

# IST 659 Database Administration Concepts and Management

## Project

### DB Design for capturing IoT data into MySQL

For the project concept, I would like to use this opportunity to create a model for an application which I am running as a startup. Currently, the application has data stored in MongoDB (noSQL database) and I am trying to build the application with MySQL Backend in AWS

Basically, converting MongoDB collections to SQL Database tables and views

**About the Application:** It's a mobile app used by Security company guards and other workers who patrol an office or location. The App captures patrol scan details (Location capture, QR Code Scan, Photo Attendance and Incident Reports) which are all monitored in central location

Below is the high-level description of how the data is broken up currently in mongoDB collections

**Scans:** Provides transaction information of each scan or location tag by a user

**Companies:** List of Companies created in the system

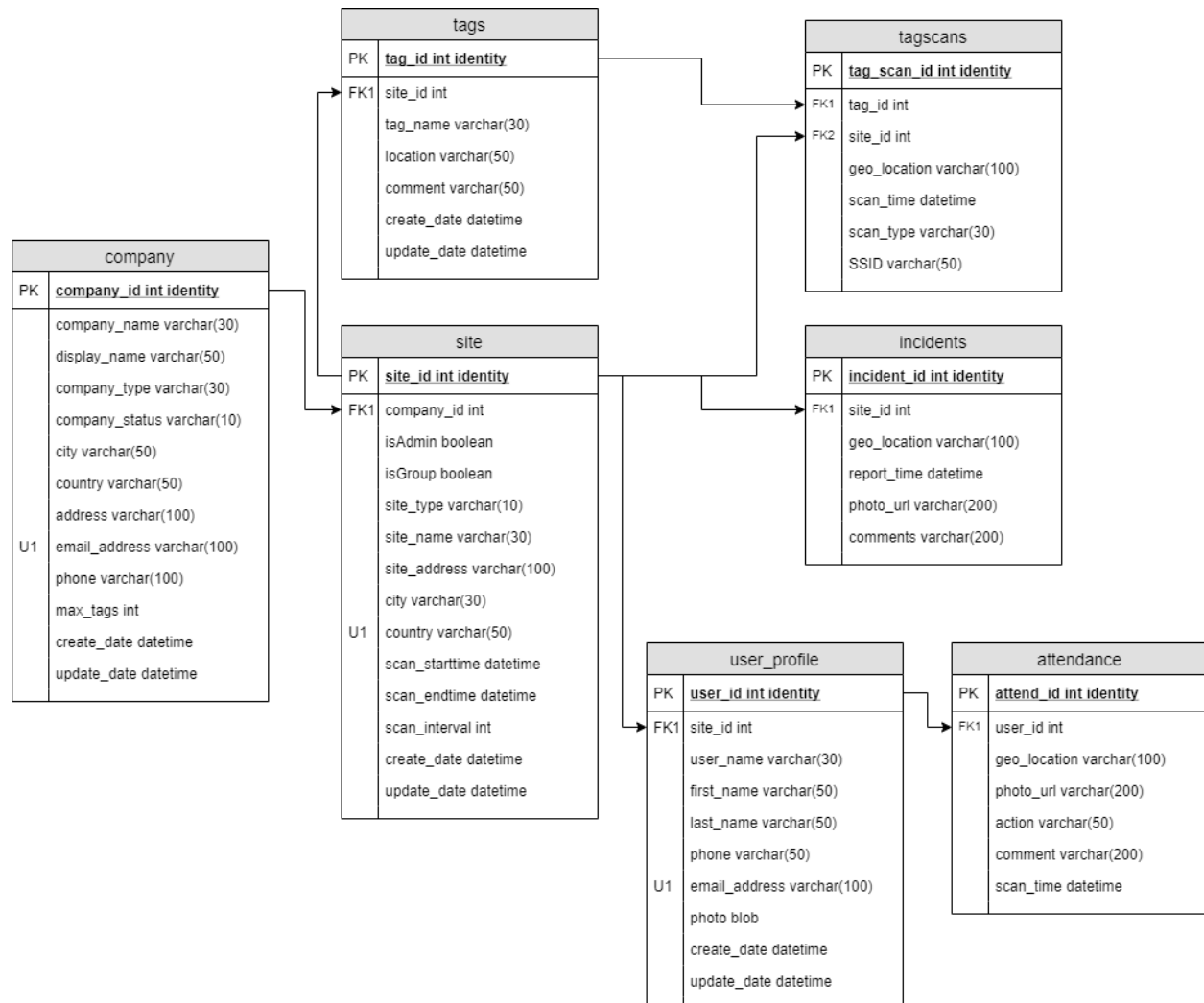
**Users:** List of users created in the system

**Admins:** Admin users who oversee number of users in a company or group

**Time Dimension:** Linking ScanTime/CreateTime to Time dimension to slice data by Year/Month/Day/Week

**User Patrol Configuration:** It has data related to user, their patrol start time, end time, how many points installed in the location they are supposed to scan per day and other details for the user

## Modeling of database in MySQL



### Company: Stores all the company details

max\_tags - how many tags are sold to this company

company\_status – active/inactive if there is a needed to deactivate a company

company\_type – type of company (bank, telecom offices, residential complexes etc)

### Site: Stores all the site details

site\_type – big office, small office, small residential complex, big residential complex

### tags: Has all the tag details issued to each site

tag\_name – tag name that is assigned for each tag id

location – where the tag has been installed in site's premises

comments – any information about tag/location for reference

user\_profile: contains all users attached to the site

**tagscans: stores all tag scanning transactions that happens in each site**

captures details from app like site\_id, tag\_id, exact location (latitude, longitude) captured on the phone when the scan happened, type of scan, SSIS captures the nearest wi-fi connection of the app

**incidents: stores all incident transaction that happens in each site**

captures information from incidents reports from app for each incident such as site\_id, exact location of incident, incident date/time, URL of incident photo uploaded to cloud storage (not storing in database), comments about incident

