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Executive Summary

It's hard to know how to use your time more effectively without a clear understanding of how much time you are actually dedicating to each of your day-to-day activities. That's where TRAXI can help. TRAXI allows you to track your time using the one item you always have on you—your cell phone.

TRAXI imports the text messages you have sent to a designated phone number, calculates the duration of each of the activities you have logged, cleans and categorizes the data, and generates a report of your time usage for the given period.

That's how TRAXI is akin to a taxi service. It helps you get from point A—how you are using your time right now—to point B—where you want to be.

Implementation Methodology

Welcome Screen

Opening TRAXI brings the user to the welcome screen pictured to the right. From this screen, the user has the choice to view the user documentation by clicking on the 'Learn More About TRAXI' button or to log in to Google Drive by clicking on the 'Log In to Google Drive' button.
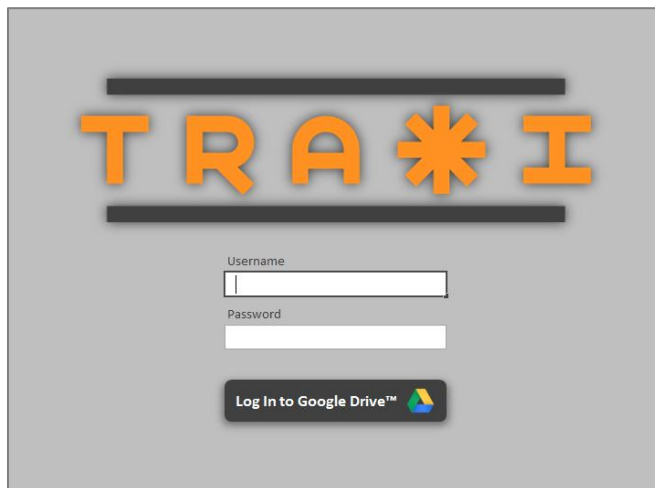
The user documentation—which has been included at the end of this write-up—walks the user through the process of preparing TRAXI to record and import text messages the user sends to a specified phone number. Set up includes registering for a Google Drive account (if the user does not already have a one), creating an If This Then That (IFTTT) account, and creating a specified IFTTT "recipe."
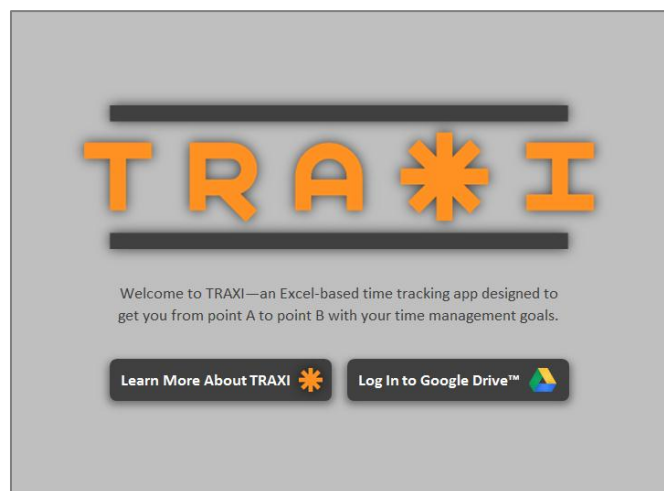
It should also be noted that the worksheet tabs typically displayed along the bottom of an Excel window are not displayed—all navigation takes place by clicking buttons that toggle between worksheets and make the user experience feel more like navigating a website than using Excel.

Login and Import

TRAXI imports data recorded to the user's Google Drive account via a web-automation service called If This Then That (IFTTT). To import the user's activity log, TRAXI signs in to the user's Google Drive account, accesses a specific spreadsheet within the user's Google Drive folder structure, and publishes that spreadsheet to the web. The application then records the URL of the published spreadsheet, navigates to that link, and imports the activity log as a new worksheet.

