

Purpose

The purpose of this research is:

- To find the optimal/best potential location for new Hospital inside Kathmandu valley.
- To work in proven methodology to establish top list of potential sites for a new hospital.
- In Kathmandu Valley and identify a shortlist of sites.
- To evaluate the alternative for the best location.

Introduction

Selecting a location for a potential hospital often decides the success or the failure of such a facility. It is thus important to assess the locations from multiple dimensions before selecting the site. This document focuses on the multi factor evaluation of hospital sites using **Data Driven Analysis process (DDAP)** and evaluates three potential sites inside Kathmandu valley. This document is considered three major factors and eleven sub factors in the evaluation. Findings show that among the sub factors, cost of land, population density and proximity to public transport evolved as the three most significant sub factors.

While opening a Hospital can be a very lucrative business, a lack of demand causes many hospitals to close overtime. There are many different factors that can account for a Hospital's success such as location, competition, patient experiences, Doctor's rating and specialities, etc. These are some important questions that every investor must carefully answer before deciding whether to open a hospital or not.

Besides there are many other factors such as environmental, clinical, potential to grow, legal and regulatory etc.

To demonstrate the process of picking a location for a client opening a business, the project will focus on answering the following question: "If the client wanted to open a world class hospital inside Kathmandu Valley, what areas are the best options to open the Hospital?"

We will follow the data driven approach and perform various analytics on those data to answer the following questions.

1. General
2. Location wise babal thau ma xa?

- a. Does the highway network, locally and strategically, have the capacity to access and serve the hospital?
- b. Kathmandu ko sabai point bata xito pugna sakinx
- c. Existing Highway networks to connect to outside of KTM
- d. Traffic Congestion ko ni issue khasai xaina
- e. Public Transportation ko availability and
- f. Availability of developable land

Data

To answer this business problem, the following factors have to be extracted from various data sources:

- Population & Ethnic Distribution of Each Neighborhood (Nepal Census)
- Income Distribution of Each Neighborhood (Nepal Census)
- Number of Hospitals in Each Neighborhood (Google Map API)
- Air Quality Index (data from <https://pollution.gov.np/>) and Local Research

The Nepal Census data was extracted from Census of Nepal

Data Collection

To answer this business problem, the following factors have to be extracted from various data sources:

- Population & Ethnic Distribution of Each Neighborhood (Nepal Census)
- Income Distribution of Each Neighborhood (Nepal Census)
- Number of Hospitals in Each Neighborhood (Google Map API)
- Distance to the hospitals from prime areas (Google Directions API)
- Air Quality Index (data from <https://pollution.gov.np/>) and Local Research

Besides, we have collected the following data manually.

1. Major hospitals inside Kathmandu Valley and various data related to them

a. General

- i. Name of Hospital
- ii. Latitude
- iii. Longitude
- iv. Address
- v. Phone Number
- vi. Website
- vii. Key Highlights
- viii. Owner Name
- ix. Owner Background

b. Location and Space

- i. Built up Area
- ii. Open Space Area
- iii. Availability of Public Transportation
- iv. Easy access from all points of Valley
- v. Traffic Congestion
- vi. Less Air Pollution
- vii. Less Noise Pollution
- viii. Encouragement of Sustainable use of Resources
- ix. Enough Car/Bike Parking
- x. Can be Accesed from Multiple Directions
- xi. Cafeteria for Visitors
- xii. Waiting Room for Visitors
- xiii. Sufficient Waiting Area
- xiv. Distance from Thankot
- xv. Distance from Koteswor
- xvi. Distance from Sanga
- xvii. Distance from Airport

c. Infrastructure and equipments

- i. Number of Beds
- ii. Number of Hospital Rooms
- iii. Number of Operating Theatre
- iv. Number of Ambulances
- v. Number of Ventilators
- vi. Number of special care beds
- vii. Number of Private and VIP cabins

d. Staff Details

- i. Number of Doctors
- ii. Number of Nurses
- iii. Number of Assistants

e. Capacity Utilization

- i. Number of Out Patients
- ii. Number of In Patients
- iii. Number of recurring Patients

f. System and Process

- i. Easy Appointment Booking Over Internet
- ii. Mobile App
- iii. Public Noticeboard and Easy to Navigate Directions
- iv. International Relations Desk
- v. Enough Consulting Time with Doctors
- vi. Implementation of EMR
- vii. Telemedicine Facility for Remote patients
- viii. Food Catering services to patients
- ix. Laundry services to patients
- x. 24/7 in house specialists
- xi. Availability of treatment packages for IPD
- xii. Average Time Taken for Discharge