**attendance: stored check-in/check-out transaction that happens in each site**

captures which user from the site has checked-in/checked-out of a site. Also captures additional details like exact location of check-in/check-out as per the phone location coordinates, URL of attendance photo when checking in or checking out, action is check-in or check-out, comments (if any), scan\_time which is the exact time the user performed this action

**Relationships:** I have used Arrows  for connecting table relationship.

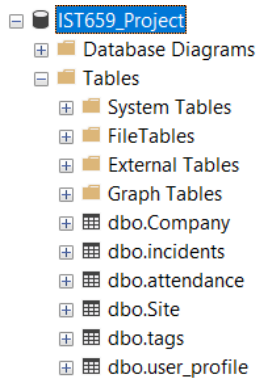
All arrows point to one to many relationship from source table to target table where the arrow is pointed to

**Note: All transactions like tagscans, incidents and attendance are kept in different transaction tables instead of 1 transaction type for 2 reasons**

- To avoid having to add more columns to cater to different type of transactions which captures different type of information
- Each transaction servers different business use case and can easily be projected to front end for reporting without having to filter data out from each transaction table

## Database Design:

Database with a name IST659\_Project created in my local machine in SQL Server as test environment to MySQL database that will be implemented in AWS



## DB Table design scripts:



IST659\_Project.sql

## Data imported to the tables:



tags.xlsx



site.xlsx



incidents.xlsx



company.xlsx



attend.xlsx



user\_profile.xlsx



tagscans\_sample.xlsx

Please note that only a sample of tagscans attached to the document. Close to 500K records were loaded into tagscans table

## Changes to Datamodel and table structure:

There were several changes made on the final table structure compared to the initial model proposed

1. Link between site and tag tables with site\_id has been removed since tags are not dependent on sites
2. Several columns across all tables have been change to NULL where there are no values in the data that needs to be loaded to respective tables
3. Foreign keys between tables have been removed as some of the data that needed to be migrated to MYSQL doesn't support the foreign key constraint since the data has been taken from a NoSQL database and I needed all data to be migrated

4. Tagscans, incidents and attendance table datetime field converted to varchar since the actual data that need to be migrated is in the format '13 FEB 2020 17:00:00 GMT'. The data conversion for these date time fields will be implemented in the front-end application

## Data Questions:

## Company:

select \* from company

100 %

Results Messages

	company_id	company_name	display_name	company_type	company_status	company_city	company_country	company_address	company_email_address	max_tags	company_create_date
1	5925e2f6cf641f0004b2aa3	intelli2	NULL	security	Active	Johannesburg	South Africa	NULL	intelli2@intelli2.com	50	2020-03-26 21:08:13.7
2	595d03e3ae9b350004bd44b	Kloofendale	NULL	security	Active	Johannesburg	South Africa	NULL	Kloofendale@intelli2.com	50	2020-03-26 21:08:13.7
3	595d047eae9b350004bd44c	Cognizant	NULL	security	Active	Johannesburg	South Africa	NULL	Cognizant@intelli2.com	50	2020-03-26 21:08:13.7
4	599d7b1f724d5f00049b54b9	WB Centre	NULL	security	Active	Johannesburg	South Africa	NULL	WB Centre@intelli2.com	50	2020-03-26 21:08:13.7
5	599d7b39724d5f00049b54ba	13 Elliot	NULL	security	Active	Johannesburg	South Africa	NULL	13 Elliot@intelli2.com	50	2020-03-26 21:08:13.7
6	599d7c3e724d5f00049b54bc	Delta	NULL	security	Active	Johannesburg	South Africa	NULL	Delta@intelli2.com	50	2020-03-26 21:08:13.7
7	59b69ab69560e0000453c6b5	WiltoWin	NULL	security	Active	Johannesburg	South Africa	NULL	WiltoWin@intelli2.com	50	2020-03-26 21:08:13.7
8	59d67bd59e9adb000465bd27	nigeria demo	NULL	security	Active	Lagos	Nigeria	NULL	nigeria demo@intelli2.com	50	2020-03-26 21:08:13.7
9	59e4ef2947d350004e1e058	hlangananiezweni	NULL	security	Inactive	Johannesburg	South Africa	NULL	hlangananiezweni@intelli2.com	50	2020-03-26 21:08:13.7
10	59f1f0ed6c25b6000498becf	DeltaPretoriaadmin	NULL	security	Active	Johannesburg	South Africa	NULL	DeltaPretoriaadmin@intelli2.com	50	2020-03-26 21:08:13.7
11	5a0c632cdcd6a6f0004ce51e3	isecure	NULL	security	Active	Johannesburg	South Africa	NULL	isecure@intelli2.com	50	2020-03-26 21:08:13.7
12	5a1edcab4838500132a824d	amith	NULL	security	Active	Johannesburg	South Africa	NULL	amith@intelli2.com	50	2020-03-26 21:08:13.7
13	5a8d45bbd0824b0013267e45	tokenpressltd	NULL	security	Active	Johannesburg	South Africa	NULL	tokenpressltd@intelli2.com	50	2020-03-26 21:08:13.7
14	5ab8ca7519a14500133b6e08	DeltaDurban	NULL	security	Active	Johannesburg	South Africa	NULL	DeltaDurban@intelli2.com	50	2020-03-26 21:08:13.7
15	5afc694d4bd14a900137de346	CrestSecurity	NULL	security	Active	Johannesburg	South Africa	NULL	CrestSecurity@intelli2.com	50	2020-03-26 21:08:13.7
16	5h3a59685c7e26001134ca712	Danonte	NULL	security	Active	Johannesburg	South Africa	NULL	Danonte@intelli2.com	50	2020-03-26 21:08:13.7

Query executed successfully.

