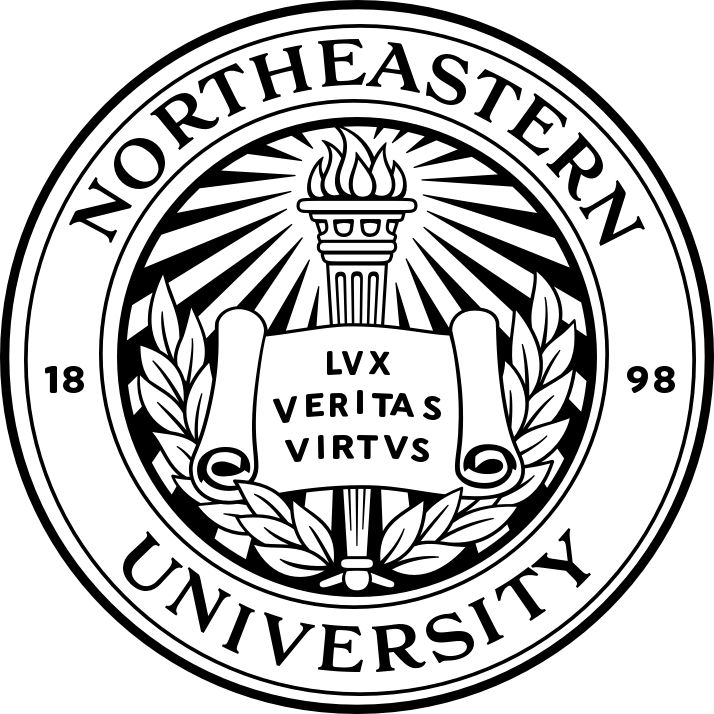
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**DOCUMENT FOR MODELLING A DENTAL CLINIC**

BY

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# **REVISION HISTORY:**

|  |  |  |
| --- | --- | --- |
| VERSION | CHANGES MADE | DATE |
| 0 | Merged content in various contents from 4 reports into this report, edited theoretical content | 11/13/2019 |
| 1 | Edited high level diagram & data model  added | 11/14/2019 |
| 2 | Reformatting for printouts | 11/15/2019 |
| 3 | Enhanced the model to manage payment of invoices.  Also tracked what is happening at tooth level of the patient. | 12/1/2019 |
| 4 | Improvement for insurances and equipment management in data model. | 12/9/2019 |
| 5 | Improvement for invoice and merging of patient clinical data and patient history in data model. | 12/11/2019 |

