OCR
Oxford Cambridge and RSA

Cambridge **TECHNICALS LEVEL 3**

IT

Cambridge TECHNICALS 2016

Unit 17

Internet of Everything

H/507/5020

Guided learning hours: 60

Version 1 September 2015

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Guided learning hours: 60

Essential resources required for this unit: Access to the internet and research materials

This unit is internally assessed and externally moderated by OCR.

UNIT AIM

This unit is about the use of the internet and how it is impacting people and society. You will learn about the Internet of Everything (IoE) and how it is used. Using your knowledge you will carry out a feasibility study for a potential idea. You will pitch your idea to potential stakeholders and use their feedback to revise your proposal.

This unit is an optional unit in the Extended Certificate and all of the specialist pathways in the Diploma suite, as the Internet of Everything is everywhere. The Internet of Everything is expanding, appearing in all of the everyday devices found in homes, businesses and cities.

Knowledge gained in the study of this unit will also help prepare you for relevant industry qualifications such as Cisco IoE.

TEACHING CONTENT

The teaching content in every unit states what has to be taught to ensure that learners are able to access the highest grades.

Anything which follows an i.e. details what must be taught as part of that area of content. Anything which follows an e.g. is illustrative, it should be noted that where e.g. is used, learners must know and be able to apply relevant examples in their work, although these do not need to be the same ones specified in the unit content.

For internally assessed units you need to ensure that any assignments you create, or any modifications you make to an assignment, do not expect the learner to do more than they have been taught, but must enable them to access the full range of grades as described in the grading criteria.

Learning outcomes **The Learner will:**	**Teaching content** **Learners must be taught:**
1. Understand what is meant by the Internet of Everything (IoE)	1.1 Things, i.e.: • physical objects • experiential interactions • aids to people • aids to society/community • machines 1.2 Where the IoE is used 1.3 Applications of the use of the IoE, i.e.: • body/health • home/garden • city/neighbourhood • industry • the environment 1.4 Global impacts, i.e.: • positive • negative • cost savings • increased productivity • new sources of revenue • enhanced citizen experiences 1.5 The four pillars of the IoE, i.e.: • people • data • process • things (devices and objects) 1.6 People, i.e.: • students • members of society • connecting people in relevant ways

Learning outcomes The Learner will:	Teaching content Learners must be taught:
	1.7 People and how they connect, i.e.: • devices • social networks • wearables 1.8 Converting data into information to allow people to make decisions 1.9 Data, i.e.: • raw data • connected things (devices) • analysis • decisions • results 1.10 Information gathering devices, i.e.: • computers • smart phones • vehicles • other devices with sensors 1.11 Process, i.e.: • delivery of information • delivery to whom • timing of processing • methods to deliver processed information 1.12 Processing capabilities, i.e.: • local • server • big data technologies • cloud services 1.13 Connectivity, i.e.: • wired • Wi-Fi • Bluetooth • local • cloud-based • data centre-based • radio-frequency identification (RFID) 1.14 Networked connection, i.e.: • manageable • intelligent • secure • scalability • congestion 1.15 Security issues, i.e.: • ownership of personal information • unauthorised access and misuse of personal information

	• facilitating attacks on other systems • can be more challenging to secure than a home network
Learning outcomes **The Learner will:**	**Teaching content** **Learners must be taught:**
2 Be able to repurpose technologies to extend the scope of the IoE	2.1 Developments, i.e.: • body/health, e.g.: o sensors, e.g. wearable thermometer o social safety wearables o Wi-Fi mattress cover o Bluetooth stethoscope o biometric patch o running analytics o Bluetooth weather sensor o Bluetooth maps for visually impaired o Bluetooth sunglasses • home/garden, e.g.: o smart air conditioner o Bluetooth tape measure o smart locks o smart lights o smart batteries o global location devices o Bluetooth measurement jars o Bluetooth flower pots o wireless water shutoff o Wi-Fi shopping lists o solar powered window blinds o Wi-Fi gas and carbon monoxide detectors • city/neighbourhood, e.g.: o real-time air traffic o smart signage o bicycle barometer o city dashboard o intelligent street lights o taxi locator o surveillance systems o wearable air quality sensor o smart urban furniture o connected car safety devices • industry, e.g.: o industrial smart helmet o smart glasses for warehouses o wireless pest monitoring o smart paving capturing kinetic energy o intelligent packaging o smart luggage/cargo o workforce driving monitors o connected e-paper displays o Wi-Fi cold storage monitoring o smart noise sensors o smart bottle labels

