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Efficient Record Management System for Higher Educational Institutions using TOE and UTAUT Model

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Abstract

Higher Educational Institutions maintain Academic Policy, Non Academic Policy, Students and Staff members' details and financial records. Information retrieval from the existing records, Records maintaining process and decision making using previous history are crucial tasks in the Higher Educational Institutions. Even though, these process occupies many storage area, man power and Processing time etc., The objective of the proposed research is Academic and non academic activities record management, Academic Syllabus Generation like Outcome Based Education, Handling the students records, marks and attendance, Inventory system for the Institution and Laboratory, Efficient Library Management System, Maintaining the financial records like fees Collection, Financial Statements, Employee Payroll etc., The paper deals with the Academic and non-academic activities record management system by using the UTAUT and TOE Model

Keywords*:* RM, HEI, University, Academic Activity, Non-academic Activity.

1. Introduction

Records represent an organization's accumulated intellectual resources, making them information assets. [6, 13]. Records are important for administrative functions and it is the heart of higher learning institutions [7]. Records hold valuable information which is a necessary input for the administrative, economic, scientific and technological functions of an organisation [15]. Records management is defined as the process of gathering and keeping complete, accurate, reliable, and usable documentation of an organization's operations in order to satisfy social, legal, cultural, and evidential needs [1, 3, and 13]. The records management function has a broad scope and may have an impact on the entire organisation; it is referred to as records management in this context [7].

The generation, organisation, and disposal of records all require efficient systems and procedures since record management is a crucial function for an institution that must be managed appropriately. Additionally, system continuity and progress depend on appraisal and evaluation. Disposition practices and retention plans need to be periodically examined on a frequent basis since institutional circumstances, particularly regulations for records format, distribution, use, and storage, change quickly. These results depended on institutional and legal framework analysis to pinpoint the research's existing difficulties [3].

Records serve a crucial role in higher education management, beginning with the establishment phases and continuing through project execution, verification, evaluation, and reinstitution [7]. In general, records are made and used to accomplish institutional goals and to provide evidence of what, when, and how transactions take place inside an institution [3]. Higher education centres have the issues to manage their academic records [5]. The main goal of record management methods is to provide systematic controls over the whole course of the record [11].

Record keeping must typically be constrained by some degree of confidentiality, adequate upkeep, security, preservation of the information and context, etc., [2]. Records management (RM) hunts for efficient and systematic control of the lifecycle of records [9]. Records management helps the university to manage its information, protect it from litigation, efficiently fulfill its mandate, preserve their corporate memory and foster accountability and good governance. The administration of records, however, keeps track of how they are disposed of [7]. The information could be recorded on paper, photos, slides, microfilms, videotapes, audiotapes, or any other computer-readable medium, including computer discs or tapes [1]. To ensure the accuracy, validity, and comprehensiveness of the records, records managers and archivists work together in an integrated record keeping structure [3].

The main objective of the paper and a part of the research work of the author as follows

- List the importance and benefits of Record Management in Higher Educational Institutions (HEI).
- To conduct the survey on the Record Management System which has been used in Higher Educational Institutions.
- Design an efficient model for academic and non-academic activity record management and report generation systems of Higher Educational Institutions.
- To analyse the performance of the proposed Record Management System Model.

2. Review of Literature

Chinyemba and Ngulube (2005) made a survey on records management practices and processes at the College of KwaZula-Natal. The article demonstrates how individual initiative approaches have been used to manage records in the absence of policies and guidelines. In order to provide recommendations for identifying the crucial records series, they advised the University to do a functional analysis of its key operations, activities, and transactions.

Ebele Joyce Egwunyenga (2009) observed that the problems in record keeping in various Universities are associated with the number of problems such as negative attitude of personnel, unfair security of records, insufficient computer terminals, improper record keeping policy. They suggested that the trained and professionally qualified personnel can resque the problems. In order to avoid such problems the human resource practices must be qualified and on the job training is essential.

Ozgur Kulcu (2009) compared the record-keeping procedures at two universities in Canada and in Turkey. The main cause of issues with record management in Turkish was the inability of the records to be organised in a timely manner, which made it challenging to locate all relevant documents. Rest of the reasons for inaccessibility of records are loss of records, misplacement of records, removal of certain important tips and unhygienic filing system.