# **DOCUMENT PURPOSE:**

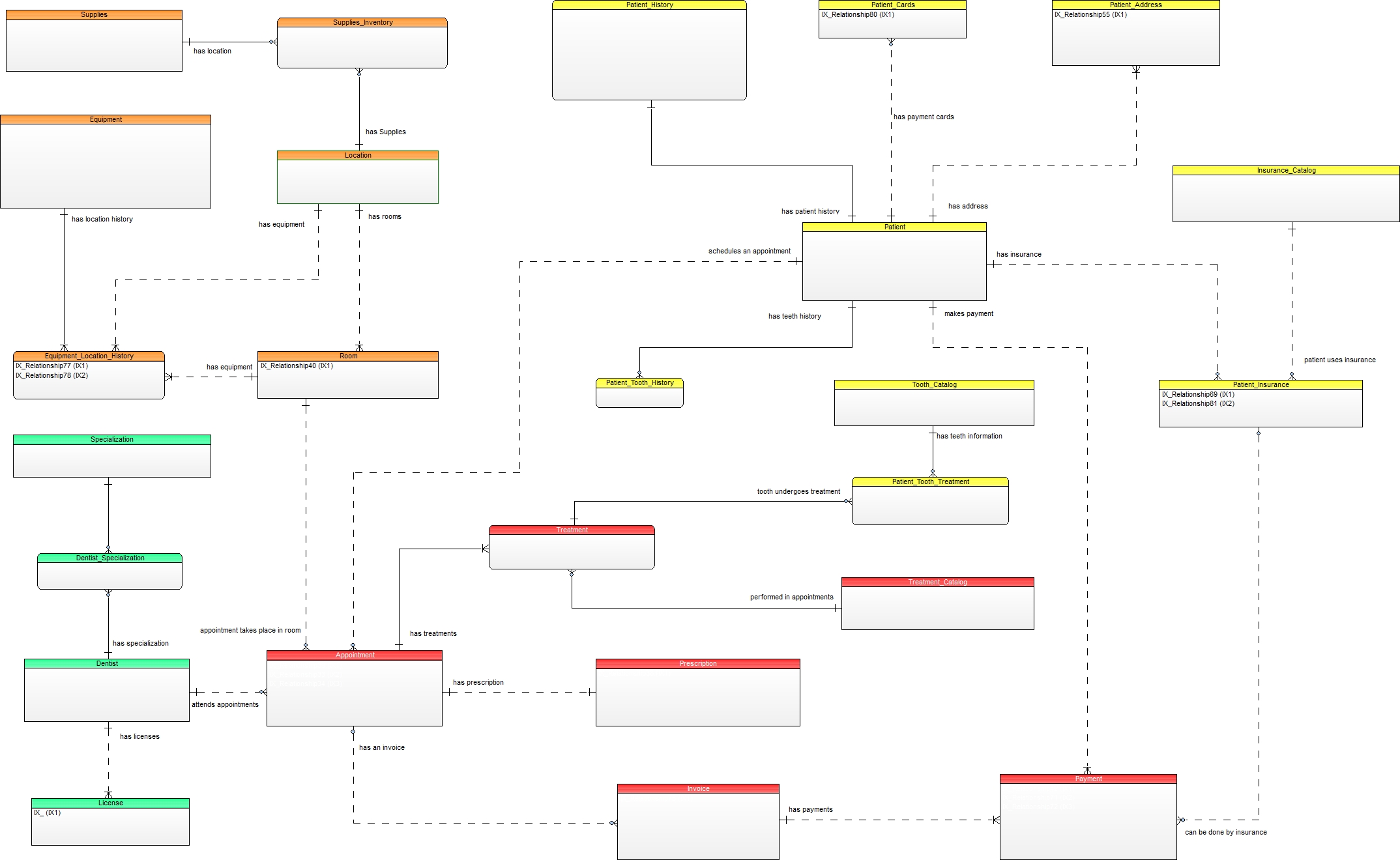
This document has been created for the **stakeholders** to identify the key subjects involved and get a proper understanding of the behavior of this model. Subject descriptions have been provided to identify the role of each subject. Furthermore, each subject has been given some business rules to define constraints and rules to help developer build and business to understand the constraints. In-scope rules states all the rules that we will be using to build the model whereas the out-scope rules consist of those that won’t be handled by the designed model.

# **AUDIENCE:**

This document contains integral information; helping the **developers** involved in building the Dentist Office model and the **Dentist’s business** reach an agreement.

* Developers
* Dentists’ Business

# **HIGH LEVEL DIAGRAM:**



# **SUBJECTS:**

**PROVIDER -**

The provider subject is where information regarding the caregivers at the dental facility will be housed. Information captured here will include the data necessary to allow for a provider to perform work on behalf of the facility.  Insurance information, licenses, specializations and general demographic information will be kept in this area. This section should support the other areas within the stem with regards to caregivers such as providing services and obtaining reimbursement for the services

**PATIENT -**

Another important subject of the model, a person who is going to receive or has been registered to receive treatment from doctors. In this case, the dentist. The patient subject will house all the information regarding the patients such as their past medical history, insurance information and their general demographic information.

This subject supports the functionality of other entities within the model such as being the subject to choose from a treatment catalog and being the subject obtaining the reimbursement for services provided by the providers.

**APPOINTMENT –**

The appointment subject of the model will consist of every information that goes into successfully having an appointment in place, between a provider and the patient. It is an arrangement to meet at a room, at a given time and place. Hence, this subject will capture information regarding the rooms and the provider’s availability information for the appointment. This information will be used by the provider to help patient’s set an appointment with the provider. This area also provides support to other areas like prescription & invoice.

**LOCATION –**

Location subject area contains the information regarding the place at which the dental treatment will take place. Information here will contain the exact address like the room which are uniquely identified, building etc. This subject area should support the other areas like the supplies used and required for the dental treatment & a track of equipment at each location.

**SYSTEM –**

The subject ‘system’ will contain different roles within the business. Each role in the system will have a well-defined scope within the business to carry out it’s functionalities. The different roles that can be included in the system can be an administrative role for higher level functionalities and users with authentication for access to their accounts.

