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Effective model of building Custom Payroll Calculation Rules in Workday Payroll

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Abstract

This article focusses on how we can effectively use the various option of calculations available in Workday Payroll to create and conFig custom payroll calculations in Workday Payroll. This research paper also provides a clear view of various calculation types and how we can create those in Workday Payroll and attach it to Earnings or deductions to build the custom business functionality. This research outcome will provide the Workday Payroll view based on US payroll rules. This article proves the success of this design with a successful live case study by implementing this design in Retail industry with over 30000 employees and concludes with the implementation strategy.

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Introduction

Organizations have their own business requirements based on various employee types and benefits offered to them. Also, often companies offer various benefits to their employees based on their business policy to accommodate their employee satisfaction. Based on this nature of ongoing changes, organizations expected their payroll team to conFig different pay components either it could be earnings or deductions to accommodate the new business requirements. As organizations are implementing SaaS model products, they are expecting their payroll team to build their custom specific business requirements apart from the delivered calculation which comes along with the products. Workday Payroll is one of the well-known Cloud-Based payroll management solutions which not only delivers in built payroll calculations but also provides a very robust technique to build easy to complex custom payroll calculations and map the same to the pay components to satisfy custom business requirements

What is Workday Payroll?

Workday Payroll is a Cloud-Based payroll management solution which is designed to automate and streamline the payroll business process for organizations irrespective of sizes and categories of employees. It helps payroll businesses to effectively manage their employees' compensation, earnings and deductions configuration rules, tax deductions, tax compliance, payroll reporting and payroll analytics in a single software solution platform. Workday Payroll offers real-time calculations, managing FLSA rules, delivered connectors with major vendors like ADP, Fidelity, seamless integrations between HR and Finance Systems. Workday Payroll also comes in with best user self -service experience interface, maintaining employee tax elections, direct deposit information and pre built audit controls which make payroll administrator to administer the payroll activities effectively.

What is Workday Calculation Engine?

Workday's calculation engine is the main building blocks / core system utility to define custom specific payroll calculations and business logic. This engine is used while configuring earnings and deductions and used in other Workday related functionalities.

- Calculations can be customer-owned or Workday-owned. Workday-Owned calculations are delivered by Workday as part of the product suite.

- Calculations can be built to refer to other calculations.
- Calculations are sequenced automatically by Workday.
- Calculations can be categorized as payroll, absence, or common.

Calculations are defined to return values that can be a number, date, true or false statement or other values. Each calculation performs a specific operation based on their type and the return value. The calculation values can be used in Earnings, Deductions, Taxes, Pay Accumulations and Time Off Plans

Categories of Calculations

Workday provides four basic categories of calculations in the calculation engine. These categories are categorized based on the return value.

- Calculations that return a Numeric Value.
- Calculations that return a Date Value.
- Calculations that return a Boolean Value.
- Payroll Specific Calculations

Calculations that return to a Numeric Value:

Workday provides you with several calculations that can return to a numeric value, Users are expected to choose the appropriate type based on the number you are calculating. Some of the calculations that return to a numeric value are as

follows:

- Aggregate
- Arithmetic
- Conditional
- Constant Value
- Date Difference
- Date Extract
- Instance Value
- Lookup table

Aggregate Calculation:

Aggregate Calculations refers to the process of combining multiple items or data points into a single summary or total. These calculations return the sum, average, minimum or maximum of two or more values. In various contexts, it can involve:

- **Data Aggregation:** Summarizing data from different sources to provide a comprehensive view, such as calculating average scores or total hours worked.
- **Payroll Aggregation:** Combining wages or hours from multiple pay results to determine total earnings or tax withholding for a specific period.

Example: Need to aggregate all the time off plan hours into a single calculation.

