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Authors: ROMO-GONZALEZ, Ana Eugenia y VILLALOBOS-ALONZO, María de los Ángeles.

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ECORFAN-México, S.C.
143 – 50 Itzopan Street
La Florida, Ecatepec Municipality
Mexico State, 55120 Zipcode
Phone: +52 1 55 6159 2296
Skype: ecorfan-mexico.s.c.
E-mail: contacto@ecorfan.org
Facebook: ECORFAN-México S. C.
Twitter: @EcorfanC

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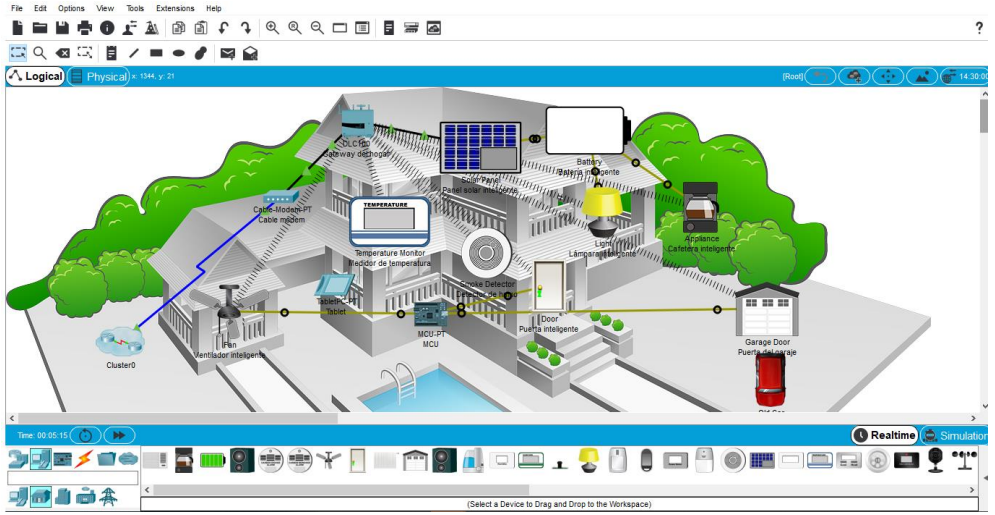
Introduction

The relevance of Internet of Things (IoT) as a concept and paradigm is based on the existence of 30 billion smart devices connected to the Internet, projection to the year 2020 (Statista, 2018) that will sevenfold the number of people on the planet.

This super connectivity feature that allows various types of devices and sensors to transmit data from anywhere.

Radio frequency identification (RFID), sensor network technologies, information systems and technologies are integrated into the environment (Gubbi, Buyya, Marusic & Palaniswami, 2013), which can even be imperceptible for users.

The virtual infrastructure that allows to integrate all the systems, devices and services, is cloud computing.



ROMO-GONZALEZ, Ana Eugenia†*, VILLALOBOS-ALONZO, María de los Ángeles
Universidad Tecnológica de Jalisco, Tecnologías de la Información. Desarrollo de Software multiplataforma
Universidad Tecnológica de Jalisco, Mantenimiento Industrial

Introduction

1. Specialized platforms, systems for IoT and massive transmission of data do not provide social economic by it selves.

2. The challenge of massive data analysis has become imperative.

3. The massification of data derived from the direct interaction between companies and users, accelerate the economic benefits in the productive chains (Evans, 2011).

4. Connectivity becomes intelligent as programs analyze the data of millions of sensors by modifying their structure and making it context sensitive.

5. The IBN or Intent Based Networking rules (Tsuzaki & Okabe, 2017; Rojas, 2017) can be reconfigured automatically,.

The problems of big cities refer to the efficient use of:

Energy, water, the disposal trash, the control of air quality, food security, job creation, manufacturing and production in mass as well as the optimization of transport and its roads.