# **BUSINESS RULES:**

**INSCOPE BUSINESS RULES –**

|  |  |  |
| --- | --- | --- |
| ID | Rule | Area |
| IS01 | Patient can book one OR many appointments with dentist, two appointments cannot be at the same time | Patient /Appointment |
| IS02 | Patient must have valid health insurance in order to claim it. | Patient / Patient Insurance |
| IS03 | One patient can apply insurance from 2 Insurance companies. | Patient / Patient Insurance |
| IS04 | Patient’s demographic information i.e. name, address, date of birth, contact number Need to be captured. | Patient |
| IS05 | One Patient can have one Appointment at one Time with one Dentist. | Patient /Appointment/Dentist |
| IS06 | Patient History needs to be captured for each patient. | Patient |
| IS07 | Patient history needs to be updated first visiting the practice and yearly thereafter. | Patient History |
| IS08 | Patient history must include medication, medical conditions and allergies of the patient. | Patient History |
| IS09 | Patient insurance will be the preferred mode of the payment from the patient. | Patient Insurance |
| IS10 | Dentist must have valid license in order to perform dentistry and they can have many. | Dentist / License |
| IS11 | Dentist can work or visit multiple locations on same day. | Dentist /Location |
| IS12 | Dentist can have multiple specialties. | Dentist /Specialization |
| IS13 | Each license must have license number and expiry date. | License |
| IS14 | Confidential data such as SSN, Tax Payer Id, etc. should be stored in separate reference table with more security applied to the table. | Patient |
| IS15 | Only the drugs prescribed by the Dentist to the Patient will be tracked in this system as a part of Prescription. |  |
| IS16 | Treatment Catalog must list all the available services. | Treatment Catalogue |
| IS17 | Price must be assigned to each service in the catalog | Treatment Catalogue |
| IS18 | Status of appointment (Open, Done, Cancelled) needs to be captured. | Appointment |
| IS19 | Dentist can have multiple scheduled appointments but not at the same time. | Dentist |
| IS20 | Every appointment should contain a patient, dentist date, time and a location for that appointment | Appointment |
| IS21 | An appointment has to be associated with a specific room at the location | Appointment /Room |
| IS22 | Every Invoice must have mode of payment i.e. Card, Cash or insurance . | Invoice |
| IS23 | A patient can have one or more than one prescriptions from multiple doctors | Prescriptions /Patient |
| IS24 | Patient’s card details need to be captured for faster payment checkouts. | Patient Cards |
| IS25 | Drugs, Anesthetics, Syringes needed for dental office need to be listed and tracked. | Supplies |
| IS26 | Details about various supplies such as number of units available, cost of each unit etc. need to be maintained. | Supplies |
| IS27 | Availability of supplies at a location should be tracked. | Location/Supplies |
| IS28 | Room can have multiple appointments but not at the same time. | Room |
| IS29 | One appointment can have more than one prescription. | Prescriptions/ Appointment |
| IS30 | The prescription can be provided without an appointment to patients by dentist. | Prescriptions |
| IS31 | Dentist should able to set their appointment slots as unavailable. | Dentist/ Appointment. |
| IS32 | Purchase Date, Warranty, Portability of the equipment needs to be tracked. | Equipment |
| IS33 | A location for equipment and a room where it is kept need to be tracked. | Equipment |
| IS34 | Maintenance schedules on all the equipment, along with the history of maintenance performed, should get tracked. | Equipment |
| IS35 | Invoice amount can be paid by multiple payments. | Invoice/Payment |
| IS36 | Every invoice must be referenced with the appointment. | Invoice |
| IS37 | Every Insurance will be related to a Insurance Company. | Insurance |
| IS38 | Patient can have multiple addresses | Patient Address |
| IS39 | Multiple appointments can be made by a patient at multiple locations. | Appointment |
| IS40 | Patient can have one or more treatments per appointment. | Appointment/ Treatment |
| IS41 | Appointment must contain patient and dentist details. | Appointment |
| IS42 | Dentist can treat a single patient at a time. | Dentist |
| IS43 | Status of the patient’s each tooth must be tracked | Patient\_Tooth\_History |
| IS44 | The invoice can have multiple payments | Invoice/Payment |
| IS45 | If the payment is done by the insurance company, insurance number should be captured for particular payment. | Payment/ Insurance |
| IS46 | The treatment performed on particular tooth of the patient at an appointment should be captured. | Patient\_Tooth\_Treatment |

**OUTSCOPE BUSINESS RULES –**

|  |  |  |
| --- | --- | --- |
| ID | Rule | Area |
| OS01 | People who work in the office but do not participate in the care of a patient are not tracked in the system. |  |
| OS02 | Maintenance of the Dental office is not covered. |  |
| OS03 | Appointment’s waitlist is not needed to be checked in the data model | Appointment |
| OS04 | Emergency situations or emergency appointments are not included. | Appointment |
| OS05 | Status of prescription is not required. The status will always be approved as it is prescribed by Dentist | Prescription |
| OS06 | Cost involved in maintaining dentists parking is not included. | Dentist |
| OS07 | Any feedback measure regarding the clinic experience is not recorded. |  |
| OS08 | Patients have no means to avail discounts through membership in the system |  |
| OS09 | Finances of Dentist office are not tracked. |  |
| OS10 | Number of treatments OR surgeries performed by dentist are not to be tracked | Dentist |
| OS11 | Cost of the medicines prescribed to the patient will not be tracked in the system. |  |
| OS12 | Work schedule of other staff apart from the dentist/provider is not tracked |  |
| OS13 | Channel of booking the Appointment is not handled | Appointment |
| OS14 | Payroll of any personnel working at the dental office is not included. |  |
| OS15 | As provider himself provides prescription, there is no need to handle status of a prescription. | Prescription |

**ENTITIES:**

**DENTIST -**

An important entity of the model who caters the patients with a license to prevent, diagnose, and treat diseases and conditions of the teeth, jaw and mouth.

