

Executive Summary:

Write -Up and Implementation:

This system required several steps:

- Connection to the *Square* (third party) server
- Request Koko's sales data (SQL)
- Receive packages of data from server
- Repeat data extraction until all desired data is received
- Review JSON return data and extract sales data
- Format data into user-friendly form
- Print data to user for use
- Create additional sub procedures that create sales summaries and reports, and business intelligence insight reports

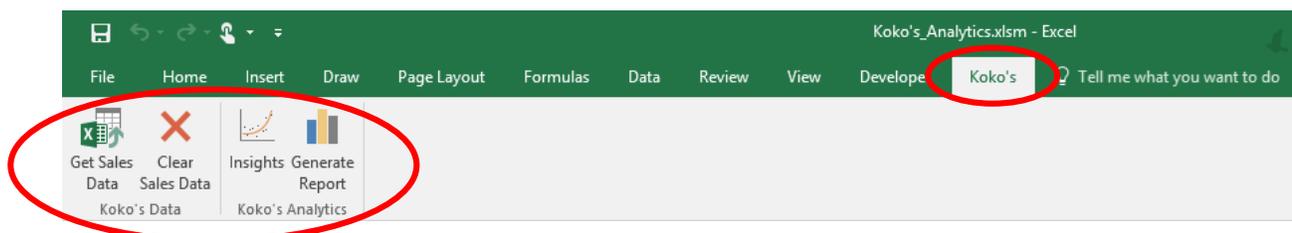
Due to the nature of *Square's* website, I was unable to login to the secure site and extract all the data. The website only provided a limited number of sales entries at a given moment so web scraping was not an option. Instead I had to research the next best option of extracting Koko's sales data. I learned that *Square* provides a port on the company server to allow for automated systems to connect and extract data.

The next step was to connect with the correct API credentials to allow for SQL access. After creating the necessary connection credentials (with the desired date range), the server returns only 100 sales entries at a time. This requires the system to continue to request data from the *Square* server until all desired data has been obtained.

The data returned by the server is in a very lengthy and confusing JSON data type so further data extraction was needed. The system successfully pulls the required data from the JSON sales entry and formats each data into a readable and usable data type (e.g. string, int). The date/time returned from the server is given as Zulu time so the system also converts the date/time into Koko's date/time.

All sales data for the requested period (the current year) is then printed to an Excel worksheet ("Data") for future report generation and management use.

To create a user-friendly experience, they system includes a custom ribbon containing elements that will allow Koko's management to easily extract data and generate sales reports and insights (seen below).



As a whole, the system is designed to be simple to use and hands-off so the user can quickly obtain current and insightful data without spending time create reports him/herself.

Learning:

I had to learn a great deal to be able to accomplish the creation of this system. The single greatest challenge to overcome was extracting the data from the *Square* server. I had little experience connecting to external servers so this required a great deal of research. Also, *Square* required specific API credentials to gain access to Koko's sales data. Also, dealing with the Zulu time difference was a challenge in formatting the time correctly. I honesty still don't fully understand all of the differences, but the data is returned correctly.

One challenge that I was not able to overcome during the given timeframe was generating particular reports that I felt would be useful for Koko's. I wanted to be able to show them what two item were most correlated and what items were most popular at specific times of day. The upside to this is that all the data are present so Koko's management can dig deeper if desired.

Assistance:

I received assistance from Prof. Allen Gove when dealing with connection to the *Square* server. Other than that, I created the system alone with references for syntax online from various websites (i.e. MrExcel.com, Overstack.com).

Additional Information:

The system was presented to Koko's Lunchbox management on 4/12/16 with training on proper use. The company is currently using the software according to management discretion.