OSS ’19, May 26th 2019, Montréal, Canada

Why Do People Give Up FLOSSing?

A Study of Contributor Disengagement in Open Source

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Christian Kästner, Bogdan Vasilescu

Carnegie Mellon University

STRUDEL
SOCIO-TECHNICAL RESEARCH
USING DATA EXCAVATION LAB

Many OSS Projects are Analogous to Critical Infrastructure

Survival Rate Among FLOSS Projects is Very Low

Bad

Having Contributors in Drivers Seat is Critical to Project Survival

41% of failed OSS projects cited developer issues

Coelho, J., & Valente, M. T. (2017, August)

Good

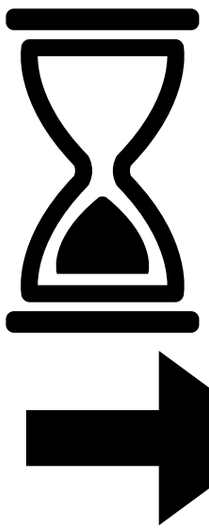
Contributor On-Boarding Has Been Thoroughly Researched

The Body of Work on Established Contributors is Much Smaller

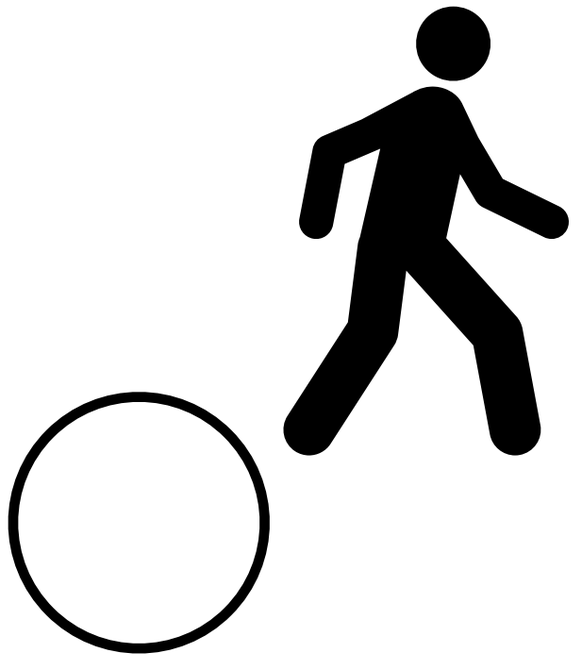
We're Interested in Exploring Factors to Predict Disengagement from OSS

?

Engaged Contributor



Disengaged Contributor



FLOSS

FLOSS

General Methodology

Survey of Disengaged Contributors

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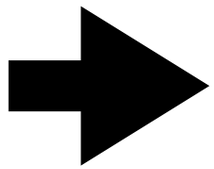
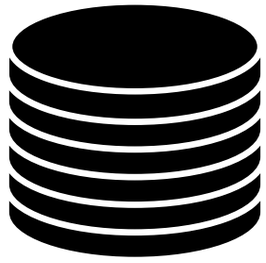
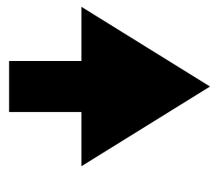
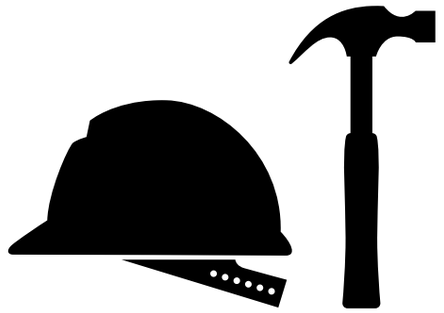
Literature Review





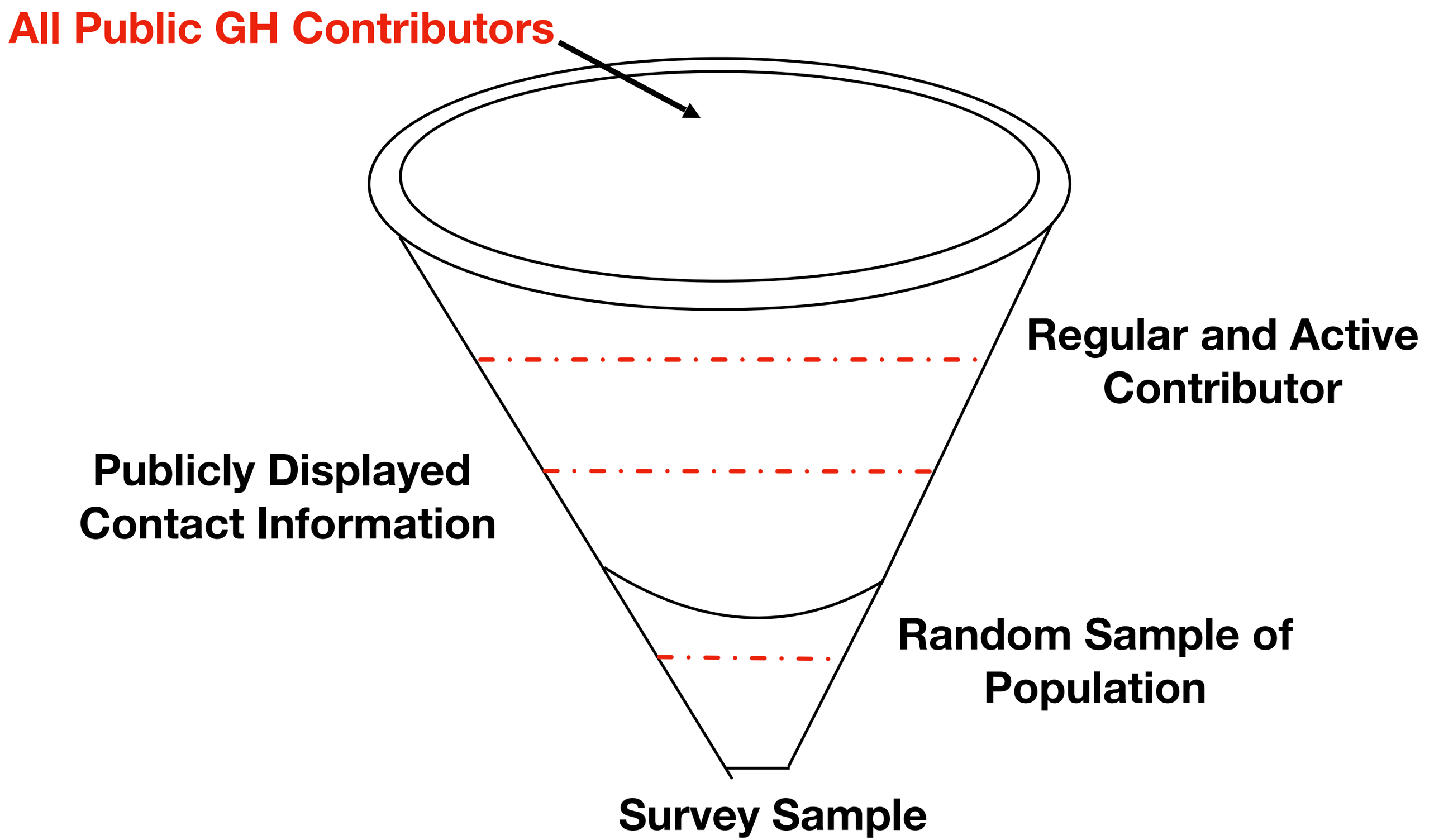
Operationalization of Predictive Factors





