Executive Summary

Introduction

Pelatron Technologies is a growing business that manufactures mobile communication systems for the United States military. They have been awarded for their success in business in Hawaii, and have offices in several other states. Currently, they manually keep track of inventory and transfer/movement of inventory through its various stages. The manager inputs numbers manually every day into a spreadsheet, which is then sent to headquarters for analysis. This is for the branch located in Lindon, Utah.

The Utah branch of Pelatron Technologies (Pelatron) receives funding and support based on many factors, one of which is their inventory reports. Automating the inventory tracking system, which is currently a manual system, improving the user interface, and creating appropriate controls in the system would resolve some major issues/risks facing the information system for this branch, and would improve the efficiency of the process.

System Overview

The Staff Kit Control Center automates the inventory tracking process, and allows the inventory manager to view inventory-related events, process builds, and create inventory kits from a single application. The Staff Kit Control Center focuses on Pelatron Technologies' main business need of process automation. Currently, this is the major source of inefficiency in the inventory management process. The Staff Kit Control Center automates the inventory management process from delivery of materials through the shipment of products. Although the current Staff Kit Control Center requires further development of reporting and security measures, these features have been considered and implemented in small measure, and are available in this release.

Roy Matsunaga
IS 520 – Spreadsheet Automation
Final Project

Pelatron Technologies – Inventory Management System

Implementation

In order to gather requirements and identify the most important business needs related to this inventory management system, I began by visiting Pelatron Technologies, and discussing the inventory management processes, current system issues, and desired features with the plant manager and inventory manager. During this process of communication, we (the managers and I) identified five main areas of focus. These areas of business need became the main components of the development and implementation process.

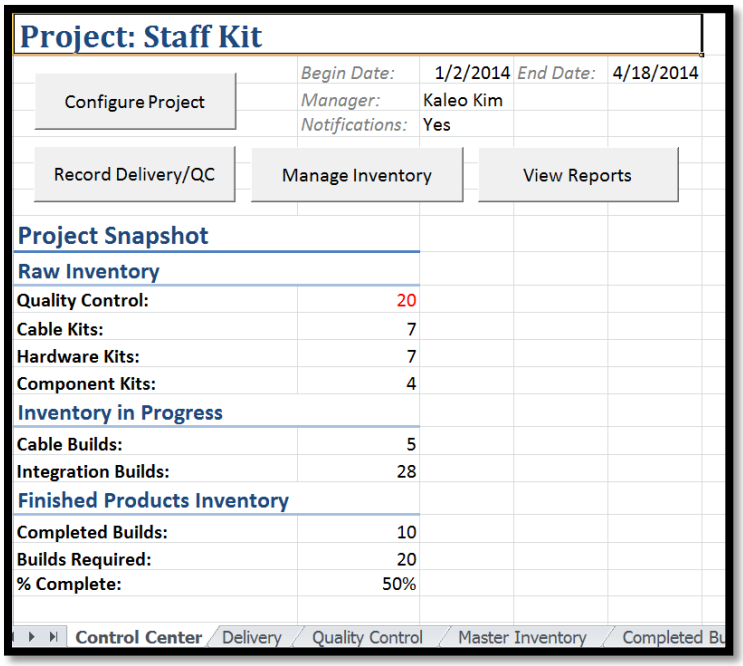
General Notes

Each of the user forms will perform input validation checks upon submission. This is an important part of maintaining data integrity.

1. Centralized management

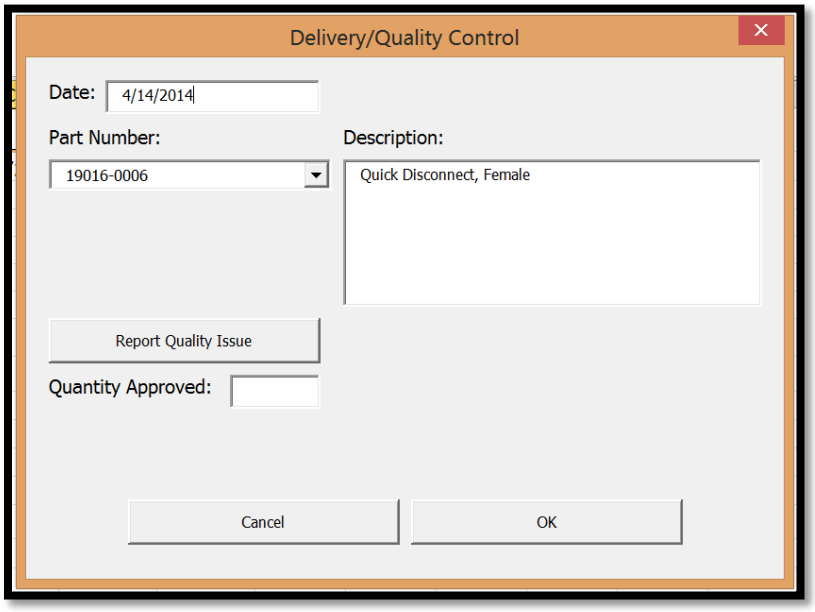
The Staff Kit Control Center "Control Center" tab is a centralized point of inventory management. Currently, the inventory manager needs to traverse several workbooks and sheets within those workbooks, in addition to performing manual updates on each inventory item. This has been a tedious and frustrating process. In order to streamline the inventory management procedures, I created a centralized management user interface, through which all inventory-related tasks can be performed. The Control Center allows the manager to:

