Automatically Finding Contact Information To Improve Survey Response Rates

Applications in the Quarterly Survey of Plant Capacity Utilization (QPC)

Jessica Huang, U.S. Census Bureau
Christian Moscardi, U.S. Census Bureau

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Introduction: What is QPC?

- The Quarterly Survey of Plant Capacity Utilization (QPC) is the only source for quarterly statistics on U.S. industrial plant capacity
- A joint effort from the Federal Reserve Board (FRB), the Defense Logistics Agency (DLA), and the Census Bureau

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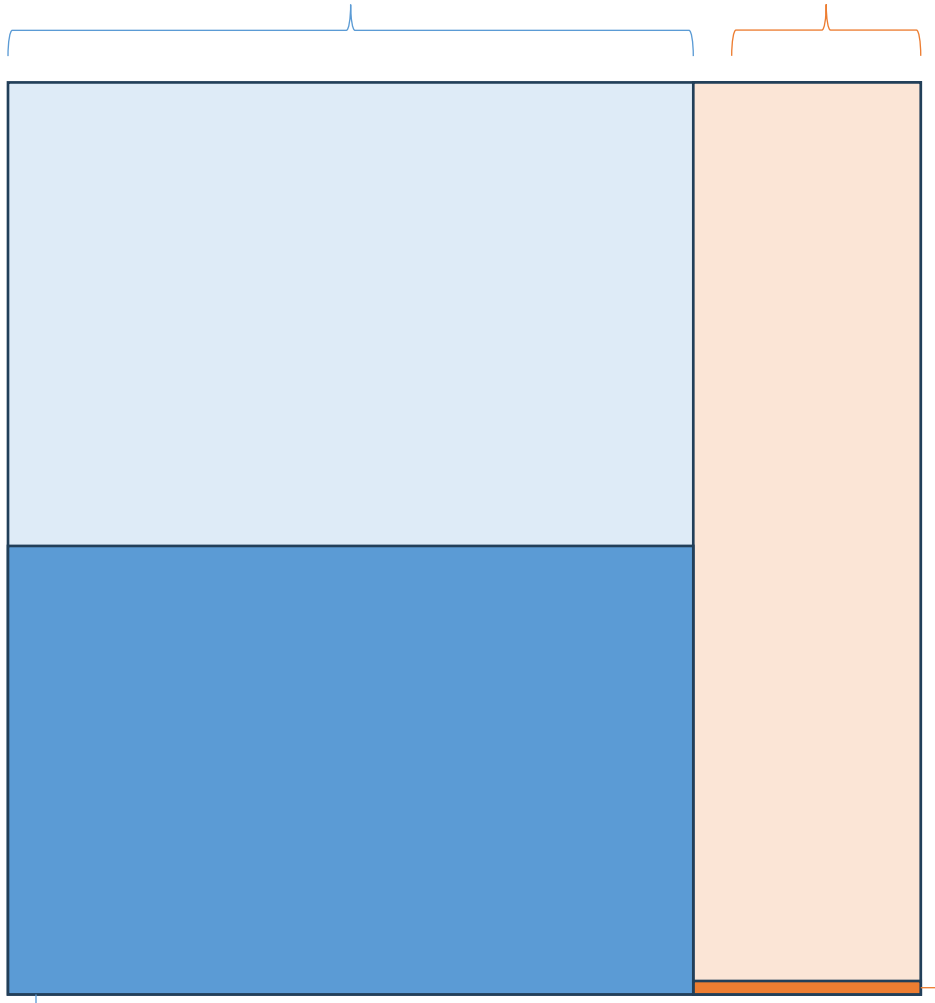
Introduction: Response Rates

- The QPC is not immune to declining response rates affecting nonresponse bias, data quality
- 2022Q1 Response Rate: **36.0%**
- Can we improve response rates with better contact information?



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Introduction: QPC Communication Strategy

QPC is a voluntary survey

QPC Communication Strategy

1. Mail out physical letter & mail out **email**
2. Reminder **email**
3. ROBO calls
4. Follow-up **email**
5. Limited telephone follow-up

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Project Goal 1: Proof of Concept for Finding Contact Information

Can we increase QPC response rates by gathering contact information?

