Contents

Introduction

The purpose of this job aid is to provide an explanation of dimensional data modeling and of using dimensions and facts to build analyses within the Human Resources – Payroll Subject Area.

Dimensional Data Model

The dimensional model is comprised of a fact table and many dimensional tables and used for calculating summarized data. Since Business Intelligence reports are used in measuring the facts (aggregates) across various dimensions, dimensional data modeling is the preferred modeling technique in a BI environment.

STARS - OBI data model is based on Dimensional Modeling. The underlying database tables separated as Fact Tables and Dimension Tables. The dimension tables are joined to fact tables with specific keys. This data model is usually called Star Schema.

The star schema separates business process data into facts, which hold the measurable, quantitative data about the business, and dimensions which are descriptive attributes related to fact data.

Examples of fact data include Total Gross, Earnings, and Tax Deductions, etc.

Related dimension attribute examples include Payroll Details, Pay Details, Department, Employment, Time etc.

Fact Tables:

Fact tables record measurements or metrics for a specific event. Fact tables consist of numeric values and foreign keys to dimensional data where descriptive information is kept. Fact tables are designed to a low level of uniform detail (referred to as "granularity" or "grain"), meaning facts can record events at a very atomic level. This can result in the accumulation of a large number of records in a fact table over time. Fact tables are assigned a surrogate key in ensuring each row uniquely identified.

Dimension Tables:

Dimension tables have a relatively small number of records compared to fact tables, but each record may have a very large number of attributes to describe the fact data. Dimensions can define a wide variety of characteristics, but some of the most common attributes defined by dimension tables include
- Time
- Department

- Payroll Information

Dimension tables are assigned a surrogate primary key, usually a single-column integer data type, mapped to the combination of dimension attributes that form the natural key.

Star Schema:

Star schemas are optimized for querying large data sets and are used in data warehouses and data marts to support OLAP cubes, business intelligence analytic applications, and ad hoc queries.

Within the data warehouse or data mart, a dimension table is associated with a fact table by using a foreign key relationship. The dimension table has a single primary key that uniquely identifies each member record (row). The fact table contains the primary key of each associated dimension table as a foreign key. Combined, these foreign keys form a multi-part composite primary key that uniquely identifies each member record in the fact table.

The Fact Table name in **STARS - OBI** Subject Areas is usually preceded with the name **FACT.** This is done to distinguish the Fact tables from the Dimension Tables.

In the example provided below, the underlying Dimension Tables in this Subject Area are joined to the Fact table to form the star schema.

Subject Area:

A subject area contains folders; attribute columns (Dimensions) and measure columns (Facts) that represent information about the areas of an organization's business or about groups of users within an organization. Subject areas usually have names that correspond to the types of information that they contain, such as Human Resources - Payroll.

There are common **Dimensions Tables** across Human Resource Subject Areas such as Time, Department and Position Details. These common Dimensions are followed by Subject Area Specific Dimensions such as Compensation, Payroll, Workforce Deployment and Time & Labor. There are **FACT Tables** across specific Subject Areas.
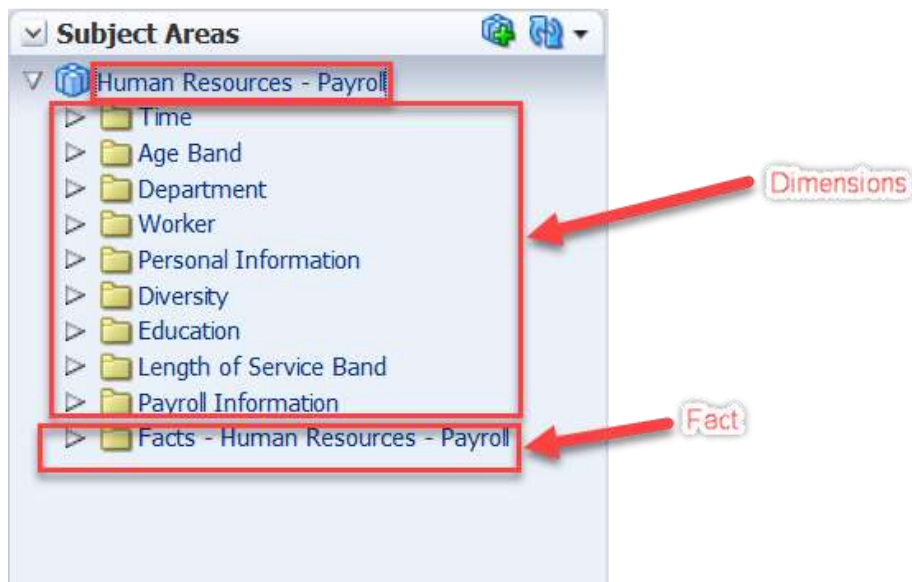
Human Resources - Payroll Analysis

