LOW LEVEL DESIGN DOCUMENT

(Crop Data Analysis)

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VERSION: 1.0

DATED: 17/12/2022

Document Version Control:

Crop Data Analysis – BusinessIntelligence Project

Version	Date	Author	Change
1.0	17/12/2022	Prashant Naima	First Version of Complete LLD

Abstract

The Agriculture business domain, as a vital part of the overall supply chain, is expected to highly evolve in the upcoming years via the developments, which are taking place on the side of the Future Internet. This paper presents a novel business-to-business collaboration platform from the agriculture sector perspective, which aims to facilitate the collaboration of numerous stakeholders belonging to associated business domains, in an effective and flexible manner.

In the world of rising new technology and innovation, the Agriculture industry is advancing with the role of Data Science and Analytics. Data analysis can help them to understand their business in a quite different manner and helps to improve the quality of the service by identifying the weak areas of the business. This study demonstrates how different analysis help to make better business decisions and help analyze customer trends and satisfaction, which can lead to new and better products and services. Different analyses were performed such as Exploratory Data Analysis and Descriptive Analysis on a variety of use cases to get the key insights from this data based on which business decisions will be taken.

This dataset provides a huge amount of information on which state is the best crop in India by production and find important insights highlighting key indicators and metrics that influence the customer choice.

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Low Level Design (LLD)

1.Introduction:

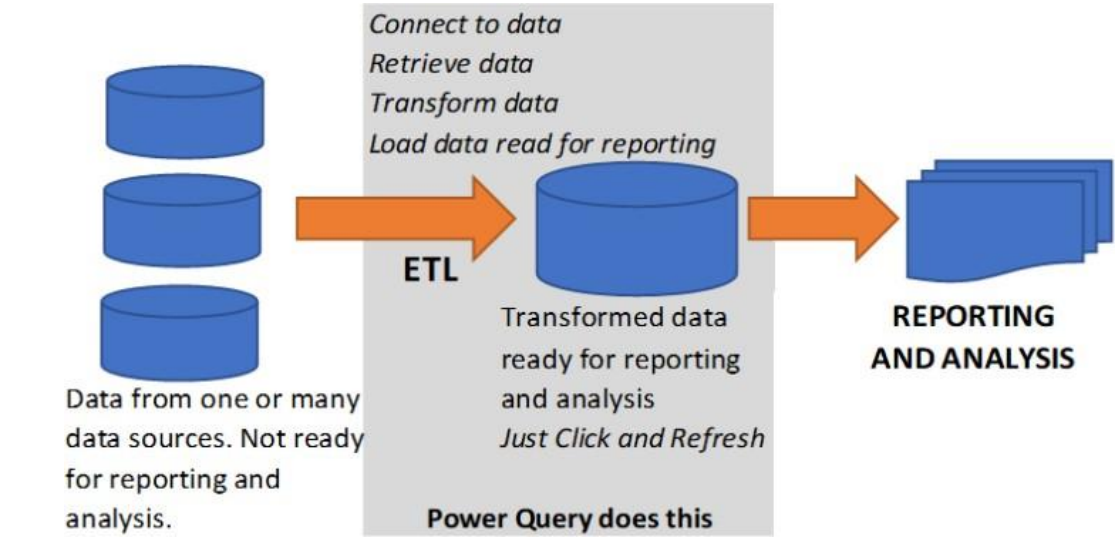
1.1. Why this Low-Level Design Document?

The goal of the LDD or Low-level design document (LLDD) is to give the internal logic design of the actual program code for the Bank Marketing Campaign Analysis. LDD describes the class diagrams with the methods and relations between classes and programs specs. It describes the modules so that the programmer can directly code the program from the document.

1.2. Scope

Low-level design (LLD) is a component-level design process that follows a step-by-step refinement process. The process can be used for designing data structures, required software architecture, source code and ultimately, performance algorithms. Overall, the data organization may be defined during requirement analysis and then refined during data design work.

2. Architecture:



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ETL (extract, transform and load) in Power BI uses preparation of data sets for analysis by removing irregularities in the data. It also involves data visualization to draw meaningful patterns and insights.

Based on the results of ETL, companies also make business decisions, which can have repercussions later.

- If ETL is not done properly then it can damage the business a lot in many ways such as loss of client which we are working for, the decision making will go completely wrong and many more issues.
- If done well, it may improve the efficacy of everything we do next.

