App Store Database Model

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Data Management and Database Design

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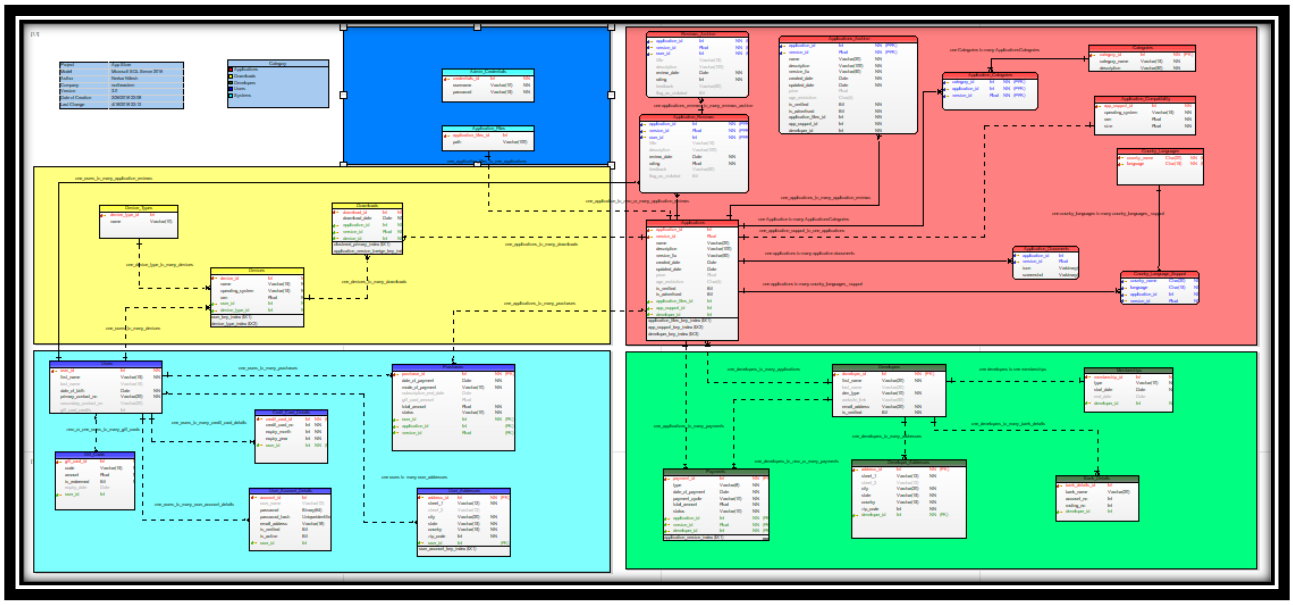
Table of Contents

Introduction

The primary idea behind the model is getting to know how an application is downloaded/purchased by a user and how the developers can get benefits for their work. Furthermore, the users are also able to download the latest versions of the application. The user's downloads will be tracked with respect to its devices as well as the version number. We will also get to know the different types of applications which are under one categories.

Although the app store database is created and maintained in NO-SQL database, here we have implemented the same in relational database.

App store data model

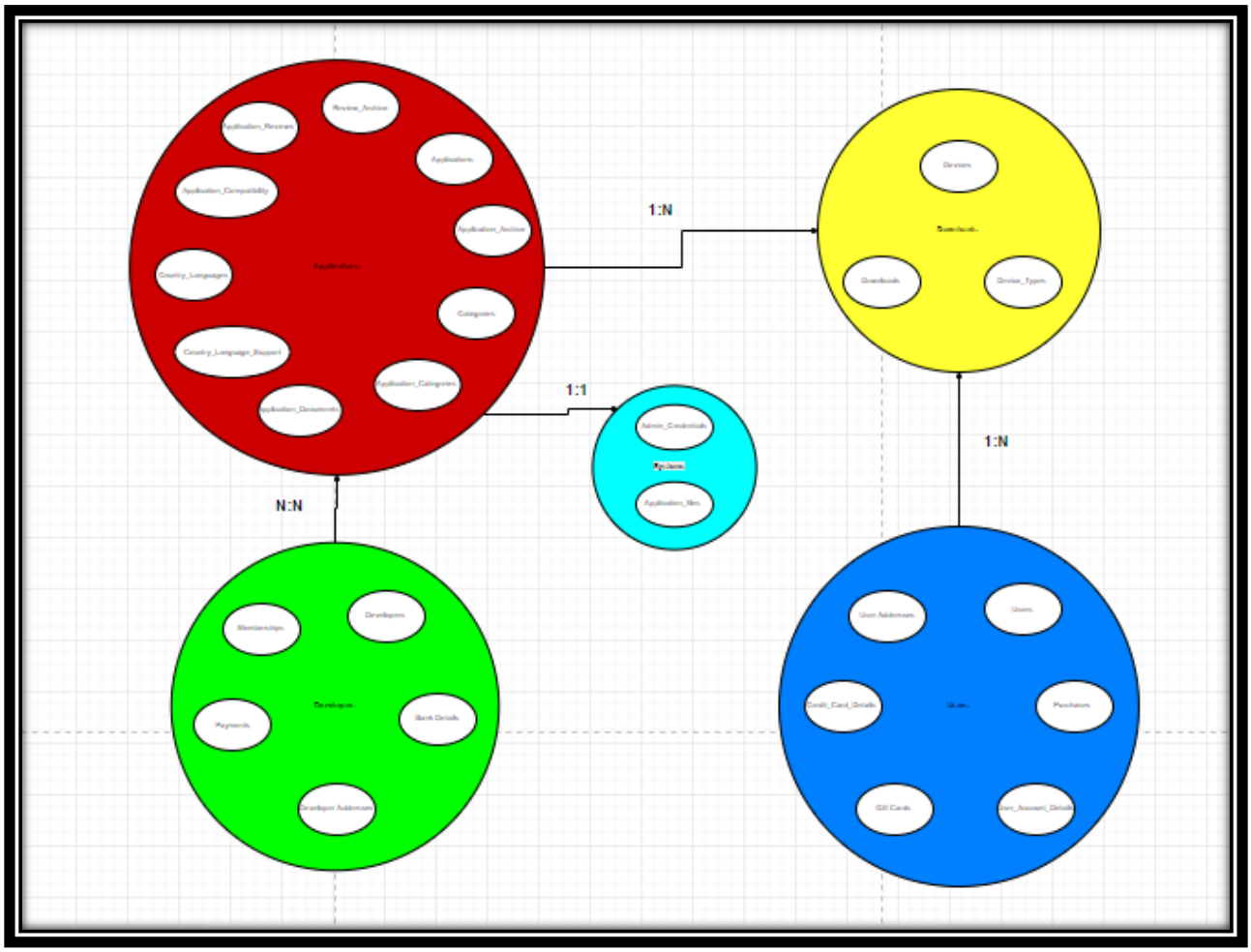


(Kindly find attached image in the documents section for bigger picture)

Description of Clusters

A cluster is collection of a similar types of entities which is linked to a common behavior. Here, we have five clusters in the app store model namely Developers, Applications, Downloads, Users and Systems. A user downloads an application which is created by the developer. A Developer creates many Applications and an Application is Downloaded many times. Similarly, a User has many Downloads. An Application has a System cluster linked to it where the meta data is stored of the applications.

