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A Proficient scheme for Backup and Restore Data in Android for Mobile Devices

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Abstract: ***Today are smart phones world. Phones are not just for contact to people but it plays vital role in the life. Now smart phones having PC-like functionality, wi-fi communication, camera, videos and all important data are present in it. yet hardware resources such as CPU's, memory and batteries are still limited. While many solutions for making backups and restoring data are known for servers and desktops, mobile devices pose several challenges, mainly due to the plethora of devices, vendors, operating systems and versions available in the mobile market. Thus there is a need of an efficient backup and restore technique to protect valuable data from loss, failure and theft. This Paper addresses this problem. In this work an efficient and secure technique of backup and restores data in Android Smartphone is presented which employs the use of efficient RLE compression technique. The compression of data helps to save time, space to store and further improves performance of the device by conserving the battery.***

I. INTRODUCTION

In the advancing world of technology and the recent explosion of mobile computing devices has resulted in a marked increase in the distribution of information. In our life Smart phones and tablet PCs are making big change. The most popular operating systems for smart devices are Apple's iOS and Google's Android. With the move internet scenario and day-to-day useful applications the amount of data that is exchanged and/or accessed through these smart phones has tremendously increased. Due to limited storage resources and certain security concerns such as lost devices has created the need to backup important data from these smart phones. This thesis work caters to this problem and presents and efficient shared backup and restore model for android device. As hardware resources such as CPU's, memory and batteries are limited in smart phone. So this work also addresses implementation of the compression module which is basically used while backup and decompressed while restore the data. Type of compression decides on the nature of the data like text, data bases, binary programs, sound, image and video. There're two major categories for methods to compress data: lossless and lossy methods.

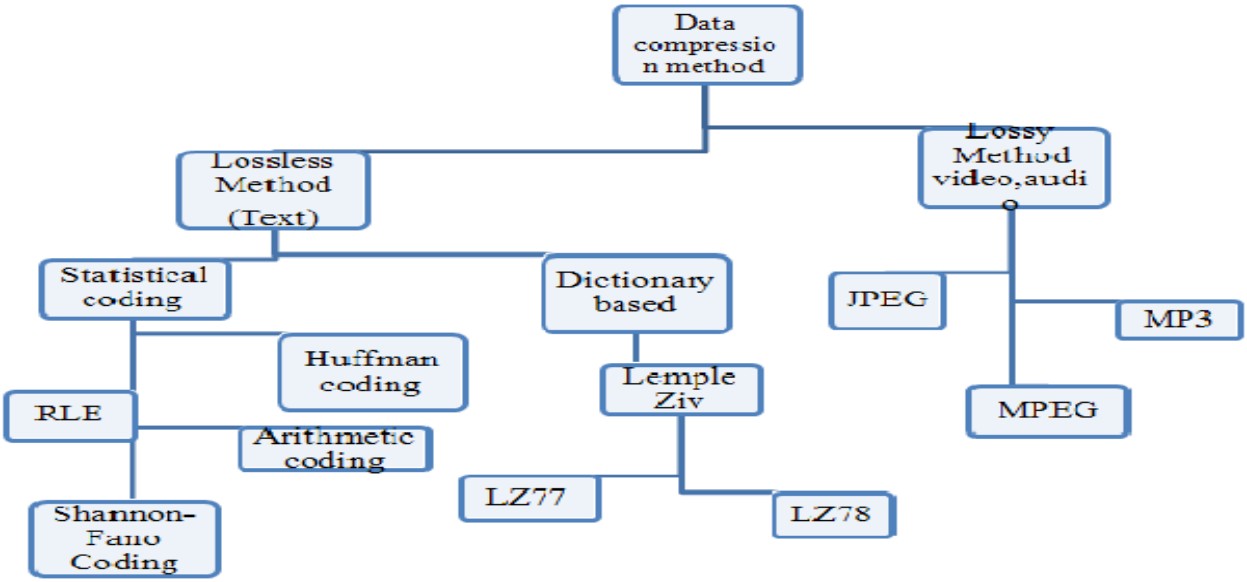

Fig 1. Data Compression techniques

II. LITERATURE SURVEY

Ildar Muslukhov the University of British Columbia dept of Electrical & Computer Engineering, "Survey: Data Protection in Smart phones Against Physical Threats" (2012) present a problem of data protection against physical threats and users' requirements to data protection systems.