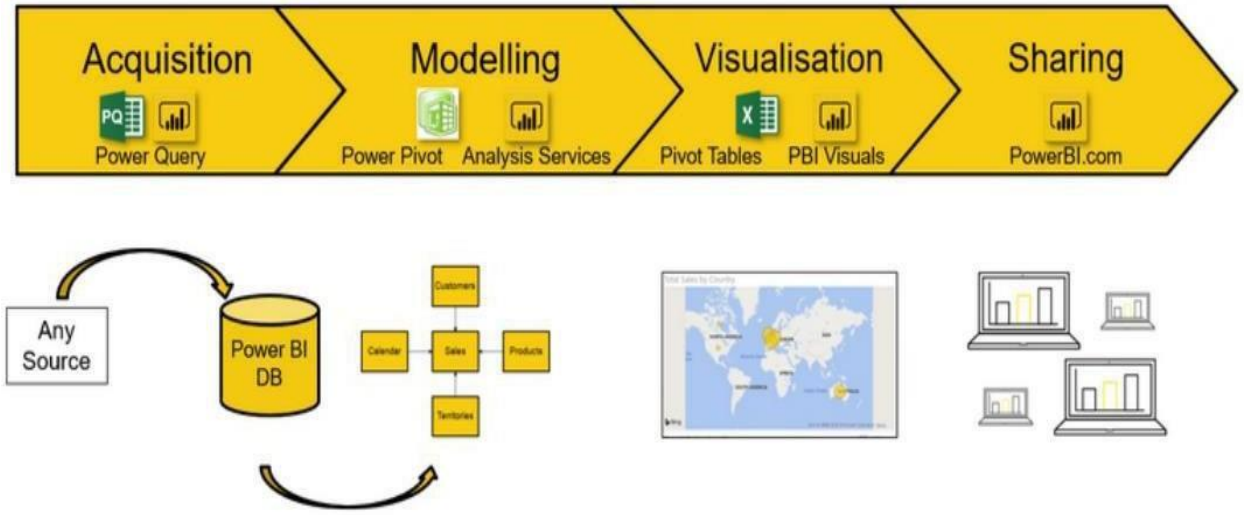
Below are following steps to follow for ETL:

1. Data Sourcing

2. Data Cleaning

3. Data Modelling

4. Data Visualization



3. Architecture Description:

3.1 Data Sourcing:

The dataset is in csv (comma separated values) format. MS Excel is used to load the data.

Low Level Design (LLD)

Citation Request:

Datasets is available in the given link. You can download as per your convenient. https://data.world/thatzprem/agriculture-india named as crop_production.csv

1. Title - crop_production.csv
2. Source - https://data.world/thatzprem/agriculture-india

3.2. Data Overview –

- The Data includes crop_production.csv file with all examples.
- The Number of Instance -246092 for crop_production.csv
- Number of attributes – 7 attributes

3.2 Data Description –

- **STATE_NAME –**

Andhra Pradesh, Arunachal Pradesh ,Assam, Bihar, ,Chhattisgarh, Goa, Gujarat, Haryana, Himachal Pradesh, Jharkhand, Karnataka, Kerala,MadhyaPradesh,Maharashtra,Manipur,Meghalaya,Mizoram,Nagaland,Odisha,Punjab,Rajasthan,Sikkim,Tamil Nadu, Telangana ,Tripura ,Uttar Pradesh , Uttara khand, West Bengal

- **UNION TERRITORRIES –**

Andaman and Nicobar Islands, Dadra and Nagar Haveli , Puducherry , Chandigarh, Jammu and Kashmir

- **DISTRICT NAME-**

NICOBARS,NORTH AND MIDDLE ANDAMAN,SOUTH ANDAMANS,ANANTAPUR,CHITTOOR,EASTGODAVARI,GUNTUR,KADAPA,KRISHNA,KURNOOL,PRAKASAM,SPSR NELLORE,SRIKAKULAM,VISAKHAPATANAM,VIZIANAGARAM,WEST GODAVARI,ANJAW,CHANGLANG,DIBANG VALLEY,EAST KAMENG,EAST SIANG,KURUNG KUMEY,LOHIT,LONGDING,LOWER DIBANG VALLEY,LOWER SUBANSIRI,NAMSAI,PAPUM PARE,TAWANG,TIRAP,UPPER SIANG,UPPER SUBANSIRI,WEST KAMENG,WEST SIANG,BAKSA,BARPETA,BONGAIGAON,CACHAR,CHIRANG,DARRANG,DHEMAJI,DHUBRI,DIBRUGARH,DIMA HASAO,GOALPARA,GOLAGHAT,HAILAKANDI,JORHAT,KAMRUP,KAMRUP METRO,KARBIANGLONG,KARIMGANJ,KOKRAJHAR,LAKHIMPUR,MARIGAON,NAGAON,NALBARI,SIVASAGAR,SONITPUR,TINSUKIA,UDALGURI,ARARIA,ARWAL,AURANGABAD,BANKA,BEGUSARAI,BHAGALPUR,BHOJPUR,BUXAR,DARBHANGA,GAYA,GOPALGANJ,JAMUI,JEHANABAD,KAIMUR(BHABUA),KATIHAR,KHAGARIA,KISHANGANJ,LAKHISARAI,MADHEPURA,MADHUBANI,MUNGER,MUZAFFARPUR,NALANDA,NAWADA,PASHCHIMCHAMPARAN,PATNA,PURBICHAMPARAN,PURNIA,ROHTAS,SAHARSA,SAMASTIPUR,SARAN,SHEIKHPURA,SHEOHAR,SITAMARHI,SIWAN,SUPAUL,VAIS

