NORMALISATION

MONASH HOSPITAL (MH)

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Documents A:

UNF:

PATIENT ADMISSION(patient_id, patient_name, admission_ datetime, supvdoctor_id, supvdoctor_name
(procedure_code, procedure_name, prescdoctor_id, prescdoctor_name, doctorcarried_id, doctorcarried_name, carried_out_on, totalproc_charge, (item_code, item_description, item_quantity, totalitem_price), totalextra_charge)
)

1NF

S1 : unique identifier for main relation,

PATIENT ADMISSION(patient_id, patient_name, admission_ datetime, supvdoctor_id, supvdoctor_name
(procedure_code, procedure_name, prescdoctor_id, prescdoctor_name, doctorcarried_id, doctorcarried_name, carried_out_on, totalproc_charge, (item_code, item_description, item_quantity, totalitem_price), totalextra_charge)
)

SUPER KEYS
= patient_id + patient_name + admission_ datetime + supvdoctor_id + supvdoctor_name
= patient_id + admission_ datetime

CANDIDATE KEYS
= patient_id + admission_ datetime
PRIMARY KEY
= patient_id + admission_ datetime

PATIENT ADMISSION(patient_id, admission_ datetime, patient_name, supvdoctor_id, supvdoctor_name)

S2 : remove any repeating group along with pk of the main relation,

PATIENT ADMISSION(patient_id, admission_datetime, patient_name, supvdoctor_id, supvdoctor_name)

PATIENT PROCEDURE (patient_id, admission_ datetime, procedure_code, procedure_name, prescdoctor_id, prescdoctor_name, doctorcarried_id, doctorcarried_name, carried_out_on, totalproc_charge, (item_code, item_description, item_quantity, totalitem_price), totalextra_charge)

S1 : unique identifier for main relation,

SUPER KEYS

= patient_id + admission_ datetime + procedure_code + procedure_name, prescdoctor_id + prescdoctor_name + doctorcarried_id + doctorcarried_name + carried_out_on + totalproc_charge

= patient_id + admission_ datetime + procedure_code + prescdoctor_id + carried_out_on

= patient_id + procedure_code + carried_out_on

= patient_id + carried_out_on

CANDIDATE KEYS

= patient_id + carried_out_on

PRIMARY KEY

= patient_id + carried_out_on

PATIENT PROCEDURE (patient_id, carried_out_on, admission_ datetime, procedure_code, procedure_name, prescdoctor_id, prescdoctor_name, doctorcarried_id, doctorcarried_name, totalproc_charge, (item_code, item_description, item_quantity, totalitem_price), totalextra_charge)

S2 : remove any repeating group along with pk of the main relation

PATIENT PROCEDURE (patient_id, carried_out_on, admission_ datetime, procedure_code, procedure_name, prescdoctor_id, prescdoctor_name, doctorcarried_id, doctorcarried_name, totalproc_charge, totalextra_charge)

PROCEDURE E-ITEM (patient_id, carried_out_on, item_code, item_description, item_quantity, totalitem_price)

S3: check again pk's, new relation normally have cpk(main relation pk and unique identifier of repeating group) but this must be checked.

SUPER KEYS
= patient_id + carried_out_on + item_code + item_description, item_quantity + totalitem_price
= patient_id + carried_out_on + item_code
CANDIDATE KEYS
= patient_id + carried_out_on + item_code
PRIMARY KEY
= patient_id + carried_out_on + item_code

PROCEDURE E-ITEM (patient_id, carried_out_on, item_code, item_description, item_quantity, totalitem_price)

FINAL 1NF

PATIENT ADMISSION(patient_id, admission_datetime, patient_name, supvdoctor_id, supvdoctor_name)

PATIENT PROCEDURE (patient_id, carried_out_on, admission_ datetime, procedure_code, procedure_name, prescdoctor_id, prescdoctor_name, doctorcarried_id, doctorcarried_name, totalproc_charge, totalextra_charge)

PROCEDURE E-ITEM (patient_id, carried_out_on, item_code, item_description, item_quantity, totalitem_price)

DEPENDENCY DIAGRAMS:

patient_id, admission_datetime → supvdoctor_id — FULL DEPENDENCY
patient_id → patient_name — PARTIAL DEPENDENCY
supv_id → supv_name — TRANSITIVE DEPENDENCY

patient_id, carried_out_on → procedure_code, precsdoctor_id, doctorcarried_id, totalproc_charge, totalextra_charge — FULL DEPENDENCY
procedure_code → procedure_name — TRANSITIVE DEPENDENCY
prescdoctor_id → prescdoctor_name — TRANSITIVE DEPENDENCY
doctorcarried_id → doctorcarried_name — TRANSITIVE DEPENDENCY

patient_id, carried_out_on, item_code → item_quantity, totalitem_price — FULL DEPENDENCY

item_code → item_description PARTIAL DEPENDENCY

2NF

PATIENT ADMISSION(patient_id, admission_datetime, supvdoctor_id, supvdoctor_name)