Entity will capture the demographic information and will be used as a reference to various other entities as Foreign Key.

|  |  |  |  |
| --- | --- | --- | --- |
| ATTRIBUTE | DATA TYPE | CONSTRAINTS | DEFINITION WITH EXAMPLE |
| Dentist\_ID | Int | PK ,NN | A Unique ID assigned to Dentist when they register with the state license Eg. 15 |
| First\_name | Varchar(15) | NN | Dentist’s first name Eg. Ric |
| Last\_name | Varchar(15) | NN | Dentist’s last name Eg. Stark |
| Email | Varchar(30) | NN | Dentist’s email ID. Eg. ricthedentist@gmail.com |
| Contact | char(12) | NN | Dentist’ Contact number. Eg. +11234567890 |

**SPECIALIZATION -**

Specialization entity is where the provider’s field of expertise is stored and is being identified to each provider in the system.

|  |  |  |  |
| --- | --- | --- | --- |
| ATTRIBUTE | DATA TYPE | CONSTRAINTS | DEFINITION |
| Specialization\_ID | Int | PK (NN) | A Unique ID assigned to specialization to uniquely identify specialization. E.g. 1 |
| Specialization\_name | Varchar(20) | NN | Specialization name.  e.g. Orthodontist |

**PATIENT -**

Another important entity of the model, a person who is going to receive or has been registered to receive treatment from doctors. In this case, the dentist. The patient entity too will be consisting of the demographic information.

|  |  |  |  |
| --- | --- | --- | --- |
| ATTRIBUTE | DATA TYPE | CONSTRAINTS | DEFINITION |
| Patient\_ID | Int | PK(NN) | A Unique ID assigned to a patient to uniquely identify them. Eg. 81 |
| First\_name | Varchar(15) | NN | Patient’s first name Eg. Michael |
| Last\_name | Varchar(15) | NN | Patient’s last name Eg. Scott. |
| Date of\_birth | Date | NN | Patient’s Date of Birth Eg. 04/24/1987 |
| Email\_ID | Varchar(30) | NN | Patient’s email ID. Eg.  MicScoot111@gmail.com |
| Contact | Char(12) | NN | Patient’s Contact number.  Eg. +14855258912 |
| Patient\_Type | Char(1) | NN | Type of the Patient  E.g. “A” =Adult or “C”=Child |

**PATIENT ADDRESS -**

This entity of the model stores different address a patient could have.

|  |  |  |  |
| --- | --- | --- | --- |
| ATTRIBUTE | DATA TYPE | CONSTRAINTS | DEFINITION |
| Address\_ID | Int | PK(NN) | A Unique ID assigned to a Address to uniquely identify them. Eg. 5 |
| Address | Varchar(150) | NN | Patient’s Address Eg. 1161 Boylston Street |
| City | Varchar(15) | NN | City of the address Eg. Boston |
| State | char(2) | NN | State of the address E.g. MA |
| ZipCode | Int | NN | Zip code of the address Eg. 02115 |
| Patient\_ID | Int | FK,NN | This will be a reference to the Patient\_ID from the patient entity. |

**PATIENT\_CARDS –**

This entity stores card details of the patient for faster checkout or bill payments in the future.

|  |  |  |  |
| --- | --- | --- | --- |
| ATTRIBUTE | DATA TYPE | CONSTRAINTS | DEFINITION |
| Card\_Number | BigInt | PK,NN | Card Number Eg. 1248 8567 8556 |
| Valid\_Through | Date | NN | The expiry date of the card  E.g. 20191211 |
| Patient\_ID | Int | FK,NN | This will be a reference to the Patient\_ID from the Patient entity. |

**TREATMENT –**

This entity provides the information regarding which treatment/s performed at particular appointment.

|  |  |  |  |
| --- | --- | --- | --- |
| ATTRIBUTE | DATA TYPE | CONSTRAINTS | DEFINITION |
| Treatment\_ID | Int | PFK,NN | This will be a reference to the Treatment\_ID from the Treatment\_Catalog entity. |
| Appointment\_ID | Int | PFK,NN | This will be a reference to the Appointment\_ID from the Appointment entity. |

**DENTIST\_SPECIALIZATION –**

This entity provides information regarding the specializations of the dentist.

