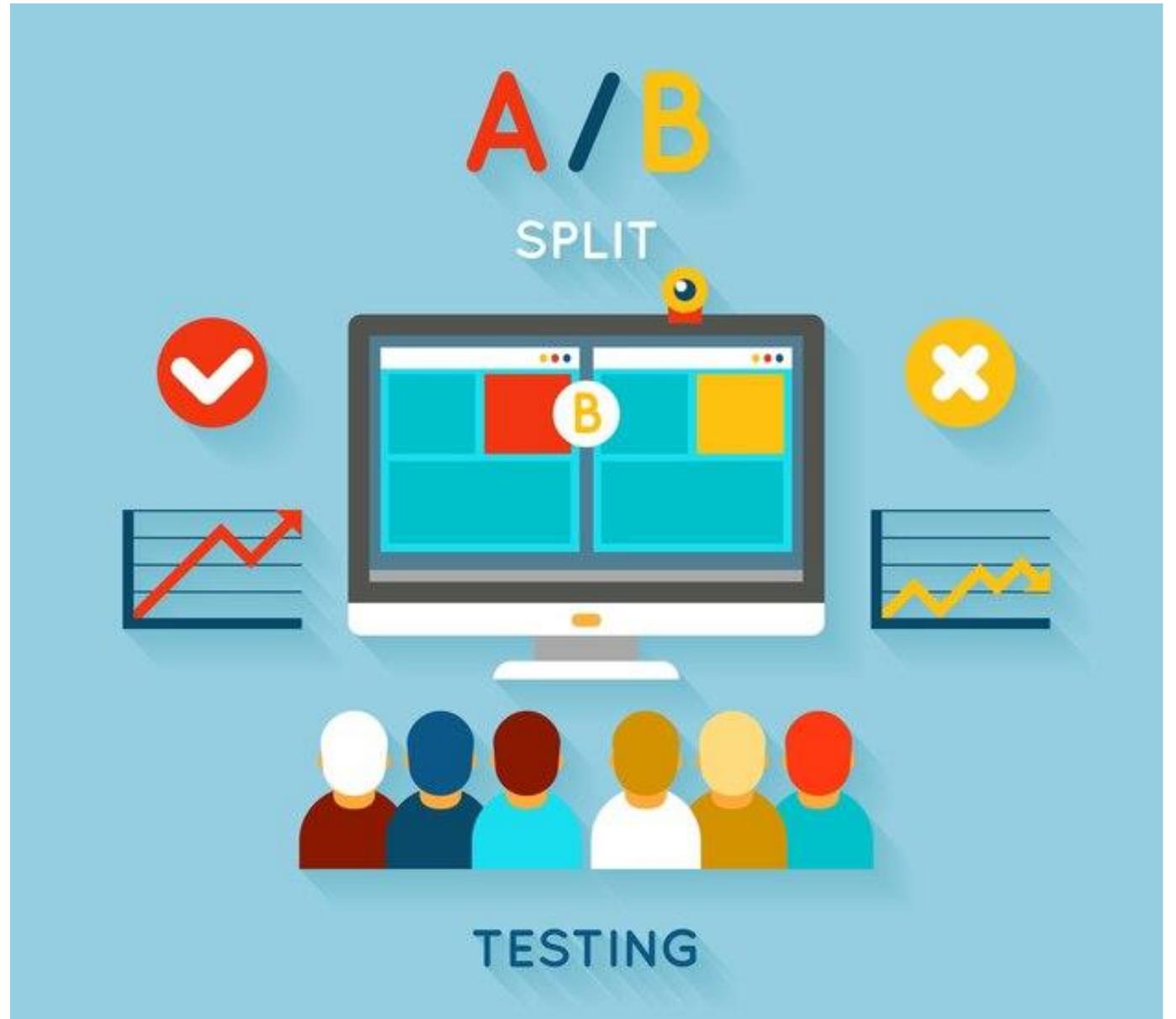


Introduction to **Big Data** in Business



Dr.Pongrapee Kaewsaiha
College of Hospitality
Industry Management
Suan Sunandha Rajabhat University

