

GEOSPATIAL MAP ANALYTICS IN MAINFRAME

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Abstract— The word geospatial is used to indicate the data that has a geographic component to it. This means that the records in a data-set have locational information tied to them such as geographic data in the form of coordinates and city. This system can open up a lot of opportunities in analytic and geospatial intelligence. Locations can be added and mapped on the screen based on the coordinates and as a future scope maps subsystem can be build up in mainframes for analytics and data mapping on geographical space. Geo-spacial Map Analytic System can be implemented in mainframes using Basic Mapping Support and COBOL-CICS application programming. The concept of geospatial map analytic system is a revolutionary innovation and has been implemented by various industries to provide better services and interactive interface to the customer.

Keywords— BMS, Coordinate system, Cursor, Dynamic attributes, World map, Map analytics, Geospatial, Drill-down approach.

I. INTRODUCTION

Mainframe usually refers to one or more very big computer(s) capable of supporting a large number of simultaneous users and doing bulk calculations and data processing. It is usually used for extensive operations like Enterprise Resource Planning or transaction processing. The Mainframe environment is expensive and ensures very high level of security and reliability supporting massive throughput. Mainframe, being one of the oldest technologies being used, is seen as one which can serve only as a back-end to applications. An unappealing user interface is by far the most apt reason for this. A lot of applications are being developed as an attempt to improve the user interface in mainframes. By exploiting mainframe features like availability, security, peak performance, energy efficiency, virtualization, recovery, data consolidation and data storage and by extending the traditional strengths of DB2 and CICS, we have implemented geospatial analytic system in mainframe [3]. Since mainframe is known for its huge data processing, the application of geospatial analytics in mainframe helps us to utilize the data in mainframe effectively and efficiently for analytics purpose.

II. IMPLEMENTATION

In mainframe, the main concepts used for implementing geospatial analytics are CICS, BMS, cursor positioning, XCTL, DB2 and dynamic graph. For this, using BMS, the co-ordinates in world map are re-mapped to the different points in CICS map and hence the world map is created. Also in order to implement the drill down approach, the continent wise / region wise maps are also prepared in a similar manner. The data present in the data base will be mapped according to the continent / region / place depending on the level to which the drill down should happen.

Cursor positioning [6] in mainframes is implemented for the drill down approach in the world map [7]. Thus by clicking on a particular country / region, the detailed map of the selected place is shown. The following equation is used for implementing cursor positioning.

$$\text{Range} = (\text{No of rows} - 1) * 80 + (\text{no of columns} - 1)$$

Cursor positing is again implemented for displaying the graph based on the analysis in the next screen. Thus a dynamic graph will be plotted based on the algorithm that we have defined for the analysis. For different regions, different graphs will be plotted depending on the data in the tables corresponding to each region based on the algorithm for analytics.

III. RESULTS

The implementation of geospatial map analytics in mainframe will help us to exploit the huge data that is present in mainframe for analytic purpose especially for predictive analysis and for studying the trends based on location for various domains. We have implemented the concept as explained below:

The world map will help to identify the places where the business is in operation. Thus an overall idea about the region of operation can be obtained from the World Map created in mainframes linked with the data from DB2 (Figure 1).

We have also implemented drill down approach which gives region based details. Thus by selecting a particular continent/ country in the world map, a detailed map of the continent / country is shown (Figure 2).

From the detailed view, it is possible to get a graphical representation of the analysis that we have implemented in the algorithm of the program which varies from domain to domain and basically depends

on the requirement of the domain (Figure 3).

CONCLUSION

Thus by implementing geospatial analytics in mainframe, the domains using mainframe can have a region based predictive analysis or trend analysis for the data they have in mainframe. The different applications in various domains include:

- Retail : For deciding on how to adjust the inventory, merchandising and pricing based on location for meeting volume and revenue targets.

- Banking: For categorizing the various types of customers and thereby deciding on the most effective incentives that can attract them
- Telecom: For analyzing and understanding the customers who can switch to competing carrier or for understanding latest trends in industry / market that can attract new customers [5]

to mention a few.

Mainframes is mostly used for the back-end processes because of its sustainability, reliability and acceptability. Adding a user -interactive feature to such a reliable system will enhance the overall performance of the system.

