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ASSIGNMENT FINAL REPORT

Qualification	**Pearson BTEC Level 5 Higher National Diploma in Computing**		
Unit number and title	**Unit 45: Internet of Things**		
Submission date		**Date Received 1st submission**	
Re-submission Date		**Date Received 2nd submission**	
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Grading grid

P1	P2	P3	P4	P5	P6	P7	P8	M1	M2	M3	M4	M5	M6	D1	D2	D3

r Summative Feedback:	r Resubmission Feedback:

Grade:	Assessor Signature:	Date:

Internal Verifier's Comments:

Signature & Date:

TABLE OF CONTENT

TABLE OF FIGURES

TABLE OF TABLE

A. Introduction

B. Content

I. Explore various forms of IoT functionality. (P1)

1. Introduction to the functionality of IoT.

The Internet of Things (IoT) is a novel paradigm that is rapidly gaining ground in the scenario of modern wireless telecommunications. The basic idea of this concept is the pervasive presence around us of a variety of things or objects - such as Radio-Frequency IDentification (RFID) tags, sensors, actuators, mobile phones, etc. - which, through unique addressing schemes, are able to interact with each other and cooperate with their neighbors to reach common goals (Atzori, Iera, & Morabito, 2010).

The Internet of Things (IoT) offers many benefits in optimizing processes or reducing operating costs and can improve work efficiency. The main functions of IoT include:

- Data collection and sensing
- Data connectivity and transmission
- Data processing and analysis
- Control and automation
- Security and privacy

2. Functional forms of IoT

2.1. Data Collection & Sensing

The most important main function of IoT is to collect data from the environment through smart sensors. These sensors can collect parameters such as temperature, light, humidity, motion, air quality and energy consumption (Xu, He, & Li, 2014).

Common types of sensors in IoT:

- **Temperature and humidity sensors:** These are often used in smart agriculture and are used to measure humidity and temperature in the air. *For example*, in agriculture, the soil moisture sensor of the automatic watering system can help automatically water when the soil is dry or the user can customize the watering time and adjust the amount of water when watering, avoiding water waste and optimizing crop productivity.
- **Light sensor:** Helps support automatic lighting system adjustment, products that apply light sensors are often energy-saving and highly efficient. *For example*, when it is dark, the street lights automatically turn on. When it is light, the lights turn off. This is because the light sensor detects ambient light and controls the light switch.
- **Motion sensor:** is a smart sensor line that can detect and measure physical movement within a certain range. From there, the sensor will send a signal to other devices to operate according to a pre-set scenario. *For example*, the hallway light automatically turns on when someone enters.
- **Air quality sensors:** help monitor and check environmental pollution levels and help environmental managers implement appropriate measures to improve air quality.

2.2. Connectivity and Data Transmission

After collecting data, IoT devices need to transmit data to the processing system through appropriate connection protocols (Razzaque et al., 2016).

Popular protocols:

2.3. Data Processing and Analytics

2.4. Control and Automation

2.5. Security and Privacy

II. **Review standard architecture, frameworks, tools, hardware and APIs available for use in IoT development. (P2)**

1. **Introduction to IoT Development**

III. **Investigate architecture, frameworks, tools, hardware and API techniques available to develop IoT applications. (P3)**

IV. **Discuss a specific problem to solve using IoT. (P4)**

V. **Employ an appropriate set of tools to develop a plan into an IoT application. (P5)**

VI. **Create a detailed test plan and examine feedback. (P6)**

VII. **Review the IoT application, detailing the problems it solves. (P7)**
Investigate the potential problems the IoT application might encounter when integrating into the wider system. (P8)

VIII. **Analyse the impact of common IoT architecture, frameworks, tools, hardware and APIs in the software development lifecycle. (M1)**

IX. **Examine specific forms of IoT architecture, frameworks, tools, hardware and APIs for different problem-solving requirements. (M2)**

X. **Plan the most appropriate IoT architecture, frameworks, tools, hardware and API techniques to include in an application to solve a problem. (M3)**

XI. **Apply selected techniques to create an IoT application development plan. (M4)**

XII. **Reconcile end-user feedback and determine advantages and disadvantages of chosen IoT techniques. (M5)**

XIII. **Compare the final application with the original plan. (M6)**

XIV. **Evaluate specific forms of IoT architecture and justify their use when designing software applications. (D1)**

XV. **Make multiple iterations of the IoT application and modify each iteration with enhancements gathered from user feedback and experimentation (D2)**

XVI. **Critically evaluate the overall success of the application including the potential impact of the IoT application on people, business and society, and the end user. (D3)**

C. Conclusion

D. References