View Aggregate Calculation	
All Time Off Paid	
Category Payroll	
Calculation	Usage
1 item	
Function	Operand
Sum	Bereavement [CAN USA] - Time Off Paid (Units) CalOSHA Pay [USA] - Hours (unprorated) Canada Bereavement Leave Time Off - Time Off Paid Canada- Bereavement Leave Time Off - Time Off Paid Canada Substitute Holiday - Time Off Paid CAN Vacation [CAN USA] - Time Off Paid (Units) CAN Vacation Salary [CAN USA] - Time Off Paid (Units) General Paid Sick Leave [USA] - Time Off Paid (Units) General Paid Sick Leave Salary [USA] - Time Off Paid (Units)

Fig 1: Aggregate Calculation

Arithmetic Calculation:

Arithmetic calculations in Workday allow you to perform basic math operations on numeric or currency fields. The primary operations include:

- **Addition:** Combines two values.
- **Subtraction:** Finds the difference between two values.
- **Multiplication:** Multiplies two values.
- **Division:** Divides one value by another.

Key Considerations

- **Field Type:** Ensure that all fields in the calculation share the same type (e.g., currency).
- **Rounding:** Workday applies rounding after each division and multiplication unless specified otherwise. For currency fields, rounding is not performed.
- **Self-referencing Fields:** Avoid using self-referencing fields as they can cause exceptions.

- **Return Zero on Error:** You can opt to return zero value instead of an error when a calculation fails.

Example: Need to define an arithmetic calculation by multiplying Minimum wage * 1.5 times

View Arithmetic Calculation MinWage*1.5

Name: MinWage*1.5
Category: Payroll

Calculation Usage

1 item

1st Operand	Operator	2nd Operand
Maximum of Federal/State/Local Min Wage	Multiply	1.5

Rounding: Round to nearest 0.01

Fig 2: Arithmetic Calculation

Conditional Calculation:

A conditional calculation is a type of calculation that determines values based on specific conditions or criteria. It evaluates different scenarios to allocate amounts or benefits according to predefined rules.

Key Features:

- **Eligibility Criteria:** Conditional calculations often include eligibility criteria that dictate which employees or students qualify for certain benefits or awards.

- **Step Evaluation:** The system evaluates conditions in a specified order, meaning that if an employee meets multiple criteria, the first applicable condition in the sequence will determine the outcome.
- **Use Cases:** Commonly used in scenarios like leave entitlements, financial aid awards, and payroll calculations.

Example: Assign the hours based on Employee Country and Employee Type

View Conditional Calculation 40 Vs 44 Hours

Name: 40 Vs 44 Hours
Category: Absence, Compensation, Payroll

Calculation Usage

Conditional Calculations: 4 items

Calculation Condition	Order	Condition	Result
...	a	TM is Canada and Full Time	44
...	b	TM is Canada and Part Time	Job: Scheduled Hours for Target Frequency (as of Sub Period End Date)
...	c	TM is USA and Part Time	Job: Scheduled Hours for Target Frequency (as of Sub Period End Date)
...	d	TM is USA and Full Time	40

Default Response: 40

Fig 3: Conditional Calculation

Constant Value:

A constant value is a fixed value that does not change and can be used in calculations or reports. There are different types of constant values, including:

- **Numeric Constant:** A fixed numeric value that can be used in various calculations, such as integers or real numbers.
- **Text Constant:** A fixed text value that can be assigned

to fields, useful for replacing or filling in blank fields in reports.

Usage

- **Creating Constant Values:** You can create constant values through calculated fields, which can then be utilized in other calculations or reports.
- **Applications:** Constant values are often used to

standardize data, such as replacing missing information

or categorizing data consistently.

Fig 4: Constant Value Calculation

Date Difference Calculation

To calculate the date difference between two dates, ensure both dates are in the same format. Here are some key points to consider:

1. **Format Consistency:** If one date includes a timestamp (e.g., Created Moment) and the other does not (e.g., Close Date), convert the timestamp to a date format that matches the other date. This prevents discrepancies in calculations.
2. **Date Functions:** Use appropriate date functions available in your system to calculate the difference. For example, if using a system like Workday, ensure that the formatted date can be utilized as a start date for the calculation.
3. **Precision:** If you need a precise difference in days, ensure that the calculation accounts for the time component if applicable. This may involve rounding or truncating the timestamp.