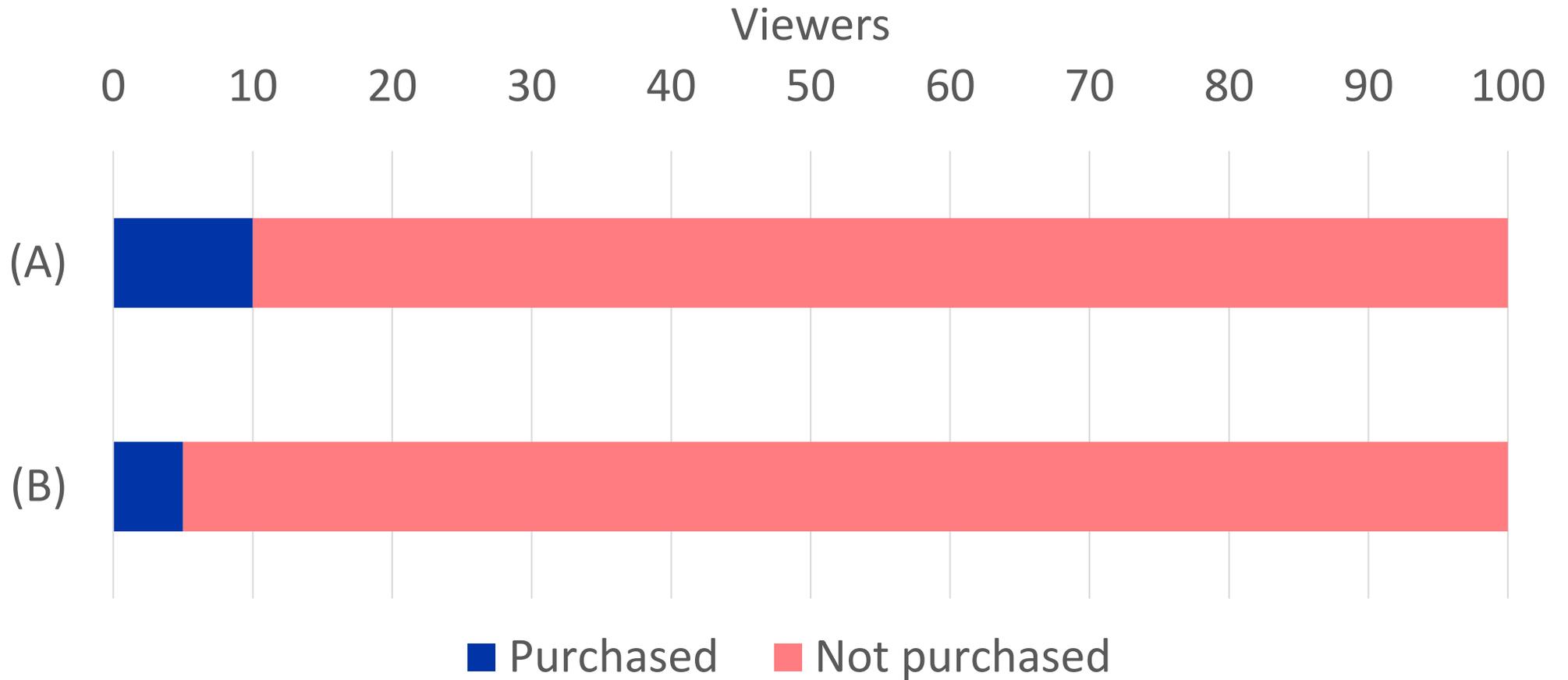
A/B Testing





Exploration

Ads performance



Total exploration



Ad **A** = 10%
performance



Ad **B** = 10%
performance

1,000 audiences divided into two groups

- 500 audiences viewed ad **A**
 - 10% of 500 (=50) purchased
- 500 audiences viewed ad **B**
 - 5% of 500 (=25) purchased

75 from 1,000 audiences purchased.

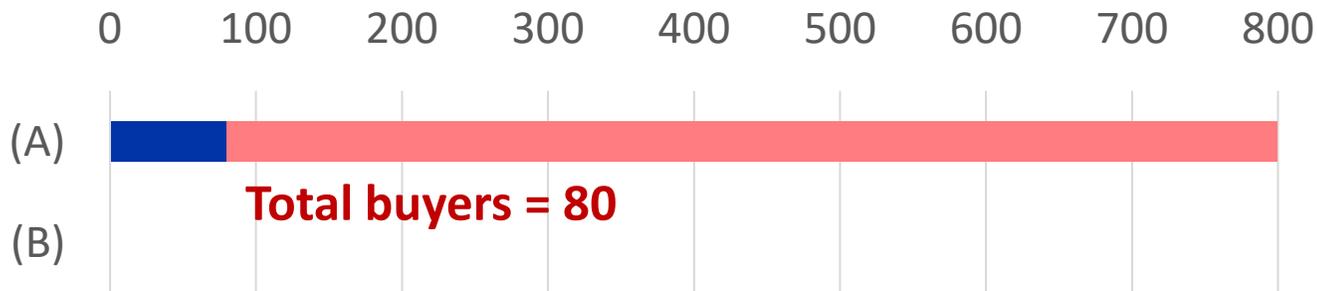
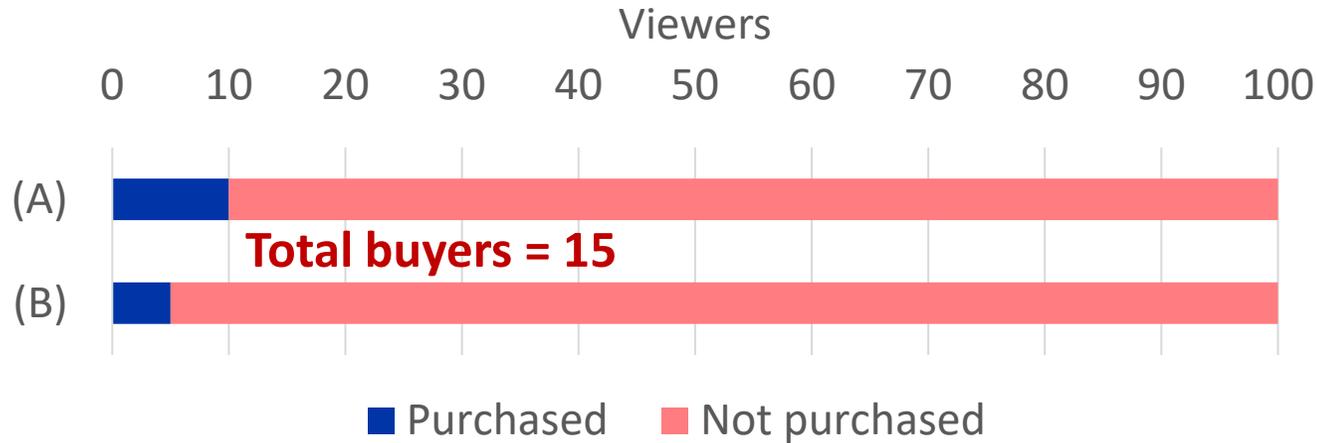
Conversions per 1,000 audiences



Total exploration

Exploitation after 200

Ads performance



We have noticed the ads performance after the first 200 views.