localhost (15.0 RTM) ICCOHIO\pugazhendhi (53) IST659\_Project 00:00:00 32 rows

## Site:

select \* from site

100 %

ResultsMessages

	site_id	site_name	company_id	isAdmin	isGroup	site_type	site_address	site_city	scan_starthour	scan_endhour	scan_interval	site_create_date	site_update
1	5925e342cf641f0004b2aa4	chandan	5925e2f6cf641f0004b2aa3	0	0	office	NULL	Johannesburg	17	6	1	2020-03-26 21:18:40.457	2020-03-26
2	5927177171f1e3a0004ec85e4	intelli2_admin	5925e2f6cf641f0004b2aa3	1	0	office	NULL	Johannesburg	17	6	1	2020-03-26 21:18:40.457	2020-03-26
3	592e95b9b1bc36000430b253	waterval	592e9549b1bc36000430b252	0	0	office	NULL	Johannesburg	17	6	1	2020-03-26 21:18:40.457	2020-03-26
4	592e9697b1bc36000430b254	carlgrundling	592e9549b1bc36000430b252	0	0	office	NULL	Johannesburg	17	6	1	2020-03-26 21:18:40.457	2020-03-26
5	592e96d4b1bc36000430b255	herbetbickley	592e9549b1bc36000430b252	0	0	office	NULL	Johannesburg	17	6	1	2020-03-26 21:18:40.457	2020-03-26
6	592e9710b1bc36000430b256	jansmuts	592e9549b1bc36000430b252	0	0	office	NULL	Johannesburg	17	6	1	2020-03-26 21:18:40.457	2020-03-26
7	592e9760b1bc36000430b257	jpmaraais	592e9549b1bc36000430b252	0	0	office	NULL	Johannesburg	17	6	1	2020-03-26 21:18:40.457	2020-03-26
8	592e977fb1bc36000430b258	ratanda	592e9549b1bc36000430b252	0	0	office	NULL	Johannesburg	17	6	1	2020-03-26 21:18:40.457	2020-03-26
9	592e97beb1bc36000430b259	heilidelburg	592e9549b1bc36000430b252	0	0	office	NULL	Johannesburg	17	6	1	2020-03-26 21:18:40.457	2020-03-26
10	592e97f2b1bc36000430b25a	daveyton	592e9549b1bc36000430b252	0	0	office	NULL	Johannesburg	17	6	1	2020-03-26 21:18:40.457	2020-03-26
11	592e981eb1bc36000430b25b	ancor	592e9549b1bc36000430b252	0	0	office	NULL	Johannesburg	17	6	1	2020-03-26 21:18:40.457	2020-03-26
12	592e9857b1bc36000430b25c	tsakane	592e9549b1bc36000430b252	0	0	office	NULL	Johannesburg	17	6	1	2020-03-26 21:18:40.457	2020-03-26
13	592e9884b1bc36000430b25d	welgedatch	592e9549b1bc36000430b252	0	0	office	NULL	Johannesburg	17	6	1	2020-03-26 21:18:40.457	2020-03-26
14	592e98aeb1bc36000430b25e	benoni	592e9549b1bc36000430b252	0	0	office	NULL	Johannesburg	17	6	1	2020-03-26 21:18:40.457	2020-03-26
15	592e9897b1bc36000430b25f	rondebuilt	592e9549b1bc36000430b252	0	0	office	NULL	Johannesburg	17	6	1	2020-03-26 21:18:40.457	2020-03-26
16	592e9908b1bc36000430b260	dekema	592e9549b1bc36000430b252	0	0	office	NULL	Johannesburg	17	6	1	2020-03-26 21:18:40.457	2020-03-26

Query executed successfully.

localhost (15.0 RTM)ICCOHIO\pugazhendhi (53)IST659\_Project00:00:00171 rows

## Tags:

select \* from tags

100 %

Results Messages

	tag_name	tag_id	tag_location	comment	tag_create_date	tag_update_date
1	Actual Location	1	NULL	NULL	2020-03-26 21:27:35.653	2020-03-26 21:27:35.657
2	Admin Block	2	NULL	NULL	2020-03-26 21:27:35.653	2020-03-26 21:27:35.657
3	Aerobic	3	NULL	NULL	2020-03-26 21:27:35.653	2020-03-26 21:27:35.657
4	Anaerobic Zone	4	NULL	NULL	2020-03-26 21:27:35.653	2020-03-26 21:27:35.657
5	Ancor 1	5	NULL	NULL	2020-03-26 21:27:35.653	2020-03-26 21:27:35.657
6	Apollo Light	6	NULL	NULL	2020-03-26 21:27:35.653	2020-03-26 21:27:35.657
7	Auditorium Parking Back	7	NULL	NULL	2020-03-26 21:27:35.653	2020-03-26 21:27:35.657
8	Auditorium Parking Front	8	NULL	NULL	2020-03-26 21:27:35.653	2020-03-26 21:27:35.657
9	Auration Substation	9	NULL	NULL	2020-03-26 21:27:35.653	2020-03-26 21:27:35.657
10	Back Farm Gate	10	NULL	NULL	2020-03-26 21:27:35.653	2020-03-26 21:27:35.657
11	Back Gate	11	NULL	NULL	2020-03-26 21:27:35.653	2020-03-26 21:27:35.657
12	Back of Office	12	NULL	NULL	2020-03-26 21:27:35.653	2020-03-26 21:27:35.657
13	Back yard 1	13	NULL	NULL	2020-03-26 21:27:35.653	2020-03-26 21:27:35.657
14	Back Yard 2	14	NULL	NULL	2020-03-26 21:27:35.653	2020-03-26 21:27:35.657
15	Back Yard 3	15	NULL	NULL	2020-03-26 21:27:35.653	2020-03-26 21:27:35.657
16	Backup Generator	16	NULL	NULL	2020-03-26 21:27:35.653	2020-03-26 21:27:35.657
17	Backward Gate	17	NULL	NULL	2020-03-26 21:27:35.653	2020-03-26 21:27:35.657