Learning outcomes The Learner will:	Teaching content Learners must be taught:
	o wireless calving alert sensors o real-time remote excavation • the environment, e.g.: o environmental monitoring o wildlife tracking o flood detection network o illegal deforestation monitoring o landslide detection systems 2.2 Feasibility study, i.e.: • identify new opportunities through investigative process • evaluation and analysis of the proposed concept proposal • evaluation of alternative proposals • market assessment • results and conclusions (e.g. whether to process or not)
3 Be able to present concept ideas for repurposed developments	3.1 Business proposal, i.e.: • target audience • processing required • data to be exchanged • things • networking requirements • devices to be used • security issues 3.2 Pitch, e.g.: • report • presentation • website/multimedia 3.3 Feedback, e.g.: • stakeholders • developers • written • verbal 3.4 Stakeholder considerations, i.e.: • who benefits from the application? • how does society benefit? • how do companies benefit? • who will develop the application? 3.5 Revision of proposal, i.e.: • analyse the feedback o identify types of problems o determine consistency of comments • decision on whether the proposal is still viable • make changes to proposal in line with feedback and viability considerations

Learning outcomes The Learner will:	Teaching content Learners must be taught:
	3.6 Possible success criteria (must be measurable), e.g.: • improved efficiency • increase in profits • increase in productivity • reduction in wasted time • reduction in overhead costs

GRADING CRITERIA

LO	Pass	Merit	Distinction
	The assessment criteria are the Pass requirements for this unit.	To achieve a Merit the evidence must show that, in addition to the pass criteria, the candidate is able to:	To achieve a Distinction the evidence must show that, in addition to the pass and merit criteria, the candidate is able to:
1. Understand what is meant by the Internet of Everything (IoE)	P1: Explain the concept of the IoE	M1: Analyse the global impacts of the IoE on society and the environment	
	P2*: Explain the four pillars of the IoE and how its innovations can transform businesses *(*Synoptic assessment from Unit 1 Fundamentals of IT, Unit 2 Global information and Unit 3 Cyber security)*		D1: Evaluate the potential negative impacts of these innovations on businesses
2. Be able to repurpose technologies to extend the scope of the IoE	P3: Outline potential development projects that could extend the scope of the IoE	M2: Conduct a feasibility study on one of these development projects	
3. Be able to present concept ideas for repurposed developments	P4: Prepare a business proposal for the chosen development project		
	P5: Deliver a business proposal pitch to potential stakeholders on the chosen development project	M3: Revise business proposal for the chosen development project incorporating stakeholder feedback	D2: Evaluate the success criteria that would be used to judge the sustainability of the chosen development project

SYNOPTIC ASSESSMENT

When learners are taking an assessment task, or series of tasks, for this unit they will have opportunities to draw on relevant, appropriate knowledge, understanding and skills that they will have developed through other units. We've identified those opportunities in the grading criteria (shown with an asterisk). Learners should be encouraged to consider for themselves which skills/knowledge/understanding are most relevant to apply where we have placed an asterisk.

ASSESSMENT GUIDANCE

LO1 Understand what is meant by the Internet of Everything (IoE)

P1: Learners must explain what the concept of the IoE is. Consideration should be given to what the t*hings* are that are part of the IoE and where the IoE is used. Understanding of what the IoE is will be illustrated by examples taken from a variety of applications. The examples used by learners do not have to be confined to the categories listed in the teaching content. Evidence can be in the form of a written report, a presentation with detailed speaker notes, a video of the information being presented to an audience, or an information guide on the IoE.
M1: Learners are required to analyse the global impacts that the IoE has on individuals, society and the environment. This could be an extension to the evidence generated in criterion P2. Evidence can be in the form of a written report, a presentation with detailed speaker notes, a video of the information being presented to an audience, or an information guide on analysing the global impacts the IoE has on society and the environment.
P2: The interconnection of the four pillars of IoE (people, data, process and things) in the evolution of technology must be explained with an explanation of how these innovations can transform businesses. Evidence can be in the form of a written report, presentation with detailed speaker notes, a video of the information being presented to an audience or an information guide.
D1: Evidence for this criterion is likely to be an extension from criterion P2. As well as having positive impacts, there may be negative impacts of the innovations to a business. These should be evaluated, using examples to illustrate the points being made. Evidence can be in the form of a written report, a presentation with detailed speaker notes or a video of the information being presented to an audience.