Krishnaveni and Meenakumari (2010) studied to identify the various ICT techniques deployed for record management in the HEI and they suggested the use of ICT in all walks of functional areas belonging to record management. This study shows that there is little correlation between demographic parameters and RM in HEI.

In order to manage the academic records kept at the Malaysian University, Shah Jahan Miah and Ahmad Zam Hariro Samsudin (2016) built an innovative Electronic Records Management System (ERMS).

Carolyne Nyaboke Musembe (2016) discussed the business operations of higher educational Institutions which are supported by record management. This study expressed that almost all the Universities are suffering from the illness of the record management system. The authors recommended that for better management of records in the premises there should be a quality management in the records keeping, for which, the policy and other frameworks should be regulated properly.

Paul Joseph Estrera (2017) sensitized that record management must be decentralized in the HEI and a copy of manual work as well as soft copy folders must be maintained. To assure the quality of document storage and filing, they recommended integrating the records management function with the university's strategic planning.

The administrative documents are preserved in both manual and computerised structures, according to research by Gudina Jirata, Munusamy Natarajan, and Geleta Negasa Binezde (2018) et al. In addition to that there are some constraints existing in relating to experienced record managers, poor administrative personnel and office space. Further, they recommended the use of electronic record management with fully trained manpower.

In their discussion of the Web-Based Students' Record Management System for Tertiary Institutions, Uka KanayoKizito and Ekwonwune Emmanuel Nwabueze (2019) outlined the challenges associated with managing students' academic records, including course registration, exam result information, and record retrieval challenges within the institution. For tertiary institutions, they recommended the android/web-based system.

David Luyombya and SalmahNdagire (2020) observed the life cycle model of record management strategies and delivery of services in Islamic University, Uganda and suggested maintaining the electronic and manual records by using advanced techniques. Additionally, there was a shortage of qualified records management staff, which created problems with record generation, usage, distribution, maintenance, and destruction. They recommended that the University may develop and acknowledge suitable record management techniques to ensure a standard method for managing records.

Nozipho Giba Fosu (2020) investigated the record management that has not been adequate in Walter Sisulu University. From the investigations it is concluded that the record management system in the business activity is not desirable. Finally, the record lifestyle framework is inadequate and it is limited to legal formalities also.

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Ajike (2021) et al. investigated how institutional issues impacted the ways the South-West Nigerian University registries managed student records. This study found that the variables had a big impact on how students managed their documents, and it recommends that degaussing and shredding are usually used for electronic data to be destroyed in order to solve disposal issues.

Abdullahi Abubakar Yaya (2021) investigated the students' records and facilities used in managing students' records revealed that the poor maintenance and lack of disaster management control plan. This study recommended the maintenance and computerization of students' records to avoid future consequences in the record management operations.

Ramatoulie Touray (2021) tinted the role and importance of record management in the business activities. The poor record management not only affects the growth of any premises which led to the ineffective delivery of services in time. They suggested that to avoid serious storage and retrieval problems, keep the active records and semi-active in order of preference respectively.

3. Research Model

In educational institutions they maintain both academic and non-academic activities in a digital format by using a structured model. Academic system contains the details of students' admission, academic performance, and curriculum etc., whereas the non-academic system consists of things such as publications, progression of events and research activities of students and faculty members etc.,.

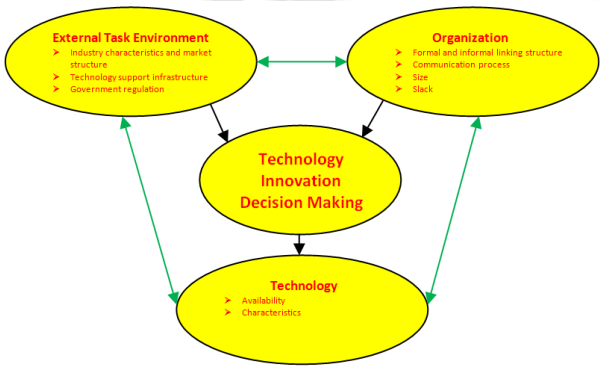

Figure 1: TOE Framework

Wikipedia has the following information about the Technology Organization Environment (TOE) Model: a theoretical framework depicts the adoption of technology in various educational and other organizations and describes the process of accomplishing technological innovations which are emphasized by the Technological, Organizational and Environmental context. Data can be obtained from folks in the target organizations and hence inevitably biased by individuals. The TOE framework is "too generic" and offers a soaring level of freedom to use different factors and measures so there is a small change in the theory itself. Figure 1 presented the TOE Framework.

