Who Does That App

CS 5332 - Database Theory and Design
Project

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1 CONTENTS

“Who Does That” App

2 REQUIREMENT GATHERING

2.1 USER AND CUSTOMER REQUIREMENTS

Requirement Number	Requirement Description
1	The user/customer will be able to search for businesses and refine those searches based on selected categories, specialties, reviews, the user’s location, and an internal rating system.
2	The user/customer should be able to choose between three different types of membership based on what service does he expects from the app. Like, a full access to the database of business, phone numbers, real-time-reviews, constant contact with business, ability to link social media, real time interaction with the users, ability to schedule services, among other characteristics that are explained in the type of membership
3	The user/customer should now on its profile the type of membership that he/she has.
4	The app should save the users payment information necessary to maintain the membership.
5	The user should be able to make questions any business.
6	When a user/customer enter the search that he/she are looking for all matches will be pinned/populated onto a map allowing the user to see the location of the business relative to their current location.
7	If the user/customer taps on a business, a “pin” will populate the details panel, containing the business’s storefront/logo, name, address, phone number and rating.
8	If the user taps the panel, it should take the user to the business’s information screen.
9	The user should be able to view a list of the search results, which tapping each result should take the user to the business’s information screen.
10	The user should see the results on a configurable order like: “alphabetically”, “nearest to me”, “by rating”.

11	The user should add any business that he/she preferred to a “Favorites list”
12	When the user logs in, should be able to view a Main/Home screen with the tabs: map/search, result list, favorites list, account information, account types.
13	The user should be able to save the type of membership that each user or business has.
14	The user should be able to save all payment information necessary to maintain the membership on the app.

2.2 BUSINESS REQUIREMENTS

Requirement Number	Requirement Description
1	The business should choose between three different types of memberships based on its needs like the information that the business wants to share with the customer, promotional advertisements, connections, access to payment processing, access to reviews, and “DUMPS” containing all connection and click information, among other characteristics that are explained in the type of membership
2	A Business user can create an account if it doesn’t exist
3	Business will be able to interact with potential customers by responding in real-time to any question that might be asked.
4	Business should have an Information Panel for business which contain: an image of the storefront, description of what the business is/does, the business’s hours of operation, the business’s contact information, the business’s URL.
5	The business should have a list of job categories where it belongs, this is going to make the search easier.
6	The business should have a list of job specialties within each category, to help the customer search.
7	The business should receive a list of reviews from the users.
8	The business should answer privately to a user who receive an unsatisfactory service.
9	The business should be able to now which employee oversees what job.

3 CONSTRAINTS

3.1 USER/CUSTOMER CONSTRAINTS

- The user is going to be able to search for a business.
- The user could refine the search based on selected categories, specialties, reviews, the user location and rates.
- The user can choose a membership between three membership levels, each level will give more accessibility and features than the previous.
- The user must first sign up in order to use the app. To create an account the user is going to be ask for the next information:
    - Email address, which is going to be the user Id.
    - Password
    - Name (First and Last)
    - Address (including City/State/Zip code)
    - Phone number
    - Membership plan information
    - All payment information
- The user must be able to pay for his selected membership, therefore on sign up, they will need to provide their payment information.
- The main screen of the app shows a map to the user with the populated by pins which are the results of the search, the user should tap these pins and then take the user to the information panel of the business, the user can also see a list of results if he/she prefers.
- The user can order the results by different criteria like alphabetically, “nearest to me” or “by rating”.
- The user can add his favorites business to a “Favorites” list.
- The user will have full control of their account and make changes.
- The user will be able to connect with a business.
- The user will be able to make a payment with the saved payment information.
- The user will be able to make a review to a business.

- A user cannot post a review if the job isn't finish.
- The user should connect with other users of the service to ask real time questions.

3.1.1 Super User Constraints

- A business user (admin user) could create an account if it doesn't exist. With this information for the business panel:
    - Information panel for business will contain:
        - An image of the storefront
        - One or more categories of services that the business provide.
        - A description of what the business does.
        - The business hours of operation
        - The business contact information
        - The business URL

- This business user could:
    - Connect with end users.
    - Respond reviews.
    - Schedule services

- This business admin user has access to make changes to the business account profile, membership level, etc.
- This staff member will be able to be both Business and User accounts.
- The super user will be notified every time a user creates an account to star the reviewing process.
    - Once the user has been approved, the super user is going to send a welcome email informing to the user that he/she could star using the app.
    - If the user is rejected, the super could send an email to notice the user.

3.2 BUSINESS

- The business can choose a membership between three membership levels, each level will give more accessibility and features than the previous.

- The business must first sign up in order to use the app.
- The business must be able to pay for his selected membership, therefore on sign up, they will need to provide their payment information.
- The business should be able to view a listing of jobs that are currently underway and the the employee that is handling that.

3.3 REVIEW

- The business will visualize a listing of all reviews received by the business from current and former users.
- The business will also be able to respond (privately) to the user so that any unsatisfactory service can be remedied.
- Number of reviews allow by membership:

Membership	Number of reviews
Basic	Maximum of 5 reviews
Standard	Up to 10 reviews
Premium	Unlimited reviews

3.4 MEMBERSHIP

- Each membership could contain the following information:
    - Name
    - Description
    - Cost
    - Duration
    - List of features available (refer to features described above).
- The membership information that the app needs to keep is the membership choose by the business or the user.
- The payment information necessary to maintain the membership.

