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Future Trends of Cloud Computing Security: An Extensive Investigation

R.S.Venkatesh¹, P.K.Reejeesh², Prof.S.Balamurugan³, S.Charanyaa⁴

Department of IT, Kalaignar Karunanidhi Institute of Technology, Coimbatore, TamilNadu, India^{1,2,3}

Senior Software Engineer Mainframe Technologies Former, Larsen & Tubro (L&T) Infotech, Chennai, TamilNadu,
India⁴

ABSTRACT: This paper reviews methods to be developed for anonymizing data in cloud from 2015 to 2014 . Publishing microdata such as census or patient data for extensive research and other purposes is an important problem area being focused by government agencies and other social associations. The traditional approach identified through literature survey reveals that the approach of eliminating uniquely identifying fields such as social security number from microdata, still results in disclosure of sensitive data, k-anonymization optimization algorithm ,seems to be promising and powerful in certain cases ,still carrying the restrictions that optimized k-anonymity are NP-hard, thereby leading to severe computational challenges. k-anonymity faces the problem of homogeneity attack and background knowledge attack . The notion of l-diversity proposed in the literature to address this issue also poses a number of constraints , as it proved to be inefficient to prevent attribute disclosure (skewness attack and similarity attack), l-diversity is difficult to achieve and may not provide sufficient privacy protection against sensitive attribute across equivalence class can substantially improve the privacy as against information disclosure limitation techniques such as sampling cell suppression rounding and data swapping and perturbation. This paper aims to discuss efficient anonymization approach that requires partitioning of microdata equivalence classes and by minimizing closeness by kernel smoothing and determining ether move distances by controlling the distribution pattern of sensitive attribute in a microdata and also maintaining diversity.

KEYWORDS: Data Anonymization, Microdata, k-anonymity, Identity Disclosure, Attribute Disclosure, Diversity

I. INTRODUCTION

Need for publishing sensitive data to public has grown extravagantly during recent years. Though publishing demands its need there is a restriction that published social network data should not disclose private information of individuals. Hence protecting privacy of individuals and ensuring utility of social network data as well becomes a challenging and interesting research topic. Considering a graphical model [35] where the vertex indicates a sensitive label algorithms could be developed to publish the non-tabular data without compromising privacy of individuals. Though the data is represented in graphical model after KDL sequence generation [35] the data is susceptible to several attacks such as homogeneity attack, background knowledge attack, similarity attacks and many more. In this paper we have made an investigation on the attacks and possible solutions proposed in literature and efficiency of the same.

II. CLOUD COMPUTING

Cloud computing is a platform that provides services to deliver information management and software through network of servers at much cheaper rate. Although concept of cloud computing is like a new phenomenon, it was originally found in early 1960's. The cloud platform is emerging to the greater extent and has been successful in recent years.

The background of cloud is a representation of development and maintenance of IT services used and paid for it.



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Cloud computing has reduced the costs of computing and has allowed various firms to deliver their computed results to its clients. This concept is gaining more advancement since it will encourage more innovations and will reduce the cost of maintenance and will be pulling the users as per their needs.

So it is broadly classified into SaaS, PaaS, IaaS. During the implementation of cloud in firms, two main questions are to be answered:

1. Where are you now?
2. Where do you want to go?

Since planning of a process require the transfer of cloud computing will follow it. If the questions are answered, we can easily complete it and deliver the service. An advantageous point in cloud computing is that most of the applications will be readily available and only the understanding of the system is important. Cloud computing provides new opportunities to perform same job in a traditional IT manner, Which gives complete satisfaction to the end user.

Important of all is the security in the cloud applications which are to be efficiently managed. Due to rapid development I the field of cloud computing, internet is widely used and it has been affected the most and cloud computing is a massive sufferer.

Business must pay more attention towards cloud security due to multi tenant nature of a cloud platform. The main point is about encryption of data and they should ensure security built in, authentication and layered security. Since security breaches can affect reputation of a company.

There are many more security issues surrounding the concept of cloud computing and hence encryption of data is must before uploading into public cloud.

2015(A)

The most powerful technological tool which is used to perform tedious task and complex computation is cloud computing. Cloud computing reduces the use of expensive hardware maintenance, space and also software. In recent years cloud computing has created a big growth in the name of data or big data. The authors through this paper reviews about the rise of big data in the field of cloud computing. They have introduced about the concepts of cloud computing with detailed explanations in this paper. The authors have also discussed about the technologies involving the relationship between big data, cloud computing and hadoop. On the whole, the authors have provided a detailed explanation of the research issues of cloud computing. The importance of cloud computing has changes the literal meaning of information technology. The model proposal for big data in this paper has been compared with the several other cloud platforms. They have also presented a MapReduce project and its related software through thus paper.