Survival Model

Used GHTorrent to Collect Survey Sample



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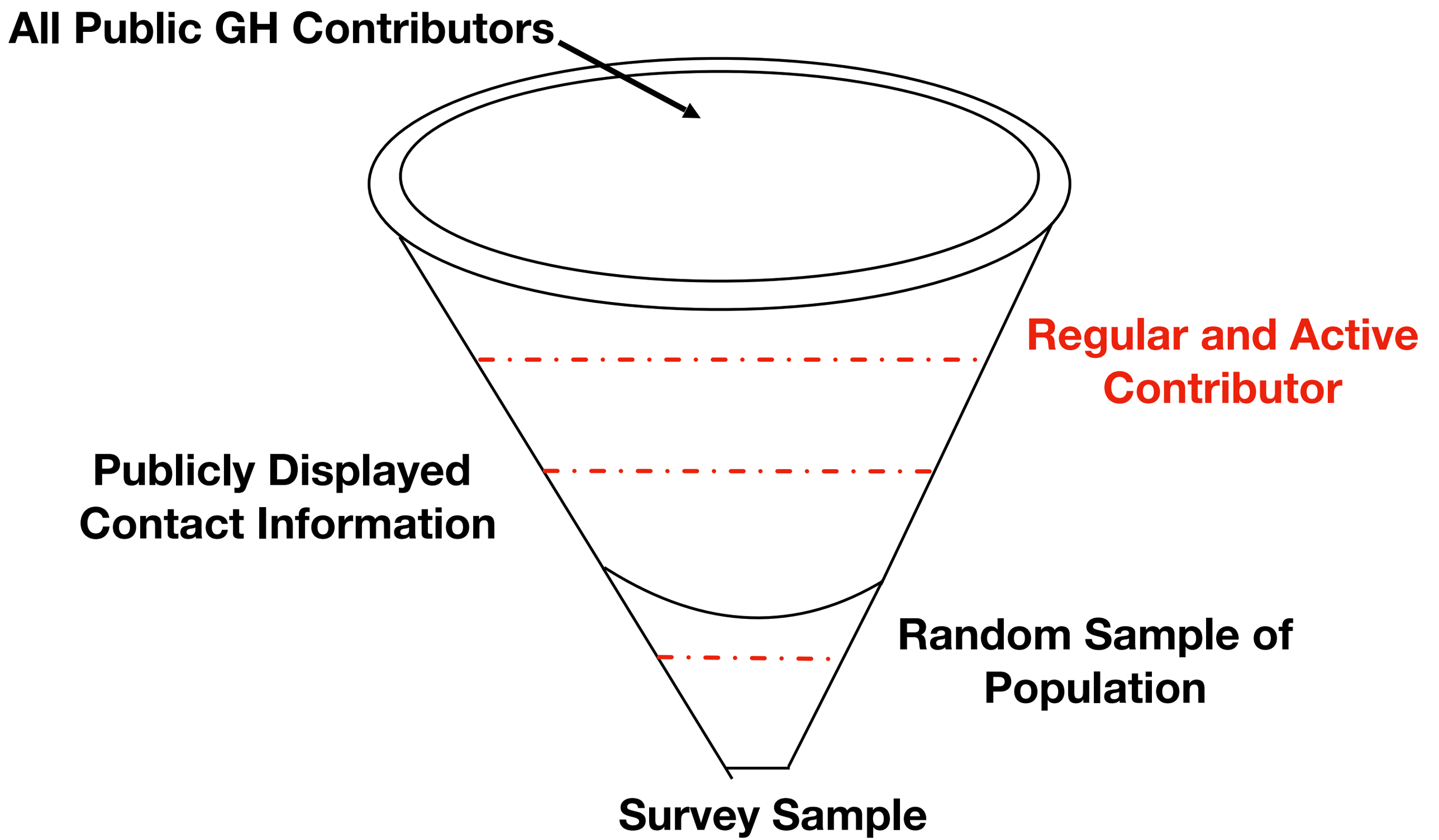
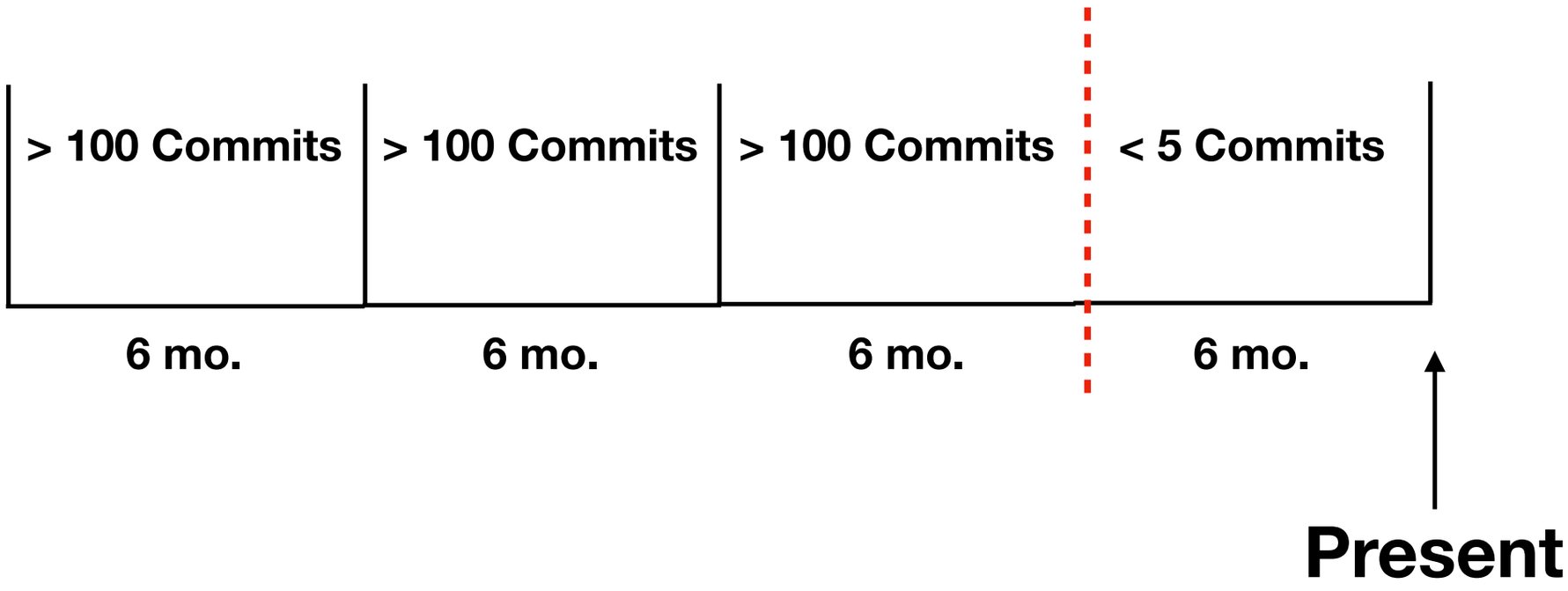
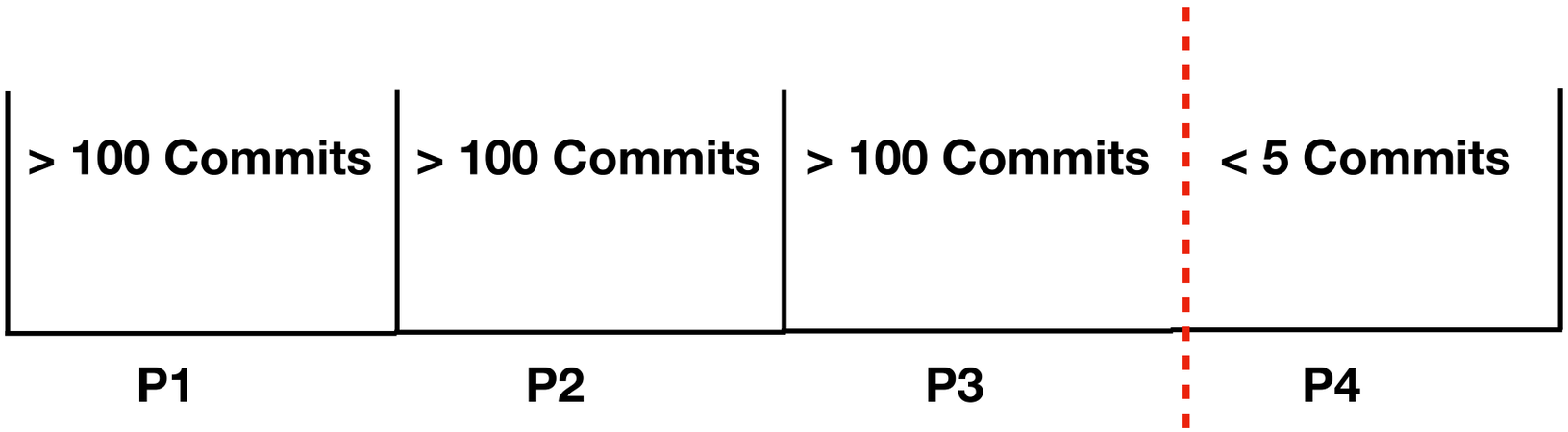
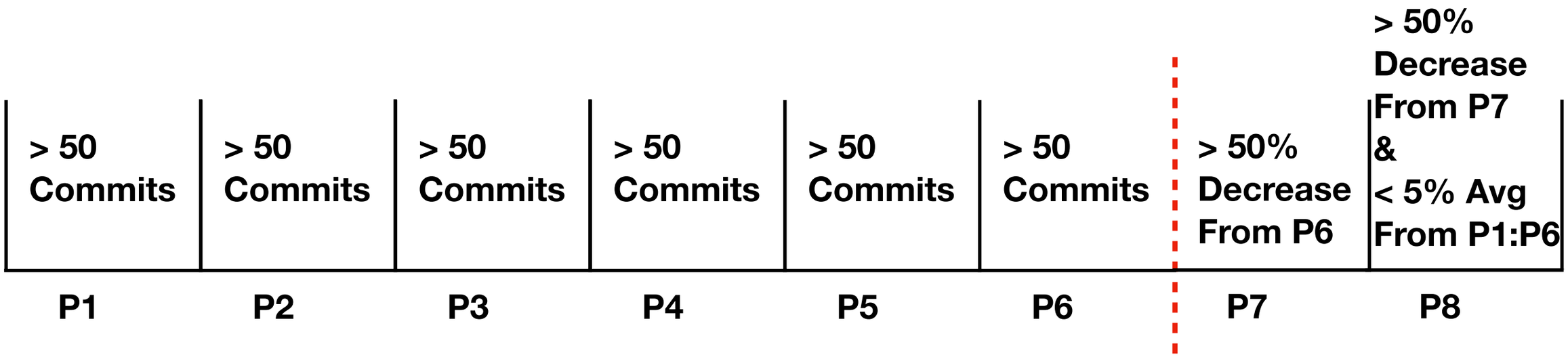
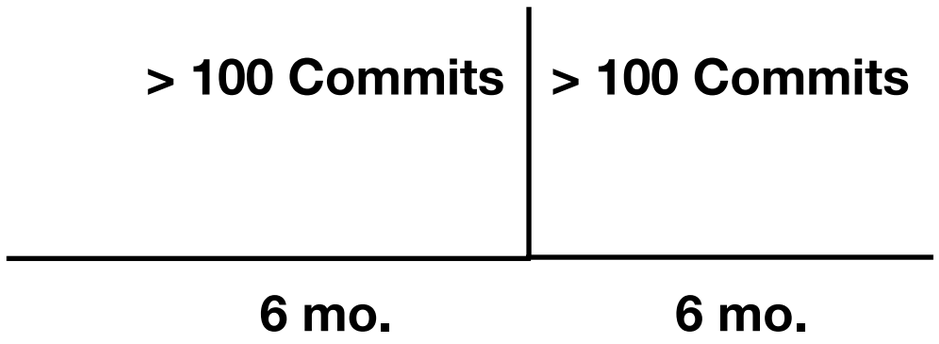