PATIENT (patient_id ,patient_name)

PATIENT PROCEDURE (patient_id, carried_out_on, admission_ datetime, procedure_code, procedure_name, prescdoctor_id, prescdoctor_name, doctorcarried_id, doctorcarried_name, totalproc_charge, totalextra_charge)

PROCEDURE E-ITEM (patient_id, carried_out_on, item_code, item_quantity, totalitem_price)

EXTRA ITEM (item_code, item_description)

3NF:

PATIENT ADMISSION(patient_id, admission_datetime, supvdoctor_id)
SUPERVISING DOCTOR (supvdoctor_id, supvdoctor_name)
PATIENT (patient_id ,patient_name)
PATIENT PROCEDURE (patient_id, carried_out_on, admission_ datetime, procedure_code, prescdoctor_id, doctorcarried_id, totalproc_charge, totalextra_charge)
PROCEDURE (procedure_code, procedure_name)
PRESCRIBE DOCTOR (prescdoctor_id, prescdoctor_name)
DOCTOR CARRIEDOUT (doctorcarried_id, doctorcarried_name)
PROCEDURE E-ITEM (patient_id, carried_out_on, item_code, item_description, item_quantity, totalitem_price)
EXTRA ITEM (item_code, item_description)

NB: should I have so many doctor or 1 doctor is enough?

Documents B:

UNF:
NURSE ASSIGNMENT (nurse_id, nurse_fname, nurse_lname, nurse_phone, cert_for_childern(ward_code, ward_name, date_assigned, date_completed))

1NF

S1 : unique identifier for repeating group,
PK OF REPEATING GROUP:

SUPER KEYS
= ward_code + ward_name + date_assigned
= ward_code + ward_name + date_completed
= ward_code + date_completed
= ward_code + date_assigned
= date_assigned

CANDIDATE KEYS
= date_assigned
= ward_code + date_copleted

PRIMARY KEY
= date_assigned

(ward_code, ward_name, date_assigned, date_completed)

S2 : remove any repeating group along with pk of the main relation,

PK OF MAIN RELATION:

SUPER KEYS
= nurse_id + nurse_phone + nurse_f/lname + cert_for_children
= nurse_id + nurse_phone + nurse_f/lname
= nurse_id + nurse_phone
= nurse_id
CANDIDATE KEYS
= nurse_id

PRIMARY KEY
= nurse_id

WARD ASSIGNMENT(nurse_id, date_assigned, ward_code, ward_name, , date_completed)

S3: check again pk's, new relation normally have cpk(main relation pk and unique identifier of repeating group) but this must be checked.

WARD ASSIGNMENT(*nurse_id*, date_assigned, ward_code, ward_name, date_completed)

FINAL 1NF

NURSE (<u>nurse_id</u>, nurse_fname, nurse_lname, nurse_phone, cert_for_childern)
WARD ASSIGNMENT (<u>nurse_id</u>, <u>date_assigned</u>, ward_code, ward_name, date_completed)

nurse_id → nurse_fname, nurse_lname, nurse_phone, cert_for_childern FULL DEPENDENCY
Nurse_id, date_assigned → ward_code, date_completed FULL DEPENDENCY
ward_code → ward_name TRANSITIVE DEPENDENCY

2NF

S1. No partial dependency

FINAL 2NF:

NURSE (<u>nurse_id</u>, nurse_fname, nurse_lname, nurse_phone, cert_for_childern)
WARD ASSIGNMENT (<u>*nurse_id*</u>, <u>date_assigned</u>, ward_code, ward_name, date_completed)

3NF:

NURSE (<u>nurse_id</u>, nurse_fname, nurse_lname, nurse_phone, cert_for_childern)
WARD ASSIGNMENT (<u>*nurse_id*</u>, <u>date_assigned</u>, *ward_code,* date_completed)
WARD (<u>ward_code</u>, ward_name)

Business Case:

PATIENT (patient_id, patient_fname, patient_lname, patient_address, patient_dob, patient_emcontact,
(admission_datetime, discharge_datetime, assigned_bed*, assigned_ward*, supervising_doctor,
(procedure_name, procedure_prescribed_by, procedure_carried_out_by
(item_code, item_description, current_stock, price, (cost_centre, centre_code, centre_title, manager_name)), Quantity_item, procedure_bill, extra_item_bill, procedure_datetime)
)

)

WARD (ward_code, number_of_beds, number_available_beds, (bed_no, bedside_tphone, bed_type,))

DOCTOR(doctor_id, doctor_fname, doctor_lname, doctor_phone, (specialization name))

PROCEDURE (procedure_code, procedure_name, procedure_description, time_req, stnd_cost)

NURSE ASSIGNMENT ((nurse_id, nurse_fname, nurse_lname), assigned_ward_date, finished_ward_date)