

**PLAN OF OPERATIONS**  
**INDIVIDUAL PROJECT OF THE FACILITY RG-O1676**  
**LINE OF ACTIVITY FOR INNOVATION PROTOTYPES**  
**“TC PROTOTYPES”**

**DELEGATION OF AUTHORITY TO COUNTRY OFFICES<sup>1</sup>**

**BRAZIL**  
**(BR-T1454, BR-G1009)**

**I. GENERAL INFORMATION**

<b>Title</b>	NeuralMed: Detection of Covid-19 pulmonary alterations on chest X-rays using artificial intelligence.		
<b>Executing Agency:</b>	US-IDB - INTER-AMERICAN DEVELOPMENT BANK		
<b>Focus Area:</b>	Knowledge Economy (Healthtech)		
<b>Project Beneficiaries:</b>	90.000 more assertive chest X-Ray reports that will improve the flow of 10 hospitals in 3 countries, providing access to a faster and more precise diagnostic to 63,000 low-income people.		
<b>Financing:</b>	IDB Lab Contingent Recovery Investment Grant (BR-G1009):	US\$ 75,000	36%
	IDB Lab Non Reimbursable Technical Cooperation (BR-T1454):	US\$ 75,000	36%
	Counterpart:	US\$ 58,000	28%
	<b>TOTAL PROJECT BUDGET:</b>	US\$ 208,000	100%
<b>Execution and Disbursement Period:</b>	12 months of execution and 11 months of disbursement.		
<b>Objective:</b>	The goal of this operation is to support the startup NeuralMed, developing and expanding to LAC its solution that uses artificial intelligence models based on deep learning to analyze chest X-ray images to better and accurately detect pulmonary changes in patients with suspected of Covid-19		
<b>Environmental and Social Impact Review</b>	This operation was screened and classified as required by the IDB's safeguard policy (OP-703) on 10/28/2019. Given the limited impacts and risks, the proposed category for the project is C.		
<b>Project Team</b>	Felipe Cresciulo (INV/CBR), Padydeh Eghbali (LAB/FIA), Jéssica Leite (DIS/CBR), Fermin Vivanco (MIF/MSM), Yolanda Strachan (LAB/KNW), Ruth Houliston (DIS/CBA), Jossette Soto (DIS/CCR), Alexandra Hambrook (FML/LAB), Eduardo de Azevedo (KIC/ICD), Catherine Pinto (SCL/SPH), George Rogers (GCL/FOM)		
<b>Unit responsible for disbursements</b>	IDB Lab		

<sup>1</sup> Delegation of authority for approval of TC Prototype operations up to US\$150,000 is established under MIF-GN-123

## Annex I – Matrix Results

### II. BACKGROUND AND JUSTIFICATION

#### A. Problem Description

- 2.1. The World Health Organization (WHO) has declared on March 11th, 2020 the COVID-19 spread as a pandemic. Since then, the disease caused by the novel coronavirus (Sars-Cov-2) has spread throughout the continents and as of 16 April 2020, there have been 1,995,983 confirmed cases of COVID-19, including 131,037 deaths, reported to WHO. In Brazil, according to the Ministry of Health, there have been 28,320 confirmed cases of COVID-19, including 1,736 deaths as of 16 April 2020. These numbers show the quick escalation of the transmission causing the health sector to be overwhelmed and lacking enough resources to fight the disease, such as exams.
- 2.2. According to the most recent report<sup>2</sup> made by the surveillance secretariat of the health ministry from the 22.9 million laboratory tests acquired, only 9,183 million have a delivery date set. Those include the RT-PCR type (also known as molecular tests) and the serological tests (also known as quick tests). In addition to the delay in delivering test kits and delay in test results, there is a problem with the accuracy of the diagnostics since there is a matter of quality of the chemical reagents.
- 2.3. The lack of diagnostics delays the correct treatment and monitoring of the patients diagnosed with COVID-19. In vulnerable regions, the latter the diagnosis, the worst the consequences, as the population has less access to health assistance and, for economic reasons, it is less susceptible to follow isolation protocols, causing the growth of the transmission curve.
- 2.4. Tests made by image analysis of CT-scans or X-rays are complementary to laboratory tests. The initial objective of the imaging exam is to provide diagnostic clues and document its consequences already installed, patients with acute flu syndrome, which is a clinical symptom of COVID, need the imaging exam at the beginning of treatment to take medical conduct. Radiography is also important to monitor the evolution of the disease in the patient.
- 2.5. Today, Covid-19's main image diagnostic tool is the computerized tomography of the chest. However, due to its high cost, it is not an alternative for most vulnerable populations in Brazil and in other countries of the region. In addition to the costs of implanting and operating the equipment, its use depends on a chain of health professionals including highly qualified, expensive and scarce specialist radiologists in Brazil. Although there are about 12 thousand radiologists in Brazil, there are significant regional differences with the concentration of these professionals in the center-south region.
- 2.6. Conventional radiography is a more widespread examination at a lower cost than CT-scans, makes it the main auxiliary diagnostic tool available, especially to deprived communities. However, its reading in emergency rooms is done by general practitioners or the nursing team, reducing its diagnostic accuracy<sup>3</sup>. The use of artificial intelligence can improve accuracy by expanding its use and bringing gains to patients, professionals and health systems.

