

Lifecycle of promotional campaigns in the online travel industry

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Booking.com



Agenda

- **About [booking.com](https://www.booking.com)**
- **Characteristics of travel promotions**
- **Campaign set up and optimization**
- **Campaign management**



Stays

Flights

Flight + Hotel

Car rentals

Attractions

Airport taxis

Where to next, Carlos?

Find exclusive Genius rewards in every corner of the world!



Where are you going?



Check-in date — Check-out date



2 adults · 1 child · 1 room



Search



Where to next, Carlos?

Find exclusive Genius rewards in every corner of the world!

Where are you going?
 Check-in date — Check-out date
 2 adults · 1 child · 1 room

 Search

~350 ML models in production

~125 ML practitioners

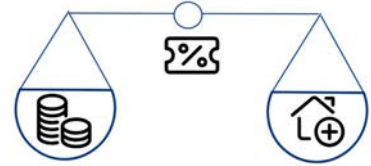
~200B predictions/day

Characteristics of travel promotions

[Booking.com](https://www.booking.com)

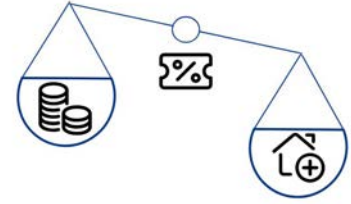
Characteristics of travel promotions

Promotion = Investment + Improvement + Return



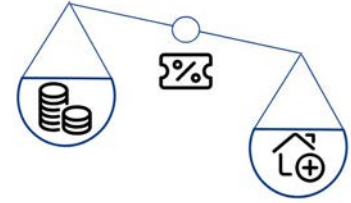
Characteristics of travel promotions

Promotion = Investment + Improvement + Return



Characteristics of travel promotions

Promotion = Investment + Improvement + Return



- Seasonality



- Promotional costs



- Connected verticals



- Low interaction frequency



- Shared and limited supply




- International nature



Campaign set up and optimization

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Campaign set up and optimization

