

# To Classify the Prediction of Ambience Conditions in Public versus Private Health Services using Data Mining

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**Abstract:** A public service providing medical care “federal health policies should ensure the provision of adequate Health Services” *Health Services* are the most visible functions of any *health* system, both to users and the general public. *Service* provision refers to the way inputs such as money, staff, equipment and drugs are combined to allow the delivery of *health* interventions. All *services* performed, provided, or arranged by the *Services* to promote, improve, conserve, or restore the mental or physical well-being of personnel. Health Services include all services dealing with the diagnosis and treatment of disease, or the promotion, maintenance and restoration of health. They include personal and non-personal Health Services. Improving access, coverage and quality of services depends on these key resources being available; on the ways services are organized and managed, and on incentives influencing providers and users. Health Services are defined as “an institution providing medical treatment and nursing for sick and Injured people, while ‘Health Services’ is defined by the Oxford dictionary as the “organized Provision of medical care to individuals or a community.” Health Services in itself describes a wide range of care, from dentistry to emergency care, to dermatology. From this it is inferred Health Services umbrellas ‘Health Services’ in that hospital Provide ‘Health Services,’ but ‘Health Services’ is not limited to a single institution caring for the ill. ‘Health Services’ consists of clinics, Health Services, purchasers of Health Services services, and pharmaceutical facilities, all of which can be public or private. Doctors—also referred to as physicians and medical practitioners—are Health Services professionals who promote, maintain, and restore health through studying, diagnosing, and treating illnesses, injuries, and other physical ailments. Doctors can specialize in certain disease types, patients, and/or types of treatment as specialist physicians/practitioners; or focus on broad and comprehensive care for individuals, families, and/or communities as general practitioners—also known as family doctors. Health Services sector of a country needs special attentions from the government as quality of Health Services provides hope and relief to the patients and their dependents. Private Health Services delivering better quality of services to their patients as compared to public Health Services.

## I. INTRODUCTION

Data Mining, *the extraction of hidden predictive information from large databases*, is a powerful new technology with great potential to help companies focus on the most important information in their data warehouses. Data mining tools predict future trends and behaviors, allowing businesses to make proactive, knowledge-driven decisions. The automated, prospective analyses offered by data mining move beyond the analyses of past events provided by retrospective tools typical of decision support systems. Data mining tools can answer business questions that traditionally were too time consuming to resolve. They scour databases for hidden patterns, finding predictive information that experts may miss because it lies outside their expectations.

### *Data, Information, and Knowledge:*

Data are any facts, numbers, or text that can be processed by a computer. Today, organizations are accumulating vast and growing amounts of data in different formats and different databases. This includes:

Operational or transactional data such as, sales, cost, inventory, payroll, and accounting

Nonoperational data, such as industry sales, forecast data, and macro economic data

Meta Data - data about the data itself, such as logical database design or data dictionary definitions

*Information*

The patterns, associations, or relationships among all this *data* can provide *information*. For example, analysis of retail point of sale transaction data can yield information on which products are selling and when.

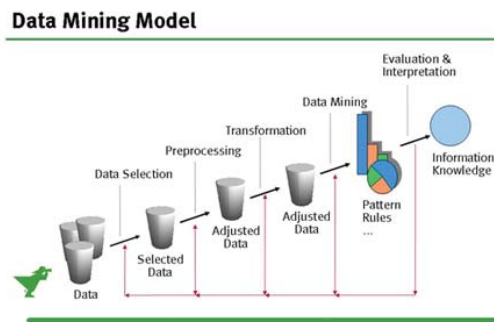
Information can be converted into *knowledge* about historical patterns and future trends. For example, summary information on retail supermarket sales can be analyzed in light of promotional efforts to provide knowledge of consumer buying behavior. Thus, a manufacturer or retailer could determine which items are most susceptible to promotional efforts.

#### *Knowledge Discovery Process*

The term Knowledge Discovery in Databases, or KDD for short, refers to the broad process of finding knowledge in data, and emphasizes the "high-level" application of particular data mining methods. It is of interest to researchers in machine learning, pattern recognition, databases, statistics, artificial intelligence, knowledge acquisition for expert systems, and data visualization.

The unifying goal of the KDD process is to extract knowledge from data in the context of large databases.

It does this by using data mining methods (algorithms) to extract (identify) what is deemed knowledge, according to the specifications of measures and thresholds, using a database along with any required preprocessing, sub sampling, and transformations of that database



## II. TECHNIQUES OF DATA MINING

There are several major *data mining techniques* have been developed and used in data mining projects recently including association, classification, clustering, prediction and sequential patterns.

### 1. Association

Association is one of the best known data mining technique. In association, a pattern is discovered based on a relationship of a particular item on other items in the same transaction. For example, the association technique is used in *market basket analysis* to identify what products that customers frequently purchase together. Based on this data businesses can have corresponding marketing campaign to sell more products to make more profit.

### 2. Classification

Classification is a classic data mining technique based on machine learning. Basically classification is used to classify each item in a set of data into one of predefined set of classes or groups. Classification method makes use of mathematical techniques such as decision trees, linear programming, neural network and statistics. In classification, we make the software that can learn how to classify the data items into groups. For example, we can apply classification in application that "given all past records of employees who left the company, predict which current employees are probably to leave in the future." In this case, we divide the employee's records into two groups that are "leave" and "stay". And then we can ask our data mining software to classify the employees into each group.

