**Teamwork I. (Software Engineering Concepts)**

**Team 7**

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1. **What is software engineering? Explain what it includes.**

Software engineering is an application of engineering to the development of software in a systematic method. Software engineering involves a numbers of fields that cover the process of software engineering:

* + **Analysis** gather software requirements from clients, analyze and document them to develop the system requirements specification.
  + **Design** the process to transform clients’ requirement into some suitable form, which help programmer in software coding and implementation)
  + **Construction** from the design developers start constructing the software
  + **Verification** the process of checking that a software system meets specifications and that it fulfills its intended purpose. It may also be referred to as software quality control
  + **Management of technical entities** related to crew management with tasks, logistics, service and maintenance.

1. **How engineering process is divided into different phases? What activities are involved in each phase?**

Engineering Process is divided into 3 phases: definition phase, development phase and maintenance phase

* **Definition phase**: the requirements are identified in this phase, which information need to be processed, what functions are desired, related to analysis and design steps.
* **Development phase**: the software is being construct in this phase, software engineering need to define structure of data, functions and interfaces that needed, translate the design into programming language.
* **Maintenance phase:** reapplies the steps of Definition phase and Development phase in a existing software, change with error correction and clients’ requirements. As software is used, the customer/user will recognize additional functions that will provide benefit. Perfective maintenance extends the software beyond its original functional requirements.

1. **Why do we need software development process models?**

Development process models help improve efficiency during the process of making a new program, by:

* Preventing waste of time and labour when milestone is set.
* Make the tasks that need to be done clear to the developers
* Splitting software development into smaller stages help improving the planning and managing of the project.

1. **How Spiral model differs from Waterfall model?**
   * The Spiral model divide the development process into smaller segments, focusing on risk-reduction iteration. Thus the cycle of development from the Spiral model is relatively “smaller” than that of the Waterfall model. And the Spiral model can have several cycle of development.
   * Unlike the Waterfall model which stop the development after 1 cycle is complete, the Spiral model continue on to another cycle, which has the same phases of development as the first cycle.
   * Another different is: when encountering errors, the Waterfall model is more likely to have restart from scratch if the developers wish to fix the error, since it only has 1 big cycle of development. While the development cycle of the Spiral model is smaller, and is divided into many smaller cycles, and a prototype is made every cycle, it is easier to go back from a previous version, and start again

**5. What are the advantages of Modified Waterfall model over Pure Waterfall model?**

* Since the MW is not done on a discontinuous phase, it enables overlapping ability.
* The requirements can be segmented into separate series of the product, each of which can be developed independently.
* Each phase is conducted with less work and mistakes are quick to fix which equals less risks into practice.

**6. What are the advantages of iterative development?**

* Since we can only begin producing the product after we have the high-level design of the application, which means we can continue improving the design and evaluating the product which has been built.
* The product is built step by step; hence we can track the defects at early stages. This avoids the downward flow of the defects.
* Reliable and fast user feedbacks are given frequently and as a result, the team gets a better understanding of the customers’ need as the the project continues and also the customers can actually see the deliverables.
* Iterative development avoids consuming high amount of time in documenting, instead more time are spent on designing and implementing the software.

**7. What are the advantages of RUP over other development process models?**

* RUP uses VML (Visually Model Software) which is a big help to presentation and mutual understanding since things are presented visually
* Provide great understanding and overall looks of projects based on accurate documentation hence solve risks at every stages of projects.
* Effectively capturing functional requirements and providing coherent threads throughout the development and deployment of the system.
* Integration requires less time as the process of integration continues throughout the software development life cycle