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IDB LAB

MEXICO

EFFICIENT SOCIAL SERVICES FOR VULNERABLE POPULATIONS IN JALISCO THROUGH RESPONSIBLE ARTIFICIAL INTELLIGENCE

(ME-T1409)

DONORS MEMORANDUM

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CONTENTS

PROJECT SUMMARY

EFFICIENT SOCIAL SERVICES FOR VULNERABLE POPULATIONS IN JALISCO THROUGH RESPONSIBLE ARTIFICIAL INTELLIGENCE (ME-T1409)

The citizens of Latin America and the Caribbean, who face increasing social challenges, are starting to demand higher quality, more individualized, and more equitable public services from the governments of the region. In this regional context, Mexico's state of Jalisco has social problems like students dropping out of school, young people in conflict with the law, and chronic diseases (like diabetes and hypertension), among others, that require new, comprehensive, prevention-focused intervention approaches that leverage technological advancements (and the use of data) to begin delivering solutions. Well aware of this situation, the Government of the State of Jalisco is starting to encourage digital transformation and the use of new technologies to reduce gaps in access to and the quality of social services.

Of the new data-driven digital technologies, artificial intelligence (AI) surely has the most potential to influence human relationships within the ongoing digital and data revolution. Not only is its predictive power transforming day-to-day consumer decisions and access to information, but it also increasingly affects how social services are accessed and/or provided in various countries. Despite the indisputable potential of AI, recent controversies[1] over the irresponsible use of personal data demonstrate the importance of promoting a responsible use of AI that respects individual privacy and consent, and in particular, prevents discrimination against vulnerable groups.

Accordingly, this project will develop the region's first model of public-private coordination to promote the responsible use of artificial intelligence to deliver social services in the state of Jalisco. This model will bring together academia, industry, entrepreneurs, civil society, and the public sector, and will identify issues in the state's priority social areas to develop use cases for responsible AI use.[2] The model will strengthen local stakeholders' skills and abilities and promote the implementation of ethical protocols for responsible AI use and personal data management. At the heart of the model will be the development of use cases expected to demonstrate the positive, at-scale impact of responsible AI use to deliver better social services to the public. Lastly, the project will work actively to develop a responsible AI entrepreneurial ecosystem in Jalisco and Mexico, to ensure that local talent will be able to take advantage of the opportunities provided by this new technology.

The project will be executed by the Instituto Tecnológico y de Estudios Superiores de Monterrey, Guadalajara campus, with support from the Government of Jalisco and the private sector, including leading technology companies.[3] This project is an outgrowth of a

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1 Notably involving private companies whose business models focus on the large-scale use of data to feed AI algorithms, which have come under scrutiny for practices that have on occasion failed to respect user privacy or consent, among other issues.

2 In this document, use cases will be understood as pilot experiments that apply responsible AI to specific issues (for example, school dropout rates or diabetic retinopathy) that will be developed following a systematic, rigorous implementation protocol of testing, iteration, and evaluation, to obtain a validated final product that can be used on a large scale.

3 Companies such as Google, Microsoft, NTT Data, and Telefónica have expressed interest in providing technical and financial support for the project.

collaboration between IDB Lab and the Bank's Social Sector and is part of a regional learning community called "fAIr LAC."[4]

This project is expected to serve as a reference point to help Mexico and Latin America and the Caribbean leverage the benefits of responsible AI use to provide better social services on a large scale, in partnership with entrepreneurs and the private sector, while developing and testing ethical standards through the use cases, which make it possible to minimize risks to data privacy and consent and prevent discrimination, especially against vulnerable groups.

[4] Within the Bank's efforts to promote digital transformation in the countries, other IDB Group departments and divisions like the Office of Outreach and Partnerships, the Information Technology Department, the Operations Financial Management and Procurement Services Office, and the Knowledge, Innovation, and Communications Sector are involved in the project.

ANNEXES

Annex I	Results Matrix
Annex II	Summary budget
Annex III	i Delta

APPENDICES

Proposed resolution

INFORMATION AVAILABLE IN THE TECHNICAL DOCUMENTS SECTION OF THE IDB LAB PROJECT INFORMATION SYSTEM

Annex IV	Itemized budget
Annex V	Diagnostic needs assessment of the executing agency
Annex VI	Project status reports, compliance with milestones, and fiduciary agreements
Annex VII	Procurement plan

ABBREVIATIONS

AI	Artificial intelligence
ITESM	Instituto Tecnológico y de Estudios Superiores de Monterrey [Monterrey Institute of Technology and Higher Education]

EXECUTIVE SUMMARY

EFFICIENT SOCIAL SERVICES FOR VULNERABLE POPULATIONS IN JALISCO THROUGH RESPONSIBLE ARTIFICIAL INTELLIGENCE (ME-T1409)

