Lahore Leads University – Lahore Pakistan

Final Term Examination Fall 2020

Department of Computer Science

Instructor: Mr. Muhammad Zubair	**Subject:** CSC-251 Introduction to Software Engineering	**Semester:** Fall 2020
Assigned Date: 19-12-2020 (At 10:00 AM)	**Due Date:** 22-12-2020 (Before 10:00 AM)	**Total Marks:** 40 (72 hours)

Objective:

The objective of this paper is to have knowledge about agile methodology and the use of unified modeling language (UML) diagrams in order to design software requirements during software development in order to produce high quality product in less time and cost.

Instructions:

This is an individual paper written in .doc format. Upload paper directly to Student LMS Portal.
Make a Paper cover page with your name, Roll number Class name and date.
Please note that you must do your own work. If anyone found copying from another student, no marks will be given to him/ her.
Only 15% plagiarism is allowed from internet sources.
Deadline of this terminal paper is 22nd December, 2020 before 10:00 AM. This deadline will not be extended.
No paper solution will be accepted through LMS after the due date.

Scenario:

It is only less than a decade that agile models were introduced and got popular steadily. The defined values in these models and their outcomes have motivated many organizations to use these methods. Since migration from traditional software development methods to agile methods is growing highly, managers of the companies should be aware of problems and challenges they may face with during the agile transformation process. Although there are many benefits of Agile software development, there are also a number of common challenges that prevent many teams from successfully scaling Agile processes out to the enterprise level. These common challenges in

agile development are; lack of dedicated cross-functional teams, unwillingness of team, lack of team ownership, improper communication, lack of planning, external and internal dependency assessment, prioritizing the problems, proper leadership and decision issues, motivating the team in right direction, testing challenges, incremental delivery issues, risk management issues, decomposition timeboxing issues, rapid product delivery and many more…

Q.1: Draw a table and compare the features/characteristics of all agile models that can address the problems or challenges given in the above scenario. (10)

Case Study # 1:

Agriculture sector contributes around 24% to the gross domestic product (GDP) of the country and accounts for half of the employed labor force. For this reason, the Punjab Agriculture Department has incentivized the farmers in the province in an effort to uplift production and productivity of key crops and has decided to financially support the cost of producing the crops. For this purpose, Punjab government had developed "Fertilizer and Pesticide Monitoring System" to automate the price monitoring mechanism for agriculture inputs. The need for the system was felt because of output and resource wastage in manual price inspections. It would take the department at least a week to finish inspection drive in a market as the staff would visit the site and report variation in prices to concerned authorities after two days. The authorities would then take another three days to analyze the variation and issue orders to magistrates for fines. Fertilizer and pesticide companies have now been provided with user logins to enter their product details and base price onto the website. Once the price is entered, it automatically syncs to the mobile application given to the inspection staff. The staff visits various dealers and uploads the evaluated price and other identification credentials against each product quantity of fertilizers and pesticides.

The system then analyses the difference between the base price and the evaluated price and automatically sends an SMS of the variation to the concerned authorities including the designated tehsil price magistrates who have also been provided with a compliance Android application. The details of the shop and the product for which variations are found is automatically updated on the application available to price magistrates. Using the application, the magistrates can readily update violator's details and issue orders to concerned officials to collect fines. Once fines are collected, the magistrate closes the case on the mobile application and submits a weekly report to the Agriculture Secretary. The system contains an online storage of the price data of fertilizer and pesticide products. It has resulted in transparency in evaluation of prices and better enforcement of base prices.

Q.2: Draw a detailed use case diagram through any tool which represents all the functionalities given in the above case study. Make the use of include and extend relationship between the use cases whenever required. (10)

Q.3: Create a sequence diagram of any one function that you have show in use case diagram. Make sure how this function will be completed with participation of different system objects. (5)

Case Study # 2:

A UK-based organization was trying to implement Dynamic system development method (DSDM), an established agile delivery framework that balances strategic and operational concerns. Three early adopter projects had been launched, each of which addressed a key domain or workstream in the organization's portfolio of healthcare insurance products.

Unfortunately, the associated agile practices struggled to make progress, despite competent and knowledgeable coaches having been hired. The agile adoption initiative was effectively an unlimited work-in-progress. More manageable changes - discretely achievable and clearly focused - had not been identified or prioritized. Coaching was largely reactive and lacked direction, and the progress of the transformation was difficult to assess empirically. In short, the organization lacked the control surfaces that are needed for a measured and managed approach to agile change.

Team-level symptoms included unclear timeboxed goals, and planning was confused with requirements refinement. Collaboration of software requirements was disengaged from the development process, since incremental delivery was neither understood nor valued. There was no agile governance and team composition was subject to frequent and unforeseen change. The relationship between Business and IT was poor.

Q.4: After understanding the practices of this UK-based organization, in your opinion on which CMMI level this organization exist and how this organization can improve their CMMI level? By using CMMI appraisals which specific area can be evaluated to identify the strengths and weaknesses of this organization? (10)

Q.5: Which software testing techniques will be used to check all the conditions and states of the system. Justify your answer. (5)

Good Luck…☺