Query executed successfully. localhost (15.0 RTM) ICCOHIO\jpugazhendhi (53) IST659\_Project 00:00:00 227 rows

## User\_profile:

select \* from user\_profile

100 %

Results Messages

	user_id	site_id	user_name	user_email_address	first_name	last_name	user_phone	user_photo_url	user_create_date	user_update_date
1	5925e152f36d28342a766bc4	5925e152f36d28342a766bc4	admin	abhishek.sircar@intelli2.com	NULL	NULL	NULL	NULL	2020-03-26 21:25:22.977	NULL
2	5925e342cf641f0004bf2aa4	5925e342cf641f0004bf2aa4	chandan	chandan@intelli2.com	NULL	NULL	NULL	NULL	2020-03-26 21:25:22.977	NULL
3	5927177171fe3a0004ec85e4	5927177171fe3a0004ec85e4	intelli2_admin	intelli2_admin@intelli2.com	NULL	NULL	NULL	NULL	2020-03-26 21:25:22.977	NULL
4	592e95b9b1bc36000430b253	592e95b9b1bc36000430b253	waterval	waterval@intelli2.com	NULL	NULL	NULL	NULL	2020-03-26 21:25:22.977	NULL
5	592e9697b1bc36000430b254	592e9697b1bc36000430b254	carlgrunding	carlgrunding@intelli2.com	NULL	NULL	NULL	NULL	2020-03-26 21:25:22.977	NULL
6	592e96d4b1bc36000430b255	592e96d4b1bc36000430b255	herbetbickley	herbetbickley@intelli2.com	NULL	NULL	NULL	NULL	2020-03-26 21:25:22.977	NULL
7	592e9710b1bc36000430b256	592e9710b1bc36000430b256	jansmuts	jansmuts@intelli2.com	NULL	NULL	NULL	NULL	2020-03-26 21:25:22.977	NULL
8	592e9760b1bc36000430b257	592e9760b1bc36000430b257	jpmarais	jpmarais@intelli2.com	NULL	NULL	NULL	NULL	2020-03-26 21:25:22.977	NULL
9	592e977b1bc36000430b258	592e977b1bc36000430b258	ratanda	ratanda@intelli2.com	NULL	NULL	NULL	NULL	2020-03-26 21:25:22.977	NULL
10	592e97beb1bc36000430b259	592e97beb1bc36000430b259	heidelberg	heidelberg@intelli2.com	NULL	NULL	NULL	NULL	2020-03-26 21:25:22.977	NULL
11	592e97f2b1bc36000430b25a	592e97f2b1bc36000430b25a	daveyton	daveyton@intelli2.com	NULL	NULL	NULL	NULL	2020-03-26 21:25:22.977	NULL
12	592e981eb1bc36000430b25b	592e981eb1bc36000430b25b	ancor	ancor@intelli2.com	NULL	NULL	NULL	NULL	2020-03-26 21:25:22.977	NULL
13	592e9857b1bc36000430b25c	592e9857b1bc36000430b25c	tsakane	tsakane@intelli2.com	NULL	NULL	NULL	NULL	2020-03-26 21:25:22.977	NULL
14	592e9884b1bc36000430b25d	592e9884b1bc36000430b25d	welgedatch	welgedatch@intelli2.com	NULL	NULL	NULL	NULL	2020-03-26 21:25:22.977	NULL
15	592e98aeb1bc36000430b25e	592e98aeb1bc36000430b25e	benoni	benoni@intelli2.com	NULL	NULL	NULL	NULL	2020-03-26 21:25:22.977	NULL
16	592e98e7b1bc36000430b25f	592e98e7b1bc36000430b25f	rondelbut	rondelbut@intelli2.com	NULL	NULL	NULL	NULL	2020-03-26 21:25:22.977	NULL
17	592e9908b1bc36000430b260	592e9908b1bc36000430b260	dekema	dekema@intelli2.com	NULL	NULL	NULL	NULL	2020-03-26 21:25:22.977	NULL

Query executed successfully. localhost (15.0 RTM) ICCOHIO\jpugazhendhi (53) IST659\_Project 00:00:00 172 rows