2015(B)

The authors through this paper discusses about the definition of big data, its important challenges faced in the process of storage, analyzing, maintenance, recovery and retrieval of big data and also the role played by the cloud computing architecture in the above mentioned issue. The authors have also presented the importance of cloud computing system for the handling of various business models in big data. They have reviewed about the various concepts namely resource pool sharing, scalability, resource shrink ability and other system of cloud computing. Authors have also explained about the cloud architecture and how big data changes to a smaller data through cloud computing tools and also discusses on the issues in order to become an important solution to handle big data.

2015(C)

As we all know cloud computing is a platform that provides the computation of data for storing and retrieval of the user data. Cloud computing, security has been implemented using various techniques since cloud security is one of the important factor. Even the security is ensured using the RSA, DES, AES and ECC. The other constraints of cloud computing are data privacy and data protection. A tool for data security is cryptography. The important fact of cryptography is encryption of data. The authors proposes various security techniques, cryptographic algorithms in order to address data preservation, privacy and protection. The authors conclude that the protected cloud computing system depends upon security results that work in parallel. Also security calculation of information is necessary which preserves the privacy of information.



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III. EFFECT OF CLOUD COMPUTING SYSTEM IN TERMS OF SERVICES QUALITY OF KNOWLEDGE MANAGEMENT SYSTEM

In recent years, information system has a very important role in every organizations. At the same time handling these system needs knowledge management system which is increasing to a great extent on the other hand, cloud computing has created a big impact in the field of processing the authors through this paper have tried to find the rate of QOS based on cloud computing.

Technologies have been improvised day by day and they play an important role in today's world. Since, it solves problems at low cost. These technologies implement most of the important concepts of IT. One such is cloud computing which is a safe, secure framework which is affordable for the users.

Social networks and cloud computing are two important platforms which are used to setup the knowledge based management system. The knowledge management system can increase the system utility, quality, work and thereby using knowledge cycle. Thus this system needs a platform to display the services where cloud computing technology is used.

As per Dawn and Mclean model, information system model contains six factors to identify its success namely system quality, information quality, service quality, sm usage, user satisfaction, net benefit among which is addressing a system on the whole if an information system is identified and measured using all these six factors, that system is said to be a successful one.

As per the definition, cloud computing is a technology where an external firm runs the application and stores their results other than running it on system locally. The main aim of this research is to use a cloud server to check the QOS of a knowledge management system.

Thus the paper explains the success of implementing a KMS based on cloud technology and it can satisfy users in terms of QOS and thereby they observed drastic differences after its implementation.

2016(B)

The authors through this paper say that in the world of the development of software, work splitting and its proper allocation are the main factors that are to be considered in order to maximize the GSD and also to meet the challenges. In this paper, they have proposed a mathematical model which is designed in order to decrease the cost, time and load balancing in the field of software development. The authors have used a technique called multi-level clustering so as to reduce the communication cost. Initial cluster is done for work partition and secondary cluster is done at the time of allocation of the divided work. The model has been implemented using MATLAB. Since the cost is the most important factor in GSD, the proposal considers the static load sharing schema for work allocation. Thus the authors focuses on two important attributes namely Execution cost and Intercommunication task that are related to tasks and sites.

IV. A FRAMEWORK FOR CLOUD BASED SMART HOME

Cloud computing has become an important concept and has reached to people of all ages due to its ability to provide cloud services from business to entertainment. Through this research work, the author proposes a framework in order to provide cloud based smart home by addressing threat and security issues by securing data as well as device elasticity.

During the past years, cloud computing has been emerging to a greater extent by providing software, data access and services such as IaaS, PaaS and SaaS enabling users to use at low cost. This is generally pay as per use technology. One of the important characteristics of cloud computing is virtualization where the virtual machine is made to run on physical machine that allows users to run applications directly by utilizing their own Operating System .

Scalability, availability of cloud computing helps users to access services “anytime, anywhere”.



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Smart home technologies contain the system that connects automatically to common interfaces. Here electronic devices are connected with each other to form a network which is termed as service. This user finds it difficult to find availability and scalability due to the difficulties of technology in small home.

Hence combination of cloud and smart home may bring users a higher range of benefits both in terms of cost and technology.

