Netherlands Enterprise Agency

IoT and Networking Technology in Brazil

Innovation in Agriculture, opportunities in Health and Industry

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April 2018

Networking Technology is a new development and the up-coming standard on factory floors. It's an internal network of equipment and installations for real-time control (Internet of Things) through wireless and 5G technologies (very low power, very short guaranteed delay-time, high volume vision data). Brazil has already pronounced that it wants to develop 5G networks at the same pace as developed countries, so that its Smart Industry can grow accordingly. The government is currently outlining this development, while simultaneously knowledge is being brought to the market through startups and international scientific cooperation, especially in the Agricultural sector. The European Union appointed Brazil as a strategical partner.

Governmental plans and investments

In October 2017 Brazil used 14,8 million Machine to Machine (M2M) connections in different applications. This is a rise of 20,1% when compared to one year earlier. The Brazilian government recently launched a national action plan IoT, after an extensive public consultation. The Ministry of Science, Technology, Innovation and Communication (MCTIC) and the Brazilian Development Bank (BNDES) announced a set of initiatives to develop and accelerate the adoption of IoT in Brazil. The plan defines what actions should be taken to create a thriving ecosystem, a.o. through resolving regulatory issues. The focus is on promoting innovation, developing human capital, defining regulation and improving connectivity. The plan also states what should be the focus areas due to capability and demand. Those priority areas are Industry (Processes, Capital goods and Stock & supply chain), Health (Chronical diseases, promotion & prevention and Management), Rural (Sanitary security and efficient use of natural recourses, inputs and machinery) and Cities (Mobility and public security). In April 2018 the BNDES will launch its first financing proposition. Most likely it will finance up to 50% of one to three IoT projects of at least €500.000 in each priority sector. The projects need to have an ecosystem in place, serve the public interest and be easy to copy to apply in similar cases. It is not yet clear if international parties can apply for these projects. A complimentary initiative that already took place is the installment of a Center for Advanced Manufacturing with IoT at the Engineering school of the University of São Paulo, which was set up in collaboration with Samsung.

A measure that the national government took, related to the action plan, is to open up low interest rate financing lines for Brazilian companies worth €1,2 billion through BNDES designated for Smart Industry projects for the coming three years. Furthermore, the national innovation and technology funding agency (Funding Authority for Studies and Projects – FINEP) will allocate €600 million to Brazilian Smart Industry projects. An important additional measure is that the government will not apply import taxes for industrial robots any longer. The Ministry of Development, Industry and Foreign Trade (MDIC) will also invest €12 million in test beds for industrial projects in Brazil and to create ecosystems that approximate startups with the industry. The national government announced these measures during the World Economic Forum on Latin America in São Paulo in 2017. At the same event the world's main tech companies present in Brazil (a.o. Siemens, Qualcomm, Microsoft, SAP) formed an alliance pledging to assist Brazil in developing its industry.

In 2016 the European Union and Brazilian Ministry for Science, Technology and Innovation signed a Joint Declaration to further develop 5G networks. This had a follow up in 2017 by the signing of two

MoU's focused on 5G and IoT between public and private parties from Brazil and the EU. The EU considers Brazil to be one of the five strategic partners in the development of 5G networks, together with Japan, China, South-Korea and North-America. In 2017 Brazil launched three joint research calls with the H2020 program of the EU on the topics IoT Pilots, 5G Networks and Cloud Computing. Both sides are contributing approximately €8 million each to 6 different projects. Three of the six projects are focused on IoT, with the involvement of several universities from Brazil and Europe alongside companies, such as Embraer and Thyssenkrupp.

Networking Technology R&D in Brazil

The Research Center for Telecommunication Developments, CPqD, located in the city Campinas, São Paulo State, has Latin-America's largest R&D program in ICT solutions. They are currently a key player in Brazil's development of Networking technologies and IoT. With the support of the Ministry of Science, Technology, Innovation and Communications they launched the Open Source platform Dojoi in 2017, based on the European Fiware platform, to develop IoT applications.

CPqD developed one interesting networking project using DOJOI together with a large Brazilian biofuels group called São Martinho. They started by setting up their own mobile LTE network for their crops. This network has a frequency lower than 1GHz, which can cover larger areas, such as agricultural lands. All production machinery (tractors, harvesters, trucks, etc.) are equipped with Radio-frequency identification (RFID) systems that send real-time data to intelligent terminals on those vehicles, which in turn sends it to a central operations center. This allows to see more accurately the amount of sugarcane produced in each area, the quantity that is send to the mills, the accurate position of the product and the distribution of its agricultural fleet. Furthermore they can also see the indicators of operators on the field. Apart from saving a lot of manual work and they use the collected data to set up an algorithm that will enable them to improve their process continuously.

Another interesting project is a result of the H2020 call on IoT with Brazil, mentioned earlier. The Smart Water Management Platform (SWAMP) project is being carried out by the Brazilian Agriculture Research Corporation (EMBRAPA) and the Federal ABC University (UFABC). They apply IoT, data analytics and autonomous devices to develop and deploy technology that senses the level of water needed by the plantation and for distributing the water to places where and when needed.