Cluster Diagram

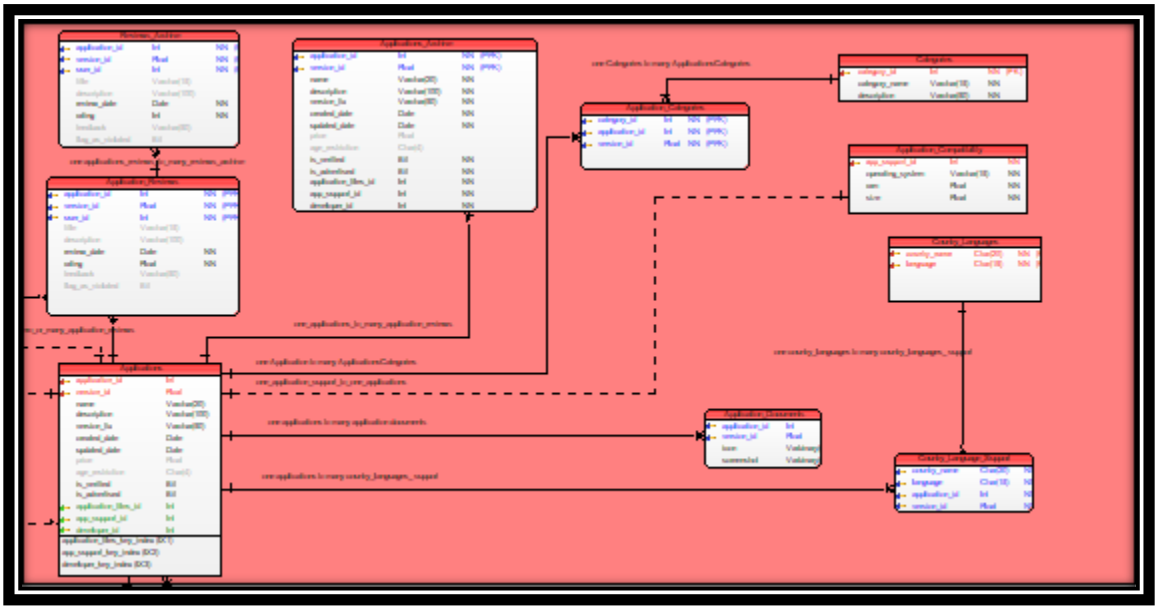


Applications Cluster

There are in all five clusters in this model namely Applications, Downloads, Users, Developers, and Systems. Here we are going to start with the application cluster and its entities. All the entities related with an application like categories, reviews, application support comes under Application cluster.

The following are the entities under Applications Cluster:

Applications cluster



Applications

Definition: This is the main entity of the Application Cluster. This entity holds the different applications published by the Developers. It holds the versions, created date, verifications of the applications and other attributes.

Business Rules:

In Scope -

1) The application_id and version_id is combine primary key of the table. It can be called as a Composite key.
2) One applications can have many downloads or can have no downloads.
3) An application should have at least one developers associated with it.
4) There should be at least one category per application.
5) There can be zero reviews for an application.
6) There can be no payments for an application when its free.
7) The application must be verified to be screened for users.
8) The applications are archived after 5 versions are entered in the application entity. i.e when there is a 6th version entered in the Application Entity, the 1st version entry will be archived.

Attribute Name	Data Type	Constraints	Definition and example
application_id	Int	Primary Key (PK) Not Null (NN)	A unique identifier to an application entity when an application is published by the developer for verification. It is a primary key combined with the version_id known as composite key. The sequence starts with 101. The id is auto incremented. Example: 101
version_id	Float	Primary Key (PK) Not Null (NN)	A unique identifier to an application entity when an application is published by the developer. It is a primary key combined with the version_id known as composite key. The id is not auto incremented. Example: 1.0
name	Varchar (20)	Unique NN	Name of the application which the developers want to be published. Example: WhatsApp
description	Varchar (100)	NN	The description of the application as in what is the use of it. Example: It is used to connect with people and chat, video call, etc.
version_fix	Varchar (50)	NN	It describes the changes in the version from the previous ones or the bug fixes. Example: contact details bug fixed.
created_date	Date	NN	The date of application published by the Developer on the store. Example: 07/18/2015
updated_date	Date	NN	Date on which the application new version was updated and published. Example: 05/21/2016
price	Float		The price of the application in dollars if it is paid otherwise the values is NULL which means it is a free application. Example: 789.90
age_restriction	Char (4)		Age limit to use the application. Above the mention age users can access the application. If NULL then no limits.

			Example: 18
is_verified	Bit	NN	It can store 2 values 0 or 1. 0 means not verified and 1 means verified. Example: 1
is_advertised	Bit	NN	It can store 2 values 0 or 1. 0 means not advertised and 1 means advertised. Example: 1
application_files_id	Int	Foreign Key (FK) NN	It is used to locate the files, images, logos, and screenshots used by the application. Example: 11
app_support_id	Int	Foreign Key (FK) NN	It is used to identify the application compatibility and other information related to support. Example: 401
developer_id	Int	Foreign Key (FK) NN	It is used to identify the developer of the application. Example: 1001

Sample Data:

application_id	version_id	name	description	version_fix	created_date
101	5.00	WhatsApp	It is used to connect with people and chat, video call, etc.	contact details bug fixed	7/8/2014
102	6.00	Instagram	It is used to share photos and videos to the people.	details deisplay bug fixed	6/22/2014
101	6.00	WhatsApp	It is used to connect with people and chat, video call, etc.	location bug fixed	2/18/2014
102	7.00	Instagram	It is used to share photos and videos to the people.	logo details bug fixed	6/11/2014
105	1.00	Gmail	It is used to connect with people via emails	contact details bug fixed	7/18/2015

updated_date	price	age_restriction	is_verified	is_advertised	application_files_id	app_support_id	developer_id
7/18/2015	40		1	1	1232	1234	1001
7/18/2015	20		1	1	1233	1235	1002
7/18/2016	20		1	1	1234	1236	1003
7/18/2016	40		1	1	1235	1237	1004
7/18/2015	40	18	1	1	1236	1238	1005

Applications_Archive

Definition: It comes under Applications Cluster and stores all the archived applications. The attributes are same as Applications Entity as well as their data type. All the applications will be archived after the sixth version of the application is released to manage the space.