3.4.1 Business Membership Type

Membership	Cost
B-MLB- Basic	$9.99 per month or $99.00 per year (savings of $19.98)
B-MLS-Standard	$19.99 per month or $199.99 per year (savings of $39.89)
B-MLP-Premium	$34.99 per month or $349.99 per year (savings of $69.89)

3.4.2 User/Costumers Membership Type

Membership	Cost
U-MLB-Basic	Free
U-MLS-Standard	$4.99 per month
U-MLP-Premium	$9.99 per month

3.5 MEMBERSHIP TYPE

3.5.1 Business Membership Features

Feature Number	Description	Membership
1	Business name and contact information available to all users.	**B-MLB-Basic**
2	Links to business website and Facebook page made available to all users.	**B-MLB-Basic**
3	Access to 5 recent reviews (with reviewer information).	**B-MLB-Basic**
4	It must have all features of the “basic” plan.	**B-MLS-Standard**
5	25% discount on banner/promotional style advertisements.	**B-MLS-Standard**
6	Free access to connect limited to 25 connections ($1.00 additional) o 0.5% per transaction for first 25 transactions	**B-MLS-Standard**

	○ 1.5% per transaction for each additional transaction	
7	Free access to Connect-Pay (in-app payment processing).	**B-MLS-Standard**
8	Access to 10 most recent reviews (with reviewer information).	**B-MLS-Standard**
9	It must have all features of the "standard" plan.	**B-MLP-Premium**
10	2 free banner/promotional style advertisements (additional/banner/promotional style advertisements at 35% discount).	**B-MLP-Premium**
11	Free access to connect with unlimited connections ○ 0.25% per transaction, unlimited transactions	**B-MLP-Premium**
12	Free access to Connect-Pay (in-app payment processing)	**B-MLP-Premium**
13	Free monthly database "DUMPS" containing all connection and clock information.	**B-MLP-Premium**
14	Free access to public user information to be used for direct marketing.	**B-MLP-Premium**
15	Free social media blast with business information (using a provided template).	**B-MLP-Premium**
16	Real-time correspondence with current/potential users.	**B-MLP-Premium**
17	Access to all reviews (with reviewer information).	**B-MLP-Premium**

3.5.2 User Membership Features

Feature Number	Description	Membership
1	Full access to search business.	**U-MLB-Basic**
2	Access to the phone number of the business	**U-MLB-Basic**
3	Real time reviews	**U-MLB-Basic**
4	It must have all features of the “basic” plan.	**U-MLS-Standard**
5	Ability to set user preferences.	**U-MLS-Standard**
6	Constant contact with business in all pending and in process services	**U-MLS-Standard**
7	Ability to link social media accounts	**U-MLS-Standard**
8	Free access to Connect	**U-MLS-Standard**
9	It must have all features of the “standard” plan.	**U-MLS-Premium**
10	Real time interaction with other users. Ability to clarify reviews	**U-MLS-Premium**
11	Ability to schedule services and appointments	**U-MLS-Premium**
12	Free access to Connect-Pay (in app payment processing)	**U-MLS-Premium**
13	Free membership to “WDT- Winners” (Loyalty program) with point earned by: o Making connections and scheduling appointments with member businesses. o Writing meaningful, honest reviews o Referrals to app community	**U-MLS-Premium**

	Loyalty points can be redeemed for services and products provided by member business.	

3.6 FEATURES

- The features are ever-changing and must be able to have features added to or removed from the membership.
- The information that a feature must have is:
    - Unique – id
    - Name
    - Description

3.7 CATEGORY

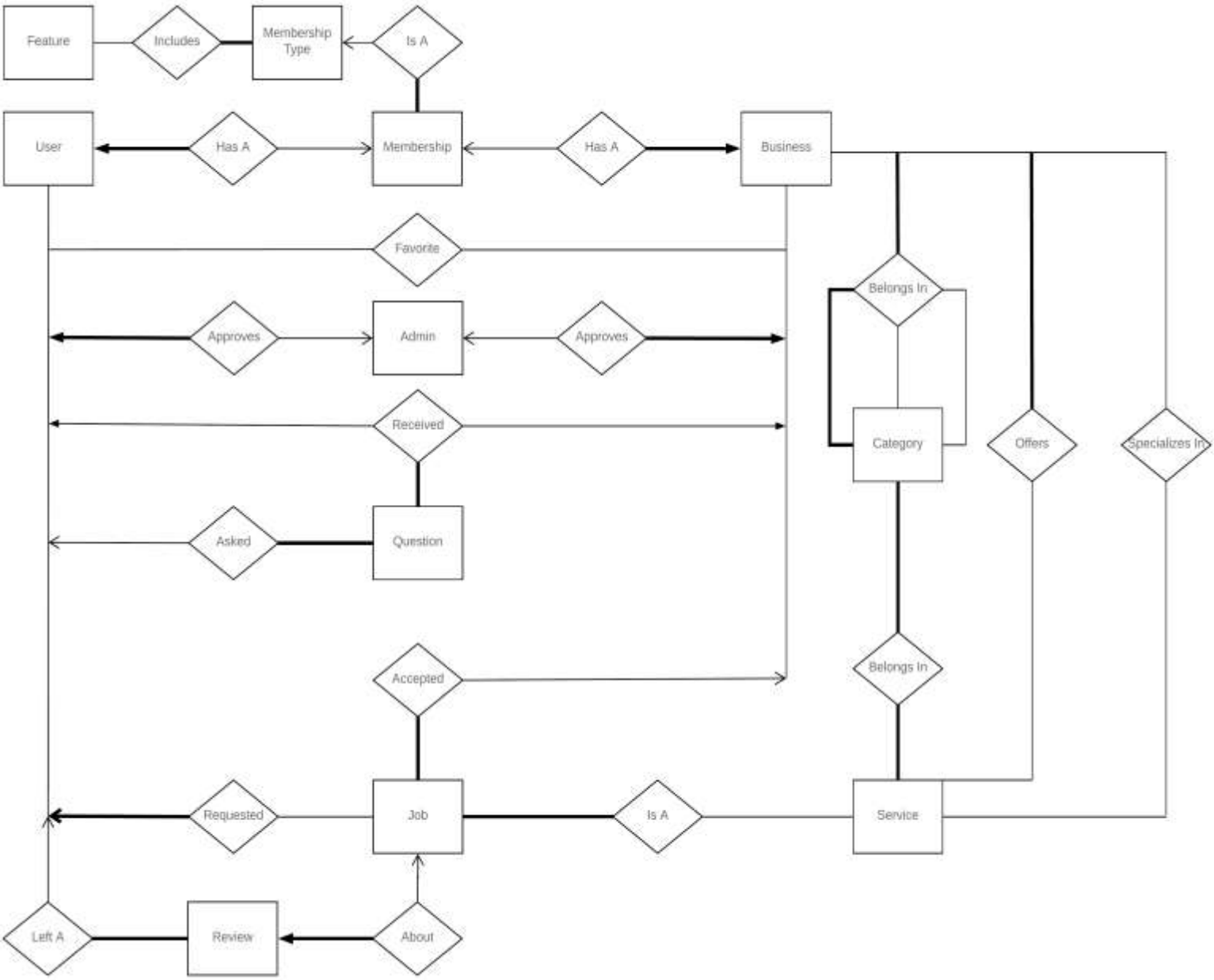
- The app should show one or more categories which the business belongs.
- The app should show one or more specialties within the selected category.
    - A specialty is a more detailed description of what the business does within its selected category.
- The app should show one or more locations to which the business provides service.
    - Business physical address
    - Business zip-code
    - Business county

