

Beyond A/B Testing: A Use Case of Multivariate Test Design and Advanced Analytics for Webpage Optimization

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JMP Discovery Summit Americas 2021

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JMP helps ensure a robust design of experiment is balanced with business constraints and enables advanced analytics to extract insights and business impact.

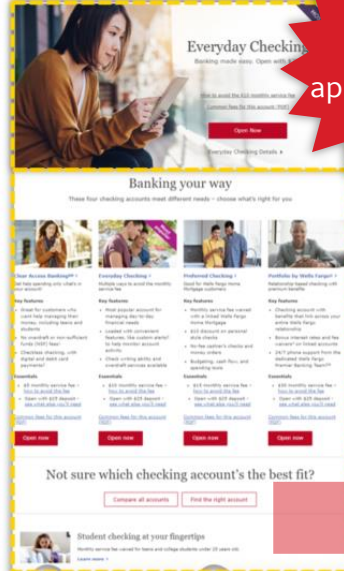
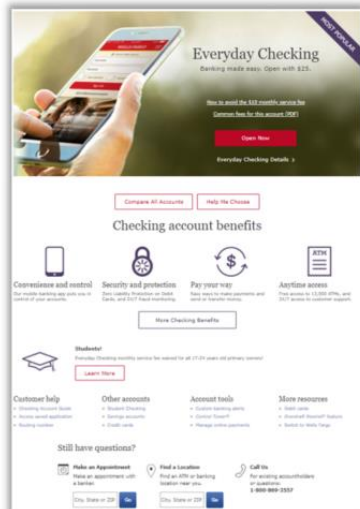
- **Two multivariate tests (MVT)** were designed, executed, and analyzed on the checking webpage leading to a combined **11% incremental lift in site applications**
- **JMP DOE platform** helped design and communicate MVT need to partners resulting in **7% application lift**
- **JMP partition model** helped uncover key insight from 1st test leading to 2nd test design and **4% application lift**

Test 1

Banner and Page Design MVT

Control:
Image A + Banner A + Body A

Winner
Image B + Banner A + Body B



7% lift applications

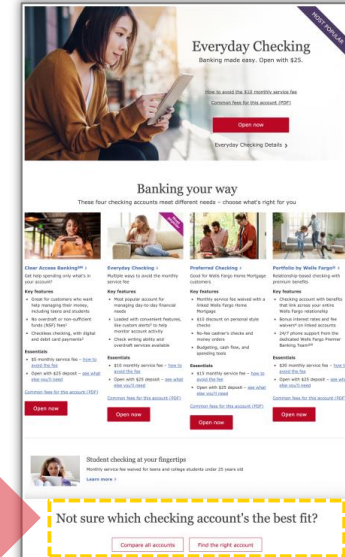
Insight: 40% lift from 'compare' clickers