HALI,CHANDIGARH,BALOD,BALODABAZAR,BALRAMPUR,BASTAR,BEMETARA,BIJAPUR,BILASPUR,DANTEWADA,DHAMTARI,DURG,GARIYABAND,JANJGIR-CHAMPA,JASHPUR,KABIRDHAM,KANKER,KONDAGAON,KORBA,KOREA,MAHASAMUND,MUNGELI,NARAYANPUR,RAIGARH,RAIPUR,RAJNANDGAON,SUKMA,SURAJPUR,SURGUJA,DADRA AND NAGAR HAVELI,NORTH GOA,SOUTH GOA,AHMADABAD,AMRELI,ANAND,BANAS KANTHA,BHARUCH,BHAVNAGAR,DANG,DOHAD,GANDHINAGAR,JAMNAGAR,JUNAGADH,KACHCHH,KHEDA,MAHESANA,NARMADA,NAVSARI,PANCHMAHALS,PATAN,PORBANDAR,RAJKOT,SABARKANTHA,SURAT,SURENDRANAGAR,TAPI,VADODARA,VALSAD,AMBALA,BHIWANI,FARIDABAD,FATEHABAD,GURGAON,HISAR,JHAJJAR,JIND,KAITHAL,KARNAL,KURUKSHETRA,MAHENDRAGARH,MEWAT,PALWAL,PANCHKULA,PANIPAT,REWARI,ROHTAK,SIRSA,SONIPAT,YAMUNANAGAR,CHAMBA,HAMIRPUR,KANGRA,KINNAUR,KULLU,LAHUL ANDSPITI,MANDI,SHIMLA,SIRMAUR,SOLAN,UNA,ANANTNAG,BADGAM,BANDIPORA,BARAMULLA,DODA,GANDERBAL,JAMMU,KARGIL,KATHUA,KISHTWAR,KULGAM,KUPWARA,LEHLADAKH,POONCH,PULWAMA,RAJAURI,RAMBAN,,REASI,SAMBA,SHOPIAN,SRINAGAR,UDHAMPUR,BOKARO,CHATRA,DEOGHAR,DHANBAD,DUMKA,EAST SINGHBUM,GARHWA,GIRIDIH,GODDA,GUMLA,HAZARIBAGH,JAMTARA,KHUNTI,KODERMA,LATEHAR,LOHARDAGA,PAKUR,PALAMU,RAMGARH,RANCHI,SAHEBGANJ,SARAIKELA KHARSAWAN,SIMDEGA,WEST SINGHBHUM,BAGALKOT,BANGALORE RURAL,BELGAUM,BELLARY,BENGALURU URBAN,BIDAR,CHAMARAJANAGAR,CHIKBALLAPUR,CHIKMAGALUR,CHITRADURGA,DAKSHIN KANNAD,DAVANGERE,DHARWAD,GADAG,GULBARGA,HASSAN,HAVERI,KODAGU,KOLAR,KOPPAL,MANDYA,MYSORE,RAICHUR,RAMANAGARA,SHIMOGA,TUMKUR,UDUPI,UTTAR KANNAD,YADGIR,ALAPPUZHA,ERNAKULAM,IDUKKI,KANNUR,KASARAGOD,KOLLAM,KOTTAYAM,KOZHIKODE,MALAPPURAM,PALAKKAD,PATHANAMTHITTA,THIRUVANANTHAPURAM,THRISSUR,WAYANAD,AGARMALWA,ALIRAJPUR,ANUPPUR,ASHOKNAGAR,BALAGHAT,BARWANI,BETUL,BHIND,BHOPAL,BURHANPUR,CHHATARPUR,CHHINDWARA,DAMOH,DATIA,DEWAS,DHAR,DINDORI,GUNA,GWALIOR,HARDA,HOSHANGABAD,INDORE,JABALPUR,JHABUA,KATNI,KHANDWA,KHARGONE,MANDLA,MANDSAUR,MORENA,NARSINGHPUR,NEEMUCH,PANNA,RAISEN,RAJGARH,RATLAM,REWA,SAGAR,SATNA,SEHORE,SEONI,SHAHDOL,SHAJAPUR,SHEOPUR,SHIVPURI,SIDHI,SINGRAULI,TIKAMGARH,UJJAIN,UMARIA,VIDISHA,AHMEDNAGAR,AKOLA,AMRAVATI,BEED,BHANDARA,BULDHANA,CHANDRAPUR,DHULE,GADCHIROLI,GONDIA,HINGOLI,JALGAON,JALNA,KOLHAPUR,LATUR,MUMBAI,NAGPUR,NANDED,NANDURBAR,NASHIK,OSMANABAD,PALGHAR,PARBHANI,PUNE,RAIGAD,RATNAGIRI,SANGLI,SATARA,SINDHUDURG,SOLAPUR,THANE,WARDHA,WASHIM,YAVATMAL,BISHNUPUR,CHANDEL,CHURACHANDPUR,IMPHALEAST,IMPHALWEST,SENAPATI,TAMENGLONG,THOUBAL,UKHRUL,EAST GARO HILLS,EAST JAINTIA HILLS,EAST KHASI HILLS,NORTH GARO HILLS,RI BHOI,SOUTH GARO HILLS,SOUTH WEST GARO HILLS,SOUTH WEST KHASI HILLS,WESTGAROHILLS,WESTJAINTIAHILLS,WESTKHASIHILLS,AIZAWL,CHAMPHAI,KOLASIB,LAWNGTLAI,LUNGLEI,MAMIT,SAIHA,SERCHHIP,DIMAPUR,KIPHIRE,KOHIMA,LONGLENG,MOKOKCHUNG,MON,PEREN,PHEK,TUENSANG,WOKHA,ZUNHEBOTO,ANUGUL,BALANGIR,BALESHWAR,BARGARH,BHADRAK,BOUDH,CUTTACK,DEOGARH,DHENKANAL,GAJAPATI,GANJAM,JAGATSINGHAPUR,JAJAPUR,JHARSUGUDA,KALAHANDI,KANDHAMAL,KENDRAPARA,KENDUJHAR,KHORDHA,KORAPUT,MALKANGIRI,MAYURBHANJ,NABARANGPUR,NAYAGARH,NUAPADA,PURI,RAYAGADA,SAMBALPUR,SONEPUR,SUNDARGARH,KARAIKAL,MAHE,PONDICHERRY,YANAM,AMRITSAR,BARNALA,BATHINDA,FARIDKOT,FATEHGARH SAHIB,FAZILKA,FIROZEPUR,GURDASPUR,HOSHIARPUR,JALANDHAR,KAPURTHALA,LUDHIANA,MANSA,MOGA,MUKTSAR,NAWANSHAHR,PATHANKOT,PATIALA,RUPNAGAR,S.A.SNAGAR,SANGRUR,TARNTARAN,AJMER,ALWAR,BANSWARA,BARAN,BARMER,BHARATPUR,BHILWARA,BIKANER,BUNDI,CHITTORGARH,CHURU,DAUSA,DHOLPUR,DUNGARPUR,GANGANAGAR,HANUMANGARH,JAIPUR,JAISALMER,JALORE,JHALAWAR,JHUNJHUNU,JODHPUR,KARAULI,KOTA,NAGAUR,PALI,PRATAPGARH,RAJSAMAND,SAWAIMADHOPUR,SIKAR,SIROHI,TONK,UDAIPUR,EASTDISTRICT,NORTHDISTRICT,SOUTHDISTRICT,WESTDISTRICT,ARIYALUR,COIMBATORE,CUDDALORE,DHARMAPURI,DINDIGUL,ERODE,KANCHIPURAM,KANNIYAKUMARI,KARUR,KRISHNAGIRI,MADURAI,NAGAPATTINAM,NAMAKKAL,PERAMBALUR,PUDUKKOTTAI,RAMANATHAPURAM,SALEM,SIVAGANGA,THANJAVUR,THE NILGIRIS,THENI,THIRUVALLUR,THIRUVARUR,TIRUCHIRAPPALLI,TIRUNELVELI,TIRUPPUR,TIRUVANNAMALAI,TUTICORIN,VELLORE,VILLUPURAM