Fig 5: Date Difference Calculation

Date Extract Calculation: Uses the date data to extract a portion of the date (day, month, or year)

Fig 6: Date Extract Calculation

Instance Value Calculation

An Instance Value Calculation (IVC) is a type of calculation that can return various data types, including:

- **Boolean values:** Indicates true or false based on a condition.
- **Currency values:** Represents monetary amounts.
- **Date attributes:** Represents specific dates.

Types of IVCs

1. **Workday-delivered IVCs:** These are predefined calculations that return values based on report fields.

2. **Customer-owned IVCs:** These are custom calculations created by users that return values based on custom fields.

Usage

IVCs can be utilized in various contexts, such as:

- **Eligibility calculations:** Used in pay and absence components.
- **Conditional calculations:** Serve as conditions within logical calculations.

Create Instance Value Calculation

Name *

IVC Worker State Tax Levy

Category *

X Payroll

Comment

Calculation

Context Instance

X Worker

Custom Field *

X Equity Holder

Rounding

Fig 7: Instance Value Calculation

Lookup Table Overview

A lookup table is a data structure used to store values that can be referenced in calculations or data retrieval processes. It

allows for efficient data management and retrieval based on specific criteria.

View Lookup Table

CA Max Vacation Balance

Name

CA Max Vacation Balance

Category

Absence

Lookup Table Data

Usage

Lookup Table Data 5 items

Search Value	Return Value
0	70
2	112
4	154

Fig 8: Lookup Table

Advanced Lookup Table

An Advanced Lookup Table is a powerful tool used to manage and retrieve data efficiently within various domains, particularly in payroll and compensation areas. Here are the key features and benefits:

- **High Volume Handling:** Designed to manage large datasets effectively.
- **Effective Dating:** Allows for the assignment of effective dates to search and return values, facilitating better data

management over time.

- **Search Criteria:** You can define search criteria based on:
 - Instance or text report fields
 - Numeric calculations
 - Text type calculations

Advantages

- **Centralized Updates:** Provides a single location for data updates, simplifying maintenance.
- **Optimized Performance:** Recommended for better performance compared to basic lookup tables.

Report Field Search Criteria ☒ Regions for Job (or Override if exists) as of Period End Date

Table Data Usage

Effective Date Min Wage by Region Lookup Table [CAN USA] - 06/29/2025

Values 49 Items

Search Value	Minimum Wage	Last Minimum wage (for initial sub-period)	Default
	0	0	Yes
1005 Highland Park	15.97	15.57	
1011 Minneapolis Athletic (inactive)	15.97	15.19	

Fig 9: Advanced Lookup Table

Build Date

A Build Date is a calculated field that allows you to create a new date or time field by using components from other fields or specified values. You can construct a date field based on the following components:

- Day
- Month

- Year

For time fields, you can use:

- Hour
- Minute
- Second
- Millisecond

View Build Date Calculation Dec 31 of last year ... 101

Name Dec 31 of last year

Category Payroll

Calculation 1 item

Year	Month	Day
Year: Payment Date Year - 1	12	31

Fig 10: Build Date

Increment or Decrement Date

The Increment or Decrement Date function allows you to calculate a date that is a specific number of days, months, or years before or after a given date. This function can be used in various contexts, such as reporting or calculations involving hire dates, termination dates, or payment dates.

Key Features:

- **Date Field Selection:** Choose a starting date from which to calculate.
- **Time Adjustment:** You can add or subtract years, months, days, and even time components (hours, minutes, seconds) if the date field includes time data.
- **Error Handling:** Optionally, you can select to return a blank value instead of an error message if the calculation results in a blank date.

