

# New Button Design

Experimental Design and A/B Testing

# Outline

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- Project Goals
- Hypotesis
- Experiment Design
- A/A Test
- A/B Test
- References

# Project Goals & Hypotesis

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# Project Goals

- This project is done with the purpose to prove that changing the download button to a new button design will encourage our customer to click more to our download link

## Old Design



## New Design



# Hypotesis

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We set this following to be our hypotesis

$H_0: \text{CTR Control} \geq \text{CTR Treatment}$

$H_1: \text{CTR Control} < \text{CTR Treatment}$

Null hypotesis determines that there would be no difference in CTR between Control and Treatment

H1 determines that Treatment would have higher CTR than control

Control = The old button that is currently being used

Treatment = A button that would direct our user to download our app

# Experiment Design

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Randomization Unit = User's IP Address

Target Randomization Unit = Our website visitor, regardless the visitor logged in or not.

Sample Size

Confidence Level (  $\alpha$  ) 5%,

Power (  $1-\beta$  ) 80%

Difference Control & Treatment (  $\delta$  ) 1%

Standar Deviasi populasi (  $\sigma$  ) 0.125

We assign those numbers because we believe the number is appropriate to set for performing A/B test, due to the size of sample that would be needed, we decided to do the project for 2 Weeks

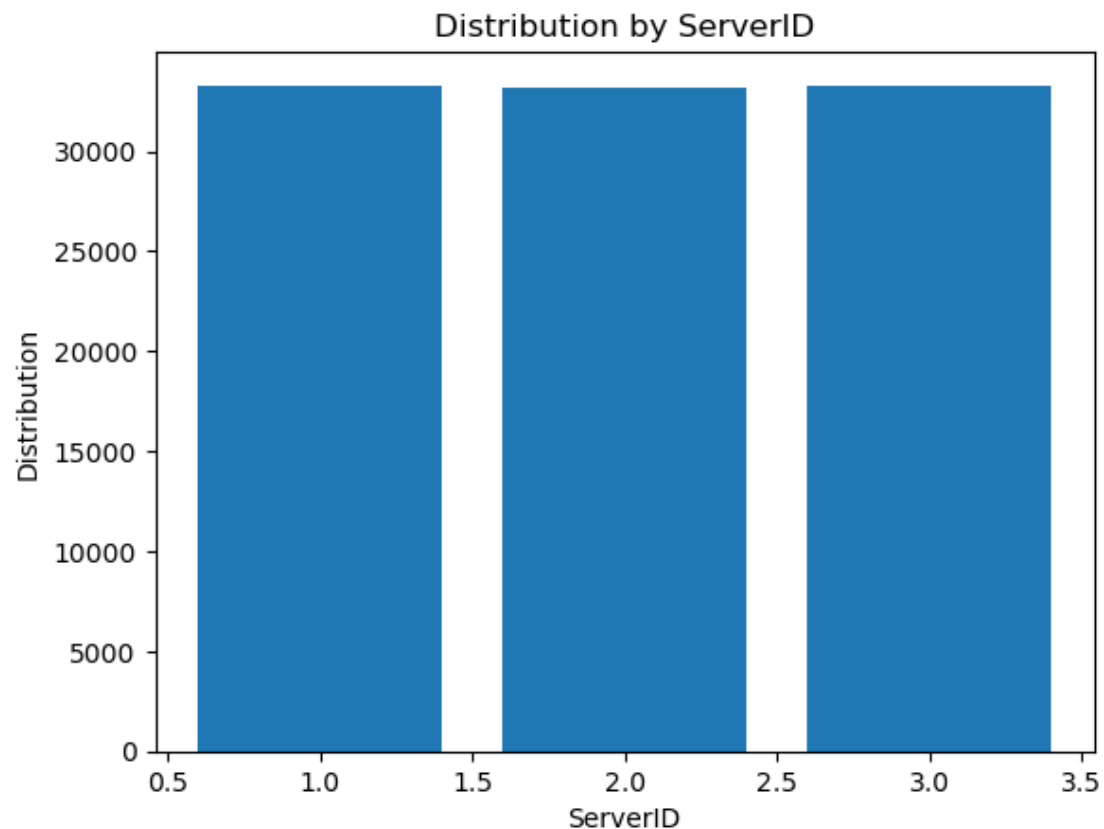
Sample needed per grup: 2500

Sample needed total : 5000

# A/A Test

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# A/A Test



Grup Control A:

Control Visit: 2458

Observasi control: 24941

CTR Control: 0.0985525840984724

Grup Treatment A:

Control Visit: 2446

Observasi control: 24941

CTR Treatment: 0.09807144861874023

Confidence Interval : 95%

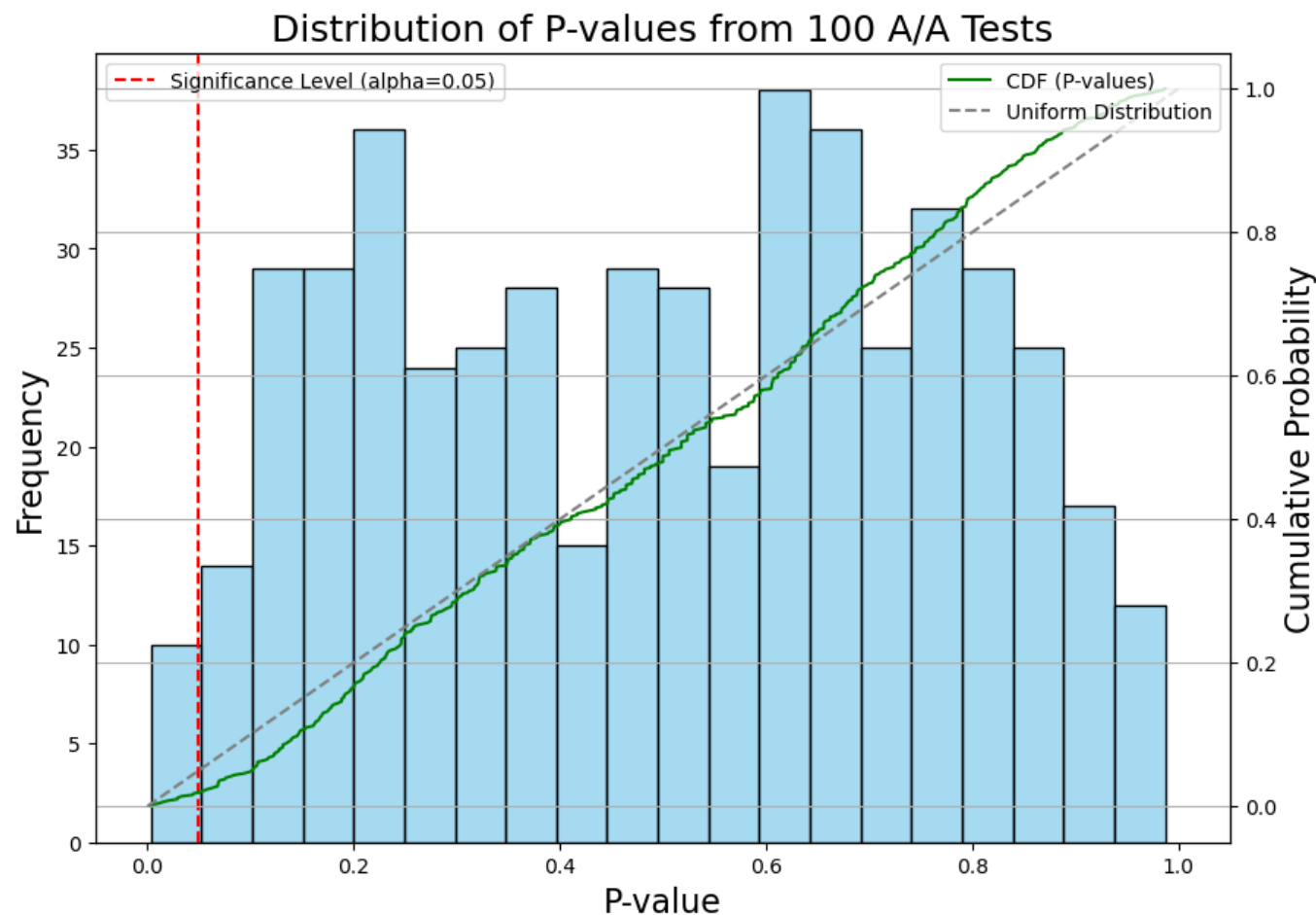
Z-statistic: 0.180

p-value: 0.572

Confidence Interval (Upper & Lower bounds) :  
(-0.005707856057668389, 0.004745499250237824)



