CAMBRIDGE NATIONAL

LEVEL 1/LEVEL 2

IT

SECOND EDITION

J836

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Contents

Acknowledgements iv

Introduction v

How to use this book vi

Unit R050 IT in the digital world 01

Topic area 1 Design tools 02
Topic area 2 Human Computer Interface in everyday life 08
Topic area 3 Data and testing 18
Topic area 4 Cyber-security and legislation 33
Topic area 5 Digital communications 54
Topic area 6 Internet of Everything (IoE) 71

Unit R060 Data manipulation using spreadsheets 91

Topic area 1 Planning and designing the spreadsheet solution 92
Topic area 2 Creating the spreadsheet solution 101
Topic area 3 Testing the spreadsheet solution 136
Topic area 4 Evaluating the spreadsheet solution 141

Unit R070 Using augmented reality to present information 145

Topic area 1 Augmented reality 146
Topic area 2 Designing an AR model prototype 158
Topic area 3 Creating an AR model prototype 168
Topic area 4 Testing and reviewing 174

Glossary 179

Index 183

Introduction

This book will help you to develop the knowledge, understanding and practical skills you need to complete your Level 1/Level 2 Cambridge National IT course. As well as preparing you for your final exam and set assignments, the book will introduce you to the IT sector. You will learn how to design, plan, create and review IT products to meet client briefs and target audience demands.

The chapters in this book closely follow all the topics required for each unit in the course specification, which you can find on the OCR website. To help with your learning the book covers the key content in detail and includes a range of real-world examples. There are also lots of activities and learning features; you can find out more about these and how to use them on the next page.

Note for teachers: You can find out more about how we have designed the textbook to support you at: **www.hoddereducation.co.uk/it-teacher-intro**

Qualification structure

The Cambridge National in IT qualification is made up of three different subject units. You will need to complete all of these:

- R050: IT in the digital world
- R060: Data manipulation using spreadsheets
- R070: Using augmented reality to present information

A chapter of this book is dedicated to each unit.

Assessment: Examined unit and final set assignments

- Unit R050 is an examined unit where you will sit a 1½ hour exam paper, which is set and marked by OCR.
- Units R060 and R070 are assessed through a series of tasks for a set assignment that you will be given. The assignments are set by OCR, marked by your tutor and then moderated by OCR.

All the examination questions contain 'command' verbs. These tell you what you have to do to answer the question or complete the task. You should always check the command verb before starting a task or answering a question. For example, if you describe something when an explanation is required, you will not be able to gain full marks; this is because an explanation requires more detail than a description. There are a range of practice questions in this book in Unit R050 to help you get to grips with the command words. A list of command verbs is available on the OCR website.

Once you have learnt all the required parts of the moderated units, you will complete an assignment that will be used to assess your knowledge and skills of the subject. It will be set in a vocational context, which means that it will simulate what it would be like to be given a project by a client or employer in a work situation. You will use the OCR set assignment or a modified version of it for the assessment. This assignment will include a series of tasks that follow the same process and sequence of the topic areas in the R060 and R070 units. The assignment practice features in this book will help you get used to working in the relevant IT contexts.

Note: The practice questions and accompanying marks and mark schemes included in this resource are an opportunity to practise exam skills, but they do not replicate examination papers and are not endorsed by OCR.

How to use this book

This student textbook contains all three units for the redeveloped OCR Level 1/Level 2 Cambridge National in IT (J836).

These are:

- Unit R050 IT in the digital world
- Unit R060 Data manipulation using spreadsheets
- Unit R070 Using augmented reality to present information.

Each unit is then divided into topic areas. All of the teaching content for each topic area is covered in the book.

Key features of the book

The book is organised by the units in the qualification. Each unit is broken down into the topic areas from the specification. Each unit opener will help you understand what is covered in the unit, the list of topic areas covered, and what you will be assessed on, fully matched to the requirements of the specification.

About this unit

An introduction to the topics covered by the unit.

Topic areas

A list of the unit's topic areas, so you know exactly what is going to be covered.

