IE-462
Section 1, CRN: 33602/603/604
Section 2, CRN: 38318/319/320
Section 3, CRN: 76433/434/435

Second Semester 1440-41 H (Spring – 2020) – 2(2,1,1)
"INDUSTRIAL INFORMATION SYSTEMS"

Sunday, March 29, 2020 (05/08/1441H)

Homework 2

Group #:	Student Names:	Student Numbers:	Sections (circle one):
		43	9 AM / 10 AM /11 AM
		43	9 AM / 10 AM /11 AM
		43	9 AM / 10 AM /11 AM
		43	9 AM / 10 AM /11 AM
		43	9 AM / 10 AM /11 AM

1) Starting with a context diagram, draw as many nested DFDs as you consider necessary to represent all the details of the employee hiring system described in the following narrative. You must draw at least a context and a level-0 diagram. If you discover while drawing these diagrams that the narrative is incomplete, make up reasonable explanations to complete the story. Supply these extra explanations along with the diagrams.

Projects, Inc., is an engineering firm with approximately 500 engineers of different types. The company keeps records on all employees, their skills, assigned projects, and the departments they work in. New employees are hired by the personnel manager based on data in an application form and evaluations collected from other managers who interview the job candidates. Prospective employees may apply at any time. Engineering managers notify the personnel manager when a job opens and list the characteristics necessary to be eligible for the job. The personnel manager compares the qualifications of the available pool of applicants with the characteristics of an open job and then schedules interviews between the manager in charge of the open position and the three best candidates from the pool. After receiving evaluations on each interview from the manager, the personnel manager makes the hiring decision based upon the evaluations and applications of the candidates and the characteristics of the job and then notifies the interviewees and the manager about the decision. Applications of rejected applicants are retained for one year, after which time the application is purged. When hired, a new engineer completes a nondisclosure agreement, which is filed with other information about the employee. (Q7.39; *Hoffer and Valacich*, 2017 textbook, pp 210)

2) Starting with a context diagram, draw as many nested DFDs as you consider necessary to represent all of the details of the system described in the following narrative. In drawing these diagrams, if you discover that the narrative is incomplete, make up reasonable explanations to make the story complete. Supply these extra explanations along with the diagrams.

Maximum Software is a developer and supplier of software products to individuals and businesses. As part of their operations, Maximum provides a 1-800 help desk line for clients who have questions about software purchased from Maximum. When a call comes in, an operator inquires about the nature of the call. For calls that are not truly help desk functions, the operator redirects the call to another unit of the company (such as Order Processing or Billing). Because many customer questions require in-depth knowledge of a product, help desk consultants are organized by product. The operator directs the call to a consultant skilled on the software that the caller needs help with. Because a consultant is not always immediately available, some calls must be put into a queue for the next available consultant. Once a consultant answers the call, the consultant determines if this is the first call from this customer about a particular problem. If it is, the consultant creates a new call report to keep track of all information about the problem. If it is not the first call about a problem, the consultant asks the customer for a call report number and retrieves the open call report to determine the status of the inquiry. If the caller does not know the call report number, the consultant collects other identifying information such as the caller's name, the software involved, or the name of the consultant who has handled the previous calls on the problem in order to conduct a search for the appropriate call report. If a resolution of the customer's problem has been found, the consultant informs the client as to what that resolution is, indicates on the report that the customer has been notified, and closes out the report. If resolution has not been discovered, the consultant finds out if the consultant who handled the previous call for this problem is on duty. If so, he or she transfers the call to the other consultant (or puts the call into the queue of calls waiting to be handled by that consultant). Once the proper consultant receives the call, that consultant records any new details the customer may have. For continuing problems and for new call reports, the consultant tries to discover an answer to the problem by using the relevant software and looking up information in reference manuals. If the consultant can now resolve the problem, the consultant tells the customer how to deal with the problem and closes the call report. Otherwise, the consultant files the report for continued research and tells the customer that someone at Maximum will get back to him or her, and that if the customer discovers new information about the

problem, he or she should call Maximum with the information, identifying the problem with a specified call report number.

Analyze the DFDs you created in the first part of this question. What recommendations for improvements in the help desk system at Maximum can you make based on this analysis? Draw new logical DFDs that represent the requirements you would suggest for an improved help desk system. Remember, these are to be logical DFDs, so consider improvements independent of technology that can be used to support the help desk. (Q7.40; *Hoffer and Valacich*, 2017 textbook, pp 210-3)

3) Develop a context diagram and level-0 diagram for the hospital pharmacy system described in the following narrative. If you discover that the narrative is incomplete, make up reasonable explanations to complete the story. Supply these extra explanations along with the diagrams.

The pharmacy at Mercy Hospital fills medical prescriptions for all hospital patients and distributes these medications to the nurse stations responsible for the patients' care. Prescriptions are written by doctors and sent to the pharmacy. A pharmacy technician reviews each prescription and sends it to the appropriate pharmacy station. Prescriptions for drugs that must be formulated (made on-site) are sent to the lab station, prescriptions for off-the-shelf drugs are sent to the shelving station, and prescriptions for narcotics are sent to the secure station. At each station, a pharmacist reviews the order, checks the patient's file to determine the appropriateness of the prescription, and fills the order if the dosage is at a safe level and it will not negatively interact with the other medications or allergies indicated in the patient's file. If the pharmacist does not fill the order, the prescribing doctor is contacted to discuss the situation. In this case, the order may ultimately be filled, or the doctor may write another prescription depending on the outcome of the discussion. Once filled, a prescription label is generated listing the patient's name, the drug type and dosage, an expiration date, and any special instructions. The label is placed on the drug container, and the order is sent to the appropriate nurse station. The patient's admission number, the drug type and amount dispensed, and the cost of the prescription are then sent to the Billing department. (Q7.41; *Hoffer and Valacich*, 2017 textbook, pp 213)

4) Develop a context diagram and a level-0 diagram for the contracting system described in the following narrative. If you discover that the narrative is incomplete, make up reasonable explanations to complete the story. Supply these extra explanations along with the diagrams.