Country and geographic location:	Mexico. The project will be executed in the state of Jalisco.		
Executing agency:	Instituto Tecnológico y de Estudios Superiores de Monterrey (ITESM), Guadalajara campus		
Focus area:	Knowledge economy		
Coordination with other Bank operations/ donors:	The project has been designed jointly by IDB Lab and the IDB Social Sector. This collaboration increases the project's strategic relevance, positions it as a forum for the exchange of technological knowledge, ensures its alignment with the IDB Group, and facilitates its future scalability.[5]		
Project beneficiaries:	40,000 individuals to benefit from the delivery of social services using responsible artificial intelligence		
Financing:	Technical cooperation:	US$1,450,000	50%
	Investment:		
	Loan:		
	Other (explain):		
	Total IDB lab contribution:	**US$1,450,000**	**50%**
	Counterpart:	US$1,450,000	50%
	Cofinancing		
	Total project budget:	**US$2,900,000**	**100%**
Execution and disbursement period:	36 months of execution and 42 months of disbursements		
Special contractual conditions:	The signing of the cooperation agreement between the Instituto Tecnológico y de Estudios Superiores de Monterrey and the Government of the State of Jalisco will be a condition precedent to the first disbursement.		
Environmental and social impact review:	This operation was prescreened and classified in accordance with the IDB Environment and Safeguards Compliance Policy (operational policy OP-703) on 9 May 2019. Since the impacts and risks are limited, the proposed classification for the project is category "C" (low risk).		
Unit responsible for disbursements:	Country Office in Mexico		

[5] The project will coordinate its activities and resources with IDB regional technical cooperation RG-T3450. Executed by the IDB Social Sector (SCL/SCL), technical cooperation RG-T3450 aims to promote responsible artificial intelligence use to provide more efficient, fairer social services.

I. THE PROBLEM

A. Description of the problem

1.1 As major social challenges persist despite the growth in public spending and the progress made in certain social indicators in recent decades,[6] governments face increasing citizen demands regarding not only the coverage of public services, but especially their efficiency and quality. In this context, digital transformation offers new opportunities for governments, the private sector, and influential entrepreneurs to improve the delivery of social services. As can be observed in more advanced countries, technology is a factor that makes it possible to develop more personalized and effective offerings, due to the availability of better information on each user's needs, while also reducing the cost of service delivery (in the United States, the Department of Education considers technology to be a critical structural opportunity for transforming education).[7] However, while technology represents a significant opportunity for improving the delivery of social services, various studies show that in order for digital transformation initiatives to have an effective social impact, they must focus on reducing the existing gaps in access and quality[8] and ensure that technological innovation effectively reaches vulnerable groups. Lastly, one critical lesson from digital transformation processes is that public-private cooperation must be strengthened in order to bolster the local entrepreneurial ecosystem in such a way that the public sector will coordinate and connect local demand with better private-sector solutions.[9]

1.2 **Social conditions in the state of Jalisco.** With more than eight million inhabitants, Jalisco is Mexico's fourth most populous state.[10] Although Jalisco's social development indicators have improved in the past few years (for example, health coverage has improved and illiteracy rates have decreased), it still suffers significant social problems[11] that will be hard to solve in the medium term using traditional means (such as students dropping out of school, juvenile offenders, chronic diseases, and waiting lists for services, etc.). Aware of these problems and of the need to embrace new tools to tackle them, the new Government of the State of Jalisco has prioritized digital transformation, creating a Department for the Overall Coordination of Government Innovation, which focuses on the state's

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6 For example, the Secretariat of Public Education (2017) reports that Mexico still has a dropout rate of near 13%, failure rate of 26%, and graduation rate of only 66% at the high school level.

7 U.S. Department of Education. https://www.ed.gov/oii-news/use-technology-teaching-and-learning

8 On account of the "digital divide," which shows that poor, vulnerable populations' access to digital solutions lags significantly behind. https://cs.stanford.edu/people/eroberts/cs181/projects/digital-divide/start.html

9 The most recent AI Index study shows that the artificial intelligence sector is accelerating in terms of volume of research, published articles, conferences, students, and funding for startups, but the bulk of this activity is taking place in just a handful of countries: China, the United States of America, Canada, and certain European countries.

10 Mexico National Institute of Statistics. https://www.iieg.gob.mx/

11 According to National Council for the Evaluation of Social Development Policy data (2018), there are significant social divides in Jalisco: 49% of the population does not have access to social security, 32% lives in poverty, and 17% lacks access to healthcare services.

digital transformation and promotes the use of new technologies as the lynchpin of its strategy for providing public services for social inclusion.[12]

1.3 **Artificial intelligence.** A significant trend in the sphere of digital transformation is the recent dramatic increase in computational capacity. This increase, combined with the massive availability of data from multiple sources, is driving the development of the field of artificial intelligence (AI), one of the principal tools for digital transformation.[13] Specifically, AI is becoming one of the principal digital transformation tools associated with social services delivery. A McKinsey Global Institute study[14] presents more than 160 AI use cases that have already been implemented in such sectors as education, health, justice, natural disasters, and the environment. The impact of AI promises to be transformative, and several governments, including in Latin America and the Caribbean, are already actively using it to address social issues, such as through predictive models for developing early alerts for such issues as students dropping out of school, adolescent pregnancy, and recidivism.[15] AI also has the potential to stimulate economic growth; several studies predict that AI could add $15.7 trillion to the global economy by 2030 and double economic growth rates by 2035.[16] However, as a critical aspect to fully flesh out the current view of the development of AI in the region, it must be noted that some reports[17] indicate that Latin America and the Caribbean face an additional challenge of building capacity so that their entrepreneurial and innovation ecosystems can take advantage of this opportunity. Specifically, these reports highlight four main challenges: (i) failure to adopt the technology; (ii) lack of investment; (iii) insufficient trained talent; and (iv) the need for new business models.

