

TECHNICAL REPORT



Internet of things (IoT) – Socialized IoT system resembling human social interaction dynamics



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INTERNET OF THINGS (IoT) – SOCIALIZED IoT SYSTEM RESEMBLING HUMAN SOCIAL INTERACTION DYNAMICS

FOREWORD

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IEC TR 30174 has been prepared by subcommittee 41: Internet of Things and Digital Twin, of ISO/IEC joint technical committee 1: Information technology. It is a Technical Report.

The text of this Technical Report is based on the following documents:

Draft	Report on voting
JTC1-SC41/227/DTR	JTC1-SC41/240A/RVDTR

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this Technical Report is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs and www.iso.org/directives.

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INTRODUCTION

The Internet of Things (IoT) technology is the third wave of information industry, following the computer, communications network and the Internet. It provides the technology tools to build an effective interactive IoT system connecting human users and the physical world, which causes the changes in individual's daily life and also in the operations of human society. The innovative ideas can be implemented in IoT systems creating new markets for technology-based but user-friendly services. The technologies in the IoT systems will keep evolving with improving the existing technology and also the insertion of new technologies.

The communications network focuses on connection and transmission, and it realizes transmission service. The Internet focuses on information sharing, and provides services related to information sharing. The IoT systems focus on the objective physical world, realizing the basic sensing service and other services for the objects of interest (i.e. targets), events, etc., in the physical world.

In order to realize the sensing of the complex physical world, an IoT system needs to have an organized and coordinated sensing capability. For a specific target, this capability activates relevant sensor nodes, and division of labour and cooperation strategies are applied, which is similar to an enterprise that organizes people with required capabilities to form a project team and completes the project with proper division of labour and cooperation. In this perspective, therefore, it can be stated that the IoT system has socialized attributes as IoT nodes and terminals establish an orderly socialized system.

This document comprises five main clauses. Clause 5 introduces the background and motivations for the study of the socialized IoT system. Clause 6 discusses the essential differences of the IoT systems compared to the communications network and the Internet. This comparison is summarized with the key features of the socialized IoT system. Clause 7 further analyses the socialized network, socialized collaboration and socialized service, which are designated as the three pillars of the IoT socialized attributes. Clause 8 addresses the sensing security issue for IoT systems. Clause 9 discusses the application methods of the socialized IoT attributes using a use case analysis, such as the intrusion prevention system or infrastructure protection. This document provides readers with the knowledge of the socialized characteristics and features of the IoT system, and inspires readers to adopt them in the design of IoT systems and provision of IoT services.

INTERNET OF THINGS (IoT) – SOCIALIZED IoT SYSTEM RESEMBLING HUMAN SOCIAL INTERACTION DYNAMICS

1 Scope

This document describes:

- key features of the socialized IoT systems, e.g. sensing the external physical world, resolving the uncertainties of targets, satisfying users' demand and providing quality service, etc.;
- socialized attributes, i.e. socialized network, socialized collaboration, and socialized services, which are derived from the key features; and
- guidelines on how to use or apply the socialized attributes in the design and development of IoT systems.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

3.1

event

something that happens in the physical world and is observable or detectable by sensors

[SOURCE: IEC 60050-113:2011, 113-01-04, modified – In the definition, "subspace time of space-time" is replaced with "the physical world and is observable or detectable by sensors.]"

3.2

object

person or thing that is observable or detectable by sensors

Note 1 to entry: Thing can be any living one (animals, plants, etc.) or any material one (table, car, etc.).

3.3

target

object or event about which information is searched by interest to IoT system

[SOURCE: IEC 60050-713:1998, 713-04-14, modified – In the definition, "or event" is added and "radar" is replaced with "interest to IoT system."]