View Date Increment/Decrement Calculation CF Today - 1 year ... 101

Name CF Today - 1 year

Category Payroll

Calculation Usage

Calculation 1 item

Start Date	Year	Month	Day
Today	-1		

Fig 11: Date Increment/Decrement

Value Comparison Calculation

A Value Comparison Calculation is a method used to evaluate and compare different values based on specified criteria. This calculation can be applied in various contexts, such as determining eligibility for benefits, assessing applicant scores, or comparing employee attributes.

Key Components

1. **Operands:** These are the values or fields being compared.
2. **Comparison Operators:** These define the relationship between the operands. Common operators include:

- Equal to: Checks if two values are the same.
- Not equal to: Checks if two values are different.
- Greater than: Determines if one value is larger than another.
- Less than: Determines if one value is smaller than another.
- Greater than or equal to: Checks if one value is larger than or equal to another.
- Less than or equal to: Checks if one value is smaller than or equal to another.

View Value Comparison Calculation 401K Loan Balance > 0		
Name 401K Loan Balance > 0		
Category Payroll		
Calculation 1 item		
1st Operand	Operator	2nd Operand
401K Loan Balance	greater than	0

Fig 12: Value Comparison Calculation

Instance Set Comparison Calculation

An instance set comparison calculation is used to compare a report field or a custom field against a value or a set of values using relational operators. This type of calculation can be utilized in various contexts, such as:

- Eligibility for pay and absence components.
- Conditional calculations or logic calculations.

Key Features

Relational Operators: Common operators include:

- Exact match with the selection list
- Is empty
- Is not empty
- Not in the selection list
- Error Handling: If there are issues, such as using a non-ISet class report field or invoking the calculation on a

null source instance, error messages will be generated.

- Field Types: It can work with both report fields and custom fields, provided they have authorized usage in the payroll calculation engine.

Usage

To effectively use instance set comparison calculations, ensure that:

- The fields being compared are correctly set up and authorized.
- The appropriate relational operators are selected to avoid inaccurate results.

This calculation is essential for determining eligibility and conditions based on specific criteria within payroll and absence management systems.

View Instance Set Comparison Calculation != California		
Name != California		
Category Payroll		
Calculation Usage		
Calculation 1 item		
Source Field	Relational Operator	Target Instance
☒ Worker Primary Work State	not in the selection list	California

Fig 13: Instance Set Comparison Calculation

Logic Calculation Overview

A logic calculation is used to build Boolean calculations that return a true (1) or false (0) indicator based on specified conditions. It employs AND and OR logic to evaluate multiple criteria:

- **AND Statements:** Returns true only if all conditions are true.
- **OR Statements:** Returns true if at least one condition is true.

Key Features

- **Nesting:** You can nest logic calculations by using one as an operand in another, but you cannot directly combine
- **Usage:** Commonly used in conditional calculations to filter data based on specific criteria.

Operator	Calculation
AND	Hire Date in 2020 pay periods
	Pay End Date >=09/27/2020 & <=12/26/2020

Fig 14: Logic Calculation

Pay Balances

Pay balances are calculations that aggregate the value of one or more pay components over a specified period. They can include:

- Deductions
- Earnings
- Pay accumulations
- Pay component related calculations (PCRCs)
- Pay component groups

Business Benefits

The pay balance feature offers several advantages:

- Flexibility in inputs and aggregation periods.

- Transparent calculations that are easy to troubleshoot.
- Automatic recalculation by Workday whenever a report or page is viewed, ensuring up-to-date information.

Use Cases

Pay balances can be utilized for various purposes, including:

- Calculating payroll inputs, such as average weekly hours paid.
- Comparing individual payroll results to month-to-date or year-to-date totals.
- Tracking open-ended loan repayments.
- Validating year-to-date pay.

Pay Component	Balance Period
FLSA Hours [USA]	30 Day Rolling Balance Period

Fig 15: Pay Balances

Pay Accumulators

Pay accumulators are a set of earnings, deductions and pay component-related calculations, pay component groups or other pay accumulations for which Workday can calculate a

total.

Accumulators return values used in payroll calculations. They support both addition and subtraction; some pay components can add to the value and others can subtract.

