IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.301
Volume 3, Issue 1, August 2023

Optimizing Product Choices through A/B Testing and Data Analytics: A Comprehensive Review

Shashank Agarwal
Senior Decision Scientist, CVS Health, Chicago, IL, USA
ORCID: 0009-0003-7679-6690

Abstract: *In an increasingly data-driven world, businesses seek to enhance their strategies and performance through effective optimization methods. One such method is A/B testing, a potent tool enabling the comparison of different versions of products or services to determine superior performance. This research paper delves into the fundamentals of A/B testing and its potential to drive improved outcomes. By investigating user funnels and journeys, opportunities for improvement emerge, forming the foundation for hypothesis development. The hypothesis, a crucial element, involves educated conjectures driven by data, research, or experience, closely linked to specific problems or opportunities. Designing a robust test includes power analysis for sample size calculation, as well as considerations such as randomization, control variables, and appropriate statistical analyses. Subsequently, the paper delves into statistical tests like t-test, z-test, and chi-squared test, determining the statistical significance of observed differences. Interpretation of A/B test outcomes involves statistical significance, effect size, user behavior analysis, practical significance, and replicability. The paper concludes by envisioning the role of AI in reshaping A/B testing, automating tasks, processing real-time data, and testing multiple hypotheses efficiently. This revolution offers data professionals unparalleled insights and possibilities for the future*

Keywords: A/B testing, Digital Products, Artificial Intelligence, Hypothesis Testing, Business Intelligence

REFERENCES

[1] Sheng J, Liu H, Wang B. Research on the Optimization of A/B Testing System Based on Dynamic Strategy Distribution. Processes. 2023; 11(3):912. https://doi.org/10.3390/pr11030912
[2] Braun, Michael and Schwartz, Eric M. and Schwartz, Eric M., Where A-B Testing Goes Wrong: What Online Experiments Cannot (and Can) Tell You About How Customers Respond to Advertising, Available at SSRN: https://ssrn.com/abstract=3896024
[3] Kohavi, Ron & Longbotham, Roger. (2017). Online Controlled Experiments and A/B Testing. 10.1007/978-1-4899-7687-1_891.
[4] R. Ros and P. Runeson, "Continuous Experimentation and A/B Testing: A Mapping Study," 2018 IEEE/ACM 4th International Workshop on Rapid Continuous Software Engineering (RCoSE), Gothenburg, Sweden, 2018, pp. 35-41.
[5] King, R., Churchill, E. F., & Tan, C. (2017). Designing with data: Improving the user experience with A/B testing. " O'Reilly Media, Inc.".
[6] Koning, R., Hasan, S., & Chatterji, A. (2022). Experimentation and start-up performance: Evidence from A/B testing. Management Science, 68(9), 6434-6453.
[7] Quin, F., Weyns, D., Galster, M., & Silva, C. C. (2023). A/B Testing: A Systematic Literature Review. arXiv preprint arXiv:2308.04929.
[8] Fabijan, A., Dmitriev, P., Arai, B., Drake, A., Kohlmeier, S., & Kwong, A. (2023, May). A/B Integrations: 7 Lessons Learned from Enabling A/B testing as a Product Feature. In 2023 IEEE/ACM 45th International Conference on Software Engineering: Software Engineering in Practice (ICSE-SEIP) (pp. 304-314). IEEE.