because AirTable splits records with comma delimiters and spaces in the names, we need to eliminate those from each company name (without needing to change the original field), we created a new field called Formatted name to link on using the following formula

Formatted name

```
SUBSTITUTE(
  SUBSTITUTE({Company Name}," ", "")," ", "")
```

The formula is two nested substitutions, so for example. A company named “XYZ Company, LLC” will be processed in the inner formula first. Resulting in “XYZ CompanyLLC” and then remove the last space in the outer substitution formula, resulting in “XYZCompanyLLC”.

Then we need to turn the field we just made into a linked record and link it to a **new table**. AirTable will add additional fields that just represent unique identifier that relates both tables together as shown in Figure 7 this new table will also be extremely useful because we’ll be able to use it for very seamless look up operations and roll ups (which aggregate field values together) as we can see in Figure 8

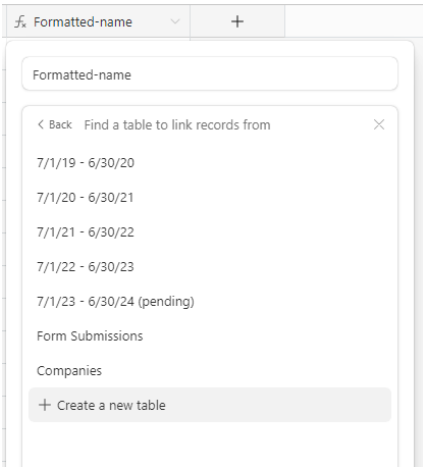


Figure 7 Right clicking on the field and changing type to linked record, selecting new table

7/30/22   7/1/22 - 6/30/23   7/1/23 - 6/30/24 (pending)   Form Submissions   Companies				
fields Filter Group Sort Color Share and sync				
<input type="checkbox"/>	Company ID	A Formatted Company Record	Company Name (fro...	Form Submissions
6	6			
7	7			
8	8			
9	9			
10	10			
11	11			
12	12			

Figure 8 New linked table called "Companies"

Notice how every company has a unique identifier which we added using auto numbers and the Form Submissions field from the Form Submissions table shows **all** their submitted records under that company name. This also enables a lot of other options for manually editing data for certain companies, since now all submitted records for certain companies will be readily available within the company table, these can be edited by just double left clicking on that form submission id as seen in Figure 9. We can extend these principles to grants, finances and many more designations and categories to fulfill any of our business needs.

8

x

*Figure 9 Looking at the record profile for Form Submission 8 through the new table "Companies"*

## More views, less tables

Views within AirTable represent essentially different “lenses” from which we can slice the data using filters, groups, hiding tools and color coordination to represent a specific number of records to develop whatever story we are trying to build to.

During a lot of our time in Koffman, one of our goals was to assist in ways to make certain reporting a lot easier, automation was also a possibility we could explore but given the available tools, we worked closely with Nick to develop a no-code approach to get the necessary data for two specific reports that we had data from the base to work with. These reports were NYSTAR and SP1. These reports, thanks to the samples that Nick made available to us, were the perfect test case for using grouping and filtering features as well as views to exemplify how powerful they can be at summarizing specific data that we might need. For that, we also created newer fields so that we could slice the data accurately for the specific view we are trying to build.

## Grouping

To aggregate pertinent information to NYSTAR and SP1 Commercialization metrics to simplify reporting

### Changes:

- Program (Multi)

```
IF(OR(Program = "SCI", Program = "KiP", Program = "Co-Working"), "BIP", "")
```

- Total Interns

Sum of Interns (paid and unpaid)

- Economic Impact

```
{Total Grant $}+{$ raised in exchange for equity}+{$ Loans taken during period}+{Total $ paid in salary}
```

- Funding Raised

{ \$ raised in exchange for equity } + { \$ Loans taken during period }

Purpose of changes:

By adding additional grid fields, we open a lot of options when it comes to grouping in separate grid views. For example, by hidden every other field except for: Program, Economic Impact, Total Grant \$, \$ raised in exchange for equity, \$ Loans taken during period, Total \$ paid in salary, \$ Company revenue # FTE Equivalent, Total Interns, # Patents issued and # Patent Applications filed. We can produce a program summary view by grouping on Program (Multi) and then Program.

This will simplify aggregation operations that were previously tabulated manually, here are a few examples of information preserved.