Business Rules:

In Scope -

1) Only latest 5 versions of the application will be present in the applications tables, all previous other will be archived.

Application_Reviews

Definition: This entity also comes under Application Cluster. This entity holds the reviews of the applications by version and keeps the feedback which can be used determine the application performance in the real world. It is the bridge table between Applications and Users. Also, an user can flag an app inn appropriate using this entity.

Business Rules:

In Scope –

1) One application review must be linked with both Application and the user.
2) The rating attribute can have maximum of 5.0 as the value and least 1.0.
3) Title, feedback and description attributes can be null as it depends on the users to give a feedback.

Attribute Name	Data Type	Constraints	Definition and example
application_id	Int	Primary Foreign Key (PFK) Not Null (NN)	A unique identifier to an application reviews entity along with version_id and user_id. Example: 101
version_id	Float	Primary Foreign Key (PFK) Not Null (NN)	A unique identifier to an application reviews entity along with application_id and user_id. Example: 1.0
user_id	Float	Primary Foreign Key (PFK) Not Null (NN)	A unique identifier to an application reviews entity along with application_id and version_id. Example: 10001
title	Varchar (15)		Title of the review. Example: Superb!!
description	Varchar (100)		The description of the application reviews given by the users. Example: It is one of the best application for chatting.

review_date	Date	NN	The date of the review was given by the user. Example: 04/04/2016
rating	Float	NN	Ratings given by the user out of 5.0 Example: 3.9
feedback	Varchar (50)		The feedback given by the user to give some advice to the developers. Example: The application should include user info in details.
flag_as_violated	Bit		It can store 2 values 0 or 1. 0 means not violated and 1 means violated according to the user but there will be a check from the app store as well before flagging the application completely violated (discontinuing the app). Example: 1

Sample Data:

application_id	version_id	user_id	title	description	review_da	rating	feedback	flag_as_violated
101	5.00	10001	superb!!	It is one of th	3/2/2011	3.90		0
102	6.00	10002	awesome		3/3/2013	4.90	It can be improved with respect to UI	0
101	6.00	10003	superb!!		3/4/2014	4.00	It can be improved with respect to buttons	0
102	7.00	10004	mindlowing	I love it a lot	3/5/2017	4.00		0
105	1.00	10005			3/6/2018	4.00	It can be improved with respect to password	0

Reviews_Archive

Definition: It comes under Applications Cluster and stores all the archived reviews. The attributes are same as Applications Reviews Entity as well as their data type. All the reviews will be archived after the version of the application is not publishing by the app store.

Business Rules:

In Scope –

1) The reviews will be archive after the application stops publishing that version.

Application_Compatibility

Definition: This entity also comes under Application Cluster. This entity holds the compatibility requirement of the application which is the minimum requirement of a device. If the requirements are not matching the device will not be able to run the application efficiently or it may not install.

Business Rules:

In Scope –

1) One application can have one application compatibility requirement per app. These details can be updated later when there is a need and the developer is ready to make the changes to the application in the next version.

Out of scope –

1) The device_type specific attributes are out of scope.

Attribute Name	Data Type	Constraints	Definition and example
app_support_id	Int	Primary Key (PK) Not Null (NN)	A unique identifier to an application supports entity. The sequence starts with 1231. The id is auto incremented. Example: 1231
operating_system	Varchar (15)	NN	The operating systems can be ios, windows, android or all. Example: android
ram	Float	NN	It minimum ram size required to download the application. It will be in gbs and not mbs. Example: 2
size	Float	NN	It is the size of the application in mbs. If the device is out of memory it cannot download the application. Example: 45.89

Sample Data:

app_support_id	operating_system	ram	size
1231	ios	4	190.00
1232	all	2	200.00
1233	android	2	170.00
1234	ios	4	190.00
1235	all	2	200.00
1236	android	2	170.00

Categories

Definition: This entity also comes under Application Cluster. This entity holds the categories of the applications. As each application has some features and ultimately leads us to define this entity so that one can distinguish between the types of applications.

Business Rules:

In Scope –

1) One category can have many applications, however at last one applications must be linked with one category.
2) Categories here are defined based on the features of the applications and the description of the applications.

Out of scope –

1) Sub categories are out of scope for this version.

Attribute Name	Data Type	Constraints	Definition and example
category_id	Int	Primary Key (PK) Not Null (NN)	A unique identifier to a category entity. The sequence starts with 1231. The id is auto incremented. Example: 201
category_name	Varchar (15)	NN	Name of the category. Example: gaming
description	Varchar (50)	NN	The description of the category Example: it is use to play games of wrestling

Sample Data:

category_id	category_name	description
202	social network	used for social interaction
203	business	used by busines people only
204	music	different music can be stored
205	books	books can be store in an e format

Application_Documents

Definition: This entity holds all the icons and screenshots associated with the applications. It is separate entity as images take a lot of space and hence it is better to keep it in a different entity than applications.

Business Rules:

In Scope –

1) One application will have atleast one application documents to store the image icon.
2) The image icon may change as per the version and the other screenshots.

Out of scope –

1) The videos are not included which can be stored as per the app.

Attribute Name	Data Type	Constraints	Definition and example
application_id	Int	Primary Foreign Key (PFK) Not Null (NN)	A unique identifier to an application reviews entity along with version_id and user_id. Example: 101
version_id	Float	Primary Foreign Key (PFK) Not Null (NN)	A unique identifier to an application reviews entity along with application_id and user_id. Example: 1.0
icon	Image	NN	It is the icon of the application which can be changed as per the version cange. Example: icon.jpg
screenshot	Image	NN	It is used to store the screenshots which are used in the application. Example: screenshot1.jpg

Sample Data:

application_id	version_id	icon	screenshot
101	5.00	image.png	image10.jpg
102	6.00	image2.png	image9.png
101	6.00	image32.png	image.jpg
102	7.00	image1.jpg	image5.png
105	1.00	image6.png	image8.jpg

Country_Languages

Definition: This entity stores the data of the country and the languages we are used in communication. One country can have many languages and hence it is and identified entity.

Business Rules:

In Scope –

1) One application can more than one language in a country.
2) A new version of the application can add new languages and country data.

Out of scope –

1) Not all the languages are included in this entity.

