OCR
Oxford Cambridge and RSA

Cambridge **TECHNICALS LEVEL 3**

IT

Unit 7

Data analysis and design

Cambridge
TECHNICALS
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Model assignment

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Contents

Please note:

You can use this assignment to provide evidence for summative assessment, which is when the learner has completed their learning for this unit and is ready to be assessed against the grading criteria.

You can use this assignment as it is, or you can modify it or write your own; we give more information in this document under Guidance for tutors.

Guidance for tutors on using this assignment

General

OCR Cambridge Technical model assignments are available to download from our website: www.ocr.org.uk.

The purpose of this assignment is to provide a scenario and set of tasks that are typical of how IT specialists would use Data Analysis and Design techniques to enable you to assess your learners against the requirements specified in the grading criteria. The scenario and its tasks are intended to give a work-relevant reason for applying the skills, knowledge and understanding needed to achieve the unit.

This assignment will not instruct learners how to meet the highest grade. Whether learners achieve a pass, merit or distinction will depend on what evidence they produce.

You can modify the scenario we provide in this assignment to make it more relevant to your local or regional needs. Please refer to the information under 'Modifying the model assignment' later in this section.

You don't have to use this assignment. You can use it as a guide to help you to design your own assignment, and we provide an assignment checking service. You'll find more information on these matters in section 8 of the qualification handbook.

In the tasks, we'll refer to the format of evidence. Learners are **not** required to follow that format **unless** we tell them otherwise.

It's essential that the work every learner produces is their own. Please make sure you read through the information we give on authenticity in section 8 of the qualification handbook and make sure that your learners and any staff involved in assessment understand how important authenticity is.

We provide this assignment to be used for summative assessment. You must not use it for practice or for formative assessment.

Before using this assignment to carry out assessment

Learners will need to take part in a planned learning programme that covers the knowledge, understanding and skills of the unit.

When your learners are ready to be assessed, they must be provided with a copy of the following sections of this assignment:

- General information for learners
- Assignment for learners
- Evidence Checklist

They may carry out preparation prior to undertaking the tasks and there is no time limit for this.

When completing the assignment

You should use this assignment in conjunction with the unit specification and qualification handbook.

- Learners must be allowed sufficient time to complete all of the tasks. The amount of time may vary depending on the nature of the tasks and the ability of individual learners. To help with your planning against each of the tasks we have given an indication of how long it should take.

- Learners can produce evidence in several sessions.

Resources to complete the tasks

There are resource requirements for this assignment. Every learner will need access to the following resources:

- For task 1
  - Access to internet and library resources
  - Access to presentation and word processing software
  - Projection system for the presentation.

- For task 2
  - A range of sample data
  - Drawing tools for data flow diagrams,etc
  - Sample data from the spreadsheet system
  - Access to the client (optician) and possibly staff through any appropriate medium including role play.

- For task 3
  - Software which will enable the development of the physical data model, which is application specific.

- For task 4:
  - Presentation software
  - Projection system.

Time

You should plan for learners to have 10–14 hours to complete this assignment.

Learners must be allowed sufficient time to complete all the tasks. The amount of time may vary depending on the nature of the tasks and the ability of individual learners. To help with your planning, against each of the tasks we've given an indication of how long it should take.

Learners can produce evidence in several sessions.

Format of evidence

Learners have to produce evidence that demonstrates how they have met the grading criteria. At the very least they must produce evidence that meets **all** of the pass criteria.

Please make sure your learners realise that missing just one pass criterion means they will not pass the unit, even if they have successfully met the merit and distinction criteria.

We have said what format the evidence **could** take for each task. Learners are not required to follow the format we have given **unless** we have told them otherwise. For example, if we say 'You could include a report on …', the evidence doesn't have to follow any specific reporting conventions. You can modify the format of the evidence, but you must make sure the format allows the learner to access all of the grading criteria. If we require that evidence **must** take a specific format, we will make that clear in the tasks for learners.

If we have not specified a format for evidence learners are free to use the format that they feel is most appropriate for the purpose and target audience for each individual task.

For more guidance on generation and collection of evidence, please refer to the section 8 'Internal Assessment', in the qualification handbook.

Authenticity

Authenticity in assessment is about making sure the work the learner produces for assessment is their own. We give information on authenticity in the qualification handbook under section 8. You must read through this and make sure all staff involved in assessment and your learners understand how important authenticity is.