How will I be assessed?

Information on how the unit will be assessed.

Getting started

Short activities to introduce you to the topic.

Key term

Definitions of important terms.

Case study

See how IT concepts can be applied and learn about real-life scenarios.

Activity

A short task to help you understand an idea or assessment criteria.

Test your knowledge

Short questions designed to test your knowledge and understanding.

Research

Research-based activities that draw on the content covered in the book, to reinforce your understanding.

Synoptic link

Links to relevant details in other parts of the book so you can see how topics link together.

Practice questions

Summary questions that allow you to apply the knowledge and skills covered in the unit. This feature appears in the examined Unit R050 and will help you prepare for the exam. The mark schemes are available online at **www.hoddereducation.co.uk/cambridge-nationals-2022/answers**

Note: The practice questions and accompanying marks and mark schemes included in this resource are an opportunity to practise exam skills, but they do not replicate examination papers and are not endorsed by OCR.

Assignment practice

A summary activity that allows you to apply the knowledge and skills covered in the unit. This feature appears in the non-examined units R060 and R070, and will help you prepare for the set assessments.

Unit R070

Using augmented reality to present information

About this unit

In this unit, you will learn what augmented reality (AR) is, what it is used for, and how it is used. You will also learn about the different devices that can be used to view an AR resource. You will learn how to plan and design an AR resource, as well as develop and test the prototype version. It is always important to reflect on work that you have carried out, so you will learn how to reflect on the processes that you followed and consider what you have learnt from your studies and the practical activities you have carried out.

Topic areas

In this chapter you will learn about:

1. Augmented reality (TA1)
2. Designing an AR model prototype (TA2)
3. Creating an AR model prototype (TA3)
4. Testing and reviewing (TA4)

How will I be assessed?

You will be set an assignment which will provide you with a scenario to create an AR model prototype. You will then need to use the skills that you have learnt to plan, design, create, test and review an AR model prototype solution to meet the requirements set out in the assignment.

The assignment will cover the following performance objectives:

PO2 – Apply knowledge and understanding

PO3 – Review knowledge, understanding and performance for the processes followed

PO4 – Demonstrate and apply skills and processes relevant to the subject area

Topic area 1 Augmented reality

Getting started

In small groups, prepare a leaflet to explain what you think AR is and how it is different from **virtual reality (VR)**. Use examples to help your explanations.

Each group will share their leaflet with the main group and agree a short statement defining the term 'augmented reality'.

1.1 Purposes and uses of AR

AR is a collection of technologies that are used to combine computer-generated information with the user's natural senses. AR has become a real revolution due to advances in mobile personal computing such as smartphones and tablets.

What AR is and its purposes

AR is a way of viewing the real-world environment with an overlay of computer-generated inputs, such as audio, video, graphics, photos and text. The two environments (the real-world and the augmented content environment) are totally separate and do not communicate with each other. This means that the computer-generated content does not recognise physical objects in the real-world environment. AR is a combination of the real world seen by the user and a computer-generated virtual world that **augments** the entire scene while also providing additional information. The virtual scene is designed so that it enhances the user's sensory perceptions of the virtual world they are seeing/interacting with. The purpose of AR is that the user cannot tell the difference between the real world and the virtual augmentation of it.

Key terms

Augment To make something larger by adding to it.

Virtual reality (VR) A computer-generated simulated environment. A person can interact within the simulated environment using special VR glasses, screens and even gloves fitted with sensors. The use of VR glasses stops the user from having any view of the real-world environment.

There are hybrid versions of AR known as **mixed reality (MR)** and **extended reality (ER)**, but for this unit you are only going to focus on AR.

The sectors where AR can be used

There are a number of sectors and industries that use AR, putting the technology to good use. Industries are continually implementing AR for the benefit and improvement of human performance as well as to support customers and encourage growth. Let's take a look at some of them.