### 3. Clustering

Clustering is a data mining technique that makes meaningful or useful cluster of objects that have similar characteristic using automatic technique. Different from classification, clustering technique also defines the classes and put objects in them, while in classification objects are assigned into predefined classes. To make the concept clearer, we can take library as an example. In a library, books have a wide range of topics available. The

challenge is how to keep those books in a way that readers can take several books in a specific topic without hassle. By using clustering technique, we can keep books that have some kind of similarities in one cluster or one shelf and label it with a meaningful name. If readers want to grab books in a topic, he or she would only go to that shelf instead of looking the whole in the whole library.

#### 4. Prediction

The prediction as its name implied is one of a data mining techniques that discovers relationship between independent variables and relationship between dependent and independent variables. For instance, prediction analysis technique can be used in sale to predict profit for the future if we consider sale is an independent variable, profit could be a dependent variable. Then based on the historical sale and profit data, we can draw a fitted regression curve that is used for profit prediction.

#### 5. Sequential Patterns

Sequential patterns analysis is one of data mining technique that seeks to discover similar patterns in data transaction over a business period. The uncovered patterns are used for further business analysis to recognize relationships among data.

### III. LITERATURE SURVEY

A survey helps the researcher to build background on the survey problem. This type of research is required when the research problem is new or when the information available about the problem is limited.

A recent study found that high-priced hospitals performed worse than low-priced hospitals on measures of re-admissions and patient safety, such as postsurgical death rates and blood clots (White, Reschovsky, and Bond, 2014)

Bhat. R. (1997), "Regulation of the Private Health Sector in India", "Private Health Sector Growth in Asia – Issues and Implications", ed. by William C. Newbrander, Chichester:

John Wiley & Sons. Within the past decade health care leaders and advocates have acknowledged this issue, bringing to light the health care sector's environmental and social impacts, and the potential to bolster society, preserve the environment, and contribute to sustainable development (Hampton, 2012).

Additionally, RP may spur more providers to learn more about the cost of the health care services. Recent research has found that only about one-fifth of doctors correctly estimated the cost of an implantable device (Okike, et al. 2014).

Berman P. and Ahuja R. (2008), "Government Health Spending in India, Economic and Political Weekly, 46: 26–7.

Health' as defined by the WHO, is the "state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity" (EU, 2009).

Msiska et al (1997) identify several determinants of health care seeking behaviour in developing and developed countries, such as the type and severity of symptoms, the course of illness, sick role, perception regarding cause of illness.

In India, the service quality of health care is miserable and in general, the health outcome is far from satisfactory (Bajpai and Goyel, 2004).

Satisfaction is also described on the basis the value of products and services that customers or patients evaluate depending on customers' experience and perception (Liljinder and, Strandvik, 1995).

According to Shi and Singh (2005), from the perspective of patient satisfaction, quality has been explained by two ways – a) quality as an indicator of satisfaction that depends on individual's experiences about some attributes of medical service viz. comfort, dignity, privacy, security, degree of independence, decision making autonomy and attention to personal preferences and b) quality as an indicator of overall satisfaction of individuals with life as well as self-perceptions of health after some medical intervention (Shi & Singh, 2005).

Maitra, S. (1999), "Financing Urban Development: Flow of Funds from External Sources", National Workshop on Urban Agenda in the New Millennium, Organised by School of Planning, Centre for Environmental Planning and Technology and UNNATI, Oxfam (India) Trust. Ahmedabad, 1999 July 23-24.

#### IV. PROBLEM FORMULATION

This research problem relates to the extent of the Ambience Conditions of public and private Health Services and decision about whether doctors and patients should go to public or private Health Services.

- The problems faced by poor people in accessing public Health Services and their compulsion of using high cost private Health Services.
- The lack of clear criteria for ambience condition in both types of Health Services.
- Poor families avoid treatment to save loss of their subsistence wages. They survive on
- Over the Counter medicines available conveniently at cheaper cost.
- The absence of any clear reasons why some doctors and patients prefer public Health Services while others prefer private Health Services based on medical achievement.

#### V. OBJECTIVE

This study aims to identify the following aspects that are associated with public and private Health Services.

- The differences between public and private Health Services regarding doctors.
- To compare and contrast the differences in Health Services standards, Facilities and the problems faced by patients.
- To analyses People think that a private health service does have better doctors.
- To study expenditure patterns of Availing Services of Private Clinics during Minor Illness.
- To compare the quality of Health Services delivered by the public and private Health Services to gain patient satisfaction.
- To predict the reasons behind the government hospitals which are generally understaffed, unfurnished and underfinanced.
- Cluster analysis will be applied on the data to form the clusters.

#### VI. METHODOLOGY

The research methodology is the basic framework action plan adopted in carrying out the research. The primary goal is to examine the ambience conditions among doctors and patients in private and government Health Services...

Following will be the steps involved during the research:-

- Selection of a study sample from those involved with medical methods patients and doctors' environment in public and private Health Services...
- To analyse the reasons of intense sickness, residing in slums, living space, water supply and sanitation facilities.
- To study expenditure pattern importance to quality, timings, convenient location, distance while accessing services.
- To develop a questionnaire consisting of various questions/parameters.
- To interact with the doctors, patients & employees in acquiring their views based on questionnaire.
- To analyse the collected response by using various statically test & data mining techniques.

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