Test 2

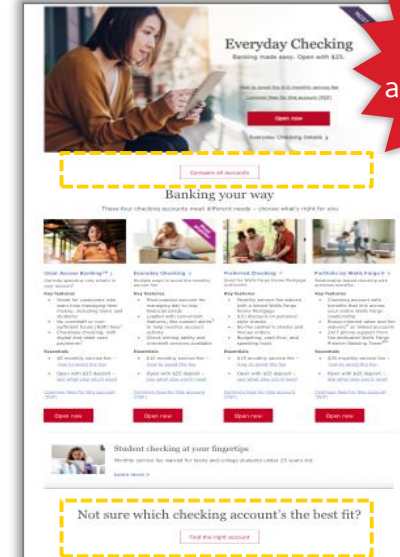
Compare & Selector Placement MVT

Control (Test 1 Winner):
Compare Bottom + Selector Bottom

Winner
Compare Top + Selector Bottom

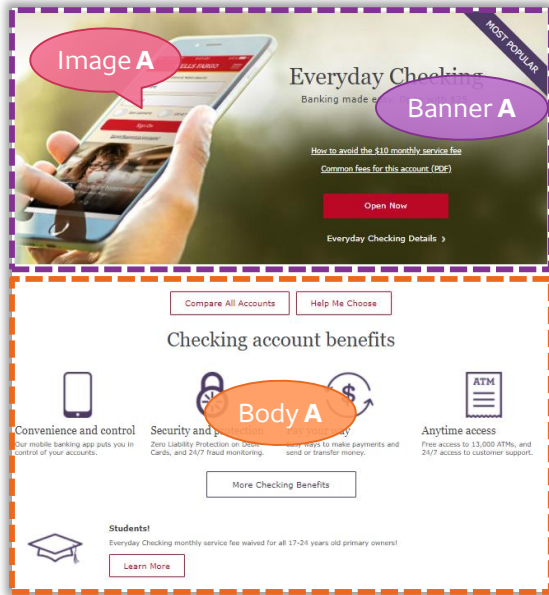


4% lift applications

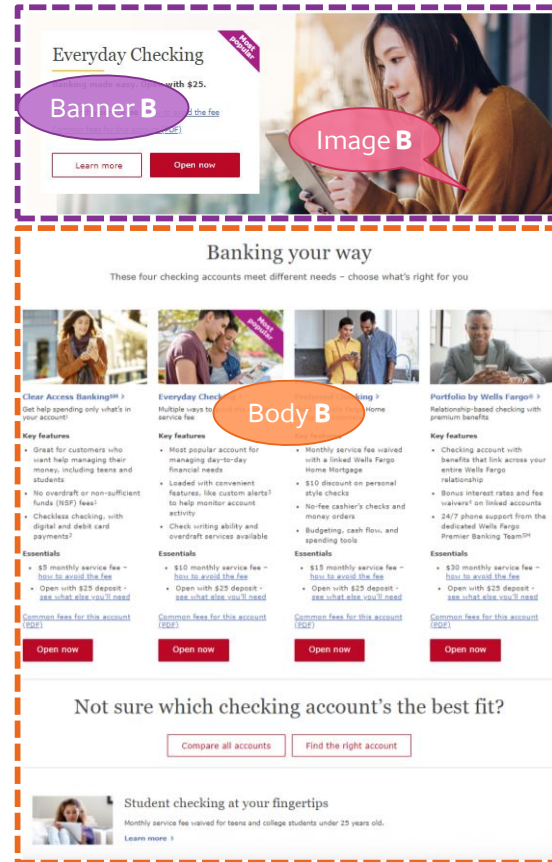


Test #1: Initial A/B Test Proposal – Simultaneously changing 3 factors

Control



Initial Variant Proposal

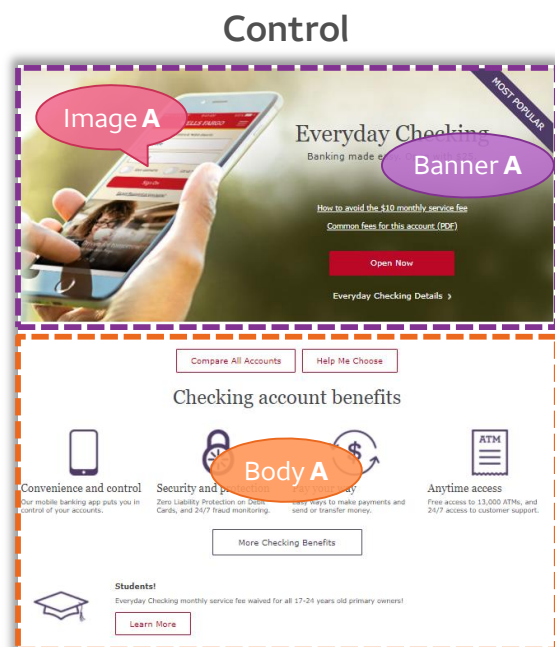


Initial A/B Test Proposal

Image	Banner	Body Page Layout	
		Body A	Body B
Image A	Banner A	Control	
	Banner B		
Image B	Banner A		
	Banner B		Variant

- Initial test proposal was an A/B test
 - Control → legacy production page
 - Variant → updated Image, banner design, and body page layout
- Potential risk that some components lift performance while others suppress yielding a flat result
- Counter-proposal to run an MVT
 - Partners agreed but with business constraints...

