
Sample Case

Case – Staff vaccination leave

The Care And Respect Enterprises encourages staff members to take vaccines by granting one day paid leave per dose. A database is to be created in order to record the vaccinations, leave entitlements, and outstanding leaves incurred.

Care And Respect Enterprises
Staff Vaccination Leave Record

Name Ever Hong Department Sales Staff No. 7021

Dose	Date of vaccination	Date of vaccination leave taken	Entitled
1	19 August 2021	20 August 2021	Yes
2	15 September 2021	24 September 2021	No
3	06 March 2022		
Total Entitled Days taken			1

Outstanding leaves entitled 1

Vaccination leave entitlement

1. Each staff member entitles 1 day of vaccination leave for each dose.
2. Vaccination leave should be taken within 7 days from the date of vaccination, otherwise counted as sick leave.

** sample data for illustration only*

Additional information:

- The company does not want staff members taking leave not related to the vaccinations. Therefore, the leave should be taken within 7 days from the date of vaccination.
- The company wants to monitor the days of leave taken and outstanding.
- The company may need to know who has not taken any vaccines.

Assumptions:

- There are no differences in vaccination leave entitlement for staff members of different job positions.

Sample Solution

This sample solution can just meet the basic requirements and has much room for enhancement.

Case – Staff vaccination leave

Business needs

- record the date of vaccination and the date of leave taken per staff member
- determine whether the leave is entitled or not
- provide status summary including leaves taken and outstanding
- list staff members who have not taken any vaccines

Database design

Two tables and one logical view

Table STAFF

Basic information of each staff member

Table VACCINATION

V_STAFF_NO and V_DOSE_ID are composite primary key

V_DATE_VAC is the date of vaccination

V_DATE_LEAVE is the date of leave taken

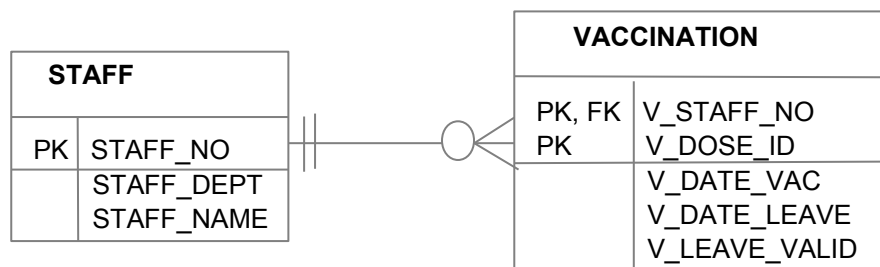
V_LEAVE_VALID is a derived attribute with value either

YES (entitled leave has been taken) or

NO (expired after 7 days from vaccination)

This attribute is derived by running a SQL at any time to ensure accuracy. It is justified because the frequency of use is high and the frequency of change is very low.

ER Diagram



Initial setup:

STAFF:

Basic information of each member

	STAFF NO	STAFF DEPT	STAFF NAME
1	7021	Sales	Ever Hong
2	7162	Sales	Steve Ko
3	3205	Finance	Francis Fan
4	7014	Sales	Yannie So
5	5239	Accounting	Connie Hung

Data entry by end-users:

VACCINATION:

Staff number, dose, 2 dates

	V STAFF NO	V DOSE ID	V DATE VAC	V DATE LEAVE	V LEAVE VALID
1	7021	3	2022-03-06	NULL	NULL
2	7021	2	2021-09-15	2021-09-24	NULL
3	7021	1	2021-08-19	2021-08-20	NULL
4	5239	1	2022-01-06	2022-01-14	NULL
5	5239	2	2022-02-14	2022-02-21	NULL
6	7162	2	2021-12-26	NULL	NULL
7	7162	1	2021-11-30	2021-12-03	NULL
8	3205	1	2021-12-31	2022-01-04	NULL