The UTAUT describes customer aspirations to use sophisticated IT techniques and subsequent behaviour. Four crucial elements make up the assumption. Performance expectations, social influence, anticipated efforts, and facilitations are these. The first three directly affect user intention and behaviour, and the fourth directly affects user behaviour. The UTAUT Model was shown in the following figure 2.

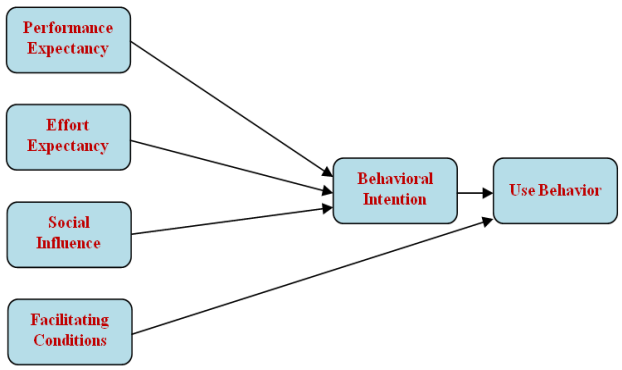

Figure 2: UTAUT Model

Educational Institutions have given more concentration on academic activities and less concentration on non-academic activities. While tie-up with other organizations and moving on to the next level to apply for an accreditation of the academic and non-academic activities which play a significant role. With a view to keeping the records of academic and non academic activities, the new structured model has been developed for the benefits of students, faculty members, management and the Institutions. The proposed model has been classified into 3 major parts. First part related to Faculty members, followed by the students and institutions. Faculty members' publication details, progression, meeting attendance, research activities and other related information are stored and reported as a first part. Students' publication, progression, meeting attendance, sports and placement activities, outreach programmes and educational tour details, social activities, research and development activities are stored and reported as the next part.

Institutions have to store both faculty and students publications, organizing events details, placement details, meeting details, alumni and guest visited details, social activities, sports activities, EDI and Career Guidance Programme details, research and development activities and other related information have to report to the committee members those who visited the organization and the management.

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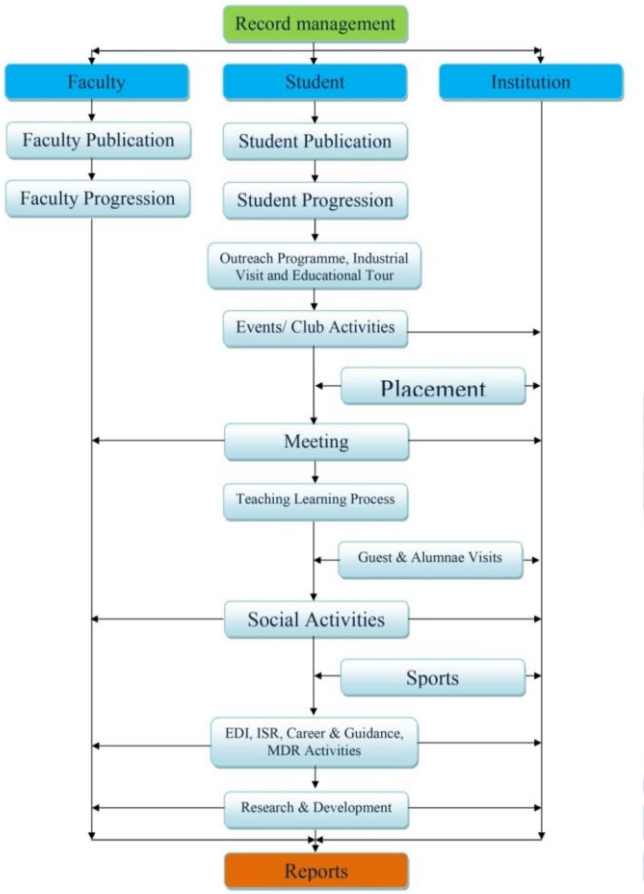

Figure 3: Architecture of Academic and Non Academic Activity Record Management Model

Through this report, the management and the evaluation committee evaluate the institutional growth. Based upon the survey, their recommendations and suggestions, the proposed model has been designed. Figure 3 presents the architecture of an efficient model for academic and non-academic activity record management systems for higher educational institutions using big data in the cloud.

