BTEC Level 2 First Certificate

Information and Communication Technology

Unit 10: Database Development

Assignment:

2 – Designing a Database

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Contents

Introduction

This report is for the design of a database for a Stamford Private school. The purpose of this database is to create it to show a teacher's information and the qualification that they have achieved. This database will log all the teacher's within the school, adding their qualifications. If a teacher was to leave their data will be deleted and replaced with a new teacher's data.

The client requires 3 tables to be created, (what hardware, software, other resources to be used), entity-relational diagram, two data entry forms, a form menu, and input and output screens. After creating the design and test plan has been asked to be filled in to check what needs to be worked on and changed.

Task 1: Purpose and User Requirements

Describe the purpose of the new system
The Purpose of the new system is to make sure data isn't repeated and is stored somewhere else, This will make the database more clearer to go through. The old system was running on an outdated version of spreadsheets, with my help I can create the database new and improved on Microsoft Access. With the new system, the Teachers will be able to fill out forms of their personal information as well as their Qualification details.

List and describe the user requirements
To be able to add, edit and delete teacher details via a form, this is so that if a teacher was to leave or to change their details they can delete or edit their records.
To be able to add, edit and delete qualifications that teachers hold via a form, this is so that the teachers can add more than one qualification, or if they have received a new one.
3 tables: teacher, qualification and teacher_qualification - This requirement is needed so that all the data is stored in separate tables, and is more accessible.
Forms to fill in Teachers information - this helps to collect data to be added to the database, the form will add the teacher's details into the database and record it.
Form to fill in Qualification Information - this helps collect data to be added to the database, the form will add the details of teachers qualifications into the database and record it.
Form of the main menu: where buttons can be pressed to take you to reports queries and tables. this is used to make it easier to get on the correct part of the database you want to access.
Hardware used - Explain the hardware that needs to be used when creating the database
Software used - Explain the software that needs to be used when creating the database
Other resources - Explain what other resources that can be used when creating the database.
Customised Forms- this is so that it can fit the client's school, and make the form look more professional and attractive.
5 Queries are needed- this is to test the usability of the database and if it can pull the information we have asked for.
After creating the 5 Queries, 3 Reports are needed so that they can present the information the query outlines.

Task 2: Design of the Database

Consider hardware required for the system
Computer, keyboard, mouse

Consider software required for the system
Microsoft Access

Consider any other resources you may need
Written copy of database

Table Structure

Teachers	Teach_Qualification	Qualifications
*Teacher_ID Teacher_Forename Teacher_Surname Teacher_DOB Teacher_Gender Address_No Address_Road Address_Town Address_County Address_PostCode	***Teacher_Qual_ID** *Teacher_ID *Qual_ID Date_Awarded Complete	***Qual_ID** Qual_Name Qual_Level Qual_Type Qual

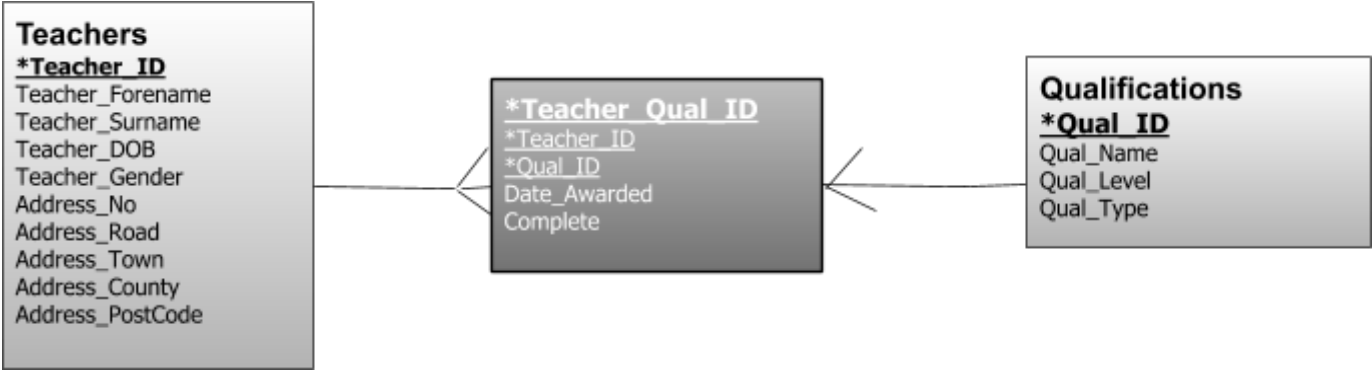### Data Dictionary – Details of your attributes

