Consumer Foods Distribution Operational Project

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Agenda

I. Context & Overview
II. Techniques and Methodology
III. Final Solution Demo

I. Context & Overview: **Customer & Data**

Customer	Large customer-facing food distribution company
Data	3M+ rows, stream of when each product is packed, quantity packed, and item name. This is a smaller sample of live-stream data stored within the company's database.

I. Context & Overview: **Customer Pain Points**

How can we reduce labor costs and increase profits?

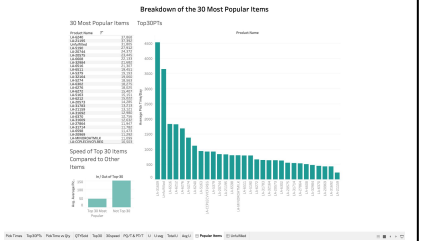
1. Identify products that cost the least to pick	**2.** Track product pick efficiency & find anomalies	**3.** Identify cost of unfulfilled picks	**4.** Make cost of cold chain items visible
Helps inform marketing spend (which products can we market that would give us the highest ROI)	Which products do we need to improve the pick time of? What are instances that cause abnormal pauses in packing?	Is it financially beneficial to staff more warehouse employees to make sure products are available?	Quantifying additional cold chain packing cost allows for decisions regarding price markups

I. Context & Overview: **Customer Pain Points**

Deliverables of each question

1. Identify products that cost the least to pick

Dashboard



2. Track product pick efficiency & find anomalies

CSV

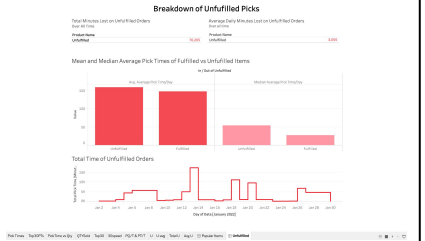
BOXID	PRODUCTNAME	ZONENAME	SHELF	LEVEL	PICKCOMPLETETIME	PICKTIME
2579763	PNW-CCPLENRPORKITAL	Zone 12	B	2	2022-01-03 07:12:09	306
2578822	PNW-33072	Zone 02	B	2	2022-01-03 05:36:16	252
2581067	PNW-KLALRGFARROCUP	Zone 11	A	4	2022-01-03 11:31:18	135
2581350	PNW-5328	Zone 01	E	5	2022-01-03 04:43:39	421
2581487	PNW-4302	Zone 05	B	4	2022-01-03 07:42:30	258
2580719	PNW-MINOROATMILK	Zone 05	C	6	2022-01-03 23:51:46	498
2580056	PNW-6432	Zone 05	B	6	2022-01-03 09:04:49	333
2576736	PNW-CCIFAASALTBUTTR	Zone 12	E	4	2022-01-03 16:37:56	353
2577901	PNW-CCPLENTRLWHOLE	Zone 06	G	2	2022-01-03 13:27:26	365
2576692	PNW-20744	Zone 08	A	1	2022-01-03 11:29:39	572
2580385	PNW-CCIFSHREDMEXCHE	Zone 13	B	5	2022-01-03 11:38:49	269
2579941	PNW-SSWPTFRVEGRANCH	Zone 05	B	5	2022-01-03 13:22:21	415

	ZONE_SHELF	VAL
0	Zone_12_SHELF_A	222
1	Zone_08_SHELF_B	217
2	Zone_14_SHELF_B	170
3	Zone_05_SHELF_B	137
4	Zone_02_SHELF_B	136
5	Zone_06_SHELF_A	132
6	Zone_10_SHELF_A	127
7	Zone_11_SHELF_A	119
8	Zone_13_SHELF_B	116
9	Zone_10_SHELF_B	115
10	Zone_05_SHELF_A	95
11	Zone_04_SHELF_A	89

	ZONE	VAL
0	Zone_12	375
1	Zone_05	338
2	Zone_10	323
3	Zone_14	306
4	Zone_08	305
5	Zone_02	293
6	Zone_06	282
7	Zone_13	277
8	Zone_04	274
9	Zone_11	248
10	Zone_07	243
11	Zone_03	237
12	Zone_09	235
13	Zone_01	229