Attribute Name	Data Type	Constraints	Definition and example
country_name	Char (20)	Primary Key (PK) Not Null (NN)	A composite primary key along with the language to identify many languages in one country. Example: USA
language	Char (15)	Primary Key (PK) Not Null (NN)	A composite primary key along with the country_name to identify many languages in one country. Example: spanish

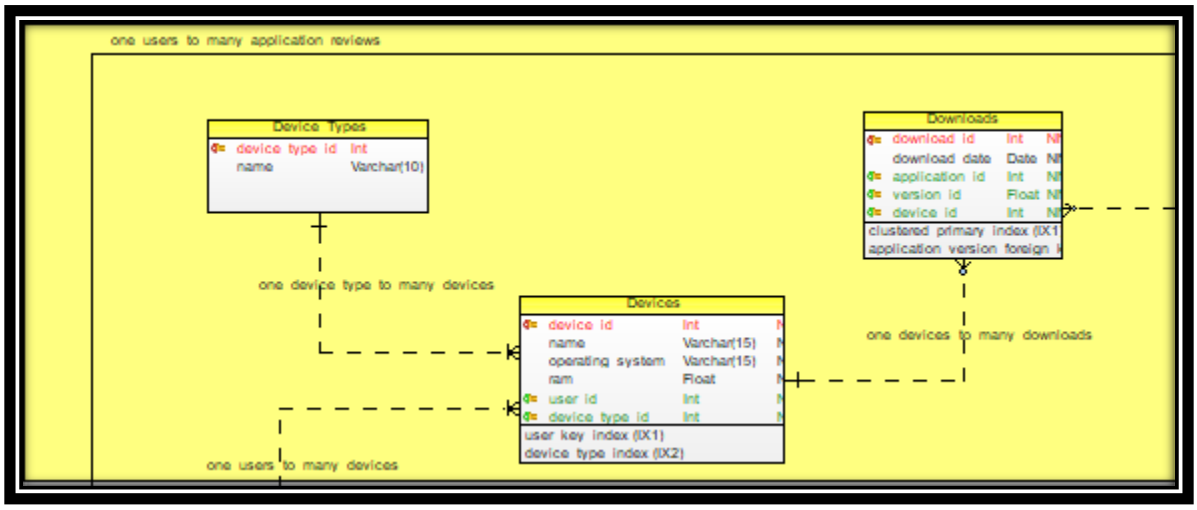
Sample Data:

country_name	language
USA	English
USA	Spanish
INDIA	English
CHINA	English
USA	French

Downloads Cluster

It holds downloads and the devices used by the users to download the applications. An application can be downloaded multiple times by an user and can be downloaded on different devices.

Downloads Cluster



Downloads

Definition: This entity holds the downloaded applications by the user on a device. It is used to track which application is downloaded on which device and let user know about the updates if available.

Business Rules:

In Scope –

1) An application can be downloaded multiple times.
2) One device can have many downloads or no downloads, but if there is a download there must be at least one device linked to it.

Out of scope –

1) Downloads archive table for the current model is out of scope.

Attribute Name	Data Type	Constraints	Definition and example
download_id	Int	Primary Key (PK) Not Null (NN)	A unique identifier to a downloads entity. The sequence starts with 11. The id is auto incremented. Example: 11
download_date	Date	NN	Date when the device downloaded the application. Example: 09/09/2015
application_id	Int	Foreign Key (FK) NN	To indicate the application along with version id. Example: 102
version_id	Float	Foreign Key (FK) NN	To indicate the application along with application id. Example: 12.2
device_id	Int	Foreign Key (FK) NN	Device indication for the downloads Example: 23

Sample Data:

download_id	download_date	application_id	version_id	device_id
11	3/2/2016	101	5.00	21
12	3/3/2015	102	6.00	22
13	3/4/2013	101	6.00	23
14	3/5/2012	102	7.00	24
15	3/6/2016	105	1.00	25

Devices

Definition: This entity holds the devices used by the users. One can get to know the operating systems and compatibility of the applications based on the devices on which the application is running.

Business Rules:

In Scope –

1) One device can be used be used by many users.
2) One device can download many applications depending upon the space on the device.
3) One device must have at least one device type associated to it.

Out of scope –

1) Device space is out of scope as it can be increased using an external memory card.
2) Devices are not further categorized based on the model number. Name itself hold entire data along with the model number.

Attribute Name	Data Type	Constraints	Definition and example
device_id	Int	Primary Key (PK) Not Null (NN)	A unique identifier to a device entity. The sequence starts with 21. The id is auto incremented. Example: 21
name	Varchar (15)	NN	The name of the device or the product name. Example: Samsung A5
operating_system	Varchar (15)	NN	The operating systems can be ios, windows, android or all. Example: android
version	Float	NN	To indicate the application along with version id. Example: marshmallow
user_id	Int	Foreign Key (FK) NN	To indicate the user of the device. Example: 10001
device_type_id	Int	Foreign Key (FK) NN	To identify the device type of the device. Example: 31

Sample Data:

device_id	name	operating_system	ram	user_id	device_type_id
21	Samsung S5	marshmallow	4	10001	31
22	Samsung S6	marshmallow	2	10002	31
23	Iphone 5S	ios 11.0	4	10003	31
24	Samsung S23	lollipop	2	10004	31
25	Samsung S2	lollipop	2	10005	31

Device_Types

Definition: This entity holds the device type used by the users. One can get to know whether the device is mobile or an ipad.

Business Rules:

In Scope –

1) One device type can have many devices.

Out of scope –

1) Desktop devices are currently not in scope.

Attribute Name	Data Type	Constraints	Definition and example
device_type_id	Int	Primary Key (PK) Not Null (NN)	A unique identifier to a device type entity. The sequence starts with 31. The id is auto incremented. Example: 31
name	Varchar (10)	NN	The name of the device_type or the product_type name. Example: Ipad

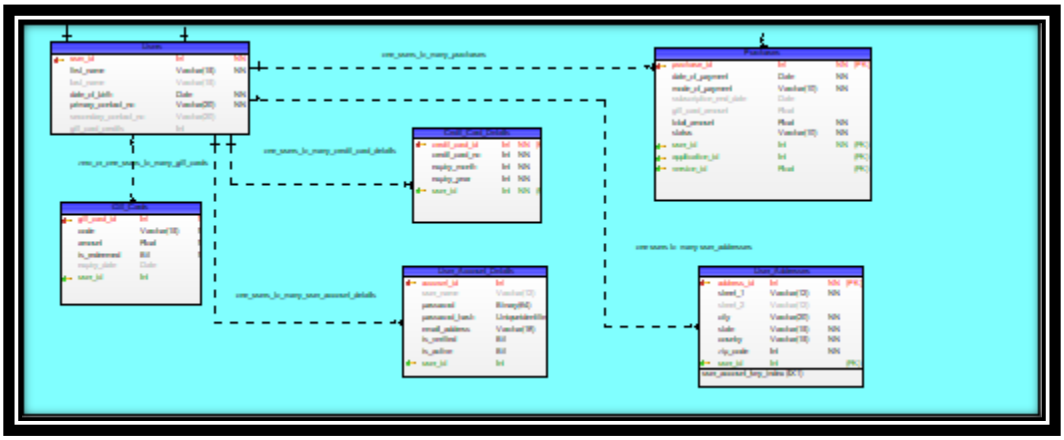
Sample Data:

device_type_id	name
31	Smart phone
41	Ipad

Users Cluster

It holds all the user details including his account details, his credit card details, personal information, purchases of the applications, etc. It is made available to track the application process through customers.