Ad A = 10%
performance



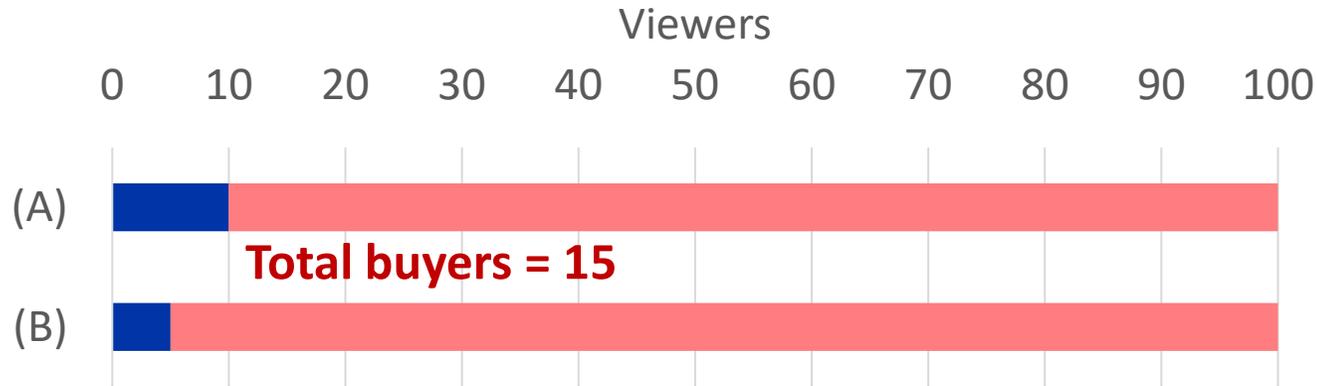
Ad B = 5%
performance

For the next 800, we only displayed ad A which was found to be more effective.

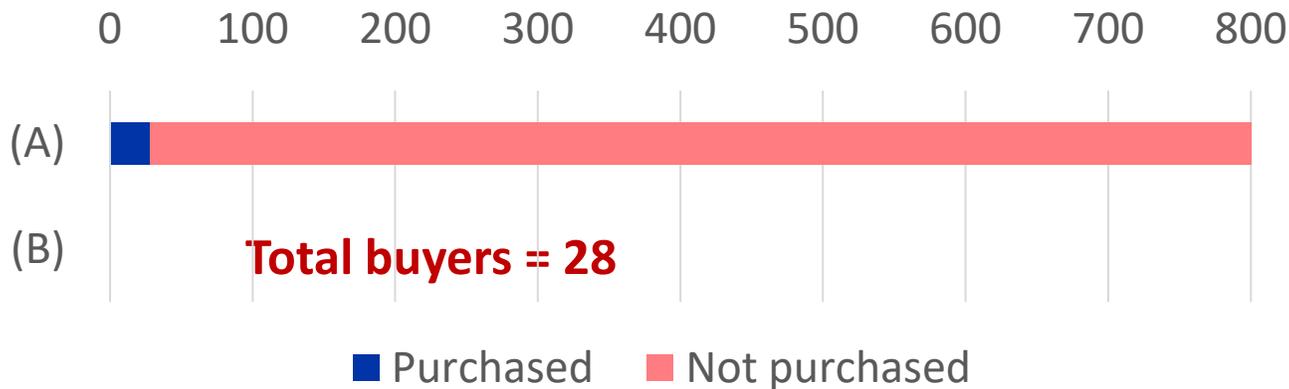
95 from 1,000 audiences purchased.

Exploitation after 200

Exploration



Exploitation



We have noticed the ads performance after the first 200 views.



