HACKING FOR HOMELAND SECURITY (H4HS)

A strategic innovation capability for DHS

Vanessa Zabala,
H4HS Program Manager

What is H4HS?

Hacking for Homeland Security (H4HS) is a mission-driven entrepreneurship accredited academic program sponsored by the Department of Homeland Security (DHS) that engages DHS employees and academia to tackle pressing homeland security challenges through project-based courses.

The Value

SOLUTIONS

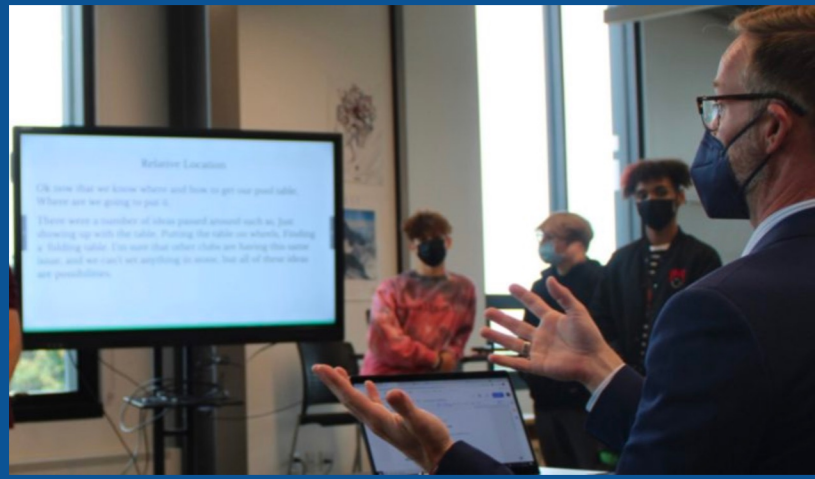
"Academic institutions host a treasure trove of brilliant minds, the greatest resource this nation has. BMNT and Common Mission Project were key to unlocking that latent talent and directing it in a way that found real, implementable solutions." - Previous Problem Sponsor

FRESH PERSPECTIVE

"Far too often, we learn from errors only after they become self-evident. With H4HS, we can lean forward and fix our flaws before they ever compromise our mission." - Previous Problem Sponsor

NEXT GEN WORKERS

"The beauty of H4HS is that we can solve today's problems with tomorrow's leaders."
- Previous Problem Sponsor



FEMA Testimonials

"Academic institutions host a treasure trove of brilliant minds, the greatest resource this nation has. BMNT and Common Mission Project were key to unlocking that latent talent and directing it in a way that found real, implementable solutions."

"Far too often, we learn from errors only after they become self-evident. With H4HS, we can lean forward and fix our flaws before they ever compromise our mission."

"H4HS was not just a FEMA affair – our state partners submitted their own wicked problem and students were able to see how problems impacted the local, state, tribal and federal-level operations. This was hugely successful and provided solutions for our front-line partners in the American west."

"The beauty of H4HS is that we can solve today's problems with tomorrow's leaders."

How it Works

FEMA employees submit problems to H4HS

important routine needs/problems that make work inefficient, not a problem that you would hire a consultant to work on. Remember, this is an academic program.

Students use entrepreneurial frameworks

Students work with the problem sponsor to hypothesis test the problem ecosystem, create solution success and fail criteria, recommend solution pathways.

Integrating solutions & career opportunities

Starting mid-semester the team begins discussing solution integration and senior leadership exposure needs.
This is also an opportunity to expose the team, and the entire class, to internship and career opportunities at FEMA.

