Evolving a Bug Bounty Program

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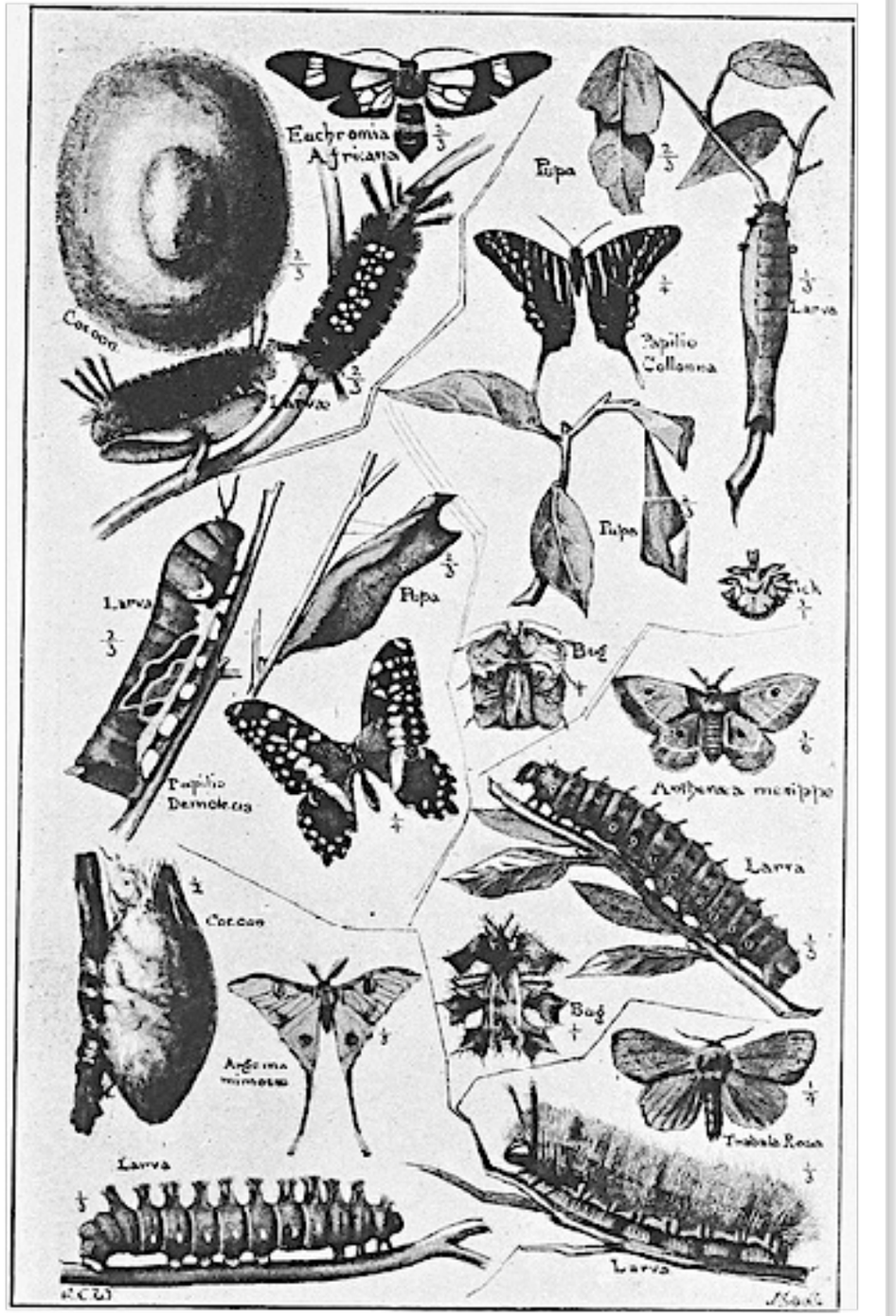
An Insect Zoo



Bug Bounties embrace a crowdsourced model for discovering application flaws.

They reward researchers for disclosing flaws in a way that minimizes risk to the app, its data, and its users.

…and they're a bit chaotic.