Pay accumulations return a single value based on the pay period being calculated.

The screenshot shows a web interface titled "View Pay Accumulation" with a sub-header "ESPP - Accumulator". Below the header, there are three fields: "Name" with value "ESPP - Accumulator", "Code" with value "ESPPACCU", and "Category" with value "Payroll". There are two tabs: "Add and Subtract Calculations" (active) and "Usage". Under the active tab, there is a section titled "Add to Pay Accumulation" with three links: "ESPP First Offering Contribution", "ESPP Second Offering Contribution", and "ESPP Third Offering Contribution".

Fig 16: Pay Accumulator

Pay Component Group

A pay component group is a collection of earnings, deductions, and related calculations that provide an aggregate value for a specific period or subperiod. These groups are essential for calculations and reporting within payroll systems.

Key Features:

- **Types of Components:** Includes earnings (like gross pay and employer-paid benefits) and deductions (such as taxes and withholding orders).
- **Custom Creation:** Users can create their own pay component groups in addition to those delivered by the system.
- **Limitations:**
 - Do not represent values over multiple periods.
 - Do not support subtraction; for that, pay balances or arithmetic calculations should be used.
- **Filtering:** Pay component groups filter by worktag, although pay accumulations can be conFigd to not filter by worktags.

The screenshot shows a web interface titled "View Pay Component Group" with a sub-header "Allocated Tips". Below the header, there are four fields: "Name" with value "Allocated Tips", "Pay Component Group Code" with value "GRP-3-12", "Category" with value "Payroll", and "Pay Component Usage" with value "Earnings". There are three tabs: "Adds to Group" (active), "Exceptions for Taxes", and "Exceptions for Withholding Orders". Under the active tab, there is a section titled "Adds to Group" with a sub-header "1 item". Below this, there is a table with three columns: "Earnings", "Deductions", and "Pay Component Related Calculations". The "Earnings" column contains a link "Rest Allocated Tips".

Fig 17: Pay Component Group

Live Case Study

One of the Top fitness club companies which got more than 30000 employees across USA and Canada has been using the Workday payroll. This organization has various types of employees like salaried, hourly, commission, exempt 7i commission, unit rate etc.

Requirement

1. This organization has different minimum wages for certain locations and regions compared to Federal and State Minimum wage and they want to apply this

override minimum wage for the employees in these locations and regions.

2. This organization wants to pay the minimum wage instead of the actual rate for the hours clocked for training and meeting purposes for hourly employees and 0 rate for exempt 7i and salaried employees.

Implementation Methodology

We build this custom calculation requirement by using the Workday Calculation types like advances lookup table, conditional calculation, Instance set comparison, evaluate

expression, true or false condition and aggregate calculation.

Step 1: Create the Advanced lookup table to conFig the

minimum wage for the override locations and regions based on effective date.

View Lookup Table

Min Wage by Region Lookup Table [CAN USA]

Report Field Search Criteria

Name

Min Wage by Region Lookup Table

Category

Absence

Payroll

Country

Canada

United States of America

Table Data

Usage

Effective Date

Min Wage by Region Lookup Table [CAN USA] - 06/29/2025

Values

49 Items

Search Value	Minimum Wage	Last Minimum wage (for initial sub-period)	Default
	0	0	Yes
1005 Highland Park	15.97	15.57	
1011 Minneapolis Athletic (inactive)	15.97	15.19	
1019 Schaumburg	15	14.05	
1023 Orland Park	15	14.05	

Fig 18: Advanced Lookup Table – Minimum Wage

Step 2: Create a Lookup calculation to get the minimum wage as of the payroll period end date.

View Lookup Calculation

Min Wage by Region Lookup Calc

⋮

Name

Min Wage by Region Lookup Calc

Category

Absence

Payroll

Comment

Lookup table for region minimum wage override rates.