H4HS FALL 2022

July 11	Problem Submission Deadline
August 15	Problem Selection by Student Teams
August 24	Semester begins
October 11	Mid-Course
December 16	Final Student Presentations

H4HS Impact

- H4HS started in **2020** and has operated for **4 semesters**
- H4HS has ran **12** challenges from **3** agencies at **2** universities with a total of **50** students
  - **7** out of 12 problems have come from FEMA, **5** for this semester
- Challenge submission topics have ranged from Technology Applications to Logistics
- **90%** of problem sponsors said they intended to develop or implement the solutions their student teams delivered

FALL 2022 - FEMA submitted challenges, so far

- The FEMA Region VIII National Preparedness team needs a way to assess the long-term economic impacts of disasters in small cities to allocate government disaster preparedness resources effectively.

- The Region I planning branch needs a process to quickly produce actionable non-notice disaster briefs for senior leaders to inform resource and funding decisions.

- FEMA Region I Planning Team needs a process to evaluate the overall risk of increased tornadoes, floods, and blizzards in New England urban environments to better anticipate long-term climate change-induced disaster impact.

- CITAP personnel need a way to implement lessons learned from past disaster responses to ensure continuous improvement of their assistance to state, local, tribal, and territorial entities in disaster situations.

- FEMA Individual Assistance personnel need a better framework for rehousing in specific regions to ensure displaced people are supported after disasters.

Evolution of a Challenge Statement

Pain Point

Original Challenge Statement

Beneficiary

FEMA buyout program team needs a way to **quantify the economic and environmental benefits of their property buyout risk mitigation program** to **incentivize targeted communities to participate in the program.**

Desired Outcome

Updated Challenge Statement

FEMA's buyout program team needs a way to **generate revenue in a carbon offset market for communities facing dangers from floods** to **increase access to equity in flood buyout programs.**

Universities for FALL 2022

- **Texas A&M**
- **Rochester Institute of Technology**

SPRING 2023

- **Challenge Submission Deadline: October, 2022**
- **Classes begin: January 17, 2023**
  - Sponsor engagement begins here
- **Universities: TBD**

H4HS challenges from previous semesters

Problem statements,
learnings, and results

FEMA, Delivering Emergency Power

Challenge: State Emergency Support Function (ESF) #12 needs a way to deliver emergency power requiring minimal sustainment to isolated communities in order to reduce risk to locals until emergency management teams can reach them.

Problem scoping and discovery: The team conducted over 100 interviews with FEMA, CISA, DOE & SERTC. Learned that power requirements of essential devices should be calculated with the combination of battery storage and solar as the solution. Communication is most essential during a disaster, so they focused on deployability.

Outcome: The team developed a beta product in the form of a drone that delivers essential relief kit consisting of a solar tarp, battery storage & thermal pads weighing only 5.5kg, and cost of $919.99. Team is developing potential test case with 40 Utah Dept. of Transportation drones.

Results/Next steps: The student team formed a company, Blackout LLC, with mentorship from early seed investors , to further develop, field and deploy a solution for FEMA

FEMA, Accommodating Evacuated People

Challenge: Responding American Red Cross teams and Emergency Managers need a way to safely accommodate evacuated individuals when neighboring towns and standard practices are not an option in order to avoid the spread of COVID-19 and save people from natural disasters.

Problem scoping and discovery: Based on extensive customer interviews, the team re-scoped the problem to focus on providing timely disaster relief information to assist individuals who might voluntarily and preemptively evacuate from a danger zone if they were provided timely and accessible information.

Outcome: The team developed an MVP in the form of a Tableau dashboard that provides live updates on local wildfires, pulling in information from across multiple sources. The dashboard provides: a timeline of updates, a map featuring locations of interest, and an embedded Google Map that provides directions.

Results/Next Steps: The dashboard has been presented to Emergency Managers within Colorado receiving overwhelmingly positive feedback. Request for future development included personalization of relevant information at the county level and implementation of a web-scraping tool to provide live updates.

FEMA, Addressing Wildfire Risk

Challenge: The Montana Forest Action Advisory Council needs recommendations to offer to agencies and other partners on how to best work together across ownership boundaries to address wildfire risk and forest health issues while representing the values of a diverse array of interests.

