Project for Database Design

Phase I. EER Design

Vinit Patel vnp130130@utdallas.edu
Madhav Patel mmp130630@utdallas.edu

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0. Pre-Illumination

For clearly describing the EER design, we separate this report into three parts. In Part 1 we specify the assumptions, explanations and limitations of the whole project, in Part 2 we draw the EER diagram in details, and in Part 3 we give the explanation of (min, max) notation for all the relationship appearing in EER diagram. Finally, a short summary will be given at the end of this report.

1. Assumptions, Explanations and Limitations

In this part we discuss all the assumptions, explanations and limitations in this project to illuminate our EER diagram, based on both the project description and real life experiences.

1.1 Assumption

- We think that all the patient contacts hospital directly with phone numbers they have and receptionist accepts their request.
- One doctor prescribes multiple patients. So we have cardinality as 1:N for relationship between doctor and patient.
- We assume that the doctor and nurses responsible for patient is same as they treats the patient.
- We have assumed that one receptionist makes appointment for multiple patients by calling and also that the receptionists have all the data of patients.
- We have assumed that age of each volunteer is less than 75.
- We assume that the system has already implemented algorithm to generate unique patient id.
- For cardinality of receptionist and patient, we assume that one receptionist communicates with multiple patients.
- We have assumed that appointment is scheduled just by call or online-website. But it is also possible that appointment is taken in person at hospital.
- Pharmacist has all information to write prescriptions.
- We have assumed that patient informs the relatives about the events organized by hospital and then even the individual relatives can attend the event.
- We assume notation M and N for showing multiple (Many) cardinality.

1.2 Explanation:

- **Subclasses of Hospital Management System:**

  ->The entities named ‘Doctor’, ’Nurse’, ‘Receptionists’, ‘Manager’, ‘Support Staff’ and ‘Pharmacist’ are subclasses of Employee entity.

  ->Part_time and Full_time entities are subclass of ‘Support staff’ entity.

  ->In_Patient and Out_Patient are subclasses of Patient entity.

  ->Call and online are subclasses of appointment entity.

  ->Patient and relatives entities are subclass of attendees entity.

- **Union of Hospital Management System:**

  The Union of Employee entity and Volunteer entity forms event holder entity.

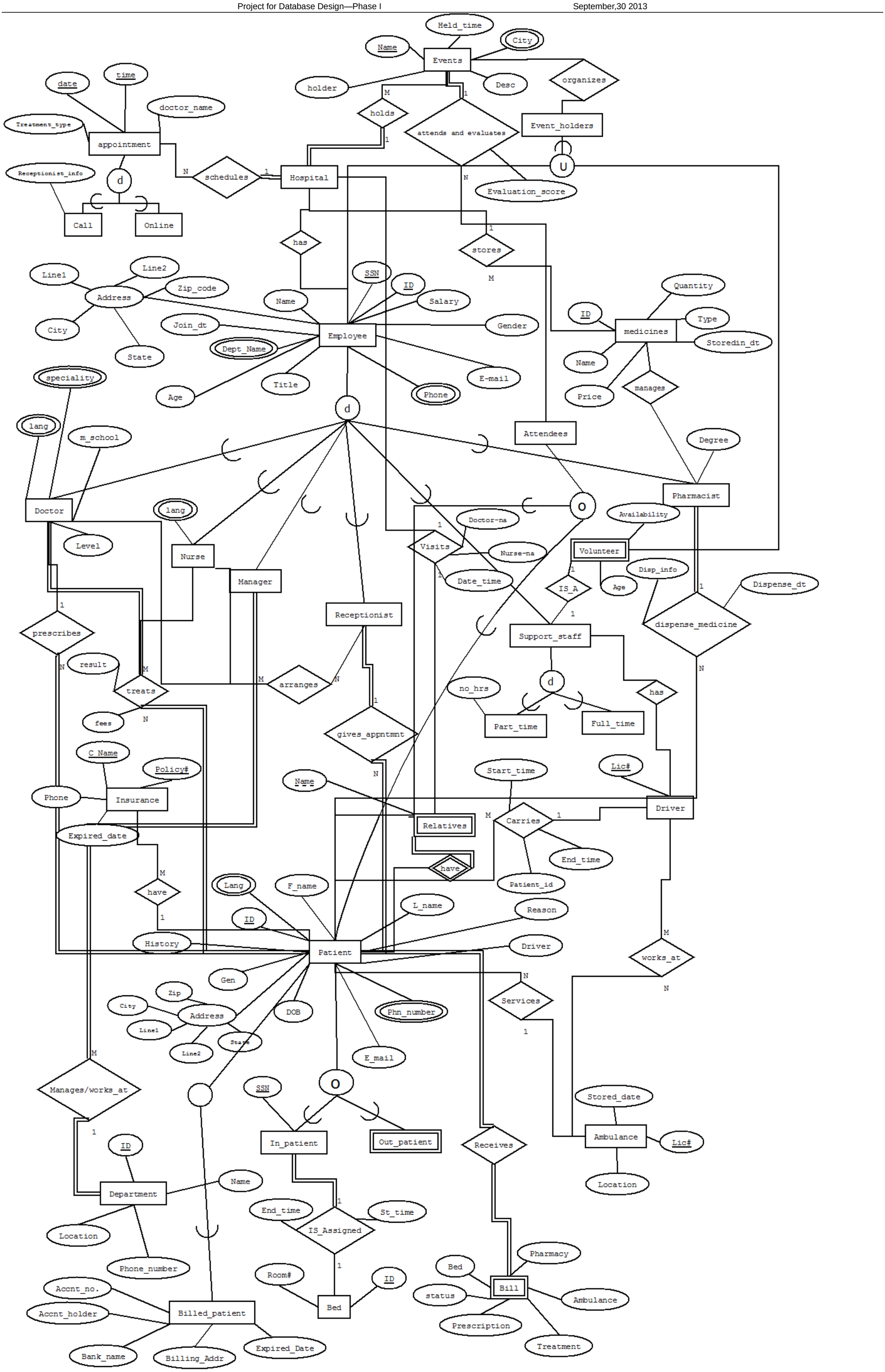
1.3 Limitations:

There are some limitations both from title statement and from daily life. We list them as follows:

- Here the system only stores weekly information of work hours so we cannot get the daily work hours of part-time support staff.
- Based on policy number, one cannot determine on what companies insurance patient is covered.
- The patient can’t have insurance of more than 3 companies.
- Ambulance is unable to carry more than 5 patients.
- The system records the name of each relatives but is not storing any other details so when individual relatives attends event, it is not possible to find which patients’ relatives has exactly attended the event.

2. EER Design Diagram:

In this part we draw an EER design diagram. Figure 1 exhibits the whole design as follows:


Held_time
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1
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Receptionist_info
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Hospital
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Nurse-na
Volunteer
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Disp_info
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Receptionist
Support_staff
dispense_medicine
prescribes
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treats
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Full_time
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Policy#
Start_time
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Reason
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History
Patient
Driver
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Line1
State
1
E_mail
Line2
M
Manages/works_at
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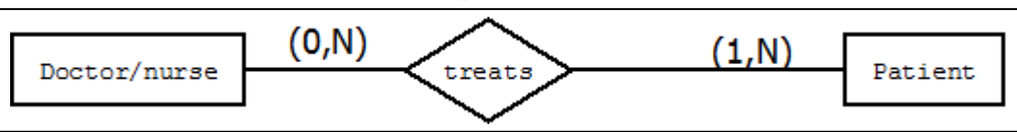
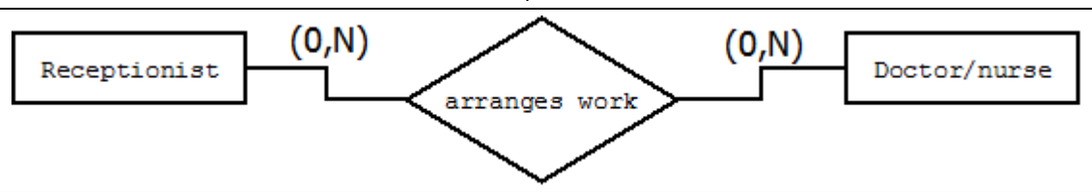
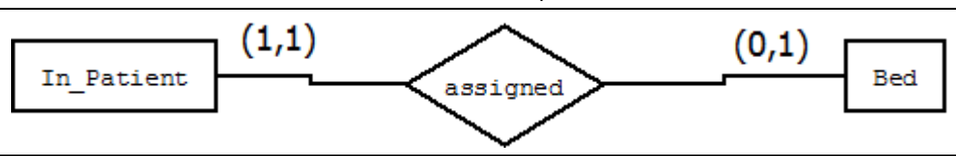
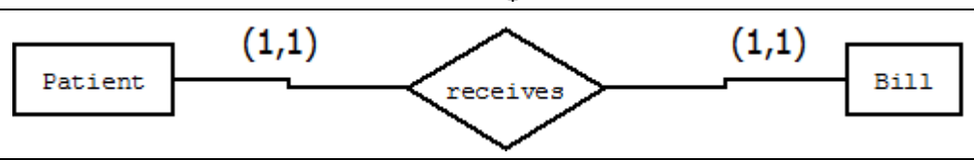
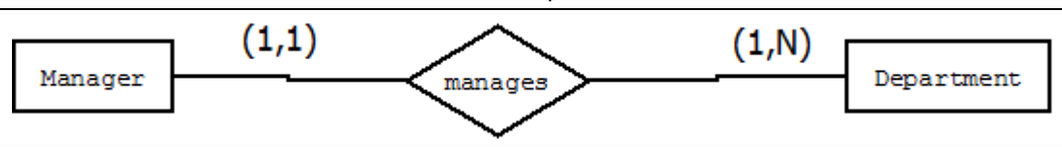
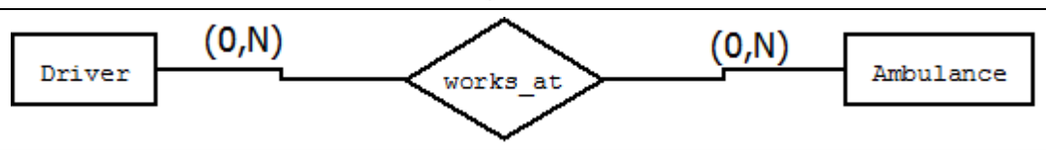
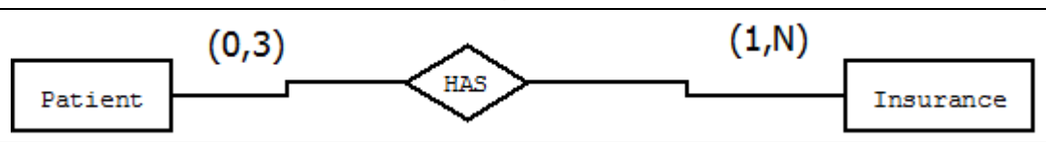
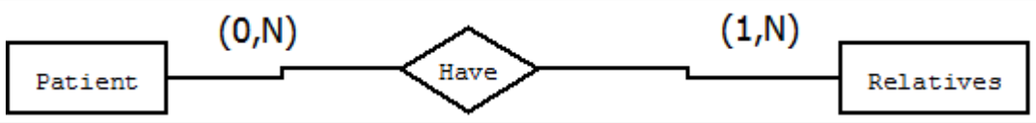
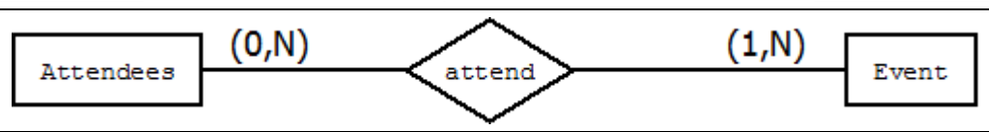
1
ID
In_patient
Out_patient
Receives
Ambulance
Lic#
Name
Department
Location
End_time
St_time
IS_Assigned
Location
Phone_number
1
Pharmacy
Bed
Room#
ID
Accnt_no.
Bill
status
Ambulance
Accnt_holder
Billed_patient
Prescription
Treatment
Bank_name
Billing_Addr
Expired_Date

