



Soil Testing Reports Extracted Using Combined Mining Patterns

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Abstract: We propose a SOA sharing of agriculture related information to the farmer in their known language. In that SOA, the information is retrieved from concern data base by using combined mining rules. SOA involves complex data sources, for instance multiple distributed and heterogeneous data sources with mixed structures. In these situations we use combined mining for discovered knowledge to present a full picture of the Database rather than single data source. The general approach of combined mining for discovering informative knowledge in complex data has been introduced. We collect different data sets in different data formats like textual data's, audio data video data's, then we find resultant pattern for combined data sets, those pattern is very useful to form a combined association rule followed by a given threshold value. At last users will get exact knowledge, In this combined mining the results are visualized very informative So farmers can get extract knowledge is very informative and understandable manner

Keywords: Combined Mining, SOA, heterogeneous Data's, and Pattern.

I. INTRODUCTION

In agriculture soil test is important to determine the nutrient, contaminants and other characteristics such as acidity and PH level of soil [6]. If you tested the soil we can know about fertility and expected growth potential of soil. The test is used to mimic the function of roots to assimilate minerals. A reference map should be created to record the location and quantity of field samples in order to properly interpret test results. Soil testing is often performed by commercial labs that offer a variety of tests, targeting groups of compounds and minerals. There may be some advantage to using a local lab that is familiar with the chemistry of the soil in the area where the sample was taken. This enables technicians to recommend the tests most likely to reveal useful information.

Laboratory tests often check for plant nutrients in 3 categories [2]:

- Major nutrients: nitrogen (N), phosphorus (P), and potassium (K)
- Secondary nutrients: sulphur, calcium, magnesium
- Minor nutrients: iron, manganese, copper, zinc, boron, molybdenum, chlorine

The frameworks are extracted from relevant business projects conducted. The proposed frameworks are flexible and customizable for handling a large amount of complex data involving multiple features, sources, and methods as needed, for which data sampling and table joining may not be acceptable. Thus the identified combined patterns are more informative and actionable than any single patterns identified in the traditional way.

A. Combined Mining:

Combined Mining is the general approach to mine informative patterns by combining the components from

either multiple data sets or multiple features or by multiple methods. Hence the frame work of multistage combined mining has been summarized, which results in the novel types of combined patterns. Large enterprise data mining applications often involves complex data, In such cases, a single method or one step mining is often limited in discovering the informative knowledge we use combined mining for discovered knowledge to present a full picture of the Database rather than single data source.

B. Advantages of combined mining:

To improve the timeliness and quality of inputs to the decision process, the end users can utilize the Business Intelligence tools to gain a better understanding [1]. The work stops at pattern discovery and not considered to soil testing results

C. Introduction about Soil Testing:

Soil may be defined as the naturally deposited material that covers the Earth's surface and is capable of supporting plant growth and development [3].

a. Process for Soil Testing:

Now a days we are move to any soil testing process means we have to wait some times as well as we follow some certain procedure, in a soil test lab follows the following procedures. In the first step in soil testing process, The samples are collected from peoples, then allot unique lab number, this number is locked with this sample permanently, In the second step, the collected soil samples are dried and ground, the dried is pulverized in a hammer mill grinder until the sample is a flour like consistency, In the next step, the pulverized sample is carried through an extraction process [5]. Then we move to filters all of the soil out of the sample leaving only a clear liquid with the extracted element for testing. The soil testing is continually

doing based on soil characteristics, at last we prepare reports. So this kind of soil testing takes so much time , In this SOA we going to collect all samples from different area the their characteristic will store in data base , so farmers and peoples easily collect these soil characteristic details .

b. Mobile soil Testing Lab:

The following diagram is the part of the mobile soil testing laboratory in Newzland[7].



Figure 1: Mobile soil testing lab

II. ISSUES OF TRADITIONAL DATA MINING

Existing efforts related to mainly focus on developing more effective interestingness metrics, converting and summarizing learned rules through post analysis and post mining and the combination of multiple relevant techniques .The main efforts developing interestingness metrics focus on objective technical interestingness metrics. They aim to capture the complexities of pattern structure and statistical significance .In traditional data mining the pattern discovery mainly focused technical significant and not considered visualize results efforts [9] . There are often many patterns mined but they are not informative and transparent to farmers.

These Traditional algorithms are delivered, but they are not executable and operable in the business system .No effective tools are provided to convert models to executables that can be integrated into the soil samples testing results Often algorithms are delivered, but they are not executable and operable in the business system. No effective tools are provided to convert models to executables that can be integrated into production systems.

Table 1: Traditional Data Mining

Customer_Id	Soil Samples	Results
1	s1	a1,a5
2	s2	a1,a2,a6,a3
3	s3	a4,a7,a9

Table 2: Traditional association mining

Rules	Support	Confidence
s1	3/5	4/5
s2	4/5	1/5
s3	2/5	4/5

III. DATA EXTRACTION

Data Extraction is the process of retrieving data from the data sources for data processing or data storage, In rule generation is combined association rule mining , the frequent item sets are discover among item set groups to improve efficiency.