3. Identify cost of unfulfilled picks

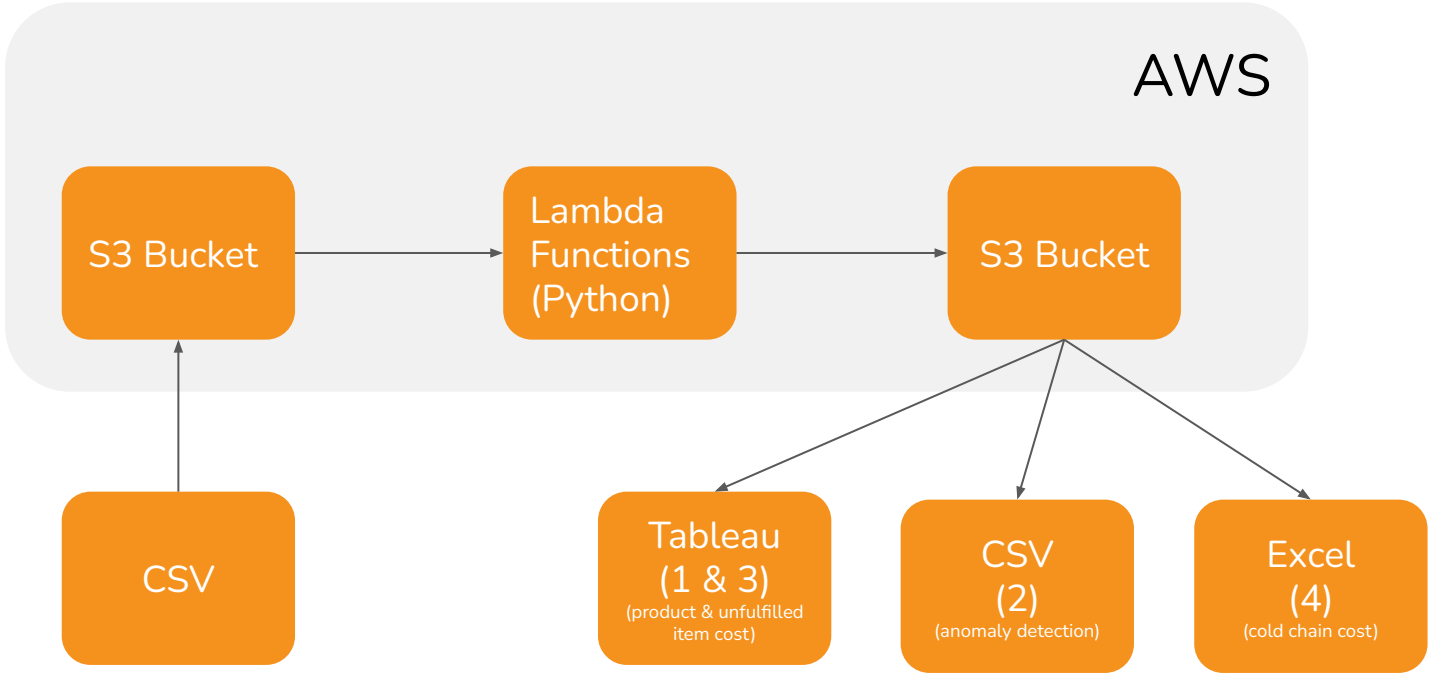
Dashboard



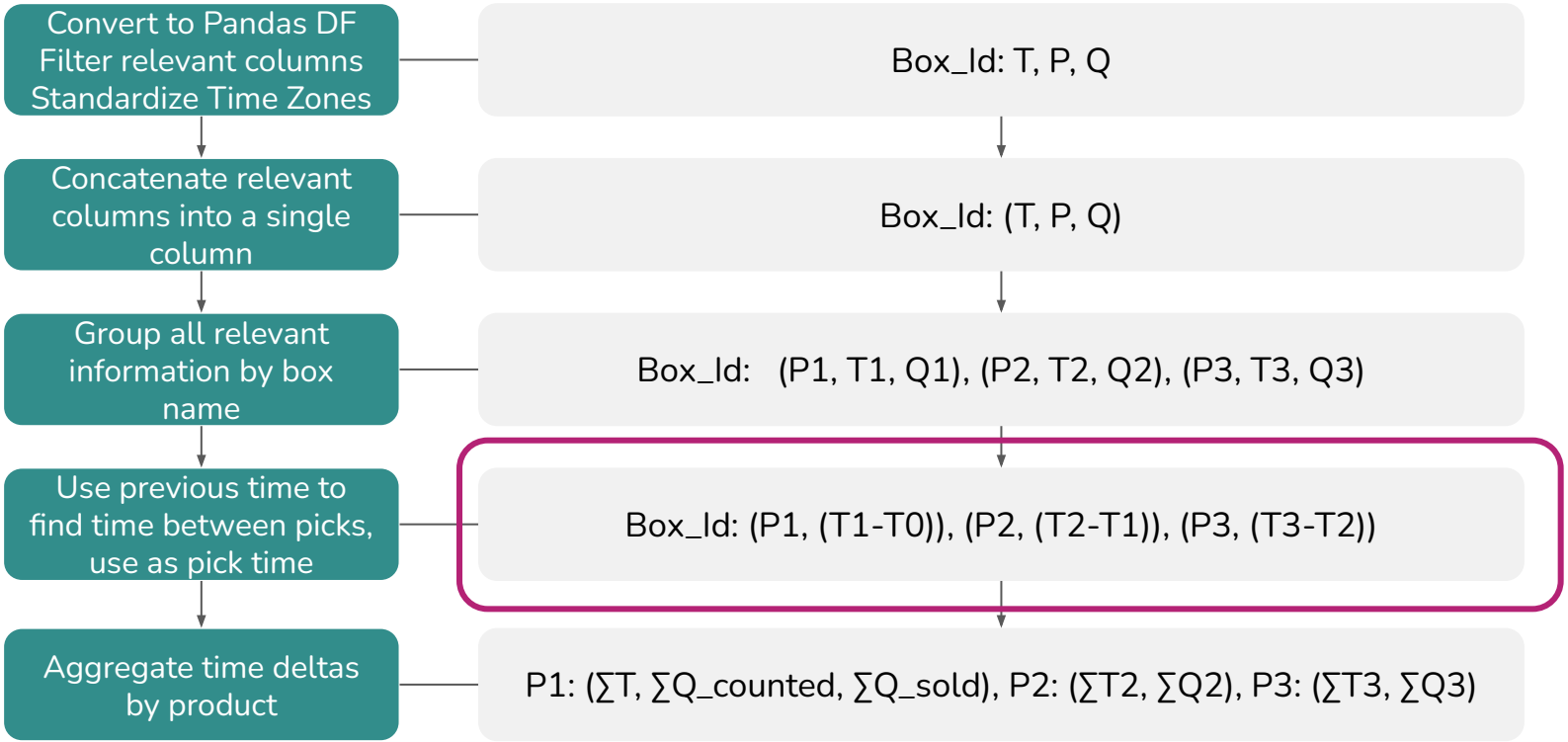
4. Make cost of cold chain items visible

