**BUSINESS GOAL SUMMARY: Conceptual Modelling**

With a budget of £114 billion in 2018/19, 1.2 million jobs, making it the country's largest employer, and opportunities for education and training for more than 38,000 nurses, scientists, and therapists and over 50,000 doctors annually, the NHS plays a crucial role in society and is a key pillar of our economic strength and stability. It provides free care to 54 million citizens at the point of need, treats more than 1.4 million patients and service users every 24 hours, and has a budget of £114 billion. The UK's life sciences industry, which earns about £50 million a year and supports 165,000 employments here, depends heavily on the NHS to remain competitive on a worldwide scale.

The NHS Trusts are seeing more patients than ever before due to rising demand, yet the care delivery mechanisms in place today don't suffice. Despite the high levels of productivity, there are still severe financial strains. The NHS Trusts are putting a lot of effort into improving productivity and transforming services as the NHS moves towards an integrated health and care system. They are doing this by enhancing care for patients and service users, innovating by utilising new technology and other approaches to improving care quality and efficiency, and changing how care is delivered through closer integration and collaboration.

Hence the new system will satisfy patients and NHS employees views on services, employee salary through providing views on specific issues done via online questionnaire and surveys which will support the organisation goal to always provide an outstanding experience for our patients, communication and help make NHS a great place to work. Improvement of Medical doctors’ specialties, Mental Health Nurse, Maternity and Women’s Unit performance as they will be evaluated through their performance on specific issues like still birth, medication administration, mental health, journals ,etc ,the results from the performance evaluation will help them apply for special training schemes and receiving funding where applicable which will support the organisation goal that patients will always receive outstanding patient safety, reduce still births, improve mental health, workforce strategy and management of funds . Enhance closer integration and collaboration between the NHS Clinical Information and decision Support through the integration of new and secured technology ,infrastructures, databases(response, cancer etc), identity access management(IAM) controls, data mining functions which will support the organisation goal that patients will always have outstanding patients’ outcome.

**LOGICAL MODELLING – Entity Relationship diagram**

ERD

Participate in online Questionnaire

Online Questionnaire and Surveys Report

Patients

NHS Employees

Fig 1: E-D Diagram(To improve service, communication and provide safe and happy environment for staff)

Assumption: the attributes for the online Questionnaire and Surveys Report is drafted towards service and work improvements, it is anonymous to enable participants freely share their opinion, hence no ID included as an attribute.

Patients- NHS Registration Number(PK),FirstName, LastName

1NF: Meets the definition of a relation

2NF: No partial key dependencies

3NF: No transitive dependency

Online Questionnaire and Surveys Report- ID(PK),How was your experience at our service? , Did clinical staff listen, understand, and answer your question? , Has the main reason you came to outpatient department dealt with to your satisfaction? , Do you think your salary is low for your level? , Do you have work ,life, balance?

1NF: Meets the definition of a relation.

2NF: No partial key dependencies

3NF: No transitive dependency

NHS Employees- NHS Employee ID(PK),Name

1NF: Meets the definition of a relation

2NF: No partial key dependencies

3NF: No transitive dependency

Assessment and evaluation of stakeholders’ performance

Performance Evaluation

Medical Doctors

Apply for funding

Different Training Schedules

Mental Health Nurse

Maternity and Women’s Heallth Unit

Fig 2: E-R Diagram(To ensure appropriate medication administration ,reduce still births, improve mental health ,improve efficiency through training and funding)

Assumption: The Performance Evaluation for each Stakeholder i.e., Doctors, Mental Health Nurse, Maternity and Women’s Unit will be done and recorded separately as the goals are unique to each other.

Medical Doctors – Specialty Code(PK),Specialty Name, Residency Type, Doctor No(PK),Doctor Name, Doctor Grade, Salary Grade, Time Allocated, Duration of Residency, Progress of Residency, Date joined.

1NF: Meets the definition of a relation.

2NF: No partial key dependencies

3NF: This is not in 3N due to the existence of transitive dependency.

Solution: Split Medical Doctors into two(2)

Specialty-Specialty Code(PK),Specialty Name, Residency Type, Doctor No(PK)

Doctor-Doctor No(PK),Doctor Name, Doctor Grade, Salary Grade, Time Allocated, Duration of Residency, Progress of Residency, Date joined.

Performance Evaluation- Improve Mental health, Doctor No(FK), Mental Health Nurse No(FK),Maternity Nurse No.(FK),Ensure accurate prescription and administration(Doctors), Reduce still births(Maternity Unit).

1NF: Meets the definition of a relation.

2NF: No partial key dependencies

3NF: No transitive dependency.

Different Training Schedules: Training ID(PK),Scheme, Who Pays?