## Tagscans:

select \* from tagscans

100 %

Results Messages

	geo_location	scan_type	scanTime	SSID	tag_scan_id	site_id	tag_id
1	-26.32764333,28.16443667	circular	Mon, 01 Apr 2019 00:00:02 GMT	HP-Print-7A-Officejet Pro 8600(82.0)	5ca154882b98540013364b1a	592e9908b1bc36000430b260	1
2	-26.16135167,28.36063833	circular	Mon, 01 Apr 2019 00:00:14 GMT	NA(63.0)	5ca154932b98540013364b1b	592e99e0b1bc36000430b265	225
3	-26.3843223,28.4697681	circular	Mon, 01 Apr 2019 00:00:32 GMT	HP-Print-AE-Officejet Pro 8610(84.0)	5ca154a72b98540013364b1c	592e9697b1bc36000430b254	81
4	-26.02369833,28.28602	circular	Mon, 01 Apr 2019 00:00:50 GMT	Erwat_Staff(98.0)	5ca154b62b98540013364b1d	592e9a13b1bc36000430b266	109
5	-26.2675005,28.4826868	circular	Mon, 01 Apr 2019 00:00:20 GMT	NA(79.0)	5ca154c72b98540013364b1e	592e981eb1bc36000430b25b	168
6	-26.53976,28.331005	circular	Mon, 01 Apr 2019 00:01:04 GMT	ERWAT(74.0)	5ca154ce2b98540013364b1f	592e97beb1bc36000430b259	81
7	-26.4346763,28.0971601	circular	Mon, 01 Apr 2019 00:01:16 GMT	NA(1.0)	5ca154d02b98540013364b21	592e95b9b1bc36000430b253	58
8	-26.32760333,28.16443667	circular	Mon, 01 Apr 2019 00:01:27 GMT	HP-Print-85-Officejet Pro 8610(82.0)	5ca154db2b98540013364b22	592e9908b1bc36000430b260	130
9	-26.43473167,28.09745167	circular	Mon, 01 Apr 2019 00:01:52 GMT	NA(0.0)	5ca154f72b98540013364b23	592e95b9b1bc36000430b253	1
10	-26.02363667,28.28573833	circular	Mon, 01 Apr 2019 00:02:01 GMT	ERWAT_MainGate(97.0)	5ca154ff2b98540013364b24	592e9a13b1bc36000430b266	104
11	-26.1355598,28.4635309	circular	Mon, 01 Apr 2019 00:02:08 GMT	VODACOM-B315-7E88	5ca155002b98540013364b25	592e97f2b1bc36000430b25a	81
12	-26.1609708,28.3600967	circular	Mon, 01 Apr 2019 00:02:10 GMT	NA(62.0)	5ca155082b98540013364b26	592e99e0b1bc36000430b265	4
13	-26.38429,28.4697833	circular	Mon, 01 Apr 2019 00:02:13 GMT	HP-Print-AE-Officejet Pro 8610(84.0)	5ca155092b98540013364b27	592e9697b1bc36000430b254	109
14	-26.22474,28.37594	circular	Mon, 01 Apr 2019 00:02:21 GMT	NA(77.0)	5ca1550d2b98540013364b28	592e9710b1bc36000430b256	139
15	-26.13574,28.46354167	circular	Mon, 01 Apr 2019 00:02:34 GMT	VODACOM-B315-7E88	5ca1551a2b98540013364b29	592e97f2b1bc36000430b25a	1
16	-26.44451667,28.44669333	circular	Mon, 01 Apr 2019 00:03:07 GMT	HP-Print-67-Officejet Pro 8610(71.0)	5ca155412b98540013364b2b	592e96d4b1bc36000430b255	206
17	-26.0229353,28.2854192	circular	Mon, 01 Apr 2019 00:03:09 GMT	NA(96.0)	5ca155412b98540013364b2c	592e9a13b1bc36000430b266	105

Query executed successfully. localhost (15.0 RTM) ICCOHIO\jpugazhendhi (53) IST659\_Project 00:00:11 497,400 rows

## Attendance:

select \* from attendance

	attend_geo_location	photo_url	action	attend_time	attend_comment	attend_id	user_id	F8
1	-26.19301333,28.47416	NULL	hop	Tue, 04 Jun 2019 16:08:30 GMT	NULL	5cf6978446949700134274fc	592e9884b1bc36000430b25d	NULL
2	-26.1932708,28.4745691	NULL	hop	Tue, 04 Jun 2019 16:10:05 GMT	NULL	5cf697e346949700134274fe	592e9884b1bc36000430b25d	NULL
3	-26.1942333,28.4736899	NULL	hop	Tue, 04 Jun 2019 16:12:31 GMT	NULL	5cf698714694970013427501	592e9884b1bc36000430b25d	NULL
4	-26.193985,28.4725633	NULL	hop	Tue, 04 Jun 2019 16:14:21 GMT	NULL	5cf698e04694970013427503	592e9884b1bc36000430b25d	NULL
5	-26.1928113,28.4731295	NULL	hop	Tue, 04 Jun 2019 16:54:01 GMT	NULL	5cf6a22c469497001342752d	592e9884b1bc36000430b25d	NULL
6	-26.1923336,28.4722589	NULL	hop	Tue, 04 Jun 2019 16:56:07 GMT	NULL	5cf6a2b0469497001342752f	592e9884b1bc36000430b25d	NULL
7	-26.1923075,28.4717517	NULL	hop	Tue, 04 Jun 2019 16:57:05 GMT	NULL	5cf6a2ef4694970013427530	592e9884b1bc36000430b25d	NULL
8	-26.1916856,28.4717535	NULL	hop	Tue, 04 Jun 2019 16:59:15 GMT	NULL	5cf6a3664694970013427532	592e9884b1bc36000430b25d	NULL
9	-26.1927049,28.4731592	NULL	hop	Tue, 04 Jun 2019 17:07:34 GMT	NULL	5cf6a5e94694970013427555	592e9884b1bc36000430b25d	NULL
10	-26.1915185,28.4737344	NULL	hop	Tue, 04 Jun 2019 17:09:55 GMT	NULL	5cf6a5e94694970013427573	592e9884b1bc36000430b25d	NULL
11	-26.19151333,28.47397667	NULL	hop	Tue, 04 Jun 2019 17:10:20 GMT	NULL	5cf6a60246949700134275c9	592e9884b1bc36000430b25d	NULL
12	-26.1917018,28.4742054	NULL	hop	Tue, 04 Jun 2019 17:11:58 GMT	NULL	5cf6a66146949700134275d5	592e9884b1bc36000430b25d	NULL
13	-26.1917897,28.4747001	NULL	hop	Tue, 04 Jun 2019 17:12:46 GMT	NULL	5cf6a69146949700134275dc	592e9884b1bc36000430b25d	NULL
14	-26.1927427,28.4744174	NULL	hop	Tue, 04 Jun 2019 17:14:45 GMT	NULL	5cf6a70946949700134275f6	592e9884b1bc36000430b25d	NULL
15	-26.19348,28.474765	NULL	hop	Tue, 04 Jun 2019 17:17:03 GMT	NULL	5cf6a791469497001342760f	592e9884b1bc36000430b25d	NULL
16	-26.1944503,28.4735852	NULL	hop	Tue, 04 Jun 2019 17:19:59 GMT	NULL	5cf6a8424694970013427628	592e9884b1bc36000430b25d	NULL
17	-26.1944379,28.472575	NULL	hop	Tue, 04 Jun 2019 17:25:15 GMT	NULL	5cf6a97e4694970013427649	592e9884b1bc36000430b25d	NULL

