



Prifysgol Cymru
Y Drindod Dewi Sant
University of Wales
Trinity Saint David

LEVEL/ LEFEL 6

SEMESTER 2

MODULE CODE/ COD Y MODIWL: M6X01088
Business Intelligence Systems

ASSESSMENT TYPE/ MATH O ASESU: ASSIGNMENT

ASSESSMENT/COMPONENT/ ASESAD/CYDRAN: 2

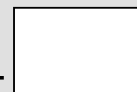
COMPONENT WEIGHTING/ PWYSAU'R CYDRAN: 70 %

WORD COUNT/ NIFER Y GEIRIAU: 3500 WORDS/O EIRIAU

MODULE TUTOR / TIWTOR Y MODIWL: Dr Nik Whitehead

SUBMISSION DETAILS/ MANYLION CYFLWYNO:

- **Make sure that Your Name , Your Student P Number, Your Module Title, Assignment Title and Your Module Lecturer's Name are clearly shown on the front page of your assignment**
- **All assignments must be submitted electronically to Turnitin unless indicated by the module lecturer here:**
- **If lecturer additionally requires you to upload coding separately to Moodle it will be indicated here: YES**
- **If a paper submission is required then it will be indicated here: YES**
you will then be required to submit the assignment parts in a suitable report folder– not in poly-pockets - to the library. For paper submissions only this form (ALL PAGES) MUST be printed out, signed, attached to the front of your assignment and submitted to the library separately from your electronic assignment submission. Paper submission assignments will not be accepted without this form as it is a requirement that you sign the disclosure regarding the referencing convention.



School of Applied Computing ASSIGNMENT SPECIFICATION

Student name:		Student P number:	
Programme:			
Lecturer:	Dr Nik Whitehead	Internal Verifier:	Dr Kemi Ademoye
Assignment Title:	Business Intelligence Systems – Data Warehouse & Data Governance		
Hand Out Date:	February 2018	Submission deadline:	11 th May 2017

Referencing:	In the main body of your submission you must give credit to authors on whose research your work is based. Append to your submission a reference list that indicates the books, articles, etc. that you have read or quoted in order to complete this assignment (e.g. for books: surname of author and initials, year of publication, <u>title of book</u> , edition, publisher: place of publication).		
Disclosure:	I declare that this assignment is all my own work and that I have acknowledged all materials used from the published or unpublished works of other people. All references have been duly cited.		
Student's Signature:	Assignments will not be accepted without a signature here	Date:	
Late submission will result in a late penalty mark, as follows: Up to one week late, maximum mark of 40% for first attempts. No late submission for resit work. (Academic Quality Handbook 2017/18 7.5 (5)) Only the Extenuating Circumstances Committee may grant an extension.			

Learning Outcomes tested (from module syllabus)

1. Synthesise a solution to a small data warehousing problem from a sound understanding of the role and capabilities of modern business information systems
2. Select and perform appropriate data analysis and reporting on data within a BIS and critically evaluate the results
3. Provide business intelligence through the creative application of appropriate data mining processes and the critical evaluation of their results.

TASK DESCRIPTION

Part 1 (70%)

a) Design and build a prototype data warehouse using the data on Spend over £500 in the UK Department of Energy & Climate Change (DECC) (<https://data.gov.uk/dataset/financial-transactions-data-decc>) for the final quarter of the financial year 2012-2013 (January 2013 to March 2013 inclusive).

b) Generate the following reports on your data warehouse:

- Show the top five expense types and the total amount spent on these for the quarter and for each month.
- Show the top five expense areas overall and the total amount spent on these for the quarter and for each of the months.
- Show the five suppliers who received the most money from each department and the totals they received for the quarter and for each month.

c) Create a dashboard for your data warehouse, designed to meet the needs of the DECC finance managers.

This should be accompanied by a 1000-word report which describes the creation and use of your data warehouse. You should include the following:

- A description of the source data used.
- An explanation of any design decisions you have made.
- An explanation of your ETL process, highlighting any particular problems you had to overcome and including examples of any SQL queries you have used.
- A relationship diagram or database schema.
- A description of how the reports were generated, illustrating the results of the analyses with screenshots.
- A copy of your dashboard design and the reasons for your design choices.

The report should be appropriately referenced and should include the appropriate tables of contents, tables of figures and tables of tables. Any figures should have titles and identification labels. The document should also be spellchecked and grammar-checked.