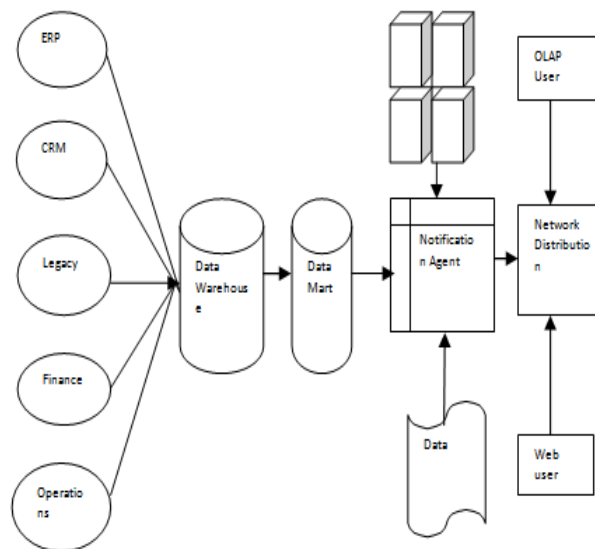


Figure 2: Diagram for Extraction of Data

A. Association rule mining:

A widely used data mining technique, in that rule expressed the frequency of relationships or associations between entities, support and confidence are the two major indices.

In traditional association rule mining can only generate simple rule, these simple rules are not useful, understandable so we produce associations in an effective way and in order to discover actionable knowledge from resultant association rules the combined pattern overcome this features [8]. By introducing the intelligence in combined mining, encouraging patterns can be discovered. The challenging problems are summarized and proposed effective pattern merging using Domain Intelligence and Business Intelligence avoided converting the models to executable.

IV. CREATING TARGET DATA SET

Formulation of the problem as a classification problem was performed at this stage. The sources of data were:

- Collecting Soil Samples
- To request the soil Testing characteristics
- To collect the details about Fertilizer requirements of particular soil testing.
- The soil testing results are generated in a visualize format.

The role of domain and business knowledge in this stage concerned the structure of the available information and the semantic value of it, so this knowledge was offered mostly by the data processing department, in particular employees involved in data entry for the information systems involved [4].

V. COMBINED PATTERN SET

In this combined mining is one of the general methods of analyzing complex data for identifying complex knowledge [10]. The actual data mining task is the automatic or semi-automatic analysis of large quantities of data to extract previously unknown interesting patterns such as groups of data records. For example we take Data Set D, Feature Set F, Method Set M, Interestingness Set I, Impact Set T, Based on the above variables a general pattern (combined pattern) discovery process can be described as follows

$P_n, m, l; Ri(F_k) Iml,$

Where $n = 1 \dots N$, $m = 1 \dots M$, $l = 1 \dots L$

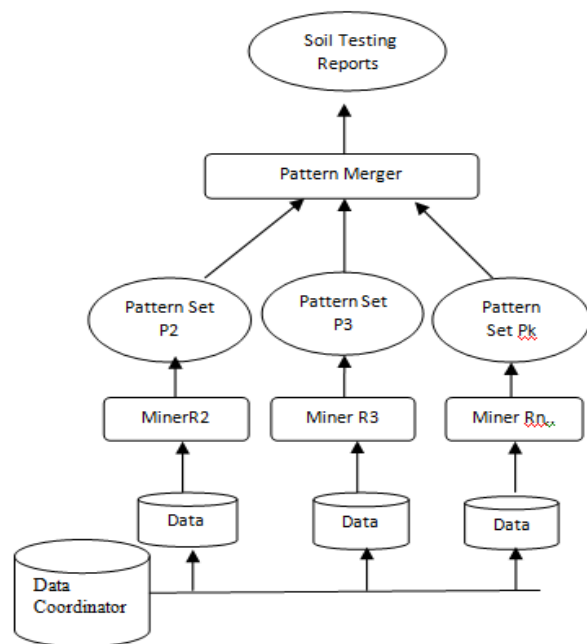


Figure 3: Process Flow for Soil Testing Report

A. Algorithm for Multisource Combined mining:

INPUT: Target data sets $D_k (1, \dots, k)$

OUTPUT: Combined Patterns (P)

Step-1: Identify a suitable data set for initial mining exploration. E.g. D1

Step-2: Partition the whole source data into K data sets.

Step-3: Extract atomic patterns on data set (P_k)

Step-4: pattern Merger: Merge the atomic patterns into combined pattern set (p)

FOR $k=1$ to k design the pattern merger functions (g) to merge all relevant atomic

Patterns are involving *domain intelligence* and *business intelligence*. Employ the method on the pattern set Generate combined patterns

ENDFOR

Step-5: Enhance pattern action ability to generate deliverables

Step-6: Output the deliverables (P)

By applying the above algorithm in various soil samples we identified the following results

Table 3: Combined association mining

Rules	Support	Confidence
$M^{\wedge}s1$	3/5	4/5
$M^{\wedge}s2$	4/5	1/5

$M^{\wedge}s3$	2/5	4/5
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VI. CONCLUSION

Combined mining approach for discovering knowledge in very informative manner, the proposal framework in SOA is flexible and customizable for handling large amount of complex data involving soil testing results and fertilizer details and that information is passing to farmers in graphical format. Under going research work is going to develop a Service oriented Architecture for soil testing and the soil testing results provided by farmers in user friendly manner, the web has vast amount of information available to search for everyone. For giving effective results is given through combined mining. So this combined pattern mining given multiple features and sources. This mining approach is giving combined patterns, those patterns more informative and actionable than any single patterns identified in the traditional mining.

VII. REFERENCES

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