Plan Your Visit

Attracting a crowd

Discovering flaws

Rewarding researchers

Reducing risk

Managing the chaos

…that's effective.

…that impact security.

…fairly.

…to elevate security.

…somehow!

Find an Ecological Niche

The maturity of a security development lifecycle influences the success of a bug bounty program.

Descent with modification

1. TRAINING	2. REQUIREMENTS	3. DESIGN	4. IMPLEMENTATION	5. VERIFICATION	6. RELEASE	7. RESPONSE
1. Core Security Training	2. Establish Security Requirements	5. Establish Design Requirements	8. Use Approved Tools	11. Perform Dynamic Analysis	14. Create an Incident Response Plan	Execute Incident Response Plan
	3. Create Quality Gates/Bug Bars	6. Perform Attack Surface Analysis/ Reduction	9. Deprecate Unsafe Functions	12. Perform Fuzz Testing	15. Conduct Final Security Review	
	4. Perform Security and Privacy Risk Assessments	7. Use Threat Modeling	10. Perform Static Analysis	13. Conduct Attack Surface Review	16. Certify Release and Archive	

https://www.microsoft.com/SDL

Encountering the Swarm

Be ready for a high rate of reports that produce a low percentage of actionable bugs.

15+ / day

<20% valid

A Cambrian Explosion

Duplicates

Non-impactful

Narrowly-impactful

Out of scope

Completely unrelated

Noise

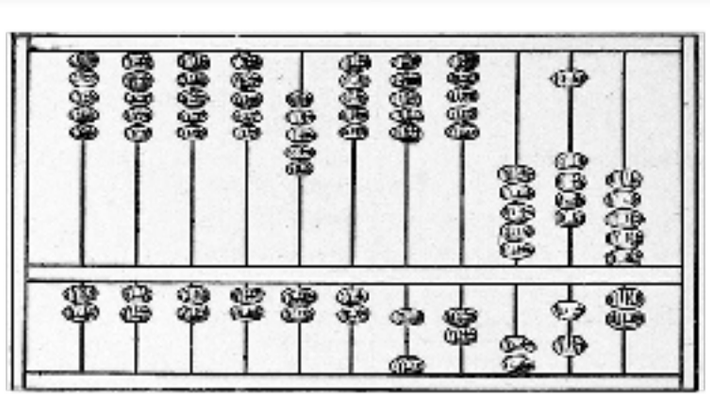
Environmental Pressures

Who determines impact? Who determines priority?

What is the SLA to acknowledge, verify, fix, validate?

Who defines, tracks, enforces the SLA?

What are the consequences for breaking the SLA?

