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Water Supply Chain Resource Management in Cities Using Data Mining Techniques

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ABSTRACT

This paper presents a comparative research study between a number of data mining techniques, knowledge discovery tools, data analysis and software packages to be used in a Decision Support System (DSS) for Smart water supply chain resources management. The case study deals with the evaluation and comparative research of water quality of city water supply within New Delhi city area. In the case of New-Delhi water supply alternative actions for improving of water supply and quality are defined for efficient supply in distributed area. The real time water quality monitor uses given standards by Water Quality Index (WQI) and Statistical analysis done on it suggests the shortest path between supply station and local area distribution Centre by used WEKA mining tool (decision tree) and OLAP. The results show that the city water isn't supplied efficiently in the city and not within the standard quality criteria of (WHO) standards and Indian standards. Leanings and research challenges observed during this comparative study have also been enumerated.

KEYWORDS

Data Mining, Smart Water Supply Chain Automation, Statistical Analysis, Water resources management, WEKA, WQI (Water Quality Index)

INTRODUCTION

Data mining is a process to structured data, finding interconnections among large amount historical-data, or discovering new information in terms of patterns or rules from huge amount of raw and unstructured data. It is involving various disciplines of fields such as: Statistics, ML, AI, IT, DT, High-Performance Computing, and Visualization methods. Data mining techniques are used to implement different structure, operation, rules and patterns in form of association rules, decision tree, sequential patterns, classification trees, etc. It is gone before by information planning before it can be yield valuable data. The principal objective of information mining comprises in separating concealed data from an informational index. The extricated data is valuable for dynamic. Right now,

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a few famous information mining devices are effectively applied to discover prescient data for various applications. The result of data mining may be reported in a variety of formats, such as listing, graphic outputs, summary tables and visualizations.

Water is a fundamental human need sufficient for the wellbeing and prosperity of people. The accessibility and arrangement of a particular measure of consumable water is a fundamental requirement for all people who are living in various territories of arranged and impromptu settlements. In the research region so as to fill this hole in the interest and gracefully of water, individuals look towards the elective hotspots for meeting out their water request like burrowing their own tube-wells and bore wells inside their premises. The investigation zone has confronting troubles in dealing with its water assets and because of persevering deficits underway of consumable water gracefully to the families which makes them subject to groundwater for drinking reason. Such water corrupted circumstance requires the current examination to assess groundwater quality for turning out to be appropriate water the executives plan in focal and southeast regions.

Data mining is an interactive, semi-automated process which is begins with unstructured and raw data. Results of the data mining process may be insights, rules, or predictive models. Figure 1 illustrates the process as a multi-step, iterative process. First step is presenting the parameters of water quality, second step is responsible to receive and collect the data from the stations, third step is choices the suitable mining tool and forth step is shows the suitable decision of water quality.

Figure 1. Phases of data mining process