Table:Teachers				
Attribute (Field)	**Primary?**	**Data Type**	**Size**	**Validation**
Teacher_ID	Yes	Autonumber	14	Unique Identifier
Teacher_Forename	No	Text	24	is not Null Presence check
Teacher_Surname	No	Text	30	is not Null Presence check
Teacher_DOB	No	Date/Time	8	Field check Range Check
Teacher_Gender	No	M/F (Boolean)	2	Restricted Choice
Address_No	No	Number	4	Field check Range Check
Address_Road	No	Text	30	is not Null Presence check
Address_Town	No	Text	20	is not Null Presence check
Address_County	No	Text	20	is not Null Presence check
Address_PostCode	No	Text	8	is not Null Presence check

Table:Teacher_Qualifcation				
Attribute (Field)	**Primary?**	**Data Type**	**Size**	**Validation**
Teacher_Qual_ID	Yes	Autonumber	14	Unique Identifier
*Teacher_ID	Yes	Autonumber	14	Unique Identifier
*Qual_ID	Yes	Autonumber	14	Unique Identifier
Date_Awarded	No	Date/Time	8	Field check Range Check
Complete	No	Yes/No (Boolean)	5	Restricted Choice

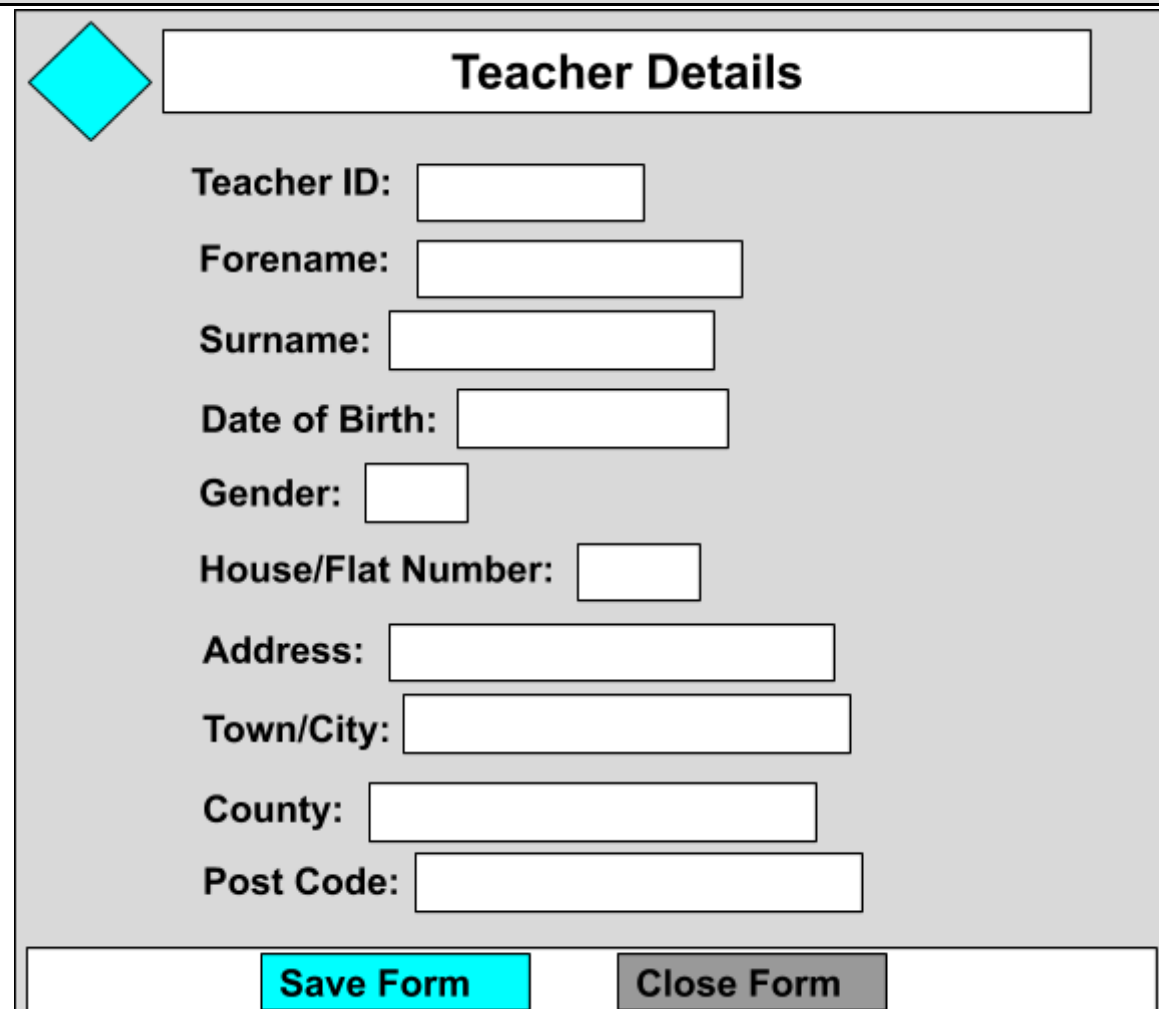| Table:Qualification				
Attribute (Field)	**Primary?**	**Data Type**	**Size**	**Validation**
*Qual_ID	Yes	Autonumber	14	Unique Identifier
Qual_Name	No	Text	30	is not Null Presence check
Qual_Level	No	Number	1	Field check Range Check Restricted Choice
Qual_Type	No	Text	25	is not Null Presence check Restricted Choice
Qual	no	Boolean (yes/no)	3	Restricted Choice is not Null Presence check