Group work

This assignment has been written to allow for group work – for example working in small teams (no more than four members) to gather information on the requirements and produce the feasibility report, to produce the application designs and to create the prototype. You must be sure that each learner can produce evidence of their own contribution to each grading criterion. When learners are working in teams, you must make sure that:

- all team members have equal opportunity to evidence their skills, knowledge and understanding;
- you consider the team composition, for example with regard to learners' preferred learning/reviewing styles;
- you consider the number of team members (though this is less important than the management and structure of the team) – small groups of three to six learners could comprise a team;
- you monitor the team as work progresses so that you can be confident all learners are meeting the grading criteria.

You can give constructive feedback to learners about working as a group and direct them on team working skills because evidence of team working skills is not required by the unit.

If witness statements are used to support learners' evidence, you have to complete an individual statement for each learner.

After completing the assignment

Once the learner has submitted their work to you to be assessed, you must judge or 'mark' the work against the grading criteria for the unit and identify one grade for the unit. For further information about assessment, please refer to section 8 of the qualification handbook.

Your assessment decisions must be quality assured across the cohort of learners in your centre who are being entered for the same unit. This must be done through an internal standardisation process. We give information on internal assessment and standardisation in the qualification handbook.

Reworking the assignment

If you and the learner feel they've not performed at their best during the assessment, the learner can, at your discretion, improve their work and resubmit it to you for assessment. If a learner is working on improving their work before it is resubmitted, you and the learner must continue to make sure the work is the learner's own.

Any feedback you give to the learner must not direct them on how to improve their work. You can identify what area of the work could be improved but you cannot give the learner any details about how they could improve it. You must follow the guidelines given in section 8 of the qualification handbook under 'Authenticity of you work'.

Modifying the model assignment

The tasks in this assignment allow learners access to the full range of grades detailed in the grading criteria of this unit.

If you modify this assignment you must **not** change the grading criteria provided in the tasks for the you or in the evidence checklist. These grading criteria are taken from the unit.

You can modify the scenario to suit your local or regional needs and the tasks may be contextualised to match any changes you have made to the scenario. If you supply your own drawings to support a different scenario, these must be sufficiently detailed for learners to complete the tasks.

You can modify the type of evidence and the format it takes, unless we expressly state that evidence must take a specific format.

You must also make sure that you avoid discrimination, bias and stereotyping and support equality and diversity. For more information, please see the section 'Designing your own assignments for internally assessed units' in section 8 of the qualification handbook.

If modifications are made to the model assignment, whether to the scenario alone, or to both the scenario and individual tasks, it's your responsibility to make sure that all grading criteria can still be met and that learners can access the full range of grades.

If you are using this model assignment and delivering the Foundation Diploma or Diploma you have an opportunity to secure meaningful employer involvement by working with an employer to modify it.

General information for learners

Q   ***What do I need to do to pass this assignment?***

A   You need to produce evidence to meet the requirements of **all** the pass criteria for the unit this assignment relates to. If you miss just one pass criterion, you will not achieve this unit and will receive an unclassified result.

Q   ***What do I need to do if I want to get a merit or distinction for this assignment?***

A   For a merit, you need to produce evidence to meet the requirements of **all** the pass criteria for the unit this assignment relates to **and** you need to produce evidence to meet **all** the merit criteria.

For a distinction, in addition to the above, you also need to meet **all** the distinction criteria for this unit.

Q   ***What help will I get?***

A   Your tutor will support you when completing this assignment and will make sure that you know what resources or facilities you need and are allowed to use. We've given your tutor information about how much support they can give you.

Q   ***What if I don't understand something?***

A   It's your responsibility to read the assignment carefully and make sure you understand what you need to do and what you should hand in. If you are not sure, check with your tutor.

Q   ***I've been told I must not plagiarise. What does this mean?***

A   Plagiarism is when you take someone else's work and pass this off as your own, or if you fail to acknowledge sources properly. This includes information taken from the internet.

It's not just about presenting a whole copied assignment as your own; you will also be plagiarising if you use the ideas or words of others without acknowledgement, and this is why it's important to reference your work correctly (see Q&A below for more information on referencing).

Plagiarism has serious consequences; you could lose the grade for this unit or you may not be allowed to achieve the whole qualification.

Always remember that the work you produce must be your own work. You will be asked to sign a declaration to say that it is.

Q   ***What is referencing and where can I find out more information about it?***

A   Referencing is the process of acknowledging the work of others. If you use someone else's words and ideas in your assignment, you must acknowledge it, and this is done through referencing.

