Optimizing Trocafone's Omni-Channel Strategy

G-LAB 2019 TEAM


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BACKGROUND

Trocafone was founded in 2014 as a marketplace for used smartphones in the Brazilian market. The company currently operates a omni-channel sales strategy to purchase and re-sell inventory. As it continues to scale its operations, the company has faced challenges in predicting supply of used smartphones and optimal allocation of its supply across different channels.

PROJECT OVERVIEW

Our team worked with Trocafone to conduct a benchmarking exercise against other similar companies, and then create an allocation algorithm and dashboard that allocated phones to each channel (marketplace, website, televendas, and kiosks) to optimize for overall profitability. We worked directly with Trocafone's Data Science, Finance, and Marketing teams and leveraged MIT resources and mentors to execute the project.

PROJECT DELIVERABLES

1. **Benchmarking report** of 4-6 comparable companies
2. Implement a **dashboard tool** to track inventory across channels and recommend optimal omni-channel stocking strategy

REMOTE PHASE: BENCHMARKING ANALYSIS

BEST BUY	CASHIFY	Laku6.com	back market
US, Canada and Mexico	*India (emerging market)*	*Indonesia (emerging market)*	*France, Italy, Germany, Belgium, Spain*
• Revenue: $42B • Online Sales: $6.5B (16% of total revenue)	• Phone Volume: 150,000 / month (targeting 250,000 by May 2020) • # of store outlets: 23	• Phone Volume: >20,000 units (targeting 30,000 by end of 2017)	• Revenue: €96mn in 2017 in five countries, growing by 220% • # of visits to website: 6M

KEY TAKEAWAYS

- Competitors ***utilize multiple channels to source inventory*** (e.g., kiosks, buyback partnerships with phone manufacturers, pick-up from customer); Trocafone primarily sources used phones from its stores
- Competitors' digital channels, including app and websites, ***range from rudimentary to sophisticated*** (Cashify's app is able to verify working features of each phone)