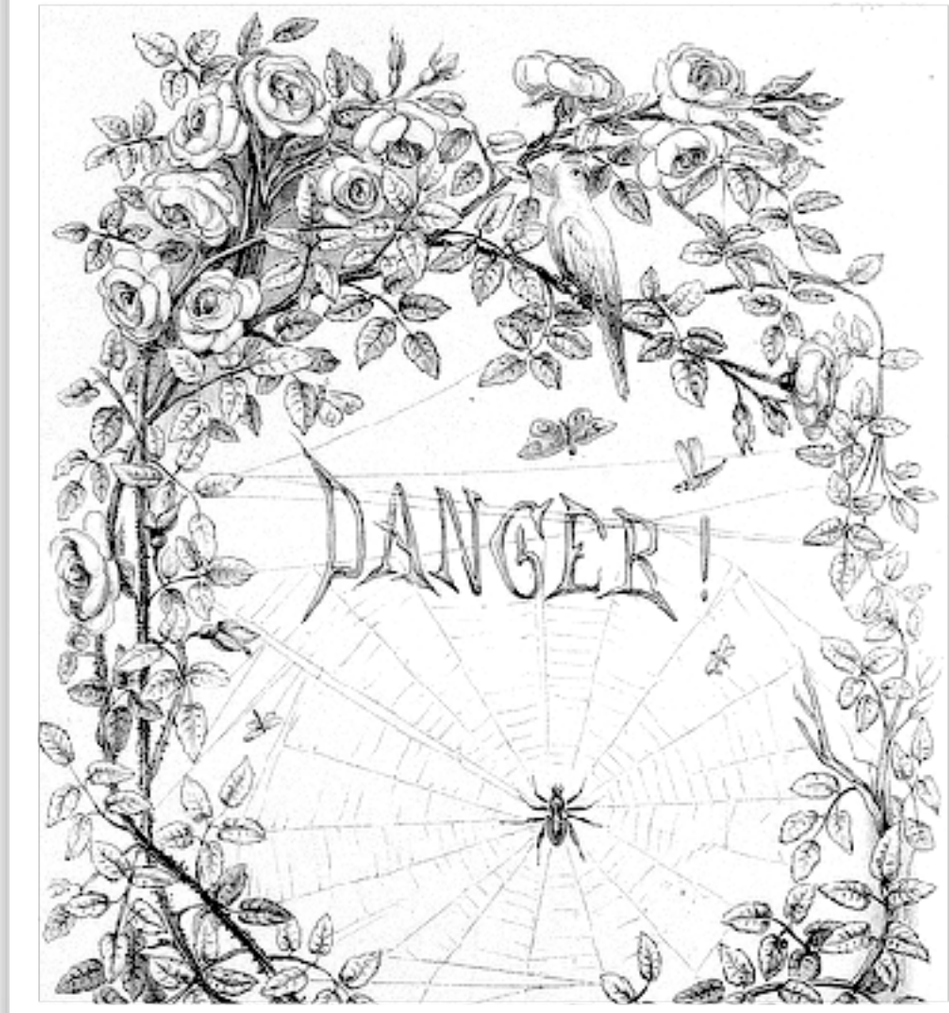


Quantifying Risk

Tie rewards to impact based on a reasonable threat model that reduces subjectivity.

More art than science.

Aim for consistency.



$0-$15K

~$800 avg.

Bounty Variance — XSS

Reflected against self

“Click this link”

Public documentation

$50

https://entire.internet

Authenticated sessions

No user interaction

Affects sensitive content

$10,000

https://klikki.fi/adv/yahoo.html

Bounty Variance — Disputes

Keep reference points of simple threat models that include impact and context.

The organization has more information about context than the researcher. And may have good reasons for not disclosing full context.

Choose a consistent payment milestone — Validation vs. Resolution.

Bug Value

Well-written descriptions and reproduction steps.

Finding (unexploited?) flaws in production code that creates an SDL feedback loop in order to…

…generate tests to catch regressions,

…refactor fragile code,

…deploy mitigating controls.

Bug Fixes

Check in code, deploy a new package, remove old package.

Make sure all systems receive the new code.

Track trends in resolution instead of absolute bugs.

Watch for recidivism due to inadequate resolution.

Same bug __ months later

Antibiotic Resistance

"This generates $X million in revenue. It's not supported due to org changes."

"No one's using it; we'll just shut it down."

"This was EOL last quarter."

"This is EOL next quarter."

"It's an internal system."

"We'll accept the risk."

Technical Flaws, Social Features

Flexibility, Transparency

Expect to change rules.

Expect to change scope.

Be clear, address ambiguity.

Be wary, avoid over-analyzing.

Document and track everything.

Adaptation

Communication

Working with researchers

Working with devs

Invite, reward

Explaining vulns

Warn, ban

Negotiating priority

Preparing for fallout

Measuring progress

> “All you have to do is follow three simple rules. One, never underestimate your opponent. Expect the unexpected. Two, take it outside. Never start anything inside the bar unless it's absolutely necessary. And three, be nice.” — Patrick Swayze, Roadhouse

Natural Selection

Search for advantageous traits among the crowd.

Skill — How many generate 90% of the valid reports?

Quality — How many earn 90% of the bounties?

Launch focused campaigns with select researchers on new apps, specific features, specific vulns.