# A/A Test (Simulation)



Perform kolmogorov smirnov (KS) test

P-value: 0.07376685360956925

Decision : Fail to Reject Null Hypothesis

# A/B Test

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# Initial A/B test

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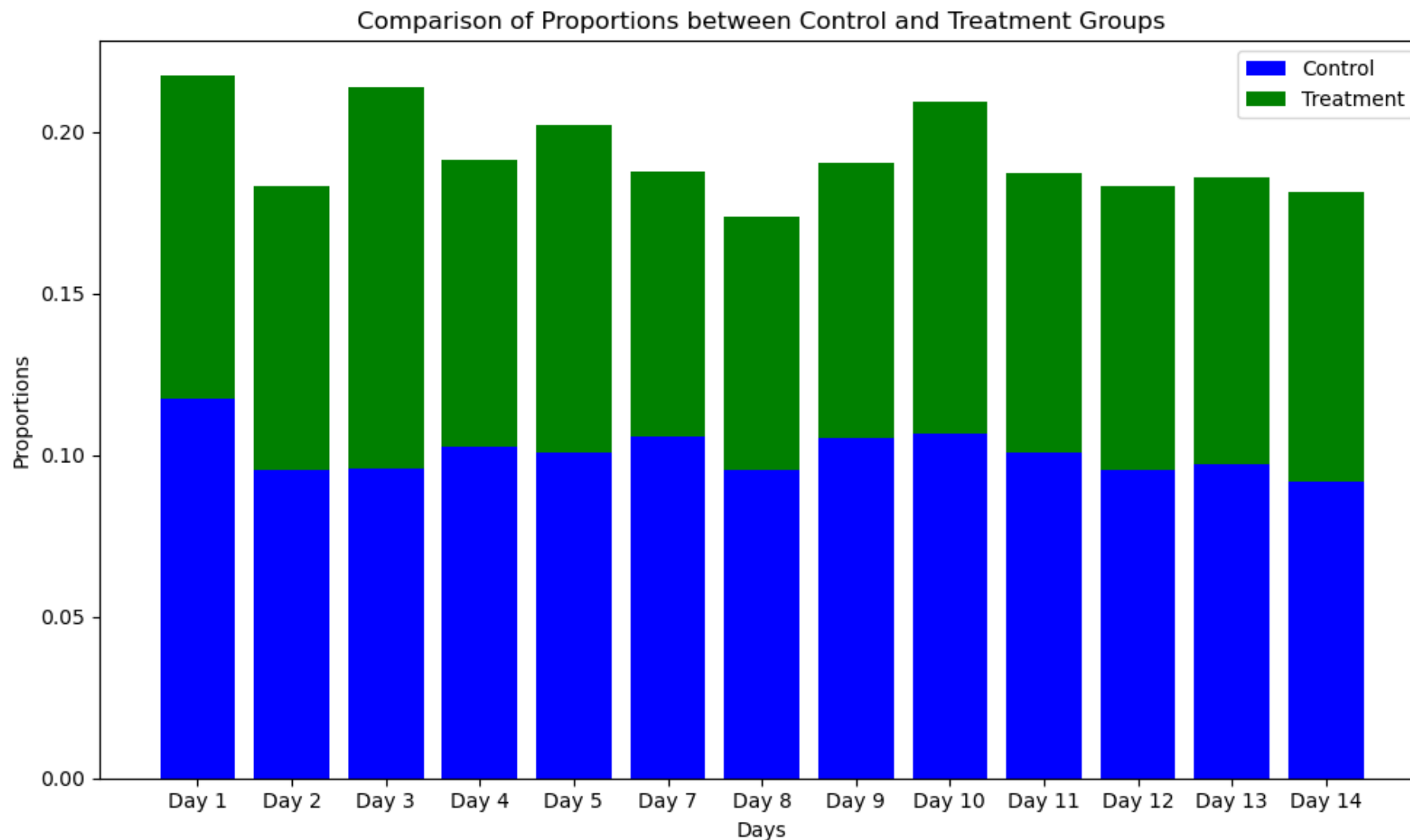
Grup Control A:  
Control Visit: 253  
Observasi control: 2500  
CTR Control: 0.1012