Ad A = 10% performance

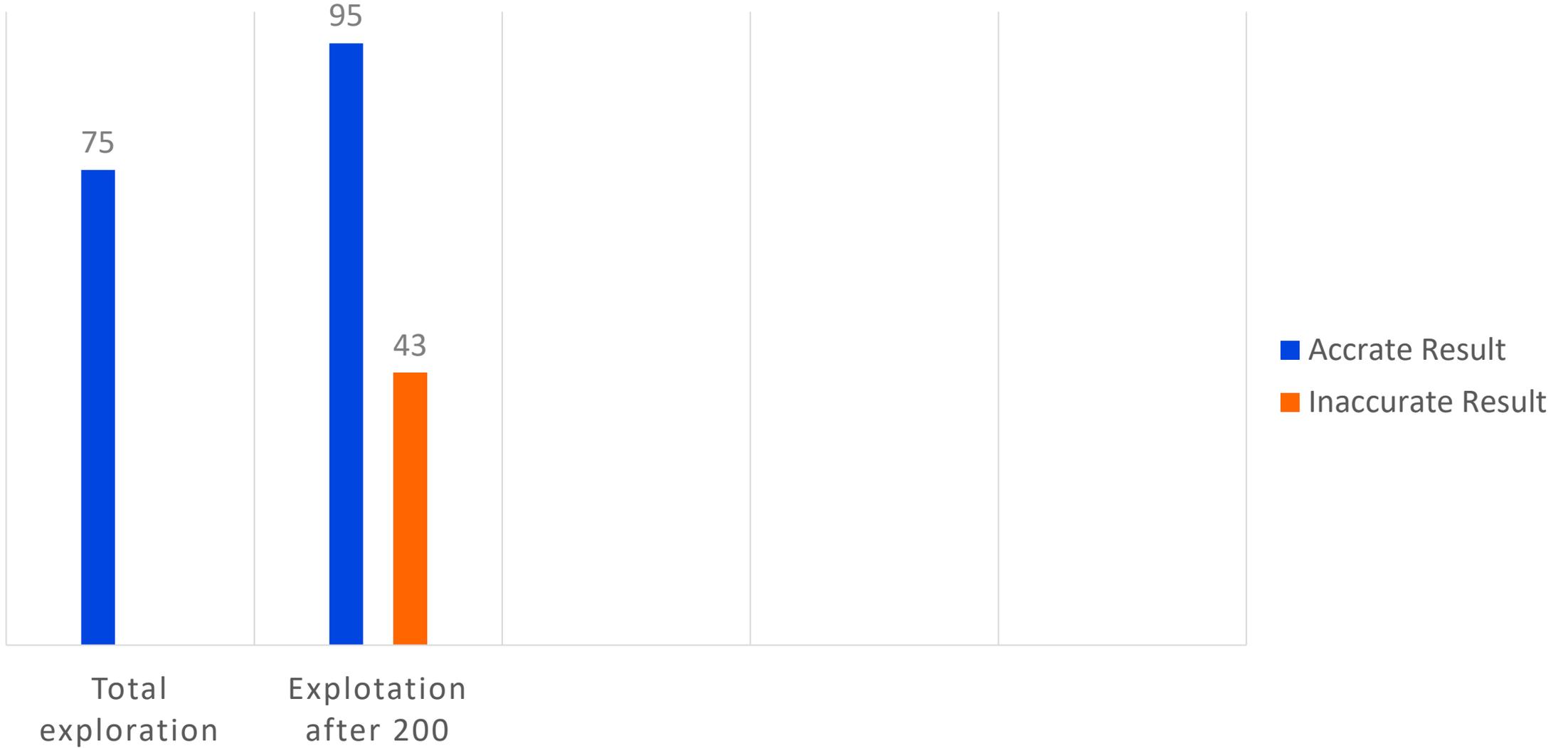


Ad B = 5% performance

For the next 800, we only displayed ad A but later found that the performance has dropped to 3.5%.

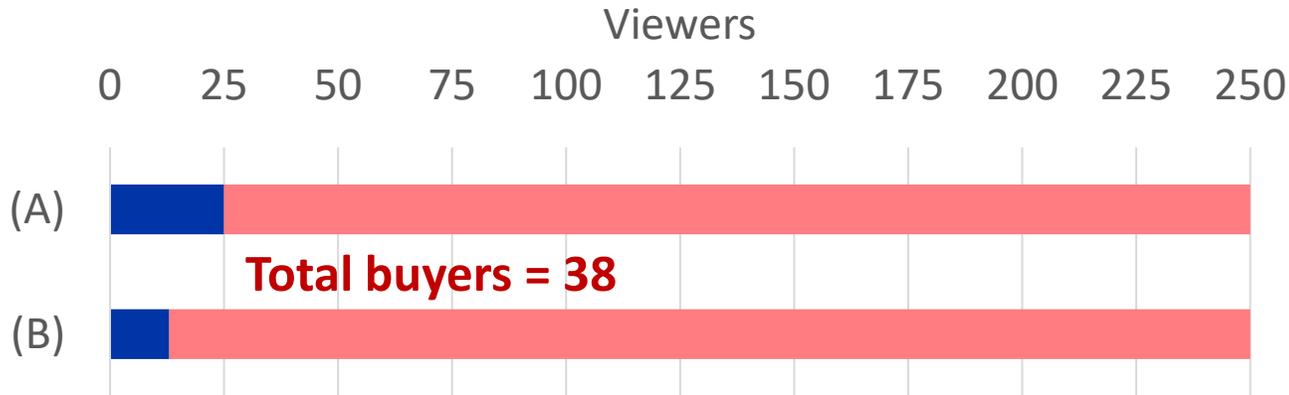
43 from 1,000 audiences purchased.