1.4 **Importance of promoting responsible AI.** Although AI offers undeniable opportunities, it also poses significant ethical challenges associated with the use of massive quantities of data, particularly when such data is personal (as in social services delivery). All future work should take into account recent private-sector controversies like the Cambridge Analytica case (which showcased the potential risk of reusing personal data through AI) and the examples of discrimination against African-American populations by facial recognition systems that use AI and discrimination against women by recruiting algorithms that use unfiltered past data. In this context, the European Union[18] and various public and private entities are

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12 In February 2019, a joint IDB Social Sector-IDB Lab team led a workshop with social sector departments of the new administration of the State of Jalisco, at which they defined priorities for their work together. The mandate of the Department for the Overall Coordination of Government Innovation is to foster the use of digital technology in all sectors of the Government of the State of Jalisco, acting as a coordinator and a catalyst. The Department includes the only Artificial Intelligence Division in Mexico.

13 AI encompasses a number of technologies, including machine learning, deep learning, natural language processing, natural language understanding, object classification in video and images, emotion detection, and intelligent robotics.

14 McKinsey Global Institute (2018). https://www.mckinsey.com/featured-insights/artificial-intelligence/applying-artificial-intelligence-for-social-good

15 http://webfoundation.org/docs/2018/09/WF_AI-in-LA_Report_Screen_AW.pdf

16 Accenture (2016). *Artificial Intelligence is the Future of Growth*.

17 Endeavor and Everis (2018). "*El impacto de la inteligencia artificial en el emprendimiento.*"

18 European Union Ethics guidelines for trustworthy AI. https://ec.europa.eu/digital-single-market/en/news/ethics-guidelines-trustworthy-ai

preparing specific guidelines on the ethics of AI that emphasize the importance of approaching the technology from a robust ethical framework.

1.5 **Opportunity to promote responsible AI in Jalisco.** The state of Jalisco is a leader in technological development in Mexico, with proven capacities for entrepreneurship and innovation in both the public and private sectors.[19] However, in Jalisco—as in the rest of the world—talent specialized in cutting-edge technology, including AI, is in short supply, and training experts is a priority. Furthermore, within the limited reserve of AI talent, there is a significant gender gap, with programmer positions predominently held by men. Though Jalisco has a very dynamic entrepreneurial sector that is just beginning to develop AI solutions, to date it does not have any specific training programs for entrepreneurs that provide tools on responsible use of AI to strengthen their business models.[20] One of the strategic objectives of the project executing agency, the Instituto Tecnológico y de Estudios Superiores de Monterrey (ITESM), is to become an artificial intelligence hub, organizing the local ecosystem to take advantage of AI technology. To do so, it will coordinate various university laboratories and centers in support of the project, forming an independent program within the university. The project will also use the "living labs" participative social experimentation model[21] to facilitate the inclusion of various groups (including beneficiaries, civil servants, and technology developers) and search for technically viable, socially acceptable solutions for the population of the state of Jalisco.

B. Project beneficiaries

1.6 The project should benefit an estimated 40,000 Jalisco residents,[22] especially women and vulnerable groups, who access social services that are delivered with the support of artificial intelligence. This estimated number of beneficiaries may increase substantially as the Government of the State of Jalisco scales up the various use cases.

1.7 The project will also benefit the AI entrepreneurial ecosystem in Jalisco, and more broadly, in Mexico as a whole, by supporting knowledge creation and developing

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19 Jalisco is home to Mexico's leading hub of electronics and information technology companies and is one of the few places in Mexico engaging in business development of AI for such diverse sectors as agriculture, finance, and the automotive industry.

20 One opportunity that has been identified is that of piloting a certification in responsible AI that would allow entrepreneurs to demonstrate that their business models feature higher standards for privacy, consent, and data use that not only comply with local laws but also have user rights at their core.

21 A "living lab" is an open-innovation model that facilitates the systematic co-creation of solutions through research and experimentation with various stakeholders. A "living lab" creates, explores, experiments with, and evaluates innovative ideas, scenarios, concepts, and technological solutions through real-life use cases. The use cases in a "living lab" involve user communities, not only as observed subjects but also as co-creators that work with experts in different areas to develop solutions.

