HUMANITARIAN INNOVATION FUND

Large Grant Final Report

Organisation Name	Humanitarian OpenStreetMap Team

Project Title	**OpenAerialMap**
Partner(s)	American Red Cross, Development Seed, Azavea, Stamen
Problem Addressed / Thematic Focus	Providing easy access to satellite and aerial imagery for humanitarian response and mapping.
Location	Global
Start Date	March 2014
End Date	August 2015
Reporting Period	Final

Total Funding	119,145 GBP
Total Spent	119,192 GBP

Innovation Stage	Development
Type of Innovation	Process innovation
Project Impact Summary	Humanitarians rely on "overhead" imagery for a variety of applications including situational awareness, deriving base map data, and assessing damage. An open source common catalogue of openly licensed imagery has not existed until OpenAerialMap was created. If is now possible for image providers, from satellite to drone operators, to share imagery they collect, with humanitarian operators and easily make it exploitable by crowdsource-mapping projects like OpenStreetMap

PROJECT ACTIVITIES AND OUTPUTS

*Please go to **Appendix 1** and attach the final workplan, showing all work that was actually completed.*

1. With reference to the final workplan, what have been the key achievements of the project?

- The successful publication of the OpenAerialMap catalog website and source code
- A federated network of imagery hosts was created, called Open Imagery Network (OIN)
- The OAM uploader allows anyone to share their own aerial imagery
- Humanitarians now have a common reference place to find and share open imagery
- The OAM Server provides rapid image processing for disaster response mapping

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INNOVATION OUTCOMES

Whether this innovative project was successful, not successful, or a mix of both, the HIF would like you to report as much detail as possible, so that success can be built on and failures can be learned from. By 'success' we mean that the innovation has achieved the planned positive impact/outcome, or that it has performed better than the current process, product or system.

2. Has the project demonstrated the success of the innovation? *(Please choose only one answer.)*

☐ Completely successful
☒ Significantly successful
☐ Partially successful
☐ Completely unsuccessful

2b. Please select the successes that your project has achieved:
(You may choose more than one)

☒ There is real evidence that the project achieved the planned outcome(s)
☒ There were perceived contributions or improvements to the planned outcome(s)
☒ Learning was achieved within the project cycle
☐ 'Lessons learned' were gathered and circulated to humanitarian stakeholders and actors
☐The completion of this project has led to another innovation
☐ Other *(please comment)* _____

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2c. Please select the challenges your project has encountered:
(You may choose more than one)

☐ The project did not complete its planned activities
☐ There is no real evidence that the project achieved the planned outcome(s)
☐ There were few perceived contributions or improvements to the planned outcome(s)
☐ Learning was not achieved within the project cycle
☒ 'Lessons learned' were not circulated to humanitarian stakeholders and actors
☐ Other *(please comment)* _____

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2d. If there is any evidence for the successful performance of the innovation, please describe it further:

- OpenAerialMap.org has been available online since May 2015 and has been accessed by over 5,000 users.
- Imagery providers have already adopted the platform for sharing imagery, from drone mappers to satellite operators.
- Digital humanitarians have been using OAM to find imagery for tracing in OpenStreetMap.
- The Red Cross and World Bank have been using OAM to store and share imagery collected for humanitarian projects.

3. Please show the components of the project which contributed the most to any *successes*:

(where 1 = most influence 3 = least influence)

Component	***1***	***2***	***3***	***N/A***
Design and placement of the innovation	☒	☐	☐	☐
The methodology or approach to collecting evidence	☐	☒	☐	☐
Context	☐	☒	☐	☐
The availability of resources and capacities (financial, human, technical etc.)	☒	☐	☐	☐
Success in identifying and responding to different project and innovation risks	☐	☒	☐	☐
Strength of relationships and collaborations within the team and with other stakeholders	☒	☐	☐	☐
The process was flexible and responsive to emerging results	☒	☐	☐	☐
Ability to draw on experience and expertise of existing practice, codes and standards	☒	☐	☐	☐
Other:	☐	☐	☐	☐
Other:	☐	☐	☐	☐