Problem scoping and discovery: Based on discovery interviews within FEMA, the team learned that a major pain point involved sub-optimal application of funding to this problem over the past 20 years. They identified 4 obstacles to optimization; vision, data accessibility, data clarity & non-comparative data.

Outcome: The team developed a graphical way to compare wildfire risk, project funding and population density to organize and optimize the impact of wildfire mitigation funding. The team developed a database addressing the four obstacles of vision, organization, data & standardization.

Results/Next Steps: The team's recommendation informs and compliments current FEMA Region VIII efforts to implement more purposeful data organization & tracking procedures. FEMA recently added a data management billet to address data issues and implement the recommended solution.

FEMA, Cyber Incident Response

Challenge: Emergency managers at all levels of government and cyber incident responders need an incident command system that facilitates their communication.

Problem scoping and discovery: During cyber incidents, roles are often unclear ,and a lack of specificity about the actual problem usually exists. The team scoped the problem to a specific use case: cyber incident response to a ransomware attack on Hospital information systems.

Outcome: The team created a beta product of a dashboard application developed on Figma that allows emergency managers to communicate essential information to relevant stakeholders during a cyber incident and provide incident commanders a tool to coordinate the actions of a response team.

Results/Next Steps: The student team identified that a cyber incident commander's response dashboard could save valuable time and money if properly developed and fielded. The student team made all data and discovery available to both FEMA and to the Colorado School of Mines for potential continued development by a senior design team.

FEMA, “War Gaming” Crisis Management

Challenge: The National Preparedness Division needs a safe and interactive way to run large-scale emergency simulations in order to improve crisis management skills and validate the response capabilities of the various communities.

Problem scoping and discovery: Through end-user and customer discovery, the student team pivoted away from emergency simulations to educating the general public on disaster hazards and preparedness in a non-resource intensive way.

Outcome: To address this re-scoped problem, the team developed a minimal viable product to test delivery of education by engaging the public in an activity that they already enjoy- gaming- while delivering disaster preparedness awareness & training.

Results/Next Steps: The team recommended two possible paths to deployment; 1. The team creates disaster preparedness games with FEMA, 2. FEMA partners with existing gaming companies who already have a large following and work to refocus currently popular games on disaster preparedness.

FEMA, Quantifying Carbon Capture

Challenge: Find a way for FEMA personnel to quantify the economic and environmental benefits of their property buy-out risk mitigation program.

Problem scoping and discovery: After the team conducted 24 informational interviews, they refined the problem statement to consider whether land from a flood buyout program could generate revenue in a carbon offset market, and further, whether this could increase equity in buyout programs.

Outcome: The team created a stochastic model determines conditions under which a community could benefit from entering a carbon market. The model outputs expected costs and payouts from market participation. The results show that although market participation is not profitable at current market prices, communities can avoid paying several hundred dollars in ongoing maintenance costs as long as yearly carbon market operational costs are below the cost communities currently pay to maintain vacant lots.

Results/Next Steps: The team highlights that future iterations of the stochastic model could consider non-financial benefits, including habitat creation, wetland restoration, outdoor recreation access, etc.

FEMA, Reunification After a Disaster

Challenge: National preparedness teams need improved coordination between emergency response stakeholders in order to reunite families quickly after a natural disaster.

Problem scoping and discovery: The team conducted 25 interviews and realized there are too many involved agencies involved in disaster relief. The team narrowed the scope to counties who are the main entity people turn to when looking to be reunited with survivors. People turn to who they are most familiar with so family members of survivor victims don't tend to think of FEMA and go straight to their local county. The county teams, such as the head of emergency operations in nashua county, do not rely on social media companies as a communication partner since those private companies have limited resources dedicated to emergency response. The reason social media communication has worked is due to the easy access without the firewall of needing to log in to a different platform.