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Vittorio Ottaviani, Alessandro Lentini, Antonio Grillo, Silvia Di Cesare and Giuseppe F. Italiano, " Shared Backup & Restore Save, recover and share personal information into closed groups of smart phones" 2011 IEEE has introduced a new backup and restore approach for mobile devices Google Android and Symbian S60, that allows users to share part of their personal data with a selected set of contacts.

Senthil Shanmugasundaram," A comparative study of text compression algorithms" International Journal of Wisdom Based Computing, Vol. 1 (3), December 2011 has provides Experimental results and comparisons of the lossless compression algorithms using Statistical compression techniques and Dictionary based compression techniques were performed on text data.

III. PROBLEM IDENTIFICATION

- Hardware resources such as CPU's, memory and batteries are limited in smart phone.
- Mobile devices pose several challenges while backup and restore from old devices to new ones, mainly due to the **plethora of devices, vendors, operating systems** and **versions** available in the mobile market.
- Making backups on external memory devices, such as on **Secure Digital (SD)** cards or on laptop disks, suffers from the same risks of failure or loss.
- As smart phones tend to be always connected to the Internet, so use backup and restore services based on the **cloud computing paradigm** but cost of cloud services depends on usage of it.
- Android **needs third party application** for data backup and restore. No of application are available but maximum are paid or free for trail versions.

- **The problem occurs during backup using compression.**

1) LZW: its simple but use dictionary. It replaces strings of characters with single characters.

2) FLC: it deals with 4 bits instead of 8 bits in ASCII for each character. This method will not give good results on a large file.

3) RLE: RLE performs better when repeatable sequences of patterns are found in data. RLE performs opposite and increases the file size to around double its original size when it does not meet a repeatable pattern.

4) Huffman: It is good for compression but it based on full binary tree.