Architecture

Architects and designers include not only people who design buildings, but also those who design gardens and other types of outdoor spaces (landscapers). One of the most important benefits to an architect of using AR is that it enables them to give their clients a sense of scale (size and proportion) that they would not have from looking at a computer screen or design drawings. Architects can show their planned projects in a 3D format using AR technology. The client can use a smartphone or similar device to walk around the objects and get a sense of the space and size of rooms, buildings, gardens, parks, and so on. Previously, a client could not have a tour of a building such as a house until it was physically built.

AR is also a useful resource for home improvements and renovations. It is possible to look at the potential changes that can be made and decide whether they are as expected or as required. This is more cost effective for the clients as they do not have to pay for the work to be done, only to discover that it is not what they wanted or does not suit the original purpose.

Key terms

Extended reality (ER) This is the overall term for all forms of real and virtual environments and includes AR, MR and VR.

Mixed reality (MR) MR enables contents to interact with objects in the physical world. This means that a computer-generated object can be partially obscured by objects in the physical world. For example, you could have a computer-generated person, animal or robot, partially hidden behind a tree in a forest.

Education

AR helps classroom education to be interactive. Teachers can show virtual examples of subjects, for example looking at a Saxon village in a History lesson or exploring organisms in a Biology lesson.

It is often easier to remember something that is visual than something that is text based. Using AR in education can help motivate students because it is more exciting and interesting.

AR is often used in professional training. Industries such as aviation, aerospace, healthcare and the military all use AR. It reduces the costs of equipment and event transportation to carry out activities. AR allows training to remain interactive but based in a classroom.

Entertainment

When people think of AR and entertainment, they often think of gaming. While AR was originally designed for games and interactive gamers, it is now used within other areas of the entertainment industry.

Gaming

Within the gaming sector, AR has defined what is known as immersive gaming. When Pokémon GO was released in 2016, for example, it captured the attention of millions of players around the world. People would walk around the streets trying to catch Pokémon, often gathering in places where there was a virtual 'Pokémon Gym'. This is because it focused on users physically interacting with the game.

Figure 3.1 This gamer can see a mythical creature superimposed in the real world

Travel and tourism

The use of AR in travel and tourism is referred to as a **travel portal**. This enables people to 'travel' the world using the screens on their smartphones or tablets. Travel industry marketing departments use AR to promote locations, products and movies so that users can explore them. Travellers can now view hotels and hotel rooms, walk around cities and even see what the seat is like on the plane they are going to fly on. AR is one of the best tools used by travel and tourism marketeers.

Art and museum galleries

AR is used to add additional information and explanations to exhibitions. Visitors can access information using their smartphones or tablets when viewing an artefact or piece of art. Some museums use AR to display digital views of the artists next to their work, who then provide a narrative. AR gives a third dimension to displays and brings objects and scenes to life.

Theatre

The use of AR has been successful in theatres. It has enabled theatregoers to have a more interesting experience. AR **avatars** can be projected on the stage alongside the actors, combining fictional worlds with the real world. Many theatres use a combination of AR and VR to provide a more **immersive** experience for their audience.

Key terms

Avatar A digital representation of a person or the person's character. It can take a 2D form as an icon used in internet forums or a 3D form in games and virtual worlds.

Immersive In relation to digital technology, this is the creation of a 3D image that appears to surround the user.

Travel portal Provides a virtual travel experience through a smartphone's AR application to help users choose the destination, hotel and holiday experience.

Music

Music fans can use AR to access information about artists, lyrics and composers, for example, or watch music videos. They simply use an app to scan the cover of the CD, or the online album cover on a streaming platform. Music artists have started to incorporate AR into their concerts. Imagine a band on the stage: members of the audience can point their smartphones towards the stage and the lead singer appears in a much larger form and looks like they are floating above the crowd.

Another use is where the artist or band is on stage and you are at home watching the concert on your television or computer. By pointing your smartphone at the screen, you have a sense of actually being at the concert.

Television

There are a number of television dramas and series that use AR – viewers point their smartphones or tablets at the screen to access additional information and feel as if they are a part of the scene. They have a totally immersive experience. The television programme *Strictly Come Dancing* uses AR to incorporate additional 'scenery' to enhance the experience of the story that the dancers are depicting through their performance.