Users Cluster



Users

Definition: This entity comes under Users Cluster. It is used to keep the user's basic information which he can use to sign up on any application. One can get to know the age of the user through this entity and can verify the user for the age restriction which are different with different applications.

Business Rules:

In Scope –

1) A user can have many devices; hence a user can have many downloads. However, a user as to be linked at least one device.
2) A user can have zero or many accounts.
3) A user can have zero or many addresses.
4) A user can have zero or many gift cards but cannot use the same gift card again.
5) A user can have zero or many credit cards.
6) A user can have zero or many purchases of the applications.
7) A user can give zero or many application reviews, however only once each version of the applications.
8) The last name and the secondary contact no attributes can be null as it is optional.

Out of scope –

1) The Users localization is out scope.
2) Friends suggestion is out of scope.

Attribute Name	Data Type	Constraints	Definition and example
user_id	Int	Primary Key (PK) Not Null (NN)	A unique identifier to a User Entity. The sequence starts with 10001. The id is auto incremented. Example: 10001
first_name	Varchar (15)	Not Null (NN)	The first name of the user using the device. Example: Peter
last_name	Varchar (15)		The last name of the user using the device. Example: Shaw
date_of_birth	Date	Not Null (NN)	The date of birth is not null since we need to keep a track on the age of the user. Example: 03/04/1994
primary_contact_no	Varchar (20)	Not Null (NN)	The contact number, could be a mobile number. Example: 8168375673
secondary_contact_no	Varchar (20)		The contact number, could be a mobile number. Example: 9168775673
gift_card_credis	Int		It is the amount (say in dollars) which was redeemed through a gift card and can be used further for any application purchase. Example: 20

Sample Data:

user_id	first_name	last_name	date_of_birth	primary_contact_no	secondary_contact_no	gift_card_credits
10001	Peter	Shaw	3/2/1992	8168375673	9168775673	20
10002	Luke		3/3/1991	8168372373	9168995673	
10003	Rick		3/4/1996	3243423423		60
10004	Tom	Brady	3/5/1997	8168399673	9168765673	20
10005	Harry		3/6/1991	8168388673	9161175673	

User_Account_Details

Definition: Since every user has an account if the application requires a user to create an account. Hence to keep a track on the accounts of the user we have created this entity in this model.

Business Rules:

In Scope –

1) One user can have many accounts.
2) If the user name is null email address is considered as the user name.
3) The account is first verified by the app store since the account might have already created hence only if is verified attribute is 1 account is able to access the applications and use.
4) The accounts status can be tracked through is active attribute. If the value is deactivated the user can still activate the account. But if the account is deleted the user cannot sign in with same credentials

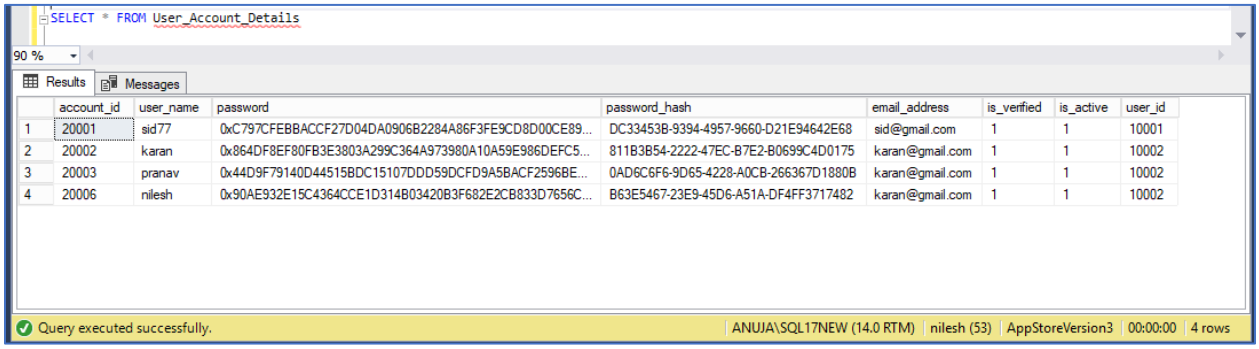
Out of scope –

1) The deleted accounts can be archived.
2) Password encryption.

Attribute Name	Data Type	Constraints	Definition and example
account_id	Int	Primary Key (PK) Not Null (NN)	A unique identifier to an account details entity. The sequence starts with 20001. The id is auto incremented. Example: 20001
user_name	Varchar (12)		The user name used to login into an application Example: nilkhs77
password	Binary (64)	NN	The password used to login into an application. It is encrypted. Example: 123
Password_hash	UNIQUEIDENTIFIER()	NN	A new unique number for encryption of password. Example : NEWID()
email_address	Varchar (18)	NN	Email address of the user Example: nikhil77@gmail.com
is_verified	Bit	NN	Used to check whether the account is verified or not. Can have two values 1 if verified. Example: 1
is_active	Bit	NN	Used to check whether the account is active or not. Can have two values 1 if active. Example: 1

user_id	Int	Foreign Key (FK) NN	It is used to identify the users. Example: 10028

Sample Data:



Purchases

Definition: It is used keep a track of the purchased application by the users and the payments information. It will keep a track of the application payment status and the user can get the information of their transactions.

Business Rules:

In Scope –

1) One user can have zero or many payments.
2) If there is a payment it must be linked with at least one application.
3) If there is payment, then it can be entirely paid through a gift or via gift card and online payments which further might be linked to a credit card.
4) The gift card amount can be null.
5) Mode of payment be only gift card, online payment or both. Both indicates gift card plus online payment using a credit card.
6) If the amount is zero, then the application is a free app.
7) If the subscription end date is null, then the subscription is life time if amount is not zero.

Out of scope –

1) The user can also get the money back in case the application has that feature to return the money back.