Loading

When the user enters their credentials and launches the login and import sequence, the loading screen to the right displays the program's progress. This screen essentially hides all of the data processing that takes place as the program generates the user's activity report. In addition to hiding the behind-the-scenes data manipulation, the loading screen also alludes to a visual theme—the pie chart—that is present in the report TRAXI generates for the user.
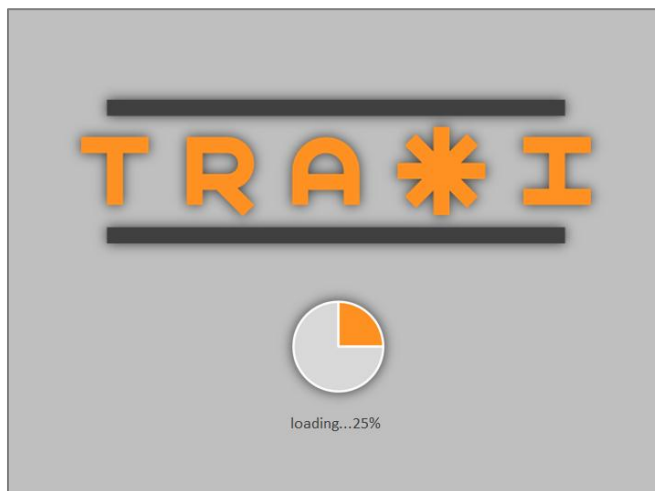
Clean, Calculate, and Categorize

Activity	Category	Date and Time	Timestamp	Length in Minutes
Getting Ready	Getting Ready	on October 11, 2012 at 05:04AM	10/11/12 5:04	31
Breakfast	Eating	on October 11, 2012 at 05:36AM	10/11/12 5:36	10
Getting Ready	Getting Ready	on October 11, 2012 at 05:46AM	10/11/12 5:46	5
Driving	Travel	on October 11, 2012 at 05:51AM	10/11/12 5:51	4
Waiting for the Bus	Travel	on October 11, 2012 at 05:55AM	10/11/12 5:55	3
Bus	Travel	on October 11, 2012 at 05:59AM	10/11/12 5:59	4
Waiting for the Bus	Travel	on October 11, 2012 at 06:03AM	10/11/12 6:03	4
Bus	Travel	on October 11, 2012 at 06:07AM	10/11/12 6:07	55
Social Media	Media Consumption	on October 11, 2012 at 06:10AM	10/11/12 6:10	5
Scripture Study	Scripture Study	on October 11, 2012 at 06:16AM	10/11/12 6:16	21

The above table shows an example of data that has been cleaned, calculated, and categorized. The only information that is imported when the user runs the log in sequence, however, is found in the 'Activity' and 'Date and Time' columns displayed above. TRAXI searches each entry in the log for certain key words and assigns each activity a specific category. The program then cleans the data in the 'Date and

Time' column and extracts a timestamp (found in the fourth column) in a format Excel can use to calculate the duration of each activity.

While calculating the duration of each activity would normally be a straightforward process, TRAXI must account for the fact that not all activities take place one after another. For this reason, the user is instructed to use a specific syntax to record simultaneous activities. Text messages logging the beginning of an activity that is nested within another activity should be tagged with "#s". The end of that activity should then be signaled by sending a second text message that lists the same activity description and an ending tag ("/end").

Pivot Table

Once the data has been cleaned, calculated, and categorized, TRAXI generates a pivot table which sorts the user's activity by category and ranks the various activities by the total amount of time dedicated to each one.

Report

Following the creation of a pivot table, the program loops through the various pivot table elements and creates a variety of charts and graphs which display the user's activity for the given time period.

The first section of the report shows the user's top five activities and what percentage of the user's time is dedicated to those five activities. Clicking on any of the top five activities displays an additional set of charts that breaks each of the top five categories into its constituent sub-activities.