Grup Treatment B:  
Control Visit: 221  
Observasi control: 2500  
CTR Treatment: 0.0884

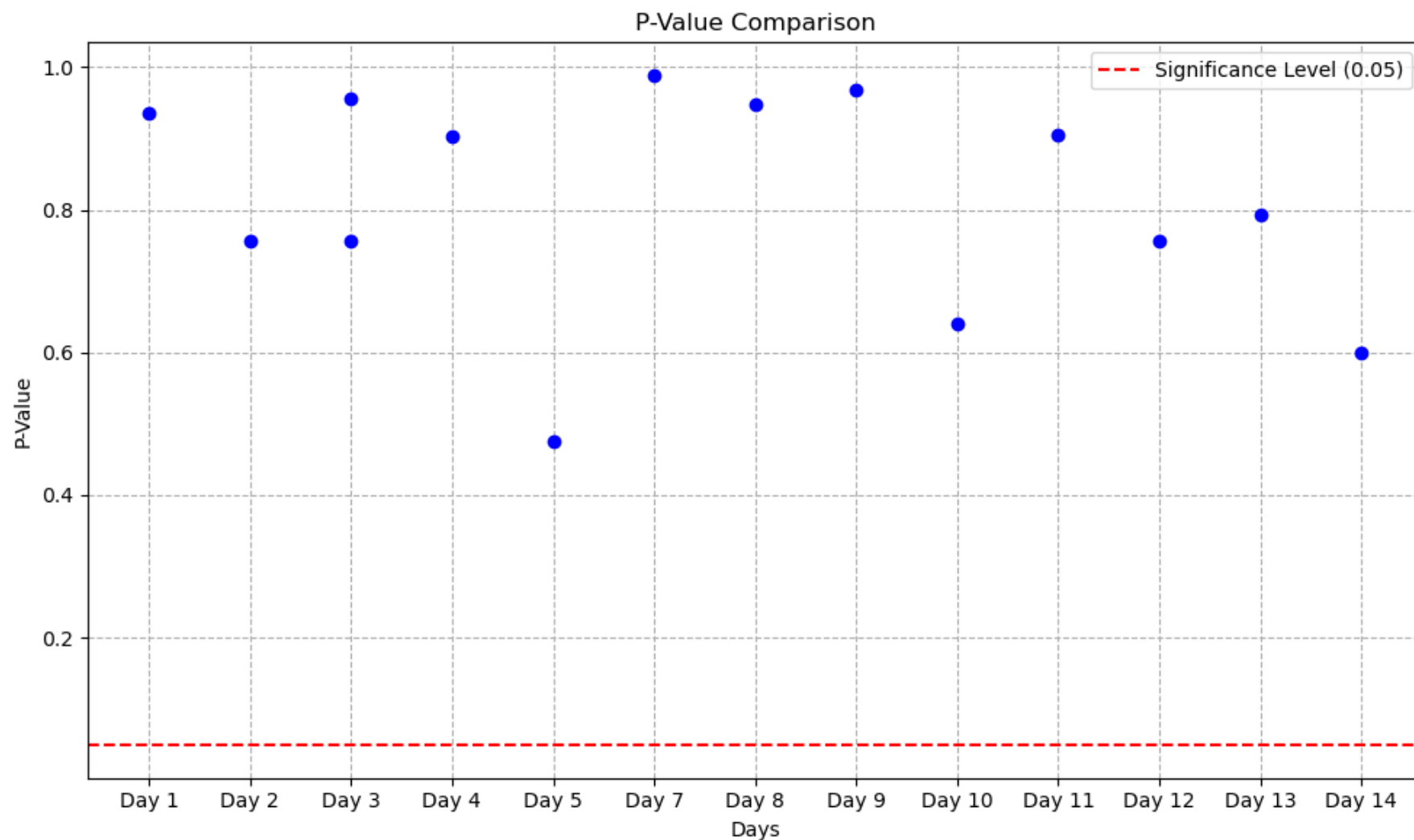
## Initial Test

Variant	Sessions	Clicks	Conversion Rate	