



FACULTY OF MANAGEMENT

DECEMBER 2014 SUPPLEMENTARY EXAMINATION

DEPARTMENT OF APPLIED INFORMATION SYSTEMS

MODULE : **STRATEGIC INFORMATION TECHNOLOGY
MANAGEMENT**

CODE : **SCS41-1**

DATE : **DECEMBER 2014**

DURATION : **3 HOURS**

TIME : **12:30**

TOTAL MARKS : **100**

EXAMINER : **G. Toko**

(EXTERNAL) MODERATOR(S): **M. Hughes**

NUMBER OF PAGES : **6 PAGES**

INSTRUCTIONS TO CANDIDATES:

- Question papers must be handed in.
- This is a closed book assessment.
- Read the questions carefully and answer only what is asked.
- Number your answers clearly.
- Write neatly and legibly.
- Structure your answers by using appropriate headings and sub-headings.
- The general University of Johannesburg policies, procedures and rules pertaining to written assessments apply to this assessment.

Section A**[50]****Case study: Health system**

Study the following case study carefully and answer the questions.

Access to health services is a basic human right for all individuals in NewCountry where all medical services are free if you go to a public hospital. The patient does not have to pay the bill, but a record of all expenses must be captured for management, planning and budgeting purposes. The public health system is posing a huge challenge to government as there is no integrated information system available. Fraud and corruption are common phenomena as the current information systems are inadequate and cannot supply trustworthy information on which to base decisions. Management also needs quality information for the daily running of the hospital.

The current infrastructure is as follows: There are public hospitals in all the major towns in NewCountry. Each town has several local community clinics that treat minor illnesses such as flu, give inoculations, provide health checks (for example pap smears and HIV screening tests) and distribute medication to patients with acute and chronic ailments. When a patient cannot be treated at a local clinic he or she is referred to a hospital. Although some hospitals are understaffed most nurses and doctors are dedicated and have the necessary skills to perform their duty. The medical equipment of the hospitals is sufficient and up to date.

All the hospitals have a standard computer system in place to manage patient records, stock, accounting and employee-related functions. Every time a person is admitted to hospital a new record is created and no link to previous admissions is available. All data is stored in a central database. All administration employees and doctors have Internet access and e-mail. The software application is relatively old and has not kept up with the latest technology. The radiography and pathology units run their own applications and there is no link to the administrative system. The chemist dispenses medication to a ward and enters that information on the system.

The nurses on the wards do not have access to the system and keep a physical file for every patient. The medicine on the ward is also controlled using a manual register. The patient file contains personal data, for example the identity number, surname and first name, gender, current address, telephone number, bed number, chronic medication, the current diagnosis of the condition, progress report, treatment and instructions from the doctors, medication administered, reports of all tests (radiography and pathology), and dates of admission and discharge. Once the patient is discharged, the file is sent to the administrative section where some of the details are captured for budgetary purposes. The patient receives a written note from the ward for follow-up consultations and a script to collect medication to take home.

Sensitive reports such as HIV screening results are kept in the file and confidentiality is maintained through physical security on the premises. The stock in the clinics is managed manually and orders for new stock can only be placed twice a month. The nurses have requested more access to patient information, the Internet and e-mail in the clinics. They also expressed a need to access treatment protocols on the Internet, to assist them in diagnosing new or rare cases.

The IT infrastructure at the hospitals typically has a local area network consisting of a number of servers with adequate storage and processing power. All administrative staff members have workstations linked to the LAN to give them access to applications, servers, printers and the Internet. The employees use Gmail for their e-mail as no mail server is available.

The IT department at the hospitals has a typical staff complement of 10 employees. Most of the IT staff are assigned to perform maintenance on the existing information systems. They support the workstations and LAN, and there is a database administrator. No data classification has been carried out to distinguish between different types. There is a high-level generic information security policy in place, but no supporting policies. The employees have access to certain applications depending on their position.

Some of the symptoms of the current system are:

- There is no effective way for doctors at the hospital to obtain up-to-date records on a patient. If a person is admitted to a hospital no previous health information about a person is available. The clinics however have paper patient files available and the doctor can request information from the clinics. However, patient's data at the clinic is not always up to date as patients do not always visit the same clinic. The result is that doctors must rely on the patient for background information on chronic conditions and medication.
- Individual departments, for example radiology, are keeping their own data in *MS Excel* and *Access* for their own record keeping purposes.
- The hospital is rendering poor customer service and incurring major losses as it is ineffective and inefficient. For example, tests (x-rays) must often be repeated as they cannot be located once a patient is discharged as files are often misplaced.
- The hospital management has a serious problem detecting fraud and theft as the required information is not available. In the most recent incident a nurse placed an order for schedule 5 pain medication for a patient. Patient did not receive any medication as the nurse was addicted to the pain medication. She has subsequently been dismissed.
- There is limited information available that can assist management with decision-making.
- Stock control is a highly problematic for the clinics and hospitals. The stock control records in the hospitals are updated daily from the manual system as received from the wards. There is a problem balancing the ward medicine stock with stock issued by the chemist. Medication is often not available as no reliable stock levels are maintained or regular re-ordering of stock carried out. Patients have died as there was no medication available. Special requests for other stock items, for example wheelchairs, are made manually.
- There are no formal feedback channels for the patients to rate the service of the specific hospital or clinic.