The remainder of the report generated by TRAXI graphs other information about the user's time usage, as seen below.
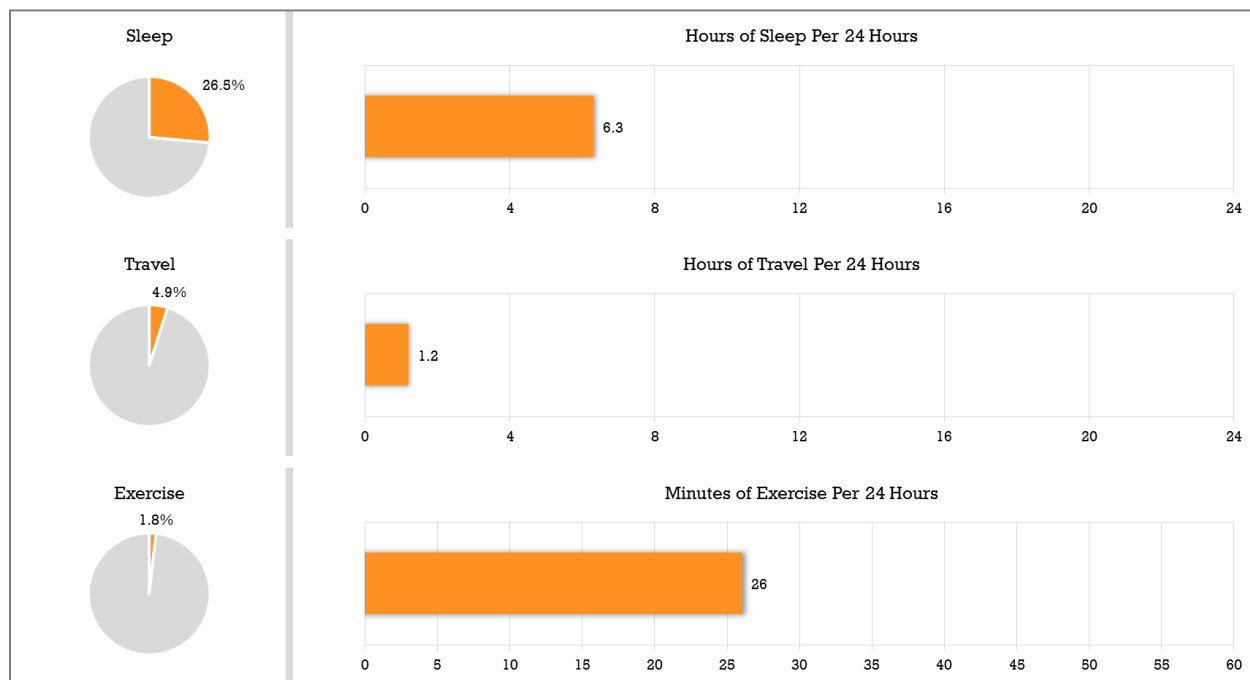
Learning Outcomes

Given my past experience with programming—none—developing TRAXI was quite the undertaking. I learned a number of valuable lessons while completing this project, most of which are tied to specific challenges I encountered along the way.

Looping Through Pivot Table Elements

The most difficult challenge I encountered had to do with programming a loop to differentiate between the categories and sub-categories listed in the pivot table. Since both the categories and their sub-categories are considered pivot fields, my loop relies on the PivotField.Name property to see if each entry belongs to the "Category" or "Activity" pivot field, all while keeping track of where each category begins and ends and the sub-categories associated with it.

Interactive Charts

Another challenge involved building interactivity into the report generated by TRAXI. I wanted the 'Top 5 Activities' section of the report to have some interactivity, but was unsure how to approach the task at first. My final solution involved assigning macros—which trigger a series of actions depending on the circumstances—to each chart, thus making the charts dynamic and responsive to user interaction.

For example, when the user clicks on a chart displaying one of their top five activities, the other four top activities are "dimmed" by a transparent shape, which has the effect of highlighting the chart the user clicked on. The same click by the user also populates and unhides up to five more charts, each

containing one of the sub-categories of the activity clicked on by the user (see the images on page 3). When the user clicks away, the sub-category charts are again hidden and the other top categories are undimmed.

Animating a Progress Wheel

The final challenge presented here was "animating" the progress wheel on the loading screen. Doing so involves nine distinct images which are made visible and hidden sequentially to represent the progress being made as the program processes the data and builds the report in the background.