ROMO-GONZALEZ, Ana Eugenia†*, VILLALOBOS-ALONZO, María de los Ángeles
Universidad Tecnológica de Jalisco, Tecnologías de la Información. Desarrollo de Software multiplataforma
Universidad Tecnológica de Jalisco, Mantenimiento Industrial

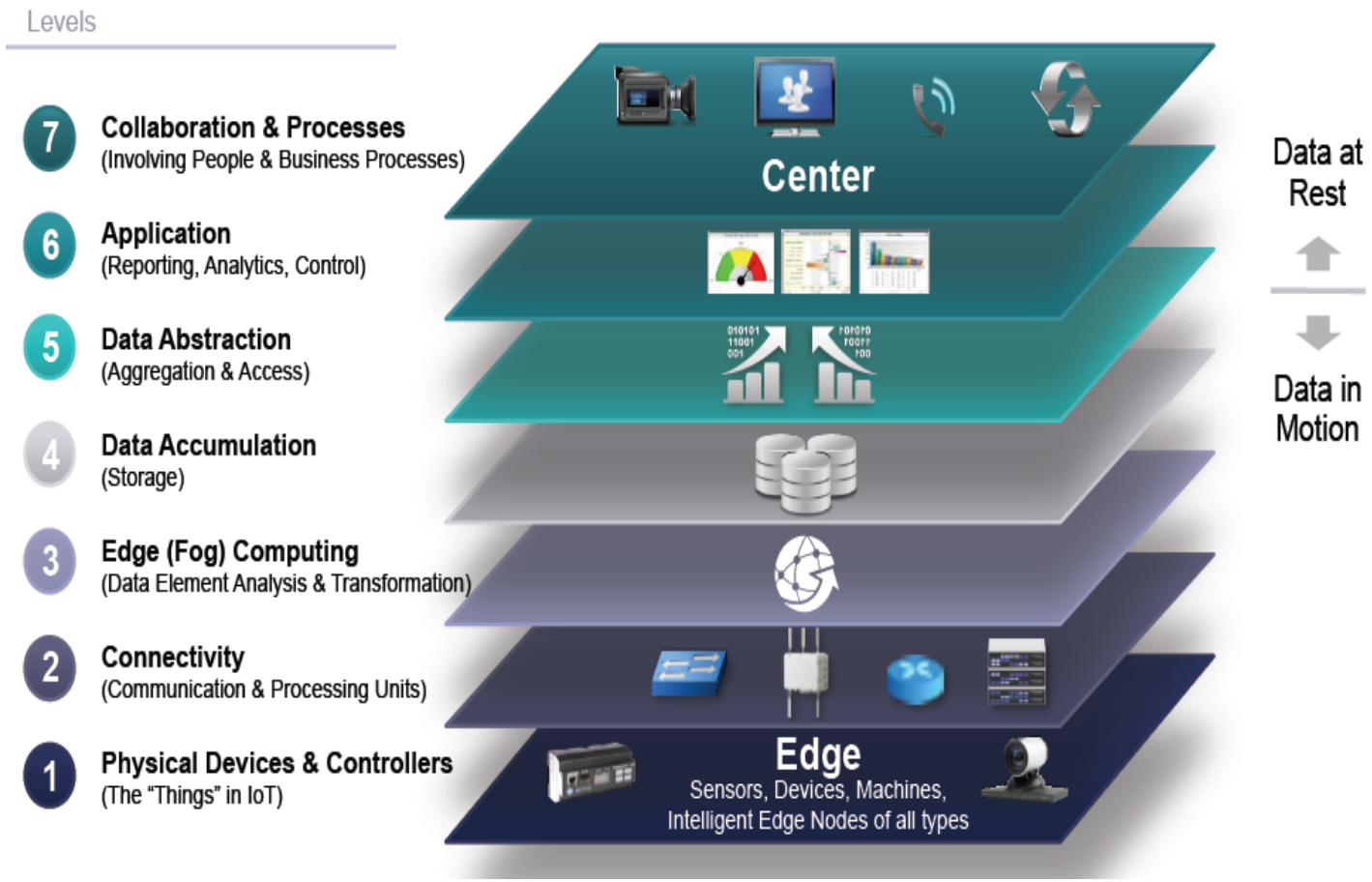
Methodology

Based on the IoT reference model

There area tree fundamental aspects must be included when implementing IoT projects:

1. Manage the devices and associated data.
2. Use connectivity and communication elements.
3. Perform Analytics and application design processes.

The methodology used is qualitative of descriptive scope such as those used in (Bautista, Parra-Valencia, & Guerrero, 2017; Ramírez Madrid, D. A., & Rodríguez Hernández (s / f) and where documentary analyzes are performed.



http://cdn.iotwf.com/resources/71/IoT_Reference_Model_White_Paper_June_4_2014.pdf

ROMO-GONZALEZ, Ana Eugenia†*, VILLALOBOS-ALONZO, María de los Ángeles
Universidad Tecnológica de Jalisco, Tecnologías de la Información. Desarrollo de Software multiplataforma
Universidad Tecnológica de Jalisco, Mantenimiento Industrial