Identifying Regular and Active Contributors Who Disengaged

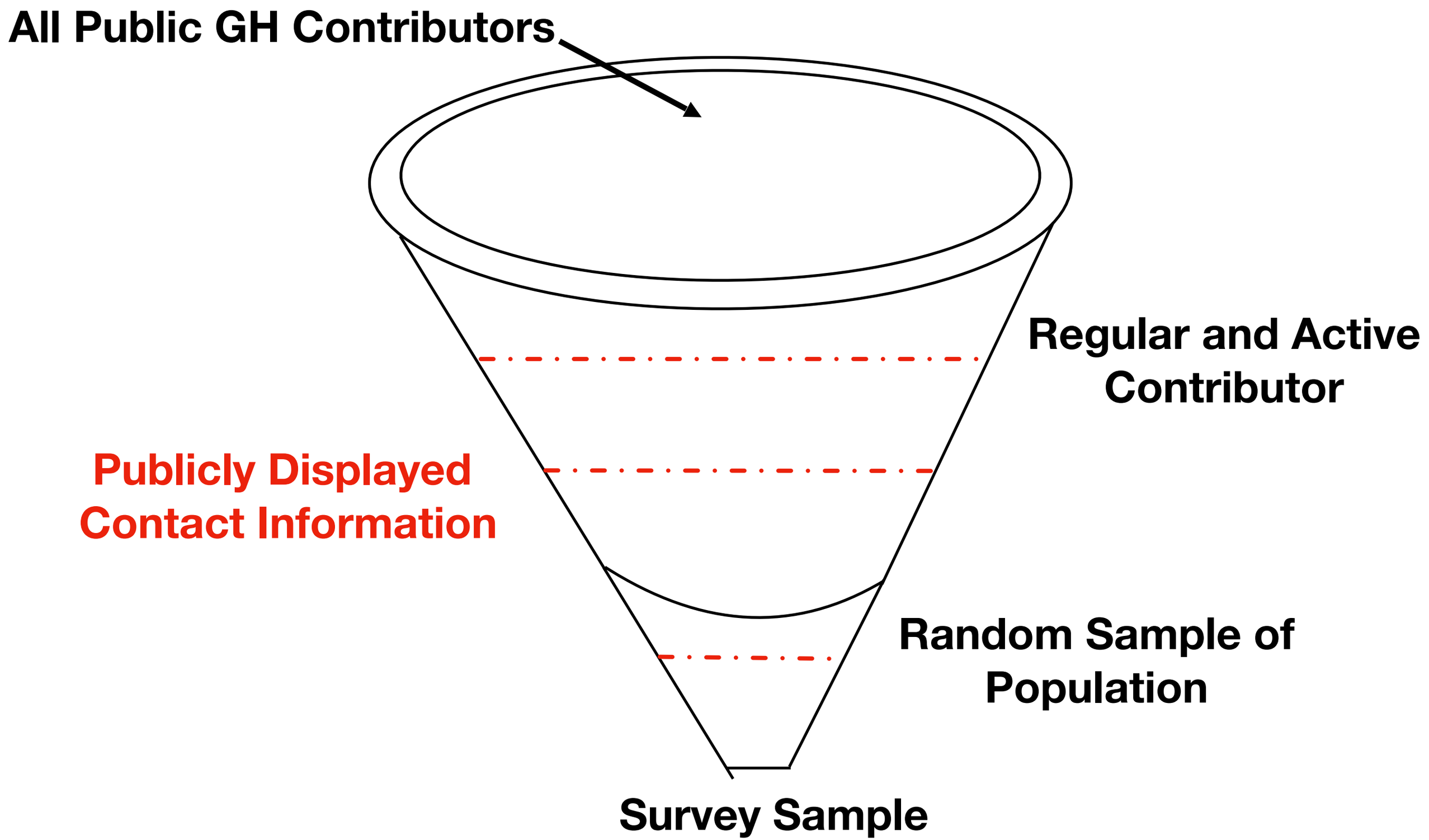



> 100 Commits
> 100 Commits
> 100 Commits
< 5 Commits
P1
P2
P3
P4


> 50 Commits
> 50 Commits
> 50 Commits
> 50 Commits
> 50 Commits
> 50 Commits
> 50% Decrease From P6
> 50% Decrease From P7 & < 5% Avg From P1:P6
P1
P2
P3
P4
P5
P6
P7
P8


> 100 Commits
> 100 Commits
6 mo.
6 mo.

Used GHTorrent to Collect Survey Sample



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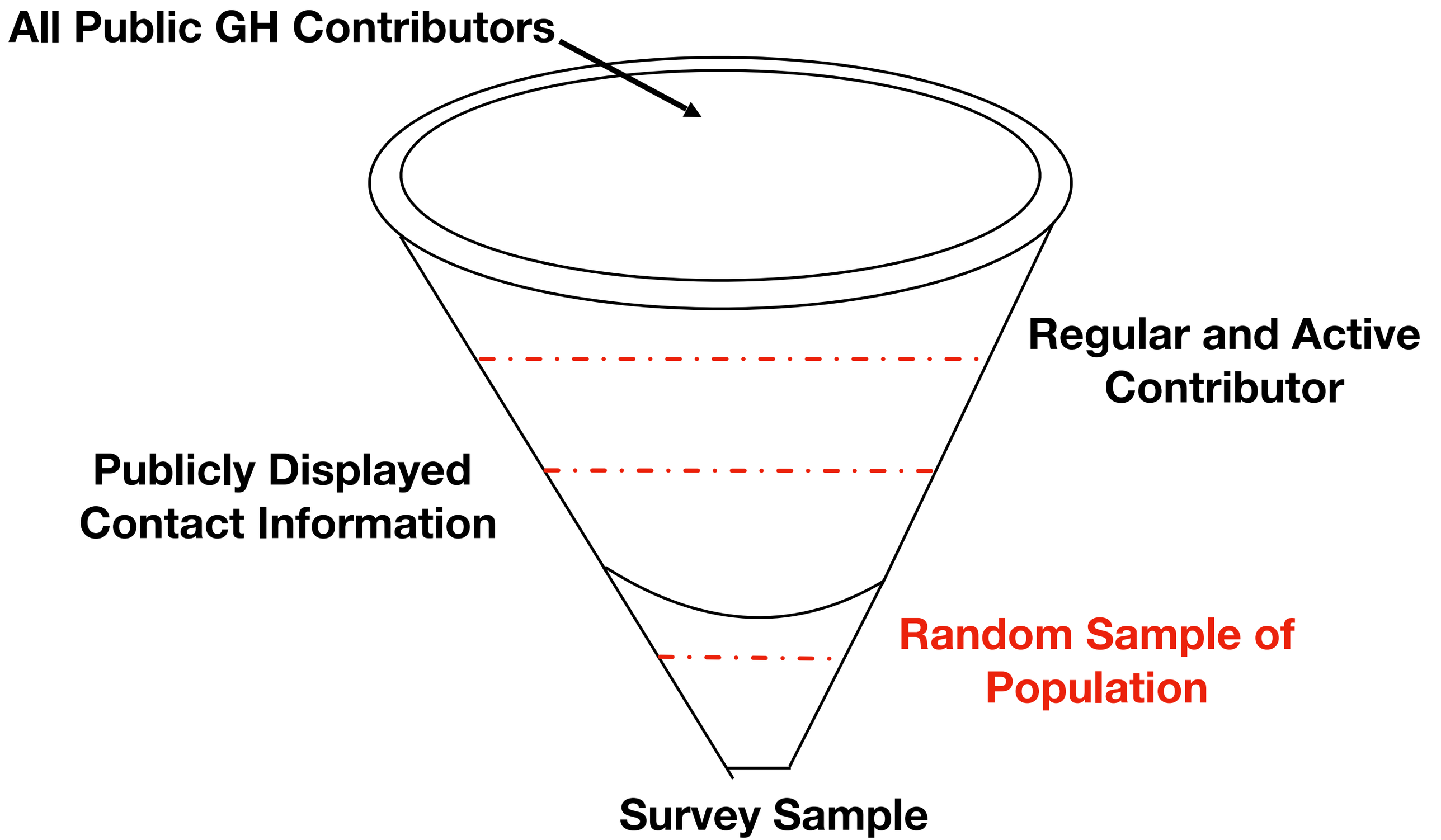