Test #1: MVT fractional factorial DOE with business constraints



Initial A/B

Image	Banner	Body Page Layout	
		Body A	Body B
Image A	Banner A	Control	
	Banner B		
Image B	Banner A		
	Banner B		Variant

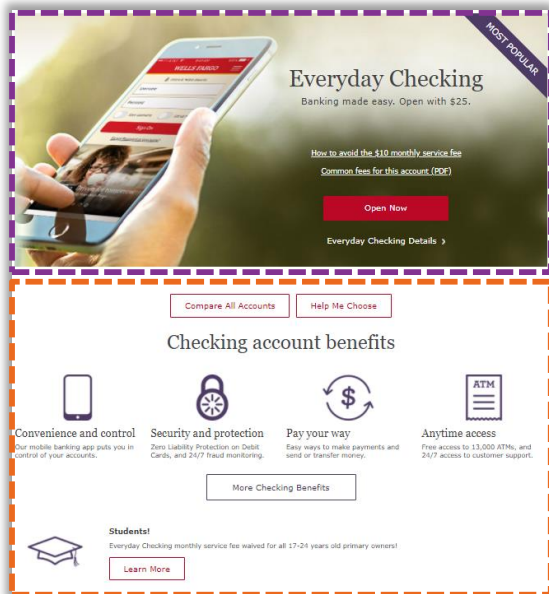
MVT Proposal – Control + 3 variants

Image	Banner	Body Page Layout	
		Body A	Body B
Image A	Banner A	Control	Variant 1
	Banner B		
Image B	Banner A		Variant 2
	Banner B		Variant 3

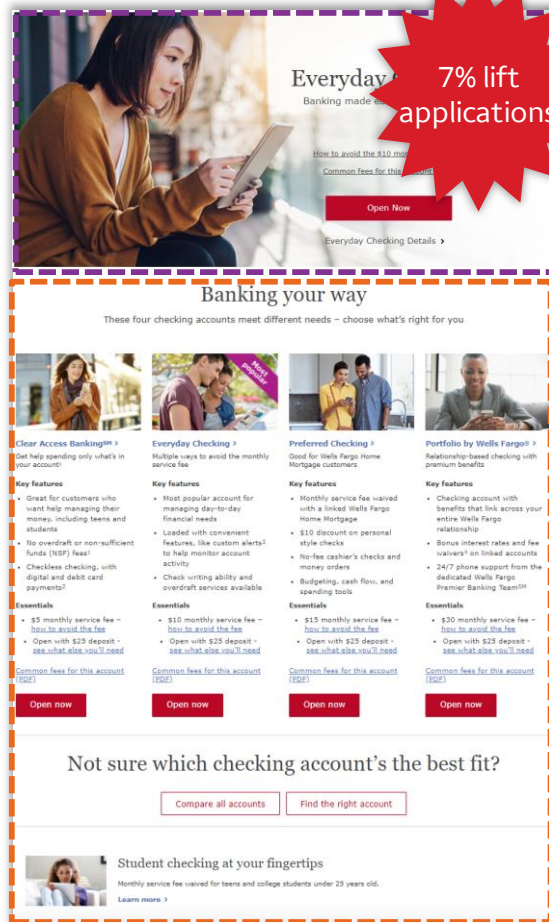
- Business priority was Body B and Image B; minimal appetite for Body A and Image A variants
- **JMP DEMO: How do I evaluate a specific fractional factorial DOE?**
 - Demonstration of JMP DOE custom design with disallowed combinations

Test #1: MVT fractional factorial DOE test results

Control



Variant 2: Winner



MVT – Control + 3 variants

Image	Banner	Body Page Layout	
		Body A	Body B
Image A	Banner A	Default	lift
	Banner B	suppress	suppress
Image B	Banner A	lift	7% lift
	Banner B	suppress	suppress

- Variant 2 had the highest lift in applications of 7%
 - Body B and Image B both lifted performance
 - Banner B suppressed performance
- **Are we done?**
- **Is there anything else the data can tell us?**

Test #1: Key insight and how to determine correlation between content clicks and applications

Control

Everyday Checking
Banking made easy. Open with \$25.

