# **Unit Assessment Pack (UAP) – Cover Sheet**

## **Student and Trainer/Assessor Details**

| **Student ID** |  |
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| **Student name** |  |
| **Contact number** |  |
| **Email address** |  |
| **Trainer/Assessor name** |  |

## **Course and Unit Details**

| **Course code** | ICT50115 |
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| **Course name** | Diploma of Information Technology |
| **Unit code** | **ICTSAD502** |
| **Unit name** | **Model data processes** |

## **Assessment Submission Method**

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| ☐ By hand to trainer/assessor | ☐ By email to trainer/assessor | ☐ Online submission via Learning Management System (LMS) |

**Student Declaration**

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| * I certify that the work submitted for this assessment pack is my own. I have clearly referenced any sources used in my submission. I understand that a false declaration is a form of malpractice; * I have kept a copy of this assessment pack and all relevant notes, attachments, and reference material that I used in the production of the assessment pack; * For the purposes of assessment, I give the trainer/assessor of this assessment the permission to:   + Reproduce this assessment and provide a copy to another member of staff; and   + Take steps to authenticate the assessment, including communicating a copy of this assessment to a checking service (which may retain a copy of the assessment on its database for future plagiarism checking).   Student signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Date: \_\_\_\_/\_\_\_\_\_/\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

## **Assessment Plan**

To demonstrate competence in this unit, you must be assessed as satisfactory in each of the following assessment tasks.

| **Evidence recorded** | **Evidence Type/ Method of assessment** | | | **Sufficient evidence recorded/Outcome** |
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| **Unit Assessment Task 1** | Unit Knowledge Test (UKT) | | | S / NS (First Attempt)  S / NS (Second Attempt) |
| **Unit Assessment Task 2** | Unit Project (UP) | | | S / NS (First Attempt)  S / NS (Second Attempt) |
| **Final result** | Competent/Not Yet Competent | **Date assessed** |  | |
| **Trainer/Assessor Signature** |  | |

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**Assessment Conditions**

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| **Unit purpose/application** |

* This unit describes the skills and knowledge required to gather process data and business information in order to model data processes within an organisation.
* It applies to individuals who can apply a broad range of technical knowledge and skills within the context of a complex project.
* No licensing, legislative or certification requirements apply to this unit at the time of publication.

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| **What the student can expect to learn by studying this unit of competency** |

* Learn the skills to design process models for an organization
* Learn about requirement gathering process, designing prototype as per business information
* Implement skills to a broad range of technical knowledge and skills within the context of a complex project.

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| **Training and assessment resources required for this unit of competency** |

The student will have access to the following:

* Learner guide
* PowerPoint presentation
* Unit Assessment Pack (UAP)
* Access to other learning materials such as textbooks

The resources required for these assessment tasks also include:

* Access to a computer, the Internet and word-processing system such as MS Word
* Sample program and their flowchart, algorithm
* A deep understanding of user interface design and its application on different tools.
* Existing test cases to check the specification

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| **Submission instructions** |

Your trainer/assessor will confirm assessment submission details for each assessment task.

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| **Academic integrity, plagiarism and collusion** |

**Academic Integrity:**

Academic Integrity is about the honest presentation of your academic work. It means acknowledging the work of others while developing your own insights, knowledge and ideas.

As a student, you are required to:

* Undertake studies and research responsibly and with honesty and integrity
* Ensure that academic work is in no way falsified
* Seek permission to use the work of others, where required
* Acknowledge the work of others appropriately
* Take reasonable steps to ensure other students cannot copy or misuse your work.

**Plagiarism:**

Plagiarism means to take and use another person's ideas and or manner of expressing them and to pass them off as your own by failing to give appropriate acknowledgement. This includes material sourced from the internet, RTO staff, other students, and from published and unpublished work.

Plagiarism occurs when you fail to acknowledge that the ideas or work of others are being used, which includes:

* Paraphrasing and presenting work or ideas without a reference
* Copying work either in whole or in part
* Presenting designs, codes or images as your own work
* Using phrases and passages verbatim without quotation marks or referencing the author or web page
* Reproducing lecture notes without proper acknowledgement.

**Collusion:**

Collusion means unauthorised collaboration on assessable work (written, oral or practical) with other people. This occurs when a student presents group work as their own or as the work of someone else.

Collusion may be with another RTO student or with individuals or students external to the RTO. This applies to work assessed by any educational and training body in Australia or overseas.

Collusion occurs when you work without the authorisation of the teaching staff to:

* Work with one or more people to prepare and produce work
* Allow others to copy your work or share your answer to an assessment task
* Allow someone else to write or edit your work (without rto approval)
* Write or edit work for another student
* Offer to complete work or seek payment for completing academic work for other students.

Both collusion and plagiarism can occur in group work. For examples of plagiarism, collusion and academic misconduct in group work please refer to the RTO’s policy on Academic integrity, plagiarism and collusion.

Plagiarism and collusion constitute cheating. Disciplinary action will be taken against students who engage in plagiarism and collusion as outlined in RTO’s policy.

