HR Analytics

Low Level Design

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Contents

Introduction

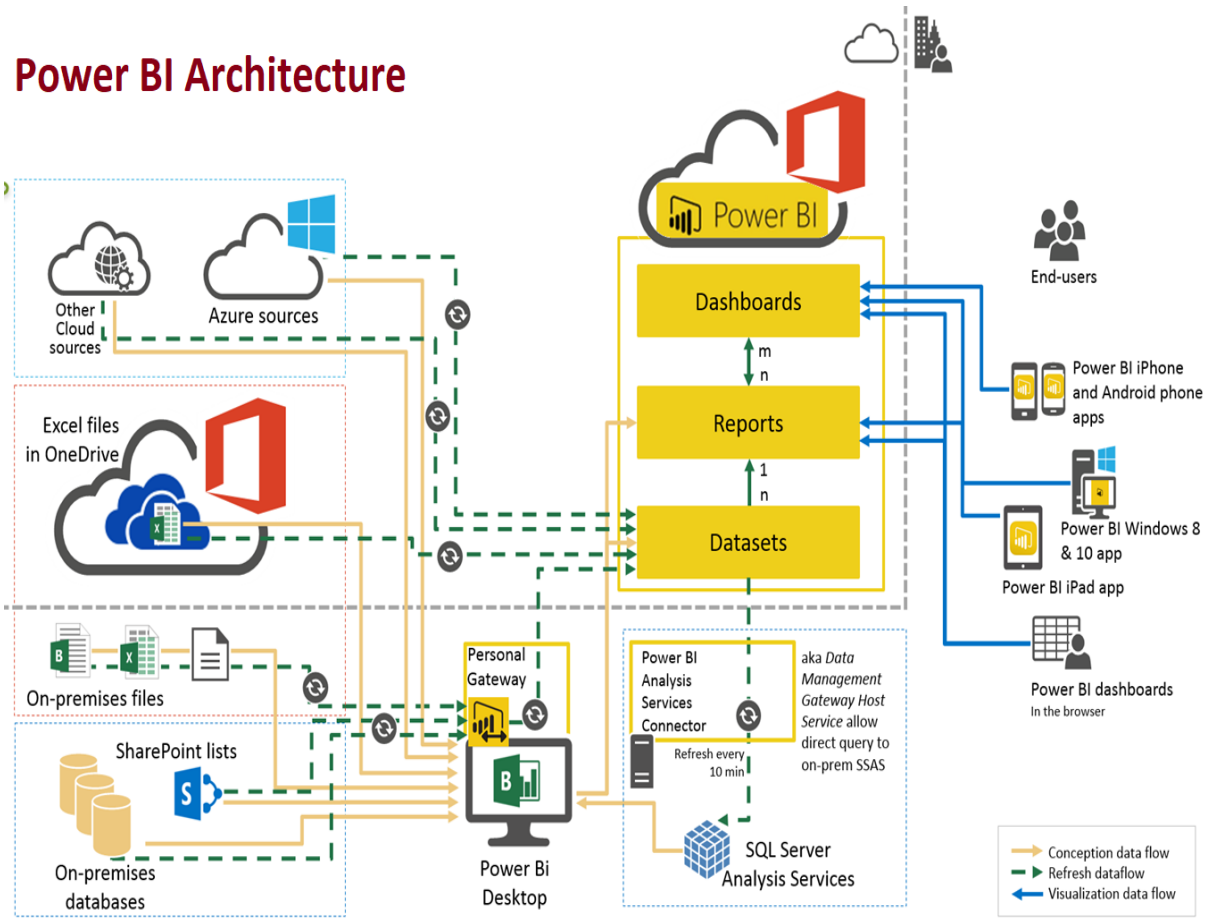
What is Low-Level design document?

The goal of LLD or a low-level design document (LLDD) is to give the internal logical design of the actual program dash board for HR Analytics. LLD describes the class diagrams with the methods and relations between classes and program specs. It describes the modules so that the programmer can directly code the program from the document.