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<sup>2</sup> “Mais da metade dos 22,9 milhões de testes não tem data para chegar” [link](#)

<sup>3</sup> “Error and discrepancy in radiology: inevitable or avoidable?” [link](#)

### **III. THE INNOVATION PROPOSAL**

#### **A. Description of the Solution being Tested**

- 3.1. The goal of this operation is to support the startup NeuralMed, developing and expanding to LAC its solution that uses artificial intelligence models based on deep learning to analyze chest X-ray images to better and accurately detect pulmonary changes in patients with suspected of Covid-19.
- 3.2. Neuralmed's solution will be especially important in three situations:
  - When there is no availability of computerized tomography and radiography is the available modality.
  - Where computerized tomography is available, the system can streamline its use, prioritizing patients who need it most.
  - Situations with limited access to laboratory tests assisting clinical team decision making.
- 3.3. The solution easily integrates into the healthcare system using the standard DICOM medical image interoperability protocol. It can be used integrating NeuralMed's API<sup>4</sup> with existing PAC systems<sup>5</sup> in hospitals, or a physician can upload an X-Ray image to NeuralMed's website and get the result in 3 seconds.
- 3.4. NeuralMed's experience includes implantations in hospitals that serve the SUS (public health system) in Brazil, having knowledge in working with images of a lower quality than those of an international standard. It has already launched a version to identify COVID-19, making free of charge access to any doctor in the world with a current assertiveness of 85%. The project aims for NeuralMed to seek new partnerships to increase its base of COVID-19 exams, as well as to improve its Artificial Intelligence to increase the assertiveness of this tool.
- 3.5. Today analysis is being made locally, without taking images outside Brazil. There are legal restrictions for processing abroad and the company has technical conditions to do it in the national territory. The training of the models can be done abroad as the images used are completely anonymized.
- 3.6. Due to the pandemic situation and lack of exams available to the population, NeuralMed's solution is an important tool to help with the diagnostics of COVID-19 cases as well as the prevention of contagion to vulnerable population. The company is committed to keeping the platform open and free of charge until the end of this health crisis and the solution has a possibility of being scaled up in IDB's operations related to COVID-19's situation.

#### **B. Description of the Beneficiaries**

- 3.7. Brazil has immense regional and even local differences, with an asymmetrical distribution of availability of CT scans and specific laboratory tests. On the other hand, there is a greater availability of X-rays, which makes it the main auxiliary diagnostic tool available. The X-ray, specifically the chest, is the most common exam in the emergency room, served as the first screening test for cardiorespiratory symptoms, however with the low price paid for the exam and the demand for agility in the emergency room, this exam is usually analyzed by a generalist, rather than a specialist, a radiologist, in this case.
- 3.8. NeuralMed's tool manages to screen patients most likely to have pulmonary complications or even separate patients confirmed to have COVID, which are

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<sup>4</sup> Application Programming Interface is a computing interface which defines interactions between multiple software intermediaries.

<sup>5</sup> Picture Archiving and Communication System is a medical imaging technology which provides economical storage and convenient access to images from multiple modalities.

more serious and require ICU care. With the X-Ray, you can totally change the flow of care, since these patients will not need to be directed to the few reference hospitals that have tomography, which increases the time of care, and thus, also the chance of contaminating other patients along that route. This advantage will become more apparent as the virus spread across the region and more patients use service stations in the peripheral regions of large cities and more distant regions of Brazil and other LAC countries.