Proven involvement in plagiarism or collusion may be recorded on students’ academic file and could lead to disciplinary action.

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| **Other Important unit specific Information** |

N/A

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| **Unit outcome** |

* This unit is not graded and the student must complete and submit all requirements for the assessment task for this cluster or unit of competency to be deemed competent.
* Students will receive a 'satisfactorily completed' (S) or 'not yet satisfactorily completed (NS) result for each individual unit assessment task (UAT).
* Final unit result will be recorded as competency achieved/competent (C) or competency not yet achieved/not yet competent (NYC).

# **Unit Assessment Task (UAT) - 1**

## **Assessment Task 1 - Unit Knowledge Test (UKT)**

**Assessment type:**

* Written Questions

**Questions:**

Question 1: Answer the following questions.

A) Define data modelling. What are the various advantages of data modelling? Write about 100-150 words.

B) List any four (4) techniques used to gather detailed requirements information? Describe each of them. Write 200-250 words.

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| 1. Data modeling (data modelling) is the process of creating a data model for the data to be stored in a database. This data model is a conceptual representation of Data objects, the associations between different data objects, and the rules. Data modeling helps in the visual representation of data and enforces business rules, regulatory compliances, and government policies on the data. Data Models ensure consistency in naming conventions, default values, semantics, security while ensuring quality of the data. The advantages of Data Modeling are listed below:  * The main goal of a designing data model is to make certain that data objects offered by the functional team are represented accurately. * The data model should be detailed enough to be used for building the physical database. * The information in the data model can be used for defining the relationship between tables, primary and foreign keys, and stored procedures. * Data Model helps business to communicate the within and across organizations.  1. Requirements analysis is critical to the achievement of the development project. Requirements should be measurable, actionable, and testable and also should be related to the user’s expectations. Requirement without any ambiguity fulfill the user’s requirement make the project successful. While gathering requirements focused on “what” should be required rather than “how” it is required. Requirement gathering techniques are listed below as :  * Interview: Interviews of users and stakeholders are important in creating wonderful software. Without knowing the expectations and goal of the stakeholders and users, you are highly unlikely to satiate them. You also have to understand the perspective of every interviewee, in order to properly address and weigh their inputs. * Observation: The observation covers the study of users in its natural habitat. By watching users, a process flow, pain points, awkward steps and opportunities can be determined by an analyst for improvement. Observation can either be passive or active. Passive observation provides better feedback to refine requirements on the same hand active observation works best for obtaining an understanding over an existing business process. You can use any of these approaches to uncover the implicit requirements that are often overlooked. * Brainstorming: Brainstorming can be utilized in requirements gathering to gather a good number of ideas from a group of people. Usually brainstorming is used in identifying all possible solutions to problems and simplifies the detail of opportunities. It casts a broad net, determining various discreet possibilities. Prioritization of such possibilities is vital to locate needles in a haystack. * Prototyping: Prototyping can be very helpful at gathering feedback. Low fidelity prototypes make a good listening tool. Many a times, people are not able to articulate a specific need in the abstract. They can swiftly review whether a design approach would satisfy the need. Prototypes are very effectively done with fast sketches of storyboards and interfaces. Prototypes in some situations are also used as official requirements.   Reference: Brighthubpm.com. 2020. *10 Essential Business Requirements Gathering Techniques*. [online] Available at: <https://www.brighthubpm.com/project-planning/60264-techniques-used-in-business-requirements-gathering/> [Accessed 13 November 2020]. |

Question 2: Answer the following questions.

1. What are the four types of data models? Write a short note about any two data models with a neat diagram. Write in 200-250 words.
2. Why requirement analysis strategy is very important for successful development of any project? Write in 100-150 words.

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| 1. ***For the creation of any database, the data model is considered a logical structure for creating a database. The data model includes entities, attributes, constraints, relationships, etc. The data models are used to represent the data and how it is stored in the database, how data is accessible and updated in the database management system. There are four types of data models: Hierarchical model, Network model, Entity-relationship model, Relational model. These models have further categories which are used according to a different use case.***   ***Types of Data Models are listed below:***   * ***Hierarchical Data Model: In hierarchical model, data is organized into a tree like structure with each record is having one parent record and many children. The main drawback of this model is that, it can have only one to many relationships between nodes. Lets say we have few students and few courses and a course can be assigned to a single student only, however a student take any number of courses so this relationship becomes one to many.***   ***hie***   * ***E-R Model: The ER model is used to describe the database structure using the entity-relationship diagram. The E-R model is just like the blueprint of a database which is used to implement the database. In the entity set, the relationship exists which can be shown using the ER diagram. The entity set consist of similar type of entities which consist of attributes.***   ***Reference:*** EDUCBA. 2020. *Types Of Data Model | Top 4 Awesome Different Types Of Data Models*. [online] Available at: <https://www.educba.com/types-of-data-model/> [Accessed 13 November 2020]. |
| 1. ***A software requirement is a capability needed by the user to solve a problem or to achieve an objective. In other words, requirement is a software capability that must be met or possessed by a system or system component to satisfy a contract, standard, specification, or other formally imposed documentation. Ultimately, what we want to achieve is to develop quality software that meets customers' real needs on time and within budget.***   ***Perhaps the greatest challenge being faced by software developers is to share the vision of the final product with the customer. All stakeholders in a project - developers, end users, software managers, customer managers - must achieve a common understanding of what the product will be and do, or someone will be surprised when it is delivered. Surprises in software are almost never good news.***  ***Therefore, we need ways to accurately capture, interpret, and represent the voice of customers when specifying the requirements for a software product.***  ***Reference:*** Visual-paradigm.com. 2020. *Requirement Analysis Techniques*. [online] Available at: <https://www.visual-paradigm.com/guide/requirements-gathering/requirement-analysis-techniques/> [Accessed 13 November 2020]. |

