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## FILE AND STORAGE MANAGEMENT SYSTEM TOWARDS CLOUD COMPUTING TECHNOLOGY

**Abstract:** The study aimed to assess the File Storage and Management System (FSMS) at Asian College of Technology, Cebu during Academic Year 2014-2015 towards Cloud Computing Technology adaptation. There were a total of forty-three (43) respondents who are employees of the said school. The study made use of descriptive-developmental research. Frequencies, percentages, ranks and weighted means were used to describe data. Pearson's  $r$  correlation coefficient was used to test the significant relationship between efficiency of the current FSMS and the perceived features of a good FSMS. On the development phase, the study used Unified Modeling Language for design and modeling, PHP and MYSQL for front-end and back-end modules, respectively. Based on the gathered data, the research revealed that the current FSMS is less efficient and less effective as perceived by the respondents. Thus, a cloud-based FSMS must be design and developed. Furthermore, it is recommended that the cloud-based FSMS will be deployed at Asian College of Technology. The innovation is believed to be a solution that will help the employees perform their job effectively and efficiently.

**Key words:** File Storage and Management, Cloud Computing, Descriptive-Developmental Research, Cebu City, Philippine.

**Language:** English

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### Introduction

Today's world of computing technology is in its eleven heavens. It is making its place rapidly and has played a vital role to most industrial enterprises. With this rapid development in businesses, most people want to use computing technology to save money,

time, space and performance, etc. Lots of businesses today are demanding the use of internet to optimize creativity.

Records management in this day and age is becoming a highly valued field. Data and information taken from records are very essential in decision

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making and strategic management for a company. If properly managed, records have the characteristics of accuracy, integrity, timely, useful and relevant. However, record management and maintenance can be tedious and challenging to implement in an organization.

Cloud computing has become ubiquitous in the present world. This technology creates a big impact across all organizations, businesses, academe, government, and even at homes. The impact of cloud computing resonates in our day-to-day life, social, education, development and health. This technology is interesting because it creates a huge potential, and there are still perspective that have not yet explored.

The cloud technology is like a service provider that users can subscribe to the service in exchange for storage space, infrastructure, applications and other services through the cloud. The service requires stable internet connection, and can be accessed in different devices such as computers, smart phones, laptops and TVs. The resources retrieved from the cloud can be used and released in small chunks, which means that the concept is on-demand.

The cloud which is a metaphor for the internet as the services is provided in the platform that is available for all (Sultan, 2011). There are different types of cloud services as there are many different users. Private, public and hybrid cloud are the most common used services (Rimal, Choi, & Lumb, 2009). The unique concept when thinking of cloud computing is that you can hire services like, hardware and only pay for the time you use the services or how much you store (Hurwitz, Bloor, Kaufman, & Halper, 2010).

While others are abreast and currently updating their way of record management, Asian College of Technology uses local drives to keep the files of the end-users such as the students, professors and the different organizations of the institutions. Files are managed locally in a drive, file transfer is done using portable drives or flash memory, and files are isolated from one computer unit to another. In this way, the users have found out vast limitations and constraints of this method such as security issues, efficacy of the process, accuracy and consistency of records.

The researchers, as an Information Technology practitioner and professor realized, through his

research, that there is a significant impact of cloud computing to businesses, specifically on document management. With this reason, a cloud-based file and storage management system was conceptualized. The idea is to make a cloud-based repository of files that is readily available for the employees of Asian College of Technology.

### METHODOLOGY

The study used the descriptive developmental method. The researcher utilized a researcher-constructed questionnaire to gather data from the respondents. The design and development uses a waterfall model of systems development life cycle. The **input** of the study includes company data respondents' data, problems encountered by managers (timeliness, consistency, and security) and impact of cloud computing to top level, middle level and operational level managers. The **process** consisted data gathering, analysis, design, development and implementation. The **output** focuses on software-as-a-service, file storage management system using cloud computing.

### RESULTS AND DISCUSSION

The status of the current FSMS in Asian College of Technology was assessed in terms of the demographics of its users also known as the people ware, and the use of technology. The following discussions reveal the results of the status assessment.

#### Peopleware

The peopleware under study were those users of the current FSMS. These are the administrators (academic and non-academic heads), faculty, and non-teaching staff at Asian College of Technology.

The demographic of the users of the current FSMS, as presented in Table 1, revealed that there are more male users (53.49%) than female (46.51%). Majority of the users are single (55.81%), and do not have a masters degree (58.14%). As far as the knowledge on the use of software application, according to the respondents, they have basic knowledge on how to operate the application programs (67.44%).