- 3.9. Therefore the main beneficiaries of this tools are i) general practitioners and the nursing team that will have access to a tool that will help them in the diagnosis of the patient, increasing their diagnostic accuracy; ii) patients, especially in peripheral regions, that will have access to a faster and more precise diagnostic; iii) health systems that will have their flow improved, reducing costs and contagion within the health system.

#### IV. THE PROTOTYPE EXECUTION STAGES

Stage	2020								2021			
	May	June	July	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr
I Definition												
II Implementation												
III Evaluation/Knowledge Dissemination												

##### A. Definition Stage:

- 4.1. The main goal of this stage will be setting NeuralMed's tool in hospitals in order to expand its database of Chest X-Rays with COVID-19.
- 4.2. **Setting up the Tool in Health Units.** Neuralmed's has developed pneumonia detection models that analyzed more than 50 thousand Chest X-Rays over the past 2 years. Based on these models and analyzing 500 CT-Scans exams with COVID-19, the company trained a preliminary model that showed 85% minimum accuracy. The company will implement this preliminary model in 1 hospital.
- 4.3. **Data collection.** After setting up of the initial version in health units, it is expected to collect cases of COVID-19 from patients at different stages and severities of the disease, as well as other patients who present opacities unrelated to COVID-19.
- 4.4. It is expected to reach a minimum 2,000 positive cases to start the next stage.

##### B. Implementation Stage:

- 4.5. The main objective of the Implementation Stage is to enhance the current model thought several developing cycles.
- 4.6. **Development of classification models.** NeuralMed already has models for detecting alveolar opacity and interstitial opacity, with AUC<sup>6</sup> of 0.93 and 0.88 respectively. The initial / mild cases of COVID-19 are usually classified as interstitial opacity, while the later / severe cases are alveolar. In parallel, the company needs to develop a model that classifies Bacterial Pneumonia or Viral

<sup>6</sup> AUC (area under the curve) is the model's ability to know when a negative result is in fact negative and when a positive result is in fact positive. The higher this indicator, the better it's the model assertiveness.

Pneumonia, important differential diagnoses, which it will develop using public and internal data. It has already obtained AUC of 0.95 in this task, but NeuralMed understand that there is room to improve its generalization and the recognition of less frequent patterns. After data collection, the team will begin training the model to specifically detect COVID-19, using transfer learning from the models mentioned to speed up training.

- 4.7. **Image marking.** After receiving the images and in parallel with the development of the classification models, doctors will mark on the images where the changes referring to COVID-19 are present. This will assist in the development of a pathology localization model, which will help doctors trusting the tool - as it will show not only if the pathology is present but where it is present -, and it will allow doctors to visualize the extent of pulmonary involvement, helping them to infer the severity of the disease.
- 4.8. **Development of location models and proportion calculation.** Models will be developed to help locate the pathology using the markings made by physicians. These models will be built in stages, turning them available gradually until they reach a good accuracy in the location. The metric used to evaluate this type of model is the Intersection over Union (iou). When a minimum iou of 0.8 is reached, a model will also be developed to estimate the proportion of the lung being affected by the disease.
- 4.9. **Validation.** Prior to roll-out the models in the health units, validation tests will be carried out. The model will be updated if the proportion of the images correctly evaluated is greater than the initial limit of 80% and above in subsequent updates. Errors will also be assessed by doctors to define the clinical impact.
- 4.10. **Implementation.** Each new model will be updated in the health units already installed. Installations in new health units may also be made according to demand.
- 4.11. It is expected that each cycle will result in an enhanced version of its model, with the final goal to reach 95% minimum accuracy. During the first 9 months of the project, it is expected to impact 63,000 people that will have their Chest X-Ray exams analyzed by NeuralMed's model.