4. Proposed work

The proposed system has been designed by using the major classifications and it has been defined by using record type. The record types are Faculty and students Publications, Progression, outreach programmes and Educational Tours, Events and club activities, placement activities, Teaching and learning process, meetings organized by the various departments in an institution, guest and alumni visited into the institutions, sports and social activities performed by the student and conducted by the institution. Career guidance programmes conducted by the institution for the students and research and development activities performed by the students, staff members. These record types have been classified into several subdivisions. They are faculty publications (FPUB), Faculty Progression (FPRO), Student Publications (SPUB), Student Progression (SPRO), Institutional Activities (IA) and Report Progression (RP).

The faculty members consolidated their publications in the Refereed journal (PRJ) and publications in the Non Refereed Journal (PNRJ), Books Published and edited (BPE) and consolidation of Faculty publications (∑FPUB) given in the equation (1)

$$\sum FPUB = \sum PRJ + \sum PNRJ + \sum BPE \quad \text{--- (1)}$$

The faculty members consolidated their publications in conferences (FP), attended Faculty Development Programme (FDP), Faculty Attended Workshop (FAW), Faculty Acted as Resource Person details (FARP), Faculty received Honours and Awards (FHAW) and Faculty members Consultancy, Patent, Sequence of Submission details (FCPSEQ) are the consolidation of Faculty progression (∑FPRO) and it has given in the equation (2)

$$\sum FPRO = \sum FP + \sum FDP + \sum FAW + \sum FARP + \sum FHAW + \sum FCPSWQ \quad \text{--- (2)}$$

The Students' consolidated Publications in Refereed Journals (SPRJ), Publication in Non Refereed Journals (SPNRJ) and Book Published and edited (SBP) are the consolidation of Students' publication (∑SPUB) and it has given in the equation (3)

$$\sum SPUB = \sum SPRJ + \sum SPNRJ + \sum SBP \quad \text{--- (3)}$$

The Students' consolidated publication and presentation in conferences (SPPR), Students participation in Events (SPAR), Student received awards and achievements (SAA) and Students received Scholarships and Fellowship details (SSFS) are the consolidation of Students' progression (∑SPRO) and it has given in the equation (4)

$$\sum SPRO = \sum SPPR + \sum SPAR + \sum SAA + \sum SSFS \quad \text{--- (4)}$$

The consolidation of Outreach Programme (ORP), Events and Club activities organized (ECA), Placement events (PL), details of Meeting conducted (MO), Teaching and Learning Process (TLP) follow-up details, Guest and Alumni visit details (GAV), Performed Social Activities (SA), Sports Activities (SPA), details of conducted and organized Career and Guidance Programmes (CGP) and Research and Development activities (RDP) are the consolidation of Institutional Activities (∑IA) and it has given in equation (5).

$$\sum IA = \sum ORP + \sum ECA + \sum MO + \sum PL + \sum GAV + \sum TLP + \sum SA + \sum SPA + \sum CGP + \sum RDP \quad \text{--- (5)}$$

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The consolidation of Faculty publications (∑FPUB), consolidation of Faculty progression (∑FPRO), consolidation of Students' publications (∑SPUB), consolidation of Students' Progression (∑SPRO) and consolidation of Institutional Activities (∑IA) are consolidated for the Report Progression (∑RP) and it is presented in the equation (6)

$$\sum RP = \sum FPUB + \sum FPRO + \sum SPUB + \sum SPRO + \sum IA \quad \text{--- (6)}$$

The proposed model for academic and non-academic activity report generation system of a higher educational institution using TOE and UTAUT model has been developed by using HTML, CSS, PHP, and PHPMYADMIN. HTML and CSS used to develop front end design, PHP is used to implement the logical operations, PHPMYADMIN used to store the records. Additionally, the FPDF tool is used to generate the reports.