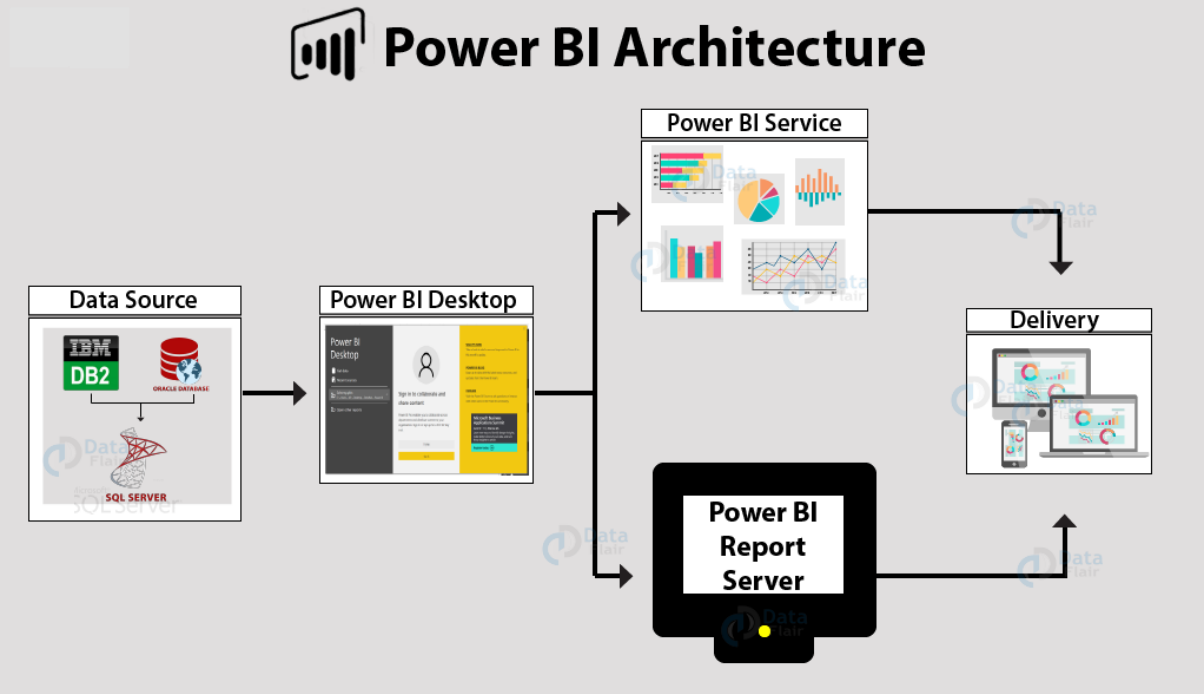
Scope

Low-level design (LLD) is a component-level design process that follows a step-by-step refinement process. This 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

Architecture:



Power BI Service Architecture:



Components of Power BI Architecture

Let us learn about the components of Power BI architecture in detail.

1. **Data Sources**

An important component of Power BI is its vast range of data sources. You can import data from files in your system, cloud-based online data sources or connect directly to live connections. If you import from data on-premise or online services there is a limit of 1 GB. Some commonly used data sources in Power BI are:

- Excel
- Text/CSV
- XML
- JSON
- Oracle Database
- IBM DB2 Database
- MySQL Database
- PostgreSQL Database
- Sybase Database
- Teradata Database
- SAP HANA Database
- SAP Business Warehouse server
- Amazon Redshift
- Impala
- Google BigQuery (Beta)

- Azure SQL Database
- Salesforce Reports
- Google Analytics
- Facebook
- GitHub

2. Power BI Desktop

Power BI Desktop is a client-side tool known as a companion development and authoring tool.

This desktop-based software is loaded with tools and functionalities to connect to data sources, transform data, data modelling and creating reports.
You can download and install Power BI Desktop in your system for free. Using Power BI Desktop features, one can do data cleansing, create business metrics and data models, define the relationship between data, define hierarchies, create visuals and publish reports.

3. Power BI Service

Power BI Service is a web-based platform from where you can share reports made on Power BI Desktop, collaborate with other users, and create dashboards.
It is available in three versions:

- Free version
- Pro version
- Premium version

Power BI Service is also known as, **"Power BI.com"**, **"Power BI Workspace", "Power BI Site"** and **"Power BI Web Portal"**. This component also offers advanced features like natural language Q&A and alerts.