### **C. Evaluation and Knowledge Dissemination Stage:**

- 4.12. The main objective of this stage will be disseminating knowledge and support NeuralMed's tool expansion across Brazil and the LAC region.
- 4.13. **Papers publications.** During the implementation stage, two scientific papers will be written by NeuralMed technical team to disseminate the knowledge acquired. Moreover, NeuralMed will make the dataset available in a public platform for research the cases of the disease.
- 4.14. **International webinars.** In close coordination with IDB Lab, NeuralMed will organize two international webinars to disseminate their findings across the LAC region and helping them to expand this solution to other countries of the region.
- 4.15. **External evaluator.** At the end of the implementation stage, a final evaluation will be made, carried out by an external evaluator, whose will be defined during the implementation stage. This report should analyze the papers submitted by NeuralMed, indicating if Neuralmed's model has reached accuracy expected in the beginning of the project and providing lessons learned and recommendations regarding use cases of this new solution. This report will be available in the same public platform mentioned in item 4.8.
- 4.16. The project has a clear connection with the priorities of the SPH's actions in Brazil during the pandemic, especially when focusing about expanding the solution to the

whole country through the operations with the public sector. Besides, the solution can be extended to other projects that IDB Lab has such as the other prototype solutions that will be supported by the IDB Lab in the Health Sector.

## **V. EXECUTION AGENCY AND ARRANGEMENTS FOR EXECUTION:**

### **A. Executing Agency**

- 5.1. NeuralMed is a healthcare startup founded two years ago. Its two founders have extensive experience in radiology, mainly implementing and operating outpatient and hospital diagnostic imaging services in public health units through management contracts. The company has an experienced team of data science and technology development. It already has products implemented in hospitals and experience in integration with hospital information services.
- 5.2. The startup NeuralMed is committed to the effectiveness of the prototype, reaching the most vulnerable population in Brazil and the LAC region, therefore the company is committed to keeping the platform, in its website, open and free of charge until the end of this health crisis. Any doctor can use this tool through NeuralMed's website even if it would not be integrated in the hospitals systems.
- 5.3. The proposal was submitted to the IDB Lab team as a part of the call for proposals working towards the COVID-19 solution. NeuralMed's proposal was among 45 proposals received in Brazil related to Diagnosis, Telemedicine, Data Tracking and Treatments. The proposals were analyzed by IDB Lab in coordination with SPH and KIC local specialists and pitched to a judging panel formed by IDB group personnel and external guests.

### **B. Implementation Mechanism**

- 5.4. **Instrument I - Contingent Recovery Investment Grant (BR-G1009):** As NeuralMed has a relevant need for capital to allocate and hire a new developing team to work on this new solution, at the same time this is a for profit company that has a capacity to scale, raising new rounds of capital and generating future profits, the project team has negotiated that US\$75,000 will be invested as a contingent recovery investment grant.
- 5.5. **Contingency Repayment Trigger:** NeuralMed shall begin to repay the Contingent Recovery Investment Grant to the Bank in the first year following NeuralMed's first fiscal year in which gross revenues exceed R\$ 10 million or EBITDA exceeds R\$ 500,000 (each, a "Repayment Trigger"). If neither Repayment Trigger indicator is reached within the first 5 (five) complete fiscal years after the effectiveness of this agreement, then the obligation of NeuralMed to make any payment in respect of the Contingent Recovery Investment Grant shall expire.
- 5.6. **Repayment Timeline:** Starting the first fiscal year after having achieved either Repayment Trigger, NeuralMed shall repay the Contingent Recovery Investment Grant to the Bank in annual payments which shall equal 4% of gross revenues of each prior year, until the US\$75,000 Contingent Recovery Investment Grant is repaid in full. Such payments shall be made no later than 150 days following the end of the prior fiscal year.
- 5.7. **Conversion of reimbursable funds; Convertible Trigger:** If an Investment Event (as defined below) occurs at any time following the execution of this project and prior to the conclusion of the repayment timeline, as set forth in subsection (b) above, IDB Lab will have the option (the "Conversion Option"), but not the obligation, to convert the unreimbursed balance of the Contingent Recovery Investment Grant into common shares of the capital stock of NeuralMed, at the Acquisition Price defined below, subject to tag along or other rights as indicated below.