22 The number of beneficiaries was estimated based on official Government of Jalisco figures and the preidentified cases: there are around 500,000 diabetics in the state, of whom 50,000 have diabetic retinopathy; around 22,000 young people drop out of middle school every year while 33,000 drop out between middle and high school; and, as regards the job market, the jalisco.gob job portal posts more than 20,000 openings. The developed use cases should benefit at least 6% of the diabetics (29,500 individuals) and 10% of young people who have dropped out of school (5,500 individuals); while at least 25% of the job openings (5,000 posts) will be filled, for a total impact of at least 40,000 beneficiaries. Ultimately, the predictive models should become firmly established as tools for social service delivery in Jalisco and reach a substantial percentage of those who benefit from State services (for example, the school system covers more than 1 million students).

AI-based enterprises with clear potential for scalability through public-private partnerships. The project will strengthen local startups in Jalisco, through consultancy funds, training, digital tools, and economic incentives (but not direct investment) in connection with specialized events and entrepreneurship competitions focused on AI for social impact. The training programs will include a specific focus on gender, which should help reduce the AI gender gap. There have also been interesting cases worldwide in which AI has been used to prevent gender violence or the trafficking of women, and such models could be implemented in Jalisco as the project's contribution to gender issues.

II. THE SOLUTION

A. Project description

2.1 The proposed solution is to develop a public-private partnership model that promotes learning and innovation on the subject of the responsible, ethical development of AI for social services delivery in the Mexican state of Jalisco. Through this model, academia, civil society, industry, and the public and private sectors will come together to identify issues in priority areas like healthcare, education, and social security, and foster social policies that leverage AI to provide more efficient and effective services. The proposed model will help stakeholders, particularly from the public sector, academia, and entrepreneurs, develop their capacities and skills, and will promote ethical protocols for the responsible use of AI. The model will include the creation of data governance mechanisms ("data sandboxes"[23]) that will facilitate agreements and commitments to lay the foundations for the responsible use of big data.

2.2 The model is based on the development of applied use cases with the potential for being scaled up and turned into social policies. The development of these use cases will begin with the screening of the priority social challenges identified by the Government of Jalisco to determine which are in areas where quality data that can be used to develop AI models are available or can be safely and responsibly generated. To achieve this, a multisector working group will be formed, which will receive training in AI[24] and work alongside experts in the social sphere. This group will propose potential AI-based solutions, and technical experts will vet the proposals and define the data that will be necessary to develop the pilots, applying ethical considerations to data-collection techniques. Subsequently, they will develop the AI model jointly with frontline workers (teachers, nurses, social workers, etc.) in direct contact with the beneficiaries of the social services, training them and ensuring that the use case will be participative, transparent, and inclusive at all stages. Entrepreneurs with AI models that provide effective solutions to the problems identified may be included in this development stage, depending on the case. The use case development process will be documented in detail, and this information will be made available to the public to ensure transparency and greater

[23] A data sandbox is an innovation methodology that brings together data from public and private actors to create a controlled environment for experimentation under data governance protocols, to facilitate experimentation and learning processes.

[24] The Fairfax County Department of Family Services Data Analytics Fellowship Academy is an example of how this training can be structured, with specialists from different government areas being brought together to jointly analyze data for government projects with high social impact.

citizen participation. Beyond the documentation of the individual cases, the lessons learned will be translated into public policy recommendations aimed at strengthening state policies on the development and implementation of new technologies as well as efficient social services delivery.

2.3 Some examples of possible initial use cases that could be developed under the project are detailed below.

Sector	Challenge	Possible solution using AI
Health	Mexico has one of the world's highest rates of diabetes incidence and prevalence, with around seven million diabetics. One of the main complications of this disease is diabetic retinopathy, which occurs in 40%-50% of people who have had the disease for at least 15 years. The major challenge of this condition is early detection to prevent blindness.[25]	• Detection of diabetic retinopathy based on deep learning techniques,[26] in two stages: elimination of poor quality images, and risk detection. • The same deep learning techniques can also be used in other types of medical imaging, like mammograms. • Model to predict the incidence of diabetes in populations using clustering algorithms. • Use of intelligent chatbots, gamification, and virtual reality for mass education of the diabetic population.
Education	Jalisco is the state with the country's highest school dropout rate. Only 47 out of every 100 students complete their studies from first grade of primary school to the third year of high school.[27]	• Model to predict who will drop out of middle school based on an analysis of risk factors. • Strategy for providing support to mitigate risks and ensure students stay in school.
Young people in conflict with the law	According to a special report on adolescents and the criminal justice system prepared by the National Human Rights Commission, in 2017 Jalisco had the third highest population of adolescent inmates at some of the three centers for this age group. The Commission counted 271 adolescents from Jalisco (260 male and 11 female), fewer only than the number from Chihuahua and the State of Mexico.[28]	• Preventive model to predict and take early action to prevent criminal recidivism in young people. • Comprehensive support strategy for young people's social reintegration and development. • Use of AI to identify job opportunities for at-risk youth.
Job markets	The IDB has extensive experience in applying technology to the job markets area. Jalisco has a two-pronged economy, made up of a modern, dynamic side that includes electronics, IT, and large-scale agroindustry, and a traditional side that includes artisans, retail trade, and other activities. We believe that the traditional labor market can be strengthened through the use of AI.	• Use of AI models in job search engines, specifically at www.empleojalisco.gob.mx. • Use of AI models to customize job skills development for workers.

