A/B TESTING & EXPERIMENTAL APPROACHES TO LEARNING

11th FSDK Research Colloquium

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AGENDA

- Introduction: The Bill & Melinda Gates Foundation
- Overview: Experimentation and A/B Testing
- Experimentation Case Studies
- Next Steps
- IPA: Messaging Replication Project
OUR HISTORY

1994
Bill Gates Sr. starts a small philanthropic foundation at his son’s request.

1997
Bill and Melinda read an article about rotavirus and are inspired to act.

2000
The Bill & Melinda Gates Foundation is created, with a focus on health, education, and libraries.

2006
Warren Buffett pledges Berkshire Hathaway stock valued at $31 billion.

2008
Bill joins Melinda full-time at the foundation.

2011
The foundation moves to its new permanent home in Seattle.
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WHAT WE DO

GLOBAL HEALTH

GLOBAL DEVELOPMENT

UNITED STATES PROGRAM

GLOBAL POLICY & ADVOCACY

COMMUNICATIONS
Our approach has three mutually reinforcing objectives:

• Reducing the amount of time and money that poor people must spend to conduct financial transactions

• Increasing poor people’s capacity to weather financial shocks and capture income-generating opportunities

• Generating economy-wide efficiencies by digitally connecting large numbers of poor people to one another, to other consumers, to financial services providers, to government services, and to businesses.
Firms have the potential to learn every day. Every new product that is introduced or process that is changed represents an opportunity to answer questions such as:

- What product features are most attractive to which clients?
- How can new services best be promoted, and through which channels?
- What pricing strategies are most effective?

However, few firms adopt a scientific approach to learning. If multiple new strategies are adopted at once or there is no comparison group, it can be difficult to measure the effects of a change.

But if well-designed and executed, experiments can be a credible method to estimate the impact of business interventions.
ALTERNATIVES TO EXPERIMENTATION

HIGHEST PAID PERSON’S OPINION?
“It’s easier to draw the right conclusions using data generated through experiments than by studying historical transactions”
Computerization and digital transactions have generated vast quantities of data on customers and business operations.

Data-driven decision making is important (and better than hippos!)

However, few firms have the technical or statistical capacity to implement a full-scale data analytics program.

Even companies that invest heavily in business intelligence software often find the results difficult to interpret and act on, and risk of spurious correlations in very large datasets.

Unlike statistical modelling, experimentation is a skill that nearly any manager can acquire.
A/B testing is the process of conducting simple, randomized experiments with two variants to see which is the most effective.

Essentially focus-group testing in real time!

By observing the behavior of real customers in response to information and outreach campaigns or changes in product design and pricing, can identify what designs and strategies achieve the best results.

Allows aspects of design, communications and operations – messaging, graphics, formatting, pricing, delivery – to be scientifically tested.
Challenge: Converting visitors to campaign website into email newsletter subscribers.

- Page included bright red “sign up” button
- A/B tested three options:
  - Learn More
  - Join Us Now
  - Sign Up Now
- “Learn More” garnered 18.6% more signups than default
- Obama family photo better than campaign rally video
- Estimated that 4 million of the 13 million addresses in the campaign’s email list, and some $75 million in money raised, resulted from careful experiments.

**Challenge:** Raise response rate to loan offer letters

- IPA study with direct mail solicitations to 53,194 predominantly urban former clients
- Photo of a smiling woman on the letter raised the response rate (of male customers…)
- Photo increased demand for loan by the same amount as a 25 percent reduction in the monthly interest rate!
- Non-price effects may play large role in consumer decisions

“Turn a **business** into a **scientific laboratory** where every decision about product design, marketing, channels of communication, credit lines, customer selection, collection policies and cross-selling is subjected to **systematic testing using thousands of experiments**”

Capital One co-founder, Rich Fairbank
EXPERIMENTATION
CASE STUDIES:

CAPITAL ONE

- Company was designed specifically as an application of the experimental method to business
- Created Capital One Labs to drive experimentation
- Demonstrates full integration of testing into business operations.
- Last year, the company performed more than 25,000 experiments!
- Important to be able to track actions and reactions: “If we sent out a blue envelope and a white envelope, we know which envelope went to which customer -- and we’ve recorded what the reaction was in each case.”

Reference: This is a Marketing Revolution (1999) Charles Fishman
EXPERIMENTATION CASE STUDIES:

PROGRESSIVE INSURANCE

Challenge: Understand whether motorcycles can be profitable to insure

- Historical data can be mined to assess performance of current customers
- But historical data can't reveal the potential profitability of people turned away (not in the dataset)
- Experiment with small populations of customers to look for pockets of profitability
- Progressive Insurance found that middle-age bikers with college degrees were low risk

LIMITATIONS OF A/B TESTING

- Some new offerings simply can’t be tested on a small scale
- Best suited to strategy execution, not strategy formulation. Not appropriate for assessing a major change in business models, e.g., a large merger or acquisition
- Easier to experiment with pricing and product decisions than with channel management or advertising decisions
- Experiment in consumer settings than in business-to-business settings, because B2C markets typically have far more potential customers to serve as subjects
- External validity issues

BARRIERS TO EXPERIMENTAL LEARNING METHODS

Managerial and Cultural Resistance

- Bringing science into the boardroom isn’t easy
- Both Microsoft and Amazon experienced resistance to the use of experiments
- Benefit: less arguments, more tests.

Need to be able to observe outcomes

- For every action, need to know the reaction
- The ease with which companies can experiment depends on how easily they can observe outcomes.
- Direct-mail houses, catalog companies, and online retailers can accurately target individuals with different actions and gauge the responses.
- But if engaging customers through broad channels can be difficult to obtain reliable feedback
Managers/staff need to become adept at using basic research techniques

Need process for designing experiments that would allow staff to formulate and test hypotheses

Need a disciplined approach to capturing and managing the knowledge learned from experiments

Technical platform: SMS, email, call centres, others? Some tools perform statistical analysis and direct non-expert through the experimental design process.
NEXT STEPS

SCOPING PROJECT

- Brief articulating use cases for experiments by financial inclusion stakeholders, MNOs and financial service providers?
- Brief documenting the process (including challenges and technical options) involved in establishing a testing facility or using commercially available experimentation platforms?

EXPERIMENTAL PILOTS

- Collaboration with IPA and other research partners on RCTs and experiments
REFERENCES AND FURTHER READING

Online Experimentation at Microsoft (2009) Ron Kohavi, Thomas Crook and Roger Longbotham
The Experimental Approach to Development Economics (2008) Abhijit V. Banerjee and Esther Duflo
How to Design Smart Business Experiments (2009) Thomas H. Davenport
How Obama Raised $60 Million by Running a Simple Experiment (2010) Dan Siroker
Experiment—A Commentary (2007) Ian Ayres and Barry Nalebuff
This is a Marketing Revolution (1999) Charles Fishman