PHASE 2: SUBMISSION CHECKLIST/SIGNOFF SHEET

GROUP: 18 GROUP NAME: Vision

Deliverables:

- ✓ Requirements Description
- ✓ ER Diagram with Min/Max Specifications
- ✓ ER Diagram Uncaptured Constraints
- ✓ Relational Schema with Referential Integrity, each table should have its primary key underlined
- ✓ Functional dependencies and Minimal Universal Key, Universal Schema
- ✓ Transaction Processing Needs: Categorized with brief description
  - ✓ Forms ✓ Reports ✓ Queries

Assessment:

- ✓ Group Status Report

We have each reviewed the contents of this deliverable.

	Printed Name	*ASUEmail*	*Signature*
Phase Leader	Phung Tran	pttran4@asu.edu	Phung tran
Phase Recorder	Cory Latino	clatino@asu.edu	Cory latino
Phase Checker	Seong Min Kim	smkim6@asu.edu	Simon Kim
Technical Advisor 1	Abdullah Alarabi	aalarab1@asu.edu	Abdullah Alarabi
Technical Advisor 2	Ladapa Chaiyasut	lchaiyas@asu.edu	Ladapa Kate

CSE 412

Database Management

Microsoft Access™ Project

Hospital Database System Database (COMPANY)

Phase 2 Deliverable

Due Date: October 14, 2017
Group No: 18
Group Name: Vision
Members: Phung Tran
Cory Latino
Seong Min Kim