Question 3: Answer the following questions.

1. What are the various methods for model validation? Write a short paragraph about each of them. Write in 200-250 words.
2. Define external events and procedure.

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| 1. Validation is the task of determining if the model constructed accurately represents the underlying real system being modeled.   For any simulation model that is to be used in actual application,it is very important to validate the model insofar as practicable, since real decisions are going to be made based on the simulation outcomes.  Techniques of model validation are listed below:   * In model construction, involve people with domain knowledge, particularly for developing the model elements. Domain experts should also have expert knowledge on where and what input/output data to incorporate. There may be previous work (such as lab experiments) or statistical models from which some model elements can be extracted or developed. * For any predefined probability distributions that are used, conduct statistical “goodness-of-fit” tests to real system data (assuming data of reasonable quality exists). It is also advisable to have the model report standard statistical measures for generated data to verify that these correspond to expected values. * A “Turing Test” is one where both real and “fake” data are examined to see if it can be determined which is which Produce a set of model runs and a set of real runs in the same format and present them to people with expert knowledge of the system. Present them with the task of determining which runs are model generated and which are not.If the knowledge experts cannot distinguish which is which with any consistency, then the test is said to fail to demonstrate model inadequacy. If the knowledge experts can distinguish which is with any degree of accuracy, then the modeler needs to question the knowledge experts to determine what modifications are needed in the model. * Conduct statistical analyses comparing model output with real system output. This may require acquisition of system data that is not currently being captured.   Reference: Unf.edu. 2020. [online] Available at: <https://www.unf.edu/~cwinton/html/cop4300/s09/class.notes/VerifyValidate.pdf> [Accessed 13 November 2020]. |
| 1. When an asynchronous event is fired (for example, barcode reading), an object can use the IAsyncEvent interface for creating an external event in 1C:Enterprise. The IAsyncEvent interface inherits from IUnknown. All events are queued and processed in the order they are added. The number of stored events is limited to the queue size. During the initialization, the queue size is set to 1 and then it can be changed by calling the SetEventBufferDepth() method and retrieved using the GetEventBufferDepth() method. A separate queue is maintained for each add-in object. External event processing is performed using the predefined ExternEventProcessing() procedure and external event handlers in form modules.   Reference: 1c-dn.com. 2020. *External Events*. [online] Available at: <https://1c-dn.com/library/add\_in\_creation\_technology\_external\_events/> [Accessed 13 November 2020]. |

Question 4: Answer the following questions.

1. What is information system? What are the major business processes of student information management system?
2. Define process data. What is the key information that data process includes? Write in 100-150 words.

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| 1. ***Information systems is a integrated set of components for collecting, storing and processing data ad for delivering information, knowledge, and digital products. Businesses reley on information systems to carry out and manage their operations, interact with their customers and suppliers, and compete in the marketplace (Zwass, 2012). Most business organizations are becoming more and more dependent on information systems to manage and maintain their internal organization infrastructures.***   ***It is necessity to maintain up-to-date, complete and accurate information to stay competitive in the changing world. Organizations utilize many types of information systems to assist in their daily operations. Some typical functional systems within an organization are human resources, accounting and finance, sales and marketing, operations, and manufacturing. Within these functions information systems play a various roles, such as in human resources, information system duties may include recruiting and training while in operations some duties may include order management and customer service. In other words business processesses are the ways in which organizations perform different tasks. Therefore it is very important to analyze business processes in order to determine how the information system can support that process.***  ***The major business process of student information management system are:***   * ***Admission*** * ***Billing and Payments*** * ***Reporting***   Reference: Boardingware Blog. 2020. *What Is A Student Information Management System?*. [online] Available at: <https://blog.boardingware.com/get-the-most-from-your-student-information-system/> [Accessed 12 November 2020]. |
| 1. ***Process data is data related to a business process that accumulates, according to configured instructions in the BPML, in an XML document during the life of the process. Process data includes:***  * ***Information extracted from a document that is used for determining, from multiple choices, what the next step will be*** * ***Information assigned in a process' BPML configuration to be used by a service in the business process, such as a map name or extract directory, which helps the service do its job but is not part of the primary document*** * ***Information about the document or the processing of the document, placed by a service – such as a content type indicator or sender information, which helps a service do its job and is specific to the document***   ***Reference:*** Ibm.com. 2020. *IBM Knowledge Center*. [online] Available at: <https://www.ibm.com/support/knowledgecenter/en/SS3JSW\_5.2.0/com.ibm.help.bpml.doc/SI\_WhatIsProcessData.html> [Accessed 12 November 2020]. |

Question 5: Explain about Joint application development (JAD)? Write 3 advantages of JAD. Write in 150-200 words.

