**qASSIGNMENT 01 FRONT SHEET**

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| **Qualification** | **BTEC Level 5 HND Diploma in Computing** | | |
| **Unit number and title** | Unit 09: Software Development Life Cycle | | |
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| **Student declaration**  I certify that the assignment submission is entirely my own work and I fully understand the consequences of plagiarism. I understand that making a false declaration is a form of malpractice. | | | |
|  |  | **Student’s signature** |  |

**Grading grid**

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| P1 | P2 | P3 | P4 | M1 | M2 | D1 | D2 |
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| **❒ Summative Feedback: ❒ Resubmission Feedback:**  <https://pma.edu.vn/blogs/mo-hinh-waterfall-la-gi-khi-nao-su-dung-waterfall/>  <https://viblo.asia/p/v-model-trong-kiem-thu-phan-mem-la-gi-tim-hieu-voi-vi-du-sdlc-stlc-Qbq5QMEL5D8>  <https://www.simplilearn.com/prototyping-in-design-thinking-article>  <https://aws.amazon.com/vi/what-is/scrum/>  <https://www.indeed.com/career-advice/career-development/feasibility-report>  <https://www.simplilearn.com/feasibility-study-article#:~:text=The%205%20types%20of%20feasibility,Economic%20Feasibility%2C%20and%20Technical%20Feasibility>. | | |
| **Grade:** | **Assessor Signature:** | **Date:** |
| **Internal Verifier’s Comments:** | | |
| **Signature & Date:** | | |

1. **Describe two iterative and two sequential software lifecycle models(P1)**
2. **Ads**
3. **Waterfall**
4. **Definition**

Known as one of the easiest project management models to understand today, the Waterfall model is a project management methodology based on a sequential and sequential design process. In the Waterfall model, the phases of the project are executed one after the other. A new phase is only started when the previous one has been completed.

1. **Stages**

* Request: Finding requirements to the project such as determining the business needs of the project, user requirements for the product or associated risks
* Design: a design for the product must address all requirements, constraints, and design goals. It should describe exactly how the logic of the system mentioned in the analysis will be implemented.
* Execute (build): Products are built to support design. Sometimes, the product is built in units for testing and subsequent integration.
* Test: Parts of the product are inspected. If necessary, they will be integrated together for testing. The entire system is tested to find defects and ensure design goals.
* Deployment: For IT projects, the product is deployed into the environment so that users can start using it. For a construction project, the implementation phase is when the building is completely ready for occupancy.
* Maintenance: Is a short monitoring period. In which the project team solves customer problems. For software projects, this usually means releasing patches and updates to fix problems. In other projects, environmental adjustments are made to address the issue. For example, optimizing air conditioning in a new building.

1. **Advantages of the Waterfall model**

* Adapts well to flexible groups
* Imposing a structured organization
* Allows for early design changes
* Suitable for landmark-oriented projects

1. **Disadvantages of Waterfall model**

* It is not an ideal model for a large size project.
* If the requirement is not clear from the start, it is a less efficient method.
* It is very difficult to move back to the previous stage to change.
* Testing begins when development is finished. Therefore, it has a high risk of bugs being found after the development phase, and it is very expensive to fix the bugs.

1. **V-mode**
2. **Definition**

Vmodel is an extension of the waterfall model. Not like the waterfall model. In the V model, corresponding to a testing phase is a software development phase, testing in the V-model is performed in parallel with the software development cycle.

1. **Stages**

* Request: At this stage only collect requirements
* Design: Plan to choose programming languages like JAVA, PHP… databases like Oracle, My SQL….
* Execute (build): At this stage, code implementation will be implemented
* Test: Perform testing to verify that it is built to the specifications provided by the customer
* Deployment: Implement application deployment in a real environment
* Maintenance: When your system is ready to use. You can perform maintenance upgrades and code changes according to customer requirements

1. **Advantages of the V – model**

* Simple, friendly and time saving
* Have specific plans and activities for the testing process
* The probability of success is higher than the waterfall model
* Quickly detect errors and find the cause from the beginning

1. **Disadvantages of the V – model**

* There is still rigidity, little flexibility (after each step must check and confirm)
* Failure to meet service requirements is to develop and sell products at the same time
* If the project requirements are simple, the verification process will take a lot of time
* Have to go back to the first steps, update the documentation if there is a technical change midway
* The product of the project is only released when the steps are completed, there is no prototype at the beginning

1. **Prototyping**
2. **Definition**

Prototypes are early samples, models, or releases of products built to test a concept or process. There are many contexts in which semantics can be used, for example, in design, electronics, and software programming. Generally, prototypes are used by system analysts and users to improve the precision of a new design.