Attribute Name	Data Type	Constraints	Definition and example
purchase_id	Int	Primary Key (PK) Not Null (NN)	A unique identifier to any transactions between purchases and a user. The sequence starts with 60021. The id is auto incremented. Example: 60021
date_of_payment	Date	NN	The date on which the payment was initiated. Example: 1/1/2015
mode_of_payment	Varchar (10)	NN	It can be gift card payment or online payment using a credit card or both. Example: both
subscription_end_date	Date		The end date can be null if the app is free or the subscription is lifetime. Example: 1/1/2015
gift_card_amount	Float		The amount used in the transaction of the gift card credits attribute of the user. Example: 20
total_amount	Float	NN	The total amount of the transaction Example: 400
status	Varchar (10)	NN	The status of the transaction whether it is initiated or successful or in the intermediate state. Example: initiated
user_id	Int	Foreign Key (FK) NN	Users identifier. Example: 1001
application_id	Int	Foreign Key (FK) NN	Application identifier. Example: 32202
version_id	Float	Foreign Key (FK) NN	Applications identifier. Example: 32.0

Sample Data:

purchase_id	date_of_payment	mode_of_payment	subscription_date	gift_card_amount	total_amount	status	user_id	application_id	version_id
60021	3/2/2016	both	NULL	20	40	successful	10001	101	5.00
60022	3/3/2016	gift card	NULL	20	20	successful	10002	102	6.00
60023	3/4/2016	gift card	NULL	20	20	successful	10003	101	6.00
60024	3/5/2016	both	NULL	20	40	successful	10004	102	7.00
60025	3/6/2016	both	NULL	20	40	successful	10005	105	1.00

Credit_Card_Details

Definition: This entity used to store the credit card details which can be used by a user if he or she purchases any application.

Business Rules:

In Scope –

1) One credit card can only be linked to one user.
2) User can have zero or many credit cards.

Out of scope –

3) Debit cards used by the user.
4) Bank details of the user.

Attribute Name	Data Type	Constraints	Definition and example
credit_card_id	Int	Primary Key (PK) Not Null (NN)	A unique identifier to Credit card details entity. The sequence starts with 109. The id is auto incremented. Example: 101
credit_card_no	Int	NN	The credit card number of the user. Example: 9836472537
expiry_month	Int	NN	The expiry month of the card. Example: 12
expiry_year	Int	NN	The expiry year of the card. Example: 2022
user_id	Int	Foreign Key (FK) NN	Users identifier. Example: 1001

Sample Data:

credit_card_id	credit_card_no	expiry_month	expiry_year	user_id
109	232435323	11	2034	1009
110	999935323	9	2024	3423
111	992435323	5	2022	6576
112	982435323	5	2018	5334
113	562435323	9	2034	4529

Gift_Cards

Definition: This entity stores different gift cards with their respective codes and also keep a track on which card has been redeemed and which is not.

Business Rules:

In Scope –

1) One gift can be linked to only one user.
2) It cannot be used once it is redeemed.
3) The redeemed amount is added to the gift card credits attribute of the users entity.
4) There can be no expiry to a gift card. In this case, the expiry date is null.

Out of scope –

1) Gift cards which are redeemed should be archive or not.

Attribute Name	Data Type	Constraints	Definition and example
gift_card_id	Int	Primary Key (PK) Not Null (NN)	A unique identifier to a gift card. The sequence starts with 103. The id is auto incremented. Example: 103
code	Varchar (15)	NN	A code which user can enter to redeem the amount to his account. Example: 1SDSA84SDREW
amount	Float	NN	A amount of the gift card, a gift card value. Example: 500
is_redeemed	Bit	NN	Whether the gift card is redeemed or not. 1 means yes redeemed, 0 means not redeemed. Example: 0

expiry_date	Date		The gift card can be expired by a date. This date can be expiry date Example: 01/02/2027
user_id	Int	Foreign Key (FK) NN	Users identifier. Example: 1001

Sample Data:

gift_card_id	code	amount	is_redeemed	expiry_date	user_id
103	SAD4354D4FD	20	1	3/2/2019	1009
104	SAD435234D4FD	50	0	3/3/2039	1010
105	3423AD4354D4FD	20	1	3/4/2029	1011
106	3267AD4354D4FD	25	0	3/5/2022	1012
107	786AD4354D4FD	20	1	3/6/2022	1013

User Addresses

Definition: This entity is used to store the address of the users as well as developers. However, the users should ideally have an address and the developers may not have an address. It is debatable; hence it comes under Users cluster in this version.

Business Rules:

In Scope –

1) One user can have zero or many addresses.
2) Country is mandatory field as it can be used to get the compatibility of the application and we can check availability with respect to the application.

Attribute Name	Data Type	Constraints	Definition and example
address_id	Int	Primary Key (PK) Not Null (NN)	A unique identifier to the Addresses Entity. The sequence starts with 101. The id is auto incremented. Example: 101
street_1	Varchar (15)	NN	Street name of the address Example: Boylston St
street_2	Varchar (15)		Street name of the address Example: apt 238
city	Varchar (15)	NN	The city where user lives Example: Boston

state	Varchar (100)	NN	The state of the user address. Example: MA
country	Varchar (15)	NN	Country of the address Example: USA
zip_code	Int	NN	Zip code of the address Example: 22993
user_id	Int	Foreign Key (FK) NN	Users identifier. Example: 1001

Sample Data:

address_id	street_1	street_2	city	state	country	zip_code	user_id
101	Boylston St	Apt 238	Boston	MA	USA	2283	10001
102	germain St	Apt 239	New York	MA	USA	2001	10002
103	Boylston St	Apt 240	Boston	MA	USA	2283	10003
104	germain St	Apt 241	Boston	MA	USA	2001	10004
105	germain St	Apt 242	Boston	MA	USA	2984	10005

Developers Cluster

It holds all the developer details including his bank details, personal information, payments of the applications, memberships, etc. It is made available to track the application process through developers.

Developers Cluster

Developers

Definition: This entity is used to store the developers details of the applications. It also stores the type of developers and check if the user is verified or not.

Business Rules:

In Scope –

1) One developer can have many applications.
2) One developer can have only one membership at a time.
3) One developers can have one or many bank details.
4) One developers can have zero or many addresses.
5) One developer can have zero or no payments.
6) Only verified user will be able to publish the applications on the app store.

Out of scope –

1) Enterprise developers are out of scope.

Attribute Name	Data Type	Constraints	Definition and example
developer_id	Int	Primary Key (PK) Not Null (NN)	A unique identifier to the Developers Entity. The sequence starts with 1001. The id is auto incremented. Example: 1001
first_name	Varchar (20)	Not Null (NN)	The first name of the developer.