3. (Min, Max) Notation for Relationship

In this part we discuss the (min, max) notation for several relationships exist in our EER design diagram. Table 1 clearly specifies how the numerical expression corresponds to the relationship between two entities.

Table 1. Explanation for (Min, Max) Notation

Numerical Expression	Discussion
	• The doctor may have 0 to N patients and on the other side each patient must have 1 doctor and even can have upto N doctors.
	• The doctor/nurses may treat 0 to N patients and on other side each patient is supposed to have atleast 1 doctor/nurse to N of them.
	• Receptionist arranges doctor/nurse on basis of patient's request. So it may arrange 0 to N doctor/nurse and vice-versa.
	• Receptionist gives appointment to one patient while Patient gets an appointment from at least one receptionist to N receptionist.
	• Each In patient is assigned exactly one bed. On the other side, bed may or may not be assigned to any in patient. So, it will be 0 to 1.
	• Each patient gets exactly one bill and vice versa.
	• One manager manages exactly one department. Each department may be managed by many managers.
	• Each driver may work at multiple ambulances and an ambulance may be driven by many drivers.
	• Each patient may have maximum 3 insurance. On the other side, an insurance must have at least one patient. SO, it will be 1 to N.
	• Each ambulance may carry maximum 5 patients. On the other side, a patient may be carried by 0 or 1 ambulance.
	• Each patient may have relatives from 0 to N. On the other side, relatives must have at least 1 patient. So, it will be 1 to N.
	• Each attendee may or may not attend event. On other side, an event is attended by at least one attendee. So, it will be 1 to N.

(The above is just an example)

4. Conclusion

In this report we discussed and drew the EER diagram for Database of **Hospital Management System**. In the first part we made our assumptions and explanations, and then we gave the diagram for our EER model. The last part is mainly focused on all relationships existed in the EER diagram.

This report analyzed the conceptual model of **Hospital Management System** Database. The next step is to build physical models and other details. In the future, we may change some mappings of this conceptual model when facing practical difficulties and other requests. In addition, Figure 1 includes all the details which we may omit in our description.