How to avoid the \$10 monthly service fee
Common fees for this account (PDF)

Open Now

Everyday Checking Details >

Compare All Accounts Help Me Choose

Checking account benefits

- Convenience and control**
Our mobile banking app puts you in control of your accounts.
- Security and protection**
Zero Liability Protection on Debit Cards, and 24/7 fraud monitoring.
- Pay your way**
Easy ways to make payments and send or transfer money.
- Anytime access**
Free access to 13,000 ATMs, and 24/7 access to customer support.

More Checking Benefits

Students!
Everyday Checking monthly service fee waived for all 17-24 years old primary owners!

Learn More

Variant 2: Winner

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Banking your way
These four checking accounts meet different needs - choose what's right for you

- Clear Access BankingSM**
Get help spending only what's in your account!
- Everyday Checking >**
Multiple ways to avoid the monthly service fee
- Preferred Checking >**
Good for Wells Fargo Home Mortgage customers
- Portfolio by Wells Fargo[®]**
Relationship-based checking with premium benefits

Key features

- Great for customers who want help managing their money, including teens and students
- No overdraft or non-sufficient funds (NSF) fees!
- Check360SM checking, with digital and debit card payments?

Essentials

- \$5 monthly service fee - [how to avoid the fee](#)
- Open with \$25 deposit - [see what else you'll need](#)

Common fees for this account (PDF)

Open now

Key features

- Most popular account for managing day-to-day financial needs
- Loaded with convenient features, like custom alerts¹ to help monitor account activity
- Check-writing ability and overdraft services available

Essentials

- \$10 monthly service fee - [how to avoid the fee](#)
- Open with \$25 deposit - [see what else you'll need](#)

Common fees for this account (PDF)

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Key features

- Monthly service fee waived with a linked Wells Fargo Home Mortgage
- \$10 discount on personal style checks
- No-fee cashier's checks and money orders
- Budgeting, cash flow, and spending tools

Essentials

- \$15 monthly service fee - [how to avoid the fee](#)
- Open with \$25 deposit - [see what else you'll need](#)

Common fees for this account (PDF)

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Key features

- Checking account with benefits that link across your entire Wells Fargo relationship
- Bonus interest rates and fee waivers¹ on linked accounts
- 24/7 phone support from the dedicated Wells Fargo Premier Banking TeamSM

Essentials

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Not sure which checking account's the best fit?