			Example: Peter
last_name	Varchar (20)		The last name of the developer. Example: Shaw
dev_type	Varchar (10)	NN	The type of developer either an individual or an organization. Example: organization
website_link	Varchar (50)		The website of the organization or the individual if he or she has. Example: www.googlegames.com
email_address	Varchar (20)	NN	The email address of the individual or company. Example: rghjitr@regamer.com
is_verified	Bit	NN	If values is 1 developer is verified otherwise the value is 0 which not verified. Example: 1

Sample Data:

developer_id	first_name	last_name	dev_type	website_link	email_address	is_verified
1001	Suman	Shah	organization	www.gooes.com	rghjitr@reer.com	1
1002	Rick	Mathew	individual		nick@gmail.com	1
1003	Tom		individual		rick@gmail.com	1
1004	Harry		individual	www.tomes.com	tom@gmail.com	1
1005	Hardy		individual		harry@gmail.com	1

Payments

Definition: It is used keep a track of the payments of an application by the app store to the developers and the payments information. It will keep a track of the payment status and the developers can get the information of their transactions.

Business Rules:

In Scope –

1) One developer can have zero or many payments.
2) If there is a payment it must be linked with at least one application.

Attribute Name	Data Type	Constraints	Definition and example
payment_id	Int	Primary Key (PK) Not Null (NN)	A unique identifier to any transactions between payments and a developer. The sequence starts with 10029. The id is auto incremented. Example: 10029
type	Varchar (8)	NN	It is used to define whether the payment is from developer or to developer. Example: to dev
date_of_payment	Date	NN	The date on which the payment was initiated. Example: 1/1/2015
payment_cycle	Varchar (10)	NN	It can be monthly quarterly or yearly. Example: monthly
status	Varchar (10)	NN	The status of the transaction whether it is initiated or successful or in the intermediate state. Example: initiated
total_amount	Float	NN	The total amount of the transaction Example: 400
developer_id	Int	Foreign Key (FK) NN	Developers identifier. Example: 10035
application_id	Int	Foreign Key (FK) NN	Application identifier. Example: 3220
version_id	Float	Foreign Key (FK) NN	Applications identifier. Example: 32.0

Sample Data:

payment_id	type	date_of_payment	payment_cycle	status	total_amount	developer_id	application_id	versioon_id
10299	to dev	3/2/2018	yearly	initiated	5000.00	33202	1001	3.00
10300	from dev	4/17/2018	monthly	successful	700.00	48543	3221	2.00
10301	to dev	3/4/2012	quarterly	unsuccessful	1200.00	32344	3432	1.10
10302	from dev	3/5/2018	monthly	initiated	400.00	56777	7644	5.10
10303	to dev	3/6/2018	monthly	initiated	700.00	12324	4432	3.00

Memberships

Definition: This entity used to store different types of memberships and the developers linked to it. Developer should have a membership to publish an application on the app store.

Business Rules:

In Scope –

1) One developer can have only one membership at a time.
2) Memberships end date can be null which means the membership is lifetime.

Out of scope –

1) Enterprise memberships out of scope.

Attribute Name	Data Type	Constraints	Definition and example
membership_id	Int	Primary Key (PK) Not Null (NN)	A unique identifier to Memberships entity. The sequence starts with 1022. The id is auto incremented. Example: 1022
type	Varchar (10)	NN	The type of membership: premium, business, golden, etc Example: premium
start_date	Int	NN	The start date of the membership. Example: 12/2/2017
end_date	Int		The expiry year of the membership. Example: 2/2/2022
developer_id	Int	Foreign Key (FK) NN	ddeveloper identifier. Example: 10021

Sample Data:

membership_id	type	start_date	end_date	developer_id
1022	premium	12/2/2017	2/2/2027	29932
1023	gold	12/6/2017	2/2/2024	29933
1024	gold	12/23/2017	2/2/2029	29934
1025	premium	12/12/2017	2/23/2022	29935
1026	premium	12/8/2017	2/12/2022	29936

Bank_Details

Definition: This entity used to store the bank details which can be used by payments entity if he or she get payments from the app store.

Business Rules:

In Scope –

1) One bank details can be linked to only one developer.
2) Developers can have many bank accounts.

Out of scope –

1) Swiss code for international banking.

Attribute Name	Data Type	Constraints	Definition and example
bank_details_id	Int	Primary Key (PK) Not Null (NN)	A unique identifier to Bank details entity. The sequence starts with 10002. The id is auto incremented. Example: 10002
bank_name	Varchar (20)	NN	The name of the bank. Example: BOA
account_no	Int	NN	The bank account number. Example: 76583242343
routing_no	Int	NN	The bank routing number. Example: 324223442
developer_id	Int	Foreign Key (FK) NN	Developers identifier. Example: 17061

Sample Data:

bank_details_id	bank_name	account_no	routing_no	developer_id
10002	BOA	894334233	843929	17061
10003	Santander	439493243	849929	12361
10004	BOI	343343232	846729	13361
10005	BOA	343234556	843429	17051
10006	BOI	894484233	843729	12061

Developer Addresses

Definition: This entity is used to store the address of the developers. The developer may or may not require storing addresses. But if there is a requirement the developer addresses are stored in this entity.

Business Rules:

In Scope –

1) One developer can have zero or many addresses.
2) Country is mandatory field as it can be used to get the application developed with respect to countries.

Attribute Name	Data Type	Constraints	Definition and example
address_id	Int	Primary Key (PK) Not Null (NN)	A unique identifier to the Addresses Entity. The sequence starts with 101. The id is auto incremented. Example: 101
street_1	Varchar (15)	NN	Street name of the address Example: Boylston St
street_2	Varchar (15)		Street name of the address Example: apt 238
city	Varchar (15)	NN	The city where user lives Example: Boston
state	Varchar (100)	NN	The state of the user address. Example: MA
country	Varchar (15)	NN	Country of the address Example: USA
zip_code	Int	NN	Zip code of the address Example: 22993
user_id	Int	Foreign Key (FK) NN	Users identifier. Example: 1001
developer_id	Int	Foreign Key (FK) NN	Developer identifier. Example: 1056

Sample Data:

address_id	street_1	street_2	city	state	country	zip_code	developer_id
101	Boylston St	Apt 238	Boston	MA	USA	2283	1001
102	germain St	Apt 239	New York	MA	USA	2001	1002
103	Boylston St	Apt 240	Boston	MA	USA	2283	1003
104	germain St	Apt 241	Boston	MA	USA	2001	1004
105	germain St	Apt 242	Boston	MA	USA	2984	1005

Systems Cluster

It stores the data of applications and other metadata.