The Human Resources – Payroll subject area is where the balance details of various metrics used in the payroll run of an organization are contained. It also provides the MTD, QTD, YTD and YAGO(Year Ago) details of various payroll balances. Using this Subject Area, we can provide insight into payroll balances for total compensation and cost analysis. The analysis on various payroll measures is done using time trends and payroll attributes that are used to measure the balances. This Subject Area can provide the information on summary balances like Gross Pay, Net Pay, Overtime Pay, Taxes and Deductions that are analyzed using categories like Regular Pay, Bonus Pay, Pension, Healthcare taxes etc.

Using Dimensions and Facts to create an analysis:
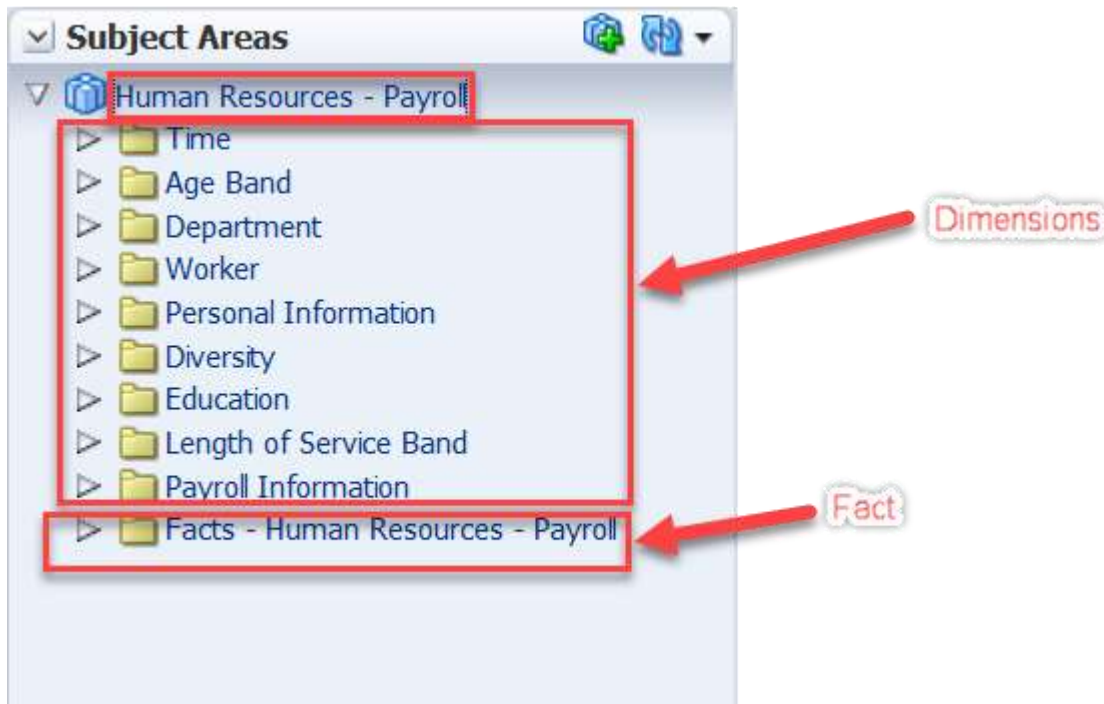
These objects in the left pane are based on database tables in the backend, and the data model behind these subject area tables is the dimensional modeling.