 Settings and Constraints



Goal



Budget

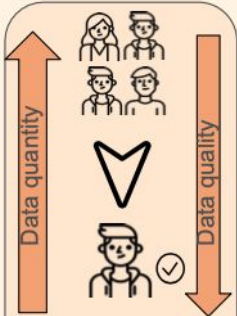


Eligibility



Levers

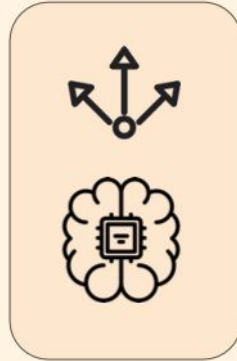
 Placement



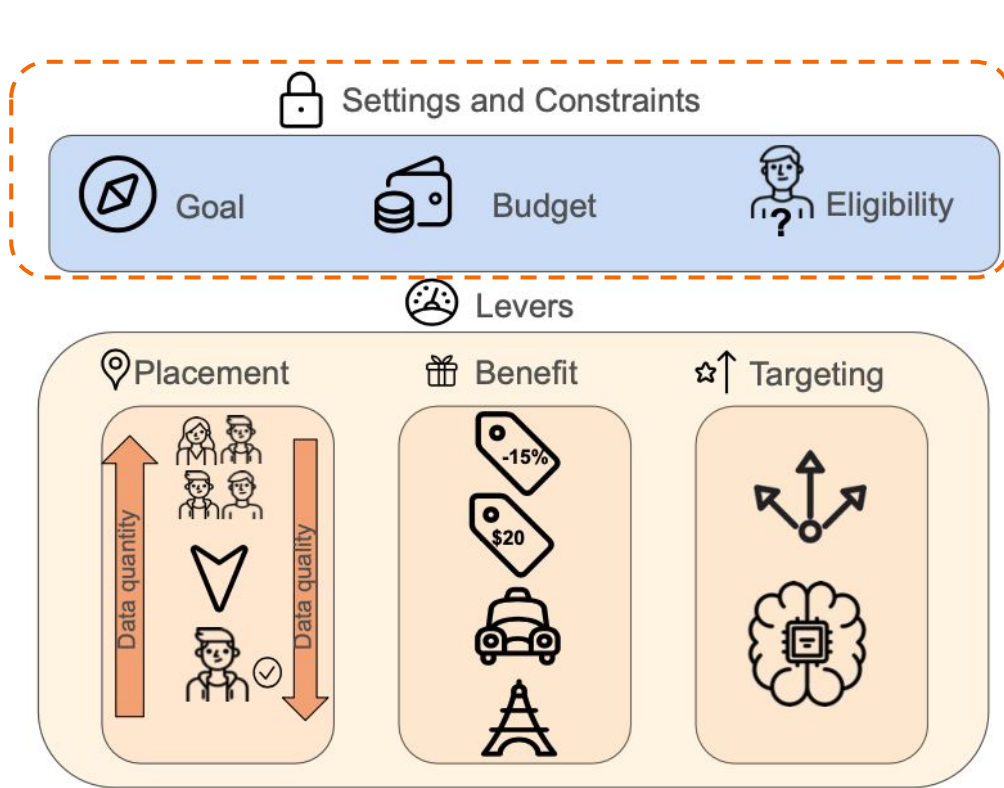
 Benefit



 Targeting

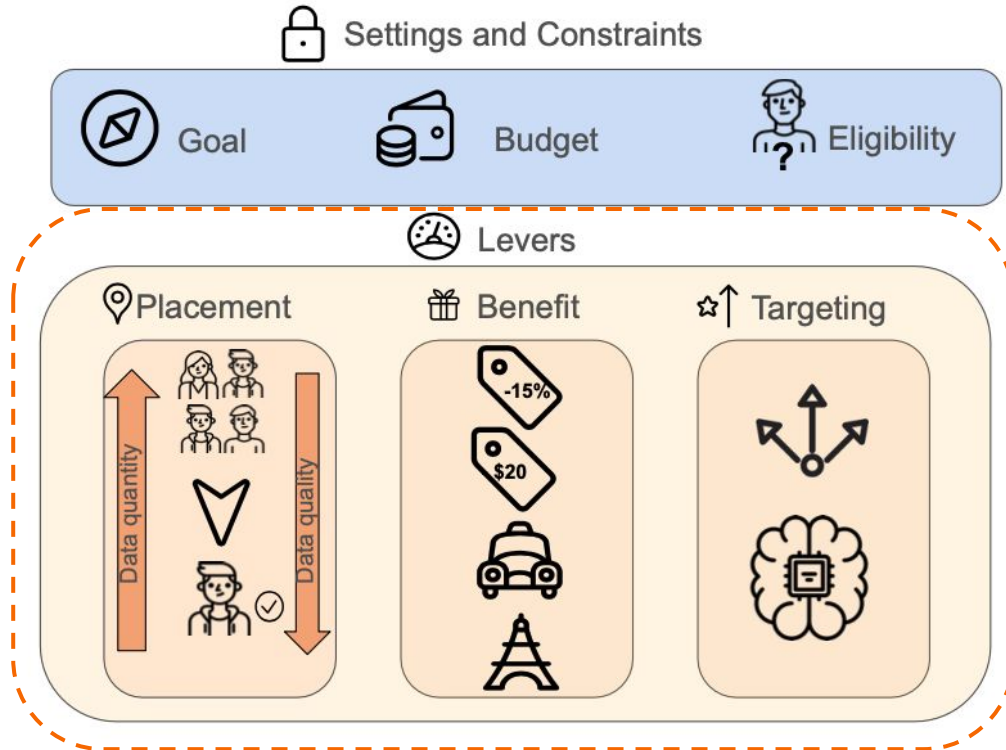


Campaign set up and optimization



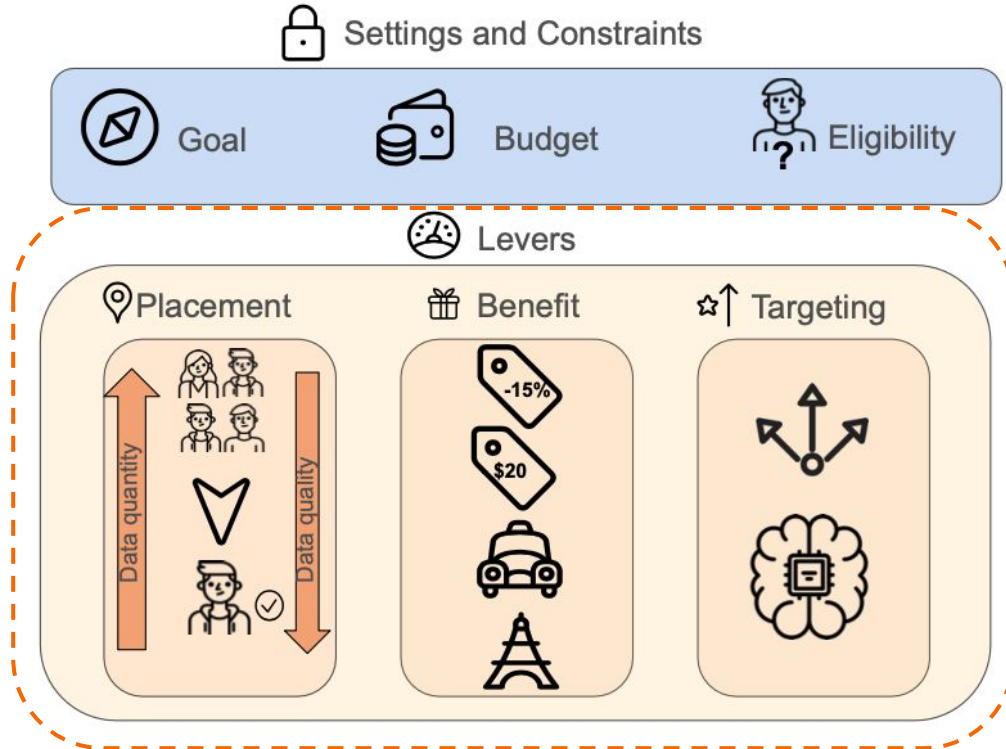
Problem definition:
Fixed boundaries → action space

