Data Science Challenge

instacart

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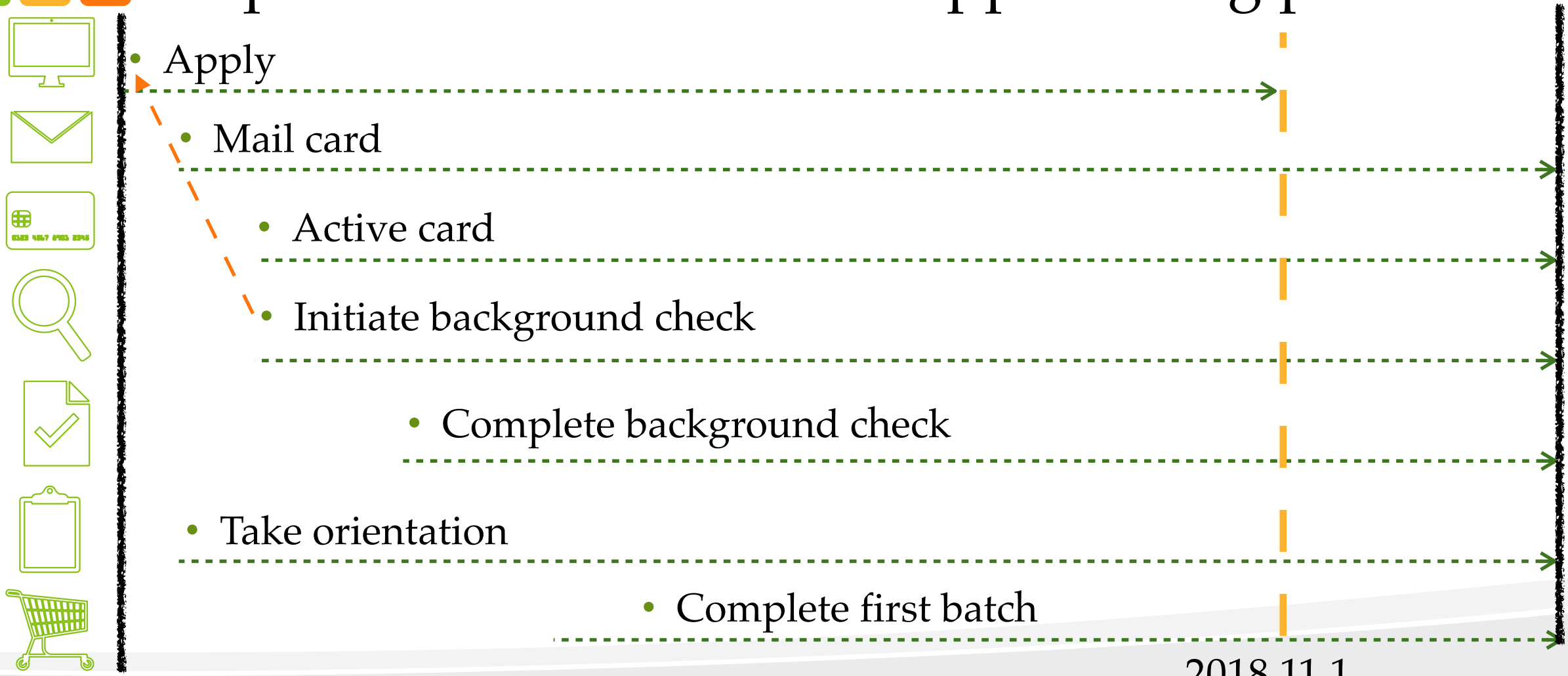
Question: What if initiating background check earlier?

Sequence of events for a shopper hiring process



Q1: Evaluate A/B Test Result

If initiating background check earlier…

❶ Increases first batch completion rate.

❷ Reduces the entire hiring process time (processes optimization).

❸ Evidence does not show shoppers will start quickly if they complete card activation and background check (we cannot include the duration of background check into shopper momentum calculation, because it is a passive waiting).

Group	# Applicant (Sample Size)	# Completed First Batch	❶ Conversion Rate	❷ # Days from Application to First Batch Completion	❸ # Days from Both Completion (card activation, background check to first batch completion
Control	10,412	2,743	26.3%	9.99 days	2.95 days
Treatment	5,812	2,399	41.3%	6.93 days	3.17 days
Conclusion			**Conversion rate significantly increased.** *(Z score 19.2, significant at 90%)* Improve	**Accelerated the hiring process significantly.** Improve	**Stimulate shopper to start more quickly insignificantly.**

* Appendix: z test and sample size

Q2: Is this Change Cost-Effective?

The background check costs us $30 to complete.

We used the total number of background check initiated and first batch completed to calculate the dollar efficiency.