- 5.8. Investment Event: means the date on which (i) 30% or more of the shares of NeuralMed are sold to third parties; or (ii) NeuralMed undertakes any primary issue of new shares by third party investors during a financing transaction or transactions through which NeuralMed receives gross proceeds equal to or in excess of USD 2M.
- 5.9. Acquisition Price: upon the occurrence of an Investment Event, (i) in respect of the sale of shares of NeuralMed by current shareholders to third parties, IDB Lab shall have the right, but not the obligation, to convert the unreimbursed balance of the Contingent Recovery Investment Grant into shares of NeuralMed at a NeuralMed pre-money valuation of USD 6M and request the acquirer to extend the offer to IDB Lab at an acquisition price of 100% of the price paid in the acquisition of secondary shares ("Tag Along") or (ii) in respect of a primary issue of shares by NeuralMed, the Bank shall have the right but not the obligation to purchase such shares with the unreimbursed balance of the Contingent Recovery Investment Grant at a price reflecting a 20% discount from the price paid for the acquisition of the primary shares, with a pre-money valuation cap of USD 6M.
- 5.10. In the case that IDB Lab opts to exercise its Conversion Option, NeuralMed and its shareholders shall proceed with any necessary action to (i) convert NeuralMed into a "sociedade anônima" or any other required corporate reorganization; (ii) authorize the issuance of shares to IDB Lab, in accordance with the applicable Acquisition Price; and (iii) provide any other necessary action for such exercise.
- 5.11. Notwithstanding the foregoing, the terms and conditions of the exercise of the Conversion Option shall be applicable to the corporate structure held by NeuralMed at the time of such exercise, so IDB Lab will agree that any reference made hereto to NeuralMed shares may be adapted, as necessary, to any holding structure incorporated by NeuralMed in any other jurisdiction.
- 5.12. **Instrument II – Non-reimbursable Technical Cooperation:**
- 5.13. Contract 1: Consulting doctors dedicated for a period of 6 months of implementation. Its function will be analyzed and teach the models developed by NeuralMed. Approximate cost US\$40,000. (ToRs attached in Annex V)
- 5.14. Contract 2: Additional cloud services capacity from the servers of the existing NeuralMed provider (AWS), the purchase aimed at expanding the existing capacity to serve the volume of projected exams. Approximate cost US\$29,000. (ToRs attached in Annex V)
- 5.15. Contract 3: An external consultant with experience in measuring the impact of projects with a health focus. Production of the final document of conclusions. Approximate cost US\$6,000.
- 5.16. For the development of this project, all the [Principles for Digital Development](#) that is endorsed by the IDB Group have been considered. During the implementation of the project, the Executing Agency and suppliers will continue to consider it as the relevant principles.

## **VI. ALIGNMENT WITH IDB GROUP, SCALABILITY, AND RISKS**

### **A. Alignment with IDB Group**

- 6.1. It is well known that qualified, objective, easy and wide-access information is extremely important to support the decision-making process, especially within the scope of health systems and services, which it is an essential tool for strategic areas of health management and the clinical care offered to populations.

- 6.2. In the current contingency of facing a global health crisis of significant proportions due to the pandemic with the new Coronavirus, the need to consolidate efficient management of public and private resources applied to health and to increase the capacity for integrated coordination of national, local and regional actions becomes more evident to fight COVID-19. Complex tasks need to be guided by the information of different levels, sources, categories and scope, including integrated national databases.
- 6.3. Additionally, health systems and services have been responding to the maximum of their capacities of physical and technological infrastructure, of inputs and even of the specialized human workforce to attend the emergency actions necessary to prevent contagion and help with the provision of care. However, resources are finite and their distribution to States and Municipalities, in Brazil, as well as in most Latin American countries is uneven.
- 6.4. The models of the health networks usually show metropolitan areas with high concentrations of hospitals and medical equipment for intensive care while numerous locations, in different regions, suffer with a shortage of beds, diagnostic support tests, equipment and medicines for clinical care.
- 6.5. Understanding this scenario, the opportunity to adopt digital solutions, technological tools, mobile applications and artificial intelligence resources that help prioritize actions, anticipate trends for alignment of preventive measures and assist in the decision-making in the clinical management of the disease are extremely relevant. Technology combined with clinical information can fill the lack of data, operational resources, access to laboratory diagnostic confirmation (COVID tests, for example), complementary diagnostic imaging tests (CT, X-Ray) and, thus, assist in the definition of clinical diagnostic confirmation and guidance of therapeutic measures that impact the outcome of patient care to help save lives.
- 6.6. NeuralMed's proposal focuses on the detection of pulmonary changes by Covid-19 in a radiological image (lung radiography) based on the use of artificial intelligence and priority applications in three conditions, in particular: (i) absence of access to the Computed Tomography (CT) exam and use of simple chest X-ray to diagnose the disease; (ii) access to CT but with no criteria for prioritizing the image to attend to the most serious cases; (iii) limited access to laboratory diagnostic tests (immunobiological). Furthermore, the product allows sharing the technical expertise of radiologists in the interpretation of images and validating diagnoses that in many locations without qualified professionals, there would be extreme difficulty in precision and, subsequently, correct therapeutic assistance.
- 6.7. In credit operations to strengthen the health and social protection sector, under development by the SCL/SPH in Brazil and in the Region, the scope generally encompasses support and institutional development actions, coordination and integration of health care networks, modernization of infrastructures and equipment, professional training and the incorporation of innovation and technologies within the public sector. Within these components, large volumes of existing resources were prioritized and redirected to promote an emergency response to the pandemic.
- 6.8. However, resources alone are not enough. The scenario of global difficulty in the acquisition of hospital medical supplies in necessary quantities, among other factors, imposes on us the adoption of new alternatives that bring high added value in individual and collective health care, which are quick to implement, easy to incorporate by organizations and that are mature enough to generate the estimated results.
- 6.9. Technology solutions, such as the product presented by NeuralMed adhering to the current challenges of health systems to care for and protect lives, can make a difference by sharing knowledge of accumulated experiences, ensuring technical validation of qualified medical professionals and delivering a support tool for taking