- xiii. Average Length of Stay
- xiv. Mortality rate
- xv. Patient Safety Guidelines and Goals
- xvi. Patient Family Education

g. Key specialists

- i. Doctor Name
- ii. Availability
- iii. Key Specialization

h. Clinical Departments

- i. Cancer Care
- ii. Cardiac Sciences
- iii. Diagnostic Medicine
- iv. Digestive Diseases
- v. Emergency Medicine & Pre Hospital Care
- vi. ENT-Head & Neck Surgery
- vii. Internal Medicine, Endocrinology & Wellness
- viii. Neurosciences
- ix. Peri Operative Medicine
- x. Physiotherapy & Rehabilitation
- xi. Renal Sciences
- xii. Rheumatology and Clinical immunology
- xiii. Clinical Nutrition and Dietetics
- xiv. Critical Care
- xv. Dentistry
- xvi. Dermatology
- xvii. General Surgery
- xviii. Gynecology and Obstetrics
- xix. Laboratory Medicine & Pathology

- xx. Neuro-psychiatry
- xxi. Ophthalmology
- xxii. Orthopedics and Joint Reconstruction
- xxiii. Paediatrics and Neonatology
- xxiv. Plastic Reconstructive and Cosmetic Surgery
- xxv. Pulmonology

i. Other Facilities

- i. Number of Pharmacies Inside Hospital
- ii. Number of Discounted Pharmacies
- iii. Number of Pharmacies within 200m radius
- iv. ATM machines within 200m radius
- v. Restaurants / Convenience Store Nearby

j. Franchise & Branches

- i. Franchise to 3rd party
- ii. Number of Branches/Franchies
- iii. Number of Checkup Clinics
- iv. Number of Official Branches

k. User Reviews

l. Miscellaneous

- i. Population Density-1KM Radius
- ii. Population Density-3KM Radius
- iii. Traffic data
- iv. Growing Population within 3KM Radius
- v. Space for Growth and Expansion
- vi. Helipad
- vii. Doctor on Call
- viii. Home care counselling

ix. AI and Future Ready Health

x. Sanitation and Cleanliness

m. Environmental impacts

i. pollution

ii. Harm to Historical and Cultural Assets

iii. Remarks

Most Significant Hospitals According to our Data

These are the top 10 hospitals computed by weighted system with data available.

SN	Name of Hospital	Latitude	Longitude	Address
1	Civil Service Hospital Of Nepal	27.6863031	85.3388038	Minbhawan Marg, Kathmandu 44600, Nepal
2	Himal hospital	27.710568	85.3284891	Thirbum Marg, Kathmandu 44600, Nepal
3	Kantipur Hospital	27.6855939	85.3447983	Shriganesh Marg, Kathmandu 44600, Nepal

SN	Name of Hospital	Latitude	Longitude	Address
4	KIST Medical College Teaching Hospital	27.6629355	85.33509900000001	KIST Hospital Road, Mahalaxmi 44700, Nepal
5	Kathmandu Model Hospital	27.702041	85.3201443	Red Cross Marg, Kathmandu 44600, Nepal
6	Nidan Hospital Ltd.	27.6789865	85.3158868	Lalitpur 44600, Nepal
7	Nobel Hospital	27.697937099999999	85.3481702	Sinamangal Rd, Kathmandu 44600, Nepal
8	भेनस अस्पताल	27.6972168	85.33765179999999	Devkota Sadak, Kathmandu 44600, Nepal
9	Norvic International Hospital	27.6899471	85.3192466	Thapathali, Kathmandu 44617, Nepal

SN	Name of Hospital	Latitude	Longitude	Address
10	Nepal-Bharat Maitri Hospital	27.711591	85.3456219	Dakshina Murti Marga, Kathmandu 44600, Nepal

Significant Hospital Details

Below are the manually inserted data for hospitals that determined the most significant hospitals available in kathmandu. These data were given some weights to be used in our weighted system. However, the collected data might not be utterly precised.