Part 2 (30%)

Using examples from the process of designing the data warehouse in part 1 to illustrate your answer, write a 1000-word executive summary identifying the data governance challenges that would be faced by the DECC in maintaining all of their financial records within such a financial data warehouse, and make reasoned suggestions as to how they might meet these challenges. This should include the following topics:

- Policy, standards and strategy
- Data quality
- Privacy, compliance and security
- Data architecture and data integration

GUIDANCE FOR STUDENTS IN THE COMPLETION OF TASKS

The mark distribution for this assignment is given below.

Part 1

- (20%) Description of the schema produced, including a schema diagram.
- (25%) Description of the ETL process, from the original data to the final tables. An ETL plan should be included as an appendix to the report.
- (25%) Generation of reports from the data warehouse.
- (20%) Design of a suitable dashboard for the data warehouse.
- (10%) Report Writing
 - Are all required features included in the report
 - Quality of report
 - Formatting.

There is no need to do screenshots of every stage of the process, but the text description should include enough detail to explain any decisions that had to be made and any data cleaning that was required.

The most effective way to do most of the reporting is to use Tableau to create reports and a dashboard based upon the data warehouse itself. If you choose this approach then extract the data to a Tableau workbook rather than using a live data connection and submit the Tableau workbook as part of your submission. You may use technologies other than Tableau if you wish.

Part 2

- (20%) Outline of major elements of data governance relevant to this dataset.
- (25%) Problems identified.
- (25%) Proposed solutions.
- (20%) Illustrations and examples from part 1.
- (10%) Report Writing
 - Are all required features included in the report
 - Quality of report
 - Formatting.

WHAT YOU SHOULD SUBMIT

Reports for part 1 and part 2 should be submitted separately through Turnitin. Do not submit the assignment brief document with this.

A zip file containing the two reports, the database file, and any related Tableau workbooks or other related files should be submitted to the School Office.

MARKING CRITERIA AND STUDENT FEEDBACK

This section details the assessment criteria. The *extent* to which these are demonstrated by you determines your mark. The marks available for each criterion are shown. Lecturers will use the space provided to comment on the achievement of the task(s), including those areas in which you have performed well and areas that would benefit from development/improvement.

QUESTION	EXCEPTIONAL 5	MERITORIOUS 4	COMPETENT 3	PASS 2	FAIL 1	NON SUBMISSION
PART 1						
Schema (20%)	Good schema with full discussion of data and of alternatives	Workable schema with description of tables and attributes	Workable schema with descriptions of tables or attributes	Schema is workable but unexplained	Unworkable schema	Missing
ETL process (25%)	Full and detailed discussion of ETL process	Discusses data transformations and missing values	Discusses data transformations or missing values	Basic description of which data goes into each <i>table</i>	Incorrect or misleading	Missing
Report generation (25%)	Full and detailed discussion of report generation	Discusses the analytical process used	Explains the screenshots	Provides screenshots only	Incorrect or misleading	Missing
Dashboard design (20%)	Elegant design with full discussion of decisions made	Good design of relevant data; uses multiple encoding methods well	Shows relevant data and uses more than one encoding method	Shows relevant data in an understandable format	Incorrect or misleading	Missing
Report writing (10%)	Reads like a technical review article	Good use of signposting; good use of English; tables of figures and tables	Clear sectioning of content; labelling of tables and figures; reasonable English	Basic use of introduction, body and conclusion; English is comprehensible; some labelling of tables and figures	No clear structure	Missing
PART 2						
Data governance elements (20%)	Clear identification of all elements and related industry standard approaches	Relation to relevant external regulations	Consideration of management and operational levels in practice	Identification of obvious data governance processes	Incorrect or misleading	Missing
Problems identified (25%)	Full discussion of a wide range of potential issues	Identifies more subtle issues as well as the obvious ones	Identifies 2-3 issues other than basic data quality	Identifies basic data quality issues	Incorrect or misleading	Missing
Proposed solutions (25%)	Full discussion with reference to professional toolkits	Provides strategic level solutions to problems; may include toolkits	Provides tactical level solutions to problems; may involve tools	Provides simple data cleaning solutions	Incorrect or misleading	Missing
Illustrations and examples (20%)	All points illustrated to a professional level	All points illustrated referring back to issues raised in part 1 ETL	Most points illustrated; some refer back to issues raised in part 1 ETL	Limited examples; some relate to specified dataset	Incorrect or misleading	Missing
Report writing (10%)	Reads like a business report	Good use of signposting; generally good language use; spellchecked and grammar-checked	Clear sectioning of content; requires spellchecking and/or grammar-checking; labelling of tables and figures	Basic use of introduction, body and conclusion; language is understandable; some labelling of tables and figures	No clear structure	Missing