Dentist can have one or more specializations.

|  |  |  |  |
| --- | --- | --- | --- |
| ATTRIBUTE | DATA TYPE | CONSTRAINTS | DEFINITION |
| Dentist\_ID | Int | PFK,NN | This will be a reference to the Dentist\_ID from the Dentist entity. |
| Specialization\_ID | Int | PFK,NN | This will be a reference to the Specialization\_ID from the Specialization entity. |

**APPOINTMENT -**

An arrangement for the dentist and patient to meet at a particular room, at a given time and place along with stored information to summarize the appointment.

|  |  |  |  |
| --- | --- | --- | --- |
| ATTRIBUTE | DATA TYPE | CONSTRAINTS | DEFINITION WITH EXAMPLE |
| Appt\_ID | Integer | PK (NN) | A Unique ID assigned to an appointment instance to keep track Eg. 3452 |
| Start\_Time | datetime | NN | Starting time of appointment. Eg. 20191018 14:00:00 |
| End\_Time | datetime | NN | Starting time of appointment. Eg. 20191018 15:00:00 |
| Status | Char(1) | NN | Status of the appointment. Eg. ‘O’=Open, ‘X’=Cancelled, ‘D’ = Done |
| Patient\_ID | Int | FK, NN | This will be a reference to the Patient\_ID from the patient entity. |
| Dentist\_ID | Int | FK, NN | This will be a reference to the Dentist\_ID from the Dentist entity. |
| Room\_ID | Int | FK, NN | This will be a reference to the Room\_ID from the Room entity. |

**LICENSES -**

Documentation to show a person is permitted to legally practice or to carry out a task, required by the dentist and providers. It will also contain information regarding it’s validity for maintenance.

|  |  |  |  |
| --- | --- | --- | --- |
| ATTRIBUTE | DATA TYPE | CONSTRAINTS | DEFINITION WITH EXAMPLE |
| License\_Number | Int | PK (NN) | A Unique ID assigned to a license by state. Eg. 6546 |
| Activatation\_Date | Date | NN | License Activation Date. Eg. 20191018 |
| Expiry\_Date | Date | NN | License Expiration Date. Eg. 20191018 |
| Dentist \_ID | Int | FK,NN | This will be a reference to the Dentist\_ID from the Dentist entity. |

**LOCATION -**

This entity defines a point where a dental service will take place. The room and address to the location are represented over here.

|  |  |  |  |
| --- | --- | --- | --- |
| ATTRIBUTE | DATA TYPE | CONSTRAINTS | DEFINITION WITH EXAMPLE |
| Location\_ID | Int | PK (NN) | A Unique ID assigned to uniquely identify each location Eg. 3 |
| Address | Varchar(50) | NN | Detailed description of the address of the location.E.g 1175 Boylston Street |
| State | char(2) | NN | State of the address E.g. MA |
| ZipCode | Int | NN | Zip code of the address Eg. 02115 |

**ROOM -**

This entity will represent the Room at the particular location where appointment is arranged.

|  |  |  |  |
| --- | --- | --- | --- |
| ATTRIBUTE | DATA TYPE | CONSTRAINTS | DEFINITION WITH EXAMPLE |
| Room\_ID | Int | PK (NN) | A Unique ID assigned to uniquely identify each Room Eg. 3 |
| Room\_number | Char(4) | NN | Number of the Room E.g 11B ,1689 |
| isRoom\_available | Char(1) | NN | Availability Status of the room e.g. “Y” =s yes or “N” = no. |
| Location\_ID | Int | FK,NN | This will be a reference to the Location\_ID from the Location entity. |

**EQUIPMENT -**

This unit holds the data about the dental equipment present in a dental office. It holds the maintenance details for the machines.

|  |  |  |  |
| --- | --- | --- | --- |
| ATTRIBUTE | DATA TYPE | CONSTRAINTS | DEFINITION WITH EXAMPLE |
| Equip\_ID | Int | PK (NN) | A Unique ID assigned to each Equipment for unique identification Eg. 5 |
| Equip\_Name | Varchar(30) | NN | The name of equipment will be stored here |
| Last\_maintainenance\_date | Date | NN | Date of the last time, the equipment was handled |
| Purchase\_date | Date | NN | The purchase date of equipment Eg. 20151213 |
| Warranty | Int | NN | Warranty of the equipment in months. E.g. 18 |
| Price | Money | NN | A cost associated with the equipment in the dental office used for dental treatment. E.g. 800$ |
| IsPortable | Char(1) | NN | Portability status for e.g yes or no. It is used to track whether the equipment is portable or not. |