Lift Over Baseline	P-Value	P(Best)	X-Loss
A	2500	266	10.64%			91.67%	3.53%
B	2500	213	8.52%	-2.12%	0.995	8.33%	13.89%

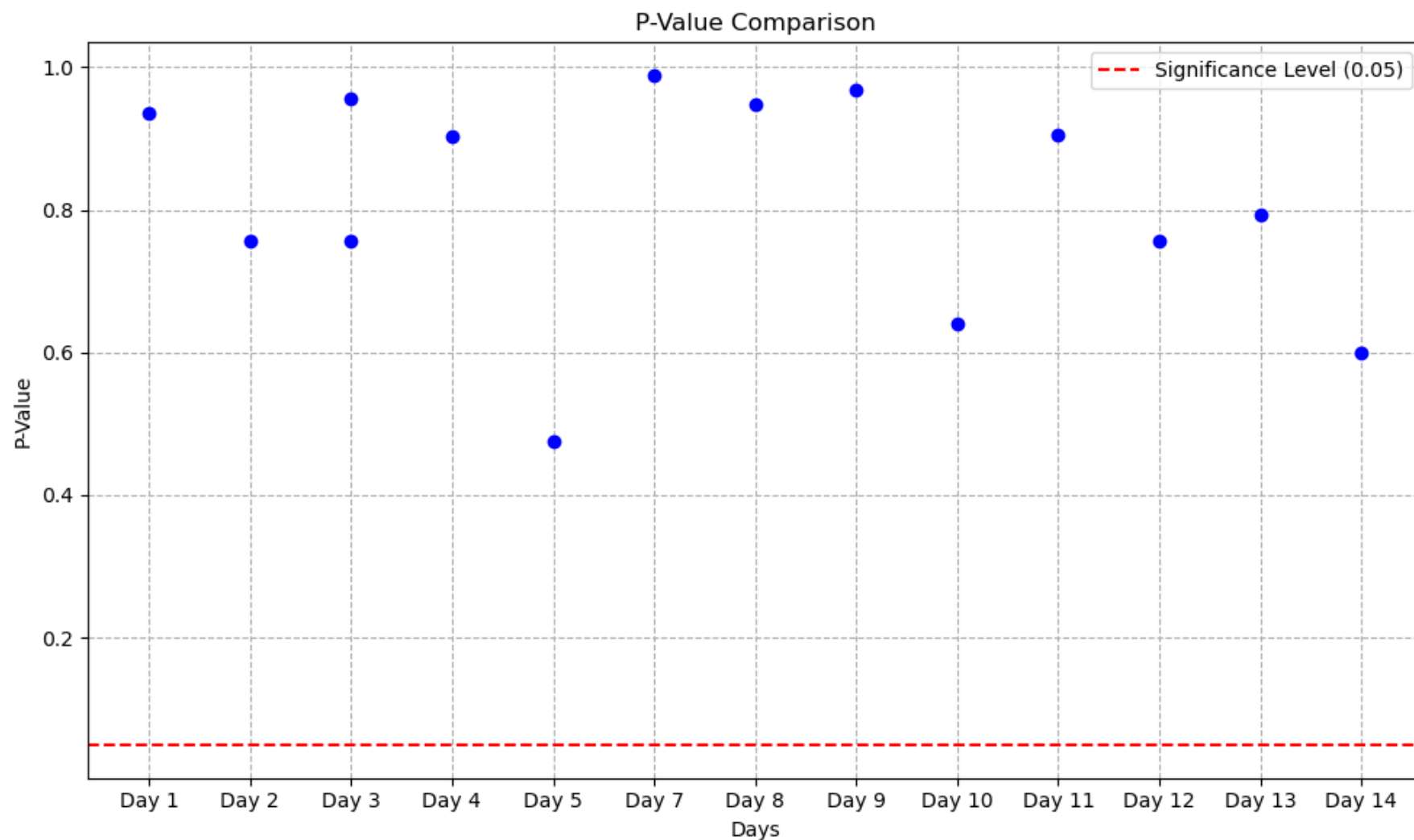
# A/B test (14 Days)