3.8 QUESTION

- Each business will be able to interact with potential customers by responding in real-time to any questions that might be asked.
- When a user submits a question, the business will receive a notification.

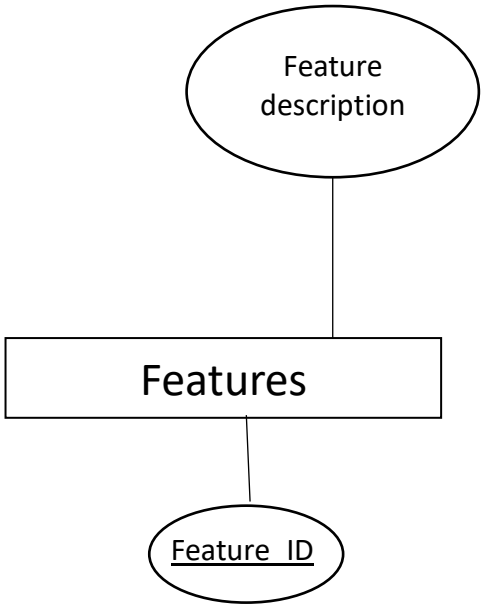
4 ER DIAGRAM

4.1 ER DIAGRAM

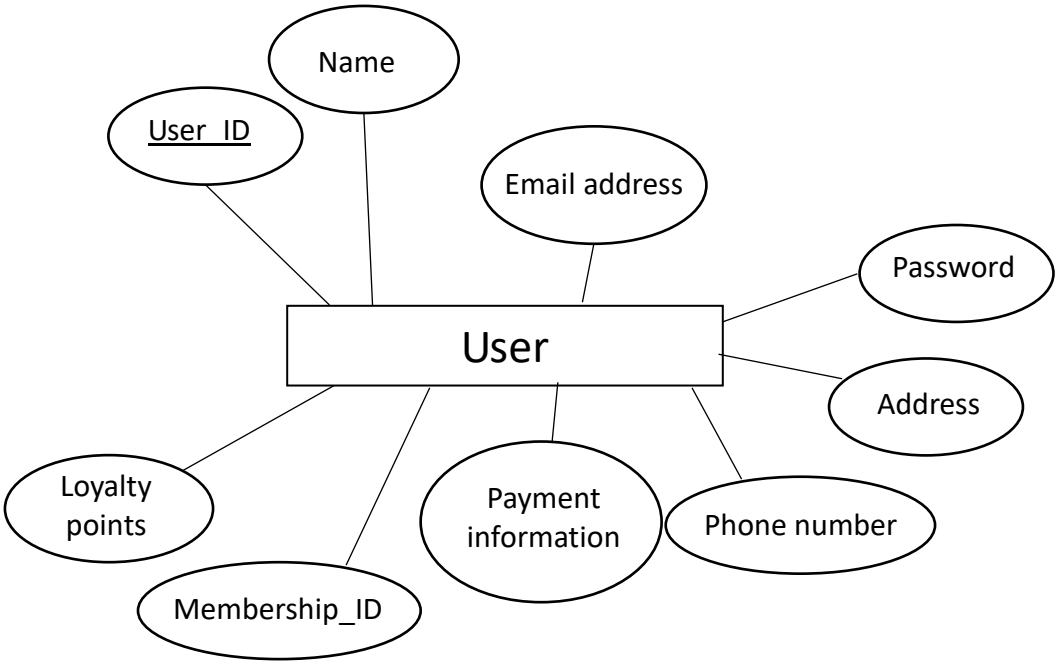


4.2 ER ENTITIES AND ATTRIBUTES

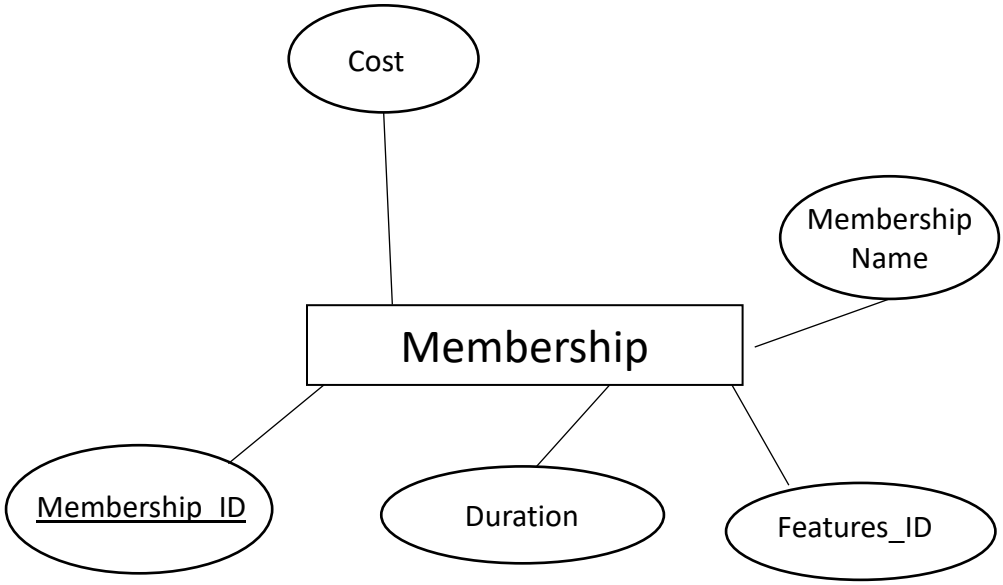
4.2.1 Features entity



