

VISHWAKARMA INSTITUTE OF TECHNOLOGY

DEPARTMENT OF ENGINEERING SCIENCES AND HUMANITIES

Health Care Management

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Subject: SYSTEM ENGINEERING

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PROBLEM DEFINITION:

The title for our project is 'Health Care Management simulation.' In this model of ours, we will focus on demonstrating the actual working of a hospital with the help of accurate data. It includes Registration, X-Ray room, Triage room, MRI, ECG, Treatment room, and Billing counter.

The simulation shows the actual clinics management model and works on real-time data collected from different departments of a particular clinic. It helps in managing the patients more effectively and even helps to save organizations and patients' time. It is primarily used in managing a hospital that mostly has an enormous number of patients engaged.

The model will be general to be used and applied for various other clinics even, and it is supposed to be detailed enough to help the complex nature of the hospital functioning.

TOOLS USED

We are using Simio software to show the simulation model of a healthcare clinic. We use tools like Data tables, sequence tables, workers as nurses, Servers as a Treatment table, and bed and chairs in the waiting area. Five different types of patients can visit the clinic in the proposed healthcare model and receives treatment accordingly.

DATA TABLE

Healthcare clinics contain the following servers:

Function at Clinic	Patient types
-Registration	-Walking
-Triage	-LAB
-Treatment	-X-RAY
-Lab	-ECG
-X-Ray	-MRI
-MRI	
-ECG	
-Accounting	

Patient Routine Sequence

Regi.	Triage	Treatment	LAB	X-Ray	MRI	ECG	ACCT.	
Walking	1	2	3					4
LAB				1				2
X-Ray	1				2			3
MRI	1					2		3
ECG	1						2	3

Inter Arrival distribution:

Walking Patients	Exponential, mean 6 minutes
Lab Patients	Exponential, mean 3 minutes
X-Ray patients	Exponential, mean 12 minutes
MRI patients	Exponential, mean 10 minutes
ECG patients	Exponential, mean 30 minutes

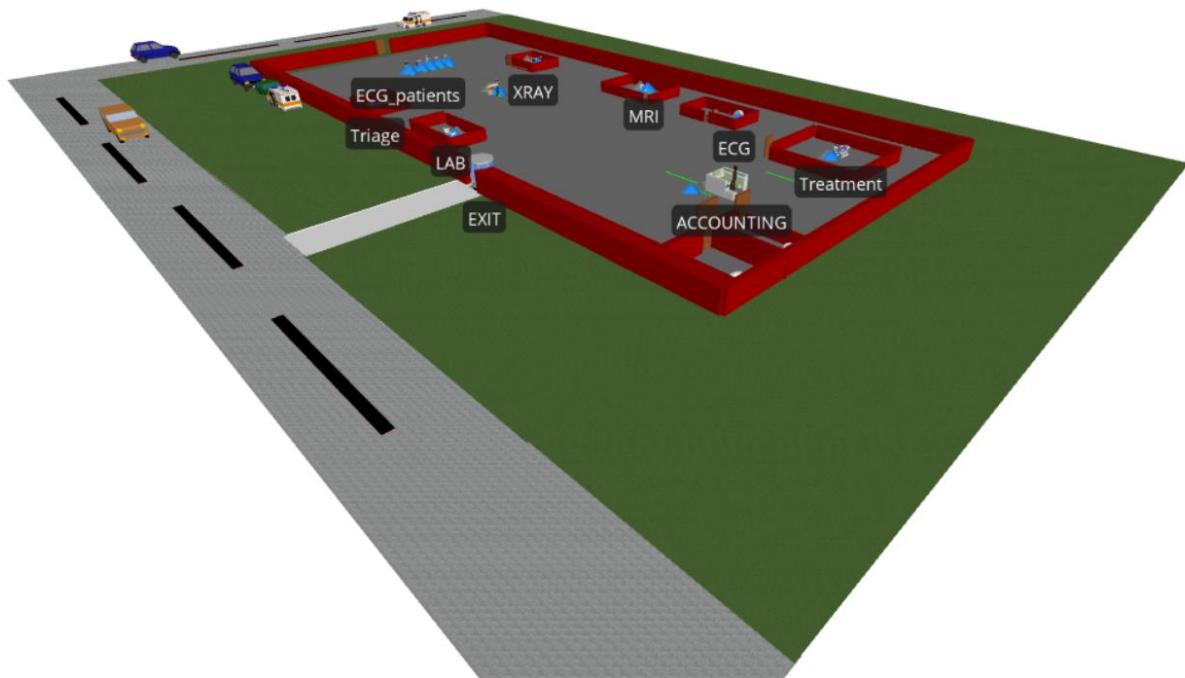
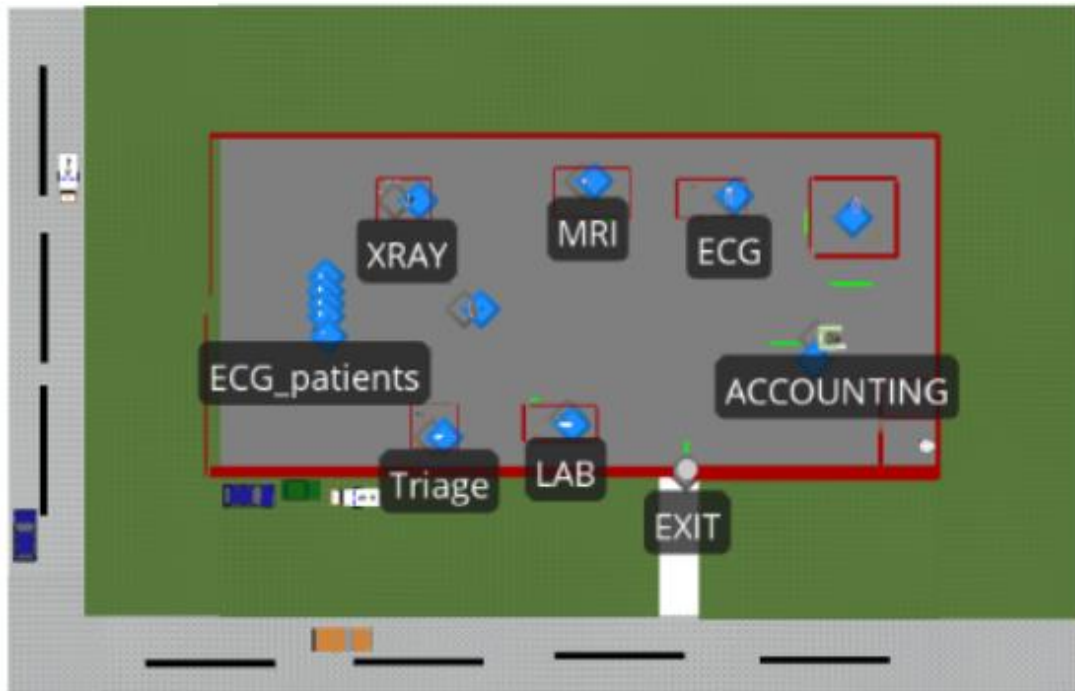
Service Distributions:

Office	Service (in minutes)	Initial Capacity
Registration	Random. Triangular(1,2,3)	1
Triage	Random. Triangular(3,5,7)	1
X-Ray	Random. Triangular(8,10,12)	1
MRI	Random. Triangular(14,18,22)	2
Treatment	Random. Triangular(7,10.5,14)	2
LAB	Random. Triangular(6,10,14)	4
ECG	Random. Triangular(20,25,30)	1
Accounting	Random. Triangular(2,5,8)	4

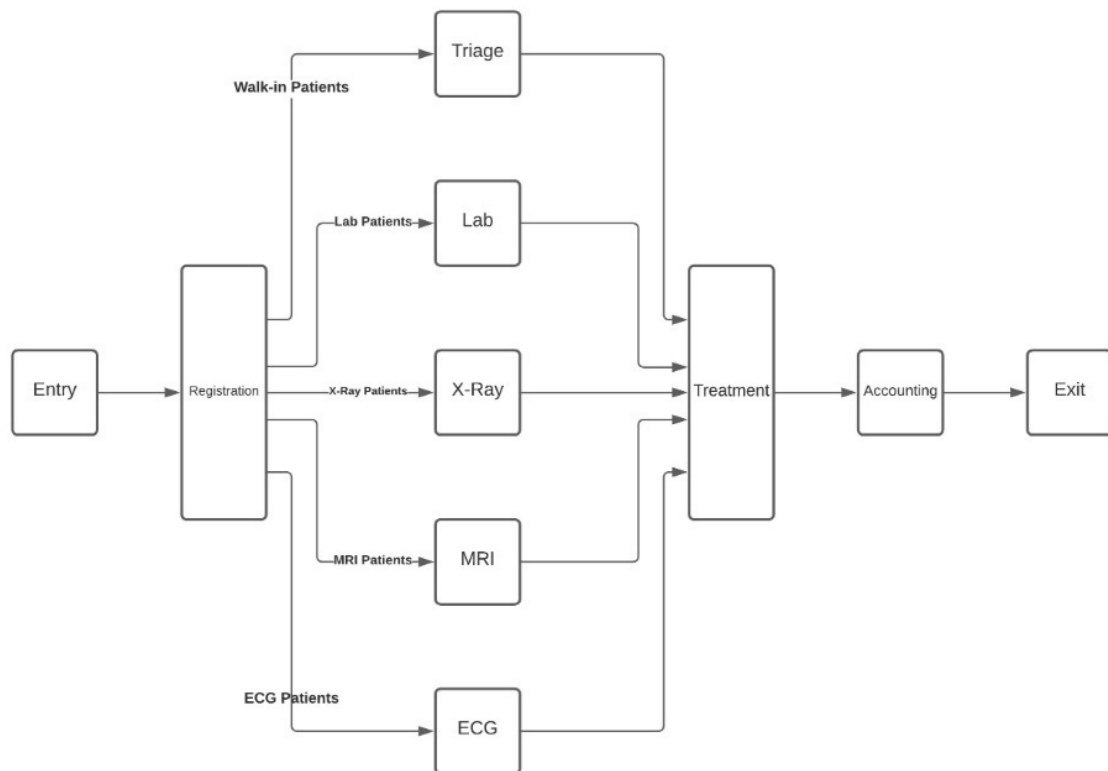
In the Proposed model, we have included various sectors in the hospital.

- **RECEPTION:** The registration counter where patients have to register their names to make an appointment with the doctor.
- **TREATMENT ROOM:** Here doctor looks for any further treatment that should be given to the patient.
- **TESTING LAB:** Here, various tests suggested to the patient are performed accordingly on the patient being diagnosed.
- **ACCOUNTING:** It is the area where the patient has to pay money for treatment, various tests, etc.
- **ECG ROOM:** It is the room where records the electrical signal from your heart to check for different heart conditions.
- **TRIAGE ROOM:** It is the room where minor health problems, illnesses, or wounds are treated.

PROJECT DIAGRAM



BLOCK DIAGRAM:



CONCLUSION:

As it is more intuitive to simulate a flow system with a clear layout and scope, we successfully made a simulation model for the patient flow, using the actual layout and resources such as nurses, physicians, allied health, lab/diagnostic machines, etc.

The development, execution, and analysis of all phases were performed using the real-time data acquired from the internet. Simio was extremely important and an excellent ally for the implementation of this work.