The tables listed from Time, Payroll Information and Worker are a few of the **Dimension Tables** in this subject area.

There is one Fact table for this Subject Area called **Fact – Human Resources - Payroll**. Under this one Fact table there are multiple sub tables. The Fact Table name in STARS subject areas is usually preceded with the name **FACT.** This is done to distinguish the Fact tables from the Dimension Tables.
Here is an example of a **Human Resources – Payroll** Subject Area analysis:

Criteria Tab

Selected Columns

Selected Filters

Results Tab

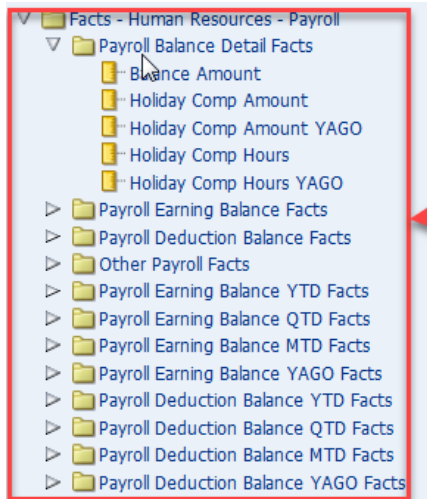| Year	Department ID	Regular Hours
2016	AAC11900	0.00
2016	AES48000	177,633.75
2016	APA11000	177,762.17
2016	APC11950	0.00
2016	APT59500	235,494.21
2016	BOR77700	23,068.80
2016	BOR77800	206,486.76
2016	BOR78100	132,181.16
2016	BOR78300	568,257.56
2016	BOR78500	174,721.47
2016	BOR78700	512,942.01
2016	BOR78900	432,778.70
2016	BOR79100	245,537.99
2016	BOR79300	366,453.58
2016	BOR79500	623,811.21
2016	BOR79700	589,227.87
2016	BOR79900	333,155.38
2016	BOR80100	352,839.85
2016	BOR80300	189,444.60
2016	BOR80500	215,749.67
2016	BOR83500	79,914.95
2016	BOR84000	1,962,552.36
2016	BOR84500	1,229,595.84
2016	BOR85000	2,102,255.37
2016	BOR85500	1,304,127.88
2016	CCC78700	55.00

Human Resources - Payroll Subject Area:

The Human Resources - Payroll is a detailed subject area that combines the information of employees payroll information and also includes MTD, QTD, YTD and YAGO details of various payroll balances. You have the ability to report on Payroll balance trends for earnings and deductions . It also provides details of the Payroll such as no.of workers, the payroll cost incurred for the month, and payroll trends over a year. This subject area can also be used to create reports on Overtime summary measures like Overtime hours, Pay, and % change of Overtime Pay viewed by attributes like Year, Job, Location, Supervisor etc.

Payroll Subject Area Dimensions

Payroll Subject Area Fact

Payroll Balance Detail Fact - Measure Definitions:

Balance Amount : Total amount required to pay workers and employees during a week, month or other period. Based on the earned or deduction code you select the amount will display. Some of them are like TOTAL_GROSS, TOTAL_TAXES, TOTAL_DEDUCTIONS, NET_PAY etc.

Holiday Comp Amount:
Holiday Comp Amount is the total Comp amount that an employee has earned or accumulated by working on a holiday or a holiday is a scheduled rest day. Earned code which is applied to this column is HCU.