Government Solutions Company (GSC) sells computer equipment to federal government agencies. Whenever a federal agency needs to purchase equipment from GSC, it issues a purchase order against a standing contract previously negotiated with the company. GSC holds several standing contracts with various federal agencies. When a purchase order is received by GSC's contracting officer, the contract number referenced on the purchase order is entered into the contract database. Using information from the database, the contracting officer reviews the terms and conditions of the contract and determines whether the purchase order is valid. The purchase order is valid if the contract has not expired, the type of equipment ordered is listed on the original contract, and the total cost of the equipment does not exceed a predetermined limit. If the purchase order is not valid, the contracting officer sends the purchase order back to the requesting agency with a letter stating why the purchase order cannot be filled, and a copy of the letter is filed. If the purchase order is valid, the contracting officer enters the purchase order number into the contract database and flags the order as outstanding. The purchase order is then sent to the Order Fulfillment department. Here the inventory is checked for each item ordered. If any items are not in stock, the Order Fulfillment department creates a report listing the items not in stock and attaches it to the purchase order. All purchase orders are forwarded to the warehouse, where the items in stock are pulled from the shelves and shipped to the customer. The warehouse then attaches to the purchase order a copy of the shipping bill listing the items shipped and sends it to the contracting officer. If all items were shipped, the contracting officer closes the outstanding purchase order record in the database. The purchase order, shipping bill, and exception report (if attached) are then filed in the contracts office. (Q7.42; *Hoffer and Valacich*, 2017 textbook, pp 213)

5) Develop a context diagram and as many nested DFDs as you consider necessary to represent all the details of the training logistics system described in the following narrative. If you discover that the narrative is incomplete, make up reasonable explanations to complete the story. Supply these extra explanations along with the diagrams.

Training, Inc., conducts training seminars in major US cities. For each seminar, the Logistics department must make arrangements for the meeting facilities, the training consultant's travel, and the shipment of any seminar materials. For each scheduled seminar, the Bookings department notifies the logistics coordinator of the type of seminar, the dates and city location, and the name of the consultant who will conduct the training. To arrange for meeting facilities, the logistics coordinator gathers information on possible meeting sites in the scheduled city. The meeting site location decision is made based on date availability, cost, type of meeting space available, and convenience of the location. Once the site decision is made, the coordinator speaks with the sales manager of the meeting facility to reserve the meeting room(s), plan the seating arrangement(s), and reserve any necessary audiovisual equipment. The coordinator estimates the number and size of meeting rooms, the type of seating arrangements, and the audiovisual equipment needed for each seminar from the information kept in a logistics database on each type of seminar offered and the number of anticipated registrants for a particular booking. After negotiations are conducted by the logistics coordinator and the sales manager of the meeting facility, the sales manager creates a contract agreement specifying the negotiated arrangements and sends two copies of it to the logistics coordinator. The coordinator reviews the agreement and approves it if no changes are needed. One copy of the agreement is filed and the other copy is sent back to the sales manager. If changes are needed, the agreement copies are changed and returned to the sales manager for approval. This approval process continues until both parties have approved the agreement. The coordinator must also contact the training consultant to make travel arrangements. First, the coordinator reviews the consultant's travel information in the logistics database and researches flight schedules. Then the consultant is contacted to discuss possible travel arrangements; subsequently, the coordinator books a flight for the consultant with a travel agency. Once the consultant's travel arrangements have been completed, a written confirmation and itinerary are sent to the consultant. Two weeks before the date of the seminar, the coordinator determines what, if any, seminar materials (e.g., transparencies, training guides, pamphlets, etc.) need to be sent to the meeting facility. Each type of seminar has a specific

set of materials assigned to it. For some materials, the coordinator must know how many participants have registered for the seminar in order to determine how many to send. A request for materials is sent to the Materials-handling department, where the materials are gathered, boxed, and sent to the meeting address listed on the request. Once the requested materials have been shipped, a notification is sent to the logistics coordinator. (Q7.43; *Hoffer and Valacich*, 2017 textbook, pp 213-4)

Rules:

- You should work with your **project group** for this assignment.
- Read carefully the question and **answer the requirements** stated along with each question statement.
- You are first required to show the list of activities involved in the IIS; e.g. using a **business model** similar to the *Hoosier Burger Inventory Control System* (*Valacich, Fig 7-12*)
- You must then use **modeling software** (e.g. *MS Visio*) to produce the requested models in each question. You must state the name of the utilized software in the supporting documentation.
- You must also provide **screenshots of all your diagrams** and provide them (with appropriate description) in a *MS Word* (.docx) file.
- Any written supplemental material must be **typed** and written in **proper English**.
- You must **submit your work by email** (in one zipped file, e.g. "HW02_G12.zip" to aelsherbeeny@ksu.edu.sa), containing all work that you have done, including:
  - models (saved in their original formats)
  - diagram screenshots (in the .docx file)
- The above questions have been assigned to projects groups as follows:
  - Q1: groups 1, 6, 11, 16
  - Q2: groups 2, 7, 12, 17
  - Q3: groups 3, 8, 13, 18
  - Q4: groups 4, 9, 14
  - Q5: groups 5, 10, 15
- Due date: **Sunday, April 19th, 2020** (26/08/1441) at **2:00 PM**