,VIRUDHUNAGAR,ADILABAD,HYDERABAD,KARIMNAGAR,KHAMMAM,MAHBUBNAGAR,MEDAK,NALGONDA,NIZAMABAD,RANGAREDDI,WARANGAL,DHALAI,GOMATI,KHOWAI,NORTH TRIPURA,SEPAHIJALA,SOUTHTRIPURA,UNAKOTI,WESTTRIPURA,AGRA,ALIGARH,ALLAHABAD,AMBEDKARNAGAR,AMETHI,AMROHA,AURAIYA,AZAMGARH,BAGHPAT,BAHRAICH,BALLIA,BANDA,BARABANKI,BAREILLY,BASTI,BIJNOR,BUDAUN,BULANDSHAHR,CHANDAULI,CHITRAKOOT,DEORIA,ETAH,ETAWAH,FAIZABAD,FARRUKHABAD,FATEHPUR,FIROZABAD,GAUTAM BUDDHA NAGAR,GHAZIABAD,GHAZIPUR,GONDA,GORAKHPUR,HAPUR,HARDOI,HATHRAS,JALAUN,JAUNPUR,JHANSI,KANNAUJ,KANPUR DEHAT,KANPUR NAGAR,KASGANJ,KAUSHAMBI,KHERI,KUSHI NAGAR,LALITPUR,LUCKNOW,MAHARAJGANJ,MAHOBA,MAINPURI,MATHURA ,MAU,MEERUT,MIRZAPUR,MORADABAD,MUZAFFARNAGAR,PILIBHIT,RAE BARELI,RAMPUR,SAHARANPUR,SAMBHAL,SANT KABEER NAGAR,SANT RAVIDASNAGAR,SHAHJAHANPUR,SHAMLI,SHRAVASTI,SIDDHARTH NAGAR,SITAPUR,SONBHADRA,SULTANPUR,UNNAO,VARANASI,ALMORA,BAGESHWAR,CHAMOLI,CHAMPAWAT,DEHRADUN,HARIDWAR,NAINITAL,PAURIGARHWAL,PITHORAGARH,RUDRAPRAYAG,TEHRI GARHWAL,UDAM SINGH NAGAR,UTTAR KASHI,24 PARAGANAS NORTH,24 PARAGANAS SOUTH,BANKURA,BARDHAMAN,BIRBHUM,COOCHBEHAR,DARJEELING,DINAJPUR DAKSHIN,DINAJPUR UTTAR,HOOGHLY,HOWRAH,JALPAIGURI,MALDAH,MEDINIPUR EAST,MEDINIPUR WEST,MURSHIDABAD,NADIA,PURULIA