Query executed successfully. localhost (15.0 RTM) ICCOHIOJpugazhendhi (53) IST659\_Project 00:00:00 7,042 rows

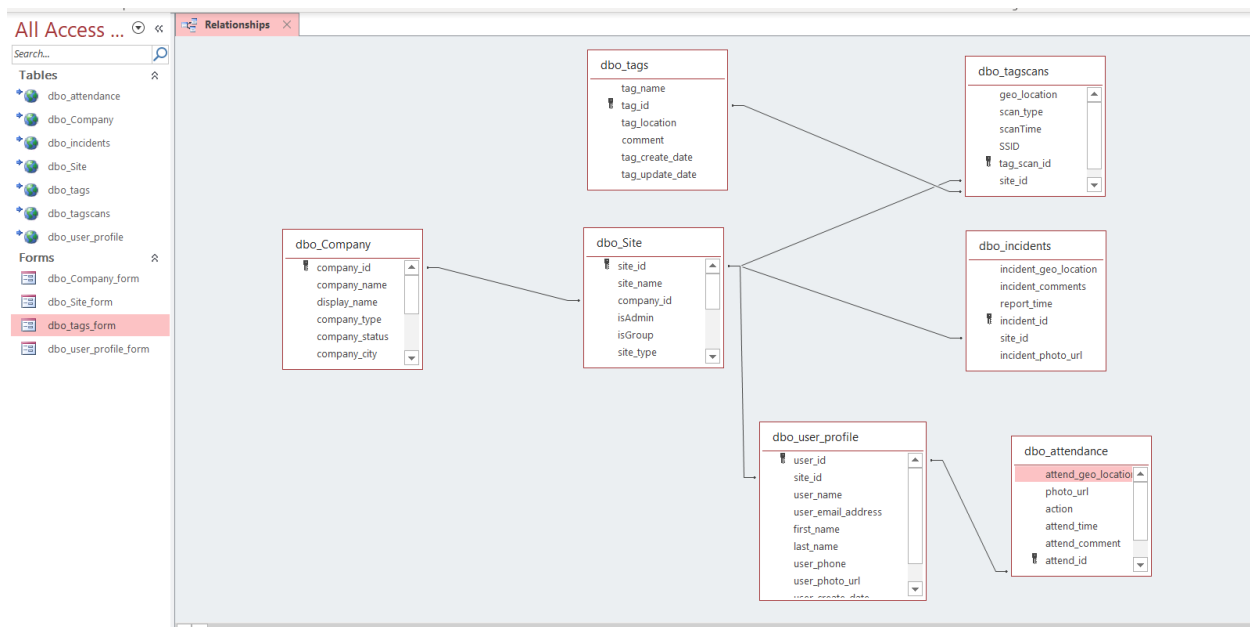
## Incidents:

	incident_geo_location	incident_comments	report_time	incident_id	site_id	incident_photo_url
1	-26.142726,28.1536503	Incident	Tue, 04 Jun 2019 08:13:20 GMT	5cf6282346949700134271df	592e99bfb1bc36000430b264	NULL
2	-26.142726,28.1536503	Incident	Tue, 04 Jun 2019 08:14:52 GMT	5cf6287e46949700134271e1	592e99bfb1bc36000430b264	NULL

## Data Relationships:

Just like the initial proposed design, the tables were linked

Only exception below is the relationship between site and tag tables removed



## Forms:

### Company\_form:

dbo_Company_form						
company_id	company_name	display_name	company_type	company_status	company_city	company_country
5ce8220c3581bf0013b44636	Dangote Ilorin		security	Active	Lagos	Nigeria
5ce8224f3581bf0013b44639	NOHI		security	Active	Lagos	Nigeria
5ce822583581bf0013b4463a	NSE		security	Active	Lagos	Nigeria
5ce822623581bf0013b4463b	A & P Dopemu		security	Active	Lagos	Nigeria
5ce8226e3581bf0013b4463c	may & baker ikeja		security	Active	Lagos	Nigeria
5ce8227b3581bf0013b4463d	CAP		security	Active	Lagos	Nigeria
5d4c03b226320500137bc14c	Inqanawa Security Services		security	Active	Johannesburg	South Africa
5d52a80d1a0f57001313565d	rapid vigil		security	Active	Lagos	Nigeria
5e132e11f132e0001364a95a	Wits		security	Active	Johannesburg	South Africa
5e132e11f132e0001364b67a	IST65_project		security	Active	Johannesburg	South Africa

Created a form to enter new company back to company table. Created new record with company\_name IST659\_project (last entry) in the screenshot. Entry got written into the DB table 'company'

31	5e132e11f132e0001364a95a	Wits	NULL	security	Active	Johannesburg	South Africa	NULL	Wits@intelli2.com	50	2020-03-26 21:08:13.7
32	5e132e11f132e0001364b67a	IST65_project	NULL	security	Active	Johannesburg	South Africa	NULL	IST659@intelli2.com	40	2020-03-27 00:00:00.00

Similarity other forms were created dbo\_site\_form to write data into table site, dbo\_tag\_form for tag table and dbo\_user\_profile\_form for table user\_profile

## Reports:

I used QlikSense to pull data from IS659\_Project data to load all tables into the BI tool



Qlik Sense Desktop

Qlik Sense Desktop hub ERWAT (Goo... \*IST659 | A...