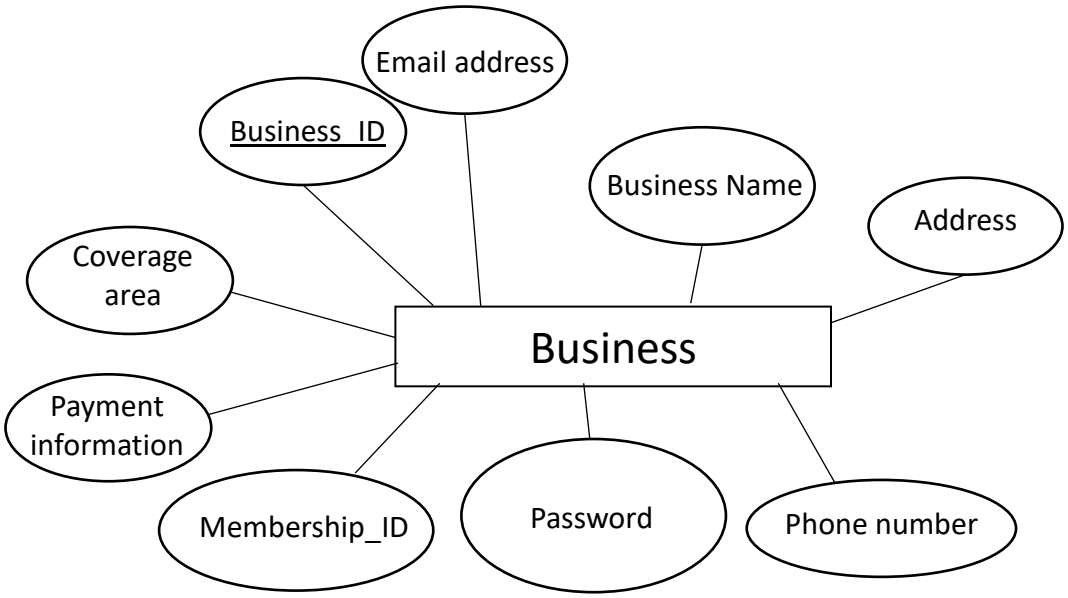
4.2.2 User Entity



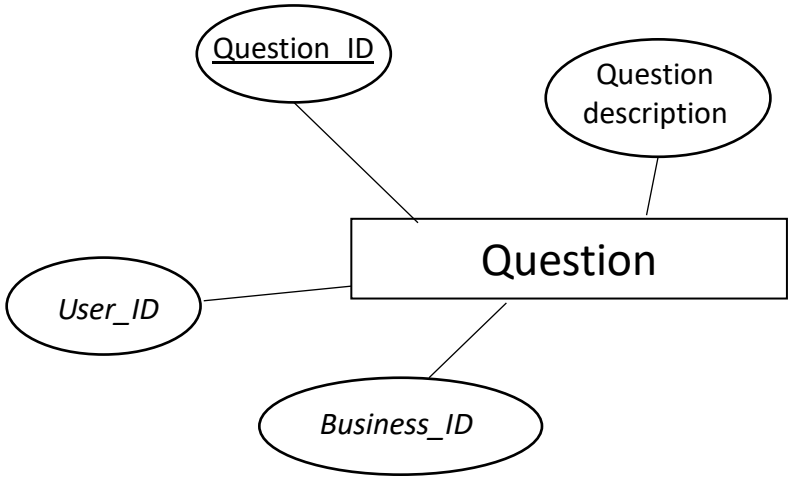
4.2.3 Membership Type Entity



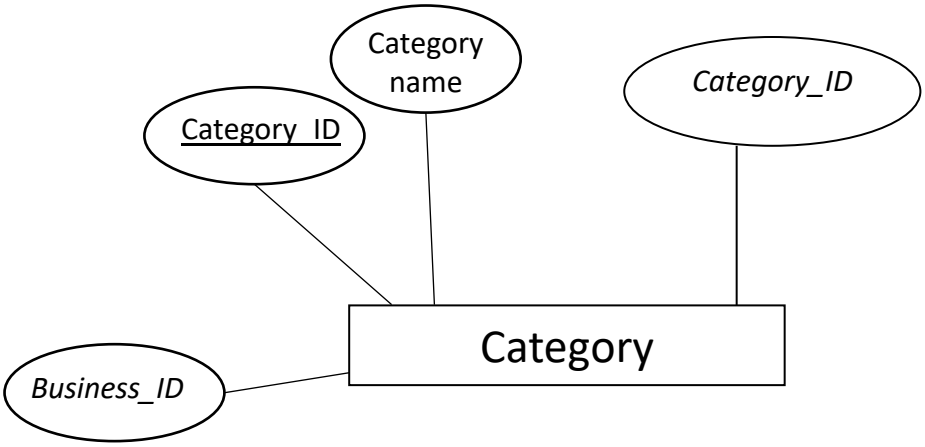
4.2.4 Business Entity



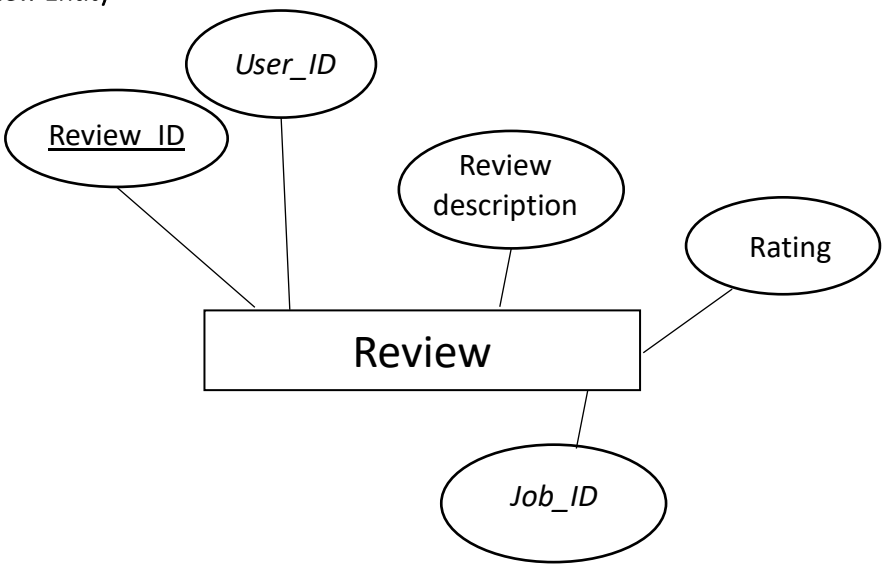
4.2.5 Question Entity



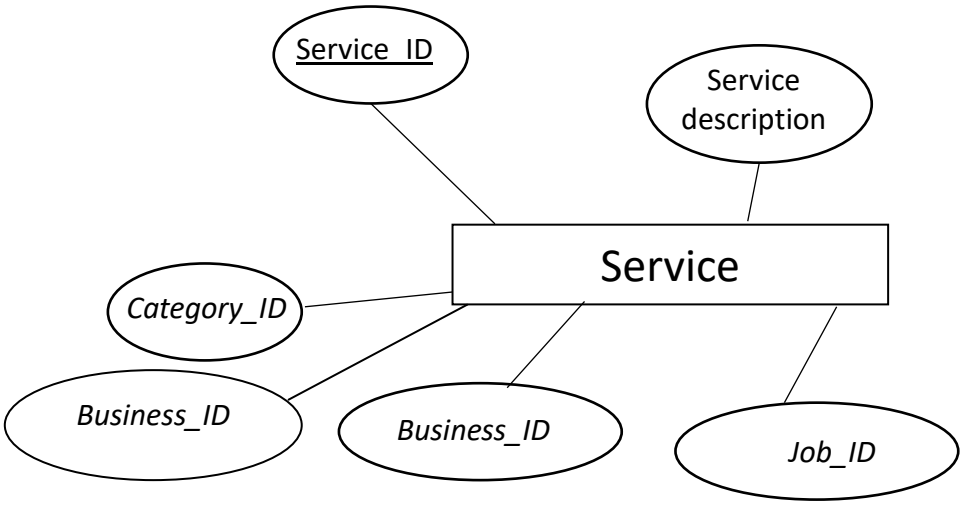
4.2.6 Category Entity



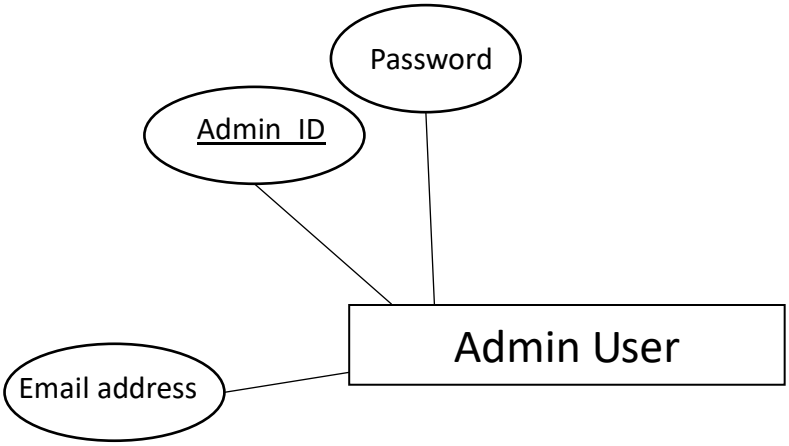
4.2.7 Review Entity



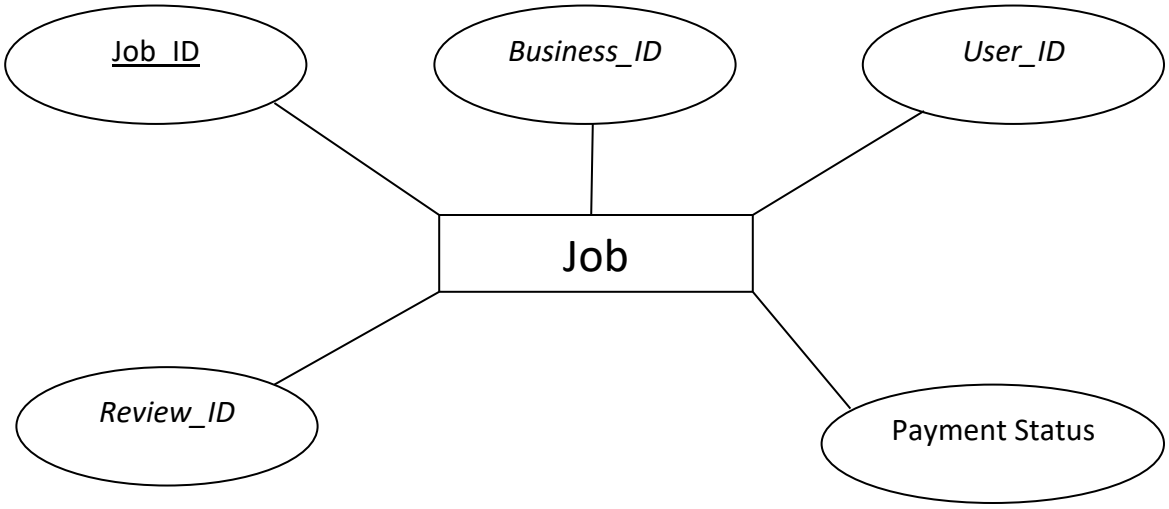
4.2.8 Service Entity



4.2.9 Admin User Entity



4.2.10 Job Entity



5 DECISIONS THAT LEAD TO THE FINAL ER

The most important decision that made us design the entity relationship diagram like how we do was the fact that the business must be totally related to the user so that in turn the user can cover his needs to find the business he needs efficiently. Next we will describe the reasons that led us to this design.