ONSITE PHASE: ALLOCATION ALGORITHM + DASHBOARD

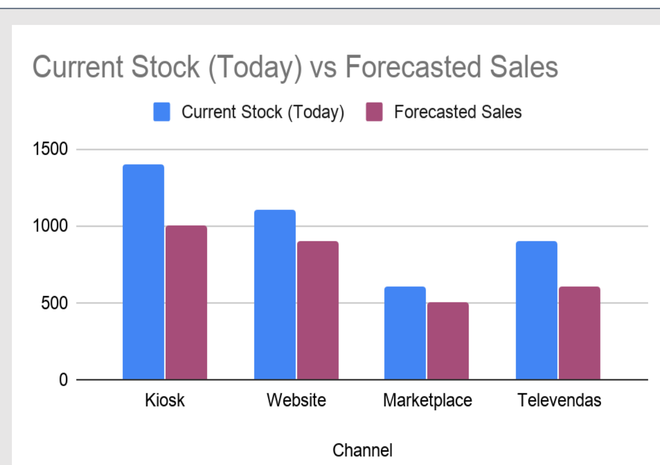
ALGORITHM DEVELOPMENT

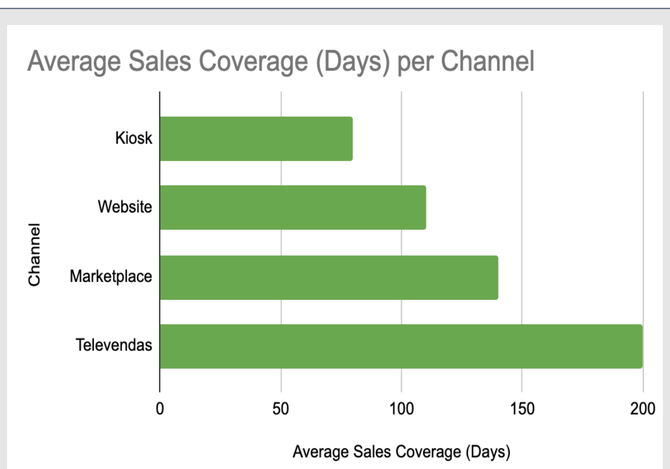
We worked with Trocafone's Data Science team to develop an **optimization algorithm** that determines the **most profitable allocation** for each channel.

```
x = cp.Variable((nr_of_top_phones,3))

non_negative_cons = x >= 0
stock_cons = cp.sum(x, axis = 1) <= total_stock
demand_cons = x <= demand

constraints = [non_negative_cons, stock_cons , demand_cons]
objective = cp.Maximize(cp.sum(cp.multiply(absolute_margins,x)))

prob = cp.Problem(objective, constraints)
result = prob.solve()
optimal_alloc_optimization = pd.DataFrame(data=np.round(x.value),
print("We could make a total profit of:",result)
optimal_alloc_optimization
```

```
We could make a total profit of: 468492.1703277907
```

	Marketplace	Kiosk	Site
Samsung Galaxy A5 2017 32GB	20.0	2.0	-0.0
Samsung Galaxy J5 16GB	5.0	-0.0	-0.0
Samsung Galaxy S6 Flat 32GB	7.0	-0.0	-0.0
Samsung Galaxy S7 32GB	41.0	19.0	251.0
Samsung Galaxy S7 Edge 32GB	37.0	-0.0	-0.0
Samsung Galaxy S8 64GB	50.0	86.0	-0.0





Key Metrics

Total Inventory Value	**$2M**
Inventory Turnover Ratio	**1.2**
Average Sales Coverage	**20 days**
Profit Margin / ROI	**30%**

Sales Coverage by Model, Channel

	Website	Marketplace	Kiosks	Televendas
Samsung Galaxy S8 64GB	7	37	22	62
Samsung Galaxy J5 16GB	3	8	24	24
iPhone 5S 16GB	1	3	39	15
Samsung Galaxy S9 Plus 128GB	2	10	9	10
Samsung Galaxy J7 Prime	31	90	28	136
Samsung Galaxy J7	5	19	54	78
iPhone 6 16GB	1	7	6	16
Motorola Moto G5	3	7	18	24
Samsung Galaxy S7 Edge 32GB	4	21	9	42
iPhone 7 32GB	1	28	20	10
iPhone 6 64GB	4	18	22	50
Samsung Galaxy S9 128GB	2	15	12	16
iPhone 6s 32GB	3	56	13	32
iPhone 7 128GB	2	23	11	15
Motorola Moto G5S 32GB	3	8	16	34
Samsung Galaxy Note 9 128GB	3	6	18	12
Motorola Moto G5 Plus	1	4	15	7
iPhone 8S 16GB	2	29	18	35
iPhone 8S 64GB	2	44	8	19
Motorola Moto G4 Plus	9	53	38	98
Motorola Moto G3 16GB 4G Dual	6	22	37	137
Motorola Moto G6 Play 32GB	2	4	3	22
Samsung Galaxy A5 2017 32GB	2	10	7	35
Samsung Galaxy J5 Prime	44	188	15	171
Motorola Moto G4 Play DTV	4	11	19	59
Motorola Moto Z2 Play 64GB	2	5	16	17
Samsung Galaxy S7 32GB	11	100	54	138
Motorola Moto G5S Plus 32GB	10	57	9	93
Samsung Galaxy S8 Plus 64GB	174	686	144	1507
iPhone 5S 32GB	1	3	14	16

Risk Dashboard

Stock-out Risk		Excess Inventory Risk	
Kiosk	*List by phone model*	Kiosk	*List by phone model*
Website	*List by phone model*	Website	*List by phone model*
MarketPlace	*List by phone model*	MarketPlace	*List by phone model*
Televendas	*List by phone model*	Televendas	*List by phone model*

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