Figure 4: Subdivision of record type Seminar/ Conference/ Symposium

The above Figure 4 illustrates the Seminar/ Conference/ Symposium which is the subdivision of record type of Events/Club Activities Organized. In the data model for the record type the following properties have been collected, stored and maintained as records. The properties are EventType, Depart, Date, No_Benificiary, Acc_Name, OrgName, SponName, Place, Level, ResPerName, ResPerAdd, Summary.

Figure 5: subdivision of record type refereed journal publication

The above Figure 5 illustrates Refereed Journal Publication which is the subdivision of record type of Faculty and Students Publication. For the record type, the following properties have been collected, stored and maintained as records. The properties are Aut_Name, Depart, Date, Paper_Title, Jour_Name, VolNo, IssNo, ISSN, eISSN, ISBN, DOI, PageNo, IMF.

The following Figure 6 illustrates the report generation module. Using this module the stakeholders can generate daily, monthly, day to day reports with images.

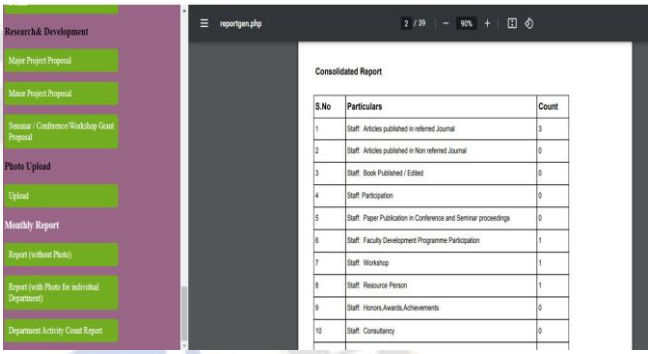

Figure 6: Report Generation by using the proposed model.

5. Result and Discussion

To evaluate the proposed model for academic and non-academic activities, the record management system of higher educational institutions using big data in the cloud has been implemented in 25 years of old private Arts and Science Higher Educational Institutions in Tamilnadu, India. The three years of records i.e., 2019, 2020 and 2021 have been stored in this proposed model.

The records count and Percentage of records stored in each year has been taken for evaluation performance and importance of the system. In the year 2019, a total of 1636 records have been recorded in the database by using the proposed system. In that, 204,114, 253, 314 and 751 records have been stored from English, Mathematics, Microbiology, Computer Science and other departments respectively.

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Year	Departmental Divisions in the Institution				
	English	Mathematics	Microbiology	Computer Science	Others
2019	204	114	253	314	751
2020	255	295	5145	1214	4239
2021	346	496	5640	2421	7468

Table 2: Activity Count Analysis

In the year 2020, a total of 11148 records have been stored in the database by using the proposed system. In that, 255, 295, 5145, 1214 and 4239 records have been stored from English, Mathematics, Microbiology, Computer Science and other departments respectively. In the year 2021, a total of 16371 records have been recorded in the database by using the proposed system. In that, 346, 496, 5640, 2421 and 7468 records have been stored from English, Mathematics, Microbiology, Computer Science and other departments respectively. The 9512, 14735 records are the differences between the first year and rest of the years respectively, which means that the institution gave the importance to store the records safely and they are adopted and feel convenient to store the information in the proposed model.

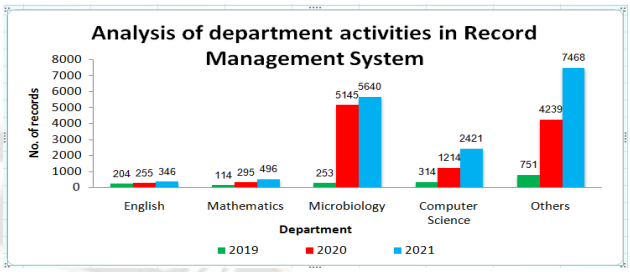

Figure 7: Analysis of department activities in Record Management System

Table 2 and Figure 7 illustrate the analysis of department activities in the Record Management System. Table 3 illustrates that percentage analysis of records stored in each year.