Holiday Comp Amount YAGO:
Holiday Comp Amount YAGO is the total Comp amount that an employee has earned or accumulated last year by working on a holiday or a holiday is a scheduled rest day . Earned code which is applied to this column is HCU.

Holiday Comp Hours:
Holiday Comp Hours is no.of Comp hours that an employee has earned or accumulated by working on a holiday or a holiday is a scheduled rest day. Earned code which is applied to this column is HCU.

Holiday Comp Hours YAGO:
Holiday Comp Hours YAGO is no.of Comp hours that an employee has earned or accumulated last year by working on a holiday or a holiday is a scheduled rest day . Earned code which is applied to this column is HCU.

Payroll Earning Balance Fact - Measure Definitions:

Vacation Hours:
Vacation Hours is no.of vacation hours that an employee has earned which has not yet been used. Earned codes which are applied like T14, U14, V14, VAC, VCO, VPH, W14, X14, Y14, Z14.

Vacation Pay:
Vacation Pay is the total vacation amount that an employee has earned which has not yet been paid. Earned codes which are applied like T14, U14, V14, VAC, VCO, VPH, W14, X14, Y14, Z14.

Sick Hours:
Sick Hours is no.of sick hours that an employee has earned which has not yet been used. Earned codes which are applied like RSP, SIC, SPE, T13, U13, V13, W13, X13, Y13, Z13.

Sick Pay:
Vacation Pay is the total vacation amount that an employee has earned which has not yet been paid. Following are the Earned codes which are applied RSP, SIC, SPE, T13, U13, V13, W13, X13, Y13, Z13.

Regular Pay:
Regular Pay is the employee wages in a pay period divided by the employee's total hours of work during that pay period.
Earned codes which are applied GS1, GS2, QRG, QRH, RE2, RE3, REG, SE1, SL1, SL2, SP1, SP2, T01, U01, V01, W01, WS1, WS2, X01, Y01, Z01.

Regular Hours:
Regular Pay is the employee's total hours of work during that pay period. Earned codes which are applied QRG, QRH, RE2, RE3, REG, SE1, SL1, SL2, T01, U01, V01, W01, WS1, WS2, X01, Y01, Z01.

Overtime Pay:
Overtime Pay is the total overtime amount that an employee has earned by working extra time which has not yet been paid. Earned codes which are applied HCO, OFO, OT1, OT2, OT3, OT4, OT5, OTA, OTD, OTH, OTP, OTS, PLO, Q1O, Q23, Q24, Q4O, Q54, QC0, QC4, QFL, QHZ, QOF, QOH, QOT, QST, SCO, T02, T07, T08, U02, U07, U08, V02, V07, V08, VCO, W02, W07, W08, X02, X07, X08, Y02, Y07, Y08, Z02, Z07, Z08.

Overtime Hours:
Overtime Hours is the total no.of overtime hours that an employee has earned by working extra hours which has not yet been used or paid. Earned codes which are applied HCO, OFO, OT1, OT2, OT3, OT4, OT5, OTA, OTD, OTH, OTP, OTS, PLO, Q1O, Q23, Q24, Q4O, Q54, QC0, QC4, QFL,

QHZ, QOF, QOH, QOT, QST, SCO, T02, T07, T08, U02, U07, U08, V02, V07, V08, VCO, W02, W07, W08, X02, X07, X08, Y02, Y07, Y08, Z02, Z07, Z08.

Holiday Pay:
Holiday Pay is the paid time off such as a government-declared holiday, maternity leave, or sick time off which has not yet been used or paid. Earned codes which are applied HOL, HOP, HPA, HPR, T10, T11, U10, U11, V10, V11, W10, W11, X10, X11, Y10, Y11, Z10, Z11.

Holiday Hours:
Holiday Hours is the total no.of paid time hours such as a government-declared holiday, maternity leave, or sick time off which has not yet been used or paid. Earned codes which are applied HOL, HOP, HPA, HPR, T10, T11, U10, U11, V10, V11, W10, W11, X10, X11, Y10, Y11, Z10, Z11.