4. Power BI Report Server

The Power BI Report Server is similar to the Power BI Service. The only difference between these two is that Power BI Report Server is an on-premise platform. It is used by organizations who do not want to publish their reports on the cloud and are concerned about the security of their data.

Power BI Report Server enables you to create dashboards and share your reports with other users following proper security protocols. To use this service, you need to have a Power BI Premium license.

5. Power BI Gateway

This component is used to connect and access on-premise data in secured networks. Power BI Gateways are generally used in organizations where data is kept in security and watch. Gateways help to extract out such data through secure channels to Power BI platforms for analysis and reporting.

6. Power BI Mobile

Power BI Mobile is a native Power BI application that runs on iOS, Android, and Windows mobile devices. For viewing reports and dashboards, these applications are used.

7. Power BI Embedded

Power BI Embedded offers APIs which are used to embed visuals into custom applications.

Problem statement:

HR is not just about hiring people it is an ocean of its own. HR department goes through a constant journey of finding, selecting, on boarding and monitoring the right talent. You are required to use analytics concept to provide a smooth monitoring of workforce for the HR department.

To investigate how the company objective factors influence in attrition of employees, and what kind of working environment is most likely to cause attrition. You shall be looking at all variables through some charts and infer about it in my exploratory analysis. And through exploration you shall try to identify the Variables that tend to have an impact in the attrition of the most experienced and talented employees.

Data Structure:

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
1	EmpID	Age	AgeGroup	Attrition	BusinessTravel	DailyRate	Department	DistanceF	Education	EducationField	Employee	Employee	Environm	Gender	HourlyRat	JobInvolv	JobLevel
2	RM297	18	18-25	Yes	Travel_Rarely	230	Research & Development	3	3	Life Sciences	1	405	3	Male	54	3	1
3	RM302	18	18-25	No	Travel_Rarely	812	Sales	10	3	Medical	1	411	4	Female	69	2	1
4	RM458	18	18-25	Yes	Travel_Frequentl	1306	Sales	5	3	Marketing	1	614	2	Male	69	3	1
5	RM728	18	18-25	No	Non-Travel	287	Research & Development	5	2	Life Sciences	1	1012	2	Male	73	3	1
6	RM829	18	18-25	Yes	Non-Travel	247	Research & Development	8	1	Medical	1	1156	3	Male	80	3	1
7	RM973	18	18-25	No	Non-Travel	1124	Research & Development	1	3	Life Sciences	1	1368	4	Female	97	3	1
8	RM1154	18	18-25	Yes	Travel_Frequentl	544	Sales	3	2	Medical	1	1624	2	Female	70	3	1
9	RM1312	18	18-25	No	Non-Travel	1431	Research & Development	14	3	Medical	1	1839	2	Female	33	3	1
10	RM128	19	18-25	Yes	Travel_Rarely	528	Sales	22	1	Marketing	1	167	4	Male	50	3	1
11	RM150	19	18-25	No	Travel_Rarely	1181	Research & Development	3	1	Medical	1	201	2	Female	79	3	1
12	RM172	19	18-25	Yes	Travel_Frequentl	602	Sales	1	1	Technical Degree	1	235	3	Female	100	1	1
13	RM178	19	18-25	Yes	Travel_Rarely	303	Research & Development	2	3	Life Sciences	1	243	2	Male	47	2	1
14	RM423	19	18-25	Yes	Travel_Rarely	489	Human Resources	2	2	Technical Degree	1	566	1	Male	52	2	1
15	RM689	19	18-25	Yes	Travel_Rarely	419	Sales	21	3	Other	1	959	4	Male	37	2	1
16	RM854	19	18-25	No	Travel_Rarely	645	Research & Development	9	2	Life Sciences	1	1193	3	Male	54	3	1
17	RM893	19	18-25	Yes	Non-Travel	504	Research & Development	10	3	Medical	1	1248	1	Female	96	2	1
18	RM910	19	18-25	No	Travel_Rarely	265	Research & Development	25	3	Life Sciences	1	1269	2	Female	57	4	1
19	RM103	20	18-25	Yes	Travel_Frequentl	871	Research & Development	6	3	Life Sciences	1	137	4	Female	66	2	1
20	RM488	20	18-25	No	Travel_Rarely	959	Research & Development	1	3	Life Sciences	1	657	4	Female	83	2	1
21	RM514	20	18-25	Yes	Travel_Rarely	1362	Research & Development	10	1	Medical	1	701	4	Male	32	3	1
22	RM663	20	18-25	Yes	Travel_Rarely	500	Sales	2	3	Medical	1	922	3	Female	49	2	1
23	RM690	20	18-25	Yes	Travel_Rarely	129	Research & Development	4	3	Technical Degree	1	960	1	Male	84	3	1
24	RM732	20	18-25	Yes	Travel_Rarely	1097	Research & Development	11	3	Medical	1	1016	4	Female	98	2	1
25	RM777	20	18-25	Yes	Travel_Frequentl	769	Sales	9	3	Marketing	1	1077	4	Female	54	3	1