4. Please show the components of the project which contributed the most to any unsuccessful elements of the project

Component	***Yes- contributed to failures***
Weaknesses in the design and placement of the innovation	☐
The methodology or approach to collecting evidence	☐
Context	☐

A lack of access to resources and capacities (financial, human, technical etc.)	☒
Difficulty in identifying and responding to different risks	☒
Lack of good relationships and collaboration within the team and with other stakeholders	☐
Having a process that was not flexible or responsive to emerging results	☐
No ability to draw on experience and expertise of existing practice, codes and standards	☐
Other:	☐
Other:	☐

5. What are the top three, key lessons learnt relating to the innovation? *This should relate to the innovation or the sector in which it operates, rather than project implementation.*

1. Rapid, easy access to open imagery is crucial to efficient disaster response.

2. Hosting imagery in one place is expensive. A distributed storage approach is more sustainable.

3. Earth observation is becoming more democratic, by way of cheaper and smaller satellites, and drones. The amount of data shared freely by government/commercial satellite providers and personal drone mappers is increasing exponentially.

6. Do the final outcomes support the initial rationale for the innovation?

☐ Yes, completely
☒ Yes, significantly
☐ Partially
☐ No, not at all

Please describe further:

Yes, the outcome provides all the functions that we originally envisioned and planned for the innovation. During the project, more ideas have developed for further functionalities, and have been recorded for implementation in the next phases.

7. How has your understanding of the innovation changed through the project period?

We initially envisioned OAM being the host of all imagery that providers would contribute, but we quickly realized that it would not have been sustainable, even if we limited the type of imagery to that for humanitarian scope. We thus formulated the idea of a Open Imagery Network that provides a distributed mechanism for hosting imagery directly by providers and donors. OAM has thus become a catalogue that indexes all those sources and provides unified access through a Web browser UI and a machine readable API.

8. Did the innovation lead to any unexpected outcomes or results? How were these identified and managed?

The only unexpected outcome was a problem in the originally planned OAM Server component architecture, which lead to a re-design through a different approach. This cause a no-cost extension delay with one of the developers.

METHODOLOGY

9. Was the methodology successful in producing credible evidence on the performance of the innovation?

☐ Yes, completely
☒ Yes, significantly
☐ Partially
☐ No, not at all

Please describe further:

The current implementation of OAM works as expected. Providers and users have already adopted it to share and find open imagery. Although the code and the architecture are built to scale, OAM at the moment only hosts a few thousand images, and with widespread adoption a more redundant implementation will be necessary.

In order to seamlessly work with more traditional desktop mapping software, and existing imagery catalogues, ISO and OGC standard endpoints will also need to be developed.

PARTNERSHIPS AND COLLABORATION

10. How and why did the partnership change during the course of the project?

The community of interested actors (commercial providers, humanitarian NGOs, developers, volunteers) consistently grew over the course of the project.

11. Are there plans to continue your partnership, either while scaling up this innovation or on other projects?

☒ Yes, with this innovation

☐ Yes, with another project
☐ Maybe
☐ No

Please describe further:

HOT and Development Seed have jointly applied for further funding to implement OAM.

DISSEMINATION

12. Please describe any steps taken to disseminate the outcomes of the project.
Please include all completed and forthcoming, as well as all planned and unplanned products (for example, research and policy reports, journal articles, video blogs, evaluations).

- Blogposts on www.hotosm.org
- Explainer video on Youtube
- Presentations at UAViators Expert Meeting, ESA EO Science 2.0 Conference, HOT Summit
- Article in Journal of International Humanitarian Action (forthcoming)
- Twitter and Facebook posts
- White paper (final draft)

13. Has the project received any third party coverage during the project (from news media, third party blogs, researchers or academics etc.)?

Yes, mostly third party blogs. Some examples:

http://irevolution.net/?s=openaerialmap

https://developmentseed.org/blog/2015/08/17/uav-for-road-monitoring/

https://smathermather.wordpress.com/tag/openaerialmap/

http://publiclab.org/notes/warren/05-29-2015/openaerialmap-open-imagery-network-public-lab-s-mapknitter

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SCALE UP AND DIFFUSION – WHAT NEXT?

