A PROJECT ON HOSPITAL NETWORK DESIGN

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for the fourth Semester

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BACHELOR OF TECHNOLOGY

IN

COMPUTER COMMUNICATION

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Examiner-1 **Examiner-2**

CONTENT

HOSPITAL NETWORK DESIGN

[Computer Communication Project]

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Abstract :

Hospitals currently use a manual system for the management and maintenance of critical information. The current system requires numerous paper forms, with data stores spread throughout the hospital management infrastructure. Often information (on forms) is incomplete, or does not follow management standards. Forms may also be lost in transit between departments requiring a comprehensive auditing process to ensure that no vital information is lost. Multiple copies of the same information exist in the hospital and may lead to inconsistencies in data in various data stores. A significant part of the operation of any hospital involves the acquisition, management and timely retrieval of great volumes of information. This information typically involves; patient personal information and medical history, staff information, room and ward scheduling, staff scheduling, operating theatre scheduling and various facilities waiting lists. All of this information must be managed in an efficient and cost wise fashion so that an institution's resources may be effectively utilised. Hospital Management Network may come in making the hospital more efficient and error free.

Hospital Management Network is designed for any hospital to replace their existing manual, paper based system. The new system is to control the following information; patient information, room availability, staff and operating room schedules, and patient invoices. These services are to be provided in an efficient, cost effective manner, with the goal of reducing the time and resources currently required for such tasks. A significant part of the operation of any hospital involves the acquisition, management and timely retrieval of great volumes of information.

Automation is one of the main benefits here. It helps to optimise the user experience. Medical specialists, patients, and hospital authorities can interact online, make the appointments and exchange information. The hospital database also includes all the necessary patient data. The disease history, test results, prescribed treatment can be accessed by doctors without much delay in order to make an accurate diagnosis and monitor the patient’s health. It enables lower risks of mistakes. Hospitals authorities are also able to manage their available resources, analyse staff work, reduce the equipment downtime, optimise the supply chain, etc. Another fact to mention is that hospital staff deal with the digital data instead of endless paperwork.

Introduction :

As long as each stage implementation needs to be accurate and explicit, the clinic management system provides certain automation of many vital daily processes. The hospital system software covers the services that unify and simplify the work of healthcare professionals as well as their interactions with patients.

There is always the wide choice of features that can be included in the system. Moreover, the most important thing they are created to streamline various procedures that meet the needs of all the users. The hospital management system feature list is concentrated on providing the smooth experience of patients, staff and hospital authorities. It might seem that their expectations differ, they still are covered by components of the hospital information system. Quality and security still remain the main criteria of the medical industry. It is also known for the constant and rapid changes to improve the efficiency of medical services and satisfaction of the patients.

Hospital management has greatly changed over the last decades. Business expertise, modern technologies, connected devices, mobile apps, and knowledge of healthcare are key elements for the implementation of hospital management system project. The number of healthcare providers has increased and the patients have a wide choice of medical specialists. The interactions between the hospital and the patient can be simplified for the convenience of both sides. Each institution has the opportunity to create the efficient, clear and fast delivering healthcare model.

Depending on the hospital management system software features, it can deal with a lot of tasks. It helps to outline and implement policies, guarantee communication and coordination between employees, automate routine tasks, design the patient-oriented workflows, advertise services, manage human and financial resources and provide the uninterrupted supply chain. The components of a hospital information system can be chosen and combined in the general system that meets the needs and norms of the healthcare industry as well as quality standards. One of the main requirements of the clinic management system is security. All medical records have to be protected and only accessible for the allowed users. The convenient and informative interfaces should correspond to their roles and responsibilities in order to protect the confidential data.

Since the purpose of the hospital information system is the arrangement of necessary, precise and appropriate data, the hospitals should ensure the system work and can be accessed at any time. The online hospital management system and desktop solutions are possible options of the healthcare providers. This could be a unique system for the certain institution, chain of clinics, state hospitals or even the international medical organisations. It is usually started with the basic version that can be scaled up.

Objective of the Project:

Main objectives of a Hospital Management System are:

- Design a system for better patient care.
- Reduce hospital operating costs.
- Provide MIS (Management Information System) report on demand to management for better decision making.
- Better co-ordination among the different departments.
- Provide top management a single point of control.

Modules of the Project:

- Reception
- Administration
- Pharmacy
- Laboratory
- Registration

1. **Reception:** The reception module handles various enquiries about the patient's admission and discharge details, bed census, and the patient's movements within the hospital. The system can also handle fixed-cost package deals for patients as well as Doctor Consultation and Scheduling, Doctor Consultancy Fees and Time Allocation.