Methodology

In this document the interest is focused on the identification of elements to quickly structure projects that allow developing IoT applications (or Internet of Things) according to the technical sheet for the descriptive study shown

Data sheet of the descriptive study

Databases

Redalyc, SciELO, Dialnet, RedIB, IEEE, Google academic

Descriptors

IoT, Programming Language, Platforms, Applications, Connectivity Elements

Exclusion and inclusion criteria

Inclusion

- I1: Research related to IoT in which technological developments are presented
- I2: Research presents elements of development: language, platform or connectivity

Exclusion

- E1: IoT research is addressed but no developments are presented.
- E2: The article does not present the complete document.
- E3: It is not an academic article

Method of obtaining information

Documentary research

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Universidad Tecnológica de Jalisco, Tecnologías de la Información. Desarrollo de Software multiplataforma
Universidad Tecnológica de Jalisco, Mantenimiento Industrial

Results

From the sheet of the descriptive study the search yielded 734 interrelated articles mainly between the IEEE and Google academic databases, according to the exclusion criteria, 612 were discarded and 122 articles were analyzed.

From the analysis performed, the answer to the four research questions is presented first and secondly, important findings found during the review are shown.

(1). As for the programming languages used for the development of the entire IoT application, cross-platform languages such as Java, Python and C are identified, which are among the most used languages, as well as JavaScript and PHP.

(2). In the sectors with the highest incidence of development of IoT applications are health, energy and automotive. So there are multiple opportunities for the development of comprehensive applications for smart cities (Smart cities) since the previously listed sectors can be integrated to improve the quality of life of citizens in megapolis.

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Universidad Tecnológica de Jalisco, Tecnologías de la Información. Desarrollo de Software multiplataforma
Universidad Tecnológica de Jalisco, Mantenimiento Industrial

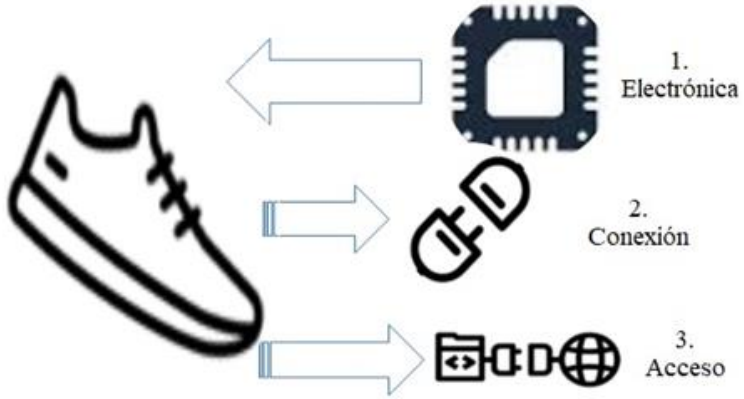
Results

(3). Although the use of radiofrequency is being extended, the communication technology that is being used is Wi-Fi, which can be derived from the extension of its use, the reduction of hardware for its use and the diffusion of open source for achieve the connection of elements through this medium.

(4). Of the sensors with a wide range of use it was found that those of proximity (ultrasonic), temperature and level, as well as their various combinations to improve applications are those that predominate in use.

Although the four elements listed are among the most used, it was also identified that JSON is a language whose use has increased for communication and the sending of data at the device level.

Among the main activities for the construction of IoT solutions, the process of communication between objects that firstly requires the identification of an object with the possibility of incorporating electronic elements and subsequently achieving its interconnection stands out.



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Universidad Tecnológica de Jalisco, Tecnologías de la Información. Desarrollo de Software multiplataforma
Universidad Tecnológica de Jalisco, Mantenimiento Industrial

Conclusions

1. The extension of IoT applications requires the development of new skills by programmers, the skills are related to the integration of multiple components, cross-platform systems and open source tools.

2. Security is an issue that acquires relevance in the field of Internet of Things due to the sensitivity of the information present in all sectors of application, so authentication schemes are the crucial elements to consider in the development of Projects.

3. Achieving technological transparency that eliminates the use of components through applications is one of the challenges of IoT.

4. Among the primary technologies for the construction of intelligent environments in IoT are biotechnology, nanotechnology and micro electronics, as well as the development of advanced materials whereby the promotion of these areas will increase the potential of IoT development projects for the improvement of the quality of life of all people.

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Universidad Tecnológica de Jalisco, Tecnologías de la Información. Desarrollo de Software multiplataforma
Universidad Tecnológica de Jalisco, Mantenimiento Industrial

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