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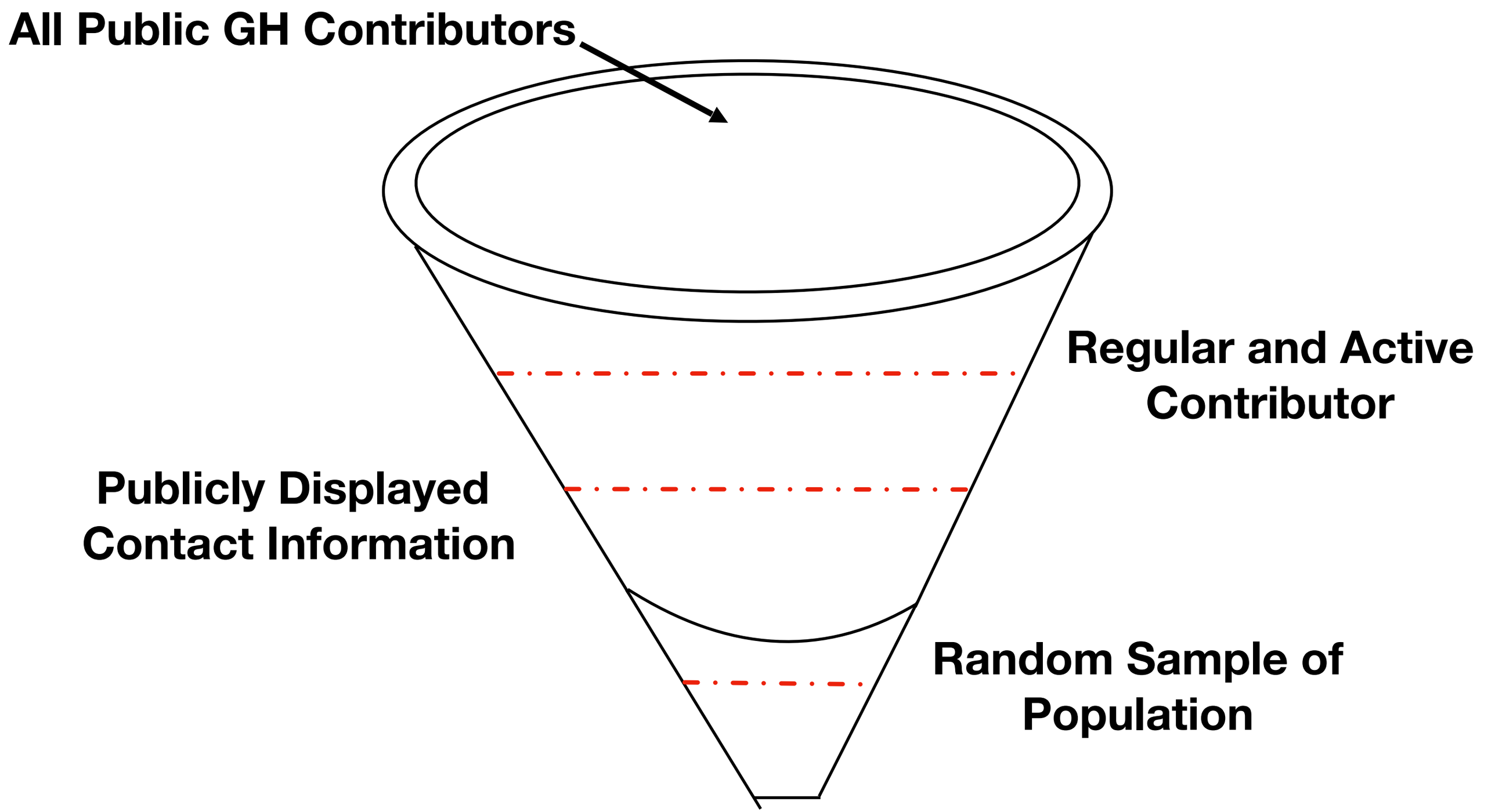
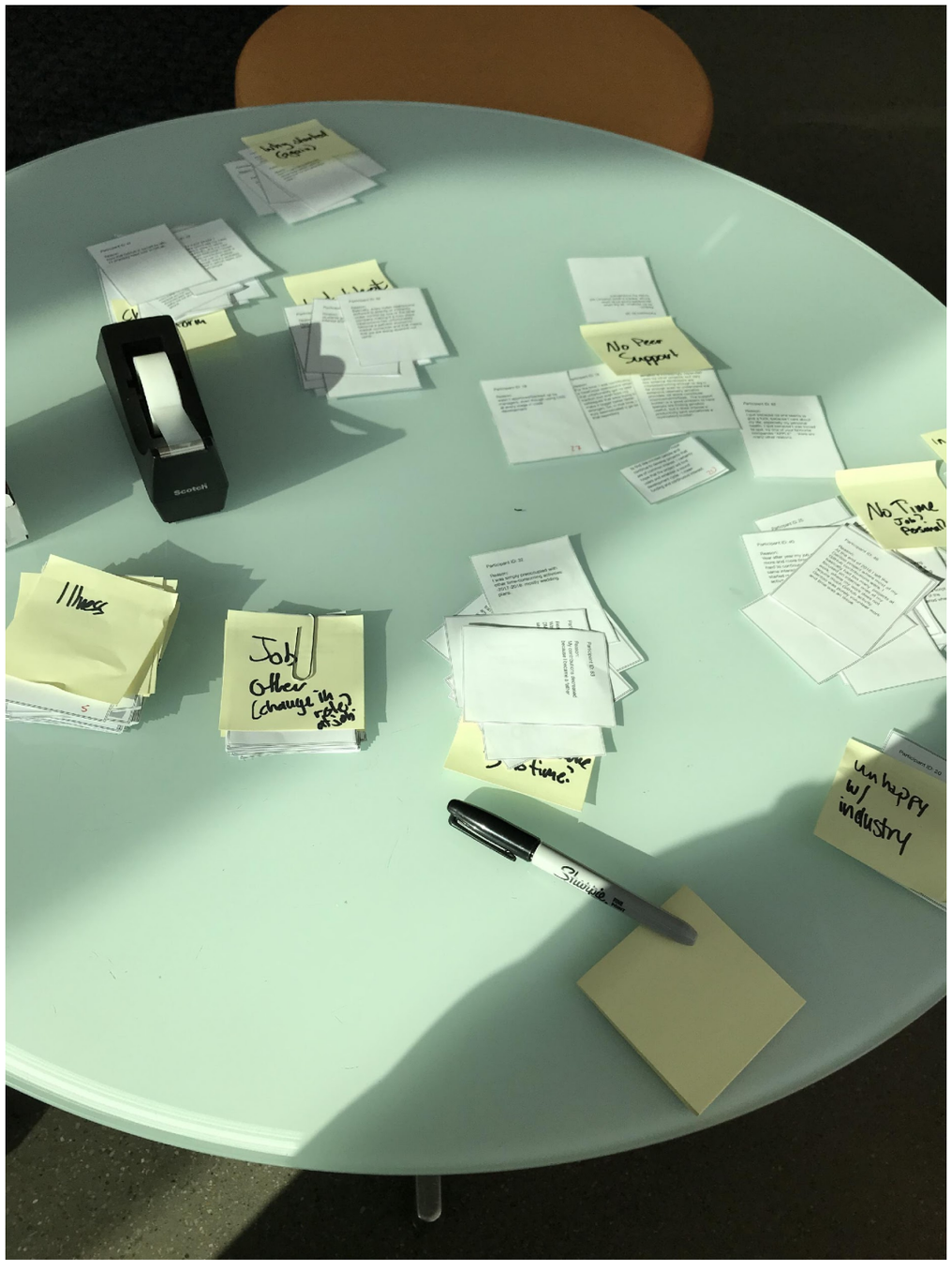