**EQUIPMENT\_LOCATION\_HISTORY –**

This entity provides important information regarding location of the equipment. It tracks the date on which particular equipment moved from one entity to another.

|  |  |  |  |
| --- | --- | --- | --- |
| ATTRIBUTE | DATA TYPE | CONSTRAINTS | DEFINITION |
| Equipment\_ID  Last\_Moved\_Date | Int  Date | Composite Primary Key  (Equipment\_ID,  Last\_Moved\_Date) | To uniquely identify Equipment’s current location/room and its current location/room to the date |
| Location\_ID | smallInt | NN | Quantity of the supply item. E.g. 500 |
| Room\_ID | Int | NN | A cost associated with supply item  e.g. $700 |

**SUPPLIES -**

Includes all the items that are required during a dental treatment.

Basic information regarding supplies are stored to keep a track for restocking. These items are not included in the billing statement of the treatment.

|  |  |  |  |
| --- | --- | --- | --- |
| ATTRIBUTE | DATA TYPE | CONSTRAINTS | DEFINITION |
| SupplyItem\_ID | Int | PK (NN) | A Unique ID assigned to supply Item to uniquely identify supply item. E.g. All the Syringes will be under one ID 2. |
| SupplyItem\_name | Varchar(15) | NN | Supply item name. E.g. Syringes, Gloves |
| Quantity | Int | NN | Quantity of the supply item. E.g. 500 |
| Price | Money | NN | A cost associated with supply item  e.g. $700 |
| Last\_order\_date | Date | NN | Last date on which particular supply is restocked. E.g. 08/24/2018 |

**SUPPLIES\_INVENTORY –**

This entity tracks information quantity of a particular item available at a particular location.

|  |  |  |  |
| --- | --- | --- | --- |
| ATTRIBUTE | DATA TYPE | CONSTRAINTS | DEFINITION |
| Quantity\_Available | Int | NN | This will be a indicate available quantity of particular Item at the paritculare location.  E.g. 250 |
| Location\_ID | smallInt | PFK,NN | This will be a reference to the Location\_ID from the Location entity. |
| Supply\_Item\_ID | Int | PFK,NN | This will be a reference to the Supply\_Item\_ID from the Supplies entity. |

**PATIENT HISTORY -**

A summary of the patient’s medical history that is updated when first visiting the practice and yearly or per visit thereafter. It comprises of the list of medications given to the person or any other medical conditions of the person and if the person has any type of allergies. Count of lower & upper teeth are recorded too.

|  |  |  |  |
| --- | --- | --- | --- |
| ATTRIBUTE | DATA TYPE | CONSTRAINTS | DEFINITION |
| Patient\_ID | Int | PFK (NN) | A Unique ID of the patient |
| Last\_updated | Date | NN | Last date on which patient history is updated. E.g. 08/19/2015 |
| Medical\_Condition | Varchar(200) |  | Medical conditions of the patient. |
| Allergies | Char(1) | NN | Allergies present or not.  E.g. “Y” = Present or “N”= Not present. |
| Teeth\_Condition | Char(1) | NN | Teeth condition E.g. “B” =Bad or “G” =Good. |
| Inflammation | Char(1) | NN | Inflammation condition  E.g. “S”= Severe or “N” = Normal or “G”= Good. |
| Plaque | Char(1) | NN | Plaque Status  E.g. “Y” =Present or “N”= Not Present. |
| Palate\_Condition | Char(1) | NN | Palate Condition  E.g. “H” = Hard or “S” =Soft or  “N” = Normal |
| Teeth\_color | Varchar(25) | NN | Color of the teeth. E.g. white, light-yellow, etc. |

**TREATMENT CATALOG -**

An organized collection of all the different types of treatments available in the dental clinic. A cost can be associated with every treatment.

|  |  |  |  |
| --- | --- | --- | --- |
| ATTRIBUTE | DATA TYPE | CONSTRAINTS | DEFINITION WITH EXAMPLE |
| Treatment\_ID | Integer | PK (NN) | A unique ID to identify and store the kinds of treatments |
| Treatment\_Name | Varchar(30) | NN | Name of the treatment E.g. Braces. |
| Cost | Money | NN | Cost of the treatment E.g. $150.50 |
| Description | Varchar(300) | NN | Description for every treatment in the catalog. E.g. Braces – A dental brace is a device used to correct the alignment of teeth and bite-related problems. Braces straighten teeth by exerting steady pressure on the teeth. |

**PRESCRIPTION -**

A dentist’s order for the preparation and administration of a drug or device for a patient after the patient has received a dental service. This entity contains the drugs list and a schedule for those drugs along with it’s usage details. Pharmacy to which it will be sent, will be shown.