- Configure project details
- Record delivery and quality control of materials
- Manage inventory (this takes the manager to a sub-page, which contains more detailed options)
- View reports

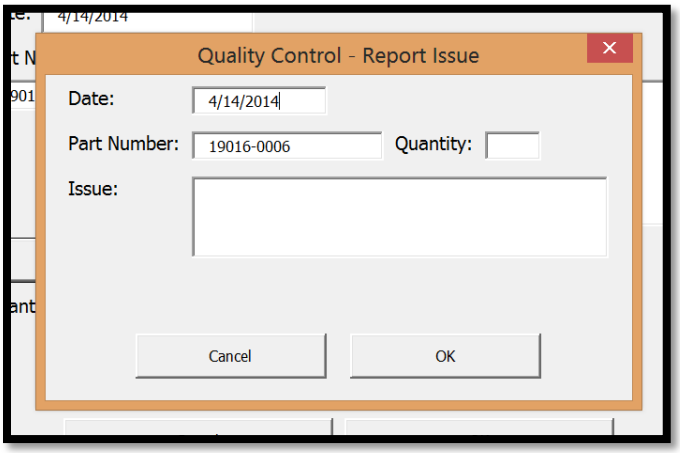


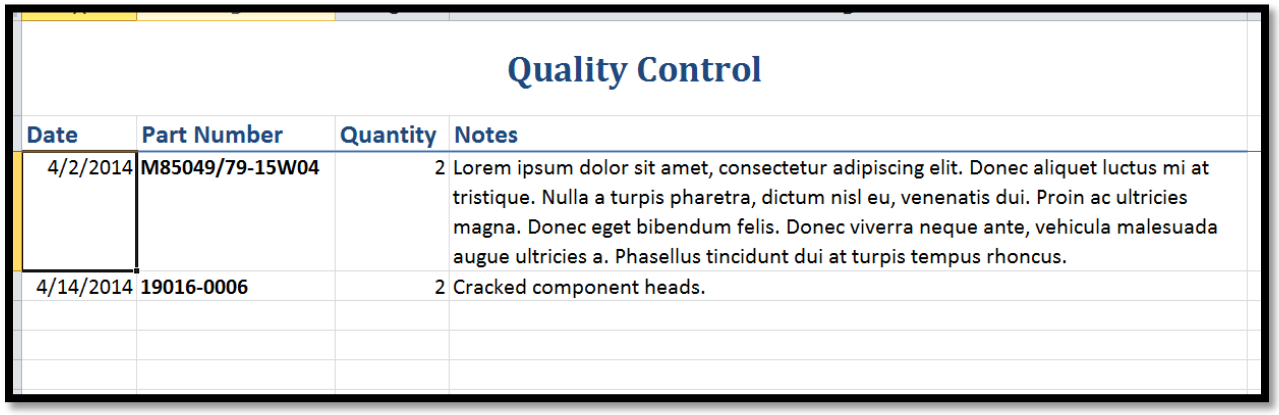
2. Delivery of materials and quality control checks

After initial reception of the materials required for the staff kit build, the managers perform a quality control check on each individual piece of inventory. While they do not yet have the funds or personnel necessary to streamline this process, their inventory system did not assist them in being more efficient during the procedure. In order to help address this issue, I implemented a way for the managers to record deliveries and quality control issues. As shown below, when the manager selects the "Record Delivery/QC" button from the control center home tab, a user form appears. I pre-fill the date, and set an initial part number for convenience.