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| ***Joint Development Application (JAD) is a very common technique in the business analysis world. It brings system developers and users together in a productive and creative environment through a structured approach that involves discussion groups with the goal to obtain requirements and specifications.***  ***In a nutshell, the ultimate purpose of JAD is to include the client in the development process and develop a more satisfactory end-product that will meet the client’s needs more efficiently. JAD allows clients to have full autonomy in project development and allows them to participate in their application's development through a series of workshops.***  ***When a business needs some technical input from the technical expertise, JAD session is required. Likewise, when technical expertise needs business input, JAD is required.***  ***Whenever a business and a technical team are trying to collaborate with each other to make certain decisions about critical issues, there is nothing more effective than organizing a JAD session.***  ***The advantages of JAD are listed below:***   * ***JAD allows you to resolve difficulties more simply and produce better, error-free software*** * ***The joint collaboration between the company and the clients lowers all risks*** * ***JAD reduces costs and time needed for project development***   ***Reference:*** ActiveCollab. 2020. *Joint Application Development (JAD) · Activecollab Blog*. [online] Available at: <https://activecollab.com/blog/project-management/joint-application-development> [Accessed 12 November 2020]. |

Question 6: Answer the following questions.

1. What do you understand by SDLC? What are the different phases of SDLC? Write in 100-150 words.
2. What can be the various sources of information for creating a data model? Write in 100-150 words.

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| 1. ***Software Development Life Cycle (SDLC) is a framework that defines the steps involved in the development of software at each phase. It covers the detailed plan for building, deploying and maintaining the software. SDLC defines the complete cycle of development i.e. all the tasks involved in planning, creating, testing, and deploying a Software Product.***   ***Phases of SDLC are listed below:***   * ***Requirement gathering and analysis:During this phase, all the relevant information is collected from the customer to develop a product as per their expectation. Any ambiguities must be resolved in this phase only.*** * ***Design: In this phase, the requirement gathered in the SRS document is used as an input and software architecture that is used for implementing system development is derived.*** * ***Implementation and coding: Implementation/Coding starts once the developer gets the Design document. The Software design is translated into source code. All the components of the software are implemented in this phase.*** * ***Testing: Testing starts once the coding is complete and the modules are released for testing. In this phase, the developed software is tested thoroughly and any defects found are assigned to developers to get them fixed.*** * ***Deployment: Once the product is tested, it is deployed in the production environment or first UAT (User Acceptance testing) is done depending on the customer expectation.*** * ***Maintenance: After the deployment of a product on the production environment, maintenance of the product i.e. if any issue comes up and needs to be fixed or any enhancement is to be done is taken care by the developers.***   ***Reference:*** Softwaretestinghelp.com. 2020. *What Is SDLC (Software Development Life Cycle) Phases Methodologies*. [online] Available at: <https://www.softwaretestinghelp.com/software-development-life-cycle-sdlc/> [Accessed 12 November 2020]. |
| 1. Data modeling is the act of exploring data-oriented structures. Like other modeling artifacts data models can be used for a variety of purposes, from high-level conceptual models to physical data models. From the point of view of an object-oriented developer data modeling is conceptually similar to class modeling. With data modeling you identify entity types whereas with class modeling you identify classes. Data attributes are assigned to entity types just as you would assign attributes and operations to classes. There are associations between entities, similar to the associations between classes – relationships, inheritance, composition, and aggregation are all applicable concepts in data modeling.   Traditional data modeling is different from class modeling because it focuses solely on data – class models allow you to explore both the behavior and data aspects of your domain, with a data model you can only explore data issues. Because of this focus data modelers have a tendency to be much better at getting the data “right" than object modelers. However, some people will model database methods (stored procedures, stored functions, and triggers) when they are physical data modeling. It depends on the situation of course, but I personally think that this is a good idea and promote the concept in my UML data modeling profile (more on this later).  Reference: Agiledata.org. 2020. *Data Modeling 101*. [online] Available at: <http://agiledata.org/essays/dataModeling101.html> [Accessed 12 November 2020]. |

Question 7: Answer the following questions.

A) Why validating process model is required before development phase? Write in 50-100 words.

B) You are required to create a student enrolment process of a university and describe all the process. Also draw a neat activity and use-case diagram of the process.

