Inter-American Development Bank

TERMS OF REFERENCE

"Benefits of IoT technology adoption for supply chain performance"

Background

Established in 1959, the Inter-American Development Bank ("IDB" or "the Bank") is the main source of financing for economic, social and institutional development in LAC. It provides loans, grants, guarantees, policy advice and technical assistance to the public and private sectors of its borrowing countries (www.iadb.org). Among IDB objectives is that of advancing private sector development in Latin America and the Caribbean (LAC). In this context, IDB is working with the public sector (Ministries of Finance, Production, Industry, Public Works, Commerce; Central Banks; and national development agencies) and the private sector in improving logistics and supply chain performance.

We are at the beginning of a revolution – the Fourth Industrial Revolution – that will change the systems of production and consumption, with breakthroughs in fields such as artificial intelligence, robotics, the Internet of Things, autonomous vehicles, and 3D printing, among others. In this context, the adoption of new digital technologies will be a key driver of efficiency and economic growth, particularly for developing countries. With more than 50 billion devices connected to the internet by 2020 (McKinsey, 2016), a trillion of sensors connected to and transmitting information to analytical platforms "on the cloud" and 44 trillion gigabytes generated (DHL, 2015), firms and public institutions taking part in a supply chain will be able to make decisions more accurately and in real time in order to optimize operations, avoid disruptions and satisfy an increasingly volatile demand.

A growing number of countries in LAC are expressing their interest in improving the performance of their supply chains. In the twenty-first century, supply chains are the paradigm of domestic and international business. Importantly, greater participation in supply chains and an improvement in their performance are essential for economic development. International evidence indicates that (i) firms that participate in supply chains are more productive, and (ii) countries that participate in supply chains and in segments of higher added value demonstrate greater economic development (Hausmann et al., 2013; UNCTAD, 2013). Enterprises in LAC countries, however, participate less than their peers in other regions and do so only in low added value sectors (Calatayud and Ketterer, 2016).

In order to change this trend, IDB is supporting the design and execution of programs in countries such as Argentina, Brazil, Colombia, Dominican Republic, Mexico and Nicaragua. IDB support includes increasing access to finance for capital investment so as to improve firms' efficiency and technological upgrading; enhancing management, technical and administrative skills at the firm level; and promoting the adoption of comprehensive approaches in policy making so as to address

the different bottlenecks that may be present along the large variety of value chain processes and actors.

In the context of the Fourth Industrial Revolution, the Internet of Things (IoT) is progressively getting public and private sector attention as a means to increase supply chain performance and boost economic growth (Calatayud, 2017; OECD, 2017). The IoT refers to sensors and other types of instruments that can connect objects and machinery to computing systems (McKinsey, 2015). With the advent of IoT, Internet connections now extend to physical objects that are not computers in the classic sense and, in fact, serve a multiplicity of other purposes. None of these objects have traditionally been connected to the Internet. However, when they are, vast amounts of information can emerge, along with potential new insights and business value (DHL, 2015). When IoT is adopted throughout firms and public agencies that take part in the same supply chain (suppliers, logistics providers, manufacturers, clients, public entities), all private and public actors gain unprecedented visibility into supply chain operations, enabling new sources of efficiency. Among the main benefits of IoT adoption are reduced inventories and warehousing costs; increased fulfillment predictability, flexibility and agility; reduced production and reaction time; reduced time spent for public procedures and clearance processes; and improved business climate (Calatayud, 2017; OECD, 2017). With particular reference to small and medium enterprises (SMEs), IoT and internet-enabled services can boost their ability to integrate to value chains, by offering access to a range of services that allow them to reduce their operating costs and increase the speed, visibility and reliability of transactions.

However, only a small fraction of firms is tapping into the power of these technologies. For example, according to McKinsey (2016), while 57% of executives around the world say they are aware of the benefits of IoT, less than 10% can confirm that their firms have IoT pilots implemented. According to OECD (2017) less than 22% of the firms located in its member countries use cloud-based technologies for operating, let alone IoT technologies. In addition, the adoption of IoT by the public sector is lagging, further hampering the adoption of IoT by all the actors involved in a supply chain. In this context, IDB has allocated technical cooperation resources to support LAC countries in fostering IoT adoption by supply chains.

Consultancy objective(s)

The objective of this consultancy is to provide evidence on the benefits that the adoption of IoT technologies may have for supply chain performance.

Activities

The IDB is looking for projects that provide evidence on the benefits of IoT adoption for supply chain performance.

