

Business Intelligence Tool for Industrial Meter's Data

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Abstract — Business intelligence tools (BIT) are a type of application software designed to retrieve, analyze and report data. The tools generally read data that have been previously stored, often, though not necessarily, in a data warehouse or data mart. We are developing BIT for Industrial Meter Data as per the need of MSEB. The BIT is needed for generating daily, weekly or monthly reporting of the data in order to make analysis on that data. It helps Industries to look over their sales, purchase and many other industry related aspects.

The MSEB needs this tool to generate reports of Industrial meter data on daily, weekly and monthly basis so that they can analyze that data to see how much power is consumed, is there any power cut down, is there any power failure, etc. There are different Meter Vendors like L&T, ABB, and Secure. Industries can purchase different meters from different vendors. All these vendors provides their own meter reading software like L&T provide VinCom, ABB provides Smart2000, etc. The data from this meter is read by an instrument called Meter Reading Instrument (MRI). Data collected from MRI is processed further by applying different complex formula to generate reports. The problem the client currently facing is that the different meter vendors are providing their own different software for reading data from MRI and processing that data further. So there is no universal software that can handle all meters data fetched through MRI. And here the need of our tool comes into existence.

We are planning to develop uniform software which will facilitate data from all different Meter Vendors. So there will be less infrastructure consumption, less financial consumption.

Index Terms — BIT(Business Intelligence Tool), MRI (Meter Reading Instrument), BCS (Base Computer Software), TOD (Time Of Day), L&T(Larsen And Turbo)

I. INTRODUCTION

Nowadays, information overload hinders the discovery of business intelligence on the World Wide Web. Existing business intelligence tools suffer from a lack of analysis and visualization capabilities and traditional result list display by search engines often overwhelms business analysts with irrelevant information. Thus, developing tools that enable better analysis while reduce information overload has been a challenge. The literature show that hierarchical and map displays enable effective access and browsing of information. However, they have not been widely applied to discover business intelligence on the Web. Our business intelligence explorer contributes to alleviate information overload in business analysis.

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II. LITERATURE SURVEY

MSEB is currently purchasing meters from vendors like L&T, ABB and Secure. The meter reading software that these vendors are providing are VinCom, Smart200 respectively. The industry can have meters from various vendors. So in order to compute meter reports for industries the client (i.e. MSEB) has to purchase all these software. Due to this overhead of purchasing all software it increases the infrastructure cost, maintenance cost and financial cost. Moreover the meter reading software currently present are slower in computation and there is no centralize solution.

The present system is semi-automated system, requires more storage space, updates of software are not present. Different soft wares from different vendors needs separate storage for their files. The files generated by these meters are of format: Meter_number extension. For example: The L&T provides VinCom software and the files generated by this software have the extension .vin. The software that ABB provides is Smart2000 and files of that software come with extension. [3]

To overcome the drawbacks of existing system, we planned to design system software which will provide parallel attention and uniqueness to the data from all different meters of various meter vendors. The data from various electrical meters is collected in Meter Reading Instrument (MRI). MRI is connected to optical port of electric meters. It has the capacity of storing up to 12GB data. The MRI outputs data in the form of instantaneous values which holds values like current and voltage supplied, load survey data, instantaneous power, etc. Based on these values power factor is calculated by using various complex calculations. This power factor is one of the major components for generating reports.

The software that we are implementing will extract these values from MRI. The values are extracted by connecting the MRI to COM port and the connector to be used is RS-232. After getting the values from MRI the software will first validate the values, whether all values are correct or not, whether all expected values are collected or not, etc. After that parsing mechanism will be applied on those values. Then analysis is done and finally reports are generated. The reports which are to be generated are of the form of graphs, charts, phasor diagrams, etc. The graphs are generated by considering two factors, the current and time. Y-axis holds the instantaneous

values of current and X-axis holds time. The styles of representing graph are bar representation, align representation and grid representation.

The software is expected to hold previous 60days data of electrical meters. Depending on the power consumption factor different timing zones are decided. The zones are as follows:

A - 10 p.m. to 6 a.m. (Conventional usage)

B - 6 a.m. to 9 a.m. (Normal usage)

C - 9 a.m. to 12 noon (Maximum usage)

D - 6 p.m. to 10 p.m. (Peak hours)

E - 12 p.m. to 6 p.m. (Normal usage)

Even though base computer software are available, the lacking features and inefficient working ability providing a provision to propose a system which will fulfill different requirements of client i.e.

- Establishing the connections for acquiring meter's data in most appropriate manner.
- Provision for faster accessibility.
- Reduction in time consumption.
- Analyzing and estimating various statistical scopes for given input which in turn helps in computing different parameters related to meter's readings.
- To build compatible, most precise and efficient framework for serving many purpose in single system.

III. PROPOSED METHOD

"Business Intelligent Tool for industrial meters" is window-based application software intended to use with electronic industrial meter (Trivector-Meter), which helps in downloading data from Industrial meters and display the data in report and graphical format. It is Application software intended for use with Electronic Trivector-Meter (TVM). This software is menu driven and self-explanatory.

It supports convenient collection of energy data either from Electronic Trivector-Meter or from MRI. It also supports data collection from remote meters and also provides a secured option for setting configuration parameters in Electronic Meter. Energy data collected from MRI is classified in different categories such as Instantaneous Values, Cumulative Energies, Reset Back-ups, Load Survey data and Tamper records.

Billing data presentation in Spread-sheet format makes it easy to analyze the data as meter has a large amount of data, not practical to read using display, better to read electronically. Load Survey data can be conveniently presented either in spread-sheet view or in a Graphical view. Also provision is given for export of data to Excel or ASCII files.

IV. RESULTS

Gives logical view of all the meter reading data according to various parameters like: Instantaneous parameter, Current energy & bill energy data, Time of day energy register data, abnormal electrical condition data. Organized storage of meter reading data and consumer data.

- Exporting the meter data in the industry standard common formats (like ASCII, CSV) so data can be used by other software for billing or otherwise.
- Load survey information is displayed graphically whereby user has an option to see multiple parameters on the same graph or on a separate view.
- All the information displayed on the screen can be printed and permanent record can be maintained.

Customer can choose what is to be printed. Selection on category such as Energy, Survey, Transaction, etc. or on subcategory such as Main energy, Bill energy, TOD energy, history of energy registers etc.

V. CONCLUSIONS

This paper deals with the implementation of "Business Intelligence Tool for industrial meter data" is basically designed for identifying requirements suggested by MSEB and implementing system that will fulfil those requirements. The project will implement the autonomous system that will be working as an add-on module to TDMS and helping in generating the various forms of analytical surveying and reporting for industrial meters. Thus purpose of project is extracting the electrical meter files from instrument called as MRI, and processing on retrieved data is in electrical format and needs manipulation. After it, system will use business intelligence tool for generating different representations of analysis (i.e. graphs, bar etc.). Analysis done will make the MSEB to issues various policies and schemes for their customers.

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