We found out that the cost for each first-batch completed person in the treatment group is less than that of the control group. Therefore, we concluded that it would be more cost effective if initiating the background checks earlier.

Group	# Background Check Initiated	Total Cost	# First Batch Completed	Dollar Efficiency
Control	8,909	$267,270	10,412	$97.4
Treatment	5,812	$174,360	2,399	$72.7

YES!
Cost Effective

Q3: Observation

Job site search channel:

- Conversion rate significantly improved, if initiating background check.
- Lowest conversion rate in the control group.
- Less than media% in control group but larger in treatment group:
- Matching speed is slow in this job site.

Social media channel:

- Conversion rate insignificantly improved, if initiating background check.
- Generates ineffective leads in the test.
- Applicants not actively seeking jobs, might be more influenced by external factors on social media.

Shopper referral bonus channel:

- Highest conversion rate in both groups.
- Generates effective leads.

Web search engine channel:

- Conversion rate significantly improved, if initiating background check.
- Lower conversion rate in the control group:
- Lower alignment between job posting and applicants.

Conversion Rate (Control Group)	
Job Search Site	16%
Shopper Referral Bonus	33%
Social Media	31%
Web Search Engine	25%
Overall	**27%**

Conversion Rate (Treatment Group)	
Job Search Site	38%
Shopper Referral Bonus	47%
Social Media	38%
Web Search Engine	44%
Overall	**43%**

Q3: Recommendation

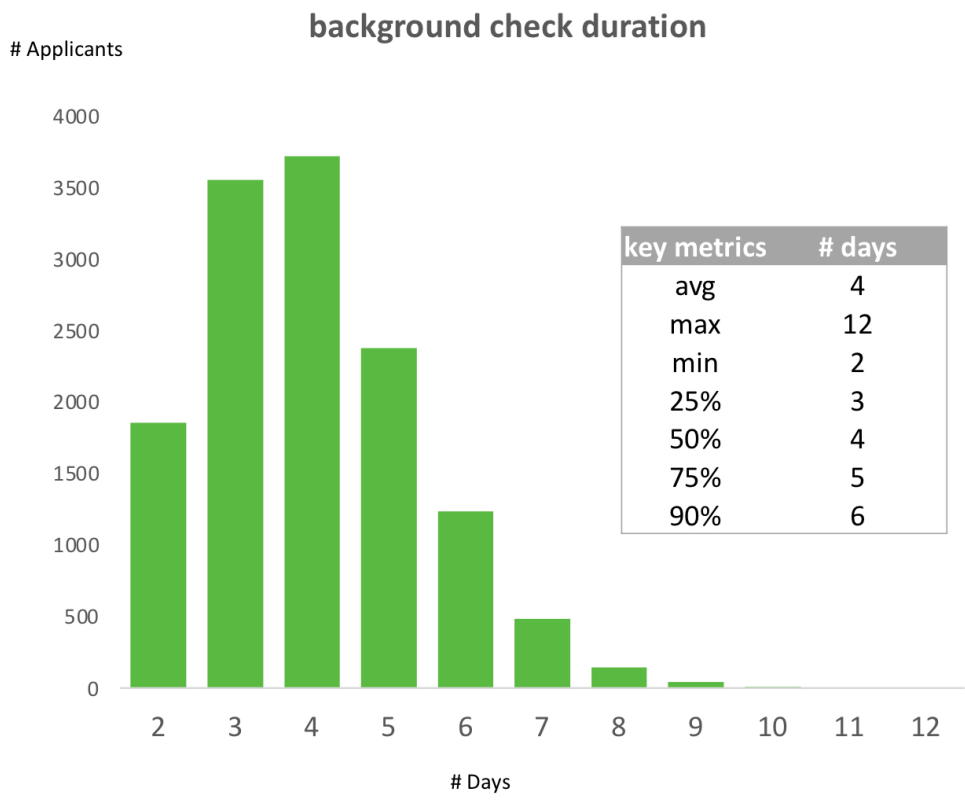
(1) Perform A/B Test:

To evaluate if **mandatory orientation** would improve the conversation rate.

(Control Group)	Successful Hiring	Not Successful Hiring
Orientation	47%	44%
No Orientation	53%	56%

(2) Perform A/B Test:

To evaluate if **accelerate the duration of background check** would make shopper start to shop quickly.



(3) Conversion rate increase in social media channel is the smallest.

Given the modest conversion lift and acquisition costs, we should evaluate the ROI, which cost = channel acquisition cost + $30 background fee, etc. to determine whether to continue or reallocate spend to higher-performing channels if this channel is paid advertising.

Group	Social Media Conversion Rate	Overall
Control	31%	27%
Treatment	38%	43%

* Due to sample size, this analysis does not break down into the city level.