Assistance

My primary sources of assistance were (1) Dr. Gove Allen, whose agent and googleDocs class modules TRAXI is based around, (2) Excel VBA forums, which I referred to early and often, and (3) the object library and help files in VBA.

User Documentation

The following section contains the user documentation and setup instructions provided within TRAXI.

Getting Started

There are three things you'll need to get started: (1) a Google Drive account, (2) an IFTTT account, and (3) an IFTTT "recipe" that relays text messages to a Google Drive spreadsheet. Follow the following steps and you'll be on your way.

Google Drive

Google Drive will be used to record your time log before it is imported into Excel.

If have a Gmail account, you are already set up with Google Drive. Feel free to skip ahead to the next step.

If you do not have a Gmail account, navigate your web browser to the Gmail login page (http://www.gmail.com) and click on the red 'Create an Account' button in the top right-hand corner. Follow the account creation steps and login to your new Gmail account.

Once you've logged in, click the link along the top of the browser window that says 'Drive'. That's it. Your Google Drive is ready to go.

If This Then That (IFTTT) Account

If This Then That will relay text messages you send to a designated phone number to a Google Drive spreadsheet. But for that to happen, you'll first need to set up an IFTTT account.

Navigate to http://ifttt.com to begin. Once there, click on the blue 'Join IFTTT' button and follow the account creation steps.

For your text messages to be relayed to Google Drive, you will need to tell IFTTT the phone number you will be sending text messages from and allow IFTTT to communicate with your Google Drive. To do this, click on the link at the top of the IFTTT homepage that says 'Channels.'

Scroll down to the icon labeled 'SMS'. Enter your phone number and click the button that says 'Send PIN'. You will receive a text message with your activation PIN, which you will then need to enter into the field on the IFTTT page requesting your PIN. Once these steps are complete, the page will display an IFTTT phone number you will use as the recipient of your time tracking text messages. Take a moment now to enter that number into your cell phone.

Return to the main Channel page and click on the icon labeled 'Google Drive', Follow the steps to authorize IFTTT to access your Google Drive account.

IFTTT Recipe

Next you'll need to create a "recipe" that relays text messages sent to the IFTTT phone number to a spreadsheet in your Google Drive.

Click on the link along the top of the IFTTT page that says 'Create'. Next, click on the word 'this' under 'Create a Recipe' (you can't miss it). Choose the trigger channel, in this case SMS. Select 'Send IFTTT an SMS Tagged'. Type in the tag you will include in each time tracking text message (i.e. #time) so that IFTTT knows how to process your message. Click on 'Create Trigger', and then click on the word 'that'. Select 'Google Drive' as the action channel, and then select the 'Add Row to Spreadsheet' option. Type 'Time Log' into both the 'Spreadsheet Name' and 'Drive Folder Path' fields. Delete what's listed in the 'Formatted Row' field and type in the following: {{MessageNoHashtag}} ||| on {{ReceivedAt}}. Click on 'Create Action,' type in a name for your recipe (how about TRAXI?), and then click 'Create Recipe'.

Whew! Your recipe is done.

A Few Things to Remember

To record an entry in your Time Log, send a text message to the number specified by IFTTT. The body of the message should begin with the tag you selected when creating the recipe (i.e. #time) followed by a description of your activity (i.e. Yard Work).

Text messages logging ctivities that occur simultaneously should include a special tag "#s" to indicate to TRAXI that the activity may overlap with another activity. An additional message containing the same activity description plus an ending tag—"/end"—should be sent to signal the end of simultaneous activities.

For best results, try to avoid describing the same activity in more than one way (i.e. Dinner and Eating Dinner). Be consistent with your activity descriptions.

It may take a little getting used to, but try to record every activity you do throughout the day. The accuracy of your time usage report depends on how regularly you track your time. If you do happen to miss an activity or two, open the Google Drive spreadsheet where your activities are being logged and

add entries in the appropriate locations. Make sure the timestamp of your additional entries is in the same format as the timestamp listed beside the other entries (i.e. on October 27, 2012 at 12:45PM).