

# Adoption Unleashed

## Deep Dive into User Behavior and Network Patterns



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### 1. PROBLEM STATEMENT

Pfizer Global Supply – Operations & Insights team has deployed multiple analytical tools to enable operational efficiencies in drug manufacturing process. Solution owners need an automated way to:

- A. Define user adoption
- B. Find target audience
- C. Know what actions will increase adoption

### 2. OBJECTIVES



Define criteria to qualify a user as an adopter of tool



Build predictive models to forecast user likelihood of adoption and understand factors driving tool adoption

### 3. DATASET

Usage activity across tools

KnowledgeGraph of people and process at Pfizer

Batch activity across sites

36 manufacturing sites

50bn doses annually

36 tools in production

20k users across tools

### 4. METHODOLOGY

#### Phase 1: Defining User Adoption Criteria

We cluster users based on their usage behavior over weeks and find target clusters for each user based on their characteristics (role, hierarchy, type of site)

#### Phase 2: Predictive Modeling

We utilize multiple *logistic regression discrete time series survival models* to predict adoption status, with unique goals for each model

#### Model 1. Predicting future adoption status from individuals' own usage metrics

**Features:** Usage metrics (days accessed/time spent on tool) summarized over 24 weeks

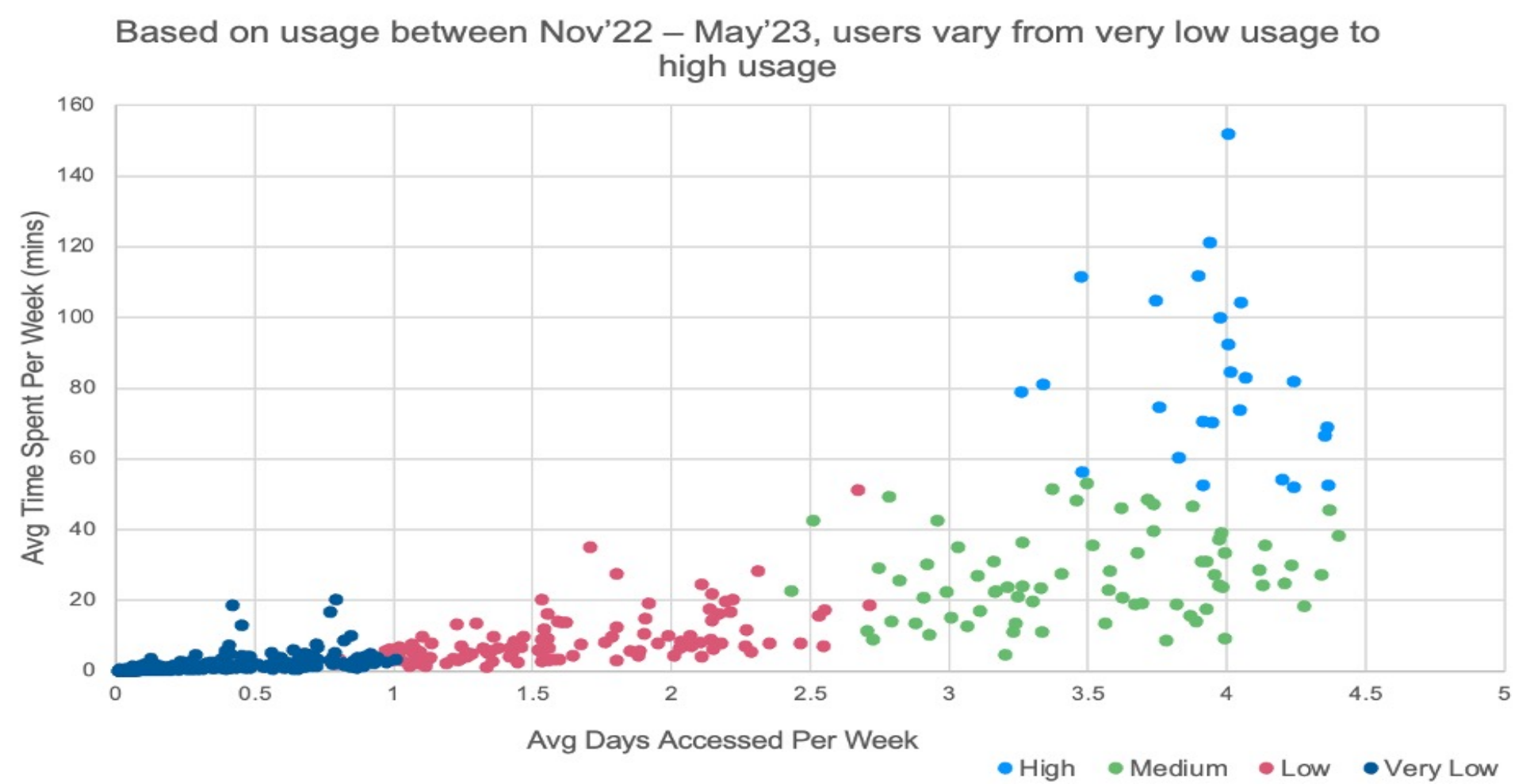
**Outcome:** Predict adoption status 5-8 weeks out in the future with 96% of test set accuracy (baseline 86%)