Sent Out Simple One-Question Survey to Sample

21.5% Response Rate

We Used Card Sorting Analysis to Parse Raw Survey Responses



Macro Survey Results

Survey Says Out of 151 Respondents…

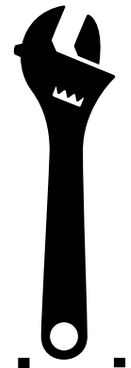
70%

Occupational Issues

34%

Social Issues

25%



Technical Issues

Breakdown of Survey Responses

Subgroup	Count
Occupational reasons	
Got new job that doesn't support FLOSS	37
Changed role/project	25
Left job where they contributed to FLOSS	16
No time: new job	15
No time: existing job	10
Left school where they contributed to FLOSS	12
No time: in school	12
FLOSS in school, now job doesn't support FLOSS	7
Too much coding at work	4
Social reasons	
Lost interest in FLOSS	24
No time: personal	23
Lack of peer support	16
No time: nondescript	15
Technical reasons	
Issues w GitHub or industry	14
Individually moved to private repos	12
Changed platform	10
Feature complete project	3

General Methodology

Survey of Disengaged Contributors

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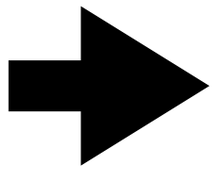
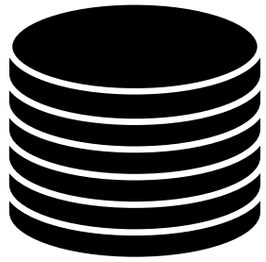
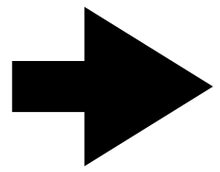
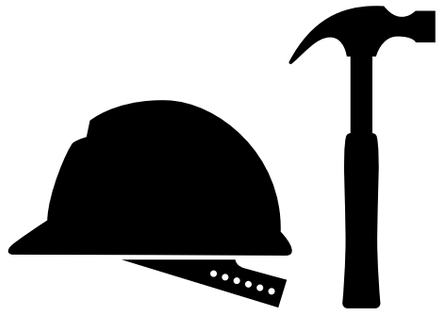
Literature Review





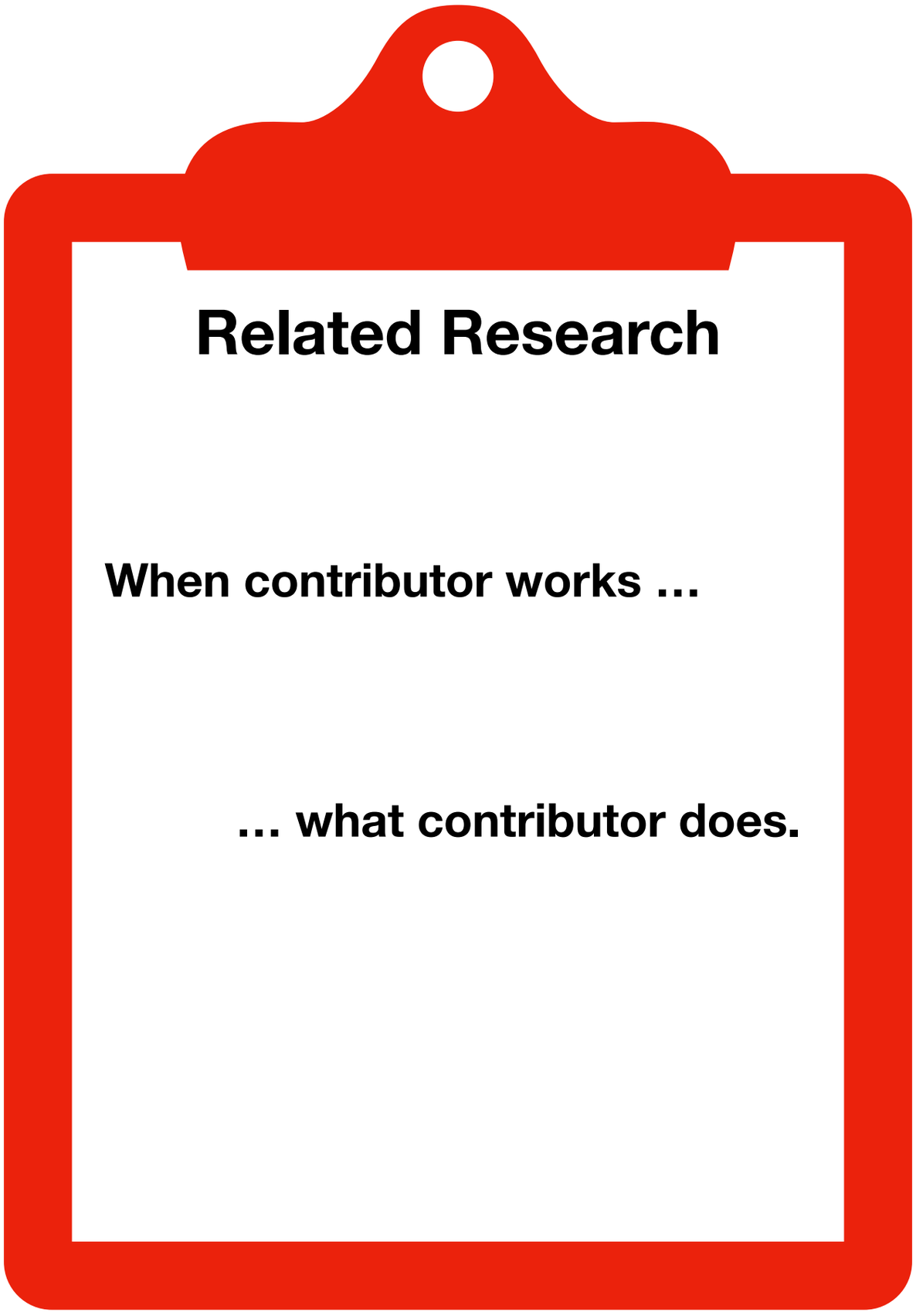
Operationalization of Predictive Factors





Survival Model

We Performed Literature Review

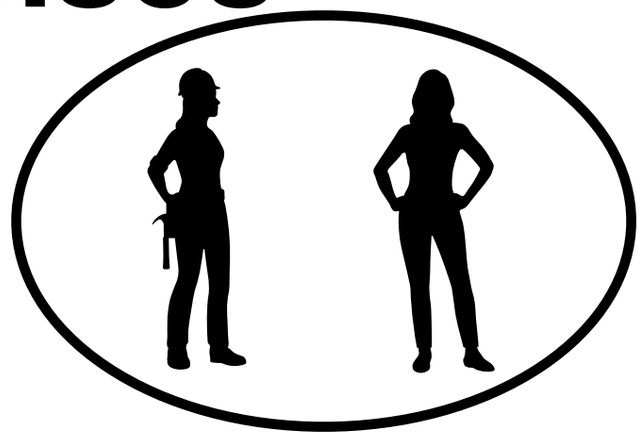


We Were Interested In Stratifying Survey Responses

H1:

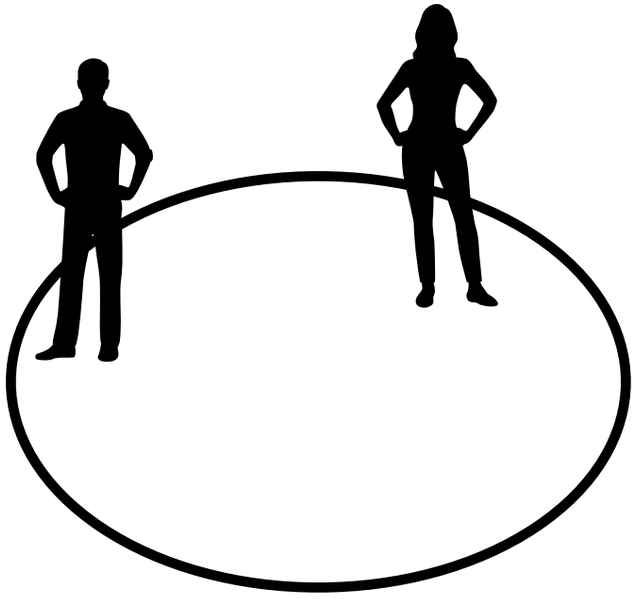
Office Hours

vs.