Entity Relationship Diagram (ERD)

Draw your Entity Relationship Diagram (ERD) showing relationships

Teachers
*Teacher_ID
Teacher_Forename
Teacher_Surname
Teacher_DOB
Teacher_Gender
Address_No
Address_Road
Address_Town
Address_County
Address_PostCode

*Teacher_Qual_ID
*Teacher_ID
*Qual_ID
Date_Awarded
Complete

Qualifications
*Qual_ID
Qual_Name
Qual_Level
Qual_Type

Consider what validation and verification procedures you may implement

Field check - to make sure you use the correct field for certain questions.
Range Check - to check the date range age and numbers.
is not Null Presence check - to make sure everything question is answered.
Unique Identifier - to give every different teacher and qualification a different unique identifier.
Restricted Choice - this is so that you only choose out of the options you have been given.

Form design

Sketch of your data entry form for tutors

Brief explanation of your form design

This design includes all the fields needed to be filled out, so the data can be added to the database, this design includes a logo of the School and the colour scheme of their school. There are bigger boxes for the fields that need more text to be written in, and there are smaller boxes for fields that only need a short amount written in. At the bottom of the form, there is a button to save the form you've completed or to close the form when you have filled the form in and saved it, press close form to close the form.

Sketch of your data entry form for qualifications

Brief explanation of your form design

This design includes all the fields needed to collect the data for the database. In some of the boxes where the details are filled in are dropdown boxes, which allow you to choose the information from a list of qualifications and level types. I have added a qualifications question where you can enter yes or no to if you have qualifications or not. The logo of the school and colour scheme is used to make the form more professional and appealing, both qualification form and teacher's detail form have the same colour scheme, logo and design.

The drop down boxes will have a limited validation, making you choose from the options given.

Sketch of your data entry form for the main menu screen

Teacher Database

Teacher Details Form

Update Qualifications

View Teachers Detail Report

View Qualification level Query

View Teacher Date Of Birth Query

Close Database

Brief explanation of your form design

This form design for the menu, includes buttons to take you to the teacher and qualification forms, as well as reports and queries. The design has the school logo and the same colour scheme as the other forms. The design is to make it more professional and appealing to look at while using the database. There is a close database button to be pressed when you are finished using the database.

Test Plan

Test (inc. sample data)	Result you expect	Actual result	Pass of Fail
Does Validation for Teachers_Forename work	Validation Appears		

Save button and Close form works	saves and closes successfully		
Dropdown for qualification type	dropdown works, options appear		
Dropdown for qualification level	dropdown works, options appear		
teacher form- gender m/f	only m/f is accepted		
Teacher Database Main Menu- Teacher details form takes you to the teachers form.	Takes you to teachers form		
Teacher Database Main Menu- update qualifications takes you to the qualification form	Takes you to qualification form		
Teacher Database Main Menu- view teacher details report, takes you to the teacher report	Takes you to teachers report		
Teacher Database Main Menu- view qualification query	Takes you to qualification query		
Teacher Database Main Menu- View teacher date of birth query	Takes you to teacher query		
Teacher details- house number limited number	House number has a limit and cannot exceed limit		
Teacher details- date of birth can't be younger than 21	won't accept anything under 21		
Qualification ID uses unique identifier	Unique identifier works		
Teacher ID uses unique identifier	Unique identifier works		
Field Validation for field types	Field validation works		
is not Null Presence check	all fields must be filled in		