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| A)In the validation phase of the study, the focus shifted from the identification of testing work effecting process components to the entire process organization. In this phase, the test process of the organization, and subsequently the concepts of test process improvement were studied. The objective was to understand how the identified test process components should be addressed at an organizational level. Additional concern was to test the feasibility of the ISO/IEC 29119 test process model and develop a framework for organizations to develop their test process toward better practices and conformance with the principles presented at the standard-defined test process model.  Reference: Sciencedirect.com. 2020. *Validation Phase - An Overview | Sciencedirect Topics*. [online] Available at: <https://www.sciencedirect.com/topics/computer-science/validation-phase> [Accessed 12 November 2020]. |
| B) |

Question 8: Answer the following questions.

1. Define business rule. Write a general business rule to store student information during enrolment process of a university. Write in 200-250 words.
2. What is meant by process modelling conventions?

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| 1. ***A business rule is statement that imposes some form of constraint on a specific aspect of the database, such as the elements within a field specification for a particular field or the characteristics of a given relationship. You base a business rule on the way the organization perceives and uses its data, which you determine from the manner in which the organization functions or conducts its business.***   ***An important aspect of any design process is making choices. In database design, for example, you must choose which data to store in the database; you would not necessarily want or need to store every last piece of data the organization might possibly use. The data you finally choose to store and how you decide to store it will be determined by the way the organization uses its data. A hospital may wish to store times of various events to the second, whereas a warehouse requires only the date for any given event.***  ***To guide these and other choices you'll be required to make during the database-design process (and later, when you implement the database in an RDBMS), you need a formal statement of the organization's business rules. These rules will influence a wide variety of database issues, such as the data you collect and store, the manner in which you define and establish relationships, the types of information that the database can provide, and the very security and confidentiality of the data itself. It is next to impossible to create a generic set of business rules that could apply to two or more organizations. Each organization has its own data and information requirements, and each has its own unique way of conducting its business; therefore, every organization needs its own specific set of business rules.***  ***Reference:*** Etutorials.org. 2020. *What Are Business Rules? :: Chapter 11. Business Rules :: Part II: The Design Process :: Database Design For Mere Mortals :: SQL :: Etutorials.Org*. [online] Available at: <http://etutorials.org/SQL/Database+design+for+mere+mortals/Part+II+The+Design+Process/Chapter+11.+Business+Rules/What+Are+Business+Rules/> [Accessed 12 November 2020]. |
| 1. ***Process modelling conventions are a set of agreed rules that govern the look and feel of all process models created within an organisation or beyond. Modelling conventions can be developed at the start of a new process modelling project; however, they are commonly managed within an organisation’s process modelling practice lead (e.g. Office of BPM). Modelling conventions govern all aspects of a process model: from the basic layout (e.g. model from left-to-right, or top-down) to the naming of specific objects (e.g. activities must start with a verb in the present-tense) and everything in between. Modelling conventions are made available as references to anyone interacting, consuming, authoring, or managing process models.***   ***Reference:*** Joebges, P., 2020. *Process Models Need Modeling Conventions*. [online] Blog.leonardo.com.au. Available at: <https://blog.leonardo.com.au/process-models-need-modeling-conventions> [Accessed 12 November 2020]. |

Question 9: Answer the following questions.

* 1. What is the difference between validation and verification?
  2. Write a short note about process mapping. What is the use of process mapping? Write in 150-200 words.

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| 1. ***The terms Verification and Validation are commonly used in software engineering to mean two different types of analysis. The usual definitions are:***  * ***Validation: Are we building the right system?*** * ***Verification: Are we building the system right?***   ***In other words, validation is concerned with checking that the system will meet the customer’s actual needs, while verification is concerned with whether the system is well-engineered, error-free, and so on. Verification will help to determine whether the software is of high quality, but it will not ensure that the system is useful.***  ***The distinction between the two terms is largely to do with the role of specifications. Validation is the process of checking whether the specification captures the customer’s needs, while verification is the process of checking that the software meets the specification.***  ***Verification includes all the activities associated with the producing high quality software: testing, inspection, design analysis, specification analysis, and so on. It is a relatively objective process, in that if the various products and documents are expressed precisely enough, no subjective judgements should be needed in order to verify software.***  ***In contrast, validation is an extremely subjective process. It involves making subjective assessments of how well the (proposed) system addresses a real-world need. Validation includes activities such as requirements modelling, prototyping and user evaluation.***  ***Reference:*** Serendipity. 2020. *The Difference Between Verification And Validation*. [online] Available at: <https://www.easterbrook.ca/steve/2010/11/the-difference-between-verification-and-validation/> [Accessed 12 November 2020]. |
| 1. ***it is an exercise to identify all the steps and decisions of an existing process in diagrammatic form, which helps organisations identify improvement opportunities so that they can improve efficiency within an organisation.***   ***More specifically, process mapping means:***   * ***Describes the flow of materials, information and documents*** * ***Shows the various tasks contained within the process*** * ***Clearly shows that the tasks transform inputs into outputs*** * ***Indicates the decisions that need to be made along the chain*** * ***Demonstrates the essential inter-relationships and interdependence between the process steps; and reminds us that the strength of a chain depends upon its weakest link.***   ***The core reason for mapping out your processes is that those organisations that perform the transformation of inputs into outputs (their processes) well, generally manage to meet or exceed customer expectation. And those that do it best are invariably the most successful. Some of the reason of using process mapping are listed below as:***   * ***Making system changes without truly understanding how the process is working today, and why, can lead to costly mistakes. It can also create conditions that make it difficult for staff to work effectively, and often creates further problems.*** * ***If you do not measure a process, you will not be able to manage it effectively and if you cannot manage a process, you cannot improve it.*** * ***It has been estimated that people working in organisations can waste about 15 – 20% of their time by re-doing things that are wrong, chasing outcomes without results, querying incomplete instructions, doing other people’s jobs and so on. This figure has been confirmed to varying degrees for all grades within CPS.*** * ***Clearly defining processes enables us to identify problem areas such as bottlenecks, capacity issues, delays or waste. Once identified, this knowledge provides a solid basis from which to develop solutions and introduce and plan new improved processes.***   ***Reference:*** Blog.triaster.co.uk. 2020. *What Is Process Mapping, Who Does It And Why Use It?*. [online] Available at: <https://blog.triaster.co.uk/blog/what-is-process-mapping-who-does-it> [Accessed 12 November 2020]. |