Year	Departmental Divisions in the Institution				
	English	Mathematics	Microbiology	Computer Science	Others
2019	12.47 %	6.97 %	15.46 %	19.19 %	45.90 %
2020	2.29 %	2.65 %	46.15 %	10.89 %	38.02 %
2021	2.11%	3.02%	34.45%	14.78%	45.61%
Consolidated	2.76 %	3.10 %	37.85 %	13.54 %	42.73 %

Table 3: Percentage Analysis of department Activities

6. Conclusion

When it comes to managing higher education institutions, keeping records is crucial from the institution's founding to the stages of programme formulation, implementation, monitoring, and renewal. These details are crucial for maintaining institutional surveillance. Records are made and used to accomplish institutional objectives and to keep track of the what, when, where, and how many transactions take place inside a given institution. The goal of records management (RM) is to effectively and methodically manage the lifespan of records that are regularly created as a result of activities and transactions. Finally, it can be said that the aforementioned assertions and the research information's aims have been followed.

References

[1] Chinyemba, Ngulube, "Managing records at higher education institutions: a case study of the University of KwaZula-Natal, Pietermaritzburg Campus", South African Journal of Information Management, Vol.7 (1), March 2005, PP: 1-20.

[2] Ebele Joyce Egwunyenga, "Record Keeping in Universities: Associated Problems and Management Options in South West Geo-Political Zone of Nigeria", International Journal of Educational Science, 1(2), 2009, PP: 109-113.

[3] Ozgur Kulcu, "Records Management Practices in Universities: A Comparative Study of Examples in Canada and Turkey", The Canadian Journal of Information and Library Science, 33,1,2009,PP: 85-107.

[4] Krishnaveni, Meenakumari, "Usage of ICT for Information Administration in Higher Education Institutions- A Study", International Journal of Environmental Science and Development, Vol.1, No.3, Aug. 2010, PP: 282-286.

[5] Shah Jahan Miah, Ahmad Zam Hariro Samsudin, "EDRMS for academic records management: A design study in a Malaysian University", Education and Information Technologies, Vol.21, No.4, July 2016, PP:1-19.

[6] Carolyne Nyaboke Musembe, "Records Management in Institutions of Higher Learning: Towards the Business Support Function", International Journal of Library and

Information Science Studies, Vol.2, No.1, Aug. 2016, PP: 13-28.

[7] Seniwoliba, Mahama, Abilla, "Challenges of records management in higher education in Ghana: The case of University for Development Studies", International Journal of Educational Policy Research and Review, Vol. 4(3), March 2017, PP: 29-41.

[8] Paul Joseph Estrera, "Electronic Document Management System for Higher Education Institution", International Journal of Innovative Science and Research Technology, Vol.2, Iss. 5, May 2017, PP: 549-556.

[9] Gudina Jirata, Munusamy Natarajan, Geleta Negasa Binezde, "Assessment of Record Management Practices among Administrative Staff of Jimma University", Indian Journal of Library and Information Science, Vol.12, No. 2, Aug. 2018, PP: 101-114.

[10] Uka kanayoKizito, Ekwonwune Emmanuel Nwabueze, "Web Based Students Record Management System for Tertiary Institutions", International Journal of Advanced Research in Science Engineering and Technology, Vol. 6, Iss. 6, June 2019, PP: 9624-9631.

[11] David Luyombya, Salmah Ndagire, "Records management procedures and service delivery in private universities: a case study of the Islamic University in Uganda", Journal of the South African Society of Archivists, Vol.53, 2020, PP: 1-19.

[12] Nozhipo Giba-Fosu, "Records Management Programs in Higher Learning Institution: Case Study of Nelson Mandela Drive Campus Walter Sisulu University, South Africa", International Journal of Community Development & Management Studies, Vol.4, 2020, PP: 23-39.

[13] Ajike, Alegbeleye, Babalola, Madukoma, "Institutional Factors and Student Records Management Practices in South-West Nigerian University Registries", Global Journal of Applied, Management and Social Sciences, Vol. 21, Jan. 2021, PP: 87-94.

[14] Abdullahi Abubakar Yaya, "Management of Students Records in Academic Departments of Hassan Usman Katsina Polytechnic, Katsina, Nigeria", Journal of Research in Humanities and Social Science, Vol. 9, Iss. 1, 2021, PP: 4-10.

[15] Ramatoulie Touray, "A Review of Records Management in Organisations", Open Access Library Journal, Vol. 8, Dec. 2021, PP: 1-23.