Campaign set up and optimization



Adjustable parameters
Within the limits of the
constraints

Campaign set up and optimization

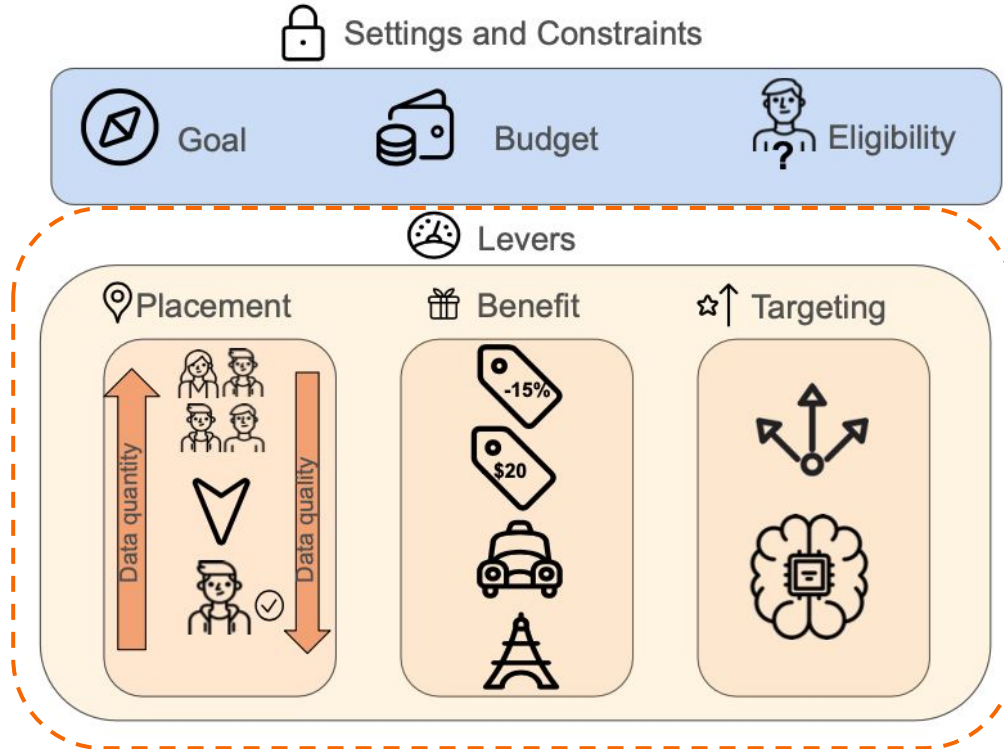








Positive response if targeted

Yes	Complier 	Always-taker
No	Never-taker 	Defier
	No	Yes

Positive response if not targeted

Campaign set up and optimization



Positive response if targeted	Yes	Complier  	Always-taker 
	No	Never-taker 	Defier  
		No	Yes
		Positive response if not targeted	

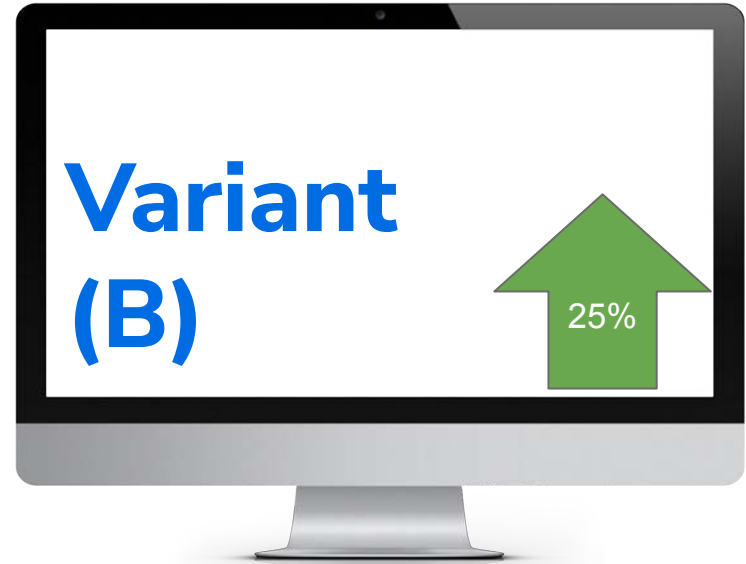
$$\text{CATE}_Y(X) = P(Y=1|\text{do}(T=1), x) - P(Y=1|\text{do}(T=0), x)$$

¹[Free lunch. Retrospective uplift modeling for dynamic promotions recommendation within ROI constrains.](#) D.Goldenberg et al