IV. PROPOSED METHEDOLOGY

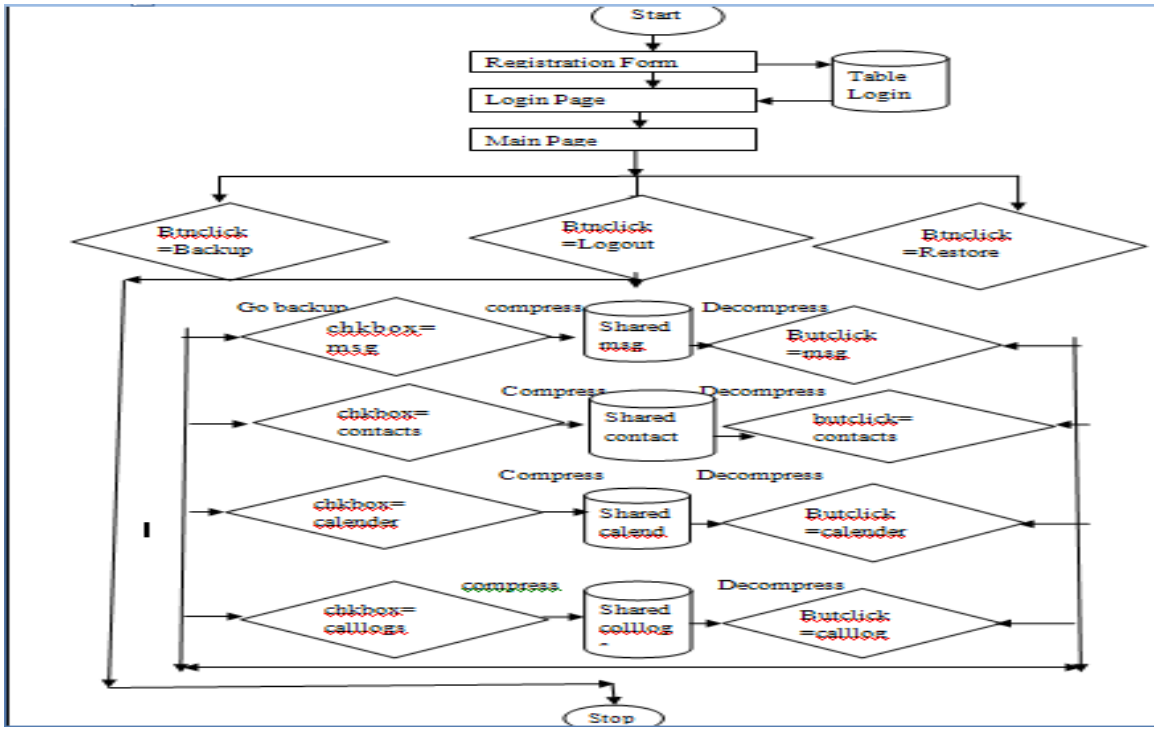

Fig 2. Data Flow Diagram

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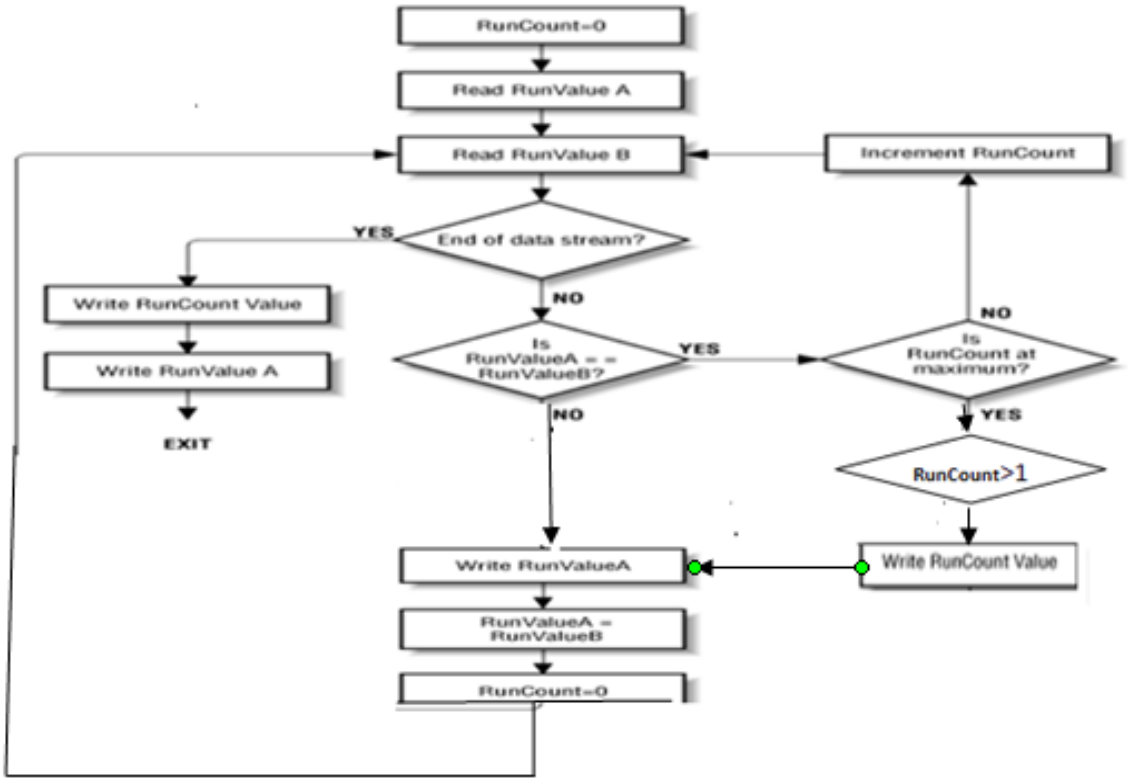

Fig 3. Flow Chart of Algorithm

V. RESULT ANALYSIS

Sr. No	File Size (Bytes)	File Size after RLE (Bytes)	Compression Ratio (%)	Backup time required without compression (in ms) [A]	Backup time required with compression (in ms) [B]	Efficiency (η = B/A *100)
1	245	189	22.86	315	204	64.76
2	512	406	20.70	495	371	74.95
3	1024	853	16.70	798	542	67.92
4	2048	1809	11.67	1356	983	72.49
5	4096	3562	13.04	2638	1863	70.62
6	8192	7371	10.02	4088	2956	72.31
7	11954	10082	15.66	5032	3495	69.46
8	16384	13053	20.33	5968	4156	69.64
9	65536	51962	20.71	7223	5362	74.24
10	93695	70649	24.60	12232	8861	73.26