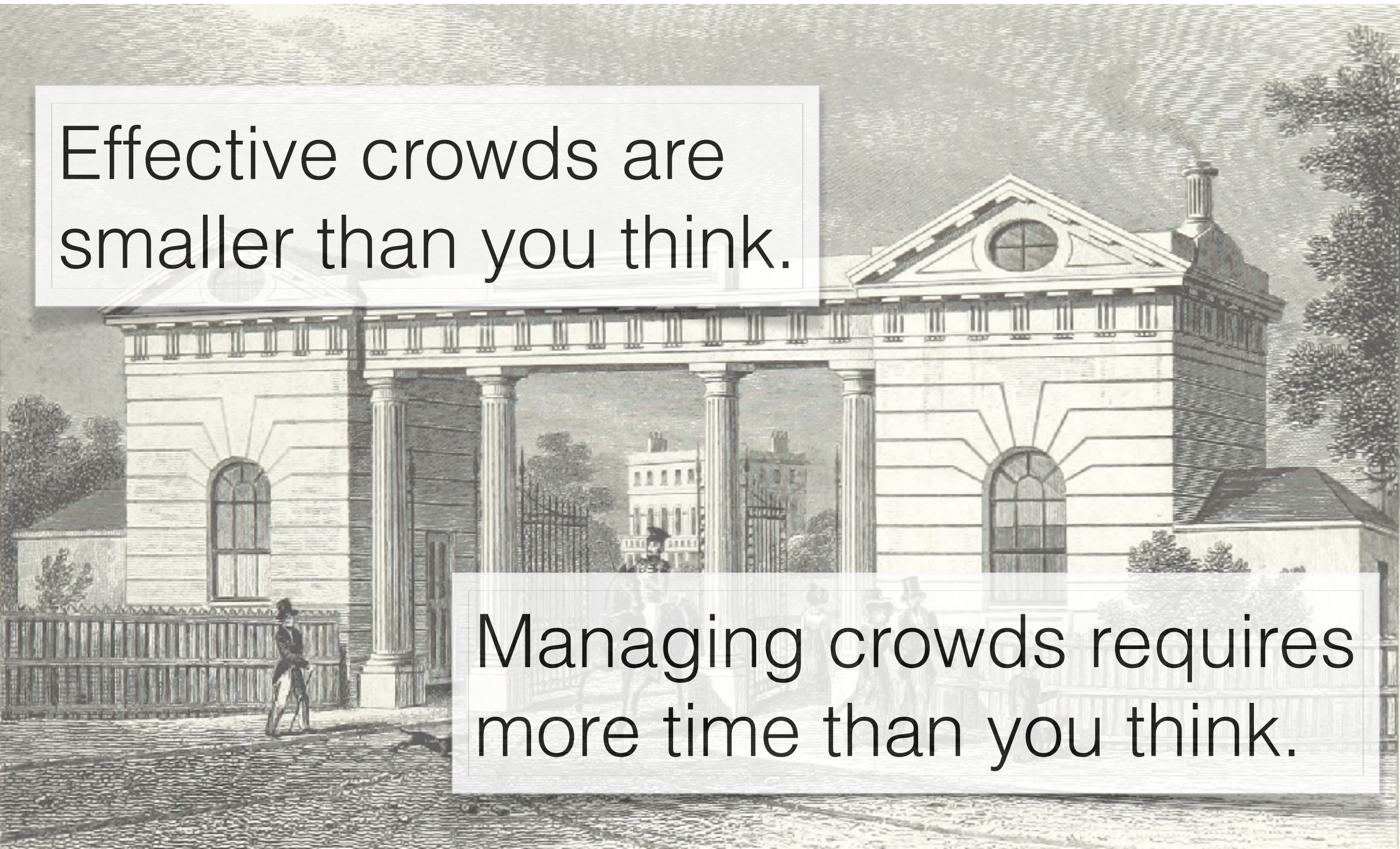
Navigating the Swarm

Measure. Test hypotheses. Review and adjust.

Focus on flaws and fixes. Be professional. Expect professionalism.

Use progressive experiments: Pen test, private bounty, public bounty.

Before You Leave



Effective crowds are smaller than you think.

Managing crowds requires more time than you think.

Thank You!

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https://deadliestwebattacks.com

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