UNIVERSITY OF JOHANNESBURG

FACULTY OF SCIENCE

ACADEMY OF COMPUTER SCIENCE & SOFTWARE ENGINEERING

MODULE	**IFM3B10** ADVANCED SOFTWARE ENGINEERING
CAMPUS	APK
EXAM	NOVEMBER 2014

CASE STUDY

DATE	10 NOVEMBER 2014	**SESSION**	08H30 – 11H30
DURATION	3 HOURS	**MARKS**	150
ASSESSOR		MR T.D. MPHUTHI	
INTERNAL MODERATOR		DR W.S. LEUNG	
EXTERNAL MODERATOR		DR L. FUTCHER	

PLEASE TAKE CAREFUL NOTE OF THE FOLLOWING:

1. Read this CASE STUDY carefully.
2. The CASE STUDY serves as a guide to describe the role that you should take on when answering the questions provided in the question paper.
3. All questions provided in the question paper that make a reference to the CASE STUDY should be answered in relation to this CASE STUDY.
4. All provided questions in the question paper that do not make a reference to the CASE STUDY should be answered in relation to the learning material covered during the course of the module.
5. This CASE STUDY consists of 4 (including this cover page) pages.

The Green House Safari Resort

The Green House Safari Resort is one of South Gauteng's top holiday destinations for wildlife lovers. The recent increase in the poaching of some of Africa's big-five game animals such as elephants and rhinos has led the resort to seek the development of a surveillance and tracking system in an attempt to counter this problem. The system is called Zero-Poaching and it aims to track all animals in the resort in order to study the patterns of movement by the animals within the resort, as well as to spot areas within the resort, which are prone to attacks by poachers.

The software project for the development of the Zero-Poaching system has started, however there has been some setbacks with the software development team and project manager. These setbacks have led the Green House Safari Resort's management to seek your consulting services for the purpose of providing guidance on what actions they need to take from a software development as well as a project management perspective.

Software Development & Testing

The software development team would like to take on a more "Agile" approach to the software development by focusing more on the actual functionality of the system and less on traditional software development processes, in an attempt to make-up for time lost as a result of the project's setback. As such, they are considering employing an approach to verification and validation where the focus is only on testing and not on inspections and reviews.

The development team would like you to advise them on ways in which they can improve the speed at which new functionality is developed and tested, so that the system is produced in a short space of time. They would like to ensure that every code segment written has at least one associated test, that new changes to the code don't introduce new bugs and that debugging is much more simplified.

System Architecture & Security

The Zero-Poaching system will have a client-server architecture where users will use a web browser to get access to the game animals' location information, stored on the system servers. The main users of the system will be employees of the Green House Safari Resort as well as visitors to the resort during their stay. Authentication of these users will be through a unique user id and password combination, where the username

is system generated while the password is user generated with minimum restrictions.

Green House Safari Resort's management would like users of the Zero-Poaching system to get access to the functionality provided by the resort's already-existing souvenirs website called ghsr-shop.com. They essentially want users to be able to purchase products on ghsr-shop.com through the Zero-Poaching system. Compatibility will not be an issue as the core components for this relationship are built on the same platform and the required interfaces are already in place. The Chief Administrator of ghsr-shop.com is reluctant to accept this agreement, as she believes that the vulnerabilities of the Zero-Poaching are such that unauthorized users will be able to place malicious orders on ghsr-shop.com, through the Zero-Poaching system.

The Green House Safari Resort's Legacy system

The Green House Safari Resort's management would like you to provide advice on the steps that they need to take regarding the legacy system currently in use at the resort. This legacy system is used to record entries of the areas where the wild animals were last spotted. This feature of the legacy system has been very useful to the game rangers since it was introduced in 1987, as the game rangers use the entries of animal sightings as a basis for deciding routes for game drives. Keeping the legacy system running has become a big problem in recent years, as the software it runs on is not supported by modern hardware technologies. This has led to the system being deployed on a small number of workstations, which are physically located at the main office of the resort.

Project Management & Cost Estimation

In your interaction with the project team members you are informed that the main reason for the delay with the software development was because there was poor teamwork within the software development team. The entirely task-oriented software development team's members were all gunning for the same piece of work and thus some of the team members were not happy with the roles that they were assigned to. The fact that the organisation has a vertical management hierarchy also fuelled the issue because the team members' grievances had to be presented in a bureaucratic manner.

The high level project time-lines for the Zero-Poaching system's development project are presented in Table 1. This time-line represents the managed process that the Green House Safari Resort uses as a starting point for executing all of their projects, each new project adapts this process to meet the project–specific requirements.

TASK	DURATION (MONTHS)	DEPENDENCIES	END DELIVERABLE
T1 (Requirements Analysis)	2		D1 (Requirements Specification Documents)
T2 (Design)	3	T1	D2 (Design Document)
T3 (Implementation)	2	T2	D3 (Working prototype)
T4 (Testing)	3	T3	D4 (Initial Release)

Table 1: High Level Project Time-Line

The resort's management have put aside R800 000 for the project based on estimations driven by measurements made on previous projects that used the same managed process.

Upon evaluating the high level requirements of the system, you have identified the variables in Table 2 as a good description of the project for use during cost modeling.

VARIABLE	VALUE
Constant Factor	10
Number of Lines of Code	20 000
Complexity	1
Multiplier	5

Table 2: Cost Modeling Variables and Values

Software Quality

The Green House Safari Resort's management values software quality, they have thus identified some quality attribute that the system should have, along with their degree of importance in Table 3.

QUALITY ATTRIBUTES	IMPORTANCE
Maintainability	High
Reliability	Moderate
Reusability	Low
Usability	Moderate

Table 3: Software Quality Importance