Systems Cluster

Application_Files

Definition: This entity used to store the meta data of the applications entity. It stores the path to the various files used by the application.

Business Rules:

In Scope –

1) One application must have at least one application files.
2) The path in the entity stores everything including .akp or .ios file, screenshots, images, etc. No separate path for separate files

Out of scope –

1) Employees of the app store

Attribute Name	Data Type	Constraints	Definition and example
application_files_id	Int	Primary Key (PK) Not Null (NN)	A unique identifier to Application Files entity. The sequence starts with 10031. The id is auto incremented. Example: 10031
path	Varchar (50)	NN	The path to the files folder of the local disk for now. Example: C:\Users\Desktop\IS\DBDS

Sample Data:

application_files_id	path
1231	C:\Users\Desktop\IS\AED
1232	C:\Users\Desktop\IS\DWBI
1233	C:\Users\Desktop\IS\Appstore
1234	C:\Users\Desktop\IS\AED
1235	C:\Users\Desktop\IS\DWBI

Admin Credentials

Definition: This entity used to store admin credentials.

Business Rules:

In Scope –

1) At least one admin should be present for managing the applications.

Attribute Name	Data Type	Constraints	Definition and example
credentials_id	Int	Primary Key (PK) Not Null (NN)	A unique identifier to the table. The sequence starts with 301. Example: 1091
username	Varchar (10)	NN	The basic username which the admin will get Example: admin
password	Varchar (15)	NN	Stores password of the admin which can be of 15 alphanumeric value Example: admin123

Sample Data:

credentials_id	username	password
301	admin	123
302	dataAdmin	2355

Relationship Description

Table 1	Table 2	Relationship	Identified/ Non-Identified	Description
Applications	Application_Documents	one to many	Non_Identified	One application will have atleast one or many icons which needs to be store. The application screenshots or icon may change as per the version change
Applications	Country_Languages	many to many	Identified	One application can support more than one languages and can be published in different countries. Similarly, one country can have many applications published in their country
Applications	Categories	many to many	Identified	One applications will have atleast one or many categories. Similarly, one category will have atleast one or many applications related to it.
Applications	Application_Compatibility	one to one	Identified	One application will have one application compatibility requirement, which be a minimum requirement.
Applications	Application_Reviews	one to many	Identified	One applications will have zero or many application reviews. Since, it must be unique for each version relationship is identified.
Applications	Applications_Archive	one to many	Identified	Since application archive cannot be independent, it is identified. One application will have zero or many archive entries.
Applications	Payments	one to many	Non_Identified	One application will have zero or many payments. Zero if the app is not downloaded or is not yet verified.
Applications	Purchases	one to many	Non_Identified	One application will have zero or many payments. Zero if the app is not yet verified.
Applications	Downloads	one to many	Non_Identified	One application will have zero or many downloads. Zero if the app is not downloaded or is not yet verified. But downloads will be linked to atleast one application.
Applications	Application_Files	one to one	Non_Identified	One application will have one application files related to it which stores the application metadata.
Developers	Applications	one to many	Non_Identified	One developer will have atleast one or many applications. A developer can create more than one application.

Developers	Memberships	one to one	Non_Identified	One developer will have one membership linked to it so that he can be verified.
Developers	Bank_Details	one to many	Non_Identified	One developer will have atleast one or many bank accounts. Atleast one is needed to get the purchase amount transferred from the app store.
Developers	Payments	one to many	Non_Identified	One developer will have zero or many payments. Zero if the application is still not verified.
Developers	Developer_Addresses	one to many	Non_Identified	One developer will have atleast one or many addresses. A developer can create more than one address.
Devices	Downloads	one to many	Non_Identified	One device will have zero or many downloads. Zero if the app is not yet downloaded.
Device_Types	Devices	one to many	Non_Identified	One device type will have atleast one or many devices. There can be multiple types of devices.
Users	Devices	one to many	Non_Identified	One user will have atleast one or many devices. Atleast one because user cannot be defined without a device.
Users	Application_Reviews	one to many	Non_Identified	One user will have zero or many application reviews. Zero if the user is not interested to review the application and many if there is a new version for the same application.
Users	Gift_Cards	one to many	Non_Identified	One user will have zero or many gift cards. Zero if the user is linked to any gift card.
Users	User_Account_Details	one to many	Non_Identified	One user will have zero or many accounts. Zero if the application does not require any account.
Users	Credit_Card_Details	one to many	Non_Identified	One user will have zero or many credit cards. Zero if the application does not require any address details.
Users	User_Addresses	one to many	Non_Identified	One user will have zero or many addresses. Zero if the user is linked to any gift card.
Users	Purchases	one to many	Non_Identified	One user will have zero or many purchases. Zero if the user has not downloaded any application but searched.

Related Documents


Input Sample Data.xlsx


ProceduresTriggers ViewsSequenceSSISI


DDL Script.sql


App Store Version 3.txp


App Store Version 3.png

Revision History

Version	Author	Last Revised Date	Comments	Reviewer	Future Scope
1.0	Nilesh Nerkar	2/2/2018	Major Entities created along with their basic definitions.	Priyal Chaudhari	More entities can be added
1.1	Nilesh Nerkar	2/13/2018	Draft 2 created. Major entities added. Relationships defined in the documents.	Akshay Jain	Relationship between the entities can be created using a data model tool and hence the DDL script for the database. Entities can be added. Sample data can be added.
1.2	Nilesh Nerkar	3/2/2018	App store Data model created using TOAD Data Modeler. Major entities like purchases, devices, downloads, memberships, addresses, payment details, account details, application metadata, reviews application support, etc added. Sample data has been added.	Akshay Jain	Sample data can be inserted into the database. Relationships between the entities can be improved. Indexes and stored procs can be included.
2.0	Nilesh Nerkar	4/6/2018	App Store Version 2 created which included 25 entity classes, relationships which were incorrect are modified. In App Advertisement, geography, languages, subscription, application compatibility, reviews archive are added. Also, indexes are included in the current model.	Akshay Jain	Stored Procedures and triggers can be included for the performance. A basic user interface can be created to test the database functionality.

3.0	Nilesh Nerkar	4/22/2018	Updated the password data type to binary and added a password_has column with uniqueidentifier datatype. Added Admin Credentials table to store admin username and password. Update the icon and screenshot datatype to VARBINARY. Included three stored procedures to insert applications which validates unique application name, one to encrypt the password and the last to decrypt the password field. Included views to get the rating of application and added trigger to archive the application after the fifth count. Applied indexes on required fields, included sequences on each primary key to auto increment the value.	Akshay Jain	Application database can be backed up using a stored procedure. An identity must set on primary key Invoice can be generated