Question 10: What are the types of documentation is System design? Explain about system documentation. Write about 300-350 words.

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| ***System documentation is a vital and important part of successful software development and software engineering. Generally speaking, it is comprised of detailed language, illustrations and photos that help different people understand the software, and it is essential reference material. Many developers face challenges in creating software documentation that is both comprehensively helpful and easy to read.***  ***Computer software documentation is broadly defined. It can be a user manual that consumers read to understand the requirements and operations of a software system so they can then download it, install it and use it. It can also be more technical, describing the capabilities and characteristics of the system for a technical user, such as someone in IT or a systems administrator. Technical documentation can include coding for the software and a record of how it was designed, such as the architecture of the creation and the goals of designing the software and each of its aspects.***  ***Generally, documentation is designed to inform the reader about the software and describe how it was created, what it is intended to do and how it works. It should also be easy to find or access, and it should have the ability to be updated as changes are made to the software over the course of time. While details have to be included for documentation to be properly comprehensive and effective, the goal is for all computer software documentation to be written in language that’s fairly easily understood. This can be a challenge when using technical language.***  ***Overall, documentation can be divided into a couple of different categories: process documentation and product documentation. Process documentation is designed for those working in the internet technology field, and it uses industry-specific jargon about the process of engineering and developing the software. Product documentation describes the product and how it is to be used.***  ***However, these categories are further divided. Product documentation includes both system documentation, which is technical, and user documentation, which should not be too technical. This is because it’s designed for the everyday average computer user, not someone in the software engineering or IT field.***  ***Reference:*** Bizfluent. 2020. *Different Types Of System Documentation*. [online] Available at: <https://bizfluent.com/facts-4962524-different-types-system-documentation.html> [Accessed 12 November 2020]. |

Question 11: What is meant by data analysis? Why is data analysis important? Write in 200-250 words.

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| ***Data analysis is the process of evaluating data using analytical or statistical tools to discover useful information. Some of these tools are programming languages like R or Python. Microsoft Excel is also popular in the world of data analytics.***  ***Once data is collected and sorted using these tools, the results are interpreted to make decisions. The end results can be delivered as a summary, or as a visual like a chart or graph.***  ***The process of presenting data in visual form is known as data visualization. Data visualization tools make the job easier. Programs like Tableau or Microsoft Power BI give you many visuals that can bring data to life.***  ***Data analysis is used by small businesses, retail companies, in medicine, and even in the world of sports. It's a universal language and more important than ever before. It seems like an advanced concept but data analysis is really just a few ideas put into practice. Data analysis is big subject and it includes some of these steps :***   * ***Defining Objectives:Start by outlining some clearly defined objectives. To get the best results out of the data, the objectives should be crystal clear.*** * ***Posing Questions: Figure out the questions you would like answered by the data. For example, do red sports cars get into accidents more often than others? Figure out which data analysis tools will get the best result for your question.*** * ***Data Collection: Collect data that is useful to answer the questions. In this example, data might be collected from a variety of sources like DMV or police accident reports, insurance claims and hospitalization details.*** * ***Data Scrubbing: Raw data may be collected in several different formats, with lots of junk values and clutter. The data is cleaned and converted so that data analysis tools can import it. It's not a glamorous step but it's very important.*** * ***Data Analysis: Import this new clean data into the data analysis tools. These tools allow you to explore the data, find patterns, and answer what-if questions. This is the payoff, this is where you find results!*** * ***Drawing Conclusions and making predictions: Draw conclusions from your data. These conclusions may be summarized in a report, visual, or both to get the right results.***   ***Reference:*** MakeUseOf. 2020. *What Is Data Analysis And Why Is It Important?*. [online] Available at: <https://www.makeuseof.com/tag/what-is-data-analysis/> [Accessed 12 November 2020]. |

Question 12: Answer the following questions.

1. Why creating a requirement determination document is important? Write in between 100-150 words.
2. What do you understand by client sign-off document? Write in between 50- 100 words.

