Palestine Technical University – Kadoorie

College of Engineering and Technology

Department of Computer Systems Engineering

Course name:

Software Engineering

Project title:

DESIGNING A STUDY WEBSITE FOR PTUK PROGRAMMING STUDENTS IN TULKARM

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Chapter 1: INTRODUCTION

We have noticed that programming students at our university suffer from difficulty starting their educational career, especially programming students in the first year, and obtaining the correct and appropriate instructions and methods to start learning, as many of them are distracted and do not know where they are headed. When he turns to the Internet, he finds many sources that may not suit his current level, and he feels frustrated.

Hence the idea of our project appeared to facilitate the educational process and provide correct guidance instead of resorting to expensive courses and institutes, especially in light of our current circumstances, to enhance the learning experience and academic success.

Through this initiative, we will create a website specifically designed to meet the educational needs of students, especially in their early years

To understand the specific needs and preferences of PTUK programming students through surveys or focus groups.

1.1 System Description

It is a study website application designed to suit the needs and level of students, whether students of computer engineering or even computer science, for their years of study. In this section, we will provide a more detailed explanation of the nature of the site. It works in an integrated manner with the electronic system based on the LMS (Learning Management System).

The application will also provide interaction between students and the application so that students can learn independently. The user only needs a web browser to open the application on an Internet-connected computer or tablet.

On this site, we will provide many features, the most important of which are user authentication and profiles, as students will be allowed to create accounts and log in securely.

Profile pages where students can update their information and preferences.

In addition to the home page, which will contain a search box to search for features on the site

In addition to the presence of a field related to events, events, and gatherings that will take place today at the university, or events related to programming.

The student will also specify his major and years of study so that the materials are appropriate for him

There will be a page for the proposed courses according to the years of study, and in each course there will be compiled and appropriate videos, whether from doctors' explanations or even from YouTube or different platforms.

In addition to a special slide for the topics that will be proposed in the course, and the questions, in addition to many other features that we discussed in the following sections.

Chapter 2: OBJECTIVES

The main goal is to help students who want to learn programming, especially new students at Palestine Technical University - Kadoorie
The other objectives can be summarized as follows:

1. *Save time and effort for the learner by collecting many sources in one system*

2. *Structuring the learner's plan and giving him a study method that helps him*

3. *Focus on the needs of individual learners as an important factor in the education process and not on the needs of teachers or educational institutions*

4. *Include flexibility, convenience and self-paced learning*

2.1 Services

This system will provide a wide service that helps learning and studying for our university students or even for any student who wants to learn programming and feels that this plan suits him, as it will provide a complete educational plan that paves the way for them to start their professional lives, which will work in integration with the university's official website.

With the possibility of learning anywhere, keeping the learner informed of the latest technologies and events inside and outside Friday related to programming, and launching many additions with each release, which in turn will expand his horizons and make him overcome the boredom that the learner feels because he will be a guide on the way in an appropriate and renewed manner, and distance To avoid confusion and distraction due to the large number of sources, and to develop tests and questions so that the student knows his level, the extent of his development, and a different sample of sources

2.2 Stockholders

- The application will be useful for programming students at Palestine Technical University - Kadoorie, whether in the field of computer systems engineering or even computer science

- Or anyone whose plan is in line with ours and who wants to start learning programming, especially for first-year students, as they are most in need of a guide

- It will also be useful to some doctors who can benefit from ancient sources and develop them

- There may be some beneficiaries of people who are placed in charge of educational courses

- There are some students who can develop the website and make it a source of income

Chapter 3: WORKPLAN

3.1 Software Model

After studying the different models of software, we found that using more than one model and taking advantage of each type is the best for the website that we will create:

1. **Incremental development:** We will use this type of model for the general design of the system, so that the system will be developable, and we will issue several versions of it. We will add new features to the system, fix problems that the old version may suffer from, and add more appropriate courses and videos based on the opinions of users in the old version. Figure1 shows how this model works

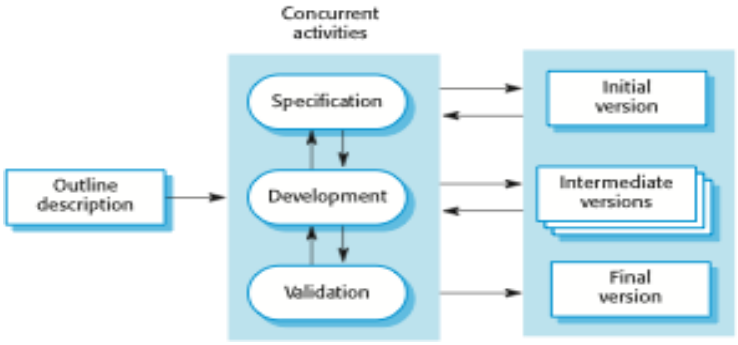

Figure 1 : ***Incremental model***

2. **Reuse-oriented software engineering:** This type of model was chosen because it takes advantage of many off-the-shelf features and will be developed to fit our system. So we will use it in every version we develop. There are many videos on the Internet and many features available on the Internet that can be taken advantage of, and the features will be chosen very carefully to suit the needs of the users and the level they have reached. Figure 2 shows how this model works