FIGURES

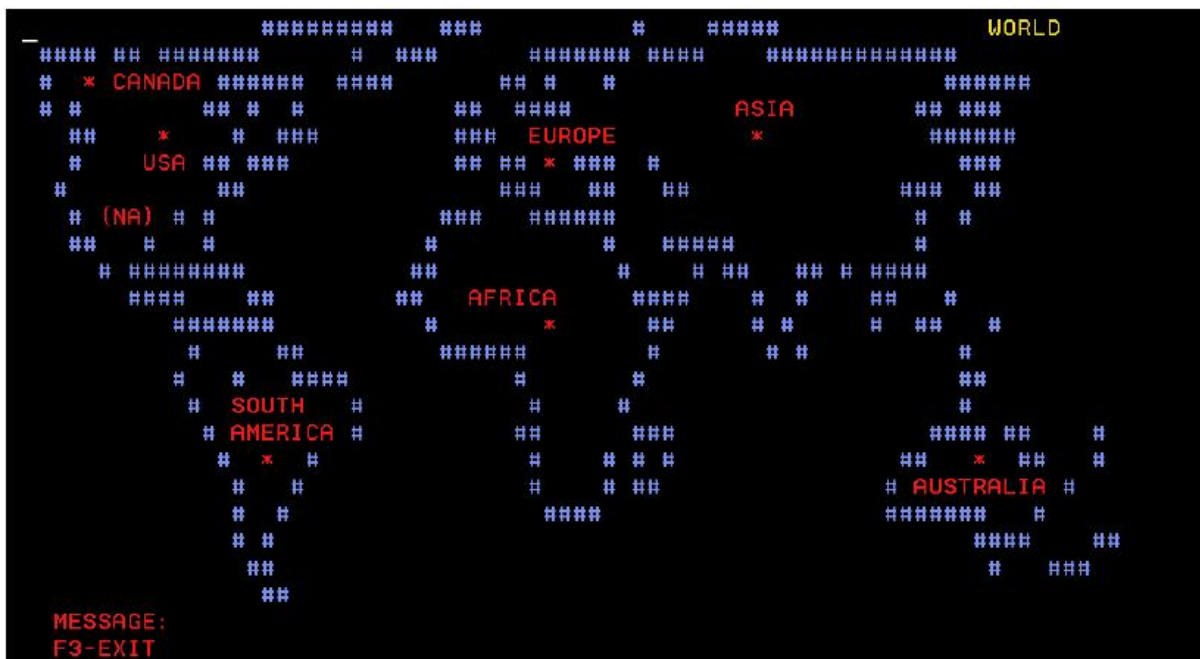


Figure 1: World map in mainframe



Figure 2: Drill down view

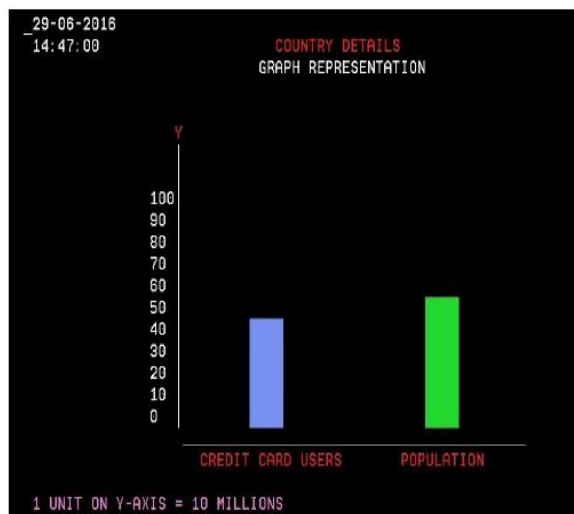


Figure 3 : Region wise graphical analysis

REFERENCES

- [1] Mohit Pabari, Vamsi Manchi, Swathi Meera, Richa Kaushal, Iguduru Manasa, Swati Kumari, *Interactive GUI in CICS mainframes*.
- [2] Hariraghavan S K , Poornima G , Suggula Anup, Chakravarthi , Krupal Mistry , Sneha K, *Implementation of dashboard in mainframes for business analysis*.
- [3] <http://www.esri.com/library/brochures/pdfs/mainframeadvantage.pdf>
- [4] CICS transaction server for z/OS, Version 4.2 – IBM.
- [5] Taruna Yadav, Soumya Nayak, Sneha Mahajan, Anuja Munjewar, Kunal Jain, *User friendly Help and Error map in CICS Mainframes*
- [6] Data Modelling Based on Usage Analytics in Mainframe CICS Applications, *IJRDE, Vol.1: Issue.2, October-November 2012pp-37-45*.
- [7] Live tiles in mainframe, AIRCC, vol 5, Number 9, April 2015; <http://airccse.org/V5N40.html>
- [8] Mike Ebbers , John Kettner , Wayne O'Brien , Bill Ogden, *Introduction to new mainframes : z/OS*.
- [9] Roul Mendes, Doug Lowe. *Murach's CICS for COBOL Programmers*.
- [10] IBM Mainframe Handbook by Alexis Leon.
- [11] Introduction to the new mainframe: Z/OS Basics – An IBM redbooks publication.
- [12] Designing and programming CICS application.

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