decision-making process that guides clinical management assists in prioritizing adequate care, at the right time, to those who need it most.

## **B. Scalability / Replicability**

- 6.10. If successful, this prototype can be expanded to the whole region and benefit millions of lives of the vulnerable population. And their technology can go beyond the diagnostics of pulmonary diseases related to COVID-19. For instance, gradually, with the use of their platform analyzing various chest x-ray exams, they will be able to differentiate the types of pneumonia. Whether they are a result from H1N1, SARS or other respiratory diseases.
- 6.11. This type of differentiation could cause tremendous impact on the medical community as to increasing the efficiency of treatments and the prioritization of admissions in hospital and, consequently, better use of resources in the public health system.
- 6.12. Besides, the solution can be easily translated to English and/or Spanish guaranteeing the use in the whole region. As well as the practicality of the use that can be both expanded to public and private sectors.

## **C. Risks**

- 6.13. It was identified four main risks for this prototype: (i) failure or delay setting up the tool, which would result in insufficient data collection; (ii) the model does not learn enough, presenting low precision; (iii) implementation error, difficulty of adoption by the hospital's IT staff, difficulty in using the updated version; (iv) Data set and articles made available. In order to mitigate these risks, NeuralMed is hiring additional IT and data science professionals, at the same time that it is expanding partnerships with startups, hospitals and research centers to enrich NeuralMed' s data set and facilitate the entering of its solutions into new hospitals. NeuralMed is in advanced conversations for partnerships with Allm and Laura, which are related with two TC porotypes currently in Due Diligence by IDB Lab.

## **VII. SUMMARY BUDGET**

- 7.1. The project has a total cost of [US\$208,000], of which [US\$150,000 (72%)] will be provided by IDB Lab, and [US\$48,000 (24%)] by the counterpart.
- 7.2. As NeuralMed has a relevant need for capital to allocate and hire new developing team to work on this new solution, at the same time this is a for profit company that has a capacity to scale, raising new rounds of capital and generating future profits, we will use two instruments for this project – a contingent recovery investment grant (CRIG) and a non-reimbursable technical cooperation (NRTC).

<b>Project Categories</b>	<b>IDB Lab CRIG</b>	<b>IDB Lab NRTC</b>	<b>Counterpart</b>	<b>Total</b>
1. Definition	US\$18,000	US\$0	US\$12,200	US\$30,200
2. Implementation	US\$55,000	US\$69,000	US\$45,800	US\$169,800
3. Evaluation & Knowledge Dissemination	US\$2,000	US\$6,000	US\$0	US\$8,000
<b>Grand Total</b>	<b>US\$75,000</b>	<b>US\$75,000</b>	<b>US\$58,000</b>	<b>US\$208,000</b>
<b>% of Financing</b>	<b>36%</b>	<b>36%</b>	<b>28%</b>	<b>100%</b>

