Internet of Things

An Action Plan for Brazil

November 2017



MINISTERIO DO PLANEJAMENTO, ESENVOLVIMENTO E GESTÃO

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Content

Introduction

Action Plan for Brazil

By 2025, IoT could add **\$4-11 Trillion** to the global economy

0,9-1,7

0,2-1,6

0,4-1,2

0,2-0,9

Size in 2025



Drivers of impact of IoT in emerging market:

Large manufacturing sector

Large populations

Low estimate High estimate

1,2-3,7



Opportunity to leapfrog legacy technologie s

USD Trillions (2015 dollars)

Min

ÎR

Settings

Factories

Cities

Human

Worksites

OutsideImage: Constraint of the second s

Within this context, the BNDES launched the study "Internet of Things: An Action Plan for Brazil", with ambitions goals

Define the aspirations for IoT in Brazil

Prioritize verticals and horizontals for the development of IoT in the country

Prepare a 2018-22 Action Plan to implement the study proposals



We have established a broad IoT ecosystem with participation of key stakeholders in the plan's construction



4,600+2.200+

Invitations to participate in the digital engagement group Written inputs from the public and private sector

150+

Technical specialists participating in thematic workshops

100+ Hours of

workshops with specialists

100+ Interviews realized throughout the

nroughout the study

27+

International specialists involved in the study The study is split in four phases and we are currently on phase III



Goals

On phase I we developed a comprehensive view on the world and a diagnostic for Brazil to define IoT settings and aspiration



Aspiration for IoT in Brazil

Accelerate the implementation of the Internet of Things as a tool for sustainable development of Brazilian society. One that is capable of making the economy more competitive, strengthen nation's productive chains, and promote improved quality of life.

Competitiveness



Promote economic **growth and development** by improving productivity, creating innovative business models and developing higher value-added goods and services based on IoT

Connected and Digital Society



Promote the appropriation and extraction of the benefits of IoT by society to manage city resources, provide smart services and train people for work using the new technologies of the 21st Century

IoT Production Chain



Take advantages of the opportunities of IoT to reinforce the production chain, strengthening SMEs, generating **innovation and increasing the potential for exporting** IoT technology, stimulating the insertion of this country in the **international scenario** Demand Analysis found three key opportunities for developing IoT in Brazil





PHASE I

Make the nation more competitive, resuming economic growth by increasing the value added of export products, and reducing the "Brazil cost" by adopting IoT solutions



Improve the well-being and quality of life of citizens, adopting IoT solutions to improve public services in health, security, mobility and natural resource management



Create an IoT development strategy that addresses the challenges of changing labor relationships and professional profiles

On phase II, setting prioritization process involved several different stakeholders and was held in 3 steps



1 Names of institutions refer to key confederations, ministries and public bodies in Brazil

The prioritization matrix highlighted three prioritary sectors for the country **Priority Front**

Demand x Development Capacity x Supply (size of circle)

PHASE II

Mobilizing Front



Phase III will map key challenges, define a vision for IoT, main applications and the action plan for each setting

	Challenge mapping	Vision Ø	IoT applications	Action plan 🔊
	Map key challenges of each setting that can be addressed by IoT	Define long term goals and quantitative targets for each setting	Establish clear relationship between setting challenges and how IoT	Identify initiatives to enable IoT development through specific applications
9			applications can help addressing	









Enablers

Content

Introduction Action Plan for Brazil

The plan is organized into four different layers that tell us "What" will be done and "How"



Over the Iot Plan of Action for Brazil

Accelerate the implementation of the Internet of Things as a tool for sustainable development of Brazil's society, capable of increasing the economy's competitiveness, strengthen national production chains, and promote improved quality of life.



Public

safety

Mobility













Ocities: Aspirations and Strategic Objectives

Aspiration

Improve quality of life in cities by adopting technologies and practices that allow the integrated management of services to citizens and improve the mobility, public safety and use of resources (energy, sewage and waste)

Strategic objectives



Reduce displacement time and **increase attractiveness** of public transport



Efficient use

Increase the capacity of surveillance and monitoring of areas of the city to **inhibit and mitigate situations of risk** to safety

Reducing waste of utilities and create **public lighting network that enables IoT solutions** in the city at large

Innovation

Promote the **adoption of solutions developed locally** for the setting challenges



Illustrative initiative example

Intelligent and Humane Cities Guidebook

- Political and economic sustainability
- Interoperability
- Financing
- Integrated systems
- etc

Health care: Aspiration and Strategic Objectives

Aspiration

Contribute to increased access to quality healthcare in Brazil through decentralized health care, integration of patient information and improvement of healthcare units' efficiency



Strategic Goals









Promotion

Innovation

Improve the **effectiveness of treatments** for people with chronic diseases by means of **continuous monitoring** of natients

Prevent risk situations and control the emergence of **epidemics** and **infectious-contagious diseases** with IoT solutions Increase the **efficiency of the** SUS **hospitals** and primary

health care units by adopting IoT solutions

Promote the **adoption of solutions developed** locally for the environment's challenges

Illustrative initiative example

Hospital 4.0

 Call for pilot project(s) for use of IoT in health units with different suppliers