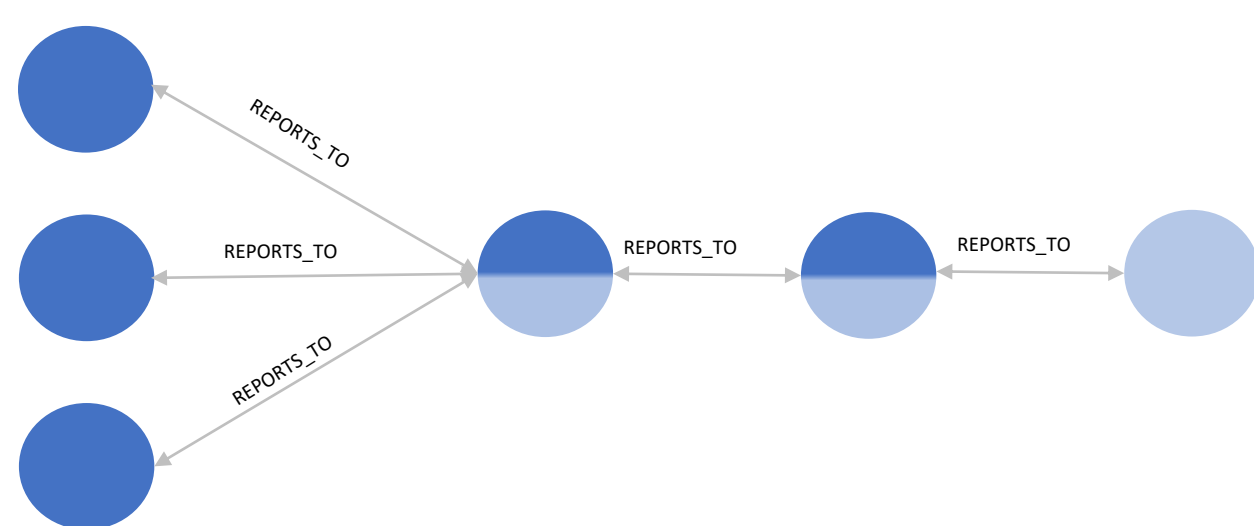
**Conversion list** of non-adopters to potential adopter if given a push



**Maintenance List** of current adopters who are prone to losing adopter status



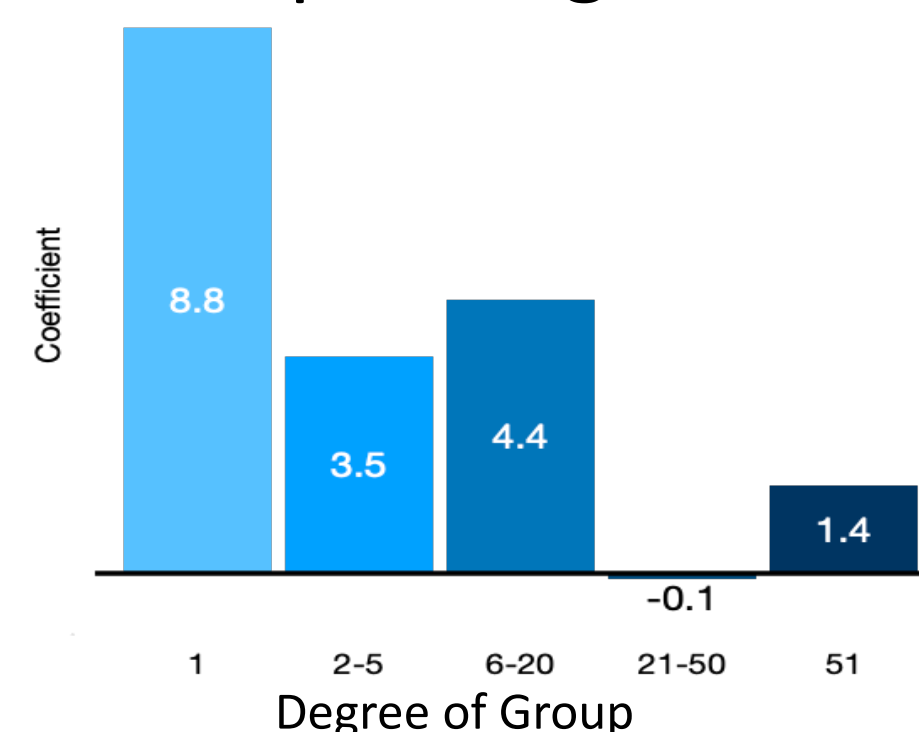
#### Model 2. Network effect on user adoption status



**Outcome:** Network metrics can predict user adoption status with 88% test set accuracy

#### Model 3. Find most influential users in network

Bin users by degree of connectedness and find proportion of bin that used tool >10 minutes in corresponding week



**Outcome:** Lower degree users in network are more predictive of adoption status. Model has test set AUC 0.7 and accuracy 87%

### 5. RESULTS & IMPACT

**Takeaway:** Conversion of lower degree network members into users can increase tool adoption rates

**Impact:** Deviation from Release Attainment time (RA: planned time to ship for batch) at sites can be reduced by increasing adoption of Batch Tracker. Batch Tracker usage and RA deviation had an average correlation  $-0.3$  at 4 large sites

### 6. NEXT STEPS

- Explore other network representations based on data availability
  - Process Centric Teams (PCTs)
  - Shift reporting structure
- Seek out “connection” data to model network on, i.e. number of emails, Teams messages, meeting data