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| 1. Collection of information is at the core of systems analysis. Information requirement determination (IRD) is frequently and convincingly presented as the most critical phase of information system (IS) development, and many IS failures have been attributed to incomplete and inaccurate information requirements. System analysts must collect the information about the current system and how users would like to improve their performance with new information system. Accurately understanding the users’ requirements will help the system developing team deliver a proper system to the end users in limited time and limited budget. If user just wants an “ant”, definitely, an “elephant” is improper. There are many methods to collect information. This article will discuss some basic and widely adopted ones of them.   Interviewing is one of the primary ways to gather information about an information system. A good system analyst must be good at interviewing and no project can be conduct without interviewing. There are many ways to arrange an effectively interview and no one is superior to others.  Questionnaires have the advantage of gathering information from many people in a relatively short time and of being less biased in the interpretation of their results. Choosing right questionnaires respondents and designing effective questionnaires are the critical issues in this information collection method. People usually are only use a part of functions of a system, so they are always just familiar with a part of the system functions or processes. In most situations, one copy of questionnaires obviously cannot fit to all the users. To conduct an effective survey, the analyst should group the users properly and design different questionnaires for different group. Moreover, the ability to build good questionnaires is a skill that improves with practice and experience.  Reference: Umsl.edu. 2020. *Requirements Determination And Requirements Structuring*. [online] Available at: <http://www.umsl.edu/~sauterv/analysis/6840\_f03\_papers/zhu/> [Accessed 12 November 2020]. |
| 1. Communication between you and your client is the most important part of your project. It began with your client explaining the project concept. You then created a Concept Paper which explained you understanding of the scope, standards, expected outcomes, intended audience, and explanation of the medium you intend to use. You then completed a set of constraints documents to solidify your understanding of the parameters of the project . . . and this is only for the planning stage. The only question is that while you have identified how you understand the project to be, does it coincide with your client's vision? The only way to find out is to ask your client. This requires you to meet with your client, share all of your documents and then receive your client's OK to move ahead with your work.   The pivotal document in this verification cycle is the Client Sign-Off. This is the document that your client signs to validate that s/he has read your materials and is in complete agreement with what you are doing. The trick is to create a document that is comprehensive enough to ensure that if your client ever changes her/his mind about what you are doing, the responsibility will rest on her/him rather than on you. This also means that your client will be responsible for paying for the additional resources that are necessary. You are not working on a pay-for-work basis, but it is still important for you to keep your connections with your client documented. This assignment asks you to create a document that, when completed, will verify the date and content of your communications with your client.  Create a client sign-off sheet. It could be the same for each of your three sign-offs or you may want to tailor it for each specific situation. Keep in mind that this document should be written so that it relieves you of liability if questions begin to surface in the future.  Reference: Sites.uni.edu. 2020. *Client Sign-Off*. [online] Available at: <https://sites.uni.edu/zeitz/icd/Assignments/ICDclientsignoff.html> [Accessed 12 November 2020]. |

# **Unit Assessment Task (UAT) - 2**

## **Assessment Task 2 – Unit Project (UP)**

**Assessment type:**

* Unit Project (UP)

**Instructions to complete this assessment task**:

* Please write your responses in the template provided.
* You may attach a separate sheet if required.
* You must include the following particulars in the footer section of each page of the attached sheets:
  + Student ID or Student Name
  + Unit ID or Unit Code
  + Course ID or Course Code
  + Trainer and assessor name
  + Page numbers
* You must staple the loose sheets together along with the cover page.
* You must attach the loose sheets chronologically as per the page numbers.
* Correction fluid and tape are not permitted. Please do any corrections by striking through the incorrect words with one or two lines and rewriting the correct words.
* The premise of the project must be closely related to the previous assessment task.
* This submission must be well presented and follow the guidelines and instructions provided.
* Please follow the format as indicated in the template section below.
* One of the most important steps that you can take: proofread your project.
* Appropriate citations are required.
* All RTO policies are in effect, including the plagiarism policy.

Resources required to complete the assessment task:

* Computer
* Internet
* MS Word
* UML designing software

***Assessment task Instructions***

* ***This assessment task requires student to assume as an database developer who is affiliated for the organization***
* ***Student must analyse the information given in the scenario given in Appendix 1.***
* ***Student must use templates provided to document their responses.***
* ***Word limit to complete activity 4 of this assessment task is 500-600words.***
* ***Time limit to complete activity 1 of this assessment task is 2 hours.***
* ***Time limit to complete activity 2 of this assessment task is 5-6 hour.***
* ***Time limit to complete activity 3 of this assessment task is 3-4 hours.***
* ***Trainer/assessor will assess the student based on the performance checklist provided.***

**Project Task:**

This assessment task is divided into following four (4) activities:

Activity 1: To successfully complete the task you need search the internet and understand about library system, tools applicable for the assignment. You need to gather all the requirements and features that can be embedded on the system.

You need to evaluate different software development models that can be feasible for the development of system.

Activity 2: You need to identify business functions and collect data using various methodologies to create a UML diagrams. Additionally, you need to identify external events, procedures and results that can be applicable for the interaction. You must test the UML model using appropriate validation process.