[25] University of Guadalajara (2015). *Retinopatía Diabética, primera causa de ceguera en adultos en México.*

[26] Deep learning is an AI model based on neural networks.

[27] Ruiz, A. (2019). *Jalisco, el estado con más deserción escolar.*

[28] Ávila, J (2019). *Adolescentes, el gran pendiente.*

2.4 The principal project components will be:

Component I: Creation of partnerships and capacity development (IDB Lab US$383,900; Local contribution US$109,010)

2.5 This component will facilitate coordination of key public and private stakeholders for the development of artificial intelligence in the state of Jalisco, by generating a local governance model that will ensure the activities are well coordinated. The component will also develop a program to strengthen the AI capacities of civil servants, academia, and other key stakeholders. Domestic and international specialists will participate in this program, sharing best practices and exchanging their knowledge. Lastly, the component will design a media campaign and narrative on the responsible AI model in Jalisco, focusing on the social impact of responsible AI and how it can be used to deliver more efficient and more equitable social services.

2.6 The activities planned for this component are: (i) implementation of a data governance model, to include the signing of cooperation agreements for data sharing (the aforementioned "data sandboxes"); (ii) training of key ecosystem stakeholders and civil servants on responsible AI issues; (iii) development of a pilot for evaluating and certifying AI;[29] and (iv) consolidation and dissemination of strategic knowledge and expansion of the Jalisco experience.

Component II: Development of responsible AI use cases (IDB Lab US$431,574; Counterpart US$1,053,089)

2.7 This component will develop a set of artificial intelligence use cases, to be selected according to the State of Jalisco's priorities (such as health, education, the environment, job markets, young people in conflict with the law, etc.). The aforementioned "living lab" methodology will be used to ensure that the use cases are designed in a participatory way, in an open, dynamic climate of innovation that includes all of the various interested parties. The development of the use cases will follow these steps as a guide: (i) the social challenge to be addressed and the available data (as well as the possible risks of data bias/discrimination) will be analyzed in detail with specific departments of the State of Jalisco (e.g., education, health, welfare), which will assign field and technical teams; (ii) the most appropriate AI technique will be selected (e.g., chatbot, machine learning); (iii) the data will be analyzed and cleaned to validate the model's precision; (iv) the algorithm will be designed and tested to identify potential ethical challenges (privacy, consent, bias, etc.); (v) innovative social interventions that dovetail with the AI model will be identified (e.g., for the issue of students dropping out of school, new protocols for communication with parents, text message alerts, or mentoring and support systems that leverage predictive AI models for greater impact); (vi) a pilot field experiment will be conducted to measure the system's efficiency and effectiveness as well as how well it is accepted socially and linked with the associated public services; (vii) the use case will be documented, emphasizing

[29] To include arrangements for domestic and international advisory services; publication; arrangements for the collaboration of 40 institutions; and dissemination of information about the protocol so it can be replicated, reviewed, and improved in year 2, through workshops with experts. Pilot studies are to take place in one to two priority sectors and in collaboration with existing IDB projects on ethics in contracting. An effort will be made to validate replicability at the regional level.

lessons learned on the responsible performance of the AI-based solution; and (viii) work will be done with the departments to ensure the model will be adopted if it yields positive results.

2.8 This component's activities will be coordinated with the third component activities focused on entrepreneurship, to ensure that AI solutions that already exist in entrepreneurial models and Jalisco's entrepreneurial talent on the whole are both actively included in the use case development process. This will be accomplished through data sandbox models and public-private partnerships on data governance that will provide critical inputs to entrepreneurs for their high-impact enterprises.

2.9 The main activities planned for this component are: (i) mapping and identification of potential use cases and international best practices, and selection thereof; (ii) identification and testing of public sector innovations that complement the AI model and broaden its social impact; (iii) systemic documentation of the use case development process, implementation and impact reports, and public policy recommendations; (iv) establishment of physical and cybersecurity protocols and regulations for the storage, transfer, access, management, and use of data and information; and (v) partnership with entrepreneurs and the private sector to pilot a data sandbox model that will make it possible to supplement public data with private data.

Component III: Strengthening of the local responsible AI entrepreneurial ecosystem (IDB Lab US$383,000; Counterpart US$125,500)

2.10 This component will consolidate the public-private partnership required for the project's success, through actions to strengthen Jalisco's entrepreneurial ecosystem and generate forums for dialogue and the exchange of best practices among the public sector, private sector, and entrepreneurs. The opportunity for entrepreneurship and innovation associated with AI requires a framework of local support so that Jalisco's existing entrepreneurial ecosystem can be leveraged, reinforced with specific training products on responsible AI for entrepreneurs, and linked with international networks and leading companies' best practices. To that end, the component will work with incubators, accelerators, and other entrepreneurial support entities (through the ITESM's experience and leadership and in partnership with the Government of Jalisco Department for Innovation) to raise awareness, train talent, facilitate market and financing opportunities, and connect entrepreneurs with responsible AI business models.