Calculation

Usage

Calculation

1 Item

Lookup Table	Column	Period Date Indicator for Lookup Calculation
Min Wage by Region Lookup Table [CAN USA]	Minimum Wage	Based on Period End Date

Fig 19: Lookup calculation - Minimum Wage

Step 3: Create an aggregate calculation to get the maximum federal, state, or override minimum wage conFigd

View Aggregate Calculation		Maximum of Federal/State/Local Min Wage	...
Name	Maximum of Federal/State/Local Min Wage		
Category	Absence Payroll		
Calculation Usage			
1 item			
Function	Operand		
Maximum	FLSA: FLSA Minimum Wage (Higher of Federal and State) Lookup Min Wage by Location Lookup Min Wage by Region Wage Rate by Pay Component Lookup Calc		
Rounding	Round down to nearest 0.01		

Fig 20: Aggregate calculation - Minimum Wage

Step 4: Using Instance set comparison and Evaluate expression calculation type build the rule to check whether the employee is salaried or exempt 7i

Calculated Field - Evaluate Expression		CF EE Primary Comp Type is Exempt7i or Salaried	...
Field Name	CF EE Primary Comp Type is Exempt7i or Salaried		
Business Object	Worker		
Calculation Additional Info Where Used			
Evaluate Expression			
Field Type	Single Instance		
Business Object	Worker		
Default Value	Worker		
1 item			
Condition	Return Value If Condition is True		
☒ CF EE Primary Comp Type is Exempt7i or Salary	☒ Empty Instance		

View Instance Set Comparison Calculation		Exempt7i or Salary	...
Name	Exempt7i or Salary		
Category	Payroll		
Calculation Usage			
Calculation 1 item			
Source Field	Relational Operator	Target Instance	
☒ CF EE Primary Comp Type is Exempt7i or Salaried	is empty		

Fig 21: Evaluate and Instance Set Comparison

Step 5: Create a conditional calculation to derive the rate as minimum wage from our custom calculation 0 for Salaried and exempt 7i employees for all others pull the

View Conditional Calculation
Meeting/Training Rates 6.21.2023

Name Meeting/Training Rates 6.21.2023

Category Payroll

Calculation Usage

Conditional Calculations 1 item

Calculation Condition	Order	Condition	Result
...	a	Exempt? or Salary	0

Default Response Maximum of Federal/State/Local Min Wage

Fig 22: Conditional Calculation

Final Step: Map the conditional calculation as override calculation in the rate for the earnings training/meeting as shown below

View Earning
Meeting/Training [USA]

Name Meeting/Training

Code TRAIN

Default Payslip Name Meeting/Training Hours

Category Payroll

Country United States of America

Related Calculations 2 items

Related Calculation	Groups	Default Calculation	Override Calculation	Input Allowed?	Aggregate	Display
Hours (unprorated)	FLSA Hours [USA] Taxes: Actual Hours Worked [USA]	Payroll Input	Timesheet: Approved Hours for Earning for Sub-period	Yes	Yes	
Rate			Meeting/Training Rates 6.21.2023	Yes	No	

Fig 23: Earnings Configuration

Case Study Outcome:

This model has been successfully implemented to process more than 30000 employees for the time recorded against the training and meeting. As this requirement of attaching the minimum wage instead of actual hourly rate, it saves cost for the organization from revenue perspective.

Conclusion

Workday Payroll is revolutionizing payroll management by its unique process model with robust configuration capabilities. It provides the payroll business function to configure their own earnings, deduction, and calculation rules. As Workday provided various calculation types for the users to build and use, Users can combine these calculation types

effectively to build easy to very complex payroll custom calculation rules and assign the same to earnings and deductions as their calculations. Workday Payroll calculation engine will automatically process the custom calculation rule once it is attached to the pay components and there is no need to contact Workday vendor to conFig these custom calculations. Another very important advantage is the output of the custom calculations will be available in all payroll reports without out any additional configuration or changes. This flexibility of building custom business requirement payroll calculations provides the best user experience to payroll team and satisfy the organization's business goals effectively.

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