The author hereby proposes a literature review of cloud based small home. The main stakeholders are customers, cloud service provider and developers. The aim is to provide a framework for delivering smart home services ensuring data security/privacy.

Combination of advanced features of the cloud computing; this framework is designed. Thus the above topic is an important one in cloud computing and sh research since it provides a future research criteria namely, smart city where this research will play a very vital role.

V. CONCLUSION AND FUTURE WORK

Various methods to be developed in future for anonymizing data in cloud from 2015 to 2017 is discussed. Publishing microdata such as census or patient data for extensive research and other purposes is an important problem area being focused by government agencies and other social associations. The traditional approach identified through literature survey reveals that the approach of eliminating uniquely identifying fields such as social security number from microdata, still results in disclosure of sensitive data, k-anonymization optimization algorithm, seems to be promising and powerful in certain cases, still carrying the restrictions that optimized k-anonymity are NP-hard, thereby leading to severe computational challenges. k-anonymity faces the problem of homogeneity attack and background knowledge attack. The notion of l-diversity proposed in the literature to address this issue also poses a number of constraints, as it proved to be inefficient to prevent attribute disclosure (skewness attack and similarity attack), l-diversity is difficult to achieve and may not provide sufficient privacy protection against sensitive attribute across equivalence class can substantially improve the privacy as against information disclosure limitation techniques such as sampling cell suppression rounding and data swapping and perturbation. Evolution of Data Anonymization Techniques and Data Disclosure Prevention Techniques are discussed in detail. The application of Data Anonymization Techniques for several spectrum of data such as trajectory data are depicted. This survey would promote a lot of research directions in the area of database anonymization.

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APPENDIX

S.no	YEAR	AUTHORS	TITLE
1	1984	Sape .MULLENDER and Andrew S TANENBAUM	PROTECTION AND RESOURCE CONTROL IN DISTRIBUTED OPERATING SYSTEMS
2	1985	Paul j.Levine	COMPUTER SECURITY SYSTEM FOR TIME SHARED COMPUTER ACCESSED OVER TELEPHONE LINES
3	1986	Norman Hardy	COMPUTER SYSTEM SECURITY
4	1987	Andreas Pfitzmann, Michael Waidner	NETWORKS WITHOUT USER OBSERVABILITY
5	1988	Chris J. Mitchell	KEY STORAGE IN SECURED NETWORK
6	1989	Fred C. Piper	VOICE NETWORK SECURITY SYSTEM
7	1990	Donald Graj	METHODOLOGY FOR NETWORK SECURITY DESIGN
8	1991	L. Todd Heberlein	NETWORK SECURITY MONITOR
9	1992	John R. Corbin	APPARATUS AND METHOD FOR LICENSING SOFTWARE ON A NETWORK OF COMPUTERS
10	1993	Michael P.	COMPUTER NETWORK ABUSE
11	1994	Bruce E. McNair	SYSTEM AND METHOD FOR GRANTING ACCESS TO A RESOURCE
12	1995	Scott D. Hammersley, Arthur D. Smet, Peter M. Wottreng	METHOD AND APPARATUS FOR INTRAPROCESS LOCKING OF A SHARED RESOURCE IN A COMPUTER SYSTEM
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15	1997	Mark S. Miller, E. Dean Tribble, Norman Hardy, Christopher T. Hibbert	DIVERSE GOODS ARBITRATION SYSTEM AND METHOD FOR ALLOCATING RESOURCES IN A DISTRIBUTED COMPUTER SYSTEM
16	1998	Ian Foster, Carl Kesselman, Gene Tsudik, Steven Tuecke	A SECURITY ARCHITECTURE FOR COMPUTATIONAL GRIDS
17	1999	Daniel S. Glasser, Ann Elizabeth McCurdy, Robert M. Price	METHOD AND SYSTEM FOR CONTROLLING USER ACCESS TO A RESOURCE IN A NETWORK COMPUTING ENVIRONMENT
18	2000	Rajkumar Buyya, David Abramson, and Jonathan Giddy	AN ARCHITECTURE FOR A RESOURCE MANAGEMENT AND SCHEDULING SYSTEM IN A GLOBAL COMPUTATIONAL GRID
19	2001	Lalana Kagal, Tim Finin and Anupam Joshi	MOVING FROM SECURITY TO DISTRIBUTED TRUST IN UBIQUITOUS COMPUTING ENVIRONMENT
20	2002	Farag Azzedin and Muthucumaru Maheswaran	TOWARDS A TRUST-AWARE RESOURCE MANAGENT IN GRID COMPUTING SYSTEM
21	2003	Von Welch ¹ Frank Siebenlist ² Ian Foste	SECURITY FOR GRID SERVICES
22	2004	Ivan Krsul, Arijit Ganguly, Jian Zhang	VMPLANTS: PROVIDING AND MANAGING VM EXECUTION ENVIRONMENTS FOR GRID COMPUTING
23	2005	Daniel Olmedilla ¹ , Omer F. Rana ² , Brian	SECURITY AND TRUST ISSES IN SEMANTIC GRIDS
24	2006	David S. Linthicum	MOVING TO CLOUD COMPUTING STEP BY STEP
25	2007	Uzi Dvir	SECURITY SERVER IN THE CLOUD
26	2008	Mladen A. Vouk	CLOUD COMPUTING-ISSUES, RESEARCH AND IMPLEMENTATIONS
27	2009	Meiko Jensen,	ON TECHNICAL ISSUES OF CLOUD COMPUTING
28	2010	S. Subashini n, V.Kavitha	SECURITY ISSUES FOR CLOUD COMPUTING
29	2011	Luis M. Vaquero	SECURITY ISSUES IN CLOUD COMPUTING
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BIOGRAPHY