# A/B test (14 Days)



# A/B test (14 Days)



# A/B test (14 Days)

Test Result      Session : 1500/day

Day	Control Visit	Control Rate	Treatment Visit	Treatment Rate	Z-Statistic	P-Value	Lift Over Baseline
1	159	10.60%	130	8.67%	1.795	0.964	-1.93%
2	173	11.53%	128	8.53%	2.735	0.997	-3.00%
3	152	10.13%	147	9.80%	0.305	0.620	-0.33%
4	161	10.73%	126	8.40%	2.173	0.985	-2.33%
5	159	10.60%	153	10.20%	0.359	0.640	-0.40%
6	166	11.07%	142	9.47%	1.444	0.926	-1.60%
7	156	10.40%	128	8.53%	1.746	0.960	-1.87%
8	155	10.33%	159	10.60%	-0.239	0.406	0.27%
9	154	10.27%	139	9.27%	0.923	0.822	-1.00%
10	193	12.87%	127	8.47%	3.904	1.000	-4.40%
11	152	10.13%	148	9.87%	0.243	0.596	-0.27%
12	146	9.73%	159	10.60%	-0.785	0.216	0.87%
13	162	10.80%	147	9.80%	0.901	0.816	-1.00%
14	145	9.67%	156	10.40%	-0.668	0.252	0.73%

# Conclusion

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# Conclusion

## Final Result (2 weeks)

Variant	Sessions	Clicks	Conversion Rate	Lift Over Baseline	P-Value	P(Best)	X-Loss
A	21000	2233	10.63%			100.00%	0.00%
B	21000	1989	9.47%	-1.16%	0.995	0.00%	12.38%

Grup Control A:

Control Visit: 2141

Observasi control: 21000

CTR Control: 0.10195238095238095

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Grup Treatment B:

Control Visit: 1898

Observasi control: 21000

CTR Treatment: 0.09038095238095238

Confidence Interval : 95%

Z-statistic: 4.022

Confidence Interval (Upper & Lower bounds) :  
(0.005933305845928513, 0.017212175748786793)

**Decision : Fail to Reject Null Hypothesis**

# Thank You

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# Reference

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- [Bayesian Calculator](#)
- [A/A Testing](#)
- [A/B Testing](#)
- [Metrics](#)

# Recommendation

- Things you need to upgrade