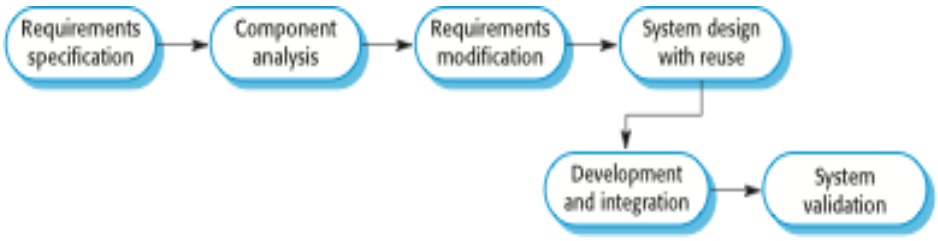

Figure 2: Reuse-oriented software model

- The general structure of the system is: **Incremental development**
- The structure assigned to each version in the system is: **Reuse-oriented software engineering**

The process used is :

We will use two types of operations.

1. **Plan-driven:** where we will determine the requirements as much as possible and prepare a pre-plan for each release
2. **agile processes:** may be some developments and requirements that will appear with us, whether in the current version or with different versions

3.2 Requirements

3.2.1 Functional Requirements:

1- Curriculum Structure:

The application should offer a curriculum with clear learning objectives for each lesson.

Lessons should be organized into modules with a logical progression.

2- Content Delivery:

Offer a structured curriculum with lessons on various programming fundamentals, concepts, and languages.

Lessons should be divided into modules with clear learning objectives.

Integrate multimedia elements like text, code samples, and quizzes.

3.2.2 Non Functional Requirements

1- Performance and Scalability:

The application should load quickly and remain responsive even with a large number of concurrent users.

The system should be scalable to accommodate future growth in user base and content.

2- Portability and Compatibility:

The application should be accessible on a variety of devices (desktop, mobile, tablets) with different operating systems (Windows, macOS, Android, iOS).

The code editor should be compatible with popular programming languages.

3- Reliability, Maintainability, Availability:

The application should function reliably with minimal downtime or errors.

The code should be well-documented, modular, and easy to maintain for future updates and bug fixes.

The application should be highly available with minimal disruptions to user access.

4- Usability:

The application should have a user-friendly interface that is intuitive and easy to navigate, so we will try to explain things and their use clearly.

5- Security

is one of the most important features, as no one can make modifications to the site, protect it using different methods, and ensure that each person has his own page by logging in and out.

3.3 Design

The design stage is considered one of the important stages that constitute an attraction factor for anyone entering the website. Therefore, we will be careful to choose comfortable colors so that the user's eyes do not get tired while using the application, in addition to making it take on a modern, youthful style that makes users have energy when using the application. We will be careful that the quality of the application is appropriate. Whether on the computer or mobile, because web applications combine both systems, and we value our users very much, so if there are any problems in the design, it will be modified in the next versions that will be launched.

3.4 Implementation

After determining the design that we will use, comes the implementation phase, which is the phase in which we will see our project transformed into a real system, and here comes our role in creating the initial version that contains the basic components that can be developed in future versions that will be produced in the long term.

Here we will present an implementation of the initial version, where we will use HTML, CSS, JS and React to build the front-end and create interactive web pages.

The first system will also consist of several pages: a basic page, an about page, and a courses page.

Home page: A welcome message, a brief introduction to the site's features, navigation options, the search box, and the events and occasions option, which will express the events that will be held during the day, such as competitions or activities within the university or electronically, and training that may take place.

Courses: Organized by semester or subject, with detailed descriptions, syllabi and resources.

About page: This is the page where an introduction to the site, its idea, and the principle of its work will be presented. And the Courses page: It is organized according to semester, years, and subject, with a detailed description, curricula, and resources.

But in this version, we will add one subject, which is a basic subject that most first-year students in our community learn, which is C++.

A short description of the subject will be provided, then the courses will be divided into several levels. Each level will contain videos explained by university doctors, slides, and customized questions appropriate to it, whether from websites or years. For example, a C++ page has two levels, the first level will be basics, and the second will be problem solving.

Then we will use git and GitHub to upload the files, compile them into one project, then upload them to the server so that they are ready for use and experimentation.

We will design the web page with responsive design so that the interface adapts to the screen width. So the user can access the web page using a computer, tablet or smartphone to facilitate communication

In this edition, we will also present a sample of some of the courses, videos, and images dedicated to them, in addition to presenting a preliminary work plan for students.

In this version, we will work with a system in which we will take advantage of many features available online and in other places and benefit from them in a way that suits our system and meets the needs of users.

Note: This is an initial release, and since we are working with a **Incremental development** system, we may in the future take this model, develop it, and issue many versions, hoping that this system will be the nucleus for other people.

3.5 Validation & Testing

The testing stage is one of the important stages. In this step, we will conduct successive tests for each feature that we will add and make sure that it works well, and if there is a problem, it will be modified.

Then we will conduct a test to add this feature to the system and ensure that this feature is consistent with the system as a whole

3.6 Evolution

- implementing a gamification system with badges, leaderboards, and rewards to motivate users .

- Allow users to save their code for revisiting past challenges and tracking progress.

- Explore integrating a forum or chat system to facilitate discussions and collaborative learning among users.

- Increase the number of materials to include educational materials for young children

- Adding slides and books translated into Arabic
- Providing the assistants who can be communicated with in the event of some problems and to help students with them
- Dividing the course based on colleges and years of study
- Checking students' level and holding periodic competitions

3.7 Development Plan

This is the distribution of tasks for the practical part, and since we are working in the incremental model, it will be difficult for us to determine all the requirements, but we have tried hard to develop a preliminary plan for the main requirements that we will develop and define the tasks, as the implementation of this plan .

First, we will create a login & logout page by Asma

create a sign in and about page by Merad

create home page by Mais

second, we create the 1 courses page which is C++ page which is divide into 2 level basic and problem solving :

This initial plan was distributed in this way because we want to give everything an appropriate time according to our discretion and it will also give an initial overview and general structure of the application.

This plan is distributed over 3 weeks from 5 May to 23 May.

	First week					Second week					Third week				
Day in May	**5**	**6**	**7**	**8**	**9**	**12**	**13**	**14**	**15**	**16**	**19**	**20**	**21**	**22**	**23**
Asma	**Log out page**		**Log out page**			**Choose topics and determine levels**		**Search about content slide**			**Add slide**		**Some design**		**Project delivery**
Mais	**Home page**							**Search about content problem**			**Add problem**		**Some design**		
Merad	**Sign in**		**About page**					**Search about video**			**Add video**		**Some design**		

3.8 Reference

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3.9 Survey

We conducted a survey to see how important it was to present our idea and how students responded to it, and these were the results of the survey

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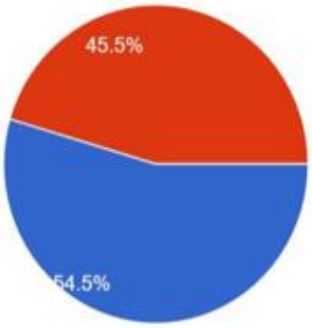
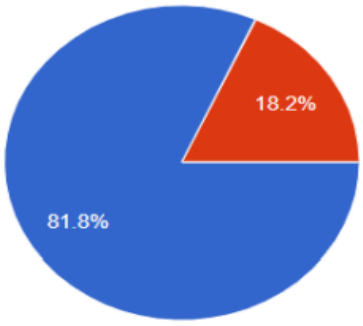
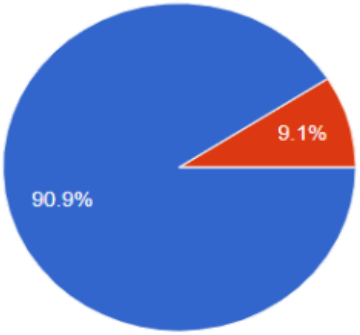
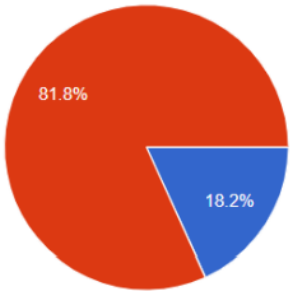
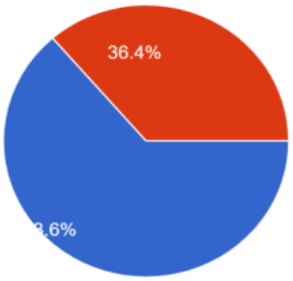
هل تعتقد ان التعليم عن بعد يعد أسلوبا مناسبا لتلبية احتياجاتك التعليمية	
هل تواجه صعوبة في اختيار المصدر الافضل لتعلم البرمجة ؟	
هل تشعر بضرورة وجود منصة الكترونيه او مساعد يرشد الطريق لك	

	هل ترى ان مصادر الجامعة كافيه من اجل ان تصبح جيدا بالبرمجة ؟
	هل لديك معرفه سابقة بالبرمجه ؟