Cardinality and Participation:

Each Membership_Type includes 1 or more Feature;
Each Feature is included in 1 or more membership type;
=> Many : Many
Every Membership_Type has at least one feature => Total
Some Features may not currently be available to any M_T => Partial

Each Membership is exactly one Membership_Type;
Each Membership_Type can describe zero or more Memberships;
=> Many : One
There may not be any of a certain Membership_Type => Partial
Every Membership is exactly one M_T => Total

Each User has exactly one membership;
Each Membership has zero or one Users;
=> One : One
Each User has exactly one Membership => Total
A Membership may belong to a non-User account => Partial

Each Membership has zero or one Business;
Each Business has exactly one Membership;
=> One : One
A Membership may be a non-Business account => Partial
Each Business has exactly one Membership => Total

Each User can favorite zero or more Businesses;
Each Business may be favorited by zero or more Users;
=> Many : Many
A User may have no favorites => Partial
A Business may not be the favorite of any Users => Partial
Each User is approved by exactly one Admin => Total;
An Admin may only approve some Users => Partial;
=> One : One

Each Business is approved by exactly one Admin => Total;
An Admin may only approve some Businesses, but approves zero to many => Partial;
=> One : Many

A Business belongs in one or more category;
A Category may exist without any current Businesses in it;
=> Many : Many
A Business must belong to at least one Category => Total
A Category may not associate with every business => Partial

Each Category belongs in one or more Category, which may be itself;
=> Many : Many
=> Total
A Category may not belong to some Category => Partial

A User may receive zero or more Questions;
A Question may be addressed to zero or one User;
=> One : Many
A Business may receive zero or more Questions;
A Question may be addressed to zero or one Business;
=>One : Many
Each Question is received by some account(User/Business) => Total
A Question will be addressed to a User OR a Business => Partial, Partial

A User may ask zero or more Questions => Partial;
Each Question is asked by exactly one User => Total;
=> One : Many

Each Business offers one or more service => Total;
A Service may or may not be currently offered by an active Business => Partial;
=> Many : Many

A Business may or may not Specialize in any Service => Partial;
A Service may or may not be the specialty of an active Business => Partial;
=> Many : Many

Each Business will accept zero or more Jobs => Partial;
Each Job will be accepted (or not) be exactly one Business => Total;
=> One : Many

Each Service belongs in one or more Category => Total;
Each Category includes one or more Service => Total;
=> Many : Many

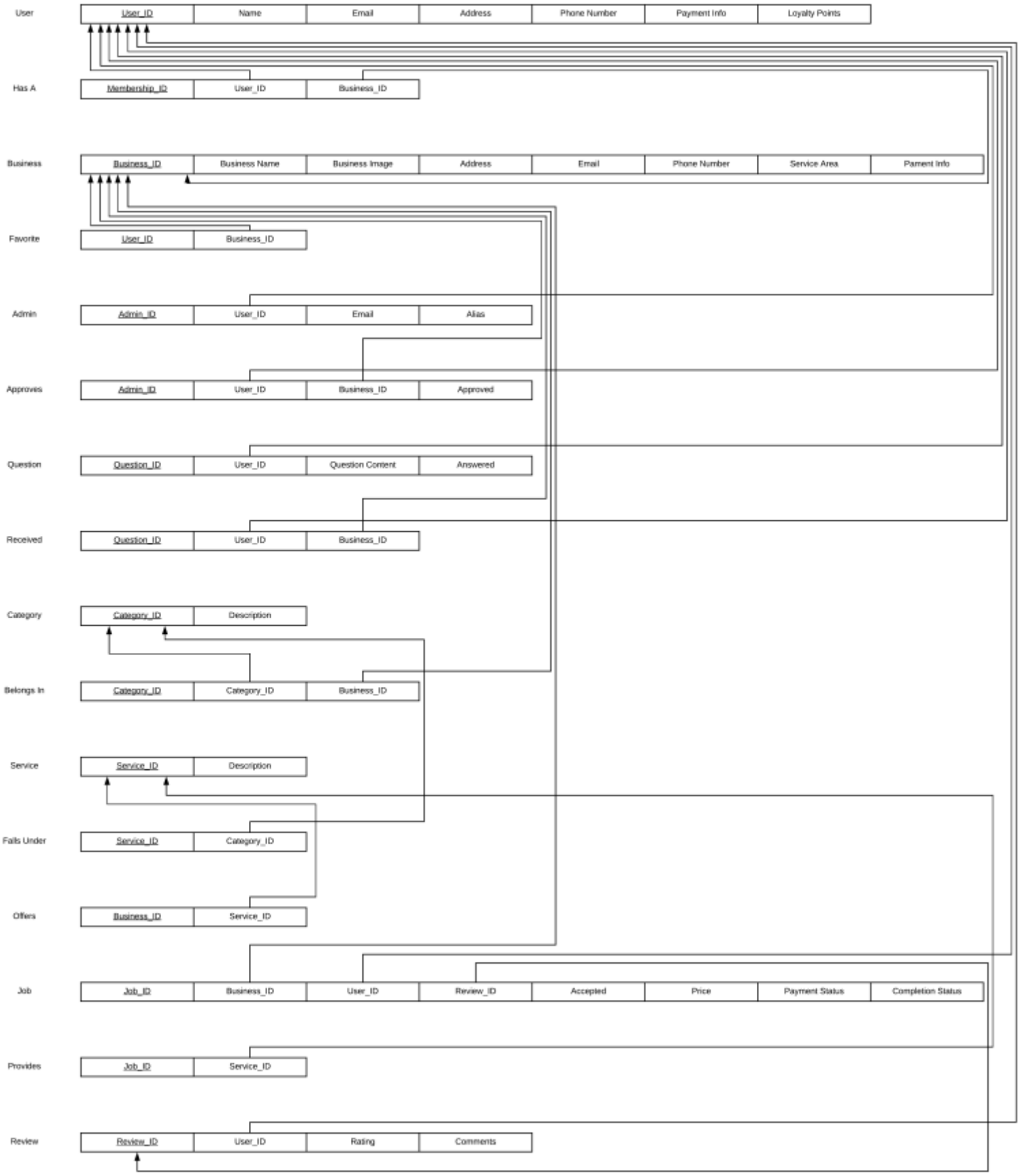
Each User may request zero or more Jobs => Partial;
Each Job is requested by exactly one User => Total;
=> One : Many