	SF Company ...	Program	Economic Impact	Total Grant \$	\$ raised in exchange ...	\$ Loans taken during...	Total \$ paid in salary	\$ Company revenue ...	# FTE Equivalent	Total Interns	# Patents Issued	# Patent Application...	
	BIP	Count 67		Sum \$114,508,158.05	Sum \$16,929,009.99	Sum \$62,302,300.00	Sum \$6,183,413.78	Sum \$29,093,434.28	Sum \$36,365,815.68	Sum 548.5	Sum 113	Sum 48.0	Sum 54.0
PROGRAM	SCI	41		Sum \$106,626,756.84	Sum \$16,805,009.99	Sum \$56,952,300.00	Sum \$5,930,590.00	Sum \$26,938,856.95	Sum \$29,613,614.31	Sum 489.0	Sum 106	Sum 29.0	Sum 43.0

	SF Company ...	Program	Economic Impact	Total Grant \$	\$ raised in exchange ...	\$ Loans taken during...	Total \$ paid in salary	\$ Company revenue ...	# FTE Equivalent	Total Interns	# Patents Issued	# Patent Application...	
	KIP	25		Sum \$7,816,401.11	Sum \$124,000.00	Sum \$5,350,000.00	Sum \$252,823.78	Sum \$2,089,577.33	Sum \$6,602,201.37	Sum 70.5	Sum 7	Sum 19.0	Sum 11

	SF Company ...	Program	Economic Impact	Total Grant \$	\$ raised in exchange ...	\$ Loans taken during...	Total \$ paid in salary	\$ Company revenue ...	# FTE Equivalent	Total Interns	# Patents Issued	# Patent Application...	
PROGRAM	Graduate	8		Sum \$7,855,989.77	Sum \$35,000.00	Sum \$0.00	Sum \$0.00	Sum \$7,820,989.77	Sum \$6,586,297.67	Sum 132.0	Sum 4	Sum 1.0	

## Segmentation of Industries

Industry segmentation helps fulfill a similar goal to the previous section where it will help us differentiate raw data from each other, as well as be able to better understand the sector that specific start ups work in so that we can evaluate their performance in a more accurate and mindful manner. In addition, it would be extremely helpful to be able to communicate what success looks like for some of these companies as they are being evaluated.

There's a couple of options that we could adopt, there's a couple of government issue codes to determine what segments of the economy does a business operate under, Standard Industrial Classification (SIC) and North American Industry Classification System (NAICS). The latter being the most recent one, the United States Census also provides a handy search tool to decipher these codes. For example, we can search for the keyword "[cloud](#)" and we'll get options as to the applicable codes for that particular description of business function.

Another option would be to implement an internal way of segmenting industries using Koffman's experience with these clients as well as some of the benchmarking data available for startups of specific business functions.

## Expand upon use extensions

Finally for this last section we'll discuss how to make the most out of collected information. Having an upgraded license will enable Koffman workspaces to make the most out of extension. There are multiple ones that work natively with and developed by AirTable, that aim at simplifying visualization, aggregation, and even automation within tables and their records.

Once the previous changes to the bases have been implemented have taken place, one of the important extensions is Schema, since it will enable anyone to visualize how the tables within a particular base relate to each other very similar to Figure 5.

The chart will also be a powerful addition now that most of the records within the base are available. We can use that to be able to group data in meaningful ways such that we are able to derive meaningful information to inform guidance, advice and business strategies related to specific companies, business sectors or even grants. A quick example of this is the mock variables using randomly generated data provided by mockaroo [2]. As we can see in Figure 10 we are able to use custom variables to set up specific conditions that those records might be applicable for, these additional fields can be added to a default view or a "raw values" view while we slice it in however many ways they are beneficial to us using multiple views. Finally, the output is the chart in Figure 11 that can be heavily edited and customized to suit our criteria of evaluation.