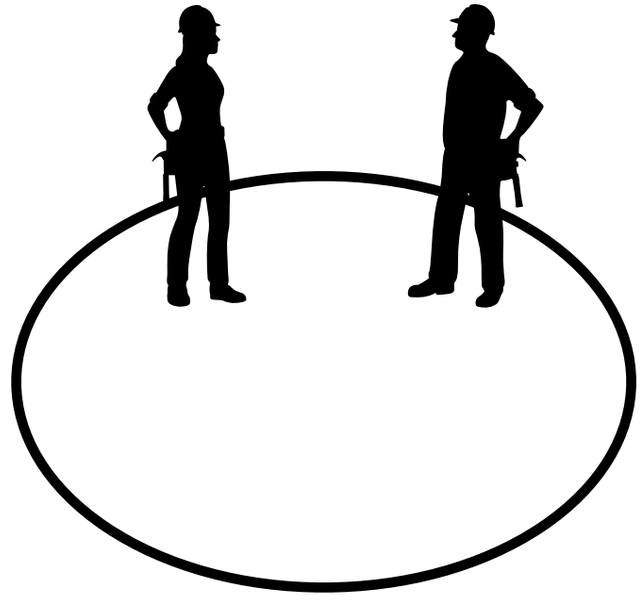
Nights & Weekends

H2:



More Support Work

vs.



Less Support Work

General Methodology

Survey of Disengaged Contributors

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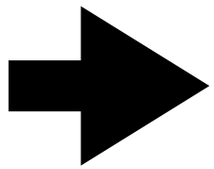
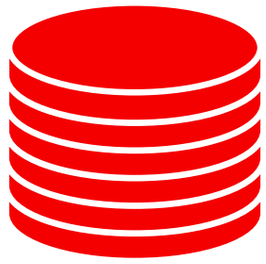
Literature Review





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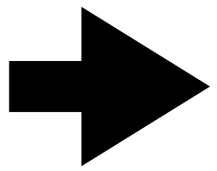
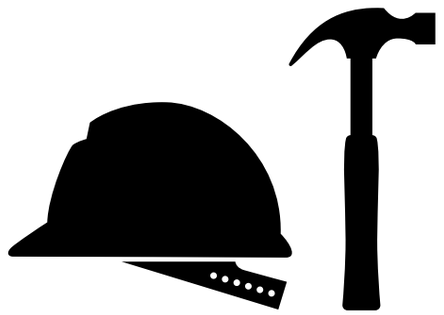




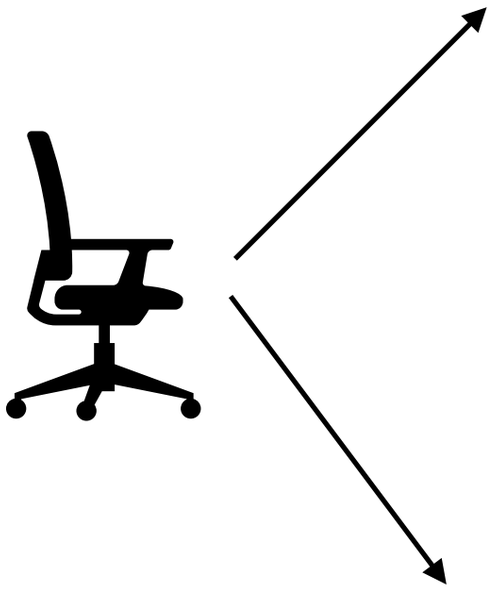
Survival Model

workingHours

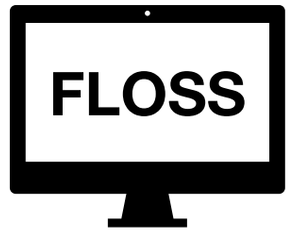
07:00

19:00

Office Hours



Nights & Weekends

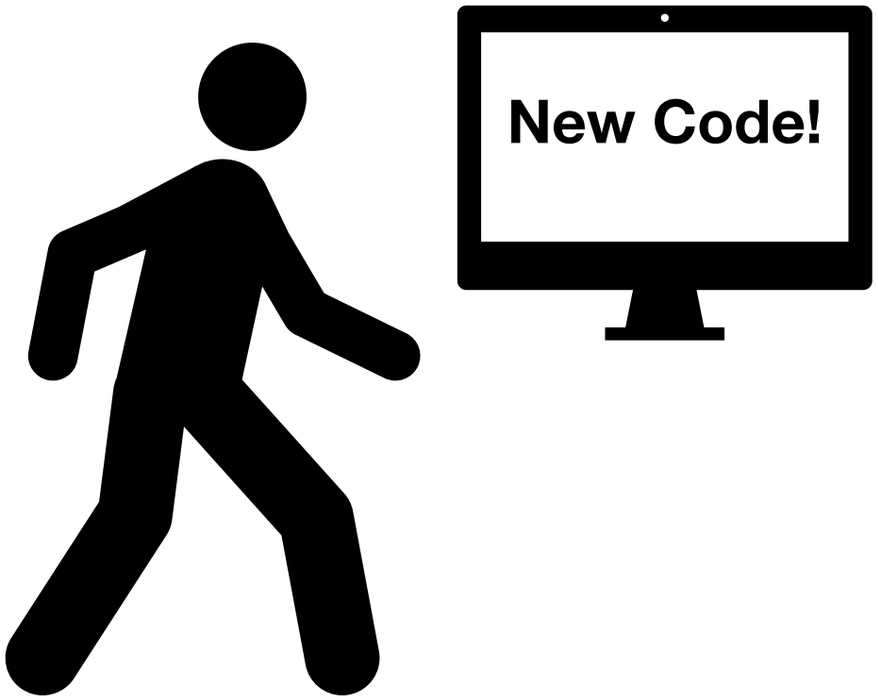


supportWork

More Support Work

Pull Requests
Issues
Etc.

Less Support Work



Commits

Stratified Survey Results

Subgroup	Count	Office Hrs vs Nights&We
Occupational reasons		
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Stratified Survey Results

Subgroup	Count	Office Hrs vs Nights&We	More Support vs Less
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Stratified Survey Results

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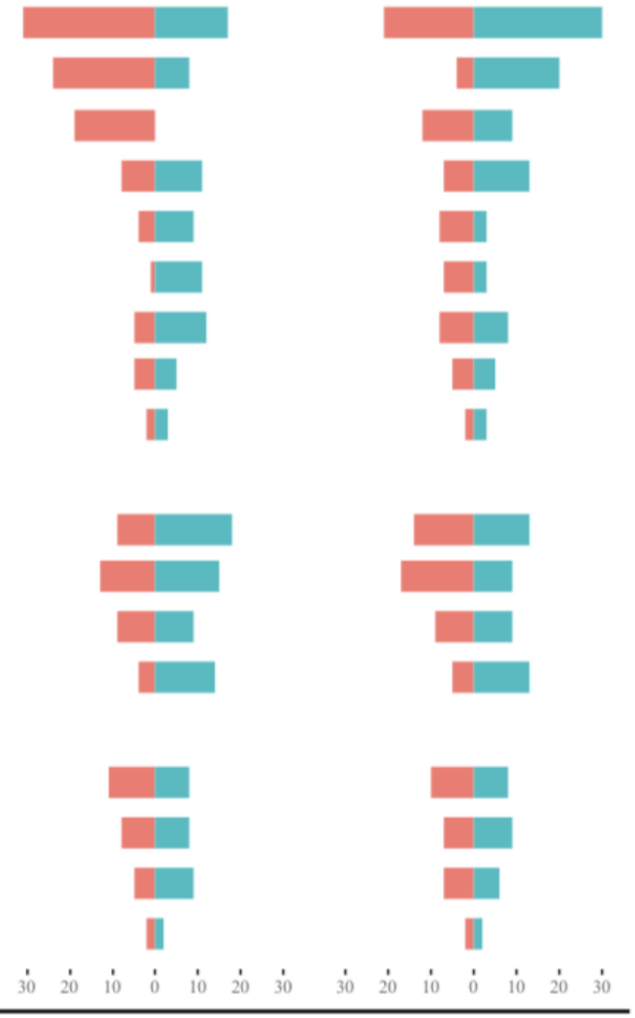

TransitionFound

A Good Example: Brett Cannon

stackoverflow

Brett Cannon

Principal software engineer at Microsoft

Vancouver, BC, Canada

brettsky

github.com/brettcannon

http://snarky.ca

Last seen on Stack Overflow 3 days ago

TECHNOLOGIES

Preferred technologies

python dart typescript

Non-preferred technologies

c++ java

Top Percentiles

Top 10% python visual-studio-code

EXPERIENCE (10)