2. **Administration**: This module handles all the master entry details for the hospital requirement such as consultation detail, doctor specialisation, consultancy fee, and service charges.

3. **Pharmacy**: This module deals with all medical items. This module helps in maintaining Item Master, Receipt of Drugs/consumables, issue, handling of material return, generating retail bills, stock maintenance. It also helps in fulfilling the requirements of both IPD and OPD Pharmacy.

4. **Laboratory**: This module enables the maintenance of investigation requests by the patient and generation of test results for the various available services, such as clinical pathology, X-ray and ultrasound tests. Requests can be made from various points, including wards, billing, sample collection and the laboratory receiving point.

5. **Registration**: This module helps in registering information about patients and handling both IPD and OPD patient’s query. A unique ID is generated for each patient after registration. This helps in implementing customer relationship management and also maintains medical history of the patient.

Aim :

To construct and implement Hospital Networking Design.

Components required: -

- 12 PC’s
- 3 Routers – 2911
- 7 Switches –PT
- 4 Servers-PT
- 1 Printer-PT

Procedure:-

1. Drag 12 PC’s, 3 routers (2911), 7 switches-PT, servers and printer into the console area.
2. Connect the PC’s to switches as shown in the diagram via copper straight through cable.
3. Connect routers with respective switches using straight through cable and connect the routers using Serial DCE.
4. Connect printer from switch and server from respective switches through copper straight through cable.
5. Assign IP address to the given PC’s. Distinct IP addresses so that the networking through CISCO Packet could be smooth.
6. The 3 routers should also be assigned IP addresses of 194.168.10.1, 196.168.10.1 and 198.168.10.1 respectively.
7. Give gateway address same for the commonly connected PC’s and different for distinctly connected PC’s.

8. The subnet masks would be automatically generated in each case.
9. In the interface of the router, go to physical tab, turn off the switch connection and then connect HWIC-2T and then switch it on.
10. Do same for all router, just for the router with 2-sided connection, repeat the process twice and it needs configuration for both connections.
11. Assign PC_0 as 192.168.20.1, PC_1 as 192.168.20.2 and so on for each PC.
12. Repeat the steps for each router and interface system setting along with it.
13. Assign interface fast Ethernet 0 for printer with IP address as 192.168.10.3
14. Assign interface IP for Server (as default gateway) with IP addresses as 198.168.10.3, 192.168.1.2, 192.168.1.3 and 192.168.1.4 respectively.
15. Using IP address, path usage and process termination configure the whole system so that message can be passed and received.
16. Now, all devices as per hospital network are physically and logically connected.
17. To check the connection, verify and validate the system network, open command prompt- ping the PC's and obtain the correct message bits.

Screenshot of Model:

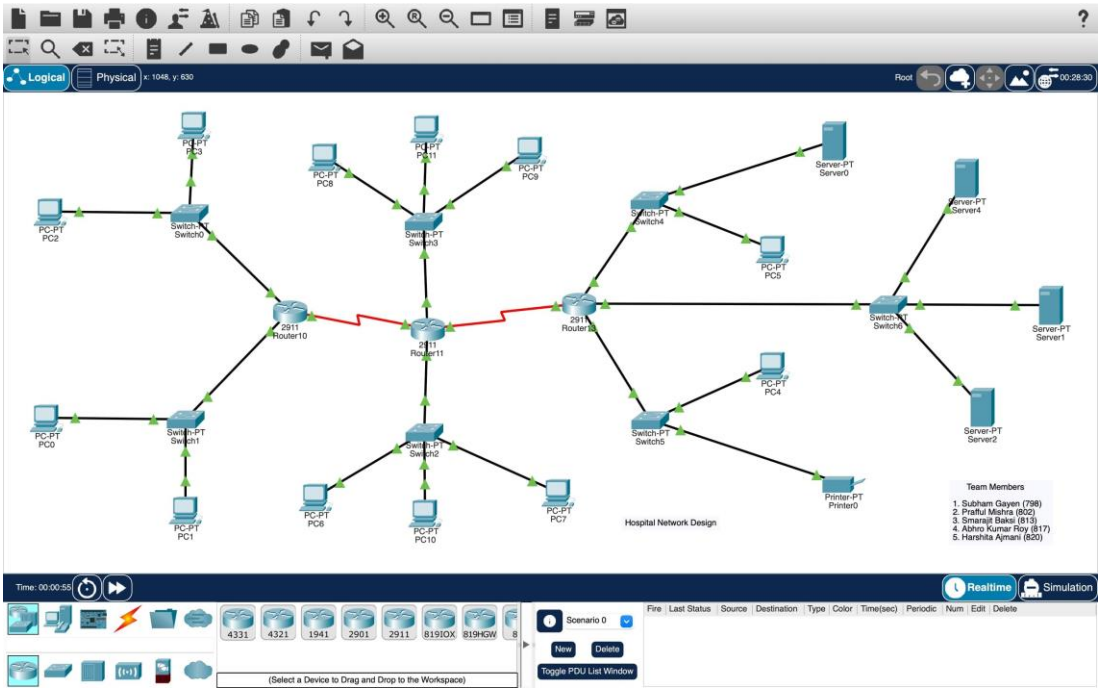
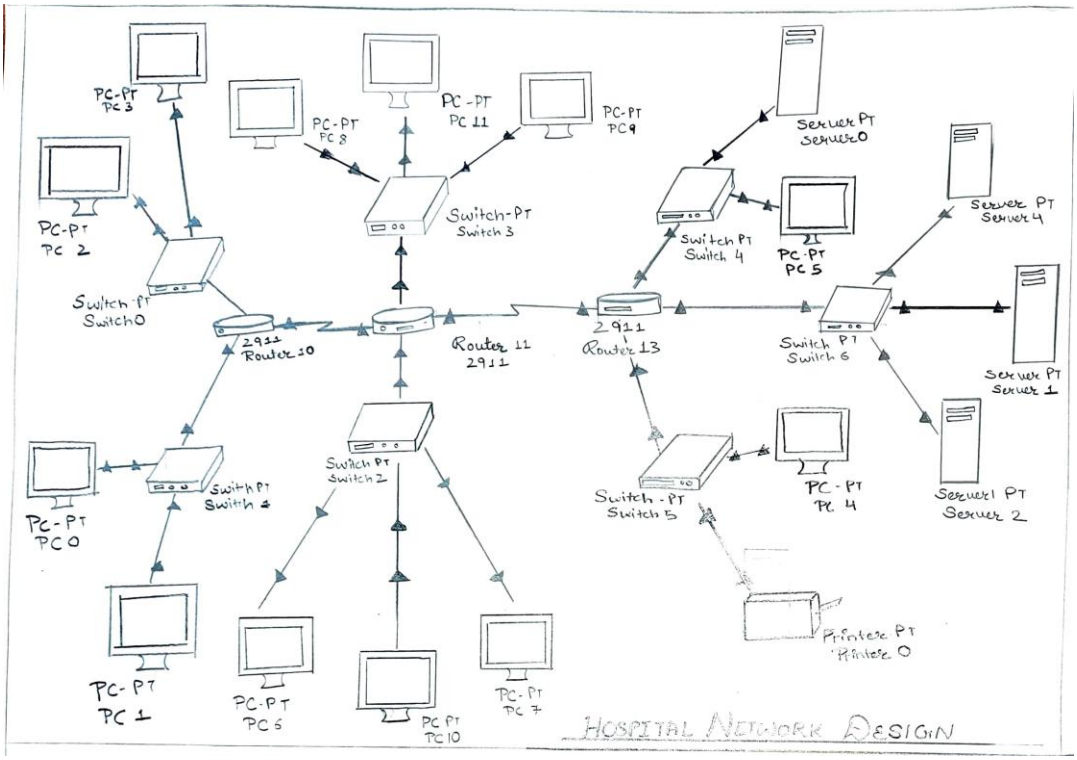


Diagram :



Inference :

The concepts learned in this context is with the core network architecture and design processes; enterprises can accomplish full redundancy, minimised downtime, and possibly save patient lives and save money simultaneously by clustering connections. The hospital management network is essentially created to establish effective and carefree communication between the different departments of the hospital. From the given network design it is evident enough that all the routers have different IP addresses assigned to them which can be accessed by someone from inside the hospital but it is also secure enough and there is little or minimum chance of data compromise from the outside. The hospital management system provides effective transfer of information from one enterprise to another with a secure and robust environment. With rapid cutting edge technologies, industry network experts can bring ingenuity and cost saving benefits and deliver a higher quality patient care to healthcare.

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Result :

Hospital Network Management System was successfully constructed as well as implemented.