It is the vision of the MEC, Joan Mbeki, to enable hospitals to offer quality service to all patients. Hospitals must become more efficient and effective. She believes that quality information can make the difference. Information must be made available for nurses and doctors to treat patients, and for administrative staff to plan, make decisions, and manage and streamline the daily operations of the hospitals.

There is a need to centralise the health information of all patients. Government has requested proposals for a new web-based centralised information system. The idea is to save all patient information in the cloud. The application will enable doctors to access patient information from any clinic or hospital in the country. The complete patient record will be available to authorised doctors and nurses. The application must be an integrated system that links the operational data of each hospital with the patient data. The operational data should be stored locally (at the hospital or the clinic).

The idea behind the new web-based system is the following:

- To capture all patient information only once.
- To ensure up-to-date patient records.

- To provide the security needed for all patient and hospital records, and ensure the privacy of all personal records.
- To improve the availability of stock with an effective and efficient stock control system.
- To link all units (admission, wards, medication and treatment plans, radiography and pathology, chemist) of the hospital to the new application to eliminate duplicate data stores.
- To provide access to patient records for the clinic staff to create and update. When a patient visits the hospital the attending doctor will have access to all records, including the clinic visits.
- To link all clinics to the hospital system and have an expert system available to help with the diagnosis of conditions. The system must provide generic treatment plans for all conditions treatable at the clinics.
- To ensure the availability of management information to enable good decision making.
- To improve the effectiveness of the daily operations at the hospital.
- To include mobile devices in the technical architecture, for example to equip the doctors or ward sister with an electronic device able to access patient records on the new system and allow them to capture all communication, prescription of medication, instructions for staff, and requests for blood tests or x-rays. The patient record should be updated immediately and requests e-mailed to all relevant departments. The results of tests or reports from the x-ray department will be uploaded and the doctor notified.
- To remind patients of follow-up appointments via SMS or e-mail.
- To improve communication and collaboration between all employees, suppliers and patients.

The intention is to implement the system in GetBetter hospital and its associated clinics as a test case. Then the rest of the province will be incorporated. Once all the provinces are on board, the final integration will take place.

Use the case study and answer the following questions

Question 1

Apply the generic strategies framework for the business strategy of a hospital.

[3]

Question 2

What must the hospital superintendent (manager) consider if he wants to apply chargeback method for the funding of IT resources?

[3]

Question 3

How can the hospitals manage the technical and organisational risks of the project? Identify one (1) example of technical and one (1) example of organisational risk in your discussion.

[5]

Question 4

The clinic nurses have requested access to a knowledge base. Use the case study and explain the knowledge management process.

[5]

Question 5

How can information be used strategically to alter the value chain of the health system?

[5]

Question 6

How will the proposed new system influence the nature of the work in the clinics and wards?

[3]

Question 7

Would you recommend the process perspective to build business processes? Motivate your answer.

[5]

Question 8

8.1 Use the case study and recommend a solution from strategy – infrastructure with regards to patient information.

(3)

8.2 What must be considered in terms of technical issues?

(2)

[5]

Question 9

List the advantages and disadvantages of outsourcing and information systems, taking the case study into consideration.

[5]

Question 10

Would a feudal governance structure benefit the new health system in NewCountry? Motivate your answer.

[5]

Question 11

Which normative theory applies for the health system? Motivate your answer.

[3]

Question 12

Who should participate in the IT decisions related to the new system? Why must they all be included?

[3]

Section B: Free standing questions

[50]

Question 1.

Evaluate the difference between ‘information’ and ‘knowledge’, assessing the appropriate tools, techniques and processes to manage each effectively.

[10]

Question 2.

‘Knowledge Management is mostly culture and people, with technology thrown in . . .’ critically evaluate the statement.

[10]

Question 3.

What is the ‘digital divide’? Produce a checklist of measures you feel could be implemented with a view to removing the ‘digital divide’.

[5]

Question 4.

List five (5) principal emerging technologies which could enhance and improving global information management.

[10]

Question 5.

List at least five (5) organizations that have been central in developing and promoting web services.

[5]

Question 6.

Suggest and defend five (5) reasons why businesses find it difficult to build effective IS systems that fully support the business strategy of the organisation.

[5]

Question 7.

The rapid development and proliferation of the Internet and related technologies have provided numerous opportunities for disruption. Identify real life examples of South African dot.co.za organisations that have developed low end, new market and top-down disruptions across different industries.

[5]