Abdullah Alarabi
Ladapa Chaiyasut

TABLE OF CONTENT

Hospital Database System

1. INTRODUCTION

The Hospital Database System Database based on the client requirements and description of the enterprise. The Hospital Database System Database implementing processes and deliverables references the following book:

Database Systems Concepts

A. Silberschatz, H. Korth and S. Sudarshan, McGraw Hill

The relational design of the Hospital Database System Database COMPANY discusses in the first part of the document, which includes the following topics:

- Requirements and Description of the Enterprise/Database
- Entity-Relationship Diagram model of COMPANY with Min/Max Specification
- Uncaptured Constraints of Entity-Relationship Diagram model of COMPANY
- Mapping from Entity-Relationship Diagram model to relational schema
- Forms, reports and queries summary

The theoretical issues of the Hospital Database System COMPANY database design addresses in the second part of the document database design, which includes the following topics:

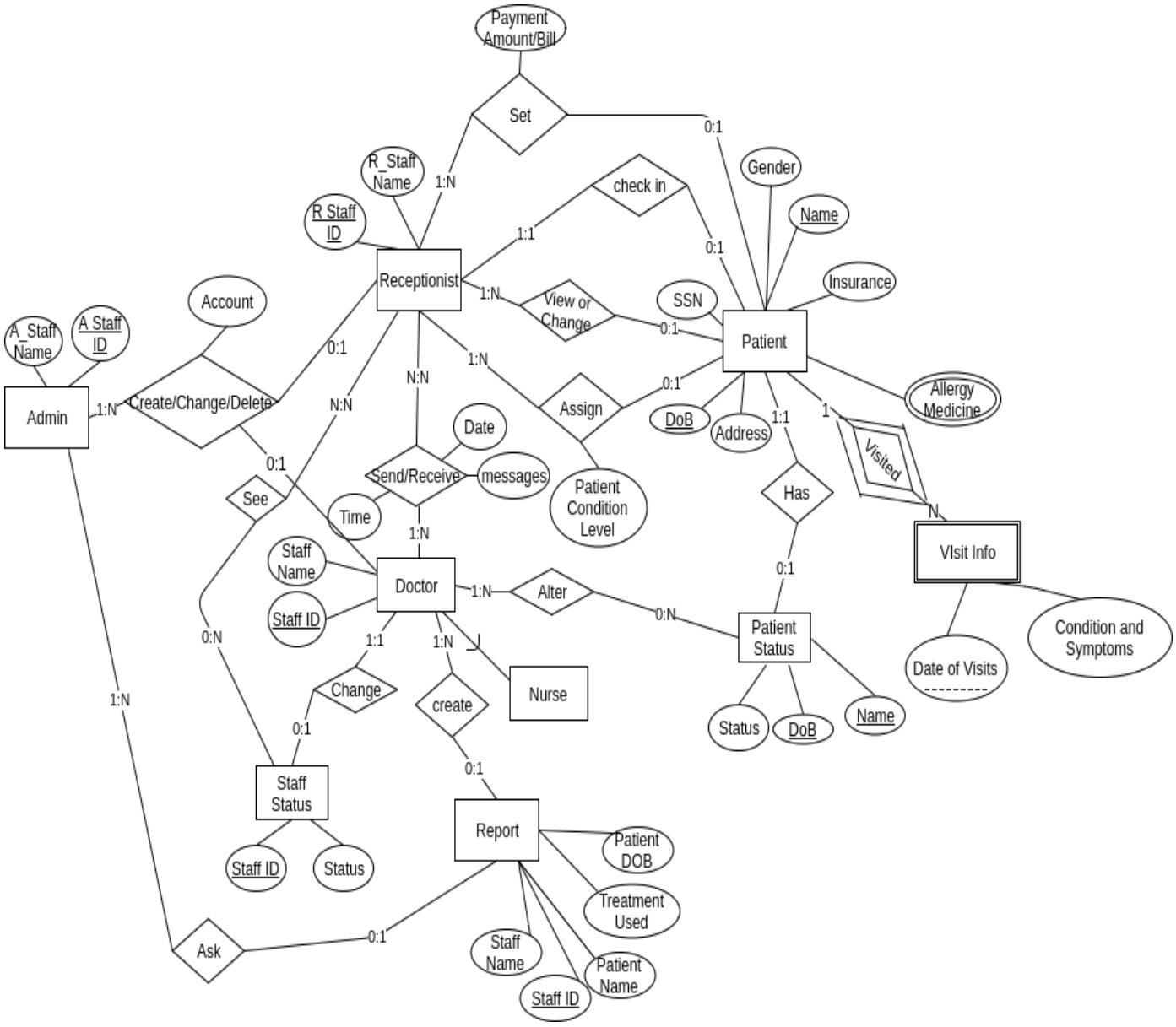
- Functional Dependencies
- Minimal Universal Key