You should think about why you want to use and reference other people's work. If you need to show your own knowledge or understanding about an aspect of subject content in your assignment, then just quoting and referencing someone else's work will not show that **you** know or understand it. Make sure it's clear in your work how you are using the material you have referenced **to inform** your thoughts, ideas or conclusions.

You can find more information about how to reference in the *The OCR Guide to Referencing* available on our website: http://www.ocr.org.uk/i-want-to/skills-guides/.

Q   ***Can I work in a group?***

A   Yes. However, if you work in a group at any stage, you must still produce work that shows your individual contribution. Your tutor can advise you how to do this.

Q   ***Does my work for each task need to be in a particular format?***

A   You can present your work in a variety of ways – it can be handwritten, word-processed, on video or in digital media. What you choose should be appropriate to the task(s) and your tutor can advise you. There may be times when you need proof that you have completed the work yourself: for example, if you do something during work placement that you want to use as evidence, the tutor might ask the employer to provide a witness statement.

Make sure you check the wording in each task carefully. For each task, we'll tell you if your evidence has to be in a specific format:

- If we say use the word '**must**', for example 'You must produce a report' or 'Your evidence/work must include a diagram', then you must produce the work in the stated format.
- If we use the word '**could**', for example 'You could include sketches of your ideas' or 'You could do this by annotating your diagram', this means that you are not required to follow the format we have given, but you must make sure that the work you do produce allows you to demonstrate the requirements of the grading criteria.

If you are unsure about what evidence you need, please ask your tutor.

Q   ***Can I ask my tutor for feedback on my work?***

A   Yes, but they can't give you detailed feedback.

We have given your tutor instructions on what kind of feedback they can give you. For example, they are **not** allowed to tell you exactly what to do to make your work better, but they **can** remind you about what they've taught you and you can use this additional learning to try and improve your work independently. They can say what they've noticed might be wrong with your work, for example if your work is descriptive where an evaluation is required, but your tutor can't tell you specifically what you need to do to change it from a description to an evaluation – you will need to work out what you need to do and then do it for yourself.

Q   ***When I have finished, what do I need to do?***

A   If you have included the personal details (such as name, address or date of birth) of someone other than yourself in your work, this must be blanked out (anonymised) – your tutor will tell you how to do this. You don't need to do this for information contained in references.

You can complete the evidence checklist to show your tutor where they can find the evidence for each grading criterion in your work.

You should make sure your work is labelled, titled and in the correct order for assessing.

Hand in the work that you've completed for each task to your tutor. They might ask to see your draft work, so please keep your draft work in a safe place.

Q   ***How will my work be assessed?***

A   Your work will be marked by someone in your centre who has been authorised to do so. They will use the information in the grading criteria to decide which grade your work meets. The grading criteria are detailed in each unit and are also given in the tasks within this assignment. Please ask your tutor if you are unsure what the grading criteria are for this assignment.

Assignment for learners
Unit 7: Data Analysis and Design

Scenario

Improving data management for 'The Eyes have IT'

Part A:

You are one of several junior data analysts at DA&D Ltd who have joined a new team whose members have been brought together to carry out the data analysis and design for the project below. It is important to ensure that everyone is up to speed with the way that DA&D Ltd interprets data analysis and design.

As part of the group you have been asked, by the senior analyst, to explain your perceptions of data analysis and design so that an agreed approach can be identified.

Part B:

'The Eyes Have IT' is a two site firm of opticians. Both locations are in the medium size town of Stanaughton in Middleshire. Until now they have used a simple 'off the shelf' spreadsheet system to manage their data, which was set up by the former book keeper. However, business is growing with more walk-in customers and, thanks to the new website designed by the son of the founder, people are also showing an interest online. The old spreadsheet system is being overwhelmed and the web designer has suggested that a new system is required and that DA&D Ltd should be approached. The current data, held on individual spreadsheets covers:

- patient details: i.e. forename, middle initial, surname, address including post code, age, gender, data of last appointment, date of next schedules appointment;
- patient medical and optical history: name and address of patient, results of tests i.e. cover test, slit test, glaucoma test, colour test;
- name and address of patient's general practitioner;
- patient prescriptions;
- glass/lenses purchased including make of frames, lens type, coatings, etc;
- staff details;
- stock;
- equipment.

Your team has been tasked to carry out this project and is required to:

- use a range of appropriate techniques and methods to identify the current and future information requirements of the business;
- provide the senior analyst with a detailed report on data requirements for the business and how they were identified for approval before continuing to the next phase;
- provide guidance on the importance of correctly identifying the data requirements before undertaking data collection activities.