2.11 The activities planned for this component are: (i) outreach talks and workshops to raise awareness of the potential of responsible AI, including hackathons;[30] (ii) development of an annual conference to raise awareness and publicize opportunities in responsible AI to the various stakeholders in the AI ecosystem in Jalisco, Mexico, and worldwide; (iii) development of an acceleration program for AI startups with three stages: call for participation, acceleration, and monitoring. Specifically, the acceleration component will include critical financing, network-building, and business infrastructure activities, as well as a platform of services for responsible AI startups; (iv) specific courses for entrepreneurs and startups on

[30] A hackathon is a high-speed, collaborative event that brings together computer programmers and other subject-matter experts in one physical space to create and program a technological solution in a limited amount of time.

ethical issues in the development of AI models; and (v) technical assistance actions to support the startups in designing, developing, and testing AI use cases.

B. Project results, measurement, monitoring, and evaluation

2.12 The responsible use of AI should help citizens receive, on a large scale, improved social services from their governments on key issues, including education, healthcare, and welfare, through more efficient, personalized services and by innovating and reducing gaps in areas where current interventions are not making an impact. For example, AI applications make it possible to make quicker, more accurate medical diagnoses and support professors in identifying their students' individual needs, thereby ensuring quality education and facilitating access to services beyond the educational sphere, like work and/or healthcare, as necessary. The implementation of use cases that prove to have the capacity to create a more efficient, just, and personalized social impact combined with the work being done to develop an institutional, regulatory, and intervention framework with management agreements and protocols that ensure responsible operating principles will produce an integrated model that can serve as an example of work done at the regional level that uses predictive models for social impact in a widespread, responsible way.

2.13 The project's principal indicators are linked to the number of residents of the state of Jalisco who benefit from the delivery of better social services using AI and the number of public and private entities that sustainably collaborate in developing the responsible AI pilot. A continuous monitoring, evaluation, and innovation system will be established early in the execution period. This system will make it possible to: (i) monitor management indicators, results, and impact, as well as provide feedback and adjust, on a daily basis, the technological solutions and project implementation, and (ii) document and share lessons to help strengthen the delivery of AI-based social services in Mexico and the region. There are three main project evaluation questions: (i) How can the responsible use of AI facilitate better social services delivery to the public in use cases that have been scaled up to be used on a massive scale?;[31] (ii) How can a territory's ecosystem be strengthened through a joint public-private-entrepreneurial program that promotes collaboration among stakeholders and the use of responsible AI best practices to solve social problems?; and (iii) How can designing AI use cases in accordance with ethical and responsible criteria reduce implementation risks and heighten social impact?

2.14 The ITESM, as the project executing agency, will be responsible for submitting project status reports within 30 days after the end of each six-month period, or more often as established by IDB Lab through a notification sent to the ITESM no less than 60 days in advance. The project status report will contain information on execution progress, achievement of milestones, and completion of the objectives established in the results matrix and other operational planning tools. Within 90 days after the end of the execution period, the executing agency will submit a final project status report to IDB Lab. This report will highlight the results achieved, project sustainability, and lessons learned. The project should contribute to the public agenda through the dissemination of its results to key audiences, including

[31] The specific improvements in the efficiency and efficacy of services will be reported according to each of the use cases (contextualized metrics).

the public sector, private sector, nonprofit organizations, academia, and the entrepreneurial sector.

2.15 The project is aligned with several sustainable development goals, in the areas of health (3), education (4), work (8), reduced inequalities (10), and partnerships for the goals (17), in particular by promoting the inclusion, efficiency, and personalization of services. Furthermore, the project will include specific actions to promote a gender-equality approach (in particular, by developing capacities/ventures in the area of AI, where there is a significant lack of women's participation), and will recognize the importance of preventing algorithmic biases that could affect women and vulnerable groups, through a replicable AI ethics certification model and the piloting thereof.

III. Project Alignment with the IDB Group, Scalability, and Risks

A. Alignment with the IDB Group

3.1 The project puts forward a comprehensive, state-of-the-art model aligned with the vision of the Jalisco government and the priorities of IDB Lab and the IDB Social Sector, leveraging both the potential of AI and the strengths of the state in terms of its commitment to responsible practices, the culture of entrepreneurship, technological infrastructure, and an innovative vision for social services delivery. The increase in public-sector demand resulting from greater acceptance of the technology when it is deployed responsibly will provide companies and startups in Jalisco and throughout Mexico an opportunity to create new, AI-based business models. To that end, the project will include activities to strengthen and provide support for the entrepreneurial ecosystem (for example, use of AI-based tools, economic incentives to motivate startups, and opportunities to participate in use cases as service providers). Lastly, due to the project's importance in the context of the regional discussion on the responsible use of AI models, it will encourage the transfer of knowledge about Jalisco's responsible AI model through outreach activities that will turn it into a reference point and real-life example of how responsible AI can be used for social impact and equity in Latin America and the Caribbean.