Interactive Excel File

II. Techniques and Methodology: **Functional Architecture**



II. Techniques and Methodology: **Lambda Function**



II. Techniques and Methodology: **Key Decisions**

Box_Id: (P1, (T1-T0)), (P2, (T2-T1)), (P3, (T3-T2))

Problem 1: T0 Does not exist.	Solution: Drop instances where product is P1
Dropping instances skews final quantity measures	Implement quantity_counted, quantity_sold
~2% of rows have quantity of 0	If quantity is 0, rename product name as '*unfulfilled*' and assign quantity =1

II. Techniques and Methodology: Anomaly Detection

Initial Technique: approximate to known probability distribution

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Issue: Data not normally distributed

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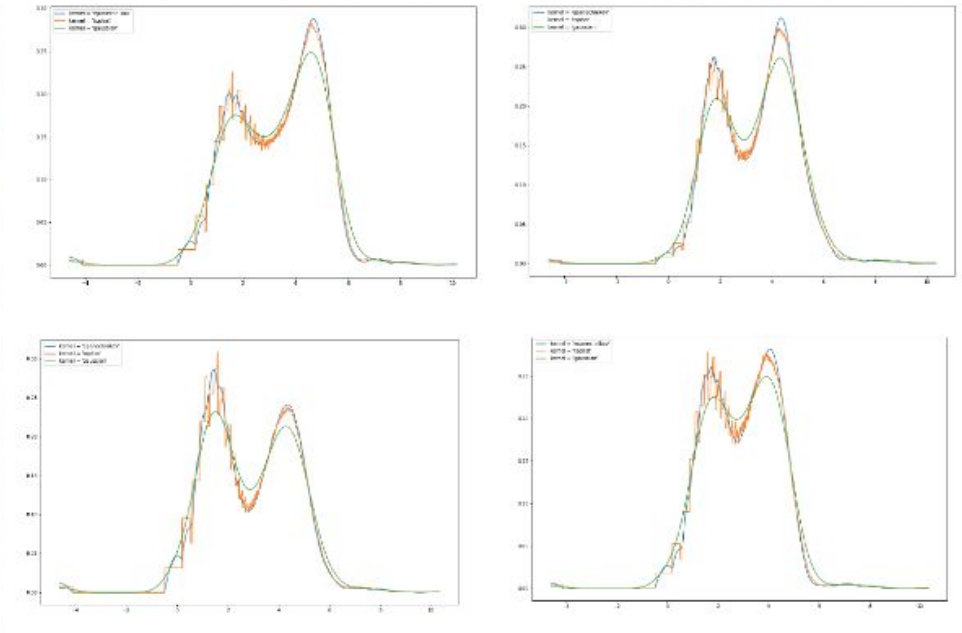
Solution: Kernel Density Function



III. Functional Demo

Thank You