Campaign management

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A/B testing



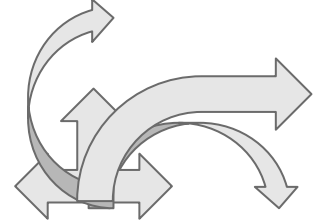
A/B testing



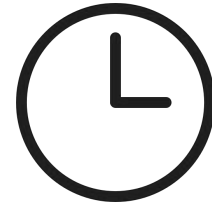
Test new Ideas



Data Driven
Testing



Flexibility



Time Consuming

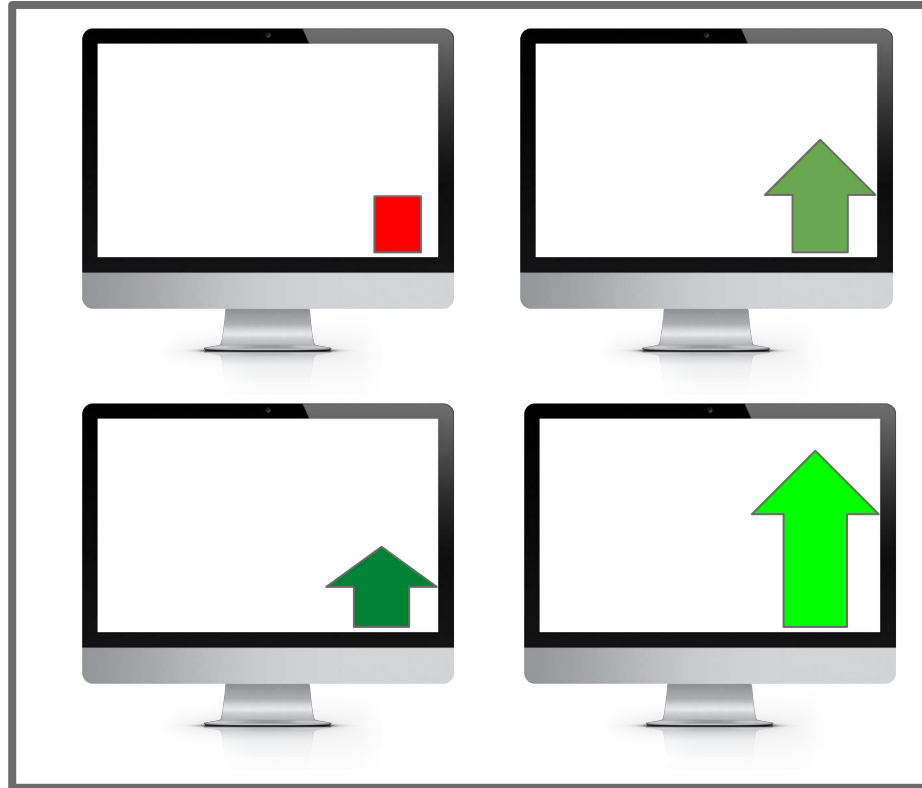
Continuous Experimentation - Portfolio Approach

finviz

S&P 500 • 1 DAY PERFORMANCE • Sun FEB 28 2016 8:02 PM EST



Continuous Experimentation - Portfolio Approach



Portfolio Approach - traffic allocation

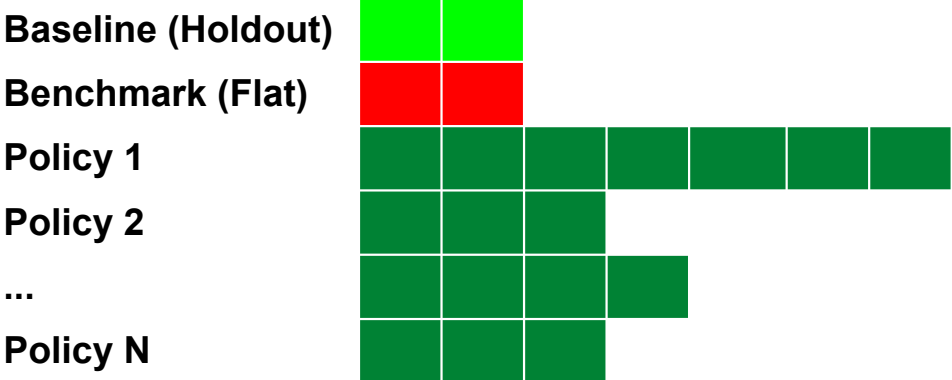
Baseline (Holdout)