Retail

AR applications can be used to provide 'try-before-you-buy' experiences. This includes being able to see what a piece of furniture or other products look like in a room. IKEA was one of the first retailers to implement this concept. Fashion retailers, such as Gucci and Louis Vuitton, have implemented AR so people can use a photograph of themselves to 'try on' clothing from the comfort of their own home. Dulux paint has provided an app called the Dulux Visualiser, where the customer takes photographs of the walls in the room they want to decorate and then selects different colour schemes to see what their walls will look like once painted. Even some jewellery retailers have introduced AR tools enabling customers to 'try on' different earring styles.

Lifestyle

People who enjoy carrying around and using the latest gadgets have been using AR without

even realising it. An example is Snapchat. It has used AR to revolutionise the culture of selfies by detecting faces and overlaying them with a range of filters. AR enables the continuous tracking of faces. This means that it does not make any difference what strange expression a person makes – they will not distort the filter. Some of the filters available in Snapchat require the user to pull funny faces to trigger some of the special effects that are available.

Some industries, such as beauty and fashion, use AR and facial recognition to provide an immersive experience for their customers. Snapchat enables people to change their appearance using virtual makeup, for example using a different shade of eyeshadow or lipstick. Beauty brands offer the use of AR on their websites. You can upload a photo of your face and try different makeup styles and colours before buying.

All of these uses of AR can have an impact on your lifestyle if you choose to engage with them. You can take virtual tours of towns, cities, national parks, beaches, the countryside and even outer space without physically travelling. Marketeers are using AR more and more to bring products and locations to customers in their homes. The immersive experience received by the customer provides them with more information and a 'feel' for what the products or locations are like. This can give the customer more confidence in what they are paying for.

Research

Research how AR is used to train the following services:

- mountain rescue
- police
- fire
- ambulance
- coastguard or Royal National Lifeboat Institute (RNLI).

Make notes from your research and consider:

- the type of training
- how AR is used for the training
- the benefits and limitations of delivering training in this way.

Activity

Work in small groups. Each group selects a different service from the research activity. For the service you have selected, prepare a presentation to include:

- what AR is
- the type of training where AR is used
- how AR is used to deliver the training (and where appropriate, how it is used to test the participants in the training)
- the benefits and limitations of delivering the training in this way.

Consider using images and, where possible, video links within the presentation to demonstrate how the training is used.

Prepare an infographic which includes examples of the training, how AR is used and the benefits and limitations.

Your group will deliver the presentation to the rest of the class, answer any questions and provide the class with a copy of the infographic.

Uses of AR

Training

AR can enhance the learning and understanding of the workforce and can increase the engagement and safety awareness of the participants. In addition, it can reduce training costs.

Engagement

Many people learn by 'doing'. AR provides the opportunity for this by providing a 'hands-on' experience in a structured and interactive way. Employees can practise work activities in real-time and at their own pace, without any pressure from outside influences such as customers and managers.

Training costs

The initial cost of the equipment required to use AR can be high. But the equipment is reusable, and many people can use their own smartphones. The use of AR headsets and apps can even replace the need for people to attend expensive seminars, external training sessions or classes.

Safety

Some workplace activities are dangerous and therefore the training required to learn how to complete these activities safely can also be dangerous, for example firemen entering burning buildings where there is not only fire but poisonous gases. AR enables employees to practise these activities in a safe environment without the risk of injury or involving themselves in real dangerous situations.

Cognitive barriers

Job training can be challenging. The use of AR provides training to show how something is supposed to work in an interactive way rather than a theoretical way which, in turn, helps people to manage things when they go wrong because they have the knowledge about how something works.

Other benefits of using AR in training include the following.

- AR can motivate people to learn about the work activity and the organisation they work for. This is because it is a more exciting and imaginative experience.
- Training is available on demand.
- It helps the participants to retain information, knowledge and skills.

Many sectors already use AR for training, such as retail and healthcare.