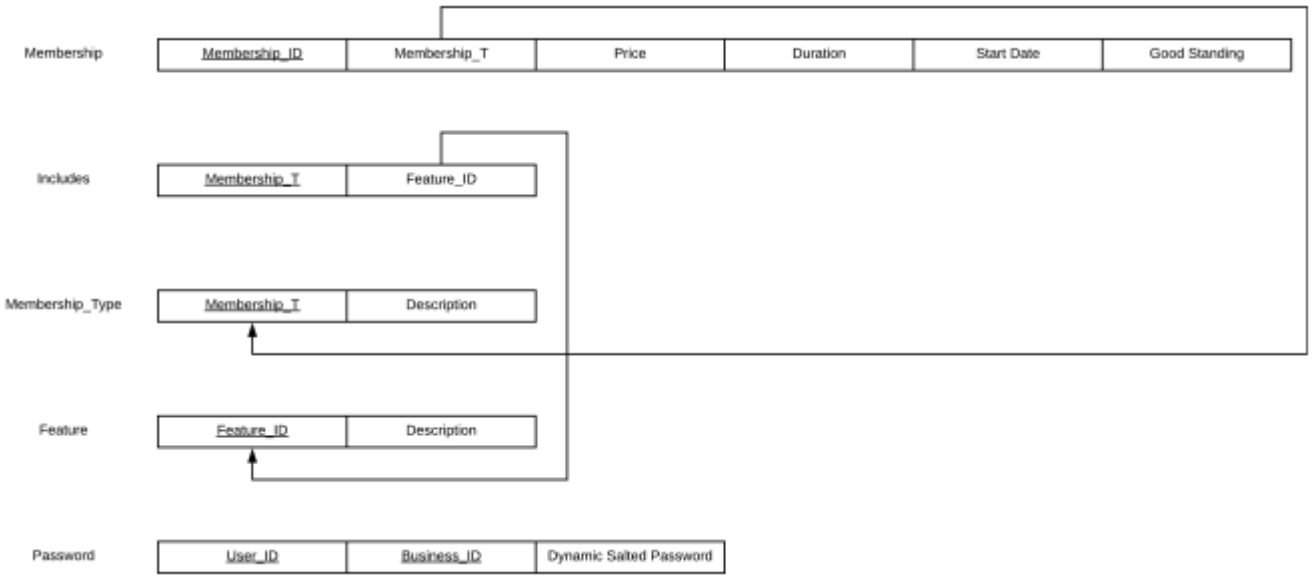
Each Job is an instance of one or more Service => Total;
Some Services may never be requested as a Job => Partial;
=> Many : Many

Each User may leave zero or more Reviews => Partial;
Each Review is left by exactly one User => Total;
=> One : Many

Each Review is about exactly one Job => Total;
Each Job may have zero or one Review => Partial;
=> One : One

6 RELATIONAL MODEL




Membership
Membership_ID
Membership_T
Price
Duration
Start Date
Good Standing
Includes
Membership_T
Feature_ID
Membership_Type
Membership_T
Description
Feature
Feature_ID
Description
Password
User_ID
Business_ID
Dynamic Salted Password

7 RELATIONAL SCHEMA

Membership (**Membership_ID**, *Membership_T*, Price, Duration, Start Date, Good Standing)

Includes (***Membership_T***, *Feature_ID*)

Membership_Type (**Membership_T**, Description)

Feature (**Feature_ID**, Description)

Password (***User_ID***, ***Business_ID***, Dynamic Salted Password)

User (**User_ID**, Name, Email, Address, Phone Number, Payment Info, Loyalty Points)

Has A (***Membership_ID***, *User_ID*, *Business_ID*)

Business (**Business_ID**, Business Name, Business Image, Address, Email, Phone Number, Service Area, Payment Info)

Favorite (***User_ID***, *Business_ID*)

Admin (**Admin_ID**, User_ID, Email, Alias)

Approves (***Admin_ID,*** *User_ID*, *Business_ID*, Approved)

Question (**Question_ID**, *User_ID*, Question Content, Answered)

Received (***Question_ID***, *User_ID*, *Business_ID*)

Category (**Category_ID**, Description)

Belongs In (**Category_ID**, *Category_ID, Business_ID*)

Service (**Service_ID**, Description)

Falls Under (***Service_ID***, *Category_ID*)

Offers (***Business_ID***, *Service_ID*, Specializes)

Job (**Job_ID**, *Business_ID*, *User_ID*, *Review_ID*, Accepted, Price, Payment Status, Completion Status)

Provides (***Job_ID***, *Service_ID*)

Review (**Review_ID**, *User_ID*, Rating, Comments)

8 RELATIONAL MODEL DOMAIN

Membership

Type	Name	Description
Int	Membership_ID	Numeric, unique, autogenerated value. Primary key
Int	Membership_T	Type of membership. Foreign Key
Double	Price	Price member agreed to pay
Time_t	Duration	Length of membership agreed to
Time_t	Start Date	Date membership was instantiated
Bool	Good Standing	Is the membership currently in good standing?