Principal software engineer
Microsoft
Jul 2015 → Current (3 years, 11 months)

Fellow
Python Software Foundation
Mar 2003 → Current (16 years, 3 months)

Software Engineer
Google
May 2011 → Jun 2015 (4 years, 2 months)

TransitionFound

Identifying Transitions

EXPERIENCE (10)

Principal software engineer

Microsoft

Jul 2015 → Current (3 years, 11 months)

Fellow

Python Software Foundation

Mar 2003 → Current (16 years, 3 months)

Software Engineer

Google

May 2011 → Jun 2015 (4 years, 2 months)

python go c++ java google-app-engine google-chrome-extension android

- Charged with finishing the master/slave to HRD migration tool for App Engine for public release
- Designed a novel algorithm to scrape web pages for *[redacted]* and implemented it as an entirely client-side Chrome extension which included live image cropping
- Heavily participated in and solely maintained an email parsing pipeline for purchase receipts to collect purchase-related data (e.g., shipment tracking numbers), which included adding support for schema markup and working with ontologists to add missing structured data support to schema.org
- Took the Google Now in-store card from a UX concept to implementation and through to launch which required writing both the Android client code along with the server code that worked with disparate backends

General Methodology

Survey of Disengaged Contributors

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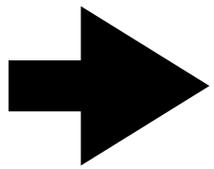
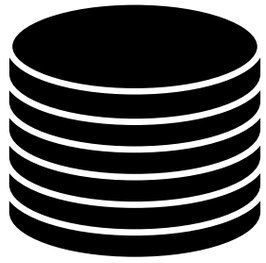
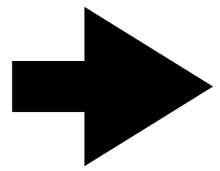
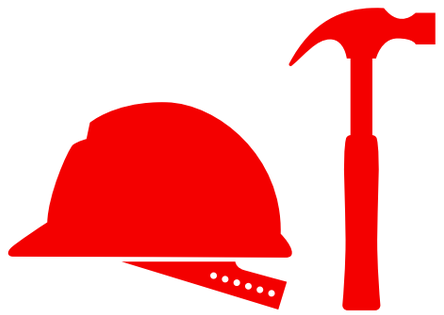
Literature Review





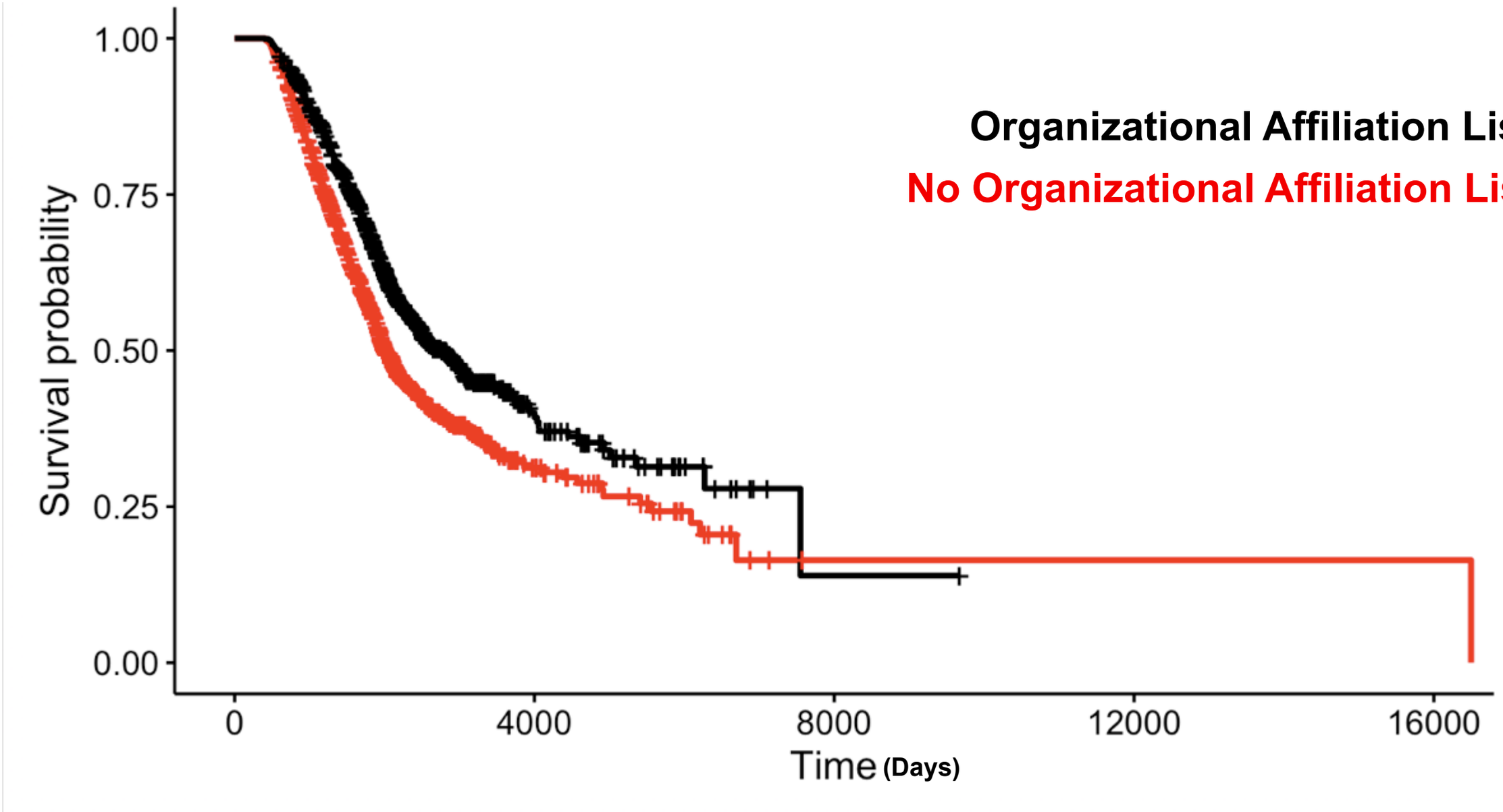
Operationalization of Predictive Factors





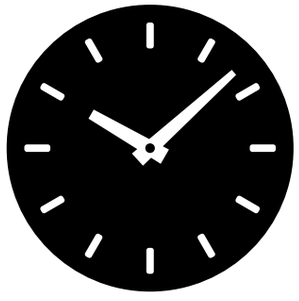
Survival Model

But What Exactly Is A Survival Model?