- **CROP YEAR -**
  1997,1998,1999,2000,2001,2002,2003,2004,2005,2006,2007,2008,2009,2010,2011,2012,2013,2014,2015

- **SEASON –** Kharif , Rabi , Autumn , Summer , Winter , Whole Year

- **CROP -**

Arecanut,Other Kharif pulses,Rice,Banana,Cashewnut,Coconut ,Dry ginger,Sugarcane,Sweet potato,Tapioca,Black pepper,Drychillies,otheroilseeds,Turmeric,Maize,Moong(GreenGram),Urad,Arhar/Tur,Groundnut,Sunflower,Bajra ,Castor seed,Cotton(lint),Horsegram,Jowar,Korra,Ragi,Tobacco,Gram,Wheat,Masoor,Sesamum,Linseed,Safflower ,Onion,othermisc.pulses,Samai,Smallmillets,Coriander,Potato,OtherRabipulses,Soyabean,Beans&Mutter(Vegetable),Bhindi,Brinjal,Citrus Fruit,Cucumber,Grapes,Mango,Orange,other fibres,Other Fresh Fruits,Other Vegetables,Papaya,Pome Fruit,Tomato,Rapeseed &Mustard,Mesta,Cowpea(Lobia),Lemon,Pome Granet,Sapota,Cabbage,Peas (vegetable),Niger seed,Bottle Gourd,Sannhamp,Varagu,Garlic,Ginger,Oilseeds total,Pulses total,Jute,Peas & beans (Pulses),Blackgram,Paddy,Pineapple,Barley,Khesari,Guar seed,Moth ,Other Cereals & Millets,Cond-spcs other,Turnip,Carrot,Redish,Arcanut (Processed),Atcanut (Raw),Cashewnut Processed,CashewnutRaw,Cardamom,Rubber,BitterGourd,DrumStick,JackFruit,SnakGuard,PumpKin,Tea,Coffee, Cauliflower,Other Citrus Fruit,Water Melon,Totalfoodgrain,Kapas,Colocosia,Lentil,Bean,Jobster,Perilla,Rajmash Kholar,Ricebean(nagadal),AshGourd,BeetRoot,LabLab,RibedGuard,Yam,Apple,Peach,Pear,Plums,Litchi,Ber,Other Dry FruitJute & mesta

- **AREA -** It refers to the area starting from 0.04 to 8580100.