	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ
1	JobLevel	JobRole	JobSatisfact	MaritalSta	MonthlyIr	SalarySlat	MonthlyR	NumCom	Over18	OverTime	PercentSa	Performa	Relationsl	Standardh	StockOpti	TotalWor	TrainingTi	WorkLifeB	YearsAtCc	YearsInCu
2	1	Laboratori	3	Single	1420	Upto 5k	25233	1	Y	No	13	3	3	80	0	0	2	3	0	0
3	1	Sales Repı	3	Single	1200	Upto 5k	9724	1	Y	No	12	3	1	80	0	0	2	3	0	0
4	1	Sales Repı	2	Single	1878	Upto 5k	8059	1	Y	Yes	14	3	4	80	0	0	3	3	0	0
5	1	Research	4	Single	1051	Upto 5k	13493	1	Y	No	15	3	4	80	0	0	2	3	0	0
6	1	Laboratori	3	Single	1904	Upto 5k	13556	1	Y	No	12	3	4	80	0	0	0	3	0	0
7	1	Laboratori	4	Single	1611	Upto 5k	19305	1	Y	No	15	3	3	80	0	0	5	4	0	0
8	1	Sales Repı	4	Single	1569	Upto 5k	18420	1	Y	Yes	12	3	3	80	0	0	2	4	0	0
9	1	Research	3	Single	1514	Upto 5k	8018	1	Y	No	16	3	3	80	0	0	4	1	0	0
10	1	Sales Repı	3	Single	1675	Upto 5k	26820	1	Y	Yes	19	3	4	80	0	0	2	2	0	0
11	1	Laboratori	2	Single	1483	Upto 5k	16102	1	Y	No	14	3	4	80	0	1	3	3	1	0
12	1	Sales Repı	1	Single	2325	Upto 5k	20989	0	Y	No	21	4	1	80	0	1	5	4	0	0
13	1	Laboratori	4	Single	1102	Upto 5k	9241	1	Y	No	22	4	3	80	0	1	3	2	1	0
14	1	Human Re	4	Single	2564	Upto 5k	18437	1	Y	No	12	3	3	80	0	1	3	4	1	0
15	1	Sales Repı	2	Single	2121	Upto 5k	9947	1	Y	Yes	13	3	2	80	0	1	3	4	1	0
16	1	Research	1	Single	2552	Upto 5k	7172	1	Y	No	25	4	3	80	0	1	4	3	1	1
17	1	Research	2	Single	1859	Upto 5k	6148	1	Y	Yes	25	4	2	80	0	1	2	4	1	1
18	1	Research	4	Single	2994	Upto 5k	21221	1	Y	Yes	12	3	4	80	0	1	2	3	1	0
19	1	Laboratori	4	Single	2926	Upto 5k	19783	1	Y	Yes	18	3	2	80	0	1	5	3	1	0
20	1	Research	2	Single	2836	Upto 5k	11757	1	Y	No	13	3	4	80	0	1	0	4	1	0
21	1	Research	3	Single	1009	Upto 5k	26999	1	Y	Yes	11	3	4	80	0	1	5	3	1	0
22	1	Sales Repı	3	Single	2044	Upto 5k	22052	1	Y	No	13	3	4	80	0	2	3	2	2	2
23	1	Laboratori	1	Single	2973	Upto 5k	13008	1	Y	No	19	3	2	80	0	1	2	3	1	0