Comments (See over)

Assignment Mark (Assessment marks are subject to ratification at the Exam Board. These comments and marks are to give feedback on module work and are for guidance only until they are confirmed.)	Late Submission Penalties (tick if appropriate)		%
	Up to one week late		
	First Attempt?		

BACHELORS COMMON ASSESSMENT AND MARKING CRITERIA

	OUTRIGHT FAIL	UNSATISFACTORY	SATISFACTORY	GOOD	VERY GOOD	EXCELLENT	EXCEPTIONAL
Assessment Criteria	0-29%	30-39%*	40-49%	50-59%	60-69%	70-79%	80-100%
1. Research-informed Literature Extent of research and/or own reading, selection of credible sources, application of appropriate referencing conventions	Little or no evidence of reading. Views and findings unsupported and non-authoritative. Referencing conventions largely ignored.	Poor evidence of reading and/or of reliance on inappropriate sources, and/or indiscriminate use of sources. Referencing conventions used inconsistently.	References to a limited range of mostly relevant sources. Some omissions and minor errors. Referencing conventions evident though not always applied consistently.	Inclusion of a range of research-informed literature, including sources retrieved independently. Referencing conventions mostly consistently applied.	Inclusion of a wide range of research-informed literature, including sources retrieved independently. Selection of relevant and credible sources. Very good use of referencing conventions, consistently applied.	A comprehensive range of research-informed literature embedded in the work. Excellent selection of relevant and credible sources. High-level referencing skills, consistently applied.	Outstanding knowledge of research-informed literature embedded in the work. Outstanding selection of relevant and credible sources. High-level referencing skills consistently and professionally applied.
2. Knowledge and Understanding of Subject Extent of knowledge and understanding of concepts and underlying principles associated with the discipline.	Major gaps in knowledge and understanding of material at this level. Substantial inaccuracies.	Gaps in knowledge, with only superficial understanding. Some significant inaccuracies.	Evidence of basic knowledge and understanding of the relevant concepts and underlying principles.	Knowledge is accurate with a good understanding of the field of study.	Knowledge is extensive. Exhibits understanding of the breadth and depth of established views.	Excellent knowledge and understanding of the main concepts and key theories. Clear awareness of challenges to established views and the limitations of the knowledge base.	Highly detailed knowledge and understanding of the main theories/concepts, and a critical awareness of the ambiguities and limitations of knowledge.
3. Analysis Analysis, evaluation and synthesis; logic, argument and judgement; analytical reflection; organisation of ideas and evidence	Unsubstantiated generalisations, made without use of any credible evidence. Lack of logic, leading to unsupported/missing conclusions. Lack of any attempt to analyse, synthesise or evaluate.	Some evidence of analytical intellectual skills, but for the most part descriptive. Ideas/findings sometimes illogical and contradictory. Generalised statements made with scant evidence. Conclusions lack relevance.	Evidence of some logical, analytical thinking and some attempts to synthesise, albeit with some weaknesses. Some evidence to support findings/views, but evidence not consistently interpreted. Some relevant conclusions and recommendations, where relevant	Evidence of some logical, analytical thinking and synthesis. Can analyse new and/or abstract data and situations without guidance. An emerging awareness of different stances and ability to use evidence to support the argument. Valid conclusions and recommendations, where relevant	Sound, logical, analytical thinking; synthesis and evaluation. Ability to devise and sustain persuasive arguments, and to review the reliability, validity & significance of evidence. Ability to communicate ideas and evidence accurately and convincingly. Sound, convincing conclusions / recommendations.	Thoroughly logical work, supported by evaluated evidence. High quality analysis, developed independently or through effective collaboration. Ability to investigate contradictory information and identify reasons for contradictions. Strong, persuasive, conclusions, justifiable recommendations.	Exceptional work; judiciously selected and evaluated evidence. Very high quality analysis, developed independently or through effective collaboration. Ability to investigate contradictory information and identify reasons for contradictions. Highly persuasive conclusions
4. Practical Application and Deployment Effective deployment of appropriate methods, materials, tools and techniques; extent of skill demonstrated in the application of concepts to a variety of processes and/or contexts; formulation of innovative and creative solutions to solve problems.	Limited or no use of methods, materials, tools and/or techniques. Little or no appreciation of the context of the application.	Rudimentary application of methods, materials, tools and/or techniques but without consideration and competence. Flawed appreciation of the context of the application.	An adequate awareness and mostly appropriate application of well-established methods, materials, tools and/or techniques. Basic appreciation of the context of the application.	A good and appropriate application of standard methods, materials, tools and/or techniques. Good appreciation of the context of the application, with some use of examples, where relevant.	A very good application of a range of methods, materials, tools and/or techniques. Very good consideration of the context of the application, with perceptive use of examples, where relevant. Evidence of some innovation and creativity.	An advanced application of a range of methods, materials, tools and/or techniques. The context of the application is well considered, with extensive use of relevant examples. Application and deployment extend beyond established conventions. Innovation and creativity evident throughout.	Outstanding levels of application and deployment skills. Assimilation and development of cutting edge processes and techniques.
5. Skills for Professional Practice Demonstrates attributes expected in professional practice including: individual initiative and collaborative working; deployment of appropriate media to communicate (including written and oral); clarity and effectiveness in presentation and organisation.	Communication media is inappropriate or misapplied. Little or no evidence of autonomy in the completion of tasks. Work is poorly structured and/or largely incoherent.	Media is poorly designed and/or not suitable for the audience. Poor independent or collaborative initiative. Work lacks structure, organisation, and/or coherence	Can communicate in a suitable format but with some room for improvement. Can work as part of a team, but with limited involvement in group activities. Work lacks coherence in places and could be better structured.	Can communicate effectively in a suitable format, but may have minor errors. Can work effectively as part of a team, with clear contribution to group activities. Mostly coherent work and is in a suitable structure.	Can communicate well, confidently and consistently in a suitable format. Can work very well as part of a team, with very good contribution to group activities. Work is coherent and fluent and is well structured and organised.	Can communicate professionally and, confidently in a suitable format. Can work professionally within a team, showing leadership skills as appropriate, managing conflict and meeting obligations. Work is coherent, very fluent and is presented professionally.	Can communicate with an exceptionally high level of professionalism. Can work exceptionally well and professionally within a team, showing advanced leadership skills. Work is exceptionally coherent, very fluent and is presented professionally.