Revenue Classification

f<sub>x</sub> Formula

Compute values based on fields. [Learn more](#)

Formula    Formatting

```
IF({Company Revenue} > 50000, "High Earner",
IF({Company Revenue} > 30000, "Medium Earner", "Stable Earner"))
```

+ Add description    Cancel    Save

Grant 1    Grant 2    f<sub>x</sub> Formula

Credit Plan

f<sub>x</sub> Formula

Compute values based on fields. [Learn more](#)

Formula    Formatting

```
IF(AND({Company Revenue} > 50000, {Grant 1} > 50000), "Plan A",
IF( AND({Company Revenue} > 40000, {Grant 1} > 40000), "Plan B",
IF(AND({Company Revenue} > 30000, {Grant 1} > 30000), "Plan C",
IF(AND({Company Revenue} > 20000, {Grant 2} > 40000), "Plan D", "Plan E"))))
```

+ Add description    Cancel    Save

Chart settings

Table  
MOCK\_TABLE

View  
Grid view

Chart type  
Bar    Line    **Scatter**    Pie    Donut

X-axis  
Credit Plan

☐ Include empty cells  
☐ Split multiple values  
☒ Show axis label

Order  
View    X value

Y-axis  
Count    **Field**

# Full Time Employees

☐ Aggregate  
☒ Group by...  
Revenue Classification

☒ Show legend  
☐ Start at zero  
☒ Show axis label

Figure 10 Proof of concept variables for Chart grouping



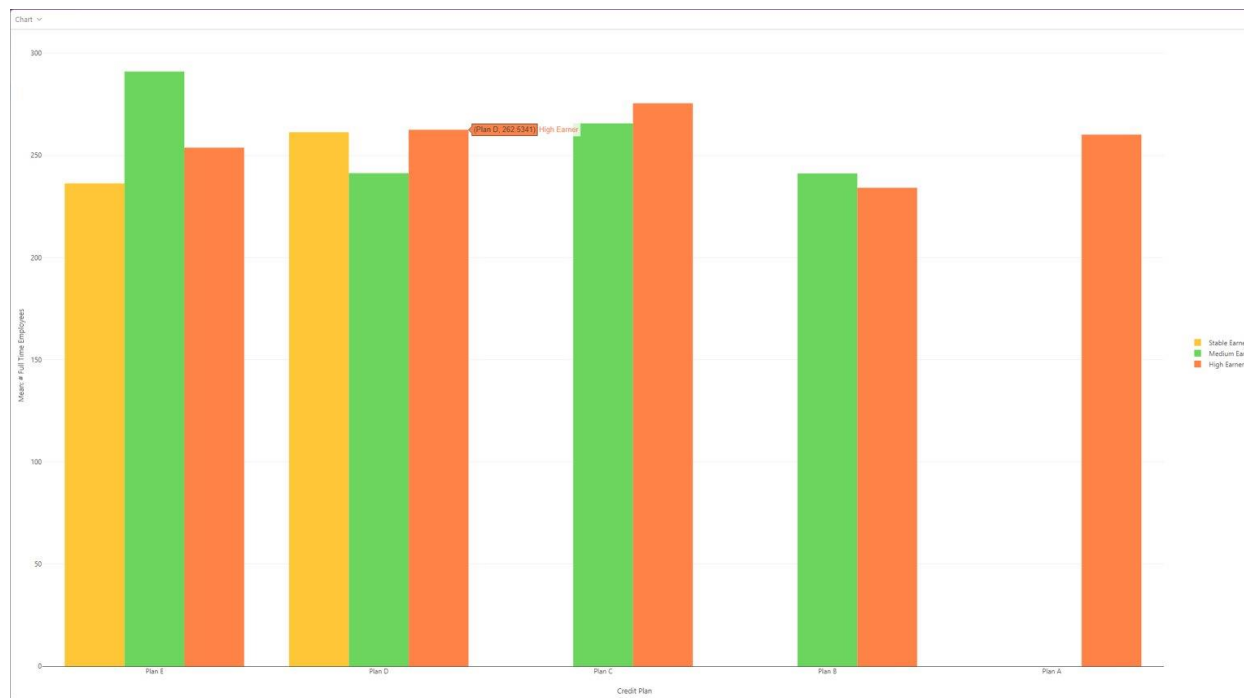


Figure 11 Output graph from Charts

## Closing remarks

We want to thank you very much for the time you delegated out of your very busy schedules to work with us throughout this project, hopefully the deliverable we put together will serve you and following Koffman members well. Thank you.

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## Works Cited

[1] P. Team, Paris, France: PlantUML, 2023.

[2] Mark, "mockaroo," mockaroo, [Online]. Available: <https://mockaroo.com/>. [Accessed 2023].