1. **Stages**

* A preliminary project plan is developed
* An partial high-level paper model is created
* The model is source for a partial requirements specification
* A prototype is built with basic and critical attributes
* The designer builds
* the database
* user interface
* algorithmic functions
* The designer demonstrates the prototype, the user evaluates for problems and suggests improvements.
* This loop continues until the user is satisfied

1. **Advantages of prototyping**

* Customers can “see” the system requirements as they are being gathered
* Developers learn from customers
* A more accurate end product
* Unexpected requirements accommodated
* Allows for flexible design and development
* Steady, visible signs of progress produced
* Interaction with the prototype stimulates awareness of additional needed functionality

1. **Disadvantages of prototyping**

* Tendency to abandon structured program development for “code-and-fix” development
* Bad reputation for “quick-and-dirty” methods
* Overall maintainability may be overlooked
* The customer may want the prototype delivered.
* Process may continue forever (scope creep)

1. **Scrum**
2. **Definition**

Scrum is a management framework used by teams to organize themselves and work towards a common goal. This framework describes a range of meetings, tools, and roles for effective project delivery. Just as a sports team rehearses for the big game, practicing Scrum enables the team to self-manage, learn from experience, and adapt to change. Software development teams use Scrum to solve complex problems economically and sustainably.

1. **Stages**

* Sprint Cycle Planning
* Sprint
* Daily Scrum meeting or standing meeting
* Sprint Cycle Assessment
* A look back at the Sprint cycle

1. **Advantage of scrum**

* The ability to maintain quality in difficult situations
* Increase return on invested capital
* Teams feel more comfortable, work more productive
* Matching metrics improve estimation results

1. **Spriral**
2. **Definition**

A risk-based strategy for software development is the spiral model. It combines waterfall and iterative methodologies. The Spiral Model helps software projects based on distinct risk patterns incorporate features of software development from several process models, leading to an effective development process.

According to the SDLC Spiral model, the development process starts out with a small number of requirements and advances according to those needs through each development phase. The software engineering team spirals in features for the additional demand up until the program is prepared for production.

1. **Advantage of spiral**

* You may expand the functionality or make changes in the future.
* Cost estimation is easy since the prototype is developed in manageable pieces.
* Continuous or recurring improvement is advantageous for risk management.
* Spiral development adds things gradually and quickly.

1. **Disadvantages of spiral**

* There is a danger that you won't complete it on schedule or on budget.
* Large projects benefit most from spiral development, albeit it does need proficiency in risk assessment.
* For proper operation, the spiral model protocol must be adhered to.
* Due to the inclusion of intermediary steps, documentation is more thorough.
* Because spiral software development may be costly, it is not advised for minor applications.

1. **What is the suitable model for the project, and explain why?**

Our company received a big project named TUNE SOURCE. The name of this project is also the name of the company that asked our company to create an application that could meet their requirements. Since this is a big project, our company has received a great investment from the very beginning, besides there are many experienced people who will be involved in this project and this project must absolutely be avoided. Make big mistakes that lead to loss of time, prestige and money. Summarizing all the above reasons, we have decided to use the spiral model for this project, the benefits of this model will help a lot when we implement this project. The process of applying this method can take place within 6 months with 4 main activities: planning, risk analysis, prototyping, component evaluation. This software development model requires a lot of interaction between the technical team and the engineer, so the intervention of the customer will also be significantly more. They have the right to participate in the ideation phase, assessing the quality of work through each prototype supervision.