1. *Identify and describe the supply chain the consultancy will focus on.* This should include a description of the echelons, the processes and the relationships among the supply chain echelons considered in the project.

2. *Identify and describe the IoT technology to be implemented in the supply chain, and the benefits expected for supply chain performance.* IoT technology is hereby understood in a broad sense, thus encompassing a diverse array of different technologies including devices for data gathering, information-sharing tools, on-the-cloud tools, wireless local (e.g., Bluetooth, RFID, Zigbee, Wi-Fi), mesh network, and wide area connections (e.g., 3G, LTE), as well as wired connections. Technologies may as well include other related/complementary technologies: optical coding, global positioning system (GPS), remote sensing, global system for mobile communication (GSM), unmanned aerial systems (drones) and connected vehicles.

3. *Identify metrics to estimate supply chain gains derived from technology adoption.* This should include a preliminary selection of a pool of metrics (Key Performance Indicators or KPIs) to assess supply chain performance and identify the gains from technology adoption.

4. *Identify information sources to assess supply chain performance gains.*

5. *Describe the activities for project implementation, their expected costs and proposed timeline.* Activities should also include identifying lessons learned from the project as well as providing recommendations on: the adoption of specific technologies for supply chain management; what needs to be in place in terms of infrastructure, knowledge, regulation etc. for such technologies to generate supply chain gains; replicability and implementation of these technologies in other supply chains. The results of the project will be presented at an international workshop in Washington D.C. All costs related to the participation in such workshop will be included in this contract.

6. *Risk assessment and risk mitigation plan.* This should include a preliminary identification of project risks and the actions to mitigate them.

7. *Work plan.* The work plan should include the following milestones: kick-off meeting: revised workplan after kick-off meeting; monthly meetings; draft report and PowerPoint presentation; final report and PowerPoint presentation.

8. *Budget* detailing activity and costs.

9. *Implement activities described in (5) and produce deliverables.* Deliverables include a revised work plan to be discussed with IDB staff; a draft report and PowerPoint presentation to be discussed with IDB staff; and a final report and PowerPoint presentation including the comments provided by IDB staff.

Reports / Deliverables

The deliverables of the Consultancy are:

1. Detailed work plan
2. Draft report and PowerPoint presentation

3. Final report and PowerPoint presentation

Every report must be submitted to the IDB in an electronic file. The report should include cover, main document, and all annexes.

Payment Schedule

Payment terms will be based on project milestones or deliverables. The Bank does not expect to make advance payments under consulting contracts unless a significant amount of travel is required.

The IDB Official Exchange Rate indicated in the RFP will be applied for necessary conversions of local currency payments.

Payment Schedule	
Deliverable	**%**
1. *Upon approval of revised work plan*	20%
2. *Upon approval of Draft Report and PowerPoint presentation*	30%
3. *Upon approval of Final Report and PowerPoint presentation.*	50%
TOTAL	100%

Qualifications

- *Academic Degree / Level & Years of Professional Work Experience:* Master's degree in Logistics, Supply Chain Management, Industrial Engineering, Business Administration, Innovation, Telecommunications, or related areas. At least ten years of relevant experience. Previous experience in LAC region in similar areas of this consultancy will be a plus.
- *Languages:* Proficiency of English or Spanish.
- *Areas of Expertise:* Supply Chain Management, Logistics, Industrial Engineering, Business Administration, Innovation, Telecommunications, or related areas.
- *Skills*: Excellent written communication skills, organization, and program management skills.
- *Project description* including workplan for activities 1 through 8.

Characteristics of the Consultancy

- Consultancy category and modality: Products and External Services Contractual, Lump Sum
- Contract amount: US$ 75,000
- Contract duration: 18 months

- Expected start date: 15th February 2018
- Place(s) of work: External consultancy
- Division Leader or Coordinator: Agustina Calatayud (mcalatayud@iadb.org), Division of Connectivity, Markets and Finance (CMF).

Payment and Conditions: Compensation will be determined in accordance with Bank's policies and procedures. In addition, candidates must be citizens of an IDB member country.

Consanguinity: Pursuant to applicable Bank policy, candidates with relatives (including the fourth degree of consanguinity and the second degree of affinity, including spouse) working for the Bank as staff members or Complementary Workforce contractuals, will not be eligible to provide services for the Bank.

Diversity: The Bank is committed to diversity and inclusion and to providing equal opportunities to all candidates. We embrace diversity on the basis of gender, age, education, national origin, ethnic origin, race, disability, sexual orientation, religion, and HIV/AIDs status. We encourage women, Afro-descendants and persons of indigenous origins to apply.