Save IST659 Data Analysis Story

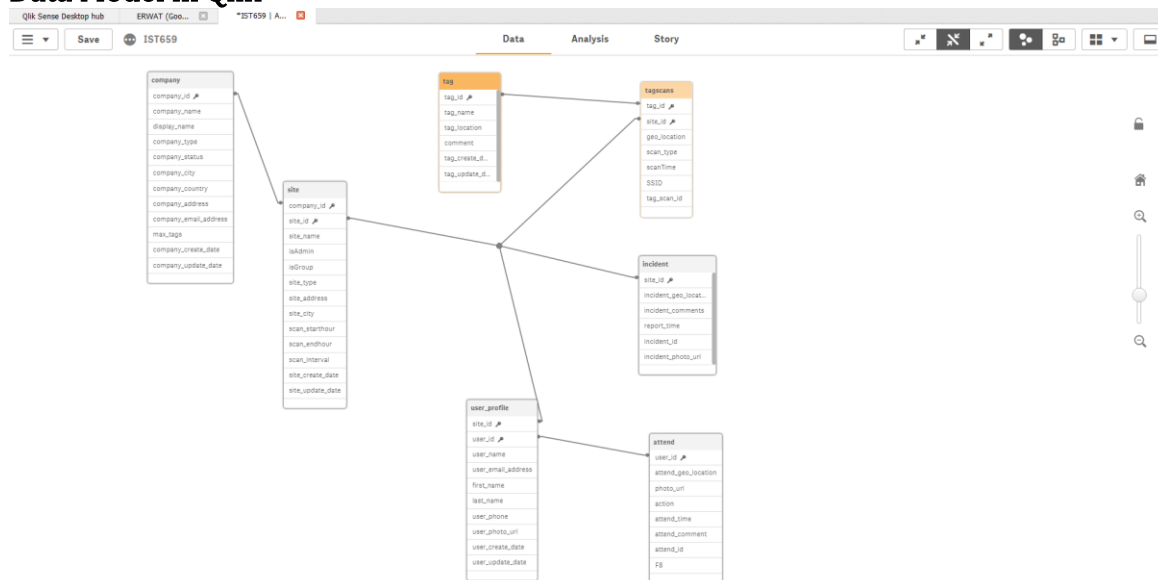
Main

```

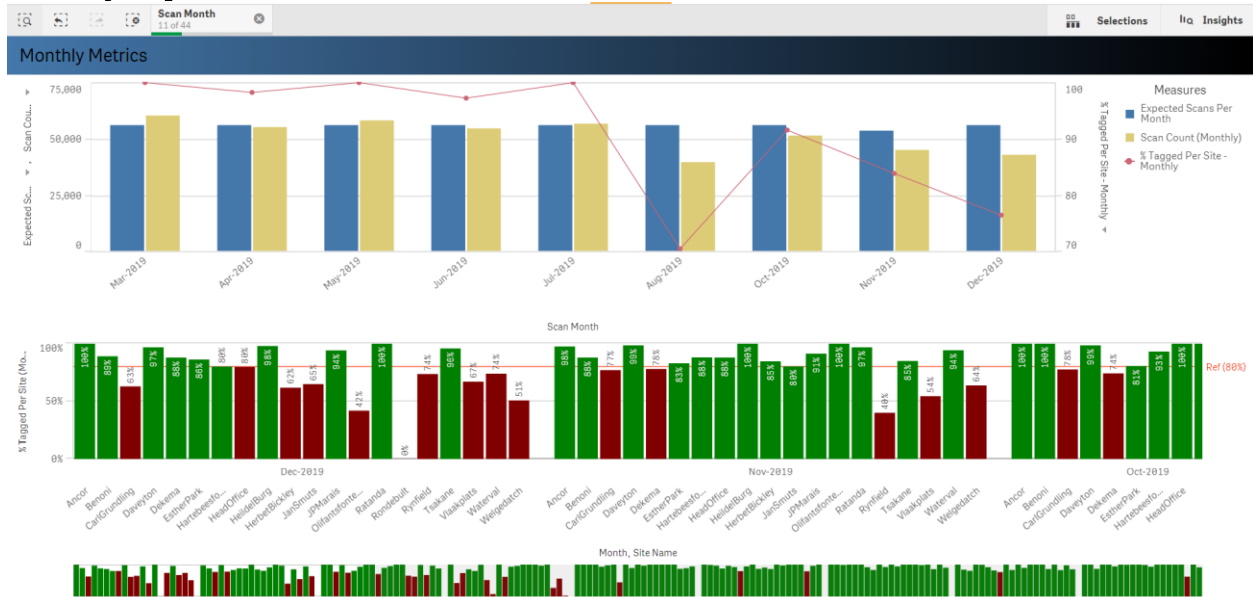
21
22 NoConcatenate
23 attend:
24 LOAD "attend_geo_location",
25      "photo_url",
26      action,
27      "attend_time",
28      "attend_comment",
29      "attend_id",
30      "user_id",
31      F8;
32 SQL SELECT "attend_geo_location",
33      "photo_url",
34      action,
35      "attend_time",
36      "attend_comment",
37      "attend_id",
38      "user_id",
39      F8
40 FROM "IST659_Project".dbo.attendance;
41
42 NoConcatenate
43 company:
44 LOAD "company_id",
45      "company_name",
46      "display_name",
47      "company_type",
48      "company_status",
49      "company_city",
50      "company_country",
51      "company_address",
52      "company_email_address",
53      "max_tags",
54      "company_create_date",
55      "company_update_date";
56 SQL SELECT "company_id",
57      "company_name",
58      "display_name",
59      "company_type",