14. Is the project or innovation to be replicated or scaled up?

☒ Yes, we will scale up in the same or similar context
☐ Yes, we will scale up within our organisation (including running more pilots or trials)
☐ Yes, we will replicate the innovation/project in another context or country
☐ Yes, the innovation/project will be replicated or scaled up by another organisation or stakeholder
☐Yes, other
☐ No

If you answered *yes* to question 14, please answer 14b:

14b. What model are you pursuing to scale up or sustain your innovation?

☒ Applying for more donor funding

☐ Selling the innovation or patent
☐ Cost recovery (for example, selling your service or being paid as a consultant to implement the innovation)
☒ Innovation to be taken up by organisation or government as standard and included in standard planning and core funding by them
☐ Other_____

Please describe further:

We anticipate that community members will continue to develop OAM with their own resources, to promote it, or to contribute hardware, storage and bandwidth. Some examples are Amazon providing additional free AWS resources and Development Seed organizing events like https://satsummit.io to talk about OAM and the needs of openly licensed imagery for humanitarian response. As mentioned above, we are also actively seeking funding to secure further development.

15. If the project or innovation could be replicated or scaled up, please list the three most important issues or actions that will need to be considered:
(where 1 = most important and 3 = least important)

Suggestion/issue	***1***	***2***	***3***
1. Despite continuing decrease in data storage and transfer costs, this is still and important aspect to consider for organizations wanting to join or replicate OAM.	☒	☐	☐
2. Adequate technical capacity is required to implement OAM instances	☐	☒	☐
3. OAM will see additional widespread adoption from more traditional data providers when further levels of access will be implemented. At the moment all data is public and open. Some providers may want to contribute data, but restrict access with a specific use license that only allow downloads by humanitarian NGOs responding to disasters.	☐	☒	☐

Appendix 1. Final Workplan

Below is a table that is the same as the workplan that you submitted with your original application. There are **three ways** to respond to this section.

1. If there have been no changes at all through the project you may cut and paste your original workplan here**.**

2. If there have been changes to the project but these changes **were previously reported to the HIF** in an *Agreement Amendment* form, please adjust your original workplan so that these changes are recorded in it here.

3. If there have been changes which were **not previously reported to the HIF,** please **also** fill in Table 2 (which is on the next page). In particular, please make sure to explain any budget various greater than 15% in Table 2.

Please paste your final workplan in here >

Expected Results	Main Planned activities	Implementation period Months												Responsible party / person	Amount 2015 HIF
		1	2	3	4	5	6	7	8	9	10	11	12		
OAM node	Feature Planning	x	x	x	x	x								Project Manager, Software Development and System Administration	80,535 GBP
	Tool Development					x	x	x	x	x	x	x	x		
	Software Release						x		x		x		x		
	Testing									x	x	x	x		
	Infrastructure Configuration			x	x	x	x	x	x	x	x	X	X		
OAM Community and Partnerships	Blog Posts		x		x		x		x		x		x	Project Manager	6,690 GBP
	Social Media Outreach	x	x	x	x	x	x	x	x	x	x	X	x		
	Community Meetings	x	x	x	x	x	x	x	x	x	x	x	x		
Clear Guides for Using and Implementing OAM	Technical Documentation					x	x	x	x	x	x	x	X	Project Manager and Researcher	19,442 GBP
	User Documentation								x	x	x	x	x		
	White Papers / Use Cases									x	x	x	x		
	Journal Article Submission												x		
	Final Project Report											x	x		
															106,667 GBP

Table 2: Changes to Workplan

For every change in the final workplan that is different to your original worktable AND that has not already been reported to the HIF, please add a record in this table. Changes can include alterations to the methodology, project process or innovation design, for example.

Change (as referenced in workplan above)	**Reason for change**	**Overall impact of change**
1. Tool development (OAM Server)	Change of software for distributed processing	No cost extension work by Azavea
2. Software release	OAM Server release shifted to October for reason above.	Further testing and integration performed through October but no major impact on overall product
3. Article submission	Challenges with finding appropriate journal	No major impact, it will be submitted in November
4.		