

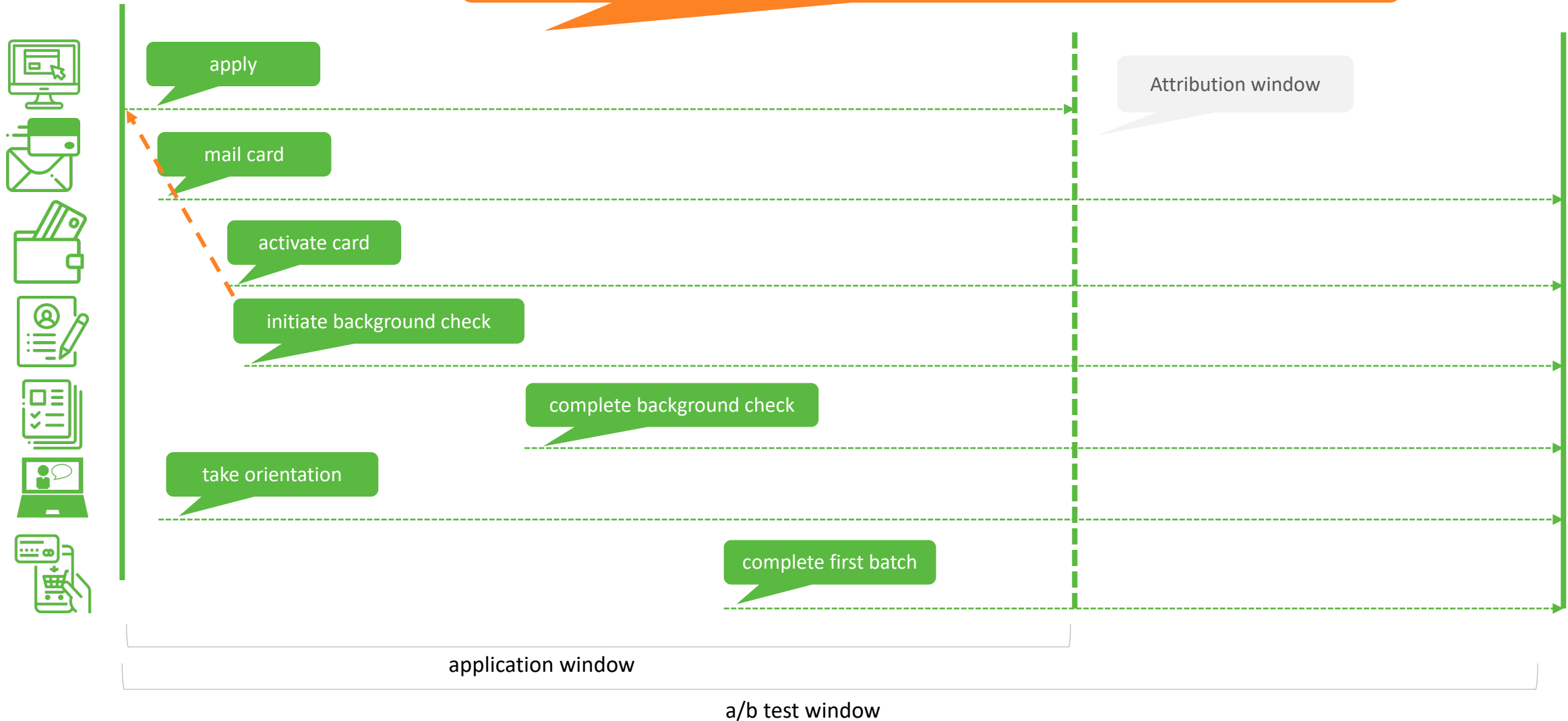


Data Science Challenge

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Sequence of events for a shopper hiring process

Question: What if initiating background check earlier



Q1: Evaluate A/B test result

If initiating background check earlier...

- ① Increases first batch completion rate
- ② Reduces the entire hiring process time (processes optimization)
- ③ Evidence does not show shoppers will start quickly if they complete card activation and background check (we can not include the duration of background check into shopper momentum calculation, because it is a passive waiting)

group	#applicant (sample size)	#completed first batch	① conversion rate	② #days from application to first batch completion	③ #days from both completion (card activation, background check) to first batch completion
control	10,024	2,678	26.7%	10.2 days	1.95 days
treatment	4,958	2,115	42.7%	7.1 days	2.00 days
conclusion			conversion rate significantly increased (z score 19.2; significant at 90%)	accelerated the hiring process significantly	stimulate shopper to start more quickly insignificantly

Q2: Is this change cost-effective?