Pay Other Amount:
Pay Other is the total amount that an employee has been earned like Additional Duty Pay, Call Back Payment, Child Care, Comp Time Paid etc. Earned codes which are applied ADP, AIR, AUT, AWD, CBA, CBP, CER, CHI, CHP, CLN, CLS, COM, CPD, CTR, CTS, CTU, DEV, DOC, DOF, DT1, DT2, DT3, DT4 etc.

Gross Pay:
Gross Pay is the total amount that an employee made while working at their job, figured before any deductions are taken for state and federal taxes, Social Security and health insurance etc. This is dervied from PS_PAY_CHECK table and TOTAL_GROSS is the column.

Net Pay:
Net Pay is the total amount that an employee made after any deductions are taken out (which commonly used are taken for state and federal taxes, Social Security and health insurance etc.). This is dervied from PS_PAY_CHECK table and NET_PAY is the column.

Overtime Percentage:
Overtime Percentage is a calculation field which gives total percentage of Overtime pay paid over Gross Pay. Calcuation is as follows:-

$$\frac{Overtime\ Pay}{Gross\ Pay}\ x\ 100$$

Annual Salary:
Annual Salary is the total gross salary earned by an employed in a given calendar year.

Pension Employer Contributions:
Pension Employer Contributions is the Employer contribution that must be paid to the pension scheme for the Employee. Earned Code which applied for Pension Employer Contributions is LNA, LNG.

Federal Tax :
Federal Tax is the total federal withholding tax that has been deducted from Employee's Gross Pay. Tax Class for this column is Federal Tax Withholding.

Connecticut State Tax:
Connecticut State Tax is the total Connecticut state withholding tax that has been deducted from Employee's Gross Pay.
Tax Class for this column is State Tax Withholding..

Does not add to Gross:
Does not add to Gross is the amount earned by the Employee that is not included with Gross Pay. Like Attendance Award, Comp Time Earned, Fringe Benefit Auto, Longevity Additive, Adjusting PL balances, Day Care Payment, Unpaid Leave etc.
Earned Code which applied for this are AAU, AJ1, AJ2, AJ5, AJ6, ATT, CTE, CTN, CTP, DAY, FRB, HD6, HWC, LN1, NTS, PLA, PLD, PLU, RFS, SCA, SCD, SDE, SG2, STM, TBA, TX1, UPL, VCA, VCD.

Retirement Employee:
Retirement Employee is deductions contributed by employee towards retirement plan. Deduction codes which are applied ADJARF, ADJARP, ADJHRF, ADJRAR, ADJRET, ADJSER, ADJSRF, ADJSRP, R1HZA4, R1HZB4, R1HZC4, R1SPB4 etc.

Retirement Employer:
Retirement Employer is employer's contribution towards employee retirement plan. Deduction codes which are applied RALTER, RHAZER, RJUDER, RNRER, RPDER, RSAER, RSERER, RSUCON, RTRER.

OASDI – Social Security Employee:
OASDI stands for old age, survivor and disability insurance, which is more commonly referred to as Social Security. This insurance is deducted from Employee Gross Pay. Deduction Code which applied for Socical Security (Employee) are CPDFIC, CPDSSA, PTFICA. Tax Class code for this column is D (OASDI/EE).

OASDI – Social Security Employer:
OASDI stands for old age, survivor and disability insurance, which is more commonly referred to as Social Security. Employer also pays a portion of the OASI tax on Employee's behalf each time Employee's receive a paycheck. Deduction Code which applied for Socical Security (Employer) are CPDFIC, CPDSSA, CPDSSN. Tax Class code for this column is E (OASDI/ER).

Additional Medicare:
The Additional Medicare Tax applies to wages, railroad retirement (RRTA) compensation, and self-employment income over certain thresholds. Employers are responsible for withholding the tax on wages and RRTA compensation in certain circumstances. Tax Class code for this column is 7 (Addl Med).

