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A Real-Time Application for Crime Patterns Prediction Using Data Science

Ahmed Khalil Abbas*[1], & Raum Saadoon Mohamed[1]

[1]M.Sc. computer Sciences

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Abstract: In recent years data mining is data analyzing technique used to analyze crime data previously stored from various sources to find patterns and trends in crimes. In additional, it can be applied to increase efficiency in solving crimes faster and also can be applied to automatically notify the crimes. However, there are many data mining techniques. In order to increase efficiency of crime detection, it is necessary to select the data mining techniques suitably. This project reviews the literatures on various data mining applications, especially applications that applied to solve the crimes. Survey also throws light on research gaps and challenges of crime data mining. In additional to that, this project provides insight about the data mining for finding the patterns and trends in crime to be used appropriately and to be a help for beginners in the research of crime data mining.

Keywords: Crime Patterns, Data Science, Data Mining, Data Analyze, Solving Crimes.

INTRODUCTION

Crime prevention and detection become an important trend in crime and a very challenging to solve crimes. Several studies have discovered various techniques to solve crimes that are used in many applications. Such studies can help speed up the process of solving crime and help computerized systems detect criminals automatically. In addition, rapidly advancing technologies can help address such issues. However, crime patterns are always changing and growing. The crime data previously stored from various sources have a tendency to increase steadily. As a consequence, the management and analysis of huge data are very difficult and complex. To solve the problems previously mentioned, data mining techniques employ many learning algorithms to extract hidden knowledge from huge volume of data. Data mining is data analyzing techniques to find patterns and trends in crimes. It can help solve crimes more speedily and also can help alert the criminal detection automatically.

Data Mining, also popularly known as Knowledge Discovery in Databases (KDD), refers to the nontrivial extraction of implicit, previously unknown and potentially useful information from data in databases. While data mining and knowledge discovery in databases (or KDD) are frequently treated as synonyms, data mining is actually part of the knowledge discovery process. The following figure Fig 1 shows different phases of data mining.

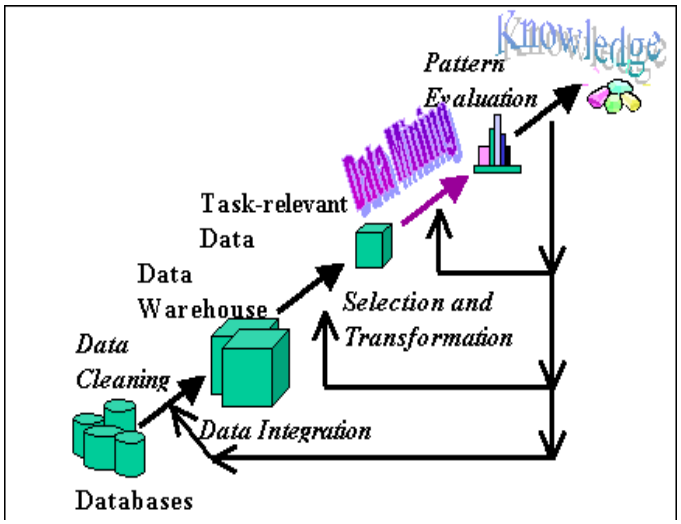


Fig 1. Phases of Data Mining

***Corresponding Author:** Ahmed Khalil Abbas

The Knowledge Discovery in Databases process comprises of a few steps leading from raw data collections to some form of new knowledge. The iterative process consists of the following steps:

- **Data cleaning**: also known as data cleansing, it is a phase in which noise data and irrelevant data are removed from the collection.
- **Data integration**: at this stage, multiple data sources, often heterogeneous, may becombined in a common source.
- **Data selection**: at this step, the data relevant to the analysis is decided on and retrieved from the data collection.
- **Data transformation**: also known as data consolidation, it is a phase in which the selected data is transformed into forms appropriate for the mining procedure.
- **Data mining**: it is the crucial step in which clever techniques are applied to extract patterns potentially useful.
- **Pattern evaluation**: in this step, strictly interesting patterns representing knowledge are identified based on given measures.
- **Knowledge representation**: this is the final phase in which the discovered knowledge is visually represented to the user. This essential step uses visualization techniques to help users understand and interpret the data mining results.

Existing System

No system to predict crimes and their patterns. We have many software and tools to maintain crime details, police station details, employee details, compliant details etc.

Web-based complaints management systems and child abuse complaints management systems are the existing systems, these online-based applications will permit the user to post complaints online but with no prediction of crime patterns, so that we can take precautionary measures to avoid crimes.

Limitations

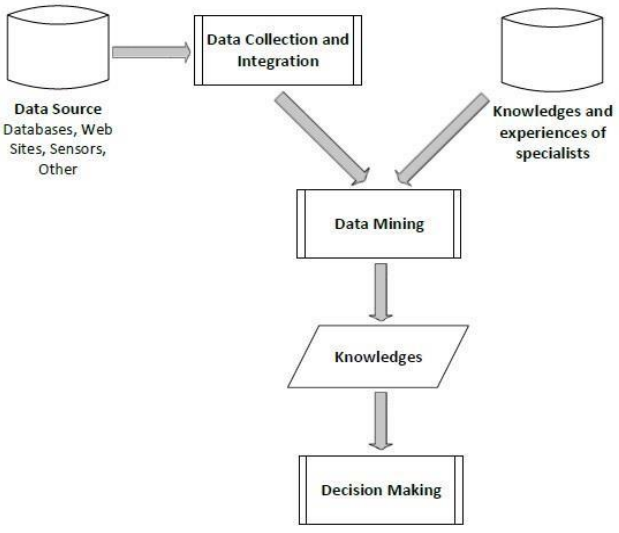
- Stores crime data and retrieves the same
- No extraction of useful information
- No extraction of crime patterns
- Lack of user satisfaction
- Less Efficient

Problem Statement

Determining crime patterns is a major challenge in today's world to reduce crimes and take precautionary measures to avoid crimes.

Proposed System

The proposed system is applicable in the field of crime. Proposed system includes modeling of crimes for finding suitable algorithms to detect the crime, precise detection, data preparation and transformation, and processing time. Proposed system identifies crime behavior, crime predicting, precise detection, and managing large volumes of data obtained from various sources. Proposed system is an automation for complaints registration, crime pattern prediction based on the previous crime details collected from various sources.



SCOPE AND OBJECTIVES

- Proposed system is a web enabled application.
- Proposed system is an innovative crime detection system.
- Proposed system major objective is to predict the crimes and their patterns.
- Proposed system makes use of data mining technique called as "*Association Rules*" for crime pattern discovery.
- Proposed system is an automation for early crimes pattern prediction which avoids crimes.
- Proposed system makes use of previous crime

***Corresponding Author:** Ahmed Khalil Abbas

details , date and location for the prediction of crime patterns.

- Proposed system is an real time application where complaints are registers and crime details.

Input and Output

- **Input** – Previous crime activities, Date and Location
- **Output** – Crime prediction and their patterns

System Requirements

- Frame work: DOTNET
- IDE: Visual Studio
- Front end: ASP.NET 4.0
- Programming Language: C#.NET
- Back End – MS SQL Server

Hardware Requirements

- RAM: 1GB+
- Processor: Pentium 4+
- Processor Speed: 2ghz+
- Hard Disk: 20GB+

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***Corresponding Author:** Ahmed Khalil Abbas