Outcome: The team learned there are significant politics in each disaster relief silo that helps break down the current and future systems created for emergency management and family reunification. For this reason, the team recommends focusing the solution on building community awareness standardization by creating an agreement that relieves the burden off of associated sats who are who are helping assist during a disaster, because, disasters are local. This agreement should be a mechanism triggered by the potential of a disaster and not have to wait for the president's order. This is already happening with the University at Albany who is working with FEMA to standardize disaster messaging for emergency managers to spread awareness to their communities.

Results/Next Steps: Focus on community Wendy is looking to continue working on this problem and integrating the solution. They will discuss awareness standardization and a product that can mimic the easy access twitter has.

Sponsor’s Role

Employee Introductions
(at least 30 during semester)

Be regularly engaged with student teams

Check-in Weekly (1-3 hrs per week)

Feedback and Coaching

H4HS Roadmap

Gather DHS challenges

Challenge Submission Deadline

Spring 2023:
October, 2022

Challenges sent to universities

Student teams select challenges

H4HS Course
(Sponsor engagement begins)

Fall 2022:
August 24 - December 10, 2022

Spring 2023:
January 17 - May 5, 2023

What next?

1) **Submit a Challenge (30 minute conversation). Schedule your conversation now by emailing:**

- h4hs@bmnt.com

2) H4HS Problem Sourcing Seminar

- Invite FEMA employees
- 60 minute duration
- Learn about H4HS
- Brainstorm agency challenges
- Create problem statements
- Decide if they want to get involved

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Thank you!

For questions and information

email: h4hs@bmnt.com

Or Vanessa Zabala: vzabala@bmnt.com

Learn more:

https://www.h4homelandsecurity.us/

Defining the Innovation Problem

Hacking for Homeland Security: Lean Innovation Training

h4xtraining@bmnt.com

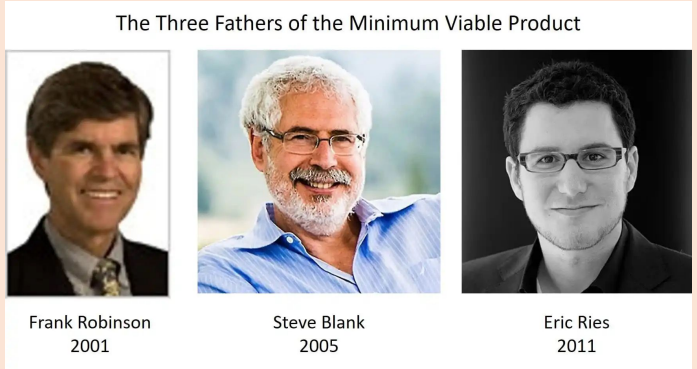
What we mean by ‘Innovation’

Inductive Reasoning

Sir Francis Bacon

Nassim Taleb

Minimum Viable Product



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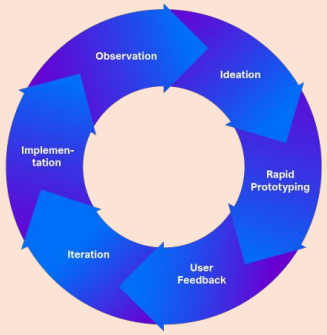
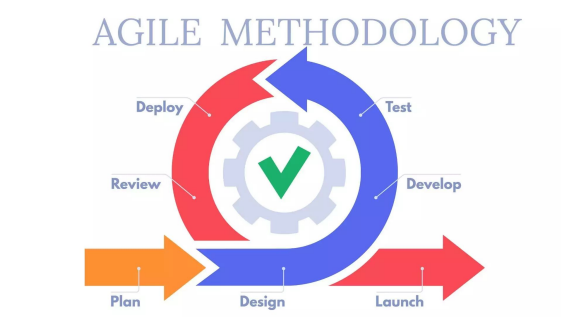


IDEO’s Human Centered Design



Agile Product Development

How is that different?