Taflen Cyflwyno Aseiniad Assignment Hand in Sheet

MANYLION Y MYFYRIWR STUDENT'S DETAILS			
ENW: NAME:		<i>RHIF P Y MYFYRIWR: STUDENT P NUMBER:</i>	P
CWRS: COURSE:	Foundation Year/HNC/HND/FdSc/BEng/BSc/MEng/MComp/MSc * <i>dileer fel y bo'n berthnasol / delete as appropriate</i>	<i>LEFEL Y CWRS: LEVEL OF COURSE:</i>	
MODIWL: MODULE:			
TEITL YR ASEINIAD: ASSIGNMENT TITLE:			
DARLITHIWR/WYR: LECTURER/S:		<i>DYDDIAD: DATE:</i>	
Staff Llyfrgell YN UNIG / Library Staff ONLY Derbyniwyd gan / Accepted by: _____ Dyddiad Cyflwyno: Date Submitted: _____ Amser / Time: _____			

DERBYNNEB / RECEIPT			
ENW / NAME:		<i>RHIF P Y MYFYRIWR: STUDENT P NUMBER:</i>	P
CWRS / COURSE:	Foundation Year/HNC/HND/FdSc/BEng/BSc/MEng/MComp/MSc * <i>dileer fel y bo'n berthnasol / delete as appropriate</i>	<i>LEFEL Y CWRS / LEVEL OF COURSE:</i>	
MODIWL / MODULE:			
TEITL YR ASEINIAD/ ASSIGNMENT TITLE:			
DARLITHIWR/WYR: LECTURER/S:		<i>DYDDIAD / DATE:</i>	
Staff Llyfrgell YN UNIG / Library Staff ONLY Derbyniwyd gan / Accepted by: _____ Dyddiad Cyflwyno: Date Submitted: _____ Amser / Time: _____			