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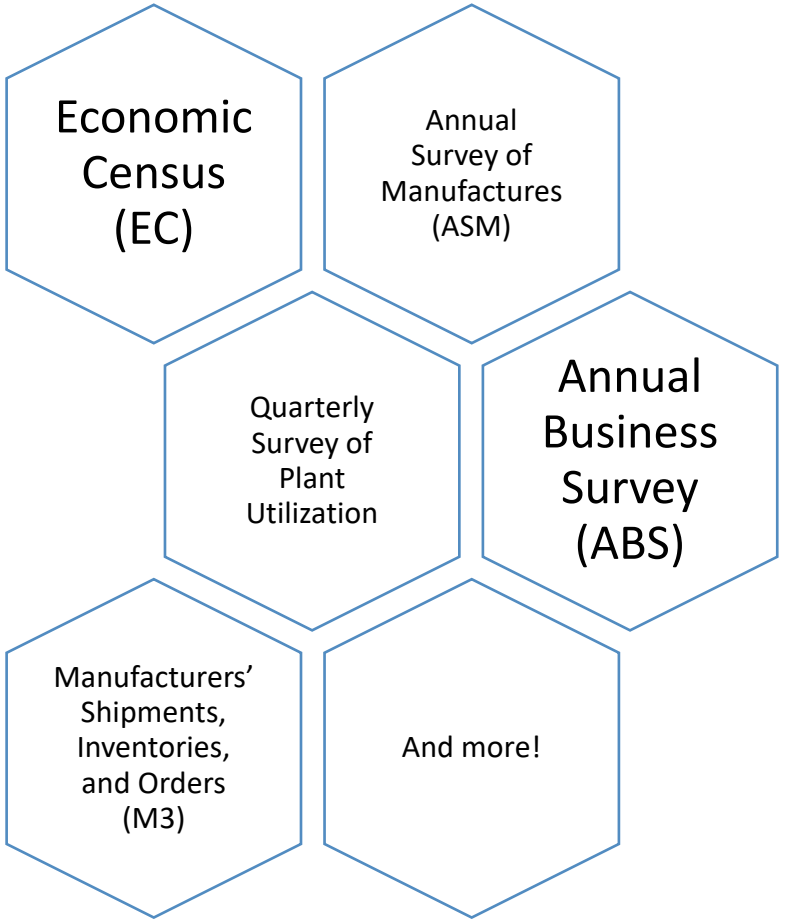
Introduction: Where else could we find business email contact information?

- At Census Bureau, QPC is just one business survey that collects contact information
- Challenges:
  - Contact information is siloed across survey specific databases
  - How do we choose among lots of possible emails? We could have lots of good contact information, but which is actionable by QPC?

Surveys for Businesses at the Census Bureau



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Methods: Manually Finding Contact Information

1. Collect contact information updates from any survey in one centralized location, in the Business Register.
2. Manually search through hundreds of emails. For each business missing contact information in QPC:
   - Search for any emails we have for that business across the Census Bureau
   - Manually decide on the most promising email (based on recency, survey comparability to QPC, contact title, establishments over enterprises, quality of the email entry, domain name)
3. Enter the new email into the QPC system for the next survey cycle.