Conversions per 1,000 audiences

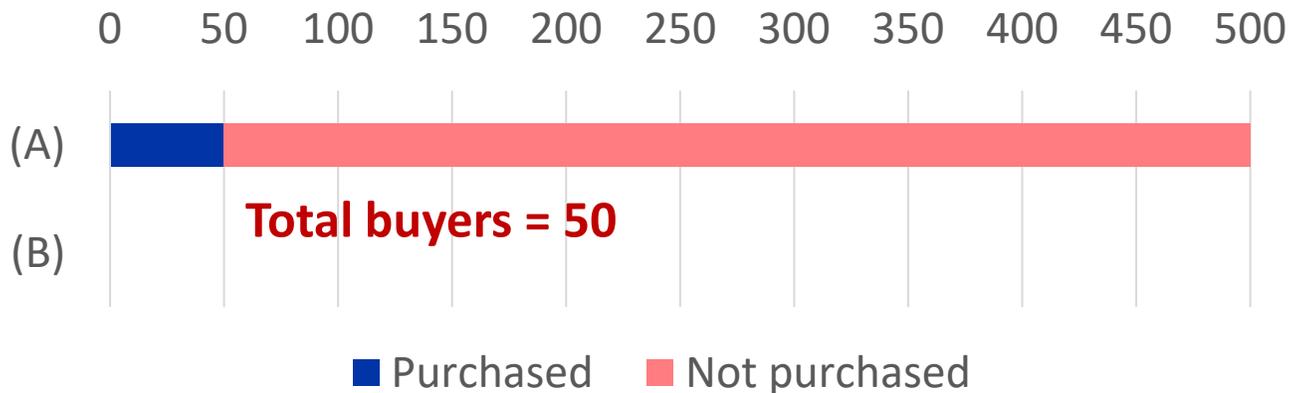


Exploitation after 500

Exploration



Exploitation



We have noticed the ads performance after the first 500 views.



Ad A = 10% performance



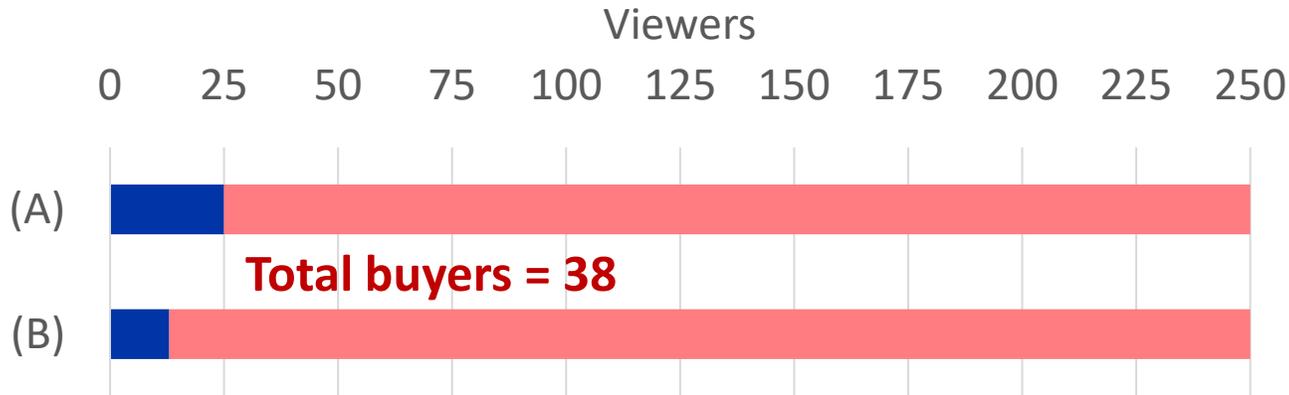
Ad B = 5% performance

For the next 500, we only displayed ad A which was found to be more effective.

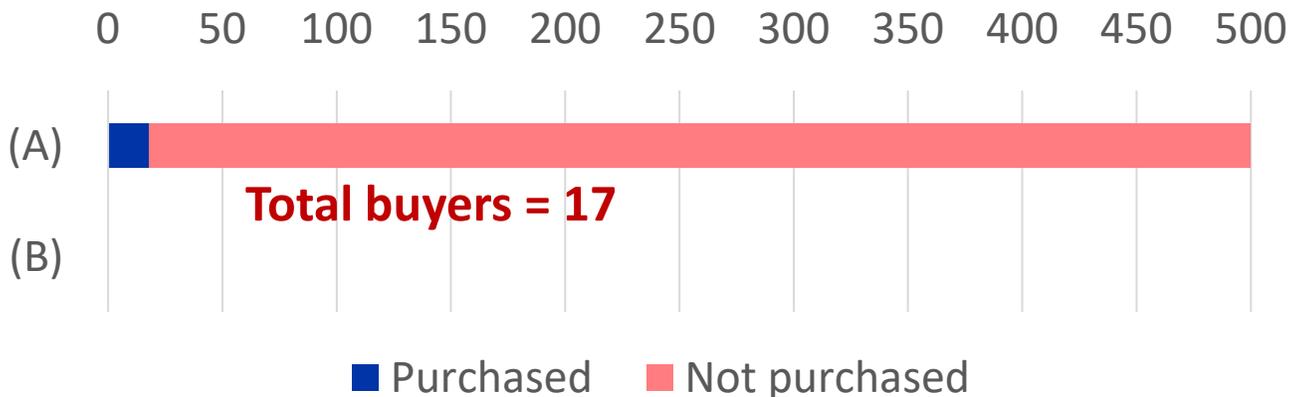
88 from 1,000 audiences purchased.

Exploitation after 500

Exploration



Exploitation



We have noticed the ads performance after the first 500 views.