Data to be computed: VACCINATION: V_LEAVE_VALID

The following SQL updates the V_LEAVE_VALID:

```
UPDATE VACCINATION
  SET V_LEAVE_VALID = 'Yes'
  WHERE ((JulianDay(V_DATE_LEAVE)-JulianDay(V_DATE_VAC)) < 8);
UPDATE VACCINATION
  SET V_LEAVE_VALID = 'No'
  WHERE ((JulianDay(V_DATE_LEAVE)-JulianDay(V_DATE_VAC)) > 7);
```

Sample results:

	V STAFF NO	V DOSE ID	V DATE VAC	V DATE LEAVE	V LEAVE VALID
1	7021	3	2022-03-06	NULL	NULL
2	7021	2	2021-09-15	2021-09-24	No
3	7021	1	2021-08-19	2021-08-20	Yes
4	5239	1	2022-01-06	2022-01-14	No
5	5239	2	2022-02-14	2022-02-21	Yes
6	7162	2	2021-12-26	NULL	NULL
7	7162	1	2021-11-30	2021-12-03	Yes
8	3205	1	2021-12-31	2022-01-04	Yes

Logical View ENTITLEMENT

```
CREATE VIEW ENTITLEMENT AS
  SELECT V_STAFF_NO, COUNT(V_DOSE_ID) AS ENTITLED,
         COUNT(V_LEAVE_VALID) AS TAKEN,
         (COUNT(V_DOSE_ID) - COUNT(V_LEAVE_VALID) ) AS OUTSTANDING
  FROM VACCINATION
  GROUP BY V_STAFF_NO
  ORDER BY V_STAFF_NO;
```

Sample results:

	V_STAFF_NO	ENTITLED	TAKEN	OUTSTANDING
1	3205	1	1	0
2	5239	2	2	0
3	7021	3	2	1
4	7162	2	1	1

Test results

(1) List the staff members with outstanding leaves entitled:

```
SELECT STAFF_NO, STAFF_DEPT, STAFF_NAME, OUTSTANDING
  FROM STAFF, ENTITLEMENT
  WHERE STAFF_NO = V_STAFF_NO
        AND OUTSTANDING > 0;
```

Sample results:

	STAFF_NO	STAFF_DEPT	STAFF_NAME	OUTSTANDING
1	7021	Sales	Ever Hong	1
2	7162	Sales	Steve Ko	1

- (2) List the staff members who have not taken any vaccines:

```
SELECT DISTINCT STAFF_NO, STAFF_DEPT, STAFF_NAME
FROM STAFF
WHERE STAFF_NO NOT IN
      (SELECT V_STAFF_NO FROM VACCINATION);
```

Sample results:

	STAFF_NO	STAFF_DEPT	STAFF_NAME
1	7014	Sales	Yannie So

- (3) List all doses taken by a selected staff member:

```
SELECT STAFF_NO, STAFF_DEPT, STAFF_NAME, V_DOSE_ID, V_DATE_VAC
FROM STAFF, VACCINATION
WHERE STAFF_NO = V_STAFF_NO
      AND STAFF_NO = ?
ORDER BY STAFF_NO, V_DOSE_ID;
```

Sample results based on runtime data input (Staff_No = 7021):

	STAFF_NO	STAFF_DEPT	STAFF_NAME	V_DOSE_ID	V_DATE_VAC
1	7021	Sales	Ever Hong	1	2021-08-19
2	7021	Sales	Ever Hong	2	2021-09-15
3	7021	Sales	Ever Hong	3	2022-03-06

Assumptions and limitations

- All staff members will take vaccination leaves shortly after taking vaccines that the status summary can be run at any time to reflect the real status.
- If one staff member left the company, the records of that member should be deleted from the VACCINATION table. Otherwise, the status summary may include that and be confusing.
- It is discovered during testing that Steve Ko (Staff 7162) has taken second dose in December 2021 but not yet taking vaccination leave. Therefore, it is counted as outstanding although it should be expired anyway.

Conclusion

This design basically supports the stated requirements. In future, this design should be enhanced to cater for:

- staff members not taking vaccination leaves for some time
- summary of sick leaves due to leaves taken over 7 days
- additional features as required

- End -