In retail, AR is used to simulate interactions with customers.

In healthcare, hospitals such as St Mary's Hospital in London have doctors and surgeons who use AR during reconstructive surgery. Before the use of AR, surgeons would use handheld scanners to locate major blood vessels near the injury. With the use of AR they can now find these major blood vessels directly and accurately by displaying them on a screen as a three-dimensional image.

Virtual tours

What is a virtual tour? Imagine walking into a shop or a building such as a hotel, or a town or city for the first time. You have a look around and walk up to objects to take a closer look. You walk around and go along the different streets of a town or city, or different rooms within a building. Now you can do this by using the screen of your smartphone or your computer screen. This is called a virtual tour. There are many virtual tours available, such as The Harry Potter Experience in London and the Louvre Museum in Paris.

Visualisation of designs, interiors and concepts

AR technology is popular with architects and designers. It enables them to transfer their projects, ideas (concepts) and drawings from a 2D static representation into a 3D dynamic model.

AR enables designers to take the design from the screen and place it in the real world as an overlay in full-scale size. People can walk around the project and understand its size within the context of the space surrounding it and its general environment.

Basically, AR brings products to life, whether it is a piece of equipment or furniture, plants for a garden or a new building being built on land. It allows us to view the product within its context. In addition, AR provides the opportunity for a more collaborative design process regardless of where the designers are situated in the world.

Marketing

Markets are driven by the needs and desires of customers (consumers). AR is an emerging trend within marketing and sales and enables brands (McDonald's, Virgin and BT are all examples of brands) to provide their customers with unique experiences. These experiences are conveniently available to the customer through the use of their smartphones.

AR allows the customers to 'try before you buy'. Earlier in this section under the heading 'Retail' there were a number of examples of how the 'try-before-you-buy' concept had been implemented. Facebook's first AR-related advertisement enabled potential customers to try on sunglasses using the camera on their smartphone.

Starbucks has provided an AR experience enabling potential customers to tour one of its coffee shops. Potential customers can scan objects within the shop and access a virtual tour with additional information.

Within the automotive industry, Hyundai was the first manufacturer to create an AR manual for drivers. Customers could scan the manual using a smart device and it would provide them with information to do with certain parts of the cars, including instructions on how to carry out some basic maintenance.

The branding materials used by businesses, such as business cards and brochures, can be enhanced with AR. Users can access information about the business or representative of the business by scanning the printed materials with a smart device. An example could be a product within a brochure and by using the app on a smart device, the user can access a video highlighting some of the important features of the product and how it works.

More and more businesses are using AR to create a more exciting experience for their customers. In Zurich, Uber has created AR experiences to amuse its passengers by adding virtual adventures at Zurich station.

This link shows what it has created using AR:

https://youtu.be/bCcvEVyAXQ0

These exciting experiences have generated more than one million YouTube views. The use of AR for marketing purposes is endless.

Research

Research how AR is used to promote virtual tours and how it can be used for marketing purposes. It could be a virtual tour of a place, a hotel, an exhibition, a new house or a building design.

Find photos and videos that show how AR has been used within the virtual tours you have selected as part of your research.

Activity

The headteacher of your school wants to implement a marketing campaign for the school. You have been asked to come up with some marketing ideas and want to use AR but your headteacher does not understand what this is.

Create a presentation that explains how AR could be used to market the school. Include images and videos to make your presentation interesting.

Test your knowledge

1. Explain the difference between AR and MR.
2. Identify **two** ways that AR has been used within the entertainment industry.
3. Describe the term 'immersive'.
4. Explain how AR is used within the travel and tourism sector.
5. Discuss how AR can have an impact on people's lifestyles.

1.2 Types of AR and user interaction

There are several types of AR, and you are now going to look at the different types with examples of how they are used.

Types of AR

Object recognition/marker-based

This type of AR uses **markers** to **trigger** an augmented experience. The markers can be made

Key terms

Markers Visual prompts that trigger the display of virtual information.