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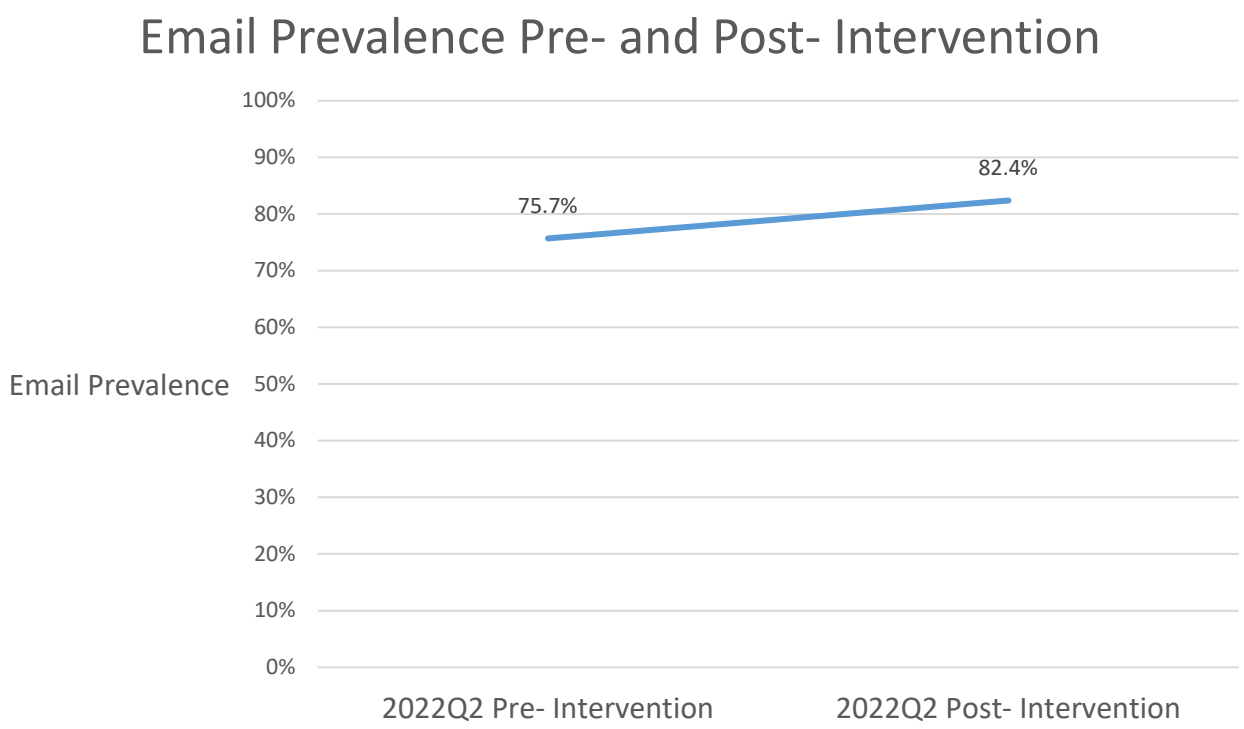
Results: Intervention Effects on Email Prevalence Rate

- **Email Prevalence** = Number of Businesses for which QPC Does Have an Email / Number of Businesses
- In 2022Q1, for **75.7%** of sampled businesses, QPC did have email contact information
- The contact information finding intervention added **450 new emails**, significantly increased the email prevalence rate by **6.7 percentage points** ($p < 0.01$)