Ad A = 10% performance

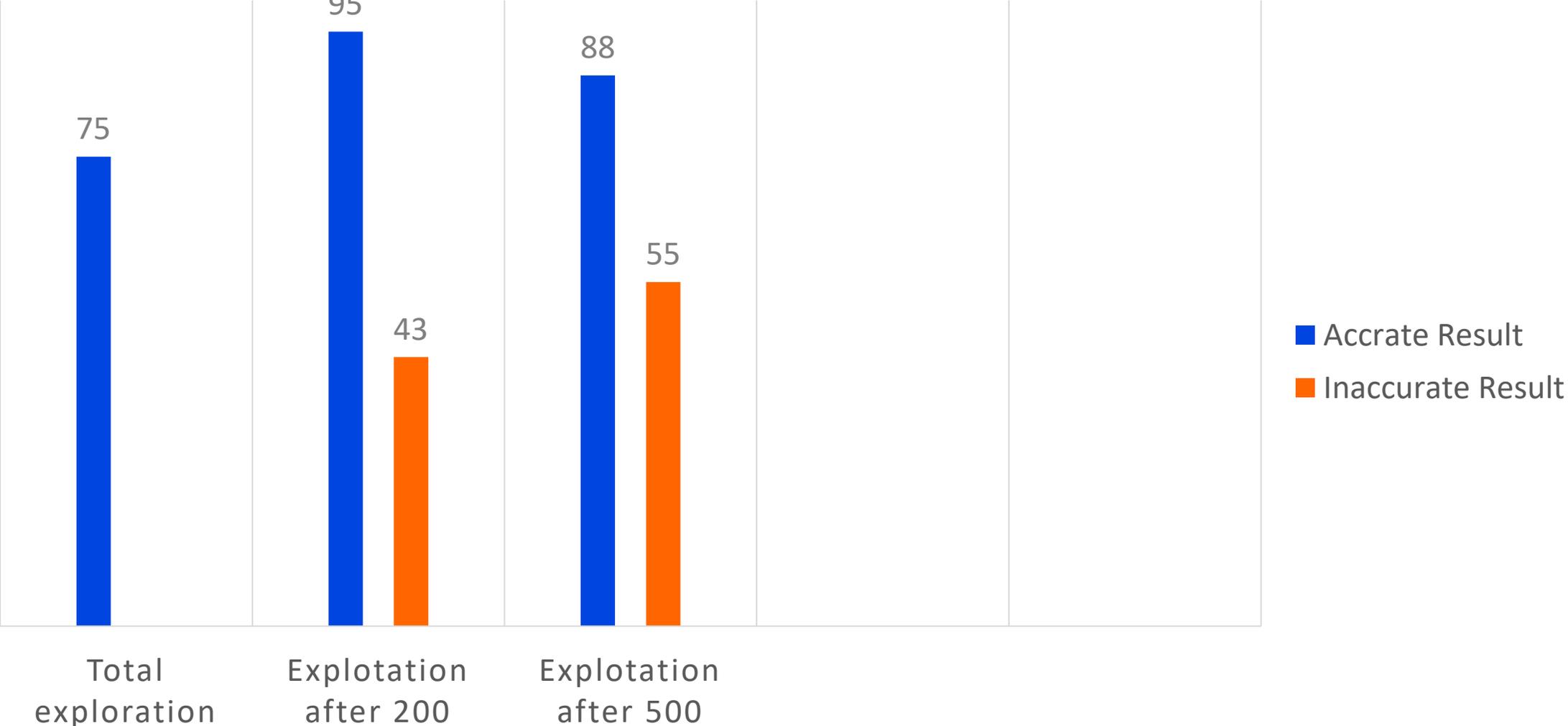


Ad B = 5% performance

For the next 500, we only displayed ad A but later found that the performance has dropped to 3.5%.

55 from 1,000 audiences purchased.

Conversions per 1,000 audiences



Epsilon-decreasing strategy

Change the exploitation ratio after we noticed the ads performance.

Viewers	A-Exploit	B-Exploit	A-Perform	B-Perform	Buyers
200	50.00%	50.00%	10.00%	5.00%	15

Split 50:50 for testing.

Ads' performances noticed after the test

$(200 \times 50\% \times 10\%)$
 $+(200 \times 50\% \times 5\%)$

Epsilon-decreasing strategy

Change the exploitation ratio after we noticed the ads performance.

Viewers	A-Exploit	B-Exploit	A-Perform	B-Perform	Buyers
200	50.00%	50.00%	10.00%	5.00%	15
200	60.00%	40.00%	10.00%	5.00%	16

Since ad A performed better in the previous phase, we allocated more visitors to it.

Ads' performances haven't changed after this phase.

↑
 $(200 \times 60\% \times 10\%)$
 $+(200 \times 40\% \times 5\%)$

Epsilon-decreasing strategy

Change the exploitation ratio after we noticed the ads performance.

Viewers	A-Exploit	B-Exploit	A-Perform	B-Perform	Buyers
200	50.00%	50.00%	10.00%	5.00%	15
200	60.00%	40.00%	10.00%	5.00%	16
200	70.00%	30.00%	10.00%	5.00%	17
200	80.00%	20.00%	10.00%	5.00%	18
200	90.00%	10.00%	10.00%	5.00%	19
				Total	85

If ad A remains a better choice, we keep adding more weight to it.
The increment rate depends on the entrepreneur's decision.