2. REQUIREMENTS AND DESCRIPTION OF THE ENTERPRISE/ DATABASE

Requirements:

- **Patient**
  - Patient can check-in with receptionist by entering name, address, date of birth, gender, SSN, insurance information, medicine that they are allergic to, description of their condition, check in time and date.
  - Each patient has a status(waiting, being seen, released, paid/checked out). When a patient checks in, the status becomes waiting.
- **Receptionist**
  - Can view and change information of patients
  - Based on the condition description of each patient, a receptionist assigns a patient condition level (severe, medium, light)
  - Based on each patient condition level/ check in time, make a queue of (sort) patients.
  - Can see the status of doctors and nurses (off duty, seeing a patient, available)
  - Can send messages to a doctor or a nurse.
  - Can set payment amount for each patient.
- **Doctor/nurses**
  - Change their status. Eg: Off duty to available.
  - Change patient status.
  - See the messages from receptionists.
- **Admin**
  - Admin can create/delete/change accounts for doctors, nurses, and receptionists.
  - Can ask for report on which doctor/nurse treated/saw which patients.

3. ER DIAGRAM DESIGN WITH MIN/MAX SPECIFICATION



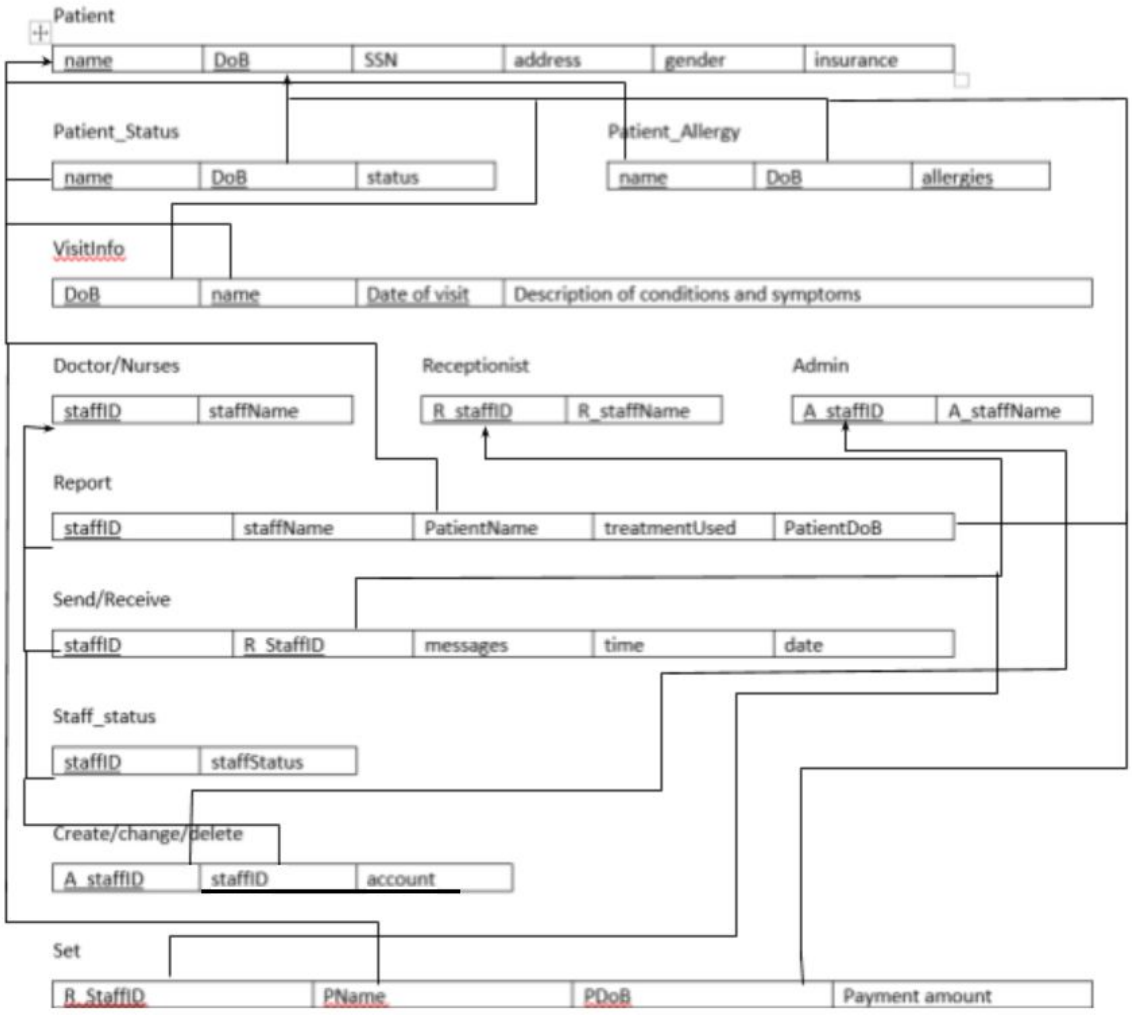
4. ER DIAGRAM UNCAPTURED CONSTRAINTS

The list of uncaptured constraints by the ER diagram of the Hospital Database System Database COMPANY:

- Doctors and Nurses cannot change other staff status
- Doctors and Nurses can only create report for their patients.
- Doctors and Nurses can only change their own patient's status, and only one at the time.
- Doctors and Nurses cannot see more than 1 patient at a time.
- Doctors and Nurses can only have one status at the time.
- Receptionist cannot assign patient condition level without hearing a description of their conditions and symptoms from the patient.
- Patient can only have one status at the time
- Bills cannot be less than 0 dollars.
- Admin can only create/change accounts for doctors/nurses/and receptionists that work for the same hospitals.
- Admin can only delete accounts if the staff quit/resign/retired.

5. RELATIONAL SCHEMA WITH REFERENTIAL INTEGRITY

The Hospital Database System Database COMPANY diagram is mapped to the relational schema with arrows indicating referential integrity.



6. FUNCTIONAL DEPENDENCIES AND MINIMAL UNIVERSAL KEY

The list of the functional dependencies (FD's) set of the Hospital Database System:

F = {

FD1: NAME, DOB → SSN, ADDRESS, GENDER, INSURANCE

FD2: NAME, DOB, ALLERGY_MEDICINE → NAME, DOB,

ALLERGY_MEDICINE

FD3: NAME, DOB → PATIENT_STATUS

FD4: NAME, DOB, DATEOFVISIT →DATEOFVISIT,

CONDITIONANDSYMPTOM

FD5: STAFFID → STAFFNAME

FD6: R_STAFFID → R_STAFFNAME

FD7: A_STAFFID → A_STAFFNAME

FD8: STAFFID, R_STAFFID → MESSAGES, TIME, DATE

FD9: STAFFID → STAFFNAME, PATIENT_NAME,

TREATMENT_USED, PATIENTDOB

FD10: STAFFID → STAFF_STATUS

FD11: A_STAFFID, R_STAFFID → ACCOUNT

F12: R_STAFFID, PATIENT_DOB, PATIENT_NAME→ PAYMENT_AMOUNT

F13: R_STAFFID, PATIENT_DOB, PATIENT_NAME →

PATIENT_CONDITION_LEVEL

FD14: A_STAFFID, STAFFID → ACCOUNT

}

Universal Schema:

Hospital (PSSN, PName, PGender, PDoB, Paddress, PInsurance, AllegyMedicine, VisitInfo_DoB, , VisitInfo_Name, VisitInfo_DescriptionOfConditionsAndSymptoms, VisitInfo_DateOfVisits, PStatus_Name, PStatus_DoB, PStatus_status, Assign_PatientConditionLevel, Set_PaymentAmount, R_Staff ID, R_Staff Name, create/change/delete_Account, Send/Receive_Date, Send/Receive_Time, Send/Receive_messages, Doctor/Nurse_StaffID, Doctor/Nurse_StaffName, Report_StaffName, Report_StaffID, Report_PatientName, Report_TreatmentUsed, Report_PatientDoB, Admin_AStaffID, Admin_AstaffName)

The **minimal universal key** is {PName, P DoB, StaffID, A_StaffID, R_StaffID, DateofVisit, Allegymedicine}. The following attribute closure of the minimal universal key shows that the minimal universal key can be used to derive all attributes in the universal schema:

Given	Patient Name, Patient DoB, Status Name, Status DoB, Staff ID
FD1	DOB, Name -> SSN, address, gender, insurance
FD2	DOB, Name, medicine -> allergy meds
FD3	DOB, Name -> patient status
FD4	DOB, Name, dateofvisit ->date of visit , description of condition
FD5	StaffID -> staffName
FD6	RStaffID->RStaffName
FD7	A_StaffID->A_StaffName

FD8	StaffID, R_StaffID -> messages, time, date
FD9	staffID->StaffName, PatientName, TreatmentUsed, PatientDoB
FD10	StaffID->Staff Status
FD11	A_StaffID, R_StaffID -> account
FD12	R_StaffID, PDob, PName -> payment amount
FD13	R_StaffID, PDob, PName -> patient condition level

The universal key {PName, PDoB, StaffID, A_StaffID, R_StaffID} is minimal because no subset of it forms a key of the universal schema:

Pname, PDoB, DateofVisit is needed to determine the attribute of weak entity in visit info.

Allergy is required to be a part of minimal universal key because it is a multi-valued and it has no other way to be access unless it has combined with the entity patient primary key

R_StaffID, StaffID (for doctor/nurse) is needed to determine messages, time and date attributes.

A_StaffID is needed to determine the attribute Account.

7. TRANSACTION PROCESSING NEEDS

The processing needs of the Hospital Database System Database COMPANY characterized with respect to the operations between a patient, receptionists, doctors, nurses, admin, and misc queries.

8. FORMS

The table summarizes the forms of the Hospital Database System Database COMPANY.

Form Name and Description	Relation Accessed	Explicit Constraints Checked
Patient Check In: Receptionist is responsible for checking in the patient. They submit the required patient information (ex: name, D.o.B, etc) into the database for the doctor and nurses to see when they treat a patient.	● Patients (Read/Insert) ● Receptionists (Read)	● None
Bill Payment: Receptionists is responsible for sending out the bill to the patient. The form enclosed will include the payment method such as credit card number, insurance information, name, and billing address.	● Patients (Insert/Update) ● Receptionists (Read)	● None
Medical prescription: Patients are seen by a doctor and nurse to review their symptoms. Based on that, the doctor or nurse are able to prescribe the medicine, daily dose, name of the patient, refill option and the location of the pharmacy for the patient	● Patients (Read/Insert) ● Doctor (Read) ● Nurse (Read)	● Patient Allergic to certain medicine
Database Configuration: Admins have the highest privilege in the database environment. They can add or change receptionists, nurses, and doctors account.	● Patients (Read/Update) ● Receptionists (Read/Update) ● Nurses (Read/Update)	● None

	● Doctors Read/(Update) ● Admins (Read)	

9. REPORTS

The table summarizes the reports of the Hospital Database System Database COMPANY.