General

Name of Hospital	Civil Service Hospital Of Nepal
Latitude	27.6863031
Longitude	85.3388038
Address	Minbhawan Marg, Kathmandu 44600, Nepal
Phone Number	01-4107000
Website	http://www.civilservicehospital.org/

Location and Space

Open Space Area	20
Distance from Thankot	15.2 km

Distance from Koteswor	1.9 km
Distance from Sanga	18.3 km
Distance from Airport	3.2 km

General

Name of Hospital	Himal hospital
Latitude	27.710568
Longitude	85.3284891
Address	Thirbum Marg, Kathmandu 44600, Nepal
Phone Number	01-4536348
Website	http://himalhospital.com/

Location and Space

Distance from Thankot	15.1 km
Distance from Koteswor	5.9 km
Distance from Sanga	22.3 km
Distance from Airport	3.3 km

General

Name of Hospital	Kantipur Hospital
Latitude	27.6855939

Longitude	85.3447983
Address	Shriganesh Marg, Kathmandu 44600, Nepal
Phone Number	01-4111627
Website	http://kantipurhospital.com/

Location and Space

Distance from Thankot	16.1 km
Distance from Koteswor	1.2 km
Distance from Sanga	17.5 km
Distance from Airport	2.4 km

General

Name of Hospital	KIST Medical College Teaching Hospital
Latitude	27.6629355
Longitude	85.33509900000001
Address	KIST Hospital Road, Mahalaxmi 44700, Nepal
Phone Number	01-5201496
Website	http://www.kistmcth.edu.np/

Location and Space

Distance from Thankot	16.7 km
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Distance from Koteswor	2.8 km
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Distance from Sanga	19.2 km
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Distance from Airport	5.6 km
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General

Name of Hospital	Kathmandu Model Hospital
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Latitude	27.702041
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Longitude	85.3201443
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Address	Red Cross Marg, Kathmandu 44600, Nepal
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Phone Number	01-4240805
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Website	http://pfectnepal.org/
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Location and Space

Distance from Thankot	13.9 km
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Distance from Koteswor	4.9 km
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Distance from Sanga	21.2 km
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Distance from Airport	4.6 km
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General

Name of Hospital	Nidan Hospital Ltd.
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Latitude	27.6789865
Longitude	85.3158868
Address	Lalitpur 44600, Nepal
Phone Number	01-5431333
Website	http://www.nidanhospital.com/

Location and Space

Distance from Thankot	13.3 km
Distance from Koteswor	4.9 km
Distance from Sanga	21.2 km
Distance from Airport	7.2 km

General

Name of Hospital	Nobel Hospital
Latitude	27.697937099999999
Longitude	85.3481702
Address	Sinamangal Rd, Kathmandu 44600, Nepal
Phone Number	01-4110842
Website	http://www.nobelhospital.com

Location and Space

Distance from Thankot	18.1 km
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Distance from Koteswor	3.0 km
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Distance from Sanga	19.3 km
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Distance from Airport	1.7 km
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General

Name of Hospital	भेनस अस्पताल
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Latitude	27.6972168
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Longitude	85.33765179999999
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Address	Devkota Sadak, Kathmandu 44600, Nepal
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Phone Number	01-4475120
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Website	http://www.venushospital.com.np/
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Location and Space

Distance from Thankot	15.6 km
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Distance from Koteswor	3.1 km
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Distance from Sanga	19.5 km
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Distance from Airport	3.0 km
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General

Name of Hospital	Norvic International Hospital
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Latitude	27.6899471
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Longitude	85.3192466
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Address	Thapathali, Kathmandu 44617, Nepal
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Phone Number	01-5970032
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Website	http://www.norvichospital.com/
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Location and Space

Distance from Thankot	12.6 km
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Distance from Koteswor	4.5 km
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Distance from Sanga	20.8 km
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Distance from Airport	5.8 km
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General

Name of Hospital	Nepal-Bharat Maitri Hospital
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Latitude	27.711591
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Longitude	85.3456219
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Address	Dakshina Murti Marga, Kathmandu 44600, Nepal
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Phone Number	01-5241288
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Website	https://nbmh.com.np/
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Location and Space

Distance from Thankot	17.1 km
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Distance from Koteshtwor	5.4 km
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Distance from Sanga	22.2 km
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Distance from Airport	2.4 km
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Data Processing and Compilation

All the data has been fed to our proprietary Research software (developed by Ombryo Pte Ltd. Singapore) The software uses GPT-3 Algorithm from Open AI to extract useful information from the data and predict the best optimised location for the hospital. We have open sourced the entire dataset on the github (<https://github.com/ombryo/sdasda>)

Major Criteria and Criteria Weight

This is decided by Investors and key stakeholders themselves

Conclusion

Based on the extensive research and the preferences, the location that will be the ideal for building a new Hospital, is **Lokanthali Chowk (23N, 87E)**.

For this conclusion we have taken into consideration following factors:

The suggested location is

- i. sufficiently far away from major hospitals

Suggestion Location Summary

Location: Lokanthali Chowk (23N, 87E) .

Features:

This location satisfies the following criteria: