HONG KONG INSTITUTE OF VOCATIONAL EDUCATION

**Laboratory 2: Basic Concepts of Software Development Process and Methods**

**Module Intended Learning Outcome:**

On completion of the module, students are expected to be able to:

* Apply appropriate requirement elicitation techniques to capture the requirements of business-oriented software applications.
* Apply design techniques in developing specifications for business-oriented software applications.
* Exercise appropriate judgment in planning and controlling software development projects.

**TASK:**

1. The systems development life cycle (SDLC) is the process of determining how an information system (IS) can support business needs, designing the system, building it, and delivering it to users. Describe the four fundamental phases.

The SDLC is composed of four fundamental phases:

Planning

Analysis

Design

Implementation

This phase is the fundamental process of understanding why an information system should be built, and determining how the project team will go about building it.

The analysis phase answers the questions of who will use the system, what the system will do, and where and when it will be used.

The design phase decides how the system will operate, in terms of the hardware, software, and network infrastructure; the user interface, forms, and reports that will be used; and the specific programs, databases, and files that will be needed.

During the implementation phase, the system is *either* developed or purchased (in the case of packaged software) and installed.

1. Name the 7 Development Methodologies. Discuss the pros and cons of the development methodologies.

Waterfall Development

Parallel Development

V-model (variation of the Waterfall Development)

Iterative Development

System prototyping

Throwaway prototyping

Agile Development

Waterfall Development

Waterfall Development is good for complex systems but bad for short time schedule.

Parallel Development is reliable but bad for unclear user requirements.

V-model is reliable but bad for unfamiliar technology.

Iterative is good with short time schedule.

System Prototyping is good with unclear user requirements but not reliable.

Throwaway Prototyping is good with unfamiliar technology.

Agile Development is good with unclear user requirements but bad with unfamiliar technology.

1. Company Three is going to implement system three. Most of the user requirements are unclear in the planning stage. However, on-site user input is available throughout the project; which methodology should company three adopt? Why?

Agile Development, it is because the user requirements are unclear and the user input is available throughout the project, so the

1. Company Four will build system four to use a new technology that staff in company four is not familiar with. The management of company four expected high risk on designing prototypes and would like to invest in that new technology. Which methodology should company four adopt? Why?

Iterative Prototyping

1. Company Five is going to implement a web-based system. They have a fixed development time, but the developer could determine the functionality to meet the schedule. Which methodology should company five adopt? Which methodology should company five avoid to do? Explain your answer.

System Prototyping

1. Company Six will build a complex system and not prototype into users’ hands at an early stage. There is a fixed target date, and the schedule is not expected to change. Which methodology should company six adopt? Why?

Waterfall

1. Write a system request for Ai-Dai Consultants Librarian System.

Project Sponsor: Board of Directors

Current Needs: 1. All library activities are manually recorded.

2. This system is inefficient, a lot of error and a lot of manual work involed.

Requirments: 1. Staff will be able to find and locate books.  
 2. Borrowing records would be keep tracked could

3. Overdue reminder.

4. Reserve books by the system

Value: 1. Increase the efficiency of searching and borrowing resources by reducing the manual work

2. Improve the utilization of the resources and reduce error

1. Distinguish between Development costs and Operational costs.

Development costs are expenses that are incurred during the creation of the system, such as salaries of the development staff, hardware and software Development costs are usually thought of as one-time costs.

Operational costs are expense that are required to operate the system, such as the salaries for operations staff, software licensing fees, equipment upgrades. Operational costs are usually thought of as ongoing costs.

1. Distinguish between tangible and intangible benefits.

Tangible value can be quantified and measured easily (reduction in operating costs).

An intangible value results from an intuitive belief that the system provides important, but hard-to-measure benefits to the organization.

1. Discuss the production and operation costs and the actual value in the case study.

Development Costs

* Development team salaries
* Consultant fees
* Development training
* Hardware and software
* Vendor installation
* Office space and equipment
* Data conversion costs

Operational Costs

* Software upgrades
* Software licensing fees
* Hardware repairs
* Hardware upgrades
* Operational team salaries
* Communications charges
* User training

1. Discuss what are the intangible and tangible benefits in the case study.

Intangible benefits

Increase the system procedure speed.

Tangible benefits  
The system will provide the due date of borrowed book, this will reduce the borrower forget to return.

1. Draft a feasibility study for the for Ai-Dai Consultants Librarian System.

Technical Feasibility

A web-based librarian system is feasible technically, with a few minor risks.

Risk regarding familiarity with librarian system is moderately low:

* Librarians have a good experience on electronic records and operating the web-based system.
* The IT department has not designed any librarian system before.

Risk regarding familiarity with the technology is low:

* The IT department has strong knowledge of the company’s exisiting intranet, web-based system, databases and Internet technology
* Consultants are readily available to provide help in this area.
* The ISP should be able to scale its services to accommodate the new library system.

The project size is considered low.

* The project team size is small and there is business user commitment.
* The project time frame is flexible

The compatibility with existing technical infrastructure should be good.

* An Internet infrastructure is already in place.
* The ISP should be able to scale up its services to accommodate the new system.

Economic Feasibility

* Tangible cost and benefit – Budget for building the system are 500k and the annual maintencance is around 30k, break even occurs after 0.5 years.
* Intangible Costs and Benefits – Improved the efficiency on searching and borrowing resources.