1NF: Meets the definition of a relation.

2NF: No partial key dependencies

3NF: No transitive dependency.

Mental Health Nurse- Mental Health Nurse No(PK), Nurse Name, how has the Mental health care improved.

1NF: Meets the definition of a relation.

2NF: No partial key dependencies

3NF: No transitive dependency.

Maternity and Women’s Unit- Maternity Nurse No.(PK), Maternity Name, Number of Still Births

1NF: Meets the definition of a relation.

2NF: No partial key dependencies

3NF: No transitive dependency

Management of secured Network connection and access controls

N3 Network and ICSs(NHS Authorities and Local Council)

Access medical data and analysis

NHS App and Platforms

NHS App and Platform Users

Filtering based on NHS App and Platform users’ response and access

NHS Cancer Database

Databases(CINAHL, Embase)

T3 and EDMS Infrastructure

Data Mining Functions

Updating of the data mining functions

NHS Clinical Information and decision Support(MHS Research teams and Audit Teams)

Fig 3: E-R Diagram( To promote digitization of the enhance closer integration and collaboration between the NHS Clinical Information and decision Support through the integration of new and secured technology ,infrastructures, databases(response, cancer etc), identity access management(IAM) controls, data mining functions.

NHS App and Platform Users-Unique Username(PK),Password

1NF: Meets the definition of a relation.

2NF: No partial key dependencies

3NF: No transitive dependency

NHS Cancer Database-Cancer ID, Cancer Patients, Cancer treatment

1NF: Meets the definition of a relation.

2NF: No partial key dependencies

3NF: No transitive dependency

NHS App and Platforms- Authentication keys

1NF: Meets the definition of a relation.

2NF: No partial key dependencies

3NF: No transitive dependency

N3 Network and ICSs(NHS Authorities and Local Council) – Admin ID(PK),Password

1NF: Meets the definition of a relation.

2NF: No partial key dependencies

3NF: No transitive dependency

**Final E-R Model normalized to Third Normal form**

Patients- NHS Registration Number(PK),FirstName, LastName

Online Questionnaire and Surveys Report- ID(PK),How was your experience at our service? , Did clinical staff listen, understand, and answer your question? , Has the main reason you came to outpatient department dealt with to your satisfaction? , Do you think your salary is low for your level? , Do you have work ,life, balance?

NHS Employees- NHS Employee ID(PK),Name

Medical Doctors – Specialty Code(PK),Specialty Name, Residency Type, Doctor No(PK),Doctor Name, Doctor Grade, Salary Grade, Time Allocated, Duration of Residency, Progress of Residency, Date joined.

Specialty-Specialty Code(PK),Specialty Name, Residency Type, Doctor No(PK)

Doctor-Doctor No(PK),Doctor Name, Doctor Grade, Salary Grade, Time Allocated, Duration of Residency, Progress of Residency, Date joined.

Performance Evaluation- Improve Mental health, Doctor No(FK), Mental Health Nurse No(FK),Maternity Nurse No.(FK),Ensure accurate prescription and administration(Doctors), Reduce still births(Maternity Unit).

Different Training Schedules: Training ID(PK),Scheme, Who Pays?

Mental Health Nurse- Mental Health Nurse No(PK), Nurse Name, how has the Mental health care improved.

Maternity and Women’s Unit- Maternity Nurse No.(PK), Maternity Name, Number of Still Births

NHS App and Platform Users-Unique Username(PK),Password

NHS Cancer Database-Cancer ID, Cancer Patients, Cancer treatment

NHS App and Platforms- Authentication keys

N3 Network and ICSs(NHS Authorities and Local Council) – Admin ID(PK),Password

In other to support the organizational goal of continuous service improvement, safe and happy working environment, the final E-R model consist of the two main stakeholders or entities(Patients and NHS Employees) whose inputs are required to fill questionnaires with specific issues to which the question in these questionnaires is focused on the organization goal, the attributes of these entities result to this outcome. Also, in other to support the organization goal of improvement in medication administration, reduced still births, improve mental health ,the final E-R model consist of stakeholders or entities that play a major part with their respective attributes. Lastly in other to support the organization goal for digitization of the enhance closer integration and collaboration between the NHS Clinical Information and decision Support through the integration of new and secured technology ,infrastructures, databases(response, cancer etc), identity access management(IAM) controls, data mining functions, the final E-R Model has the respective entities to ensure and drive this goal.

APPENDIX

* Entity

* Weak Entity(Shows it depends on another entity)
* Attributes
* Relationship between entities

1NF- 1st Normal Form

2NF- 2nd Normal Form

3NF- 3rd Normal Form

(PK)-Primary Key

(FK)-Foreign Key