Data Columns:

```
In [4]: data.columns
```

```
Out[4]: Index(['Age', 'Attrition', 'BusinessTravel', 'DailyRate', 'Department',
       'DistanceFromHome', 'Education', 'EducationField', 'EmployeeCount',
       'EmployeeNumber', 'EnvironmentSatisfaction', 'Gender', 'HourlyRate',
       'JobInvolvement', 'JobLevel', 'JobRole', 'JobSatisfaction',
       'MaritalStatus', 'MonthlyIncome', 'MonthlyRate', 'NumCompaniesWorked',
       'Over18', 'OverTime', 'PercentSalaryHike', 'PerformanceRating',
       'RelationshipSatisfaction', 'StandardHours', 'StockOptionLevel',
       'TotalWorkingYears', 'TrainingTimesLastYear', 'WorkLifeBalance',
       'YearsAtCompany', 'YearsInCurrentRole', 'YearsSinceLastPromotion',
       'YearsWithCurrManager'],
      dtype='object')
```

PROPOSED SOLUTION:

- Conduct EDA to gain initial insights into the data. Explore correlations, patterns, and trends in HR metrics to identify potential areas for improvement or further investigation with the help of excel pivot chart**.**
- Segment employees based on various criteria (e.g., job role, department, performance level) to identify distinct groups with unique characteristics and needs with the help of Interactive dashboard and develop employee profiles to tailor HR interventions and strategies accordingly.
- Diversity and inclusion analysis: Evaluate diversity and inclusion metrics to ensure equal opportunities and inclusivity within the organization. Identify potential biases, barriers, or underrepresented groups and develop strategies to foster a diverse and inclusive workforce.
- Create intuitive and visually appealing dashboards and reports to present key HR metrics, trends, and insights to stakeholders. Use interactive visualizations to facilitate data exploration and decision-making.

Dashboard:

Deployment:

- The first step in the deployment process is to develop and test your Power BI content. This includes creating reports, dashboards, and data models using Power BI Desktop. You can connect to data sources, transform and model the data, and design visualizations to meet your analysis requirements. During the development phase, it's important to thoroughly test your content to ensure accuracy and functionality.

- Once your Power BI content is ready, you can publish it to the Power BI Service. The Power BI Service is a cloud-based platform where you can store and share your reports, dashboards, and datasets. To publish your content, you can save your Power BI Desktop files (.pbix) and upload them to the Power BI Service.

- In the Power BI Service, you can configure security settings and define access permissions for your content. You can control who can view, edit, or share your reports and dashboards. Power BI provides options to share content with specific individuals, groups, or the entire organization. You can also set up row-level security to restrict data access based on user roles or attributes.

Conclusion:

1. Power BI empowers HR professionals to access and analyze vast amounts of HR data quickly and effectively. By visualizing key HR metrics and trends, Power BI enables informed decision-making across various HR functions, including recruitment, employee engagement, talent management, and workforce planning.

2. Power BI's interactive dashboards and reports allow HR teams to explore data and identify meaningful patterns and correlations. This leads to actionable insights that can drive strategic initiatives, such as enhancing employee engagement, reducing turnover, or optimizing training and development programs.

4. Power BI's rich visualization capabilities allow HR professionals to present HR data in a visually compelling manner. Interactive charts, graphs, and maps make it easier to communicate complex HR insights to stakeholders, enabling effective data storytelling and enhancing data-driven discussions.

6. Power BI enables collaboration and knowledge sharing within HR teams and across the organization. HR professionals can collaborate on reports, share insights, and provide access to relevant stakeholders, fostering a data-driven culture and aligning HR strategies with business objectives.

7. Power BI offers robust security features, including role-based access controls, data encryption, and compliance with industry standards. This ensures the protection of sensitive HR data and compliance with data privacy regulations.

By leveraging Power BI's capabilities, organizations can unlock the full potential of their HR data, gain valuable insights, and drive evidence-based decision-making. However, it is important to address data quality, ensure stakeholder buy-in, and invest in the necessary training and resources to maximize the benefits of HR data analytics using Power BI.