LO2 Be able to repurpose technologies to extend the scope of the IoE

P3: In order to consider potential developments for the IoE it will be necessary for learners to explore existing developments. An extensive list of examples is provided in the teaching content. Learners will need to outline potential development projects that could extend the scope of the IoE. These developments could be an extension to an existing application, a new application or taking an existing application and identifying how it could be developed in a different context. Evidence can be in the form of a written report, a presentation with detailed speaker notes, a video of the information being presented to an audience or an information guide describing the different potential developments.
M2: This criterion is an extension from criterion P3. A feasibility study must be carried out on one of these development projects. Evidence presented must detail the nature of the feasibility study to be carried out as well as the analysis and evaluation of the findings. Evidence can be in the form of a written report, a presentation with detailed speaker notes or a video of conducting the feasibility study, analysing the outcomes and evaluating the concept proposal.

LO3 Be able to present concept ideas for repurposed developments

P4: This criterion requires learners to prepare a business proposal for the chosen development project. This naturally leads on from LO2. The business proposal should cover the headings identified in the teaching content for the unit. The evidence will be the completed business proposal.
P5: This criterion requires learners to deliver a business proposal pitch to potential stakeholders. This is an ideal opportunity to engage with representatives from industry. If suitable industry representatives are not available, other representatives from industry may be used for the purpose of the business proposal delivery pitch. Evidence can be in the form of a presentation with detailed speaker notes with an accompanying witness statement or a video of conducting the business proposal pitch. Evidence of feedback from stakeholders must also be included.
M3: Learners are required to consider the feedback from the potential stakeholders and revise the business proposal. The business proposal produced for criterion P4 will be updated to reflect the stakeholder feedback. The evidence will be the revised business proposal with a rationale for decisions made based on the feedback.
D2: Learners are required to evaluate the success criteria that would confirm the sustainability of the development project. The success criteria should provide a stakeholder with a good indication as to how to measure the success of the development and therefore should be measurable. The evidence could be an extension to the evidence presented for P5/M3 or a separate report.

Some providers for the industry qualifications offer quizzes, tests and assessments. Reference to these websites may support knowledge and learning.
www.**cisco**.com/UK

EMPLOYABILITY SKILLS

Employability skills	Learning outcome
Communication	P1, P2, P3, P4, P5, M1, M2, M3, D1, D2
Problem solving	P4, P5, M2, M3, D1, D2
Time management	P1, P2, P3, P4, P5, M1, M2, M3, D1, D2
Critical thinking	P2, P3, P4, P5, M1, M2, M3, D1, D2
Team working	P4, P5, M2, M3, D1, D2
Negotiation	P5, M3
Decision making	P4, P5, M2, M3, D2

MEANINGFUL EMPLOYER INVOLVEMENT - a requirement for the Introductory Diploma, Foundation Diploma and Diploma (Tech Level) qualifications

The 'Diploma' qualifications have been designed to be recognised as Tech Levels in performance tables in England. It is a requirement of these qualifications for centres to secure for every learner employer involvement through delivery and/or assessment of these qualifications.

The minimum amount of employer involvement must relate to at least one of the mandatory units, although we encourage you to find ways to engage with employers for other units as well.

Eligible activities and suggestions/ideas that may help you in securing meaningful employer involvement for this unit are given in the table below.

Please refer to the *Qualification Handbook* for further information including a list of activities that are not considered to meet this requirement.

Meaningful employer involvement	Suggestion/ideas for centres when delivering this unit
1. Learners undertake structured work-experience or work-placements that develop skills and knowledge relevant to the qualification.	Learners could undertake an investigation during work experience to establish how developments in technology have impacted on an application within a company and how it has affected the employee(s).
2. Learners undertake project(s), exercises(s) and/or assessments/examination(s) set with input from industry practitioner(s).	Learners could produce proposal documents for a scenario and then carry out a feasibility study for these proposals. The industry practitioners would be able to identify strengths and weaknesses in the activities undertaken by the learners.
4. Industry practitioners operating as 'expert witnesses' that contribute to the assessment of a learner's work or practice, operating within a specified assessment framework. This may be a specific project(s), exercise(s) or examination(s), or all assessments for a qualification.	Industry practitioners would be engaged by centres so that learners could deliver a business pitch to the practitioners and receive feedback on the pitch. In turn learners would revise the business proposal as a result of the feedback. This would provide practitioners with the opportunity to contribute to the assessment of LO3.

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Alternatively, you can email us on **vocational.qualifications@ocr.org.uk**

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