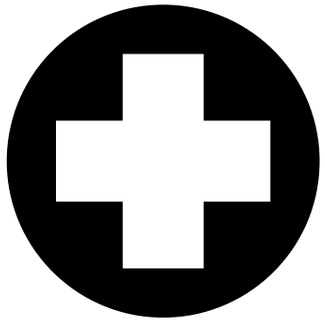


Survival Model Factors

Activity

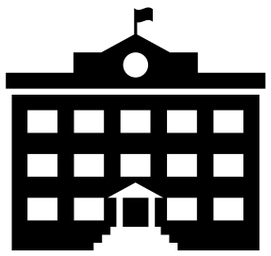


WorkingHours

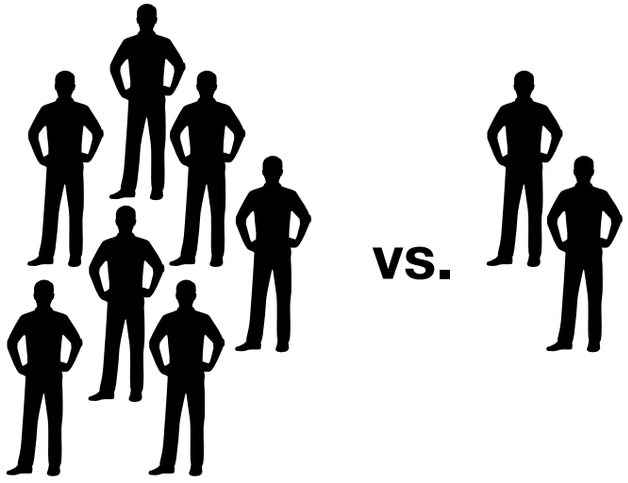


SupportWork

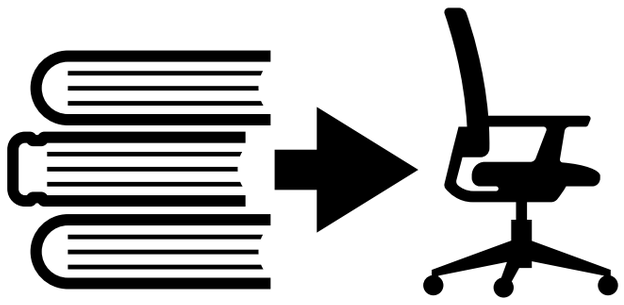
Project Popularity



Organizational Affiliation

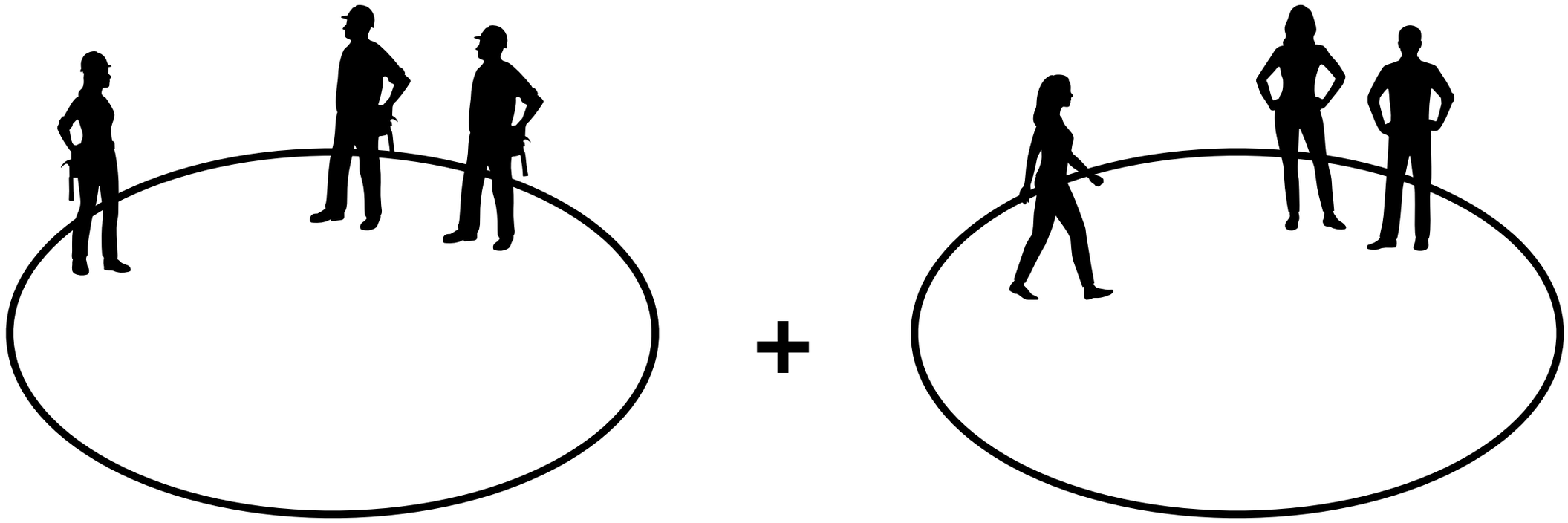


Team Size



Transition Found

Survival Model Participants



Survey Respondents with Transition Data

Control Group

Participants with Transition 2.48 Times More Likely to Disengage

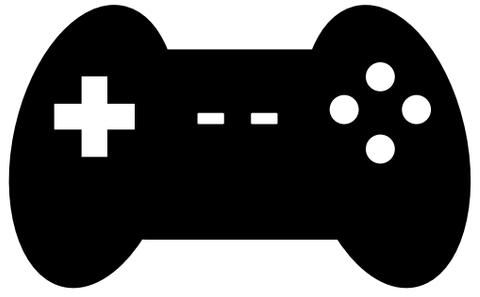
“I started employment with a company that didn’t really like open sourcing their projects.” (P25)

“I’ve moved to more of a product owner role in my position, so less time to develop.”(P50)

Working Predominantly During Office Hours Increased Risk of Disengagement by Factor of 2.20

Mandatory Participation

vs.

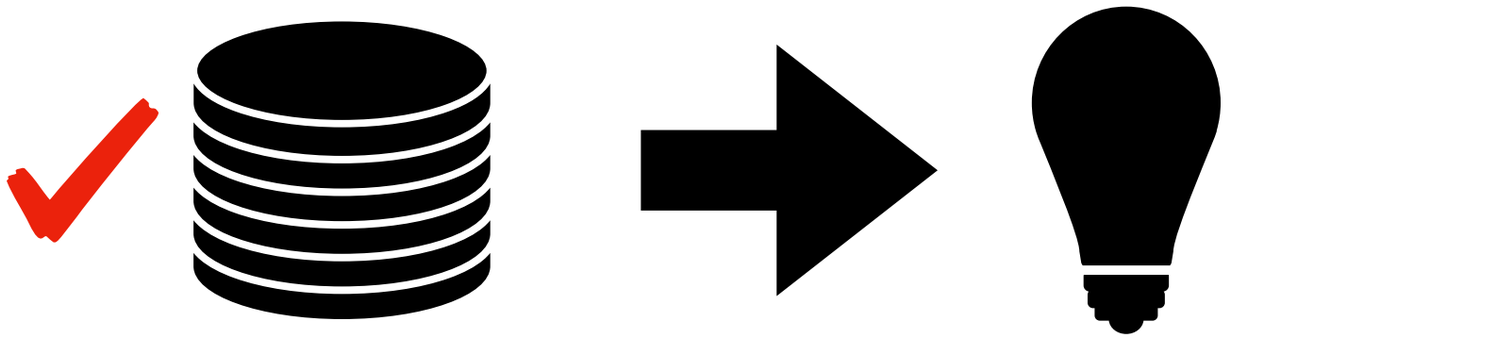


Elective Participation

“[It’s] quite simple. I was active because the project was sponsored by my employer, i.e., my job. I'm not active on GitHub because I've moved to another project.”(P75)

Operationalization of Predictive Factors Provided Promising Results

Subgroup	Count	Office Hrs vs Nights&We	More Support vs Less
Occupational reasons			
Got new job that doesn't support FLOSS	37		
Changed role/project	25		
Left job where they contributed to FLOSS	16		
No time: new job	15		
No time: existing job	10		
Left school where they contributed to FLOSS	12		
No time: in school	12		
FLOSS in school, now job doesn't support FLOSS	7		
Too much coding at work	4		
Social reasons			
Lost interest in FLOSS	24		
No time: personal	23		
Lack of peer support	16		
No time: nondescript	15		
Technical reasons			
Issues w GitHub or industry	14		
Individually moved to private repos	12		
Changed platform	10		
Feature complete project	3		



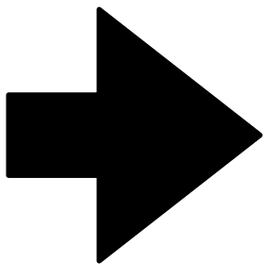
Data Driven Operationalization Of Predictive Factors

Valuable Insights About Disengaged OSS Contributors

To learn more about sustained participation of contributors in FLOSS…

Friday, May 31st at 11:20, Sophie Qiu

Going Farther Together:
The Impact of Social Capital on Sustained Participation in Open Source



11:00 - 12:30: Papers - Developer Biases and Trust at Viger
Chair(s): Kelly Blincoe University of Auckland

11:00 - 11:20 ☆ FLOSS Participants' Perceptions about Gender and Inclusiveness: A Survey
Amanda Lee University of Alabama, Jeff Carver University of Alabama INDUSTRY PROGRAM TECHNICAL TRACK
Pre-print

11:20 - 11:40 ☆ Going Farther Together: The Impact of Social Capital on Sustained Participation in Open Source INDUSTRY PROGRAM TECHNICAL TRACK
Huilian Sophie Qiu Carnegie Mellon University, Pittsburgh, Pennsylvania, United States, Alexander Nolte University of Tartu, Anita Brown Bryn Mawr College, Bryn Mawr, Pennsylvania, United States, Alexander Serebrenik Eindhoven University of Technology, Bogdan Vasilescu Carnegie Mellon University
ACM SIGSOFT Distinguished Paper Award
Pre-print

11:40 - 12:00 ☆ Investigating the Effects of Gender Bias on GitHub INDUSTRY PROGRAM TECHNICAL TRACK
Nasif Imtiaz North Carolina State University, Justin Middleton , Joymallya Chakraborty , Neill Robson NC State University, Gina Bai North Carolina State University, Emerson Murphy-Hill Google
Pre-print

Key Takeaways

Occupational reasons were most commonly cited in survey, specifically occupational transitions and novel transitionFound operationalization proved successful factor in survival model

Used operationalizations of potential disengagement factors to (1) categorize survey respondents; and (2) predict disengagement

Established contributors who do different kinds of work and perform said work at different times tend to cite different reasons for their disengagement.

Factors such as project popularity, when contributors work, and how much they work can also be used to predict established contributor disengagement from FLOSS

Questions?

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