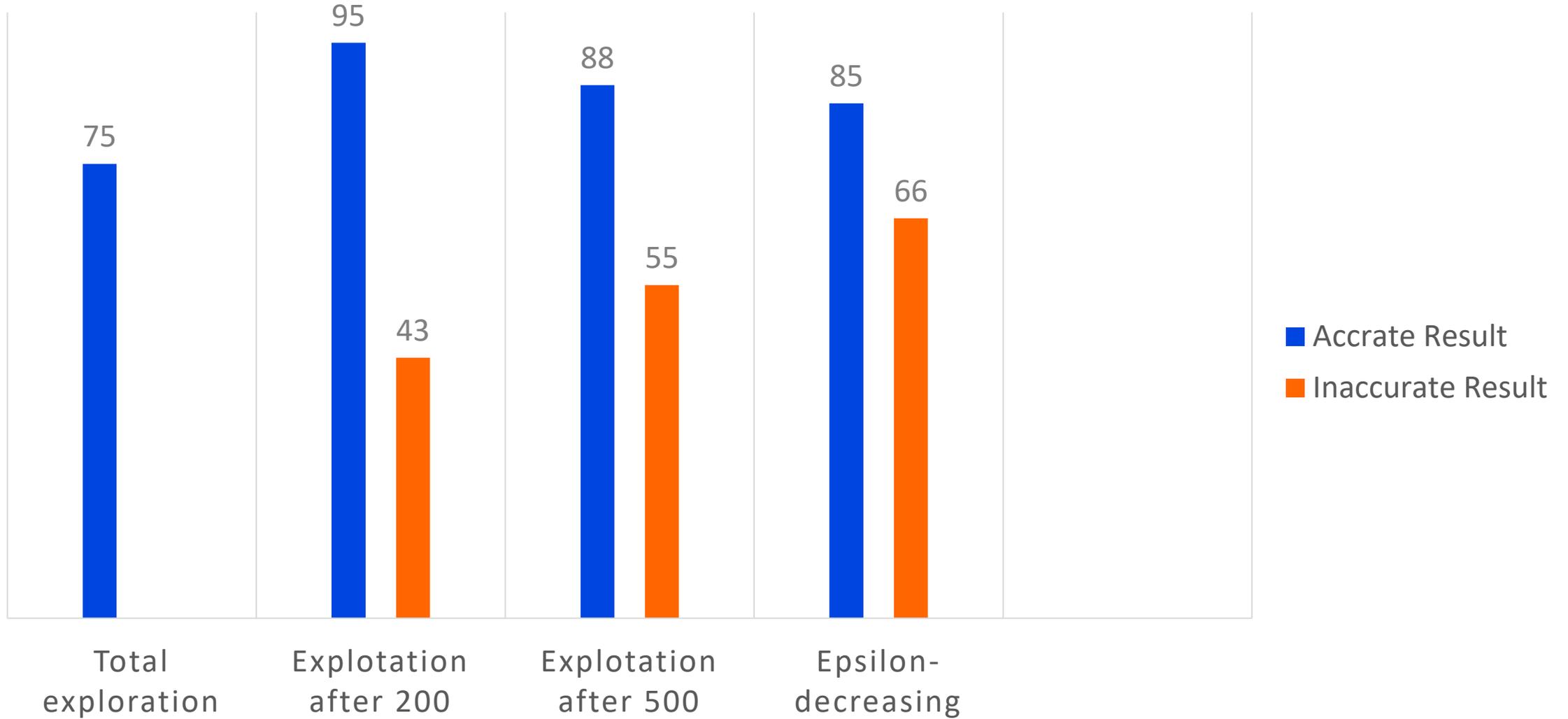
Epsilon-decreasing strategy

Change the exploitation ratio after we noticed the ads performance.

Viewers	A-Exploit	B-Exploit	A-Perform	B-Perform	Buyers
200	50.00%	50.00%	10.00%	5.00%	15
200	60.00%	40.00%	10.00%	5.00%	16
200	70.00%	30.00%	3.50%	7.50%	9
200	30.00%	70.00%	3.50%	7.50%	13
200	20.00%	80.00%	3.50%	7.50%	13
				Total	66