Queries

Query Description	Table and Fields to Use	Criteria
Query to ask for certain level of Qualification and where the teacher lives. for example: Staff who hold a level 4, 5 OR 6 qualification (HE level) who live in Stamford.	Teacher_Table: Field - town/city Qualification_Table: Field - Qualification level	Searches for all teacher's with level 4, 5, 6 qualification levels and who lives in stamford. Filter out level 1, 2, 3 and who live in stamford. Filter out other towns and cities.
Query to ask for certain gender of staff and with filtered words of qualification. for example: Female staff who have the term *Computing* AND *IT* in qualification name	Teacher_Table: Field - Gender Qualification_Table: Field: Qualification name	Searches for all Female staff, who have qualifications with computing and IT in there name. Filters out all male staff and staff without computing and IT in there qualification name.
Query to ask for a certain age, and who hold a certain level of qualifications. for example: date of birth (DOB) greater than or equal to 01/01/1996 who hold a level 3 qualification	Teacher_Table: Field - DOB Qualification_Table: Field - qualification level	Searches for all people with date of births greater than or equal to 01/01/1996 and who have a level 3 qualification. Filters out, staff younger than 01/01/1996, and filters out levels above or below 3.
Query to ask for certain gender of staff, with a certain level of qualification. for example: Male staff who hold a level 6 qualification	Teacher_Table: Field - Gender Qualification_Table: Field - qualification level.	Searches for all Male staff, who hold a level 6 qualification. Filters out all female staff and staff with qualifications lower than 6.
Query to ask for staff who have not completed there qualification yet.	Qualification_Table: Field - Qualifications	Searches for the staff who have said they have no qualifications and filters out the staff with qualifications out.

Reports

Report Description	Table and Fields to Use	Purpose
Shows report of gender specific, with a certain level of qualification query for example: Male staff who hold a level 6 qualification	Teacher_Table: Field - Gender Qualification_Table: Field - qualification level.	Pulls all the data that was asked for in the query and fills out a report with results of the query. This query will show all male staff with level 6 qualifications.
Shows report of staff who have no qualifications yet query.	Qualification_Table: Field - Qualifications	Pulls all the data that was asked for in the query and fills out a report with results of the query. This query will show all staff who have not yet got qualifications.

Shows report of certain age, and who hold a specific level of qualification for example: <u>date of birth (DOB) greater than or equal to 01/01/1996</u> who hold a <u>level 3</u> qualification	Teacher_Table: Field - DOB Qualification_Table: Field - qualification level	Pulls all the data that was asked for in the query and fills out a report with results of the query. This query will show all people with dates of births greater than 01/01/1996, and who have a level 3 qualification

Task 3: Alternatives

Consider alternative solutions for the database i.e. different tables, software, solutions.
Other software that can be used is an excel spreadsheet, but it is much harder to store a database on there and it is outdated. Some other table suggestions, that could be possible to add would be: Attendance - we could add an attendance table to keep track of Teacher's punctuality. Feedback - we could add a feedback table, where we have comments from students or from other teachers on how well the teacher teaches their classes, and suggestions for improvement. Schedule - We could have a schedule table, to keep track of staff meetings or days of the week each teacher works and what classes.

Sketch of your alternative solution

Brief explanation of your drawing design(s)

In These Drawings, I have decided to try and format the questions in a different way, this is to visually see which will be the most productive and the best for the form.

In this design I have also customised it a bit more by adding a coloured strip at the sides of the form to make it more custimesed to fit the schools colour scheme.

Task 4: Justification

Justify your design decisions; how will it fulfil the purpose, any constraints in the design?
I designed the designs I created to be practical. I wanted to format the forms in a way it will be easy to see and know where to fill out. Ive decided to make the questions and the fill in box horizontaly as it is easier to see and have it write near the question. I have designed the forms with a logo of the school to make it look more customised and better to look at then a simple form. The designs fit the purpose by have included all possible fields in both of the forms, by having different field types when filling in the forms, having different styled boxes for questions for example a drop down box for options. Concerns of constraints when creating the buttons on the main menu and the save and close button on the forms.

Bibliography

https://teachcomputerscience.com/database-validation/