```

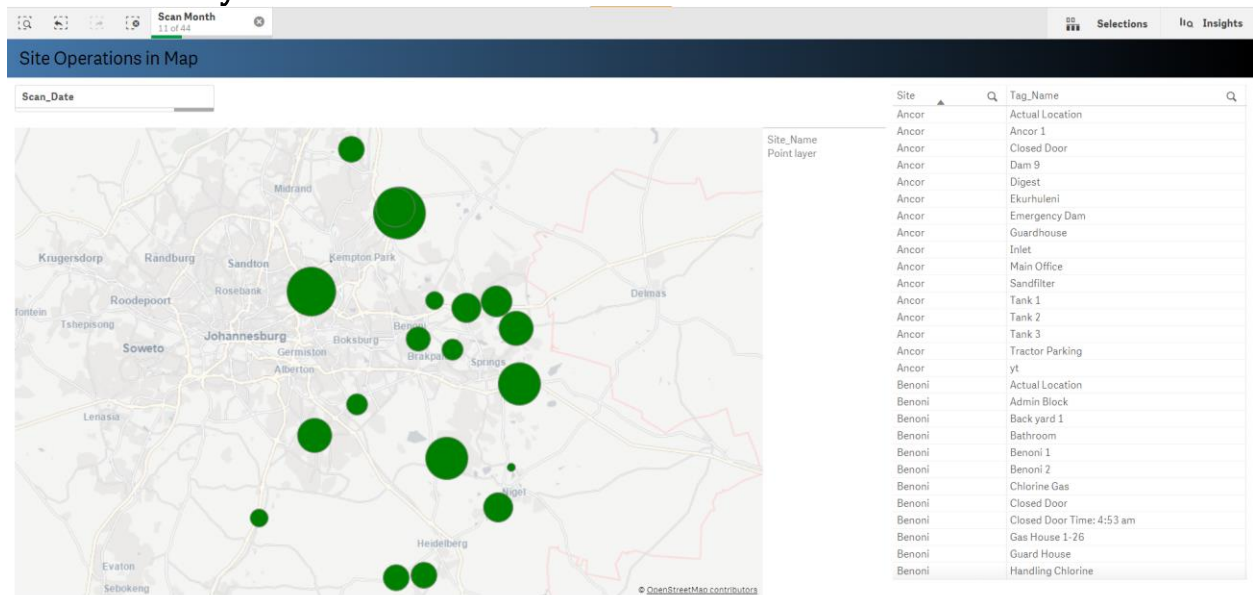
## Data Model in Qlik



### Monthly Report:



**Status of Scan by site Location co-ordinates:**



## Detailed Records:

Scan Month  
11 of 44

Selections

Info

Insights

SLA

Date

Site Name

Scan Hour

Scan Date	Q	Hour	Q	Site Name	Q	Tag_Name	Q	Scan Month	Q	Location_Tag	Q
31/12/2019		23		Ancor		Actual Location		Dec-2019		[28.5008113,-26.2686221]	
31/12/2019		23		Ancor		Dam 9		Dec-2019		[28.5008113,-26.2686221]	
31/12/2019		23		Ancor		Digest		Dec-2019		[28.4745348,-26.2722569]	
31/12/2019		23		Ancor		Ekurhuleni		Dec-2019		[28.4745348,-26.2722569]	
31/12/2019		23		Ancor		Emergency Dam		Dec-2019		[28.5008113,-26.2686221]	
31/12/2019		23		Ancor		Inlet		Dec-2019		[28.4802789,-26.2713854]	
31/12/2019		23		Ancor		Main Office		Dec-2019		[28.4802789,-26.2713854]	
31/12/2019		23		Ancor		Sandfilter		Dec-2019		[28.5008113,-26.2686221]	
31/12/2019		23		Ancor		Tank 2		Dec-2019		[28.4802789,-26.2713854]	
31/12/2019		23		Ancor		Tractor Parking		Dec-2019		[28.5008113,-26.2686221]	
31/12/2019		23		Benoni		Chlorine Gas		Dec-2019		[28.3158172,-26.2108168]	
31/12/2019		23		Benoni		Guard House		Dec-2019		[28.3131255,-26.2078453]	
31/12/2019		23		Benoni		Office		Dec-2019		[28.3177941,-26.2086532]	
31/12/2019		23		Benoni		Office 2 Steps		Dec-2019		[28.3114558,-26.2081495]	
31/12/2019		23		Benoni		Parking		Dec-2019		[28.3132452,-26.2078642]	
31/12/2019		23		Benoni		Pump Station		Dec-2019		[28.3172847,-26.2109296]	
31/12/2019		23		Benoni		Sample Location		Dec-2019		[28.3148599,-26.2105626]	
31/12/2019		23		Benoni		Toilet		Dec-2019		[28.3157641,-26.2103085]	
31/12/2019		23		CarlGrundling		Actual Location		Dec-2019		[28.470065,-26.3850833]	
31/12/2019		23		CarlGrundling		Bus Power		Dec-2019		[28.4692133,-26.384555]	
31/12/2019		23		CarlGrundling		Guard Room		Dec-2019		[28.4698017,-26.3843167]	
31/12/2019		23		CarlGrundling		Power Station		Dec-2019		[28.4704362,-26.385477]	
31/12/2019		23		CarlGrundling		Storage		Dec-2019		[28.46993,-26.3861833]	
31/12/2019		23		Daveyton		Actual Location		Dec-2019		[28.463674,-26.1357786]	
31/12/2019		23		Daveyton		Actual Location		Dec-2019		[28.4636556,-26.1357627]	
31/12/2019		23		Daveyton		C-Pump Station		Dec-2019		[28.4633141,-26.1366265]	

## Summary:

Database was created and tables (company, site, user\_profile, tag, tagscans, incidents and attendance) were created to load data into those tables

Primary keys were set on each table to uniquely identify a record on each table. Keys were created which tie each table to another table thus establishing a snowflake type of schema

Created a live connection through ODBC database connection in MS Access to all the tables. Created forms for company, site, user\_profile and tags. Only these tables need the forms to create new entries manually. All other tables are transaction data supplied by a mobile app action

All data from the respective tables were loaded to QlikSense Business Intelligence application and a snowflake schema model designed in QlikSense to use for reporting

Some transformation and enrichment rules were applied on the data imported to create Scan\_month, Scan\_Year, Scan\_Week, Scan\_Hour, Day/Night Shift based on scan Hour and few other metrics like Expected\_Scan\_Count, Total\_Scans and % of Scans were designed to be used in the final graphs

Monthly scan reports, location wise charts, detailed records were created in QlikSense based on the data imported from IST659\_Project tables for Year 2019