**Smart Gate Controller**

*Cypher*

*Date*

***Important Notes:***

* ***The descriptions in italics in this document (except for some section headings) are exemplary and explanatory and must be removed from the completed report.***
* ***Identify which section of this report was created by which team member***
* ***Your documentation should have ca. 8 pages.***

# Team members

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# Introduction

What are “Internet of Things” and “Wireless Sensors Network” in your project domain about?

Over the last decade, a growing number of “things” have become connected to the Internet. The term “things” refers to a wide variety of devices, from cars with built‑in sensors, to heart monitoring implants or smart thermostats in private homes. Sensors and networkconnectivity allow these things to monitor their environment, report their status and location, receive instructions and even execute actions based on the data they receive. This giant and fast-growing network of physical objects, equipped with sensors and network connectivity, is what is meant by the term “the Internet of Things” (IoT). By 2020 an estimated 30 billion objects will be connected, but even this is only 15 per cent of all connectable things. In the coming years, the IoT revolution will affect every aspect of societies and economies around the world.

Up until now, the Internet has generally been understood as a network which manages information created and processed by people. But the Internet of Things now also allows objects to communicate with each other, make decisions and take actions – without any human intervention. By bringing devices and objects online, IoT creates new ways of managing and monitoring processes, companies and organisations. The sensor technology which underpins IoT is developing quickly, and now ranges from basic identification tags to complex sensors. Basic radio- frequency identification (RFID) tags can be attached to almost any object. Sophisticated multi-sensors which transmit data about location, performance and environment are becoming more common. With new technologies such as micro elec tromechanical systems (MEMS), it is becoming possible to place such sensors in any object (even in humans). In its essence the Internet of Things can be imagined as a seamless flow of data between objects with sensors across different types of networks. Smart algorithms can learn from the data collected by sensors, make predictions, provide data-driven decisions in real time, and react to changes in environment.

Rapid Growth of the Internet of Things in Emerging and Developing Countries

It seems clear that the IoT offers an enormous potential for future economic income and prosperity in industrial countries: IoT applications are projected to create an income increase of 10.6 trillion US-dollars by 2030. Now the focus is shifting, and is no longer exclusively on industrialised contexts. As experts discussed during the IoT Solutions World Congress this year, IoT will also create substantial changes for populations in emerging and developing countries. In some rapidly developing markets, such as in Asia, annual growth in IoT connections reached 55 per cent a year between 2010 and 2013, in contrast with Europe where it slowed to 28 per cent.

The internet of things, or IoT, is a system of interrelated computing devices, mechanical and digital machines, objects, animals or people that are provided with unique identifiers (UIDs) and the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction.

A thing in the internet of things can be a person with a heart monitor implant, a farm animal with a biochip transponder, an automobile that has built-in sensors to alert the driver when tire pressure is low or any other natural or man-made object that can be assigned an Internet Protocol (IP) address and is able to transfer data over a network.

An IoT ecosystem consists of web-enabled smart devices that use embedded systems, such as processors, sensors and communication hardware, to collect, send and act on data they acquire from their environments. IoT devices share the sensor data they collect by connecting to an IoT gateway or other edge device where data is either sent to the cloud to be analyzed or analyzed locally. Sometimes, these devices communicate with other related devices and act on the information they get from one another. The devices do most of the work without human intervention, although people can interact with the devices -- for instance, to set them up, give them instructions or access the data.

5G network is the up-to-the-minute generation network that will address the transformation beyond the massive IoT (Internet of Things) for the millennium and it is the next big step in our technological advancements. It is also known as the latest network technology that allows us to transfer data rapidly and steadily. The alluring part of 5G is that it will enable a perceived fully ubiquitous connected world. In fact, 100 times faster in comparison to 4G and the previous wireless technology due to its lower latency which only allows us to transfer data at only a mere 100 megabit per second. A myriad of improvements could be made a reality with the assistance of this upcoming technology such as self-driving cars, breakneck internet speeds and countless scientific researches that can be conducted within a shorter period.

# Concept description

*Block diagram of your target application.*

*What is the main application for your prototype?*

*Which devices, sensors, actuators, apps etc. are using for your application?*

1. *Requirement diagram*
2. *Use case diagram*

*Diagram

Description automatically generated*

1. *Activity diagram*
2. *System architecture*

# Project/Team management

*Which project methods you used in your project?*

*Breakdown: How you managed your tasks?*

*What are the different tasks/roles of the team members in the project?*

*Describe which team member did which tasks.*

# Technologies

# *Describe the technological approaches you will use to implement your project.*

* *Sensor technologies*
* *Communication protocols*
* *programming languages*
* *...*

# Implementation

*Describe the static structure of the environment.*

*Provide a class diagram for this purpose and briefly explain the classes or modules.*

*Describe the use case(s) of your environment*

# Use Case

*Give instructions on how to use your application. Potentially using an/more example(s), figures, screenshots etc.*

# Sources/References

*Provide the sources on the technologies and algorithms you used in your project (Github).*

*[1]* A. S. Gillis, “What is IOT (internet of things) and how does it work? - definition from techtarget.com,” *IoT Agenda*, 04-Mar-2022. [Online]. Available: https://www.techtarget.com/iotagenda/definition/Internet-of-Things-IoT. [Accessed: 15-May-2022].

*[2]* F. Kreische, A. Ullrich, and K. Ziemann, “Introduction: The internet of things is already here,” *10innovations.alumniportal.com*, 2013. [Online]. Available: https://10innovations.alumniportal.com/internet-of-things/introduction-the-internet-of-things-is-already-here.html. [Accessed: 15-May-2022].