Includes

Type	Name	Description
Int	Membership_T	Type of membership. Foreign Key
Int	Feature_ID	Refers to a feature. Foreign key

Membership Type

Type	Name	Description
Int	Membership_T	Numeric, unique, autogenerated value. Primary key
String	Description	“Business Basic,” “User Premium,” etc.

Feature

Type	Name	Description
Int	Feature_ID	Numeric, unique, autogenerated value. Primary key
String	Description	Description of feature

Password

Type	Name	Description
Int	User_ID	Refers to User. Foreign key. May be NULL
Int	Business_ID	Refers to Business. Foreign key. May be NULL
String	Dynamic Salted Password	Dynamically salted password text

User

Type	Name	Description
Int	User_ID	Numeric, unique, autogenerated value. Primary key
String	Name	User's full name
String	Email	User's email address
String	Address	User's full physical address
String	Phone Number	User's phone number
Payment_t	Payment Info	User's primary payment method
Int	Loyalty Points	Count of user's loyalty points

Has A

Type	Name	Description
Int	Membership_T	Refers to Membership Type. Foreign key
Int	User_ID	Refers to User. Foreign Key
Int	Business_ID	Refers to Business. Foreign Key

Business

Type	Name	Description
Int	Business_ID	Numeric, unique, autogenerated value. Primary key
String	Business Name	Name of business
PNG	Business Image	Image of storefront
String	Address	Business's full physical address
String	Email	Email address
String	Phone Number	Phone number
Location_t	Service Area	Area served by business
Payment_t	Payment Info	Business's primary payment method

Favorite

Type	Name	Description
Int	User_ID	Refers to User. Foreign Key
Int	Business_ID	Refers to Business. Foreign Key

Admin

Type	Name	Description
Int	Admin_ID	Numeric, unique, autogenerated value. Primary key
Int	User_ID	Admin is a super-User; i.e. has own user account.
String	Email	Admin's email address
String	Alias	Username presented when acting anonymously

Approves

Type	Name	Description
Int	Admin_ID	Refers to Admin. Foreign Key
Int	User_ID	Refers to User. Foreign Key. May be NULL
Int	Business_ID	Refers to Business. Foreign Key. May be NULL
Bool	Approved	Did Admin approve User/Business?

Question

Type	Name	Description
Int	Question_ID	Numeric, unique, autogenerated value. Primary key
Int	User_ID	Refers to User asking the Question. Foreign Key
String	Content	Text of the Question being asked
Bool	Answered	Has this Question been answered?

Received

Type	Name	Description
Int	Question_ID	Refers to the Question being received. Foreign Key
Int	User_ID	Refers to User receiving the Question. Foreign Key. May be NULL
Int	Business_ID	Refers to Business receiving the Question. Foreign Key. May be NULL

Category

Type	Name	Description
Int	Category_ID	Numeric, unique, autogenerated value. Primary key
String	Description	Description

Belongs In

Type	Name	Description
Int	Category_ID	Refers to the Category in which a Business or Category belongs. Foreign Key
Int	Category_ID	Refers to the Category which belongs in another Category. Foreign Key. May be NULL
Int	Business_ID	Refers to the Business which belongs in a Category. Foreign Key. May be NULL

Service

Type	Name	Description
Int	Service_ID	Numeric, unique, autogenerated value. Primary key
String	Description	Description

Falls Under

Type	Name	Description
Int	Service_ID	Refers to a Service that falls under a Category. Foreign Key
Int	Category_ID	Refers to the Category a Service falls under. Foreign Key

Offers

Type	Name	Description
Int	Business_ID	Refers to the Business who offers a Service. Foreign Key
Int	Service_ID	Refers to the Service offered by a Business. Foreign Key
Bool	Specializes	Does this Business specialize in this Service?

Job

Type	Name	Description
Int	Job_ID	Numeric, unique, autogenerated value. Primary key
Int	Business_ID	Refers to Business receiving Job request. Foreign Key
Int	User_ID	Refers to User requesting Job. Foreign Key
Int	Review_ID	Refers to Review left about this Job. Foreign Key. May be NULL
Bool	Accepted	Has the Business accepted this Job?
Double	Price	Price set by Business and agreed to by User
Int	Payment Status	[0: Not paid], [1: Partially Paid], [2: Paid in Full]
Int	Completion Status	[0: Pending], [1: Started], [2: Finished], [3: Other]

Provides

Type	Name	Description
Int	Job_ID	Refers to a Job, which provided one or more Services. Foreign Key
Int	Service_ID	Refers to a Service that was provided by a specific Job. Foreign Key

Review

Type	Name	Description
Int	Review_ID	Numeric, unique, autogenerated value. Primary key
Int	User_ID	Refers to User who left Review. Foreign Key
Int	Rating	Rating ϵ [0,5]
String	Comments	Review comments made by User

9 MAPPING ER TO RELATIONAL MODEL

Mapping N:M Relationships:

- Add table named after the relation between the two
- Make entries in the table tuples of N,M
- E.g., Membership Type : Feature :: Many : Many
  => Create table “Includes”
  => Entries of “Includes” will be [Membership_T, Feature_ID]

Mapping Ternary Relationships:

- For a ternary relationship T, there exists one entity such that T relates it to one of two other entities, call it IN; and there exists two entities such that T relates IN to one or the other, call them OUT1 and OUT2.
- Create a table TR such that the first foreign key belongs to IN, one foreign key belongs to OUT1 and the other to OUT2
- TR will contain tuples with either OUT1 or OUT2 entered as NULL
- E.g., A User “has a” Membership, and a Business “has a” Membership
  => Create table “Has A”
  => Entries of “Has A” will be [Membership_ID, “NULL”, Business_ID] or [Membership_ID, User_ID, “NULL”]

Mapping Recursive Relations:

- Only one instance: Category
- A Category can both contain other Categories and belong to another Category
  => Create table “Belongs In”
  => Handle same as ternary relationship
  => Entries will be [Category_ID, Category_ID, “NULL”] or [Category_ID, “NULL”, Business_ID]