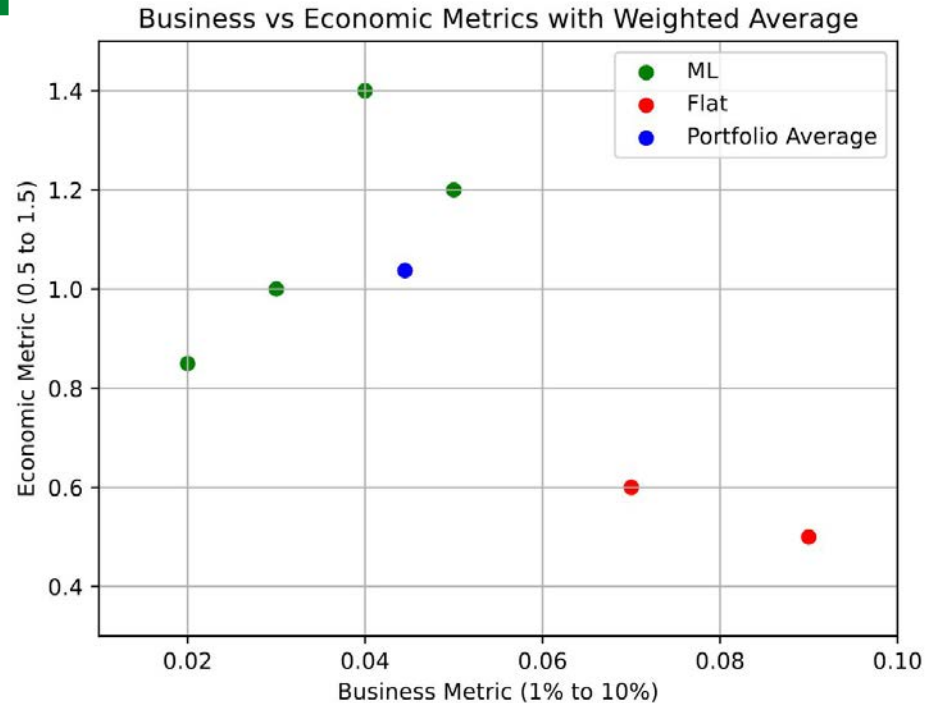
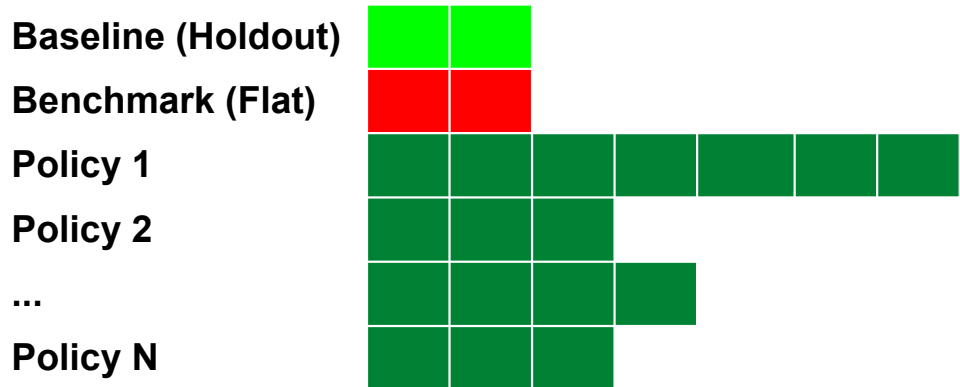
Benchmark (Flat)



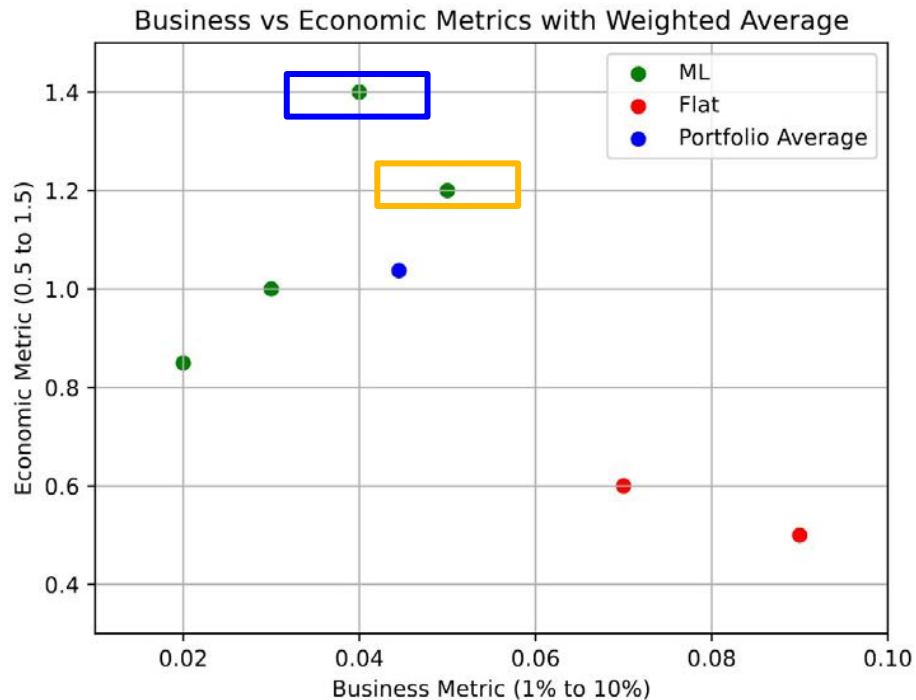
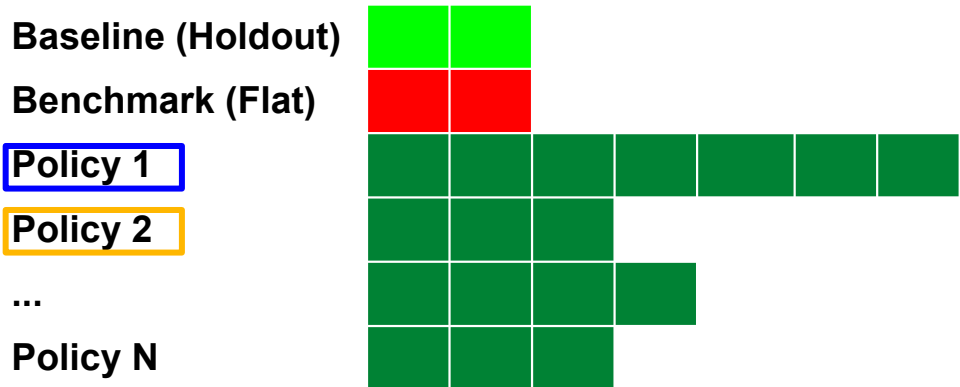
Portfolio Approach - traffic allocation