Trigger The trigger activates the function of the AR experience.

with distinct patterns such as **QR codes**, logos or the packaging of products. These markers act as **anchors** for the technology to use. When a marker in the physical world is recognised by an AR application, the digital content is placed on top of it. It is commonly used in marketing and retail. Think of business cards that can talk to you or holiday brochures that can move.

Figure 3.2 The barcode/QR code is scanned by a shopper to purchase the product

Figure 3.3 A warehouse manager scanning packaging to identify picking and delivery time of products

How it works

Marker-based AR uses a specifically designed marker placed in the real-world space for the camera of the device or **computer vision** to lock on to. As stated above, this specifically designed marker could be a QR code, a logo or product packaging. Once the AR software has locked on to the marker, it will display the digital information associated with it.

The chocolate manufacturer Kinder includes a leaflet with a QR code on it with the toy in its Kinder Surprise egg. When the QR code is scanned by the AR app on a smartphone, it shows an AR version of the toy.

Research

Search on the internet for examples where QR codes, logos and product packaging are used as triggers for an AR experience.

Here are some links to YouTube clips to get you started.

- Using a QR code: **https://youtu.be/9w6_QBNuNuA**
- Using a logo: **https://youtu.be/cidBVt0ZkJE**
- Using product packaging: **https://youtu.be/YnJ0m-uzJbI**

For each of the types of triggers (QR code, logo and product packaging), consider how it could be used in different sectors. How could you provide an AR experience to a customer who wants to buy a washing machine by using the washing machine packaging as a trigger?

Remember, when carrying out your research think about the search criteria that you use (keywords). Try to be as specific as possible by using examples of:

- the use of QR codes as triggers for AR
- the use of logos as triggers for AR
- the use of product packaging as triggers for AR.

Markerless/location-based

Markerless AR is more versatile than marker-based AR. This means that it is more adaptable to

Key terms

Anchor Objects that AR software can recognise.

Computer vision How a computer understands the environment. It 'sees' via a digital image or video.

QR code A two-dimensional barcode that can be read using a digital device. It stores information as a series of pixels in a square-shaped grid.

Figure 3.4 This card game uses an AR app to bring the characters to life

many different functions and activities. It enables the user to decide where to put the virtual object. It relies on the device's hardware, including the camera, **Global Positioning System (GPS)**, **digital compass** and **accelerometer** to gather the information needed so that the AR software can work as required. Markerless AR is very popular in gaming, for example Pokémon GO.

The following types of AR also come under the heading of markerless AR because they do not require a physical marker to trigger the digital content.

- **Location-based AR:** This is where the digital content (AR content) is tied to a specific location. This is often used for navigation. For example, you are walking down a street in a location you are unfamiliar with. You use the camera on your smartphone to view the street and a virtual street sign will be displayed, giving you the name of the street. This is location-based AR. It will allow you to reach your destination with directions for where to go that are displayed on the streets in front of you. Another example of location-based AR is the game Pokémon GO.

Figure 3.5 This smartphone app uses AR to give the visitor information about nearby businesses and services

- **Superimposed:** This is where an object that is in the physical world is recognised by the superimposition AR. It is then enhanced in some way to provide an alternative view. The enhancement can relate to just a portion of the object being enhanced or the whole object.

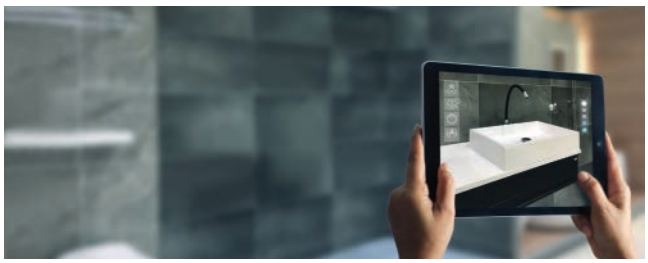

Figure 3.6 The marker is the bathroom within the image, the digital content is the sink that is overlaid on top; this allows the customer to see what a particular sink will look like in their bathroom

Key terms

Accelerometer In a mobile phone, the accelerometer detects the orientation of the phone.