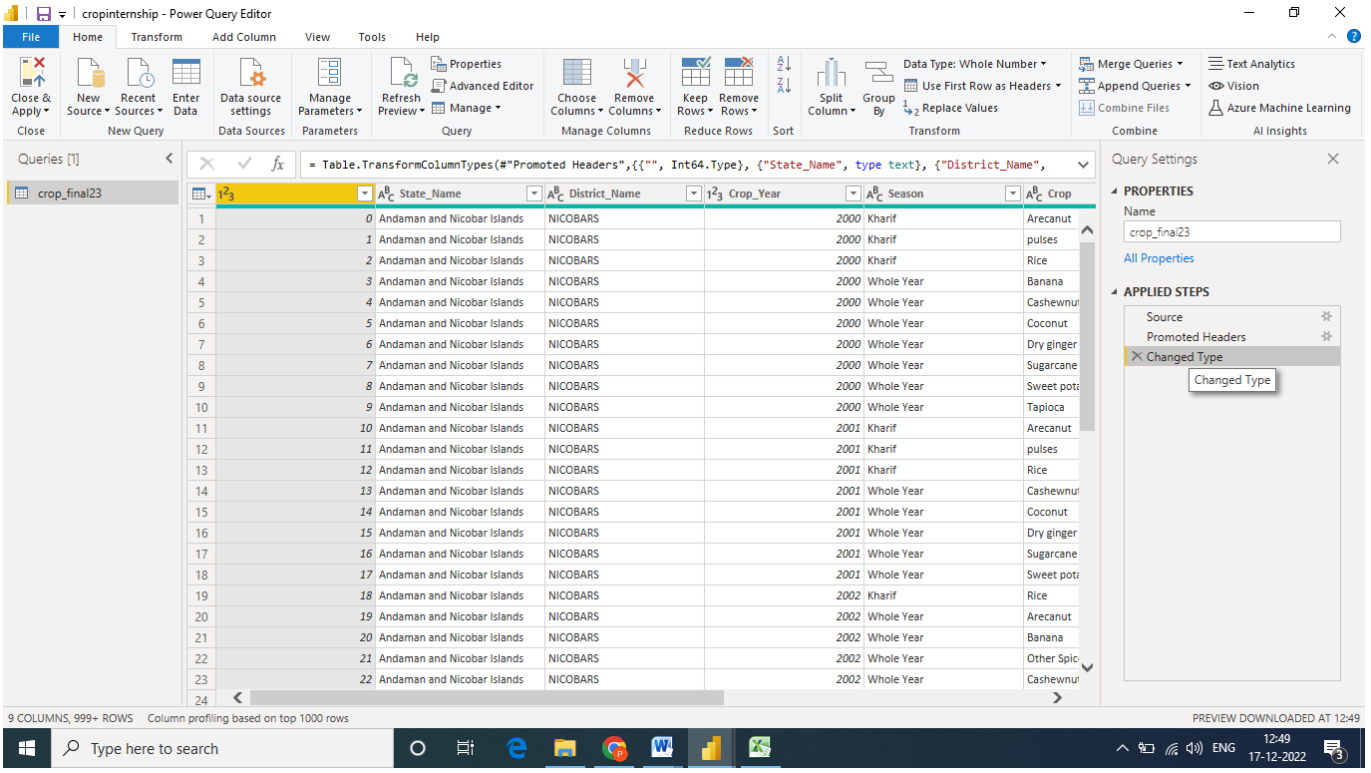
- **PRODUCTION -** It simply refers to the production by state starts from 0 to 1250800000.