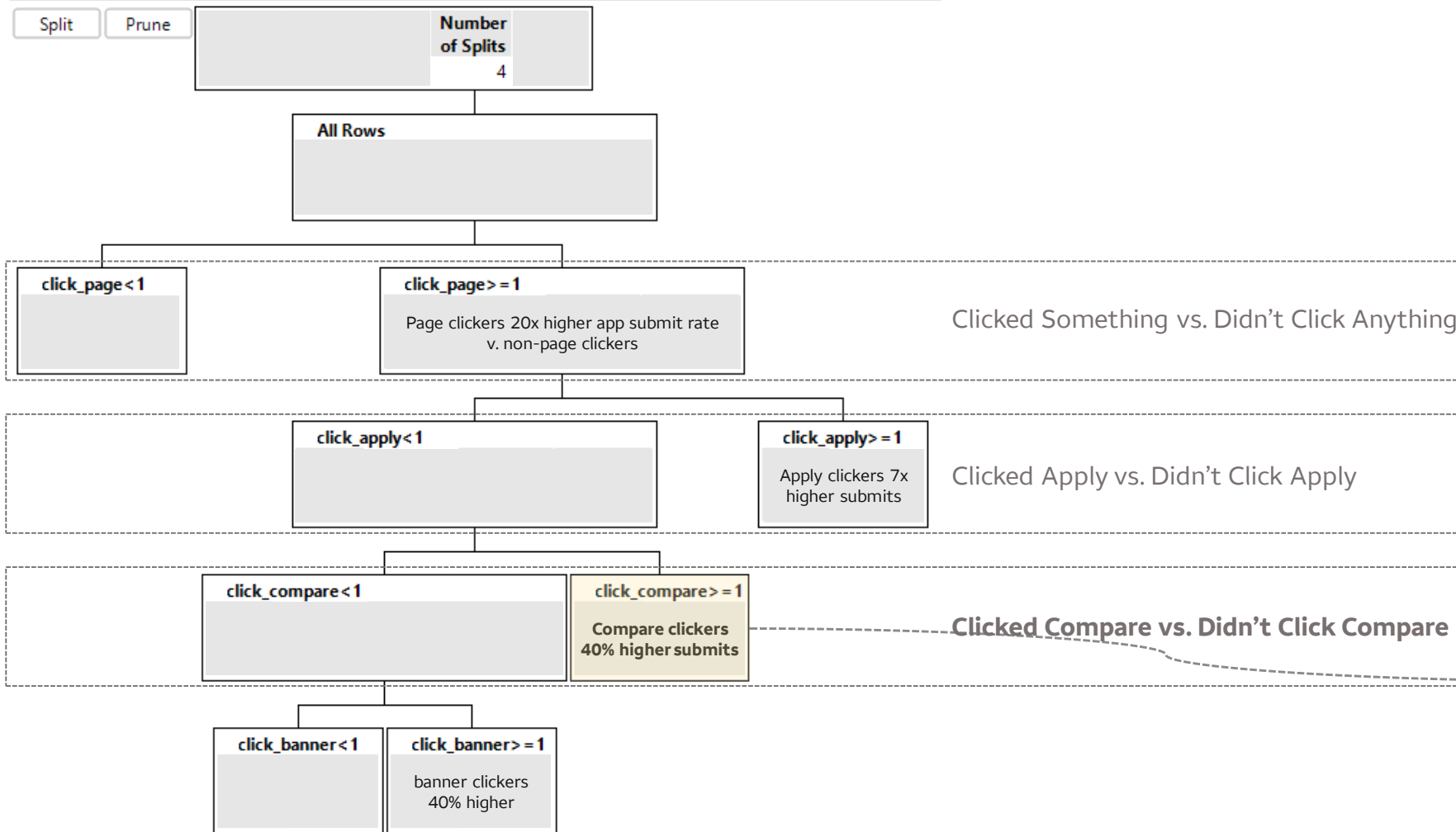
Compare all accounts Find the right account

Student checking at your fingertips
Monthly service fee waived for teens and college students under 25 years old.
Learn more >

- Variant 2 had the highest lift in applications of 7% – but had significantly less “compare” clicks due to being much lower on the page
- **Is that a problem?**
- **How important is that content to aid in the customer’s decision to apply?**

Test #1: Partition model decision tree to uncover compare content was impactful but was just moved to bottom of the page

Partition for AppSub Element1=Variant 2



Variant 2: Winner

Everyday Checking
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Banking your way
 These four checking accounts meet different needs - choose what's right for you

Not sure which checking account's the best fit?
 Compare all accounts | Find the right account

Test #2: MVT to test position and grouping of compare and selector content. Single presentment of compare provided incremental lift.

Control (Test1 Winner)