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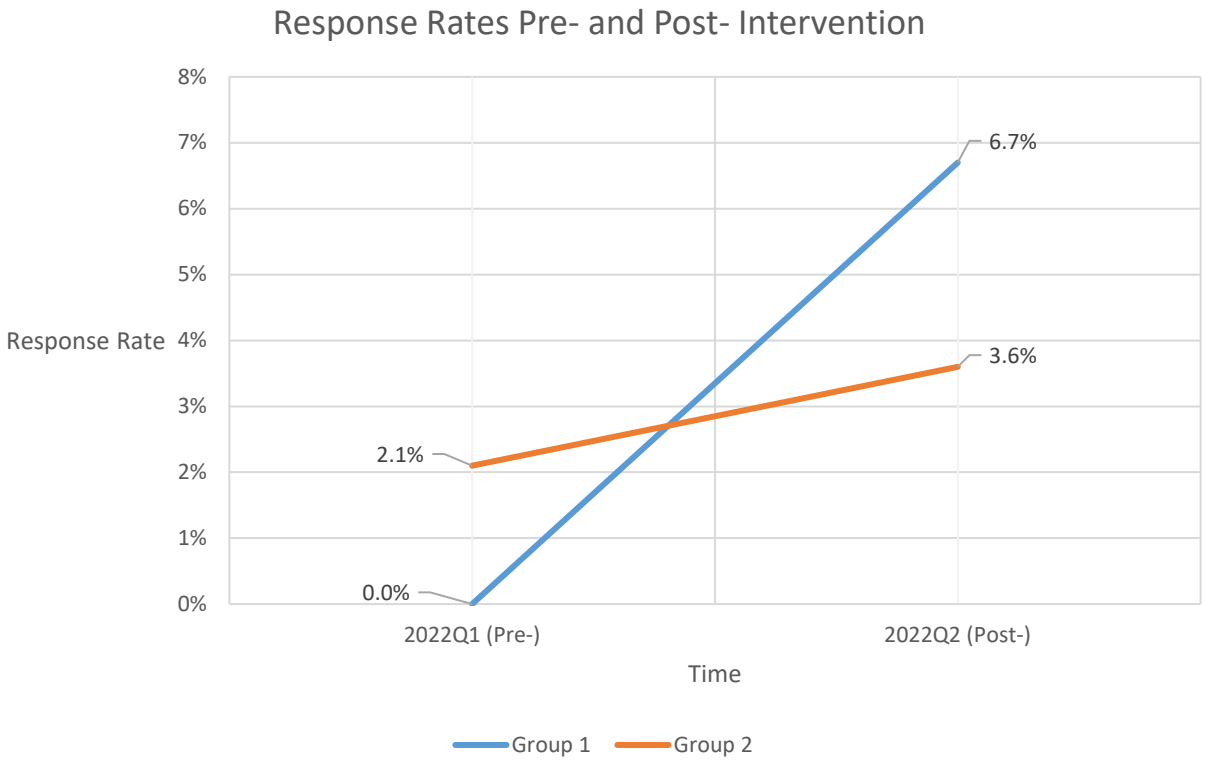
Results: Intervention Effects on Response Rate

- Group 1 = 450 businesses with new emails
- Group 2 = 1100 businesses without contact information in 2022Q1 and not in the intervention
- The contact finding intervention increased response rate in group 1



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Project Goal 2: Tool Development of Automated Contact Finding

Can we build automated contact finding that effectively replicates manual efforts?

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Introduction: Automatically Finding Contact Information

Benefits of Automation

- Saves manual work/ time
- Can be more systematic/ less error prone
- Is scalable to many businesses and surveys

Challenges of Automation

- Can it replicate the manual process of finding contact information?

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Methods: Automated Contact Finding Design

- **Simplicity**: no regressions, just ranked preferences (based on recency, survey comparability to QPC, establishments over enterprises, quality of the email entry)
- **Inexpensive**: when possible, we use open-source Python over SAS
- **Ease of Use**: integrated into existing analyst software (StEPS II)
- **Reasonable**: we build in contact information sanity checks
- **Visibility**: every step generates outputs that the analysts can verify and intervene as needed
- **Effectiveness**: trying to replicate the decision making of the analyst

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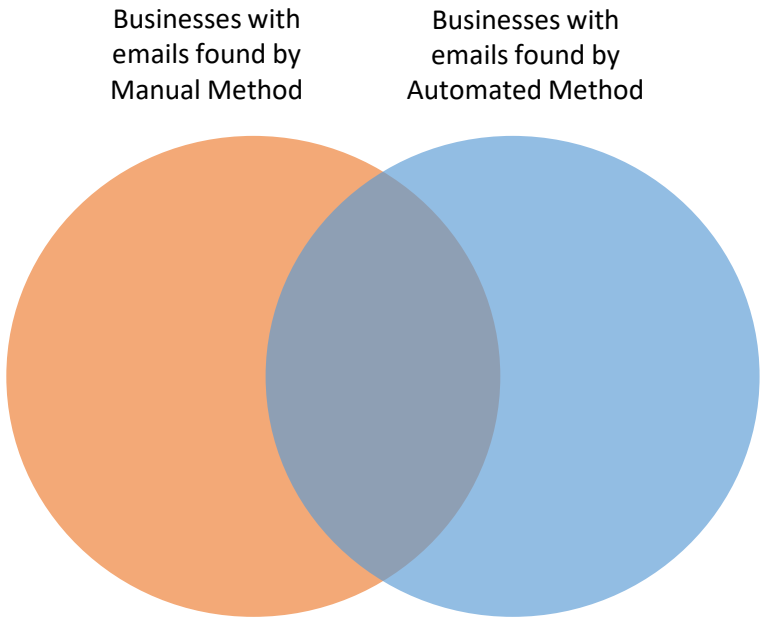
Methods: Automated Contact Finding Evaluation