|  |  |  |  |
| --- | --- | --- | --- |
| ATTRIBUTE | DATA TYPE | CONSTRAINTS | DEFINITION |
| Prescription\_ID | Int | PK(NN) | A Unique ID assigned to prescription to uniquely identify prescription. E.g. 5 |
| Date | Date | NN | Date on which prescription is given to patient by dentist.  E.g. 11/28/2019 |
| Details | Varchar(500) | NN | Information regarding drugs, meditation prescribed by the dentist to the patient. |
| Appointment\_ID | Int | FK,NN | This will be a reference to the Appointment\_ID from the Appointment entity. |

**INSURANCE CATALOG -**

This entity holds the information about the insurance plans a patient has. A person can have one or more insurance plans but a maximum of three. It will also track the insurance related information for further policy renewal.

|  |  |  |  |
| --- | --- | --- | --- |
| ATTRIBUTE | DATA TYPE | CONSTRAINTS | DEFINITION |
| Insurance\_ID | Int | PK (NN) | A Unique ID assigned to insurance to uniquely identify insurance. E.g. 55 |
| Insurance\_provider\_name | Varchar(30) | NN | Name of the insurance. |
| Description | Varchar(500) | NN | Details about the insurance like what the insurance covers, the coverage amount, how much is the cover etc. E.g. This insurance covers 50% of the cost for braces up to a 700$. |
| Expiry\_date | Date | NN | Expiry date of the insurance. |
| Patient\_ID | Int | FK | This will be a reference to the Patient\_ID from the patient entity. |

**INVOICE -**

A bill generated for the treatment taken by the patient. This entity is represented by the list of the treatments that the patient has undergone and the associated price total for those treatments along with payment mode chosen.

|  |  |  |  |
| --- | --- | --- | --- |
| ATTRIBUTE | DATA TYPE | CONSTRAINTS | DEFINITION |
| Invoice\_ID | Int | PK(NN) | A Unique ID assigned to invoice to uniquely identify invoice.  E.g. 125 |
| Amount | Money | NN | Amount paid by the patient.  E.g. $550 |
| Date | Date | NN | Date on which invoice is generated. |
| Appointment\_ID | Int | FK,UNIQUE, NN | This will be a reference to the Appointment\_ID from the Appointment entity. |

**PATIENT\_INSURANCE –**

This entity store information regarding patient’s insurance/s. Patient can use this insurance to make the payment of the invoice.

|  |  |  |  |
| --- | --- | --- | --- |
| ATTRIBUTE | DATA TYPE | CONSTRAINTS | DEFINITION |
| Insurance\_Number | Varchar(15) | PK(NN) | A Unique ID assigned to insurance to uniquely identify insurance.  E.g. 125 |
| Expiry\_Date | Date | NN | Date on which insurance will expire. E.g 20121112 |
| Insurance\_ID | Int | FK,NN | This will be a reference to the Insurance\_ID from the Insurance\_catalog entity. |
| Patient\_ID | Int | FK, NN | This will be a reference to the Patient\_ID from the Patient entity. |

**TOOTH\_CATALOG -**

An organized collection of all the different types of tooths patient could have. The flag “Adult\_or\_Child” present in the entity would be used to identify the tooth in the catalog is of adult’s or child’s.

|  |  |  |  |
| --- | --- | --- | --- |
| ATTRIBUTE | DATA TYPE | CONSTRAINTS | DEFINITION |
| Tooth\_Label | Char(3) | PK (NN) | A Unique ID assigned to tooth to uniquely identify tooth. E.g. C1, A1 |
| Tooth\_Quarter | Char(2) | NN | Quarter of the mouth in which the tooth in present. E.g. “UL” |
| Adult\_or\_Child\_Tooth | Char(1) | NN | The Flag assigned to tooth to recognize if it is child’s or adult’s tooth. E.g “C”= child or “A”=Adult |
| Tooth\_Name | Varchar(20) | NN | Name of the tooth.  E.g.Central Incisor, First Molar etc. |

**PAYMENT -**

Payment entity stores the information regarding payment details such as payer, amount paid in one payment of the particular invoice, the date on which payment is made. One invoice amount can be paid by multiple payments.