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Table 1. Comparison Results

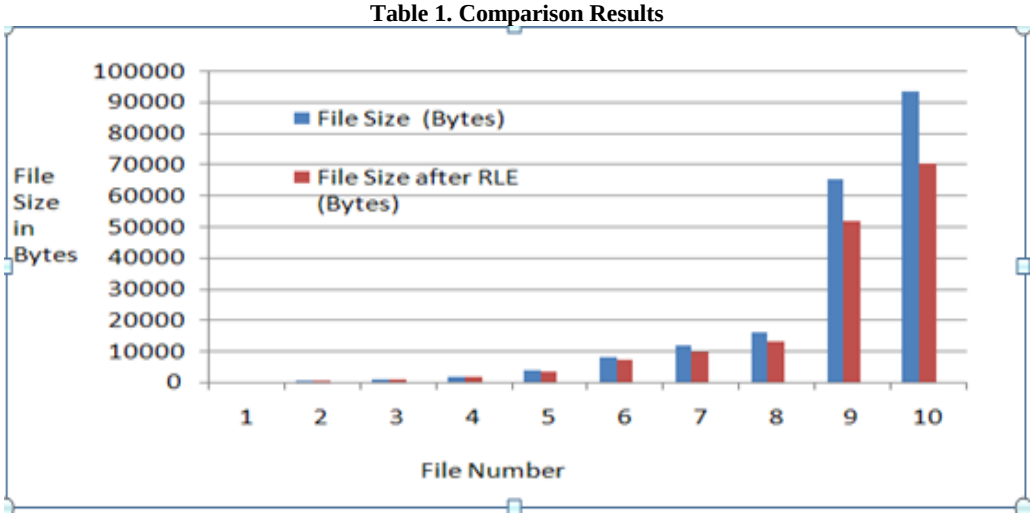


Fig 4. Size of File before and after compression

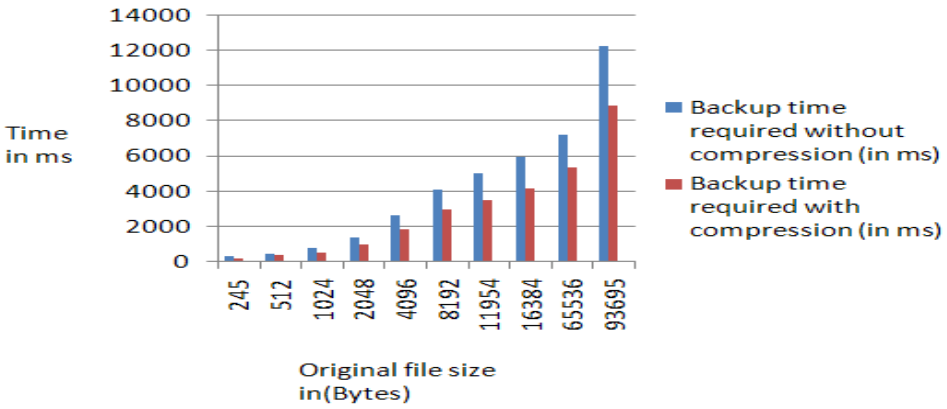
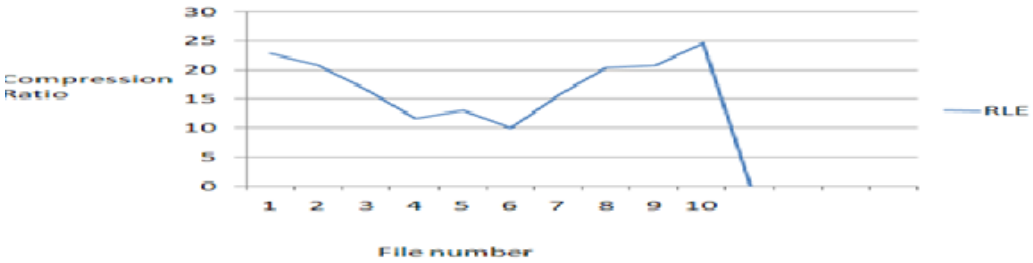


Fig 5. Time required for backup the file with and without compression



compression ratio for the file using RLE compression

VI. CONCLUSION

The use of smart phones are increased as it having PC-like functionality, memory and batteries are still limited. So compression is needed while backup and restore the data from mobile to server To solve this problem studied the different backup and restore techniques, compression algorithms and evaluates the performance of it. In this work an efficient and secure technique of backup and restores data in Android Smartphone is presented which employs the use of RLE compression technique and enhance the performance of RLE by modified it. RLE is simple to implement, fast to execute, and requires less CPU power. Thus compression of data helps to save time, space to store and further improves performance of the device by conserving the battery.

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