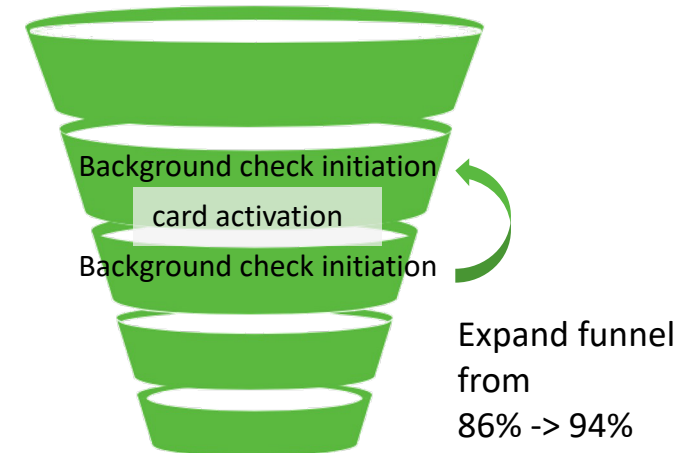
We are using card activation rate, and the average of first batch completion cost to evaluate cost-effective

Because the card activation event is the most close to the initialing background event in the hiring funnel, and the average cost per first batch completion is the most effective metric to evaluate dollar efficiency.

We could like to check whether the activation funnel is expanding, if initiating background check earlier.
Orientation event is one of factors might impact the conversion rate, so using bottom of funnel to evaluate is not an ideal metric.

A qualified potential shopper in hiring process must both activate card and pass background check, then enable them to become a “successful” shopper, so we would like to focus on card activation rate and dollar efficiency at the same time.

card activation rate						
group	overall	job site search	shopper referral bonus	social media	web search engine	Dollar efficiency
control	86%	67%	96%	96%	83%	\$96
treatment	94%	87%	97%	98%	94%	\$70
z score At 90%	17.1 significant	12.35 significant	0.54 insignificant	3.4 significant	13.3 significant	



Yes
cost effective

Yes
cost effective

Q3: Observation

job site search channel:

- **lowest conversion** rate in the control group
- **conversion rate significantly improved**, if initiating background check
- **orientation completion rate is the lowest** in the test

social media channel:

- generates **ineffective leads** in the test
- **conversion rate insignificantly improved**, if initiating background check
- **lowest orientation completion rate**

shopper referral bonus channel:

- **highest conversion rate** in the control group;
- generates **effective leads**
- **highest orientation rate**

web search engine channel:

- **lowest conversion rate** in the control group;
- **conversion rate significantly improved**, if initiating background check

Control

	conversion rate	card activation rate	orientation rate	background check completed rate	#days from application to first batch completion	#days from both completion (card activation, background check)
job site search	16%	67%	69%	100%	9.5	2.1
shopper-referral-bonus	34%	96%	82%	99%	9.5	1.8
social-media	17%	96%	24%	98%	11.3	2.0
web-search-engine	25%	83%	65%	99%	9.6	1.9
Overall	<u>27%</u>	<u>86%</u>	<u>47%</u>	<u>100%</u>	10.2	2.0

Treatment

job site search	38%	87%	58%	100%	6.3	1.9
shopper-referral-bonus	50%	97%	83%	100%	6.9	2.1
social-media	20%	98%	20%	100%	8.0	2.0
web-search-engine	45%	94%	54%	100%	6.8	2.0
Overall	<u>43%</u>	<u>94%</u>	<u>58%</u>	<u>100%</u>	7.1	2.0

Q3: Recommendation

- ① To perform A/B Test to evaluate if mandatory orientation would improve the conversion rate

(control group)	successful hiring	Not successful hiring
orientation completed	47%	42%
no orientation	53%	58%
	100%	100%

- ③ The conversion rate in social media channel is much lower than average

If this channel is paid advertising, we should evaluate the ROI, which cost is channel acquisition cost + \$30 background fee, etc. to check if the social media channel is an effective way to attract potential shoppers

group	social media conversion rate	overall
control	17%	27%
treatment	20%	43%

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

- ② To perform A/B Test to evaluate if accelerate the duration of background check would make shopper start to shop quickly