Government Process

Innovation Process

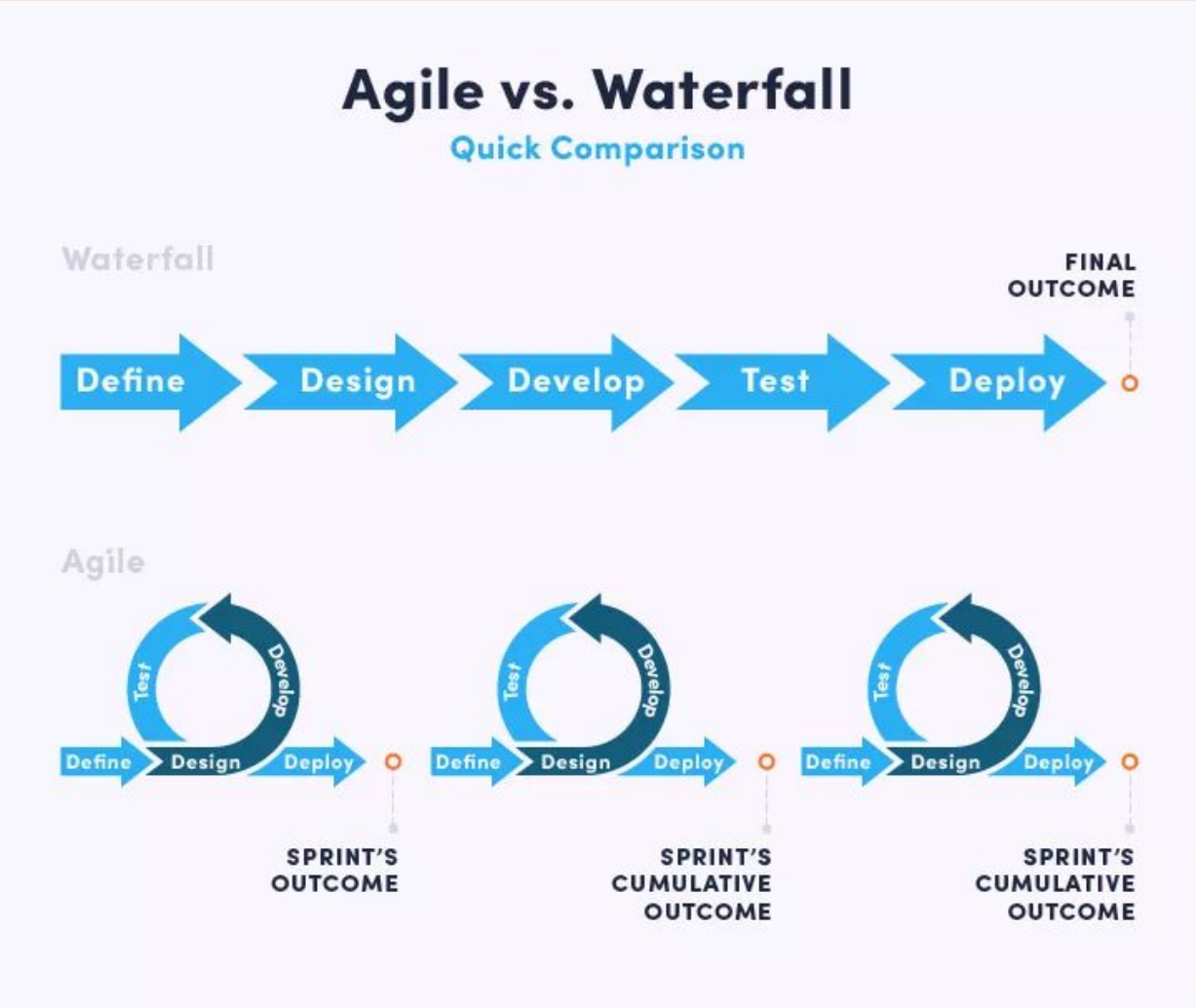


Image by Sello.com

Hurricane Maria

Hacking for Homeland Security: Lean Innovation Training

h4xtraining@bmnt.com