From the delivery user form, the manager is able to record the part delivered, and has the option to report quality control issues. These issues are stored in a table on the "Quality Control" sheet, where the manager can then print and send recall/reimbursement orders to the supplier(s). This functionality is shown in the screenshots below:





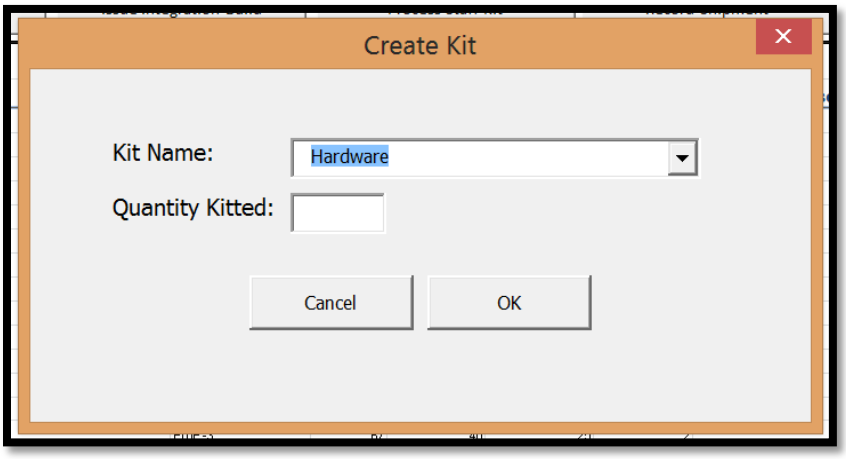
Quality Control

Date	Part Number	Quantity	Notes
4/2/2014	**M85049/79-15W04**	2	Lorem ipsum dolor sit amet, consectetur adipiscing elit. Donec aliquet luctus mi at tristique. Nulla a turpis pharetra, dictum nisl eu, venenatis dui. Proin ac ultricies magna. Donec eget bibendum felis. Donec viverra neque ante, vehicula malesuada augue ultricies a. Phasellus tincidunt dui at turpis tempus rhoncus.
4/14/2014	**19016-0006**	2	Cracked component heads.

3. Kit creation and recording

From the Control Center, the manager can also navigate to the "Manage Inventory" section of the application. Although the entire application deals with inventory management processes, the "Manage Inventory" section deals with the majority of processes related to inventory flow through the manufacturing lifecycle. Clicking the "Manage Inventory" button takes the manager to the inventory master sheet, which has several options. The first option is to record a kit creation.

Kit creation refers to the process in which the inventory manager separates the raw materials into their various groups for manufacturing. There are four main kits: cable, component, hardware, and integration. When the manager clicks the Record Kit Creation button, a user form appears that allows him/her to select the kit created, and the quantity of kits produced:



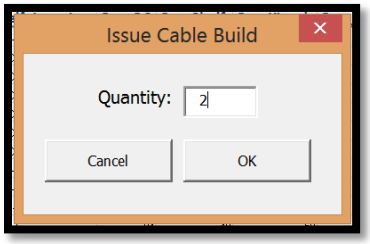
When kits are created, the system logs their creation in the reports_data sheet, which is used to generate the inventory pivot table in the "Reports" tab, and the movement of those particular inventories for that kit (or those kits) are recorded in the master inventory table. Thus, a record of inventory movement is kept for future reference by the inventory and/or plant manager(s). The automation of this process, and the recording of inventory flow from delivery to kitting, was nonexistent in the previous system.

4. Build issuance (cable and integration)

The next step in the inventory management process at Pelatron Technologies is the issuance of cable and integration builds. When a build is issued, the cable, component, hardware, and integration kits are sent to the manufacturing floor. Pelatron Technologies specifies two types of builds: cable (consisting only of the parts in the cable kits), and integration (consisting of all four kits). In order to help the inventory manager know how many builds he/she has issued, and which type of build had been issued, I created forms for both cable and integration builds.

When these builds are issued, the movement of those inventories from the kit area (raw materials) to work-in-process/progress inventory, is recorded in the reports_data sheet, and is also recorded in the inventory master record. The main issue that Pelatron was experiencing during this process was the inefficiency of manually recording inventory movement. When asked if knowing the exact times and locations associated with inventory transfers was vital, they responded by saying that information was not as important as saving time by automating the processes.

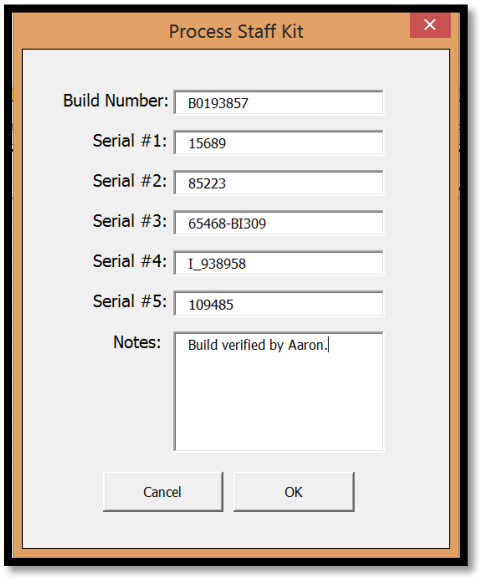
The manager(s) can specify how many builds were issued, for each type of build:



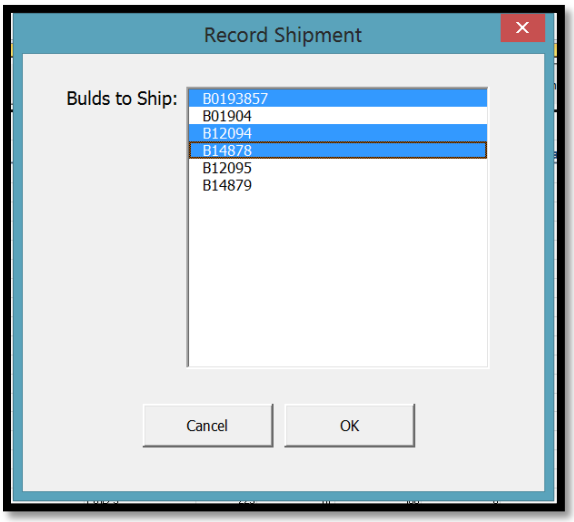
These forms validate input, making sure that the user inputs a positive integer for the quantity, and not anything else.

5. Staff kit processing (completion) and shipment

Processing the staff kits is done on an individual basis. The inventory manager must verify the integrity of each build (staff kit), and must record five important serial numbers from critical components in the staff kit. Currently, the build number and corresponding serial numbers are recorded on a notepad by hand. The "Process Staff Kit" option allows the inventory manager to record this important information from the application, and stores the information in a centralized location for future use.



When the staff kits have been shipped, the inventory/plant manager can click on the "Record Shipment" button of the inventory management page, which allows the manager to select builds that were shipped, and update the shipment dates for those builds in the "Completed Builds" page of the application. After builds have been shipped, they will no longer appear in the list of options, shown in the Record Shipment user form.



Completed Builds

Build	Serial1	Serial2	Serial3	Serial4	Serial5	Notes	Shipped
B002	1	2	3	4	5	None	4/14/2014
B003	6	7	8	9	10	Cleared by Kaleo	4/14/2014
B004	11	12	13	14	15	Quality verification performed on 4/11/2014	4/14/2014
B005	16	17	18	19	20	None	4/14/2014
B006	21	22	23	24	25	None	4/14/2014
B007	26	27	28	29	30	Minor flaws on external case	4/14/2014
B008	31	32	33	34	35	Part of order 2104958	4/14/2014
B009	36	37	38	39	40	None	4/14/2014
B010	41	42	43	44	45	Shipped with order 2104958	4/14/2014
B011	46	47	48	49	50	Cleared by Kaleo	4/14/2014
B012	104921358	103901538	230589325	230958678	120194848	Completed as per instructions from Georgia office	4/14/2014
B0193857	15689	85223	65468-BI30	I_938958	109485	Build verified by Aaron.	4/15/2014
B01904	I_938958	15689	85223	I_938958	230589325		
B12094	I_938958	I_938958	15689	85223	47		4/15/2014
B14878	15689	85223	I_938958	230589325	I_938958		4/15/2014
B12095	230589325	15689	85223	I_938958	230589325		
B14879	I_938958	230589325	15689	85223	I_938958		

Learning and challenges

Learning

One of the most important things that I learned from this project is that it is easy to underestimate the scope of the work. Initially, I planned to create sophisticated, automated reports from the data, based on the processes. Although I intend to make it a part of the product in the future, the initial requirements gathering and planning phases of the project were much more complicated than I expected. I learned that in order to create a robust, viable solution, the first step is to understand the business processes, and then to think critically in order to streamline and improve them. Communication with the plant and inventory managers helped me in this process.

I also learned that handling data from user forms, and validating data manipulation and input, is a tedious process, but is satisfying once complete. Debugging often, throughout the entire product development, is can significantly increase efficiency in the development process.

Challenges

The main challenge I had was that of controlling the scope of the project, and making sure that my customer and I were aligned in our efforts. Initially, as stated previously, I was focused on developing a complex and robust reporting solution, so that the inventory and plant managers would be able to see the flow of their inventory, and have some nice-looking documents to send to headquarters. However, after communication with my project sponsor, I learned that my customer really wanted a system that would keep track of inventories, and that they would take care of the interpretation. For that reason, the "Reports" section of my project is not as robust as the inventory processing component.

Assistance

I did not receive substantial (or any) assistance from any other professionals during the development of this product.