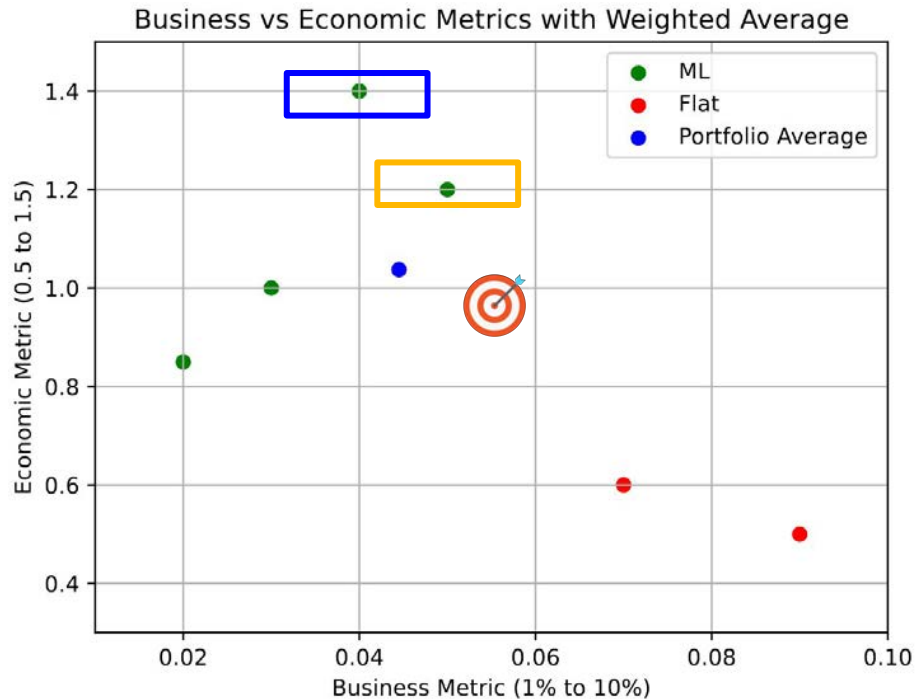
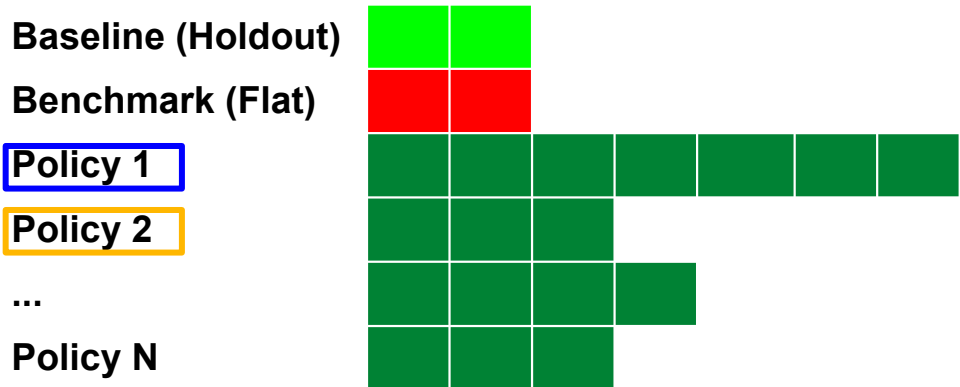
Portfolio Approach - traffic allocation