ORural: Aspiration and Strategic Objectives

using IoT

Aspiration

Increase Brazil's productivity and relevance in worldwide trade of agribusiness products, with high quality and social-environmental sustainability, positioning Brazil as the largest exporter of IoT solutions for tropical agribusiness



Increase the productivity and quality of rural productionIncrease the productivity and quality of rural productionIncre



Strategic objectives



Increase information volume and accuracy to **monitor biological assets**

Innovation

Promote the **adoption of solutions developed locally** for environment challenges

Illustrative initiative example

Tropical Farm 4.0

Provide connectivity in farm(s) with different crops to develop solutions

OIndustry: Aspiration and Strategic Objectives

Aspiration

Increase local industry productivity through more efficient and flexible production processes, integration of production chains and design of products and business models with higher added value



Strategic objectives Illustrative initiative Increase the efficiency and flexibility of industrial Resources and example processes using IoT solutions to manage operations processes **IoT in SMEs** Promote the development of new products and business **Capital goods** models that incorporate IoT solutions **Dissemination of** kits/basic Promote the integration and cooperation in supplier training/guideboo Inventory and k for IoT use in chains of goods, components, services and inputs. supply chain **SMEs** Promote the adoption of solutions developed locally for Innovation environment challenges

PRELIMINARY

2 Specific Objectives reflect the initiatives

- Expand skilled workforce in IoT in the prioritized environments, with special focus on demand
- Stimulate interest in IoT/TIC by young people
- Strengthen R&D and engineering for IoT world class staff
- Promote training of public managers for IoT



inclusion

Safety and

Privacy

- Refine and disseminate more agile financing instruments
- Encourage the adoption of IoT and support newinnovative companies
- Encourage experimentation and dissemination of successful business models
- Internationalize local solutions in line with global and interoperable standards
- Build for continuous monitoring and participatory IoT Plan environment

- Expand the supply of communication networks in accordance with the demands for IoT services
- Articulate IoT topic into public policies to expand solutions and infrastructure for connectivity
- Encourage and promote interoperability and standardization of IoT Networks, devices and solutions

Anectivity

Connectivity and interoperabili ty infrastructure

- Address telecommunications barriers regulation, aimed at accelerating the development of IoT applications
- Create a regulatory framework to protect personal data appropriate to for foster innovation and protection of individual rights
- Identify and deal with specific regulatory issues in the prioritized verticals
- Establish appropriate institutional design to face the challenges in privacy and safety for IoT

The study also proposes a number of initiatives be grouped into work fronts to maximize their potential



PRELIMINARY

An innovation ecosystem for IoT should seek to overcome a number of the current barriers

Problems of the TIC innovation system in Brazil

- Discontinuity, lack of assessment and articulation for innovation policies
- Excessive dispersal of funds without focusing on areas with the greater potential/need for fund concentration
- Low-level and contingency funds → discontinuity in the accumulation of technological skills
- No coordination between government funding sources
- Poor articulation between innovation agents
 (universities, ICTs and companies)
- Modest international vision in the support of P,D&I
- Legal insecurity and low private investment in innovation

Proposed vision for an innovation system for IoT

Finep, Embrapii etc)

internationalization

of skills (Skill Centers)









Selection, assessment and disqualification based on **technical criteria**

Agreement of various players with

funding for innovation (MCTIC, BNDES,

Concentration of funds in few issues

(Innovation Networks) with the creation

and key agents, without creating new

institutions/structures with a view to

Innovation driven by demand





- Institutionalization of an **updatable** planning process
- Chance for the IoT National Plan to be the pilot for the innovation system for TIC of the Brazilian Digital Transformation Strategy

A Pilot proposal for the innovation ecosystem with alignment and coordination of existing instruments and initiatives



One of the main examples of the program is the Innovation Ecosystem, which includes Skills Centers and Networks

Innovation and cooperation networks

- Purpose: adoption, technological tests and business models in environments given priority to resolve local problems + exports
- Articulation of innovation funding
- Private-public governance
- Examples of activities: laboratories for tests, support for

start-ups, development of qualified technologies, promotion of hacktons, innovation awards etc.

Focal point for discussions with the government standards, interoperability, security etc.



Opportunity for broad public and private cooperation agreement

PRELIMIN

BIoT Observatory

Goal

Consolidate data and information that will enable different stakeholders to have a thorough view of some real world application, its impact and relevant players

Examples of Initiatives within the Observatory

Main actions

- Create the IoT Observatory as a online platform
- Identify financing instruments available for suppliers as well for customers, especially those from government programs

Other initiatives

- Identify training programs focused on IoT
- Estimulate quality and transparency for ICTs by creating rakings of productivity, innovation, etc.



C Guidebook for planning in IoT will detail the basic elements of success in order to implement IoT

Examples of basic elements of the IoT Guidebook in Cities

Local legislation

Political willingness



Active system to listen to citizens



Incorporation of IoT requirements in public purchases Local governance system



Public access to information generated by IoT

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Multidisciplinary center of skilled public managers

V

Shared infrastructure with other players

