Flying Labs: Harnessing the Power of Robotics for Social Innovation

1. Problem Statement

Panama is the fastest-growing economy in Latin America and the Caribbean, with an average annual GDP growth rate of 8.3% between 2010 and 2014. However, the effect of growth on poverty reduction was lower than the average for Latin America, due to the country's pronounced social gaps and institutional shortcomings. There are very dynamic sectors in Panama, such as the Canal conglomerate, which enjoy special regulations to facilitate investment and require skilled labor, operating side-by-side with other sectors, such as agriculture and manufacturing, which continue to face restrictive legal and regulatory frameworks, resulting in low investment and productivity levels. This is coupled with significant gaps in health, education, and other basic services, which create barriers that prevent the lower-income population from gaining a foothold in the productive areas undergoing expansion. This situation reflects persistent challenges for the public provision of social services and for the consolidation of a social safety net that comprehensively addresses the needs of rural areas and indigenous comarcas, as well as growing urban centers. It also reflects an opportunity for social innovation, which adds value through new products, services, and business models that address social problems that are not being solved by the market. And technology plays a key role in developing, deploying, and scaling social innovation solutions.

Emerging Fourth Industrial Revolution technology breakthroughs in fields such as robotics and artificial intelligence in particular have a transformative role to play in the development sector, aside from their well-known impact in manufacturing and other industries. After all, the rise of intelligent automation as a global economic force is paralleled by increasingly complex social challenges, such as climate change, rapid urbanization, environmental degradation, and entrenched poverty, all of which call for innovative and tech-driven solutions. Drones, the most well-known robotics technology, are being used to combat deforestation by monitoring illegal mining and logging in the Amazon, to survey natural disaster sites, and to deliver vaccines to rural villages. Data collection and cargo delivery applications for maritime and terrestrial robotics are also advancing.

However, despite their promise, the potential application of robotics technology as a social innovation solution is not widely known in Panama, as in the rest of LAC. This is largely due to the lack of local capacity in practical applications of this technology in industry or social sectors, and paucity of local technology businesses focused on robotics that could provide test cases. Increased understanding of and demand for these technologies can also signal new business opportunities, sparking entrepreneurial activity and tech-driven job creation within the local innovation ecosystem. However, the convergence of demand for tech-driven social innovation solutions with appropriate robotics technologies will not happen automatically. A catalyst is required to accelerate the transfer of professional and technical skills to local technology and social innovation partners along with appropriate robotics solutions.

2. Executing Agency and Strategic Partners

Fundación Tecnológica de Panamá (FTP) from the Universidad Tecnológica de Panamá will be the project's Executing Agency, given their technological and engineering expertise in the field of robotics and artificial intelligence, connections with other local innovation ecosystem actors, and the Foundation's ability to sustain the Flying Lab in the future. Fundación Tecnológica will partner with **WeRobotics**, a US-based non-profit dedicated to scaling the impact of robotics solutions for key social

problems worldwide, which always works with local partners to co-create local innovation labs (Flying Labs) to serve as regional robotics for good hubs and business incubators. **Ciudad del Saber** will be a key partner of the Flying Lab, given their expertise in business incubation and entrepreneurship. To establish the lab and build local capacity, WeRobotics will serve as independent experts (to be contracted by FTP), transferring the latest and most appropriate technologies and skills to local lab partners. WeRobotics is not a tech provider, but rather helps local partners access these technologies thanks to strategic partnerships with major robotics manufacturers, tech companies, and research institutes. Starting in Nepal, WeRobotics is in the process of creating a global network of flying labs, with work initiated in over 25 countries.