Medicare – Employee:
Tax deducted from the wages of every legally working Employee's that is used to pay for the Medicare program provided to individuals over the age of 65. Tax Class code for this column is F (MED/EE).

Medicare – Employer:
Tax paid by the Employer for every legally working Employee's that is used to pay for the Medicare program provided to individuals over the age of 65. Tax Class code for this column is Q (MED/ER).

NRA 1042:
If a foreign person is employed then the Employer is subjected to NRA Withholding tax. Tax Class code for this column is A (1042).

Personal Leave Hours:
An employee's entitlement to paid personal/carer's leave accrues progressively during a year of service according to the number of ordinary hours worked, and accumulates from year to year. Earned codes which are applied for this column are PPH, PPL.

Personal Leave Pay:
An employee's entitlement to be paid for his/her accured Personal leave hours during a year of service according to the number of ordinary hours worked, and accumulates from year to year. Earned codes which are applied for this column are PPH, PPL.

Pay Other Hours:
Pay Other Hours could be anything like it could be regular Hours, Sick hours, Vacation hours, Comp Time Hours etc. Some of the earned codes applied to this column are ADP, AUT, CBA, CBP, CER, CHI, CHP, CLN, COM, CPD, CTR, CTS, CTU, DEV, DOC, DOF, DT1, DT2, DT3, DT4, EXP, F51, F52, FL1, FL2, FPY, GRA, HCC, HCU, HDA, HDP etc.

Pay Unit Override:-
Pay Unit Override are the Differentials like Shift Diff, Meal Allowance, Weekend Diff, On Call/Standby Diff etc. Some of the earned codes applied to this column are CD2, CD3, CD4, CD5, CD6, DCV, DF1, DF2, DI1, DI2, F11, F12, F21, F22, F31, F32, F41, F42, F43, F61, F62, F71, F72, HD1, HD2 etc.

Note:- To view the same data based on Year, quarter, month level please follow the mention facts accordingly **Payroll Earning Balance YTD Fact, Payroll Earning Balance QTD Fact, Payroll Earning Balance MTD Fact, Payroll Earning Balance YAGO Fact.**

Note:-
1) **Payroll Earning Balance YTD Fact:-** Columns in this Fact are dervied from **Payroll Earning Balance Fact** at selected Year to Date level.
2) **Payroll Earning Balance QTD Fact:-** Columns in this Fact are dervied from **Payroll Earning Balance Fact** at selected Quarter to Date level.
3) **Payroll Earning Balance MTD Fact:-** Columns in this Fact are dervied from **Payroll Earning Balance Fact** at selected Month to Date level.
4) **Payroll Earning Balance YAGO Fact:-** Columns in this Fact are dervied from **Payroll Earning Balance Fact** at previous Year.

Payroll Deduction Balance Fact - Measure Definitions:

Life Insurance Employer :
This is basically referred as Group life Insurance and it is provided as a part of a complete employee benefit package and this is paid by the Employer. It has both Basic and Supplemental Group Life Insurance. Some of the Deduction codes for this column are AETLIF, BASLIF, DPWLIF, EBSLIF, RETLIF, RTJLIF, SLRJ05, SLRJ06, SLRJ07, SLRJ08, SLRJ09, SLRJ10, SLRJ11, SLRJ12 etc.

Life Insurance Employee:
This is basically referred as Group life Insurance and it is provided as a part of a complete employee benefit package and this is paid by the Employee. It has both Basic and Supplemental Group Life Insurance. Some of the Deduction codes for this column are AETLIF, BASLIF, DPWLIF, EBSLIF, RETLIF, RTJLIF, SLRJ05, SLRJ06, SLRJ07, SLRJ08, SLRJ09, SLRJ10, SLRJ11, SLRJ12 etc.