Report Name	Description	Relations Accessed
Doctor and Nurses Report	For the admin to obtain a report of the patients that doctors and nurses treated and the treatments they gave to the patients. The report also shows the patient's name, symptoms, and insurance.	● Hospital ● Patient ● Doctors ● Nurses
Receptionist Report	Receptionist is responsible to obtain the description of conditions or symptoms of the patient to determine the condition level (severe, medium, or light) of the patients. Afterward the receptionist form a report to send to the doctors and nurses to determine the queue of which patient to see first.	● Hospital ● Patient ● Receptionists
Admin Report	Admins manage the Hospital database and have the highest privilege in the database. They can access, create, and edit any of the other entities within the database.	● Hospital ● Patient ● Doctors ● Nurses ● Receptionists ● Admins

10. QUERIES

The table summarizes the queries of the Hospital Database System Database COMPANY.

Query Name	Description	Output	Relations Accessed
Patient with Severe Condition Information	For each doctor to retrieve the names and symptoms of patients who have a severe condition.	● Patient first name ● Patient last name ● Patient Symptoms ● Patient Condition	● Patient ● Doctor
Receptionist Messages	For each doctor to retrieve the receptionist's messages from the past 3 days.	● Messages Date ● Receptionist Messages	● Doctor ● Receptionist
Patient Older than 50 with Heart Disease	For each doctor to retrieve the names and gender of patients who older than 50 with have heart disease.	● Patient first name ● Patient last name ● Patient gender ● Patient age ● Patient Symptoms	● Patient ● Doctor
Doctor with Off-Duty Status	Retrieve the names of the doctor who has an off-duty status.	● Doctor first name ● Doctor last name ● Doctor status	● Doctor ● Receptionist
Patient with Check-in Status Information	Retrieve the names, insurance, SSN, and symptoms of patients who have a check-in status.	● Patient first name ● Patient last name ● Patient insurance ● Patient SSN ● Patient Symptoms ● Patient Status	● Patient ● Receptionist

GROUP STATUS REPORT

GROUP #: 18 GROUP NAME: Vision PHASE #: 2

We have each reviewed the contents of the following group status report:

	Printed Name	*Signature*
Phase Leader	Phung Tran	Phung tran
Phase Recorder	Cory Latino	Cory Latino
Phase Check	Seong Min Kim	Seong Min Kim
Technical Advisor 1	Abdullah Alarabi	Abdullah Alarabi
Technical Advisor 2	Ladapa Chaiyasut	Ladapa Kate

- Dates & attendance at group meetings in this phase:

  Monday, October 16, 2:00 p.m. - 4:00 p.m. All group members present.

  Wednesday, October 18, 4:00 p.m. - 5:00 p.m. All group members present.

- Overview of progress on project as of October 16, 2017 (date):

  Implemented the relation schema, functional dependencies and universal schema. Double check the relation schema and make sure the design contains all the requirements. Transferred the physical relation schema to the diagram. Added the relations accessed and explicit constraints to the forms, report, and queries to met with the new ER diagram.

- Overview of progress on project as of October 18, 2017 (date):

  Final overview and agreement on the new ER diagram and the document format. Double check the new ER diagram, relation schema, functional dependencies, universal schema and make sure the design contains all the requirements.

- For each group member, indicate in detail the contributions and expected contributions in this phase:

Leader:

- Coordinate details upon meeting and planning the meeting schedule.
- Assist with keeping track of the requirements
- Contribute to design and forming ER diagram.
- Will do a final check on the ER Diagram.
- Assist with FD and relational Schema with integrity constraint
- Technical advice to universal minimal Key
- Final check with team on the Phase 2.

Recorder:

- Write down teams key points, ideas and decisions
- Record facts only

Phase Checker:

- Check the progress of the on going project to ensure that the group members are on schedule to finish in time.
- Check for any errors present
- Checked and revised the errors in ER diagram

Technical Advisor 1:

- Rewrote and revised requirements and descriptions
- Implemented patient's branch of the ER diagram
- Contributed to designing the final ER diagram

Technical Advisor 2:

- Created documents for deliverable.
- Implemented report’s relations accessed.
- Implemented induction.
- Implemented queries’ output and relations accessed.
- Reviewed database requirements and descriptions.