



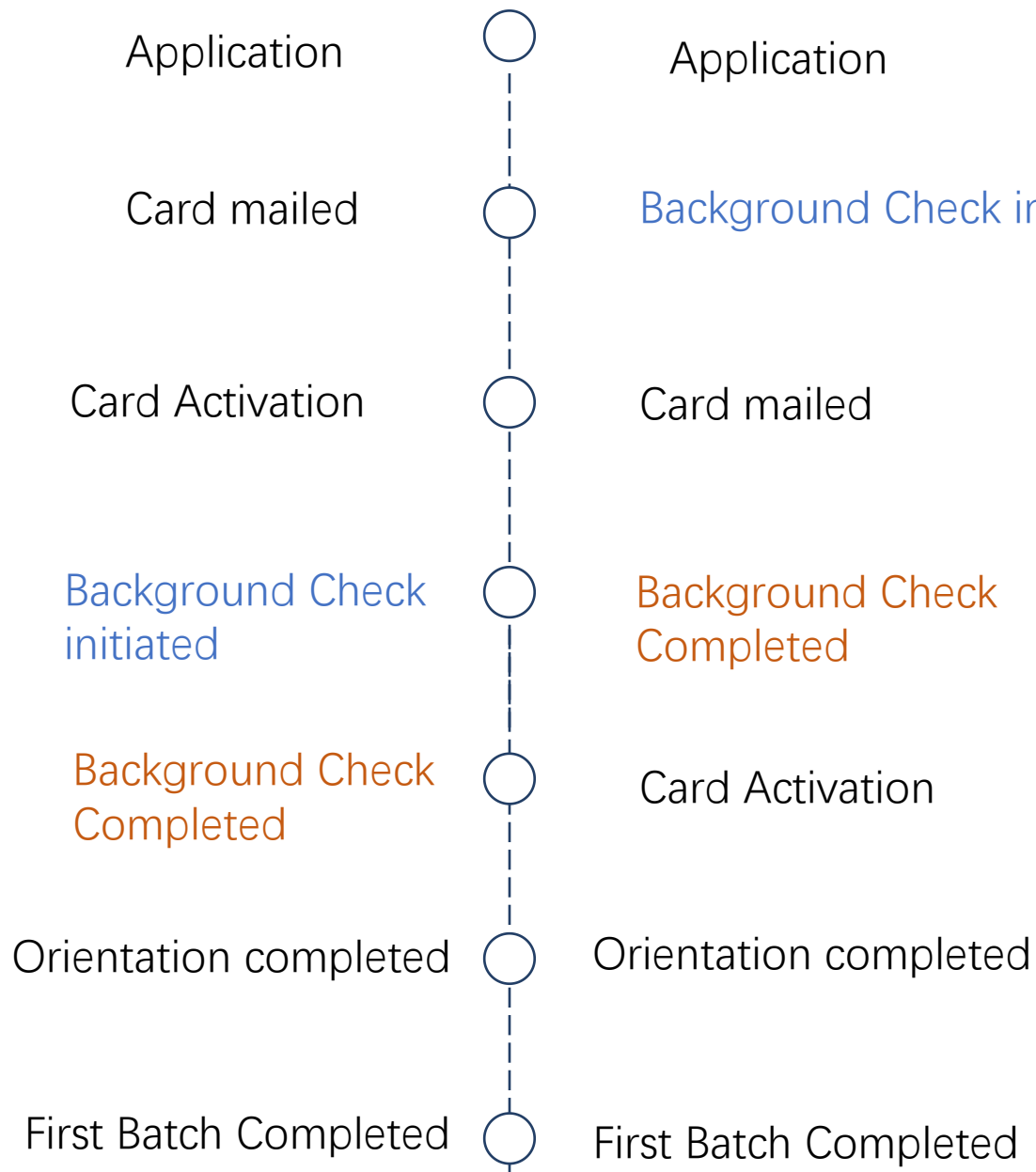
# Shopper Hiring Problem



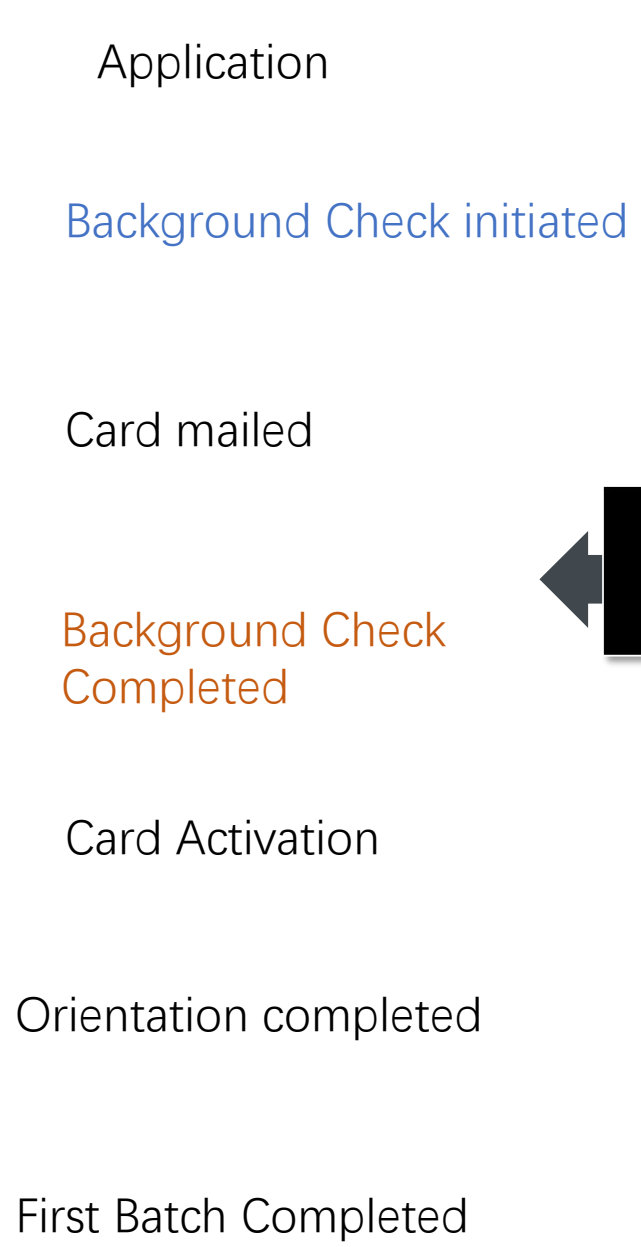
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# Recruitment Process