**Table 1. Demographic Profile of the Respondents**

	<i>f</i>	%
<b>Gender:</b>		
Male	23	53.49
Female	20	46.51
<i>Total</i>	<b>43</b>	<b>100.00</b>
<b>Civil Status:</b>		

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Single	24	55.81
Married	18	41.86
Others	1	2.33
<b>Total</b>	<b>43</b>	<b>100.00</b>
<b>Highest Educational Attainment:</b>		
College Graduate	25	58.14
Masters	18	41.86
<b>Total</b>	<b>43</b>	<b>100.00</b>
<b>Software Application Knowledge:</b>		
Little Knowledge	29	67.44
Much Knowledge	9	20.93
Very Little Knowledge	5	11.63
<b>Total</b>	<b>43</b>	<b>100.00</b>

**Use of Technology**

The researchers, being an employee at Asian College of Technology (ACT), assessed the current FSMS in terms of the use of technology. Present infrastructure, in both hardware and software, were

evaluated based on its number of desktop computers deployed, connectivity setup, and application programs installed. Table 2 below illustrates the present status of the school in terms of the number of desktop computers and connectivity deployed at various offices.

**Table 2. Current Hardware Infrastructure Setup at the Locale of the Study**

Offices	Total # of Desktop Units	# Units with Internet Connection	# Units w/o Internet Connection	# Units Connected to LAN
College of Computer Studies	3	3	0	3
College of Arts, Sciences and Pedagogy	3	2	1	2
College of Nursing and Allied Programs	1	1	0	1
College of Business and Management	3	3	0	3
Student Welfare Services	1	1	0	1
Scholarship Office	2	2	0	2
Guidance Office	2	2	0	2
Admin Office	5	4	1	4
Software Development Office	8	8	0	8
Department of Network and Technical Services	8	8	0	8
Data Center	6	6	0	6
Library	5	3	2	3
<b>Total</b>	<b>47</b>	<b>43</b>	<b>4</b>	<b>43</b>
<b>%</b>	<b>100%</b>	<b>91.49</b>	<b>8.51</b>	<b>91.49</b>

Each department is given ample number of desktop computer units. Some of these units have connectivity, in terms of a Local Area Network (LAN) and Wide Area Network. Although, this is the current infrastructure setup in ACT, this does not necessarily mean that a LAN-based file storage and management system exists in the campus. As presented in Table 3,

ACT’s current file storage and management system is partially computerized. This means that each department is provided with computer units, each of which were installed with the basic software application suite such as Microsoft Office, web utilities like browsers, and other essentials programs.

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**Table 3. Current Software Infrastructure Setup at the Locale of the Study**

Installed Programs	F	%
Office Suite	12	100.00
Web Utilities (browsers, programs, etc.)	12	100.00
Security Tools (firewall, anti-virus, etc.)	12	100.00
Cloud-based Repository Software (Dropbox, Google Drive, One Drive, etc.)	1	8.33
Customized Application Software (enrollment, accounting, etc.)	1	8.33

Although, there are desktop computers in each office or department, absence of a LAN-based custom-built file storage and management system is very evident. Only one office has an installed cloud-based repository (Dropbox). Office staff, heads and faculty manage their files locally – i.e. managed and saved within the local drive of a computer, which made files management localized and isolated. Additionally, file transfer is facilitated using portable drives or flash memory.

These mechanisms of file storage and management system in Asian College of Technology make the entire records management of the department tedious and present possible risks such as file lost and malicious attempts, apart from being **less efficient, less timely and less accessible**.

**Practices**

The current locale of the study, Asian College of Technology, does not have a cloud-based file storage and management system. Each department or office is given an ample number of desktop computers. Employees in each department can use these machines

for office-related tasks. However, files are saved in the local drive. There is no current backup and recovery software. Files are transferred using email and flash memory.

**PERCEPTIONS OF THE RESPONDENTS ON THE CURRENT FILE STORAGE AND MANAGEMENT SYSTEM (FSMS) AS TO UTAUT MODEL**

Respondents were asked to evaluate the current FSMS of Asian College of Technology in terms of: computer efficacy, ease of use, usefulness and system storage.

**Computer Efficacy**

Efficacy of a computer is defined as having features that are at least eighty (80) percent satisfactory and are capable of handling the required activities. In the research, the current FSMS was assessed by the respondents in terms of its efficacy.

In Table 4, all criteria set to evaluate the computer efficacy of the current FSMS were perceived to be less effective.

