Innovation and Collaboration Studio Store

INTRODUCTION TO ZEANAH COMPLEX

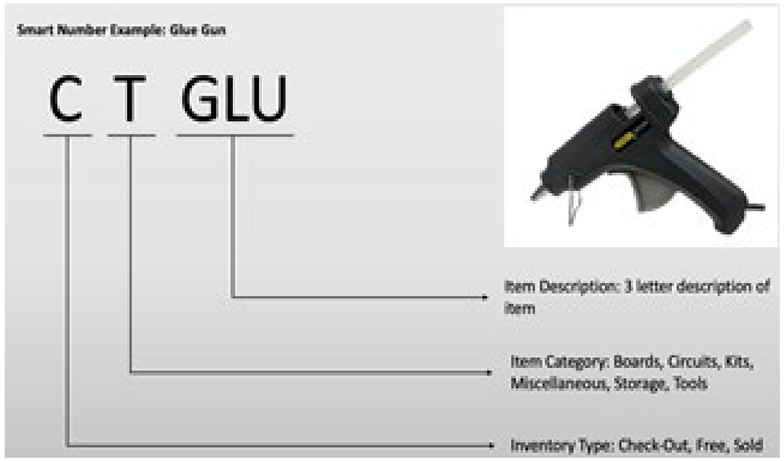
The Zeanah Engineering Complex will provide educational facilities and a learning environment of 228,000 square-feet for young engineering students at the University of Tennessee. The $129 million dollar building is expected to open in the fall of 2021. Part of the educational facilities is going to be the Innovation and Collaboration Studio Store. The store will provide engineers with various items for check-out as well as equipment to buy. While the shop will be open to all students and faculty, it will be especially important to first-year freshman.

BACKGROUND

In order to provide the best experience for the department, we focused on these four categories: inventory, POS (point-of-sales), check-in/check-out system, and databasing. The main constraints faced were technical, legal, time, and economic.

MAIN CONTENT

We developed an ABC inventory model, which places items in three different categories based on the demand and the value of the item. A-items are high in value and low in demand, and C-items are small in value and high in demand. This helps to find the reorder point and find the most beneficial amount of inventory. We developed an Excel sheet with integrated formulas that are flexible with lead times and safety stock to be adjusted to best fit the customer's needs when the store opens. Additionally, we developed a smart part numbering system to ensure inventory efficiency.



Smart Part Numbering System

We had planned to build interface options through a data repository in a PowerBI dashboard tied to a commercial POS system, but stakeholder feedback led us to change this to an Excel dashboard so that staff could easily update and utilize it. Instead of using a commercial POS system, the store will utilize the VolCard POS system.

Inventory	Inventory Type	Part Numbe	Part Description	Cost	Average Cost per Un	EOQ	Reorder Point	Location
A	sold	STBAT20	Batterie: 20302	$152.30	$152.30	990	9	Walmart
A	sold	STHST93	Heat Shrink Tube: 9/32" (p.piece)	$6.35	$6.35	42	11	Amazon
A	sold	STWIR26	Jumper Wires size 22/6	$13.99	$0.12	91	13	Amazon
A	sold	SBENG00	Engineering Paper Pad	$5.50	$5.50	36	18	Amazon
A	sold	STWIR22	22 GA Stranded Wires	$12.98	$12.98	65	9	Amazon
A	sold	SKLPK00	Lathe Pen Kits	$59.95	$59.95	390	5	Amazon
A	sold	SCBCOT00	Cotton Board	$6.59	$0.47	43	9	Walmart
A	sold	STTMS00	Temperature Sensor	$3.28	$3.28	22	13	Amazon
A	sold	STDTS00	Distance Sensor	$9.59	$1.92	63	13	Amazon
A	sold	SCCON01	Molex Connector:1	$8.35	$8.35	55	18	Amazon
A	sold	SCCON02	Molex Connector: 2	$11.99	$4.00	78	18	Amazon
A	sold	SCCON03	Molex Connector: 3	$13.99	$4.66	91	18	Amazon
A	sold	SCCON04	Molex Connector: 4	$4.93	$4.93	33	18	Amazon
A	sold	SCSMO00	Servo Motor	$8.99	$1.80	59	13	Amazon
A	sold	SCCBL00	Lightning Cable	$5.99	$2.00	39	11	Amazon
A	sold	SCLED00	LED: Red	$6.20	$0.06	41	18	Amazon
A	sold	SMDCT00	Duct Tape	$2.97	$2.97	20	7	Walmart
A	sold	STBAT09	Batterie: 9 volt	$8.49	$2.12	56	9	Amazon
A	sold	SCLED00	LED: Blue	$4.99	$0.05	33	18	Amazon
A	sold	SCLED00	LED: Yellow	$6.30	$0.06	41	18	Amazon
A	sold	SCLED00	LED: Green	$6.36	$0.06	42	18	Amazon
A	sold	SBBIR00	12x12 Birch Sheet	$3.25	$3.25	22	7	Walmart
A	sold	SBEWB00	Exotic Wood Pen blanks	$22.49	$1.87	147	5	Amazon
A	sold	STBAT03	Batterie: AAA	$13.29	$0.55	87	9	Amazon
A	sold	STBAT02	Batterie: AA	$15.99	$0.67	104	9	Amazon
B	sold	SMEPO00	Epoxy	$20.95	$20.95	293	6	Walmart

Inventory Sheet

A checkout sheet was developed to keep track of items being checked in and out of the store. This is a basic but efficient way to run this process. If the POS system that we suggested is purchased in the future, the check-out process can be run through the software. We used a Pugh Decision Matrix to determine that Lightspeed POS would best fit the needs of the store.

	Importance Weighting	Baseline (Square)	Postec	Shopkeep	Lightspeed	Shopify
Maintainability	3	0	+	0	+	-
Vol-Card Compatibility	3	0	NA	NA	NA	NA
Inventory Modeling	3	0	-	-	0	0
Cost	2	0	-	-	-	-
Equipment Tracking	2	0	-	0	+	0
Industry Standards	1	0	+	0	0	0
Business Model	1	0	-	0	0	-
Ease of Use	1	0	-	+	+	0
	Net Points	0	-5	-4	4	-7
	Rank	2	4	3	1	5

Pugh Decision Matrix

CONCLUSION

Overall, it was challenging to design the plan for the store virtually without much data. However, we are proud to be a part of the development of the Zeanah Engineering Complex and the fact that it will make an impact on the learning environment of future UT engineering students.

TICKLE COLLEGE OF ENGINEERING
THE UNIVERSITY OF TENNESSEE, KNOXVILLE

Phillip Garland - Johanna Silva - Seth Worley - Greg Farrell