3.2 The project is a joint initiative of IDB Lab and the IDB Group Social Sector (Education Division, Labor Markets Division, Social Protection and Health Division, and Gender and Diversity Division),[32] with the participation of other Bank units, like the Office of Outreach and Partnerships; the Knowledge, Innovation, and Communication Sector; the Information Technology Department; and the Operations Financial Management and Procurement Services Office.[33] The project also notably aligns with several priorities of the Institutional Strategy 2020-2023, like innovation, technology adoption, the future of work, transparency, resource mobilization, and the promotion of diversity and institutional capacity. As regards IDB Invest, there is still not an established demand for large-scale financing for the

[32] Within the aforementioned regional fAIr LAC learning initiative that promotes the responsible use of AI to deliver more efficient, fairer social services. The project will be part of this initiative, and a working group consisting of stakeholders from the Bank's social services sector, IDB Lab, and other IDB units will be established to that end.

[33] The Office of Outreach and Partnerships will manage the partnerships with the private sector; the Knowledge, Innovation, and Communication Sector will contribute knowledge on AI and innovation; and the Information Technology Department and the Operations Financial Management and Procurement Services Office will offer contributions on digital transformation issues.

subject matter addressed in this project. However, as a market is developed based on public demand for predictive models, activities to support AI enterprises will concurrently be established (in partnership with incubators, companies, and other ecosystem stakeholders) and will stimulate private-sector offerings.[34] It should be emphasized that this is a highly innovative project on a digital frontier in which IDB Lab and the IDB Group are experimenting so as to learn hands-on lessons that will be effective resources for several Bank units. As such, it is critical for all of the units to work together, from the design stage onward.

B. Scalability

3.3 First, there is a clear vision of how the ITESM will work in concert with the Government of Jalisco authorities from the very beginning (the digital transformation, innovation, and social sector departments agenda), according to demand and the social needs identified within the State's strategic priorities. This means that the use cases that are developed will indeed reflect public demand and can immediately be incorporated into different social areas to improve social services delivery. This is a critical aspect: working together based on demand (and not just supply) precludes the risk that the use cases might not be adopted due to a lack of knowledge or confidence. Therefore, it should be possible to scale up the use cases developed to deliver better social services to the citizens of Jalisco on a large scale.

3.4 Second, the public-private partnership model for the development of responsible AI that will be implemented in Jalisco is innovative in Latin America and the Caribbean and is expected to serve as an example that can be replicated in other countries of the region to create hubs for the responsible experimentation of AI models, initially by the public sector (in partnership with the private sector and the local entrepreneurial ecosystem). In addition, the project will support the creation of a private-sector/entrepreneurial innovation hub that will consolidate Jalisco's existing entrepreneurial capacities, positioning the state as a regional leader in responsible-AI-based business development.

C. Project and institutional risks

3.5 The first risk identified for project execution is the possible lack of quality data on the target populations, especially vulnerable groups. The potential of AI is strongly tied to the availability of high-quality data, and the limited availability of data in the correct formats could affect the training of the algorithms, and therefore, the impact of the tools created for developing the use cases. To mitigate this risk, the project will work closely with the Government of Jalisco and the involved municipal governments to free up the data required for the use cases. Furthermore, data from national institutions like the National Institute of Statistics and Geography (INEGI) will be used to take advantage of available open data. The second potential risk is the lack of specialized talent for developing the responsible AI models in Jalisco, especially considering how new the technology is and the current high level of demand for this talent in the private sector. To mitigate this

[34] The project is closely aligned with the Government of Jalisco's vision of a prosperous, inclusive economy described in the State Development Plan 2013-2033, which, among other aspects, involves: (a) sustained economic growth; (b) access to business innovation; and (c) the establishment of technological infrastructure to leverage state opportunities and advantages.

risk, the ITESM will tap into its national network to bring in specialized talent and will invite other institutions with specialized AI resources to participate, along with other leading private-sector entities that have shown an interest in contributing to capacity development (Microsoft, NTT, etc.). Their participation will be leveraged for training professionals on the subject. A third potential risk is the leak or misuse of data used or generated by the models. To mitigate this risk, the project will strictly adhere to the Personal Data Protection Act and will apply global best practices for data protection and cybersecurity.

IV. INSTRUMENT AND BUDGET PROPOSAL

4.1 The total project budget is US$2,900,000, of which US$1,450,000 (50%) will be provided by IDB Lab as nonreimbursable technical cooperation funding, and US$1,450,000 will be contributed by the ITESM as counterpart resources.