Control Group



Treatment Group



# Question1: What is the conclusion of this AB Test? How confident are we in this conclusion?

exp_group	event_type	n_event_type_complete	n_application	cvr
control	first_batch_completed	2873	14501	0.198124267
treatment	first_batch_completed	2471	7197	0.343337502

1)  $0.198124267 < 0.343337502$

 Conclusion: Starting background checks earlier in the process can increase the conversion rate.


2) Assume a significance level of 0.05

$$p_1=0.198 \quad p_2=0.343 \quad N_1=14501 \quad N_2=7197$$

$$\text{sqrt}((0.198 * (1-0.198) / 14501) + (0.343 * (1-0.343) / 7197))=0.0065$$

$$d=p_2-p_1=0.145$$

The 95% confidence interval :  $[0.145 - 1.96 * 0.0065, 0.145 + 1.96 * 0.0065] = [0.13226, 0.15774]$ .

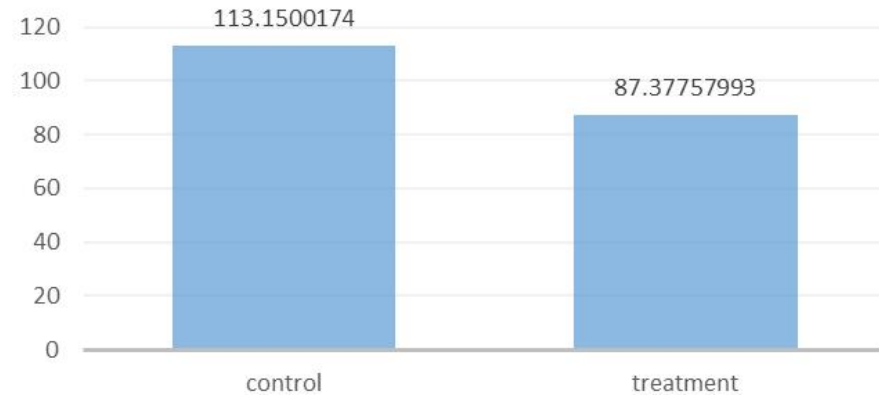
 Since the confidence interval does not include the value 0, it is natural to conclude that the improvement is statistically significant, and the test group shows a significantly better effect compared to the control group.

## Question2: Is it cost-effective?

exp_group	successful applicant	totalnumber_background	cost/background_check	cost/person
control	2873	10836	30	113.1500174
treatment	2471	7197	30	87.37757993

Relative Cost Reduction =  $((113.15 - 87.38) / 113.15) * 100 \approx 22.77\%$

The treatment group's average expenditure is approximately 22.78% lower than that of the control group, indicating a significant cost efficiency advantage for the treatment group.



The treatment group is more cost-efficient. We should start background check earlier.

# Question3: Other Observation

Row	exp_group	channel	event_type	n	n_applicants	cvr
1	control	job-search-site	first_batch_completed_date	300	2468	0.121555915721...
2	control	web-search-engine	first_batch_completed_date	1062	5445	0.195041322314...
3	control	social-media	first_batch_completed_date	983	4090	0.240342298288...
4	control	shopper-referral-bonus	first_batch_completed_date	528	2498	0.211369095276...
5	treatment	social-media	first_batch_completed_date	630	2000	0.315
6	treatment	shopper-referral-bonus	first_batch_completed_date	442	1233	0.358475263584...
7	treatment	web-search-engine	first_batch_completed_date	1018	2777	0.366582643140...
8	treatment	job-search-site	first_batch_completed_date	381	1187	0.320977253580...



The conversion rate of the treatment group observed among applicants through the web-search-engine channel is significantly higher than the conversion rate of the control group.



Possible reasons for the observed differences in conversion rates between treatment and control groups could be due to various factors. One possible reason might be that many candidates did not pass the background check, leading to a lower conversion rate in the control group. Additionally, the timing of the recruitment process might have played a role in influencing the results.

To understand the specific reasons behind the remarkable differences in conversion rates between the treatment and control groups, further investigation and analysis are needed.