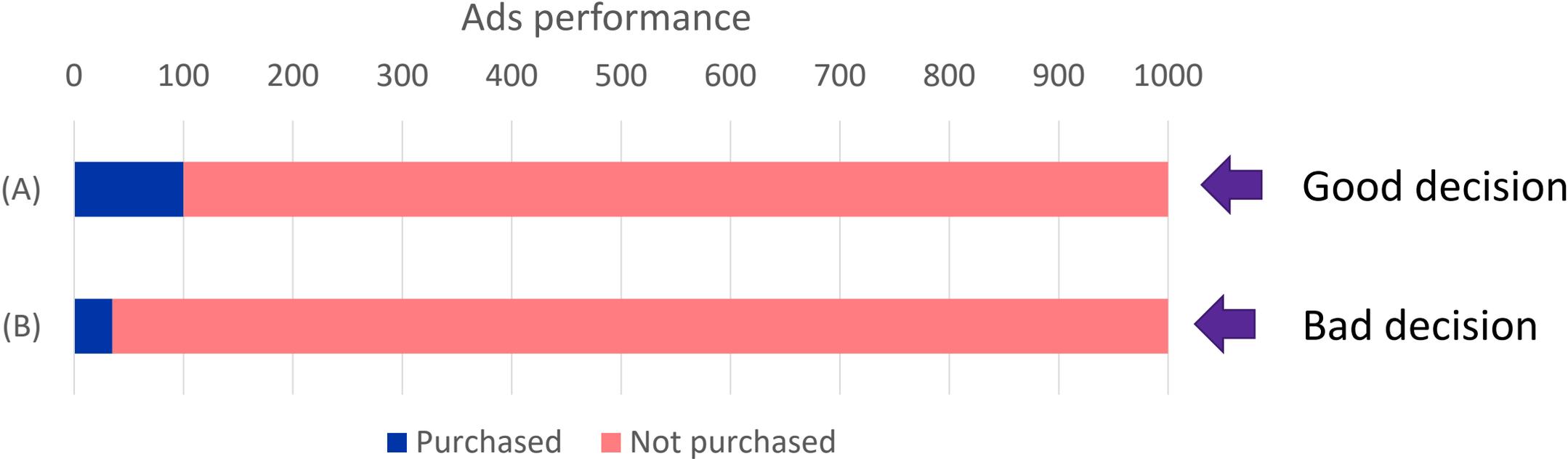
Adjust the ratio if there the ad performances change.

Conversions per 1,000 audiences

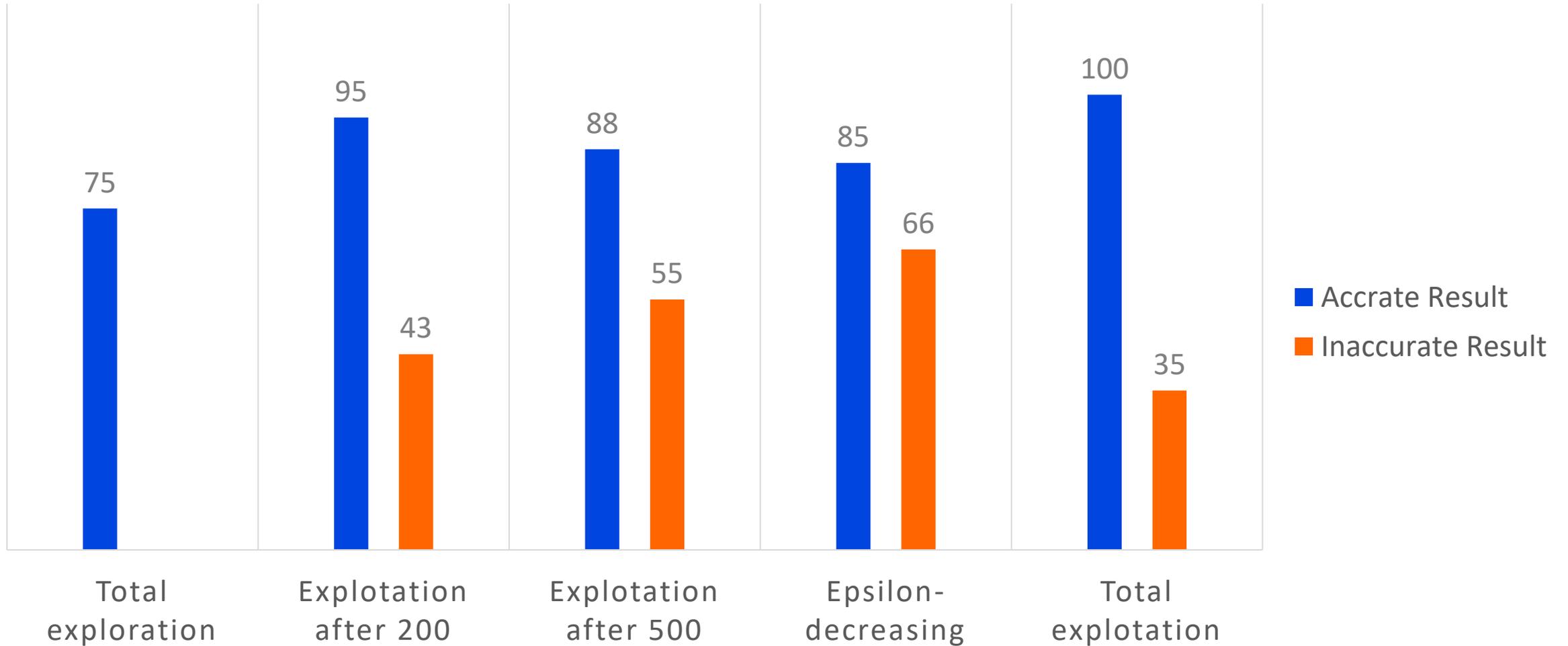


Total exploitation

Apply one strategy to all audiences without conducting any test.



Conversions per 1,000 audiences



Summary

- A/B testing in business aims to find a more effective approach.
- Often used to test marketing or advertising plans while the sale is ongoing.
- A certain group of potential customers will be exploited by what is later concluded as a less-effective method.
- Epsilon-decreasing strategy, will help reduce the risk.
- Only apply A/B testing if the two strategies are interchangeable.