Digital compass A sensor that uses the Earth's magnetic fields to find direction. A digital compass will always find north.

Global Positioning System (GPS) A global navigation satellite system that provides the location of an object.

Research

Research 'IKEA Place'. You might want to look on YouTube for videos on how it works, for example:

www.youtube.com/watch?v=UudV1VdFtuQ

Explain to another member of the class how IKEA Place uses AR and how it helps IKEA's customers.

Discuss with your classmate how the same AR experience could be used within your school.

Layers/user interaction

Synoptic link

You learnt about layers/user interaction in Topic area 1, section 1.2 of this unit.

Action flow

You want the AR experience of the user to appear smoothly and flow from one area to the next. It is, therefore, important to consider the following:

- How will the user interact with the AR app to move from one 'area' to another? Will there be multiple layers?

  For example, you select the door of a house, it takes you into the hallway, you then have a choice of doors to open and view the rooms. So, by selecting a particular room you can enter, look around, exit the room back into the hall and go into the next room, and so on.
- How will the action flow? Flow charts are a good design tool when designing the flow of the AR experience.

Static

Will the digital content alter during any user interaction? If the answer is no, then this will be a static layer.

For example, you only want some information to appear on the screen when the user clicks on a trigger. Consider an image of a Formula 1 car. By clicking on the image, text will appear informing the user who the manufacturer is, who its drivers are, and so on.

Interactive

Will the digital content alter during user interaction? If the answer is yes, then this will be an interactive layer.

For example, you want the user to rotate an image of a room so that they can see the various views of the room. The user will interact with the image and rotate the image as if they were turning round to look at different parts of the room. This is interactive.

Test your knowledge

1. Explain why it is important to carry out research when planning and designing an AR app.
2. What is the purpose of a visual indicator?
3. Describe the key points to remember when using photographs and images for an AR app design.
4. Explain the difference between a marker-based and a markerless trigger.
5. Explain the term 'static' with reference to layers and user interaction.

Assignment practice

Task 1

You have been asked to create an AR app for students at Key Stage 3 to use in a Geography lesson about the Antarctic and the impact of global warming. The AR app can be for use with a smart device and/or a PC.

Prepare a document or presentation that explains your planning and design considerations for the AR app.

2.2 Design tools

The first stage of any development process is to design the solution. The design stage and use of design tools helps you to check that the solution you plan will:

- meet the requirements of the person you are designing the solution for (the client) and the end user
- be fit-for-purpose and provide the information required, as well as providing the end user with an exciting AR experience
- enable the end user to use the AR app as intended regardless of their skill level when using the technology.

Synoptic link

Design tools were covered in Unit R050, Topic area 1, section 1.1.

Assignment practice

Task 5

Carry out a review of the AR model prototype that you created for the Geography class in Assignment practice task 3. Follow the guidance provided in section 4.2 above. Write a report for the review of the processes you followed while planning, designing, creating and testing your AR model prototype.

Case study: Assignment

The Science teacher in your school has asked you to create an AR app for the Year 4, Key Stage 2 class on the topic of sound. The students have to look at the creation of sound through vibration and changes in pitch and volume.

Following the processes that you have learnt in Topic areas 2, 3 and 4, develop an AR model prototype that the Science teacher could use with the students in the class.

CAMBRIDGE NATIONAL

LEVEL 1/LEVEL 2

IT

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ABOUT THE AUTHORS

Mo Everett has been a qualification developer, examiner and moderator for a range of IT, Computer Science and Business qualifications for more than 25 years. She has also taught students of all ages, from entry to degree level, and has written several student books, revision guides and online teaching and learning resources.

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Trust highly experienced teachers and authors Mo Everett, Richard Howe and Sonia Stuart to guide you through the redeveloped Level 1/ Level 2 Cambridge National in IT (J836). This thorough and accessible introduction to the IT industry will develop your understanding of the core examined content and boost the skills required to tackle the NEA with confidence.

This OCR-endorsed textbook is:

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