## VIII. COMPLIANCE WITH MILESTONES, FIDUCIARY AND REPORTING ARRANGEMENTS

- 8.1 **Disbursement by Results.** The EA will adhere to the standard IDB Lab disbursement by results as established in the "Operational Guidelines for Management of Milestones and Financial Supervision for IDB Lab and PES Technical Cooperation Projects" (updated in 2019). Monitoring will be undertaken in accordance with the performance and risk management policies (fulfilment of milestones) established in these Operational Guidelines. Project disbursements will be contingent upon verification of the achievement of milestones. These milestones will be verified using their means of verification, which will be agreed upon between the EA and the IDB Lab. Achievement of milestones does not exempt the EA from the responsibility of reaching the logical framework indicators and the project objectives.
- 8.2 **Project Supervision.** The Project will be associated with the Line of Activity RG-O1676 in Bank systems. It will be supervised by the IDB Lab Specialist based in the Brazil's IDB Country Office and executed in coordination with the Project Team for RG-O1676.
- 8.3 **Procurement.** The Executing Agency shall have a procurement policy in place to ensure that Project-related procurement is done at competitive market prices. It shall also prepare a procurement plan (the "Procurement Plan") acceptable to the Bank, that describes the contracts for goods and services required to carry out the Project, including the estimated cost of each contract, and the proposed methods for acquisition of its goods and services, including consultants' services. The Bank may request annual reports on execution of the Procurement Plan by the Executing Agency. Implementation of the procurement policies, terms of reference, and contracts for the acquisition of goods and services, as well as the Procurement Plan and fulfillment thereof may be subject to ex ante review or ex post supervision by the Bank, at its discretion.
- 8.4 **Financial Management:** Disbursements will be made in accordance with the Financial Management Guidelines for IDB-Financed Projects (OP-273-12) July 2, 2019 or future updates. The Executing Agency shall maintain *financial data and internal accounting and administrative control systems acceptable to the Bank* so as to provide the necessary documentation to permit verification by the Bank of the procurement and expenditures for the Project and facilitate the timely preparation of financial statements, budgets, and reports. The Bank reserves the right to audit all financial statements, internal controls, procurement, or other aspects of the Project.
- 8.5 **Financial Statements:**
- The Executing Agency shall prepare and make available for the Bank its annual financial statements and include a note on the use of the Contribution and Counterpart Resources for the Project. The financial statements must be submitted to the Bank within 120 calendar days of the close of each fiscal year. Together with its annual financial statements, the Executing Agency must submit to the Bank a certification of integrity, transparency and use of funds in the format to be outlined in the Technical Cooperation Agreement. The Executing Agency presented the following business plan

(BRL '000)	2019	2020	2021	2022	2023	2024
NET REVENUE	4	357	2976	10804	23398	39776
COGS	(760)	(280)	(1250)	(1680)	(1800)	(1980)

GROSS MARGIN	(756)	77	1726	9124	21598	37796
SG&A EXPENSES	(140)	(2219)	(6180)	(8747)	(9727)	(10699)
EBITDA	(896)	(2142)	(4454)	377	11871	27097

- 8.6 **Project Status Reports:** The Executing Agency is responsible for presenting a PSR to the IDB Lab within 30 days within 30 days following the end of each semester or more frequently if required by IDB Lab. The PSR must include information on the implementation of the project, results obtained and contribution to reaching the project objective as presented in the Result Matrix (Annex I) and other planning instruments. Additionally, the document must include information on challenges encountered during the implementation period and possible paths to address these challenges. Within 90 days of finishing the execution period, the Executing Agency will present to IDB Lab a Final PSR giving priority to reporting on key results achieved, a sustainability plan, scaling up strategy and lessons learned.
- 8.7 **Project Coordinator:** The Executing Agency will appoint a Project Coordinator either from its existing staff or at its own cost. Expenses relating to project coordination and/or administration costs are not eligible under the IDB Lab contribution, rather such expenses must be financed by the counterpart contribution. The Project Coordinator shall have overall responsibility for the management of the project, including submission of PSRs, tracking milestones and results and coordination with IDB Lab.

#### APPROVAL

This Technical Cooperation Prototype is recommended and approved for funding under IDB Lab's Line of Activity for Innovation Prototypes MIF/GN-123 (project number RG-O1676, document number MIF/AT-1565, and resolution number MIF/DE-8/19).