

Space Medical System

With this model we are concerned mainly with the diseases (and their treatments) that are found on specific planets. We also wish to keep track of which people have visited the planets, whether or not they contracted the disease and if so who treated them.

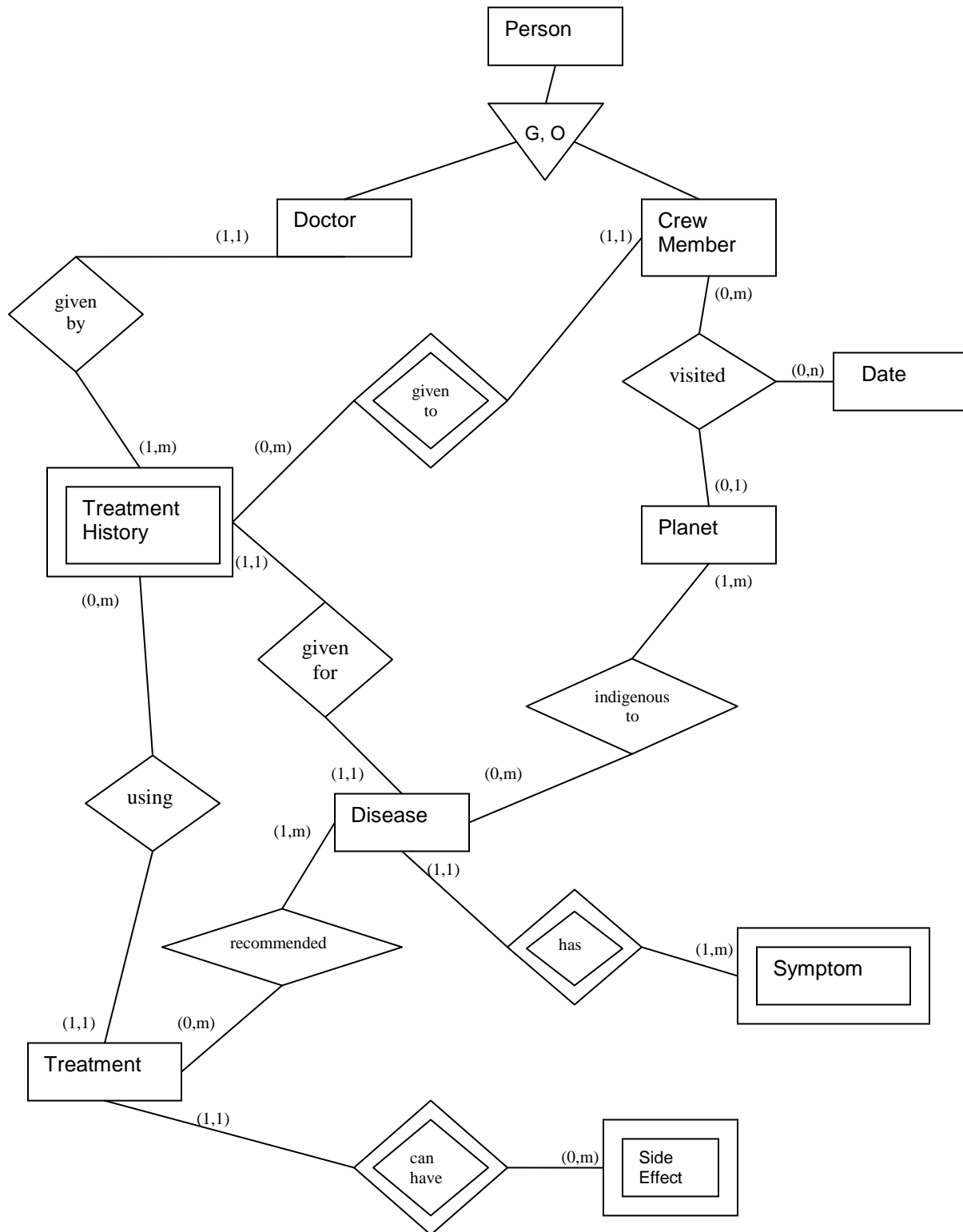
We began the design of the ER diagram for the Space Medical System by reviewing the requirements:

The sick bay of the starship Enterprise keeps the following information about its physicians and the crew members they treat.

1. For each crew member, the physician maintains a history of the diseases contracted and a record of drug allergies.
2. The planets on which the crew member has visited is kept as history information.
3. Also a description of each planet is maintained including the know diseases indigenous to the planet.
4. For each disease known a description of the symptoms, treatments and possible side effects of the treatment is kept.
5. The captain of the Enterprise needs to be able to list the names of all the crew members that a given physician has treated.
6. A list is needed showing the names of all the planets a given crew member has visited along with the disease and treatment information.
7. A specified treatment for a given disease and a list of all crew members who are known to be allergic to this treatment is needed.
8. Be able to produce the following statement for each crew member:

Crew member "Jones"
HAS-RECEIVED "treatment"
FOR "disease x"
USING "treatment y"
BY "physician Smith".

We have elected to only show the entity types and relationships on the graphical model. The attributes and their value types are listed on the page following the diagram.



ENTITIES**PEOPLE**

people-id (entity identifier)
name
birthdate

CREW-MEMBER (the entity
identifier is same as **PEOPLE**)
position
salary

DOCTOR (the entity
identifier is same as **PEOPLE**)
degree
school
degree-date
speciality

PLANET

planet-id (entity identifier)
planet name
planet location

DATES

visited-arrival-date
visited-depart-date

DISEASE

name-of-disease (entity
identifier)
description-of-disease

SYMPTOMS

symptom-number
(discriminator)
symptom-description

TREATMENT

treatment-id (entity identifier)
treatment-description

SIDE-EFFECTS

side-effect-number
(discriminator)
side-effect description

TREATMENT-HISTORY

date-contracted
(discriminator)
date-released-from-treatment
description-of-symptoms-
occurred
results-of-treatment
allergic-reaction-description

RELATIONSHIPS**PLANET-INDIGENOUS-TO-
DISEASE**

planet-id, name-of-disease
(relationship identifier)
date-discovered
name-of-person-discovering-
disease

**DISEASE - RECOMMENDED -
TREATMENT**

name-of-disease, treatment-id
(relationship identifier)
recommendation-priority

We feel that a further explanation of the **CREW-MEMBER - VISITED - PLANETS - VISITED - DATES** relationship is needed. What we needed was to keep track of all the times a crew member has visited a planet. If we were to assign the **ARRIVAL-DATE** and **DEPART-DATE** as attributes on the visited relationship instead of a related entity, we could have only kept track of the last time a crew member visited a planet--not all the times.

To completely understand this situation, let's look closer at the two types of **VISITED** relationships. Without the **DATE** entity, the relationship identifier would be **PEOPLE-ID, PLANET-ID**, with the two dates as intersection data. Since the purpose of a relationship id is to uniquely identify a relationship in a relationship type, we could only keep one combination of **PEOPLE-ID, PLANET-ID**. Therefore, we could only keep track of one visit of a the crew member to a planet. By making the dates a separate entity, the relationship identifier of **VISITED** is now changed. It is the combination of **PEOPLE-ID, PLANET-ID**, and **DATES**. Now, we can keep data on more than one visit of a crew member to the same planet--as long as it is on different dates.