Deductions Before Tax:
Deductions before tax will reduce your taxable wages. Some before-tax deductions will reduce your federal and state, or W-2, wages, while others will also reduce your Social Security and Medicare wages. They are taken only after taxes have been withheld from your taxable wages. Some of the deductions code which applied are ADJOPE, AETCUD, ANCURX, ANQCD1, ANTD01, ANTLS3, CCDPM1, CGDN01, DEFELT, DPOXRX, OPE2, OPEB, OTR2, OTRS etc.

Deductions After Tax:
Deductions after tax do not reduce your taxable wages. They are taken only after taxes have been withheld from your taxable wages. Some of the deductions code which applied are ADJFD1, AETCUD, AFLAC, ANTM01, CGETM, CGDN01, FCYM2F, LIFBAS etc.

Total Employee Deductions:
The tax laws allow a number of deductions from your gross, or total, income to arrive at your adjusted gross income, or AGI. If you qualify for any of these deductions, they are generally deductible regardless of whether you claim the standard or itemized deduction. This is dervied from PS_PAY_CHECK table and TOTAL_DEDUCTIONS is the column.

Benefit Cost Before Tax Employee :
Benefit Cost Before Tax is the total benefits cost deducted before taxes are applied on your wages. Some of the deduction codes which are applied for this are AETCUD, AETDEN, ANCUD1, ANGDP1, ANTLS1, CIGDEN, HNCURX, OXFLS2, PHHNRX etc.

Benefit Cost After Tax Employee:
Benefit Cost After Tax is the total benefits cost deducted after taxes are applied on your wages. Some of the deduction codes which are applied for this are CPDADA, CPDADJ, CPDADN.

Unemployment Comp Employer :
Unemployment Insurance is temporary income for workers who are unemployed through no fault of their own and who are either looking for new jobs, in approved training, or awaiting recall to employment. The funding for unemployment insurance benefits comes from taxes paid by employers. Deduction code for this column is UNCER.

Healthcare Employer Contributions :
Healthcare Employer Contributions are the contributions made by the employer to provide required health coverage to Full Time Employees or else pay a tax penalty. Deduction codes for this column which are applied AETCUD, ANCUD1, ANCURX, ANDPRX, ANTM02, CIGCUD etc.

Healthcare Employee Contributions:
Healthcare Employee Contributions are the remaining contributions made by the FTE employee after employer does his part to provide required health coverage. Deduction codes for this column which are applied CIGGD1, CIGGD, CIGGH1, OXFGH1, OXFGR1, OXGRD.

Note:- To view the same data based on Year, quarter, month level please follow the mention facts accordingly **Payroll Deduction Balance YTD Fact, Payroll Deduction Balance QTD Fact, Payroll Deduction Balance MTD Fact, Payroll Deduction Balance YAGO Fact.**

Note:-
1) **Payroll Deduction Balance YTD Fact:-** Columns in this Fact are dervied from **Payroll Deduction Balance Fact** at selected Year to Date level.
2) **Payroll Deduction Balance QTD Fact:-** Columns in this Fact are dervied from **Payroll Deduction Balance Fact** at selected Quarter to Date level.
3) **Payroll Deduction Balance MTD Fact:-** Columns in this Fact are dervied from **Payroll Deduction Balance Fact** at selected Month to Date level.
4) **Payroll Deduction Balance YAGO Fact:-** Columns in this Fact are dervied from **Payroll Deduction Balance Fact** at previous Year.

Other Payroll Facts - Measure Definitions:

# of Employees Paid:- Count of distinct Employees Paid

# of Employees Paid YAGO:- Count of distinct Employees Paid YAGO

# of Employees Paid YTD:- Count of distinct Employees Paid for a selected Year to Date level.

# of Employees Paid QTD:- Count of distinct Employees Paid for a selected Quarter to Date level.

# of Employees Paid MTD:- Count of distinct Employees Paid for a selected Month to Date level.