R.S.Venkatesh and P.K.Reejeesh are currently pursuing their B.Tech. degree in Information Technology at KalaingarKarunanidhi Institute of Technology, Coimbatore, Tamil Nadu, India. Their areas of research interests include Network Security, Cloud Computing and Database Security.



Prof.S.Balamurugan obtained his B.Tech degree in Information Technology from P.S.G. College of Technology, Coimbatore, Tamil Nadu, India and M.Tech degree in Information Technology from Anna University, Tamil Nadu, India respectively. He is currently working towards his PhD degree in Information Technology at P.S.G. College of Technology, Tamil Nadu, India. At present he holds to his credit **65 papers International Journals and IEEE/ Elsevier International Conferences**. He is currently working as Assistant Professor in the Department of Information Technology, Kalaingar Karunanidhi Institute of Technology, Coimbatore, Tamil Nadu, India affiliated to Anna University TamilNadu, India. He is **State Rank holder** in schooling. He was **University First Rank holder** M.Tech. Semester Examinations at Anna University, Tamilnadu, India. He served as a Joint Secretary of IT Association, Department of Information Technology, PSG College of Technology, Coimbatore, Tamilnadu, India. He is the **recipient of gold medal and certificate of merit** for best journal publication by his host institution **consecutively for 3 years**. Some of his professional activities include invited Session Chair Person for two Conferences. He has guided 16 B.Tech projects and 2 M.Tech. projects. He has won a best paper award in International Conference. His areas of research interest accumulate in the areas of Data Privacy, Database Security, Object Modeling Techniques, and Cloud Computing. He is a life member of ISTE,CSI. **He has authored a chapter in an International Book "Information Processing" published by I.K. International Publishing House Pvt. Ltd, New Delhi, India, 978-81-906942-4-7. He is the author of 3 books titled "Principles of Social Network Data Security", ISBN: 978-3-659-61207-7, "Principles of Scheduling in Cloud Computing" ISBN: 978-3-639-66950-3, and "Principles of Database Security", ISBN: 978-3-639-76030-9.**



S.Charanyaa obtained her **B.Tech** degree in Information Technology and her **M.Tech** degree in Information Technology from Anna University Chennai, Tamil Nadu, India. She was **gold medalist** in her B.Tech. degree program. She has to her credit **27 publications in various International Journals and Conferences**. Some of her outstanding achievements at school level include **School First Rank holder in 10th and 12th grade**. She was working as Software Engineer at Larsen & Turbo Infotech, Chennai for 3 years where she got promoted as Senior Software Engineer and worked for another 2 years. She worked at different verticals and worked at many places including Denmark, Amsderdam handling versatile clients. She is also the recipient of **best team player award for the year 2012 by L&T**. Her areas of research interest accumulate in the areas of Database Security, Privacy Preserving Database, Object Modeling Techniques, and Cloud Computing. **She is the author of 3 books titled "Principles of Social Network Data Security", ISBN: 978-3-659-61207-7, "Principles of Scheduling in Cloud Computing" ISBN: 978-3-639-66950-3, and "Principles of Database Security", ISBN: 978-3-639-76030-9.**