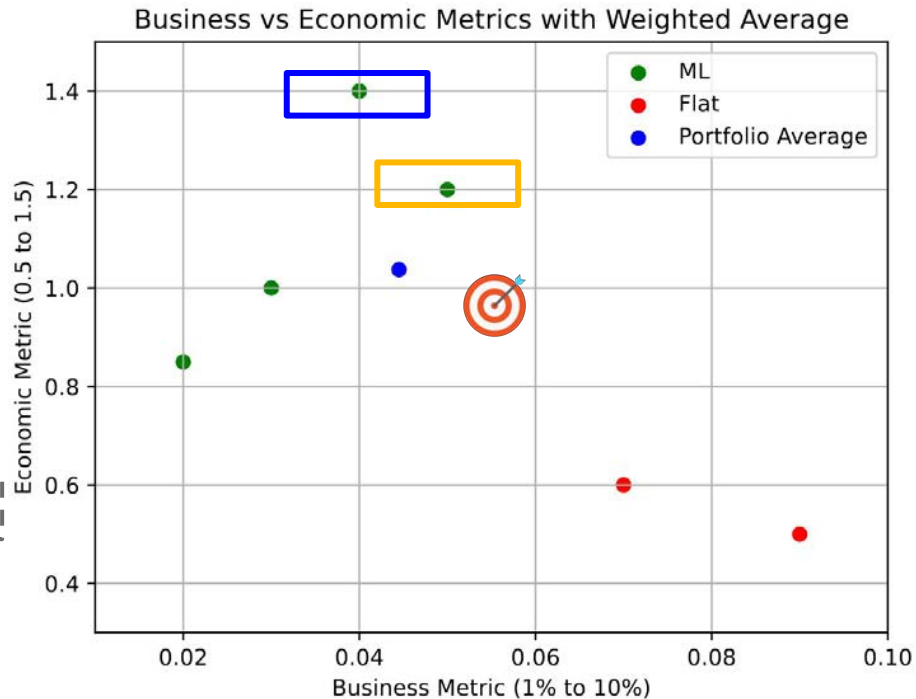
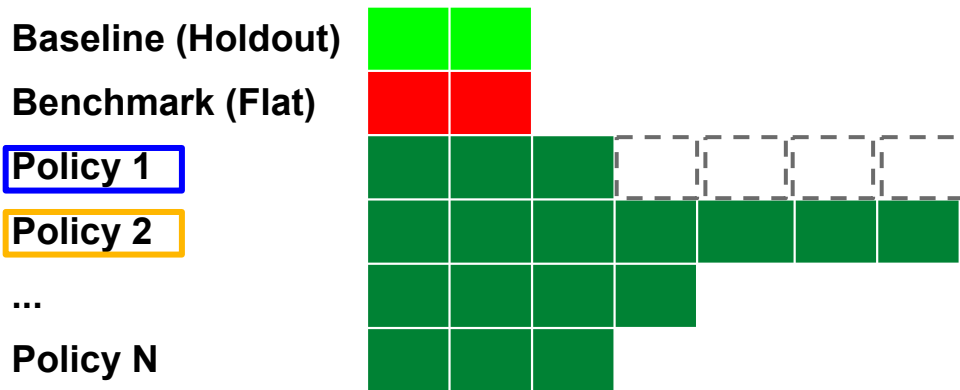
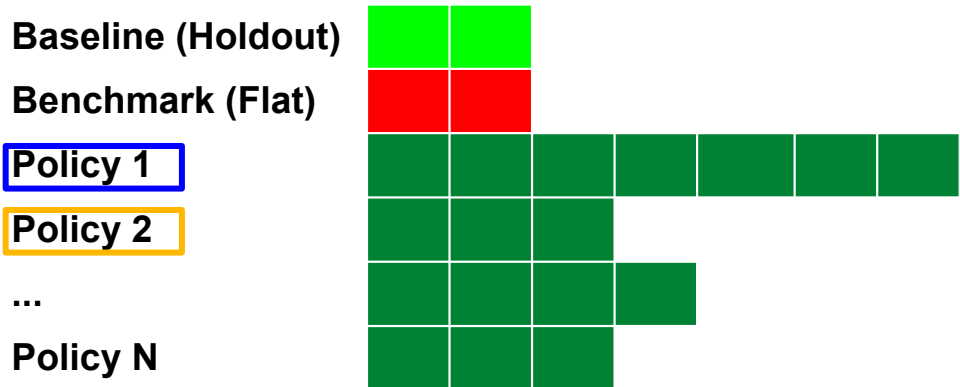
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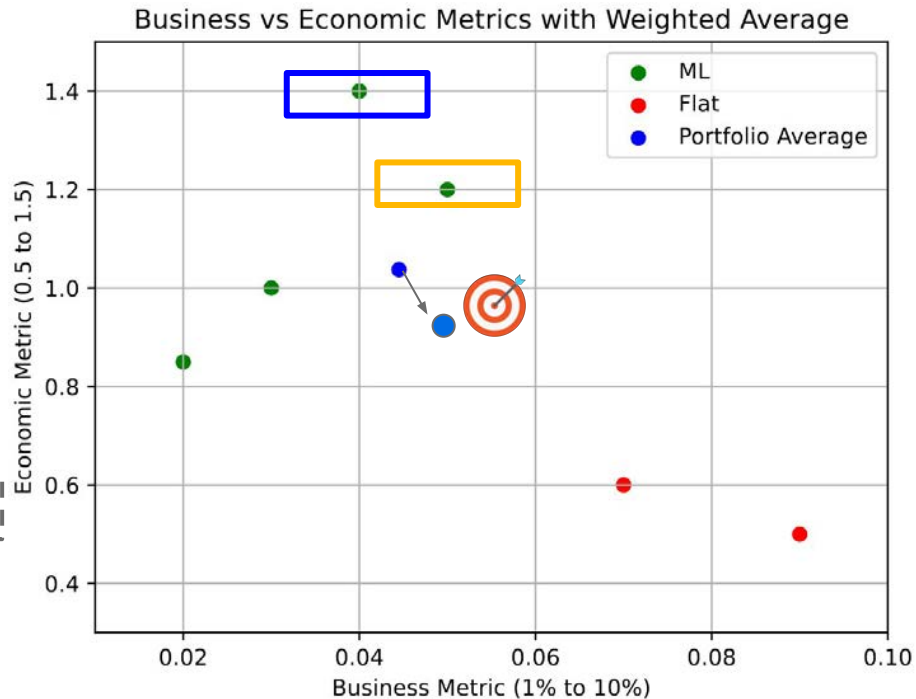
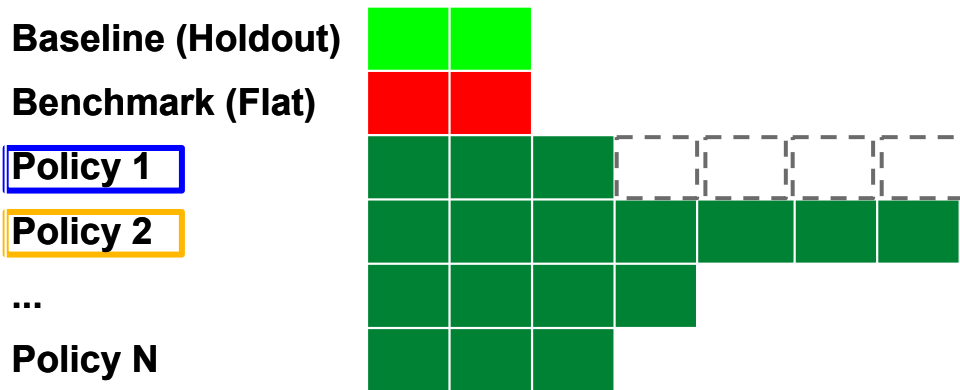
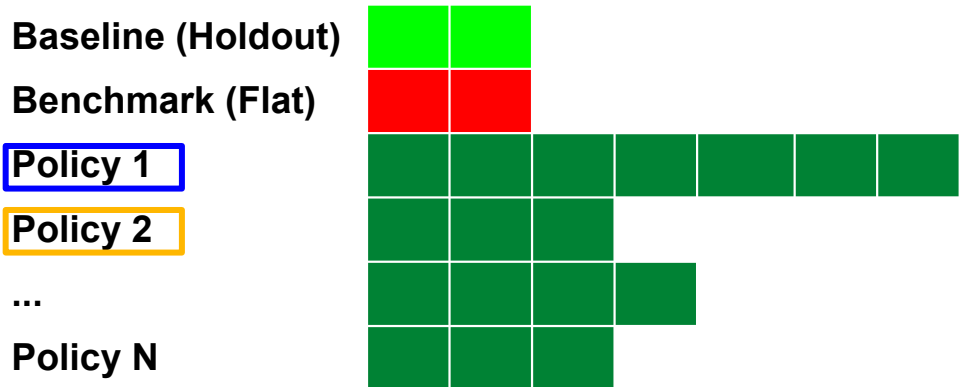
Portfolio Approach - traffic allocation