The Agriculture College of the University of São Paulo (ESALQ/USP) is an important player in the development of Agritech in Brazil, a.o. through their incubator EsalqTec. Two of its startups are worth mentioning. SOMO, the startup of a Dutch researcher/entrepreneur of the Wageningen Agricultural University (WUR), Mark Spekken. SOMO helps farmers choose the best route for machinery to harvest crops, that will reduce costs and also cause less soil erosion. The product of SOMO creates different simulations (automated and semi-automated) through data obtained of the soil, declivity, rainfall, etc. Another product of SOMO uses drones that obtain information of the plantation process. These drones are in contact with the software system that can detect real-time errors in this process. The other startup is Agrosmart, which uses sensors, meteorological data, image processing and an online application to provide real-time crop monitoring for precision agriculture. Agrosmart helps farmers to better manage their agribusiness and understand their crops needs in terms of irrigation, pests and diseases. Currently they are one of the most internationally recognized players in this area, with awards by Forbes, the World Bank and the Kairos Society, an American nonprofit society for global entrepreneurs.

According to ESALQ/USP, Brazil nowadays has a lot of knowledge on generating and processing (tropical) agricultural data. Room for improvement lies mainly in the production of specific sensors and connectivity. The projects mentioned above already provide for this. . In addition to this and due to the high demand of the Brazilian agricultural sector and the high supply of knowledge on the subject

in Brazil, IBM started an open innovation platform on technology in agriculture (IBM AgriTech) to further develop technologies in this field.

More in general, private investments in connectivity are surging, especially in remote rural areas. For example, the company WND Brasil, which represents the French wireless network company Sigfox in Brazil, launched a network that can support IoT solutions in one of Brazil's most important agriculture states, Mato Grosso. Areas that up until then did not have a good network, are now connected and farmers can install cheap internet signals at their production sights.

In the Brazilian Health sector the application of IoT is not as developed as in the agricultural sector, but it is growing. Some of the biggest private Hospitals have a networking system set up. Even though most of it is still focused on improving communication among doctors, initiatives of connected machines are growing. Such as the Mãe de Deus Hospital in Porto Alegre which connects tools, such as RFID's, to facilitate the rotation of beds and patients that are being released and hospitalized. Over the last three years the Albert Einstein Hospital in São Paulo invested over €40 million to update their networking system. Their Intensive Care (IC), for example, integrates data from pressure and temperature monitors to cross it real-time for more integrated Electronic Health Records (EHR) for each patient. Also their complete medications stock is labelled with RFID which aligns their cooling system with the amount and type of medicine that are present. More in general all departments (IC, laboratory, surgery center, blood banks) send their data to a central system which assists doctors in their decision-making process and creates real-time EHR's.

As said in the National IoT Action Plan, Brazil's Industry is also set to have a growth in its IoT applications, although currently the number of companies with Smart Industry applications is still very low. According to the National Confederation of Industries for only 1,6% of the medium and large companies Smart Industry is a reality. The Confederation projects that in ten years' time this will increase to 21,8%. This statement is supported by data related to the market for IoT hardware and software in Brazil. This market is expanding at a rate of 19.6% annually and could be worth €2.7 billion by 2021. One important industrial sector in Brazil is the automotive sector, with most of the world's manufacturers present in Brazil. Mercedes-Benz recently invested €184 million in a new top notch production plant for trucks in the State of São Paulo, that is connected with an already existing plant in Brazil. Mercedes-Benz applies Automatic Guided Vehicles (AVG's), video monitoring and sensors that all connect to their internal database. The president of Daimler Latin America states that the techniques applied here are not even fully present in their German Factories. Until 2022 Mercedes-Benz in Brasil will invest another €590 million in modernizing their other production plants.

Conclusion

The Brazilian government acknowledges the importance of the application of Internet of Things for its society. The national action plan focusses on areas that have the most potential for growth in Brazil. The opening of several lines of credit and subsidies for infrastructure and innovation in IoT is aimed at stimulating the development of networking technologies and applications in areas such as Health, Agriculture , Smart Cities and Industry in Brazil. This also provides for commercial opportunities for hard- and software manufacturers. Measures such as the exemption of import taxes on robots shows the need for foreign products and expertise.

Brazil will invest in networking technology projects including research institutes and foundations. The European H2020 calls with Brazil have been a good example to showcase the interest of Brazil in foreign knowledge.

The networking technology and applications that are being used in Brazil in areas such as health, agriculture, industry and smart cities are in general from foreign input. Brazil is lacking in an high-end innovation infrastructure. However the use of this networking technology in different areas, amongst others due to the big data is innovative.

Events 2018

São Paulo is the host of most of Latin America's events on Networking and IoT. The 3rd Brazilian/Latin-American Congress and Fair for IoT will take place on the 29th and 30th of August. A broader, but bigger event, the Futurecom, will take place from the 15th to the 18th of October.

More information

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