The tasks

Task 1: Produce a guide to the stages of data analysis and design

(This task should take between 1 and 2 hours)

Learning Outcome 1: **Understand the purpose and stages of data analysis and design**, is assessed in this task.

Your task is to provide:

1. an explanation of the different data types identified in the teaching content

2. a summary of each of the stages of data analysis to the Senior Analyst and the team Brief examples, possibly using evidence from the scenario, should be used to aid understanding of each stage by the audience (P2).

3. an explanation as to why it is important to accurately identify information requirements prior to data collection (M1).

There is little to be gained by collecting data, which is inaccurate or unnecessary and you will need to make this clear to your team, so that they avoid such errors during the data analysis phase.

Pass	Merit	Distinction
P1: Explain the types of data that can be analysed	M1: Explain the importance of accurately identifying information requirements prior to data collection	
P2: Summarise the stages of data analysis		

Evidence

A presentation – P1, P2

The presentation must include:

*   an explanation of the different types;
*   a summary of the purpose of each stage of data analysis and the types of activity or data each stage covers.

A handbook – M1

This should be a guide for the team so that they understand the importance of accuracy by identitfying the information requirements for data prior to starting to collect them.

The handbook should have a front page, content sheet, section headings and page numbers.

*   Thoughout the task it is important that you correctly reference all sources used, following appropriate conventions.

Task 2: *Investigate the data requirements for the optician business*

(This task should take between 3 and 4 hours)

Learning Outcome 2: **Be able to investigate client requirements for data analysis**, is assessed in this task.

Your task is to:

Establish the data analysis and design requirements for the optician business so you can ensure any data collection is fit for purpose.

Carry out the data collection using appropriate quantitative and qualitative techniques.

Record your findings using techniques identified in the teaching content. From these you should create the data requirements for the new database. The evidence could be recorded on forms provided by the optician business or you may use forms produced from examples that has been identified during your research.

The evidence should be sufficiently detailed to enable the Senior Analyst to be confident that the choices will enable the team to develop options on data design which can be placed before the client in a presentation.

Pass	Merit	Distinction
P3: Establish the data analysis and design requirements for a specified business requirement	M2: Develop the data requirements for the specified business requirement using different qualitative and quantitative data analysis methods	
P4: Gather data for the specified business requirement using quantitative and qualitative techniques		

Evidence

A summary report and associated documentation – P3, P4, M2

A summary report which confirms the reasons for carrying out the data analysis, the documents which will be used to record the outcomes from the investigation as well as the potential data which will be gathered, the techniques to be used to gather the data and where such data may be found. Each document must have a clear heading, a brief explanation of how it should be read and clearly laid out findings.

Your report should confirm the choice of quantitative and qualitative techniques used, the types of data collected and a brief conclusion as to how well the data gathering has gone and what alterations had to be made to the planned data collection, should any arise. Copies of any data sets should be presented as annotated diagrams, which are appropriate for the choice of data analysis technique used.

Task 3: *Create the documentation setting out the scope of the model and the logical data model itself*

(This task should take between 9 and 15 hours)

Learning Outcome 3: ***Be able to develop data design solutions to meet business requirements***, is assessed in this task.

Learning Outcome 4 (part): ***Evaluate the logical data model against the original specified business requirement***, is assessed in this task.

Your task is to:

- Produce a document explaining the options for designing the data design model for the optician business. To do this you will need to:
    - identify the aims and goals of the project, the main deliverables and milestones;
    - produce a conceptual level data model for presentation to the Senior Analyst for approval (P5).
- Create a logical data model building upon the conceptual level model and feedback from the Senior Analyst. You must include:
    - the structure of the components e.g. entities, queries;
    - manipulation which will be carried out e.g. updating, retrieving content;
    - integrity – how the data will be validated (D1)
- Review the logical data model and evaluate it against the original business requirements (D2)

Pass	Merit	Distinction
P5: Create the outline scope of the data design model for the specified business requirement		D1: Construct the logical data model for the specified business requirement
		D2: Evaluate the logical data model against the original specified business requirement

Evidence

A report – P5

This must include the following elements:

- Project details:
    - purpose (what is the reason for the data design model?);
    - data to be investigated;
    - who prepared it;
    - their contact details by email;
    - project name;
    - project type;
    - project goals;
    - issues ie major challenges or obstacles, for example, resource limitations, waiting for additional information;
    - outline of the design work you need to carry out in order to complete the project, for example, additional research, conceptual design, prototyping, user research
    - team members;
    - major deliverables and milestones.