3. Proposed Solution

WeRobotics' Flying Lab model aims to catalyze and accelerate the transfer of professional skills and robotics technologies (aerial drones/UAVs, marine, and ground) to local partners (universities, NGOs, communities) who can apply these technologies to address local problems. Building the lab follows a 4-phase framework. Phase 1 is the scoping phase, in which key partners, specific country challenges, and appropriate robotics solutions are identified. Phase 2 is the transfer phase during which WeRobotics transfers professional and technical skills to the lab, along with a fleet of robotics technologies. Phase 3 entails the implementation of projects driven by the local lab team ('learning by doing') to address challenges identified with local communities. Projects can focus on climate change, forestry, agriculture, infrastructure, development, disaster resilience, cargo delivery, among other areas. Phase 4, which will be developed in collaboration with Ciudad del Saber, focuses on linking the innovations being developed at the Lab with local industries and strategic partners, generating new business opportunities to help sustain the Lab and catalyzing entrepreneurship opportunities within the local ecosystem around robotics-as-a-service. For example, in Nepal, the Flying Lab was established with the Engineering Department of the University of Kathmandu. Once trained, the first test case the local team performed was an aerial mapping of the earthquake zone in order to assist with rebuilding efforts. Government officials have since contracted the lab team to carry out similar services in other parts of the country.

Ultimately, the Flying Lab in Panama will become a regional innovation hub for accelerating the growth of robotics applications in the social sector, tech-driven enterprise creation around robotics-as-a-service, and robotics applied research. The vitality of Canal-driven economic activity in Panama, anchored by a productive conglomerate engaged in export logistics and transportation services, enables the creation of new businesses which facilitate the implementation of the project. The lab will carry out impactful projects, capturing knowledge and best practices around applications of robotics for social good, while also sharing with and learning from other labs being established around the world to accelerate cross-pollination among use cases, contests, and new robotics solutions.

4. The Innovation

Beyond the robotics technologies themselves, the goal of expanding access to these technologies and empowering local actors to apply them to address social problems is very innovative. WeRobotics is the only organization working to accelerate the impact of social good globally through the sustainable transfer of robotics solutions through a dedicated network of Flying Labs. The labs will create valuable solutions and data products in remote and high need areas, augment learning and innovation, test leading edge technologies in tough conditions, and catalyze local technology startups.

5. Scaling Strategy

While the initial scope of work for the WeRobotics lab focuses on Panama, the goal of the lab is to serve as a regional magnet for robotics research, robotics companies and social good applications. In order to build towards regional scale, the first step beyond the initial Panamanian focus will involve inviting organizations and individuals from elsewhere in Central America and the Caribbean to attend the lab, learn from current practices, and engage in consultation on possible applications of the WeRobotics lab model to their contexts. Also, the solutions developed and implemented in communities in Panama could be applicable to Central American and Caribbean communities as well. In parallel, the lab will hold regional events and webinars designed to cultivate a community of practice throughout the region. Once regional demand has been demonstrated, WeRobotics will aim to establish additional labs in key locations which can build off the Panamanian example. By supporting the WeRobotics approach at this early stage, the MIF will help to strengthen and consolidate the Flying Lab business model through its implementation in Panama, including developing a sustainability strategy for incorporating robotics-as-a-service into lab activities, which could then be applied at regional and global scale.

6. Alignment to IDBG strategies (including country strategy)

The project is directly aligned with a new IDB/CTI loan with the National Department of Science, Technology, and Innovation (SENACYT), particularly the component on “Innovation for Social Inclusion”, which includes organizing competitions with excluded groups to identify problems (related to education, health, access to services, etc.), followed by competitions to identify tech-driven solutions, which may include robotics solutions offered by the Flying lab to be established. The project is also aligned with the Panama country strategy 2015-2019, specifically the strategic objective to strengthen the population’s educational profile, establishing the need for an innovation system that promotes social inclusion and productivity, as well as objectives related to enhancing competitiveness.

7. Alignment to main thematic area

This project fits within the Knowledge Economy, particularly the Ecosystem area. Specifically, the Flying Lab will create an innovation hub around robotics technology in Panama, bringing different local ecosystem actors (universities, accelerators, businesses, public sector) together and paving the way for the development of tech-driven solutions to social and environmental problems.

8. Indicators

- # of individuals trained and certified in robotics applications
- # of social innovation projects using robotics technology supported
- # of startups incubated
- # of new jobs created (jobs created through business incubated)

9. Financing

The MIF would provide a $600,000 grant to be matched with at least $600,000 in counterpart resources.

10. Team

Gina Cambra (MIF/CPN); Norah Sullivan (MIF/KE); Svante Persson (MIF/IC); Yves Lesenfants (MIF/MIF); Galileo Solis (CTI/CPN)