The Inventory Count

My interest in data science has allowed me to think of different ways of solving work-related problems. While I was an auditing intern at one of the Big 4 auditing companies, many of my tasks involved data gathering, manipulation, and (bleh) formatting. I approached all new tasks with maximum efficiency in mind, while also maintaining effectiveness. Excel formulas and shortcuts were the norm in mine and my coworkers’ workflows. On occasion, Excel just wasn’t powerful enough. While my coworkers would start manually completing complex tasks, I would try to complete them using my favorite programming language, R.

Having a computer do tasks is always more efficient, and sometimes even more effective. I’ve noticed that human error is way too common in the auditing field. Writing scripts often takes longer than manually completing a task, and it may result in time lossed. My argument against this is:

1. I’m learning more about the tool and the task by dealing with it in a “big picture” sort of way. This extra experience will help me perform better in the future.

2. A well-written script can be reproducible, resulting in future man-hour reduction.

My boss took interest in my unique (in this field) skill and tasked me with creating a script to generate a basic report. Easy for an intermediate programmer. The result was as simple as I could make it. Put X files in Y folders, then hit run. The product completes the task, but any major revamp of the business process will render it useless.

This got me thinking, how could I approach an entire audit engagement with maximum reproducibility and automation in mind?

As of late-2017, there is a surprisingly well-made GUI that all auditors in this company use to work on projects. This GUI acts as a version control system, as well as a database to host all engagement-related projects and documents. It shows information about documents, and even includes some useful functions to generate reports. The benefits of this system are priceless, but the contents within the system need to be improved. 95% of the projects are Excel or Word documents, with company-default Visual Basic functions. Since audit work is client-dependent, streamlining of the work is very limited. During my short experience I’ve noticed that, although the tasks themselves are not automated, the variables involved in certain tasks are nearly the same for most clients.

My idea is to require data input in a very specific way, so that analysis work can be done by a computer. The goal is to create a process for commonly used auditing techniques, that is the same for 80% of clients.

For my proof of concept, I chose to automate the tracing of an inventory count. I’m assuming that most of my readers (all 2 of them) are not familiar with the inventory count, so I will give a brief description of it.

At the end of a public company’s financial year, they must file their annual financial statements. Included in the reports is a summary of their assets, in which includes an estimate of their total inventory balance. This number reflects the total value of inventory as of the date of the financial statements.

Along with everything else included in the client’s financial statements, the auditor must check the adequacy of the inventory balance. This is done by testing the validity of client assertions, or claims made by the client’s management, related to the inventory balance. These are the assertions:

1. Existence: This amount of inventory exists
2. Completeness: We have included all of our inventory in this amount
3. Rights & Obligations: We have the right to ownership of this amount of inventory
4. Valuation: The stated amount is accurate

Many procedures are performed to verify the inventory balance. In this article I will only concern myself with the **inventory count** procedures.

There are three observation units that an auditor uses as evidence from an inventory count.

1. Inventory listing

The auditor will request a detailed listing of the client’s inventory. Most clients have an inventory database to generate this report. The report includes a complete listing of every unique inventory item and the total quantity of the item on-hand.

Variables included in most inventory listings are:

* Item ID
* Item description
* Item location
* Supplier
* Item quantity on-hand

2. Tag listing

During an inventory count, representatives of the client will count every inventory item that they have. The details are placed on tags. Each tag includes a count of a unique item, in a specific location. Since items may be located in various places, a tag may not include the total quantity of that item. However, the sum of counts on each tag, with that unique item from all locations, should add up to the total quantity of that unique item.

Variables included in most tag listings are:

* Tag ID
* Item ID
* Item description
* Tag location
* Counter name
* Tag quantity

3. Test samples

The auditor will randomly select a number of tags

Variables included in most test samples are:

* Sample ID
* Tag ID
* Item ID
* Item description
* Sample quantity
* Auditor name

Obviously I would need to know a lot more than I do about the audit, which will hopefully come with more experience.