Conceptual Data Model

This should provide a summary diagram or diagrams of the optician's business requirements. It must contain:

- top level entities;
- relationships between the entities;
- entity definitions;
- all data stored electronically or paper-based.

The diagram should fit on one page, with a key and up to one page of further explanation.

Logical Data Model – D1

This could be a set of tables and diagrams and associated keys and clarifications which will provide a logical view of the data required for the new business and how they are related. It should include the following:

- Structure:
  - all entities;
  - all entity relationships;
  - attributes;
  - keys e.g. Primary, foreign;
  - normalisation;
  - queries;
  - data dictionary.
- Manipulation:
  - updating;
  - retrieving;
  - editing or deletion of content.
- Integrity:
  - Validation of the accuracy of the data.

A report – D2

This must be presented to the Senior Analyst with your evaluation of how well the development of the logical data model has gone.

This must be a qualitative and quantitative evalution which should include:
- project title;
- date;
- project Manager;
- reviewer/author.

Other sections may include:
- were goals achieved?;
- benefits expected/unexpected;
- changes to the plan;
- lessons learned;
- mangement of project;
- risks not identified at the start of the project;
- recommendations.

Task 4: *Present your findings to the client*

(This task should take between 2 and 3 hours)

Learning Outcome 4 (part): ***Evaluate the logical data model against the original specified business requirement***, is assessed in this task.

Your task is to:

- create a design document – this may be a collation of documents produced in Task 2 and 3 with some further explanation (P6);
- create a presentation to the client on the data design in a way which can be understood by a person with no or limited knowledge of data design (P6);
- make the presentation to the client, including answering questions, if required (M3)

Pass	Merit	Distinction
P6: Prepare the data design documentation for a presentation to stakeholders	M3: Present the data design documentation to stakeholders	

Evidence

Data design documentation for the physical design team

This report is for the specialist group who will use your design to implement a data management system which could be a database, spreadsheet, document management system, e.t.c. The documentation could include:

- the Data flow diagrams (DFDs);
- information flow charts;
- entity attribure relationship diagrams (EARD);
- hierarchical tree diagram;
- events;
- entire life history (ELH);

together with diagram or chart keys and clarifications, where required.

Presentation – P6

The presentation must be suitable for the stakeholder to understand, therefore you explanation of the diagrams must be clearly expressed..

It should focus on the business perspective and include relevant diagrams to support and justify your explanations. The diagrams may include copies of those presented in the report for the physical design team.

Presentations should have concise bullet points with the main text included in the speaker notes.

Witness statement – M3

This is a formal presentation and therefore you must be prepared. You should arrive smartly dressed (this does not mean a suit and tie but neat and tidy). You should practice your presentation as you are representing your organization and also to show respect to your client.

Evidence Checklist
OCR Level 3 Cambridge Technicals in IT
Unit 7: Data Analysis and Design

LEARNER NAME:

For PASS have you: (as a minimum you have to show you can meet every pass criterion to complete the unit)	Where can your tutor find the evidence? Give page no(s)/digital timings, etc.
Explained the types of data that can be analysed (P1) e.g. A presentation of the different data types	
Summarised the stages of data analysis (P2) e.g A presentation of the purpose of each stage of data analysis	
Established the data analysis and design requirements for a specified business requirement (P3) e.g. A summary report which outlines these requirements	
Gathered data for the specified business requirement using quantitative and qualitative techniques (P4) e.g. Associated documentation which relates to this data collection process	
Created the outline scope of the data design model for the specified business requirement (P5) e.g. A report which scopes out the data design model to meet the business requirement	
Prepared the data design documentation for a presentation to stakeholders (P6) e.g. Data design documentation which can be supplied to the client	

For Merit have you:	Where can your tutor find the evidence? Give page no(s)/digital timings, etc.
Explained the importance of accurately identifying information requirements prior to data collection (M1) e.g. A handbook for the team which highlights important considerations around data collection	
Developed the data requirements for the specified business requirement using different qualitative and quantitative data analysis methods (M2) e.g. A summary report which captures this information	
Presented the data design documentation to stakeholders (M3) e.g. A witness statement which accounts for you presenting, the design documentation to stakeholders	

For Distinction have you:	Where can your tutor find the evidence? Give page no(s)/digital timings, etc.
Constructed the logical data model for the specified business requirement (D1) e.g. A logical data model	
Evaluated the logical data model against the original specified business requirement.(D2) e.g. A report which evaluates the data model against the original brief	

To find out more
ocr.org.uk/it
or call our Customer Contact Centre on **02476 851509**

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

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