**Table 4. Current FSMS in terms of Computer Efficacy**

Criteria	[3] A	[2] FA	[1] D	WM	DV
1. Can effectively complete work using the system.	7	31	3	2.10	Fairly Agree
2. Can complete work quickly using the system.	5	27	9	1.90	Fairly Agree
3. Can efficiently complete work using the system.	8	29	4	2.10	Fairly Agree
4. Became productive quickly using the system.	6	29	6	2.00	Fairly Agree
5. The information is effective in helping the user to complete the tasks and scenarios	14	20	7	2.17	Fairly Agree
<b>Composite Mean =</b>				<b>2.05</b>	<b>Fairly Agree</b>

Legend:

- A = Agree
- FA = Fairly Agree
- D = Disagree
- WM= Weighted Mean
- DV = Descriptive Value

As perceived by the respondents, the current FSMS is **less effective** in terms of computer efficacy. According to them, completing their work as quick as possible is very difficult with the current FSMS making the system less effective. As presented in Table 4, ACT does not have its own custom-built and

network-based file storage and management system. Employees of the said school find current FSMS tedious in terms of file transfer and accessibility, which make their work difficult to complete as quick as possible.

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### Ease of Use

Ease of use defined as the functions and capabilities of the system exist and the users are satisfied with its simplicity and user-friendly features. The current FSMS was assessed in terms of its ease of

use. Respondents were asked to answer series of questions evaluating this feature of current FSMS.

On ease of use, according to the respondents, the current FSMS is less effective. In Table 6, the results revealed that the current FSMS does not have all the functions which make it easy to use.

**Table 5. Current FSMS in terms of Ease of Use**

Criteria	[3] A	[2] FA	[1] D	WM	DV
1. Satisfied with how easy the use the system.	12	21	8	2.10	Fairly Agree
2. It is simple to use the system.	14	24	4	2.24	Fairly Agree
3. It is easy to learn to use the system.	18	16	7	2.27	Fairly Agree
4. It is easy to find the information needed.	15	19	7	2.20	Fairly Agree
5. The information provided for the system is easy to understand.	11	23	8	2.07	Fairly Agree
6. The interface of the system is pleasant.	8	27	7	2.02	Fairly Agree
7. The system has all the functions and capabilities that the user is expecting to have.	7	25	10	1.93	Fairly Agree
<b>Composite Mean =</b>				<b>2.12</b>	<b>Fairly Agree</b>

Since the current FSMS is partially computerized, each department has its own mechanism of files management. Thus, ease of use is not standardized across all departments of the school. The user experience varies from one department to another. This made the ease of use of the current FSMS less effective.

### Usefulness

Usefulness of an application refers to the comfort ability of the system to provide notifications and information to the user. In this study, the respondents were asked to evaluate the usefulness of the current FSMS.

As presented in Table 6, the respondents find it less comfortable using the current FSMS. In addition, backup and recovery of lost files is not effective.

**Table 6. Current FSMS in terms of Usefulness**

Indicators	[3] A	[2] FA	[1] D	WM	DV
1. It is comfortable using the system.	15	22	5	2.24	Fairly Agree
2. Easy to learn how to use the system.	12	27	3	2.21	Fairly Agree
3. The system gives error messages that clearly tell how to fix problems.	4	27	11	1.83	Fairly Agree
4. Recovery is easy and quick.	2	21	19	1.60	Disagree
5. The information provided with this system is clear such as online help, on-screen messages, and other documentation.	7	23	12	1.88	Fairly Agree
6. The organization of information on the system screens is clear.	8	28	6	2.05	Fairly Agree
7. Using the interface of this system is more likeable.	6	33	3	2.07	Fairly Agree
<b>Composite Mean =</b>				<b>1.98</b>	<b>Fairly Agree</b>

These results are effects on the current records management in the respective departments and offices of Asian College of Technology which is local, isolated and offline. Thus, the respondents find the current FSMS as **less effective** as far as being useful is concerned.

### System Usage

Respondents were also asked to evaluate the current FSMS in terms of system usage. This is a feature which refers to an ability of the system to enable the user to accomplish a certain task more quickly.

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Since there is absence of a custom-built and cloud-based FSMS in the research environment, the users of the current FSMS find it difficult to perform office and files management tasks quick, easy, reliable and effective; thereby, making the current FSMS tedious to use. Additionally, as perceived by the

respondents, system usage of the current FSMS is also **less effective**.

In Table 7, the results showed that using the current FSMS in completing the task quickly is less effective.