Activity 3: Create documentation with all design models, user requirements, screenshots of models and its functionality. Also, you have to create a client sign-off document to get completion agreement.

**Scenario:**

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| You have recently joined *“ESoft*” as junior IT consultant. The company has a new project in hand to evaluate your performance. The project is about a new library system for which you have to research, gather and analysis development model. You have to search various sources of information to gather relevant information for data processes. The methodology of structured systems analysis & design provides a roadmap for the development of functional specifications for library system.  For this assignment, you will write **one** report that covers the steps in the system analysis and design process based on a hypothetical firm's business profile. Your report should focus on defining, justifying, and planning the project, and on the tasks associated with testing, implementing, and maintaining the proposes system. |

**Activity 1: Understand the design principle new City library system**

You need to read and understand the above given scenario and write a brief about it.

Before you start designing a system you should remember to do following task:

* Search the internet about various models to system development (SDLC, AGILE), evaluate the usefulness and limitation of each approach
* Choose one model that is suitable for development of library system and justify your answer
* You must validate the model you have chosen for development of City library system
* You need to identify all source of information that are relevant
* Apply the best development process for the assignment
* Evaluate the results of applying this approach and how model meets the requirements
* Validate the model with your accessor/ trainer. Address necessary amendments that are required on the process models. Also, you need to assess different feasibility criteria on City library system.

You need to submit your report with all the output of test case to the assessor/ trainer in a word file. Also, you need to create java file so the assessor can check the program.

**Performance checklist criteria**

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| --- | --- | --- | --- |
| **Trainer/ Assessor to complete** | | | |
| **Does the candidate meet the following criteria** | **Yes** | **No** | **Trainer/Assessor Comments** |
| Identified and documentation about different development models  ***Included:***   * + Definition, advantages, limitation for the assignment |  |  |  |
| Documented initial methodology to the model validation |  |  |  |
| Documented various types of designing tools available on market |  |  |  |
| Documented all the requirements for the design and development |  |  |  |
| Documented various sources of information to gather relevant data |  |  |  |
| Used clear, logical document structures, relevant terminology and correct grammatical structures |  |  |  |

**Activity 2: You need to design UML models**

This activity is continuing from previous activity.

In this activity you need to analysis the scenario from the case study and carry out in-dept investigation using various fact-finding techniques.

* During the requirement analysis and feasibility study, you must demonstrate the complex problems with more the one variable from user and system functionality prospective. For eg: there can be multiple copies of one book which can be borrowed by multiple people
* List library’s main functions and business processes.
* After completing the investigation and analysis, you need to use appropriate system analysis and design tools and methods such as UML etc. to create a functional illustration of the system with user interactions and functions.
* While you are creating design, you must ensure use of a range of UML diagram such as USE case, class, object, activity diagrams, DFD (level 0,1,2) to present you finding of the system interactions including possible events, processes and results.

Your trainer will observe you during the session and complete the following performance checklist.

**Performance checklist criteria**

|  |  |  |  |
| --- | --- | --- | --- |
| **Trainer/ Assessor to complete** | | | |
| **Does the candidate meet the following criteria** | **Yes** | **No** | **Trainer/Assessor Comments** |
| Identified and documentation about data processes |  |  |  |
| Documented different components with more than one variable from user and system functionality |  |  |  |
| Documented different types of external events, procedures and results |  |  |  |
| Applied appropriate and clear UML models |  |  |  |
| Developed the UML with required functionality to meet the specification |  |  |  |
| Used clear, logical document structures, relevant terminology and correct grammatical structures |  |  |  |

**Activity 3: Create a documentation**

This activity is continuing from previous activity.

You need to cover the following information in the session:

* Introduction about development methods and tools applicable for the assignment
* How to use the development tool for this assignment
* Attached screenshots of prototype/design
* Explanation the benefits of using the tool and development language
* Design and development of the UML model
* Description of functionality for the design
* Test cases and results of the UML
* Correctly validated the requirements to meet the specification of assignment
* Correct, concise and error free grammatical sentences

*Your trainer will act as Project manager. You will be acting as IT consultant and one of your class mate will work as quality assurance manager, who have to check if all the requirements are met or not.*

Your trainer will observe you during the session and complete the following performance checklist.

**Performance checklist criteria**

|  |  |  |  |
| --- | --- | --- | --- |
| **Trainer/ Assessor to complete** | | | |
| **Does the candidate meet the following criteria** | **Yes** | **No** | **Trainer/Assessor Comments** |
| Identified and documentation about development methodologies with advantages and disadvantages |  |  |  |
| Documented about tools and development languages for the UML design |  |  |  |
| Designed and developed appropriate model for the library management system |  |  |  |
| Documented and applied appropriate model validation techniques |  |  |  |
| Attached clear UML design screenshots |  |  |  |
| Provided client sign-off document |  |  |  |
| Used clear, logical document structures, relevant terminology and correct grammatical structures |  |  |  |

# **End of the Assessment**