1. **Discuss the merits of applying the waterfall model to a large software development Project**

First, this model is only suitable for small or short projects so that it can be deployed easily. Secondly, with this model, the project must be intuitive and easy to understand because with the nature of this project once done, it cannot be changed. Third, as well as the second reason, it is difficult for the project to adapt to changes from the requester. And finally about the seamlessness, when implementing projects using this model, the visualization is low and the delivery progress is slow because at the end of the cycle the user can see and use the product. The product cannot be viewed while it is in progress.

1. **Explain how risk is managed in the Spiral lifecycle model.**
2. **What is risk management**

Identification, assessment, and control of financial, legal, strategic, and security threats to the assets and profits of an organization constitute the process of risk management. These dangers or hazards might be caused by a broad range of things, such as monetary instability, legal obligations, poor strategic management, mishaps, and natural calamities.

Your company may only see a little effect from an unexpected incident, such as a slight increase in overhead expenditures. In the worst-case situation, though, it may be disastrous and have severe repercussions, including a heavy financial load or possibly the liquidation of your company.

1. **Why is risk management is important**

Any business or organization when operating must manage the risks that organizations face, which can include:

* Saving the organization's limited resources: Time, assets, people, etc.
* Protect the image of the business in the society.
* Avoid harm to the organization when operating.
* Avoid violating legal regulations when doing business.
* Protect resources and the environment.

1. Five step of the Risk Managenent

The steps that must be done are outlined in the risk management process. The risk management process, which consists of these five fundamental components, is used to manage risk. Starting with risk identification, it then moves on to risk analysis, risk prioritization, solution implementation, and risk monitoring. Each stage in manual systems requires a significant amount of administration and paperwork.

These are the five categories of risk management:

* Identify the Risk
* Analyze the Risk
* Evaluate or Rank the Risk
* Treat the Risk
* Monitor and Review the Risk

1. **Explain the purpose of a feasibility report.**
2. **What is feasibility report**

A feasibility study is a document that assesses the viability of a group of suggested project pathways or solutions. When writing a feasibility report, the author assesses the viability of several alternatives before making a suggestion for the best one. After that, they give their advice to the firm and provide the feasibility report.

1. **What is the purpose of a feasibility report?**

Finding out if solutions or project pathways are feasible can help you choose the best course of action. The purpose of the feasibility report is to explain several ways to a project or issue and assist readers in determining the viability of each strategy. Readers may choose to follow the study's advice for the best course of action based on the assessment presented in the report. Making the best options for projects and issues may be made by businesses with the aid of this detailed review of various techniques.

1. **Type feasibility**
2. **Technical Feasibility**

The technological resources that the organization has access to are the main focus of this examination. It helps companies in determining if the technical resources are enough and whether the technical team has the skills necessary to turn concepts into functional systems. Evaluation of the proposed system's hardware, software, and other technical needs is another aspect of technological viability.

1. **Economic Feasibility**

Before allocating financial resources, this evaluation often includes a cost/benefit analysis of the project to assist businesses examine the feasibility, costs, and advantages related to a project. Additionally, it improves project credibility and acts as an impartial project evaluation, assisting decision-makers in identifying the favorable economic advantages that the proposed project would bring to the business.

1. **Legal Feasibility**

This evaluation looks at any potential legal infractions of the planned project, including zoning rules, data protection laws, and social media laws. Let's imagine that a company wishes to develop a new office building in a certain area. The organization's preferred site may not be permitted for that kind of operation, according to a feasibility assessment. By realizing that their project was unworkable from the start, that company has just saved a great deal of time and effort.

1. **Operational Feasibility**

This evaluation entails doing research to evaluate whether—and how effectively—the requirements of the organization can be satisfied by finishing the project. Operational feasibility studies also look at how a project plan fulfills the needs discovered during the system development process' requirements analysis phase.

1. **Scheduling Feasibility**

As a project will fail if it is not finished on time, this evaluation is crucial to its success. An organization determines the project's estimated completion time when determining scheduling feasibility.

The feasibility study assists in identifying any potential obstacles the proposed project may encounter, such as:

* Internal project constraints, including those related to technology, finances, and resources.
* Financial, marketing, and export restrictions are internal corporate constraints.
* Logistics, the environment, laws and regulations, among other external constraints.

1. Describe how technical solutions can be compared.