In US$	IDB Lab (US$)	Counterpart (US$)	Total (US$)
Project components			
Component 1: Creation of partnerships and capacity development	383,900	110,290	494,190
Component 2: Development of responsible AI use cases	431,574	1,053,090	1,484,664
Component 3:Strengthening of the responsible AI entrepreneurial ecosystem	383,000	125,500	508,500
Execution unit	170,000	161,120	331,120
General expenses, including evaluation, audits, and contingencies	81,526		81,526
Grand total	**1,450,000**	**1,450,000**	**2,900,000**
% of financing:	**50%**	**50%**	**100%**

V. EXECUTING AGENCY AND IMPLEMENTATION STRUCTURE

A. Description of the executing agency

5.1 **The Instituto Tecnológico y de Estudios Superiores de Monterrey (ITESM)**,[35] also known as "Tec," is a widely respected private educational institution with 31 campuses in 25 Mexican cities, 21 offices around the world, and academic partnerships with 644 universities in 53 countries. It belongs to the Association of Pacific Rim Universities, an international consortium of leading research universities that also includes Stanford University, the University of California at Berkeley, Caltech, and MIT. The ITESM has successfully worked on previous IDB Lab projects and it has a reputation in Mexico and the region for developing technological innovation and entrepreneurship iniatives.

5.2 The ITESM will sign a service provider agreement with C Minds[36] for the amount of US$472,474, to come from the IDB Lab contribution, for implementation of the following activities listed in the project budget: 1.1 Development of the responsible

[35] Specifically, the ITESM Guadalajara campus will be responsible for project execution.

[36] C Minds' legal name is "Plataforma Integral de Desarrollo Sustentable PIDES A.C."

AI methodology, including a governance model, collaborator management, and advisory services for methodology iterations; 1.3 Design of a replicable AI ethics certification model and the piloting thereof in the state of Jalisco; 1.4 Capacity-building program for civil servants on using AI for more effective public policies; 2.3 Reports on lessons learned from the use cases and public policy recommendations; and 2.4 Recommendation for regulatory guidelines (framework) for public and industry data for training AI. In accordance with the Bank Policies for the Selection and Contracting of Consultants (document GN-2350-12), this will be considered a single-source selection covered by paragraph 3.11(d) of the policies, which cites experience of exceptional worth for the service as a reason for the direct contracting. In that respect, a specific need does exist, and the knowledge and experience that C Minds will bring to the project have exceptional worth, given the firm's experience in developing AI initiatives in the country and the region (where AI expertise is still in its infancy). C Minds authored the report "*Hacia una Política de IA en México: Aprovechando la Revolución de la Inteligencia Artificial* [Towards an AI Policy in Mexico: Taking Advantage of the Artificial Intelligence Revolution]*,"* which laid the foundations for the development of the first National Strategy for AI unveiled by the federal government in 2018. Furthermore, C Minds is a national leader in developing public policy on new technologies with a focus on ethics and social impact, especially due to its participation and leadership in IA2030Mx,[37] a multisector coalition made up of academic institutions, companies, startups, public agencies, civil society organizations, the media, and other key players in the digital and AI ecosystem in Mexico, which helps coordinate stakeholders in the country to discuss AI-related opportunities and challenges in various spheres.

5.3 **Other participants: The Government of Jalisco** new state administration for 2018-2024 seeks to create conditions conducive to promoting, coordinating, and contributing to regional development through innovation and the educational, scientific, and technological development of Jalisco, as well as to gear scientific and technological activities toward problem-solving or addressing market or social-development opportunities. **Private companies:** several companies that are leaders in implementing artificial intelligence, including Google, Microsoft, and NTT Data/Everis, have expressed interest in participating in the project by providing financing and experts for developing the responsible AI for social impact use cases. Each company's role and participation will be determined based on the use case or deliverable for which they can provide value added.

B. Structure and implementation mechanism

5.4 The ITESM will establish an execution unit and the structure necessary to efficiently and effectively execute project activities and manage project resources. The project coordinator will monitor project activities and administrative requirements. The coordinator will be in charge of report preparation and administration in accordance with IDB Lab requirements. Other coordinator responsibilities will include: (i) preparing and updating six-month plans; (ii) supervising and coordinating activities to ensure that any necessary changes are made; and (iii) oversight and management of the activities involved in IDB Lab-required financial processes.

[37] The results of the survey and document are available at https://www.ia2030.mx/.

VI. COMPLIANCE WITH MILESTONES AND SPECIAL FIDUCIARY ARRANGEMENTS

6.1 **Disbursement by results and fiduciary arrangements.** The executing agency agrees to adhere to the standard IDB Lab disbursement by results arrangements and the Bank policies on procurement (documents GN-2350-9 and GN-2349-9)[38] and financial management[39] specified in Annex V and VI.

[38] Link to the Policies for the Procurement of Goods and Works Financed by the Inter-American Development Bank and the Policies for the Selection and Contracting of Consultants Financed by the Inter-American Development Bank.

[39] Link to the Financial Management Guidelines for IDB-financed Projects.