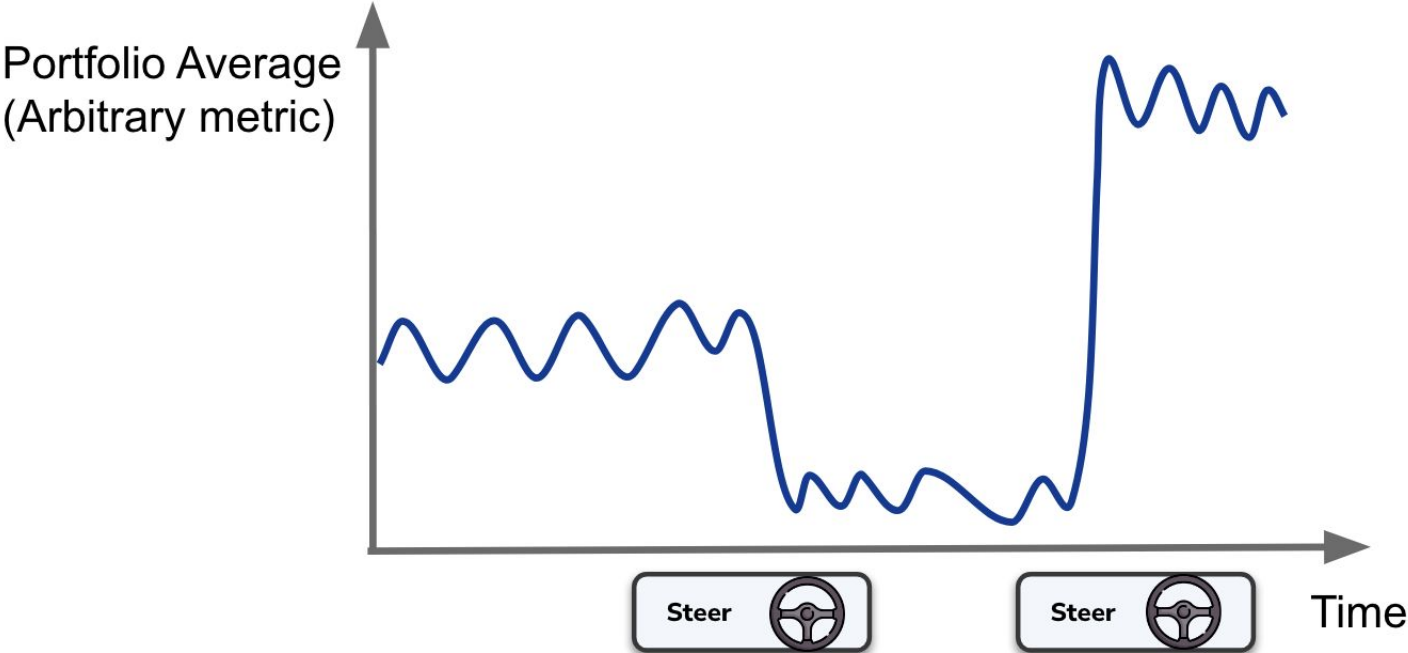
Portfolio Approach - traffic allocation



Portfolio Approach - traffic allocation



Portfolio Approach - traffic allocation



Summary

- **Characteristics of promo campaigns at tourism**



- **Campaign optimization: settings and levers**



- **Continuous Experimentation & Portfolio Approach**



Thank you !

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