Compare: **Bottom**
Product Selector: **Bottom**

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Variant 1

Compare: **Top**
Product Selector: **Top**

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Variant 2

Compare: **Top**
Product Selector: **Bottom**

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4% lift applications

Variant 3

Compare: **Bottom**
Product Selector: **Top**

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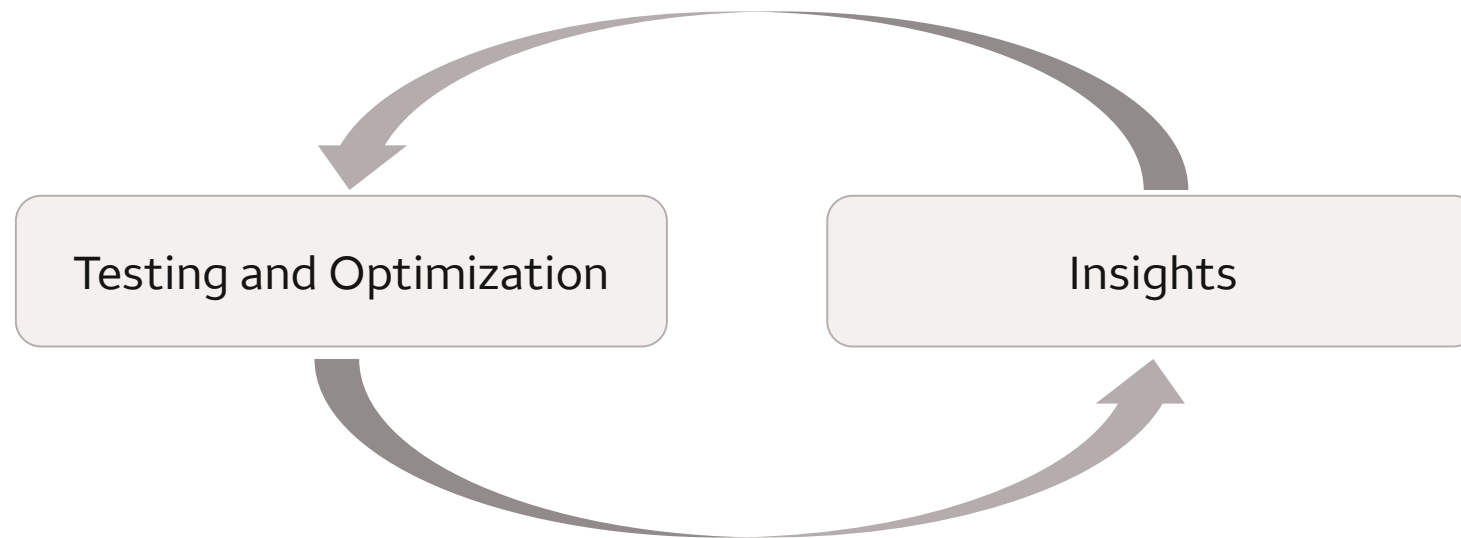
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Conclusions

- Multivariate testing can be an effective method to isolate the impact of specific changes when several update are being test simultaneously
- JMP DOE is an effective platform to help evaluate and develop fractional factorial MVT designs to balance business constraints with testing insights
 - The use of disallowed combinations can be employed to evaluate specific test proposals
- JMP Partition Models can be used in combination with testing to extract additional insights. These insights can be leverage to further test and optimize your use case.



Thank you

Special thanks to my testing colleagues

- **Lorraine**
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- **Preeti**
- **Sam**
- **Srini**
- **Bharghava**
- **Sushma**
- **Swetha**
- **Lakshmi**

Extra special thanks to my long time testing colleague and friend, **Rudy**, for his guidance, expertise, and tenacity to always strive to do better.

Steve Crist

[LinkedIn !\[\]\(a03a7eb2f4046e1d3c76772003e549ea_img.jpg\) http://linkedin.com/in/steve-crist-2bb2186](http://linkedin.com/in/steve-crist-2bb2186)

Appendix: Abstract

Beyond A/B Testing: A Use Case of Multivariate Test Design and Advanced Analytics for Webpage Optimization

It is well known that optimization of the layout and content of webpages can be achieved through thoughtful pre-test design of experiment (DOE), post-test analysis and identification and productionization of a winning variant webpage. The present use case demonstrates the use of the JMP custom DOE platform to create a fractional factorial multivariate DOE for a financial services checking account webpage that effectively managed business constraints while providing the necessary data that lead to a 7% increase in application volume as compared to the legacy webpage. Additionally, leveraging the JMP partition model platform, an additional key insight was discovered that visitors who clicked on the 'compare accounts' link were 40% more likely to submit an application. The 'compare accounts' insight was not the main inquiry of the original test but provided guidance for future testing to further optimize the webpage and resulted in an additional 4% lift. The presented use case demonstrates the effectiveness of the testing continuum of a test leading to actionable insights resulting in the next optimization test and so on.

Appendix: Disallowed Combinations

|Image==1 & Banner==2 & Body==1

|Image==2 & Banner==1 & Body==1

|Image==2 & Banner==2 & Body==1

|Image==1 & Banner==2 & Body==2

MVT Proposal – Control + 3 variants

Image	Banner	Body Page Layout	
		Body A	Body B
Image A	Banner A	Default	Variant 1
	Banner B	121	122
Image B	Banner A	211	Variant 2
	Banner B	221	Variant 3