3.4 Data loading in Power BI Query Editor

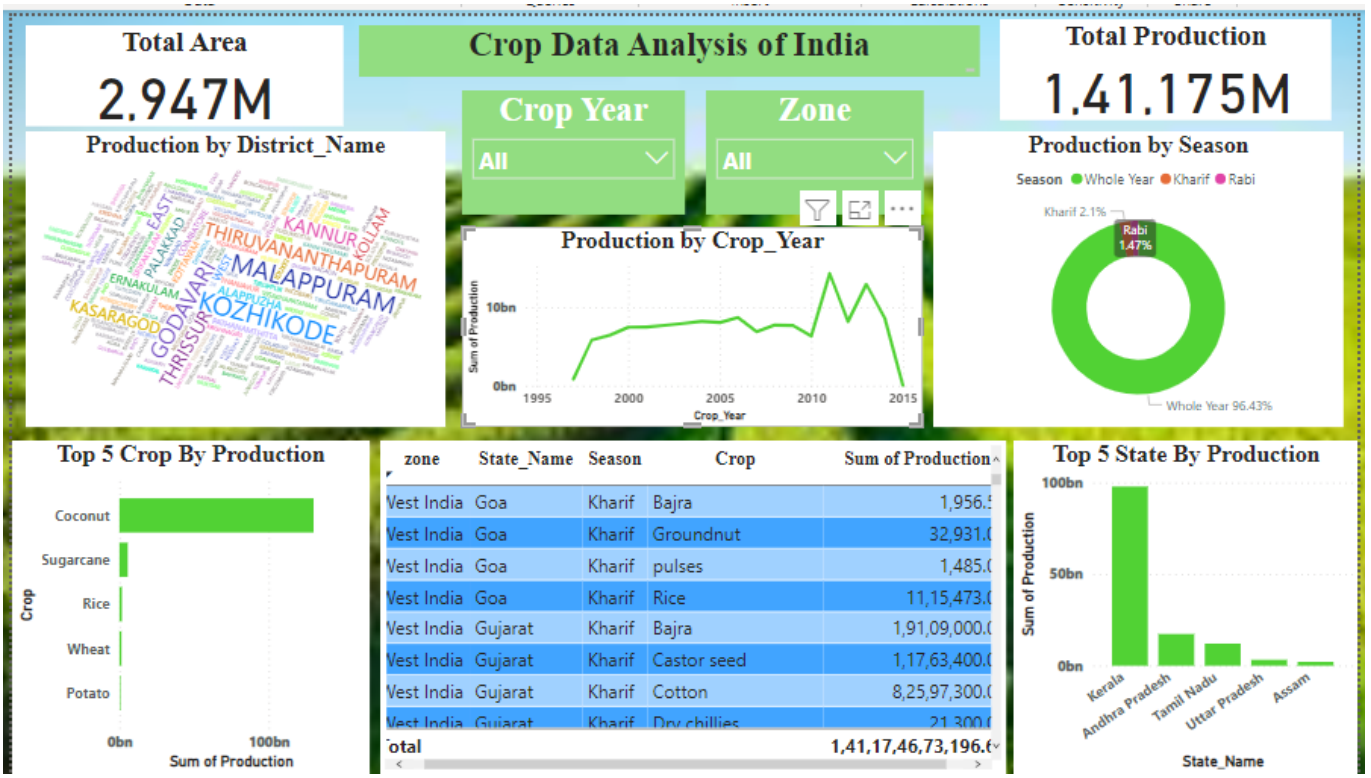
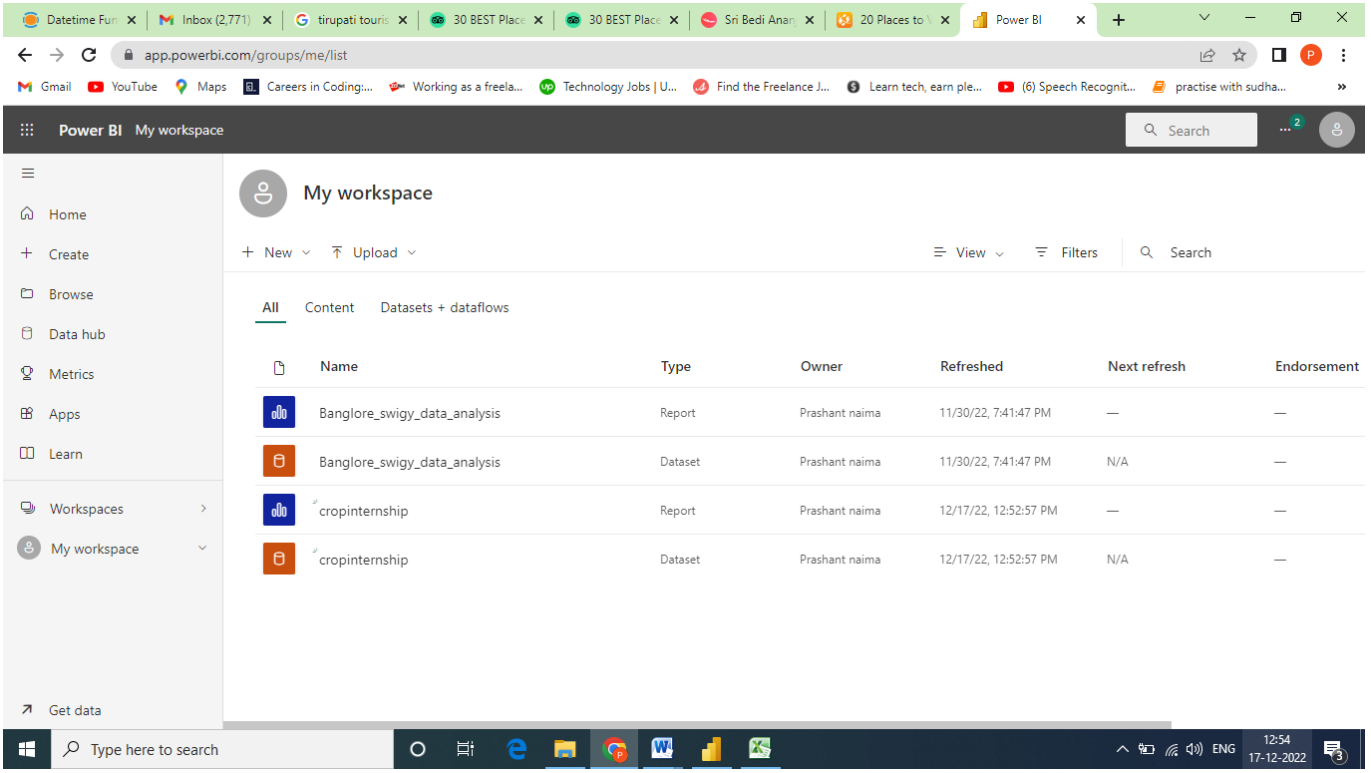
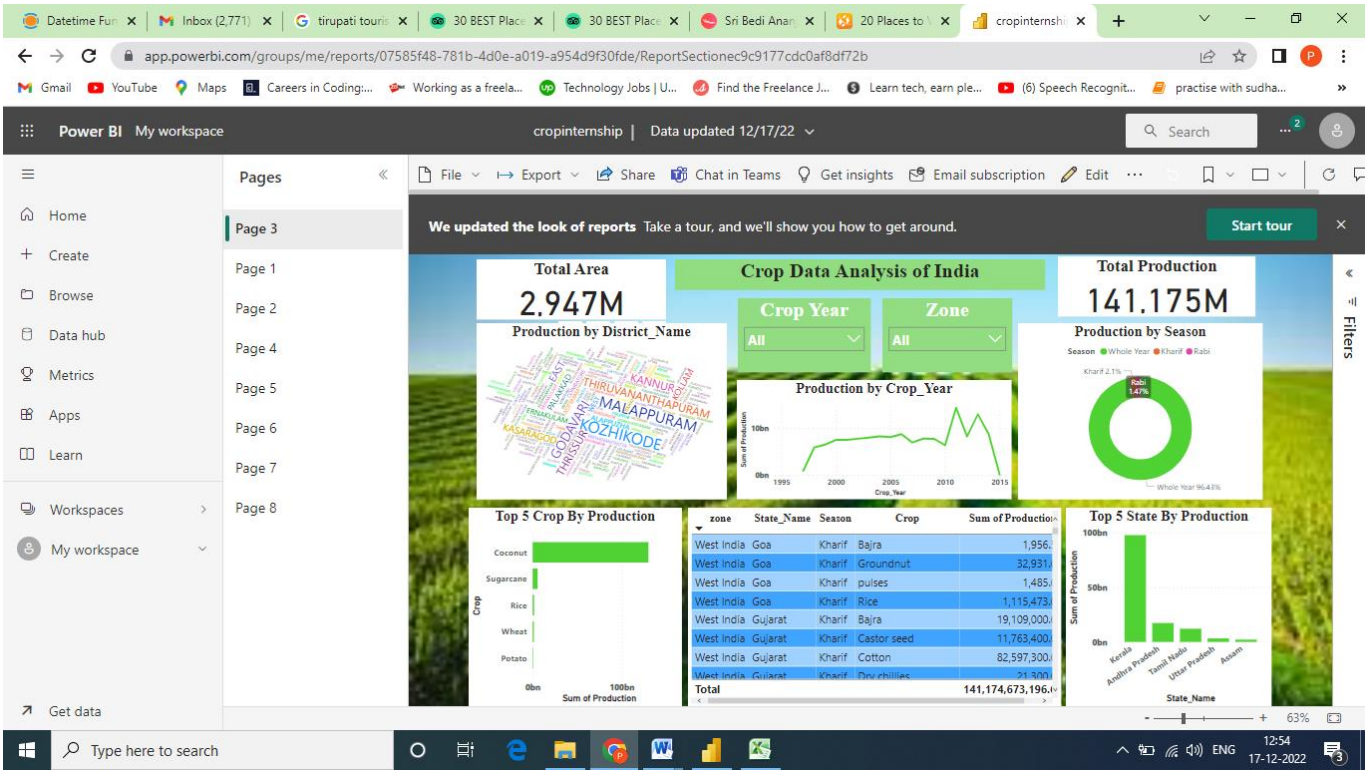
Power Query is the data connectivity and data preparation technology that enables end users to seamlessly import and reshape data from within a wide range of Microsoft products, including Excel, Power BI, Analysis Services, data verse, and more with the following characteristics:

- There can be multiple rows and columns in the data.
- Each row represents a sample of data,
- Each column contains a different variable that describes the samples (rows).
- The data in every column can be a different type of data – e.g. numbers, strings, dates, Boolean etc.

Low Level Design (LLD)



3.5 Data to Insights through Visualizations and Excel Data Analysis



3. Deployment to Power BI Service