- Backcast automated contact finding to 2022Q1 pre-intervention versions of QPC contact information, of Census contact information
- Compare and contrast the email contact information found by the manual method and the automated method



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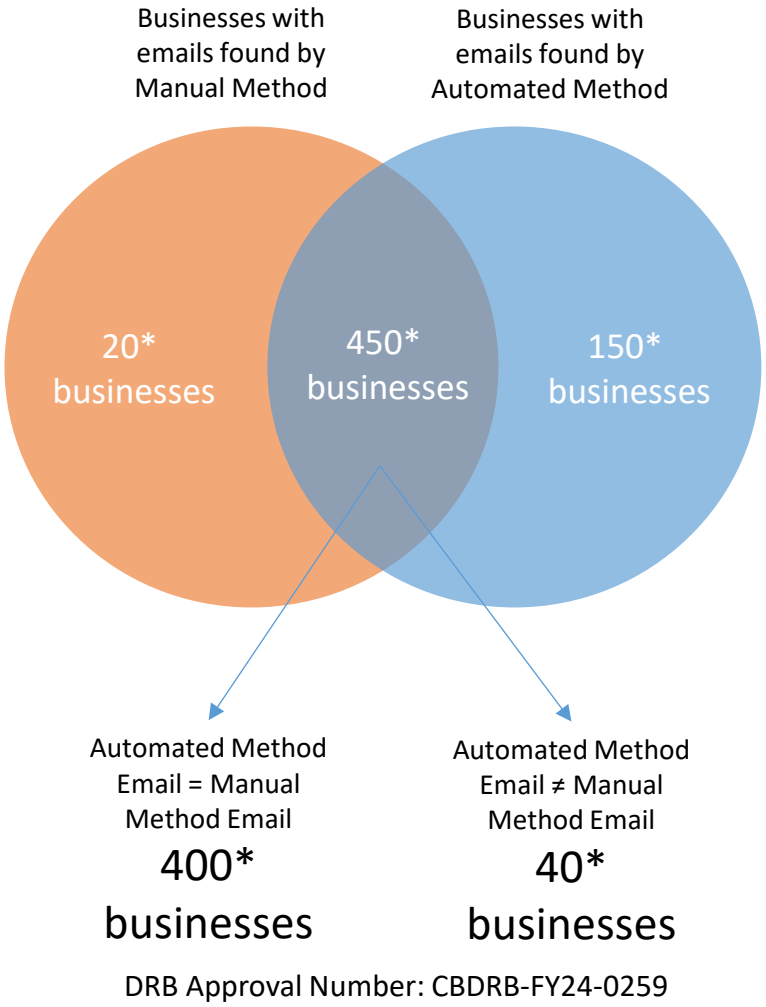
Results: Automated Contact Finding

- The automated method affected many of the businesses affected by the manual method
  - The automated method finds a match for 450* of the 470* manually mined cases (96%)
- The automated method exactly replicated the emails chosen by the manual method in 400* of 450* cases (91%)
- The automated method affected 150* extra businesses, these extra emails were validated by survey staff (32% more)



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*rounded child values don't add to parent values due to disclosure avoidance policy procedures

Conclusion

- Our findings suggests that finding emails for businesses could be a powerful tool to increase response rates
- We've built an automated tool for finding emails that effectively replicates manual efforts
- Future investigations
  - How often should we find contact information?
  - How do we make automated contact finding user friendly?
  - What other surveys across Census could benefit from this work? How could we generally strategize about reducing siloed contact information at Census?
  - How can this work benefit the broader federal statistical system?

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Questions or Ideas?

jessica.l.huang@census.gov

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