|  |  |  |  |
| --- | --- | --- | --- |
| ATTRIBUTE | DATA TYPE | CONSTRAINTS | DEFINITION |
| Payment\_ID | Int | PK(NN) | A Unique ID assigned to payment to uniquely identify payment.  E.g. 125 |
| Payment\_Mode | Char(1) | NN | The payment mode i.e.  Cash, card or insurance used by the patient to pay the amount.  e.g. “C” =card or “B” = Bill/cash or  “I”=Insurance |
| Payment\_Amount | int | NN | Amount paid by the patient.  E.g. $550 |
| Date\_of\_Payment | Date | NN | Date on which invoice the payment is done. |
| Payer | Char(1) | NN | The payer for the payment i.e.  e.g. “S” =self or “G” = Guardian or  “I”=Insurance Company |
| Invoice\_ID | Int | FK,NN | This will be a reference to the Invoice\_ID from the Invoice  catalog entity. |
| Patient\_ID | Int | FK,NN | This will be a reference to the Patient\_ID from the patient entity. |
| Insurance\_Number | Varchar(15) | FK | This will be a reference to the Insurance\_Number from the Insurance entity. |

**PATIENT\_TOOTH\_HISTORY-**

This entity stores important information regarding patient’s tooth status. This entity will provide information regarding number of teeth does a patient have.

|  |  |  |  |
| --- | --- | --- | --- |
| ATTRIBUTE | DATA TYPE | CONSTRAINTS | DEFINITION |
| Patient\_ID | Int | PFK (NN) | This will be a reference to the Patient\_ID from the Patient entity. |
| Tooth\_Label | Char(3) | PFK(NN) | This will be a reference to the Tooth\_Label from the Tooth\_Catalog entity. |
| Is\_Present | Char(1) | NN | The Flag assigned to check if the tooth is present for the patient or not. E.g “Y”= present or “N”= Not Present |
| Last\_updated | Date | NN | The date on which details regarding patient’s tooth are updated. E.g. 2017/12/19 |

**PATIENT\_TOOTH\_TREATMENT-**

This entity tracks information regarding what treatment was performed on particular tooth at an appointment. With the help of this we can get information regarding all the treatments and tooth on which those treatments were performed for particular patient.

|  |  |  |  |
| --- | --- | --- | --- |
| ATTRIBUTE | DATA TYPE | CONSTRAINTS | DEFINITION |
| Tooth\_Label | Char(3) | PFK,NN | This will be a reference to the Tooth\_Label from the Patient\_tooth\_history entity. |
| Treatment\_ID | Int | PFK,NN | This will be a reference to the Treatment\_ID from the Treatment\_Catalog entity. |
| Appointment\_ID | Int | PFK,NN | This will be a reference to the Appointment\_ID from the Appointment entity. |

**SYSTEM -**

To get access of the system. Individual needs to login in the system with valid username and password. This entity contains data regarding user credentials. User will be granted access to the system based on his role. This entity also stores status of the user account, last logged in details etc.

|  |  |  |  |
| --- | --- | --- | --- |
| ATTRIBUTE | DATA TYPE | CONSTRAINTS | DEFINITION |
| Username | Varchar(15) | PK(NN) | A Unique ID assigned to user to uniquely identify user.  E.g. shubh714 |
| Password | Varchar(10) | NN | Password entered by the user while logging in. E.g. \*\*\*\*\* |
| Role | Varchar(10) | NN | The role of the user in the system.  E.g. admin role. |
| Last\_login | Date | NN | Date on which user last logged into the system. E.g. 11/27/2019 |
| Status | Char(1) | NN | Account status of the user.  E.g. “I” :- Inactive and “A”:- Active. |

# **CLUSTERED DATA MODEL :**

Patient Cluster

A screenshot of a social media post

Description automatically generated

Dentist Cluster

A screenshot of a cell phone

Description automatically generated

Appointment Cluster

A screenshot of a cell phone

Description automatically generated

Location Cluster

A screenshot of a map

Description automatically generated

# **COMPLETE DATA MODEL DIAGRAM :**

# **DEFINITIONS:**

**DENTIST/PROVIDER/DOCTOR**

An important entity of the model who caters the patients with a license to prevent, diagnose, and treat diseases and conditions of the teeth, jaw and mouth.

**DEMOGRAPHIC**

This means it is the information that pertains to a population and used to identify them individually

**ANESTHETICS**

A kind of supply that is used by the providers to induce sensitivity to pain for the patient while performing his/her duties

**PAYROLL**

Payroll is a list of the business’ employees and the amount of money they are to be paid for their services in the business

**PASSWORD**

Password is the input field used by different roles in the system which validates correct input by the user to provide authentication

**TOOTH\_QUADRANT**

TOOTH\_QUADRANT indicates the part or quadrant of the mouth in which particular tooth presents.

# **ABBREVIATIONS:**

1. **PK :** Primary Key
2. **PFK :**Primary Foreign Key
3. **FK :** Foreign Key
4. **CK :** Composite key
5. **NN :** Not Null
6. **SSN :** Social Security Number