**International Institute of Health Management Research (IIHMR), New Delhi.**
**Plot 3, Sector 18A Dwarka New Delhi 110075**

# Postgraduate Diploma in Management
# Hospital and Health

## Third Semester
### HIT 706 Designing for Health Information Technology

**Time: 2 hours** **Maximum Marks: 70**

**Note: Question 1 (a & b) should be scanned and uploaded.**

**Answer all questions**

1. The Best Life hospital is constructing and enacting an original hospital-based cancer registry using an electronic medical records system. This involves a system in which the health information managers perform the hospital cancer registration tasks and complete the registry via confirmation from the attending doctors. Registration system is available for both electronic medical records and diagnosis procedure combination (DPC). Nearly all information registered in the electronic medical records, including patient information, prescription contents, tests, and surgery information, etc., is stored in the Data Ware House (DWH), where it can be searched for specific clinical information. The electronic medical records are populated by the clinicians attending the patients, pharmacy and pathology departments. The cancer registrar does the DPC information. The DPC combines information on (1) main diagnosis, (2) interventions, and (3) co-morbidities/ complications and additional information from the medical record. The health information manager completes the hospital cancer registration tasks by extracting the EMR, DPC and pathology reports and stores the information in hospital-based cancer registry database. Pathology reports are kept independent of the hospital information system but the report database can be searched with the cooperation of the pathology department. The cancer registrar files the data into the population based cancer registry. When filing data to the population-based cancer registry, the registered data extracted from the hospital based cancer registry database are first read into HosCanR2.1 to conduct quality control. After checking for errors with HosCan-R and correcting the mistakes, the data is then submitted in a specified format and posted to the population-based cancer registry.

Draw Data Flow Diagrams: -
a. Zero level Diagram **(10 marks)**
b. First Level Diagram for the above case **(25 marks)**

2. ABC has acquired a tertiary hospital in Delhi. The hospital provides number of services including bariatric, bone marrow treatment, cardiac services, cancer care, endocrinology, kidney transplant, liver transplant, ENT services, dental services, maternal services, respiratory diseases etc. The hospital is updating its processes through clinical transformation using technology with a focus to become HIMSS EMRAM stage 6 certified. The hospital is in stage 1 of the model where IT systems are used in pharmacy, laboratory and radiology departments. Carefully considering the following HIMSS EMRAM Model given below, list out stage specific (**stage 2 to 7**) digital activities (minimum 2 to 3) to be followed by the hospital in each stage to finally become stage 7 certified by the HIMSS. Activities should not be more than 2 or 3 lines. Just simple statements only. Fall back on all the technologies that can be used in healthcare. **(Marks 35)**

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| **Stage 7** | A hospital at this stage never uses *paper documents* while providing services. All data, documents and medical images are processed electronically. Data stored in a digital environment are analyzed and used to increase the quality of healthcare, ensure patient safety and offer efficient services. The relevant data are standardized electronically ready for use and information exchange by authorized persons and institutions (management, other hospitals etc.). The hospital ensures the data continuity of all service processes and publishes such data. At this stage, healthcare materials such as blood products are also made available via *Closed Loop Medication Administration System*. |
| **Stage 6** | A full-fledged and marketable physician documentation system is in practice for at least *one in-patient clinic*. Third stage clinical support system provides guidance in all clinical processes. Closed loop medication management system and coded drugs system are fully in practice. To maximize the patient safety, other automated identification technologies and automated delivery systems such as electronic medication management record and computerized physician order entry/e-Prescription and Barcoding or RFID (radio frequency identification) integrated with the pharmacy are in practice. Thus, in accordance with "5 rights (right patient, right drug, right dose, right route and right time)" principle developed in order to prevent Erroneous Drug Use, patient credentials and medicine barcode are verified at the patient bedside. |
| **Stage 5** | Medical images in the full-fledged Radiology Image Archive and Communication System (PACS) are open to the access of all physicians and sent to other locations via intranet. At this stage, if image documents of cardiology department (ECG etc.) are entered into the PACS system, the hospital is given extra points. |
| **Stage 4** | At this stage, the second stage of clinical decision support systems for evidence-based medical protocols is available. In this system, any licensed Clinician can write an order and add a nurse for his/her access to data in the Computerized Physician Order Entry (CPOE) system. If the Computerized Physician Order Entry system is used in an in-patient service area and previous stages are completed, then this stage is deemed to be completed as well. |
| **Stage 3** | Clinical documents regarding nursing care (vital signs, flow sheets, nursing notes, eMAR) and/or electronic medication management record and order entry and tracking systems must be integrated with electronic patient records and clinical data store in at least one service process. The first stage of clinical decision support may be practiced to check the errors in order entry. Drug/drug, drug/food, drug/laboratory interaction data are usually available in the pharmacy. Medical pictures in the picture archive must be accessible from the system via intranet to the physicians outside the radiology department. |
| **Stage 2** | Information systems of the clinical data repository (CDR) send all kinds of medical information and results of the patients to a system viewable by the physicians. This system sends data to the Electronic Patient Record or Clinical Data Archive receives feedback and forward them to the sub-systems. The system can receive and send medical picture documents and enable information exchange between hospitals. |
| **Stage 1** | It describes that digital systems are set up in main clinical support units (pharmacy, laboratory and radiology). |
| **Stage 0** | It describes the hospitals where even main clinical support units (pharmacy, laboratory and radiology) and processes are not included in digital environment. |