Hacking ML into your Organization

ML Reliability

CATHY CHEN ♦ 2021-Oct ♦ SRECon ML Track
Agenda

What’s this about?
Deploying ML requires organizational changes to keep it reliable

The Scenario
What’s Wrong?
Org Design
Concrete Suggestions
The Scenario: Yarnit.ai

INFORMATION TECH
- Convinced the rest of the C-Level execs that investment in ML is the way to make yarn sales take off
- Proof of Concept is working

OUR VISION
Best in Class Machine Learning for the Yarn Distribution Sales Industry

PROOF OF CONCEPT
- Invest in the model, Test model quality and metrics about the model
- Made sure the Happy Path worked and the model is serving
What Could Possibly Go Wrong?

- MANAGEMENT TRUST
- QUALITY, FAIRNESS, MODEL ISSUES (NOT MONITORED)
- LACK OF INVESTMENT
- NO USER FEEDBACK
- ML / ORG SILOS

and so much more...
Org Design: Star Model™ (Galbraith)

- Structure is only one facet of an org design
- “Most design efforts invest far too much time drawing the organization chart and far too little on processes and rewards.”
- No one-size-fits-all
- Design org based on Strategy
- Policies around facets can be used to address negatives in structure

HACKING ML INTO YOUR ORG

Org Design: Star Model™ (Galbraith)

STRATEGY

- How will this business succeed?
- ie. Machine Learning in all aspects of the business

Org Design: Star Model™ (Galbraith)

STRUCTURE

- MENTAL MODELS: Leadership mindset of ‘how things work’. Mental Models may need to change when using ML in the organization (centralization vs decentralization)

- See also Team Topologies book
HACKING ML INTO YOUR ORG

Org Design: Star Model™ (Galbraith)

PROCESSES

● VERTICAL PROCESSES allocate the scarce resources (i.e. business planning, budgeting)

● HORIZONTAL PROCESSES are designed around the workflow. (i.e. new product development, or entry and fulfillment of a customer order)
Organizational Design: Star Model™ (Galbraith)

**REWARDS**

- **FINANCIAL**: salaries, promotions, bonuses, profit sharing, stock options, etc.
- **NON-MONETARY**: recognition or challenging assignments
- Must be aligned to influence the strategic direction

Org Design: Star Model™ (Galbraith)

- Human resource policies of recruiting, selection, rotation, training, and development

- ORGANIZATIONAL CAPABILITIES
  - Flexible organizations require flexible people
  - Cross-functional teams require people who are generalists and who can cooperate with each other
  - Matrix organizations need people who can manage conflict and influence without authority
Adjust the Organization to Make it Right

Organizations are SYSTEMS. There are many levers to pull.

- MANAGEMENT UNDERSTANDS & TRUSTS
- QUALITY, FAIRNESS, MODEL MONITORING
- PROPER INVESTMENT
- USER FEEDBACK
- DISTRIBUTED KNOWLEDGE
Concrete Suggestions

ML EVERYWHERE
Build ML skills on the technical side
Concrete Suggestions

SERIOUSLY, ML EVERYWHERE

Build ML skills on the business side, too!
Concrete Suggestions

APPLY THE STAR
Start thinking carefully about the organizational changes that would be needed to integrate ML into the organization
Thanks!
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Upcoming ML Reliability book
Subscribe to O’Reilly Learning Platform to check out early release chapters of the ML Reliability book by Cathy Chen, Niall Murphy, Kranti Parisa, D Sculley, Todd Underwood.

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References


Murphy, Niall. (2020, May 15) “Mental Models for Reliable Software Engineering” talk at DevOps Days Kyiv. https://www.youtube.com/watch?v=qD_qBUFkKMAt=1076s


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