**Table 7. Current FSMS in terms of System Usage**

Indicators	[3] A	[2] FA	[1] D	WM	DV
1. Using the system in a task would enable the user to accomplish tasks more quickly.	2	35	5	1.93	Fairly Agree
2. Using the system would improve job performance.	6	32	4	2.05	Fairly Agree
3. Using the system would increase productivity.	8	29	5	2.07	Fairly Agree
4. Using the system would enhance the effectiveness on the job.	11	25	6	2.12	Fairly Agree
5. Using the system would make it easier to do the job.	9	27	6	2.07	Fairly Agree
6. The system is useful in the job.	16	21	5	2.26	Fairly Agree
	<b>Composite Mean =</b>			<b>2.08</b>	<b>Fairly Agree</b>

As presented in the summary of results, Table 8, all indicators are perceived to be **less effective**. The

usefulness of the current FSMS ranked last among other indicators.

**Table 8. Summary Results on the Current FSMS**

Indicators	Composite Mean	Interpretation
Computer Efficacy	2.05	Less Effective
Ease of Use	2.12	Less Effective
Usefulness	1.98	Less Effective
System Usage	2.08	Less Effective
<b>Overall Composite Mean</b>	<b>2.06</b>	<b>Less Effective</b>

Absence of custom-built and cloud-based FSMS in Asian College of Technology makes the current FSMS less effective in terms of its usefulness. These results are effects on the current records management in the respective departments and offices of Asian College of Technology which is local, isolated and offline.

**PERCEPTIONS OF THE RESPONDENTS ON THE CURRENT FILE STORAGE AND MANAGEMENT SYSTEM (FSMS) AS TO SaaS**

The efficiency of the current FSMS were evaluated by respondents, in terms of: timeliness, accessibility and security.

**Timeliness.** Timeliness refers to an adeptness of the system to deliver a certain task on a span or specific period of time. The current FSMS is perceived to be **less efficient** in terms of its timelines.

Table 9 reveals that the current FSMS of Asian College of Technology is less efficient when it comes to on-time delivery of files or documents. Searching of files is also less efficient in the current FSMS. This discomfort is experienced by the respondents since there is no file tagging in the current FSMS. File tagging facilitates easy searching of files or documents. Moreover, files or documents cannot be delivered or accessed on-time since files are located in local drives which are isolated and localized.



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**Table 9. Efficiency of the Current FSMS in terms of Timeliness**

Criteria	[3] A	[2] FA	[1] D	WM	DV
1. The needed documents or files are delivered on time.	3	31	9	1.86	Fairly Agree
2. It does not require much time and effort in doing file organization.	7	27	9	1.95	Fairly Agree
3. Search option is offered to allow faster searching.	18	18	7	2.26	Fairly Agree
<b>Composite Mean =</b>				<b>2.02</b>	<b>Fairly Agree</b>

**Accessibility.**  
Accessibility is an ability of the system to be available or manageable to the users. Since the current FSMS is not connected to a local area network; thus,

files management is localized and isolated. According to the respondents, in Table 10, the multiple accesses of files by concurrent users, and quick searching using keywords and/or tagging are less efficient

**Table 10. Efficiency of the Current FSMS in terms of Accessibility**

Criteria	[3] A	[2] FA	[1] D	WM	DV
1. Files are accessible anywhere as long as there is internet connection and you are given the right.	13	23	6	2.17	Fairly Agree
2. A file can be accessed by more than one user at the same time.	9	25	9	2.00	Fairly Agree
3. There is navigation option to allow easy access to files.	12	24	5	2.17	Fairly Agree
4. Search option use keywords to allow easy location of files.	13	23	4	2.23	Fairly Agree
<b>Composite Mean =</b>				<b>2.14</b>	<b>Fairly Agree</b>

**Security.**  
This is a feature of a system that assures the user with access rights and authentication. Security is one of the main concerns of the current FSMS since it does not support user accounts management that can

facilitate authorized login. According to the respondents, in Table 11, the current FSMS is less efficient in terms of access rights, authentication and user accounts management and monitoring.

**Table 11. Efficiency of the Current FSMS in terms of Security**

Criteria	[3] A	[2] FA	[1] D	WM	DV
1. There is access right for every stored file in the system.	12	26	4	2.19	Fairly Agree
2. Versioning is offered so that original files are not overwritten when there are modifications being done.	8	29	5	2.07	Fairly Agree
3. There is a user log to monitor who accessed and what file is modified.	9	24	9	2.00	Fairly Agree
<b>Composite Mean =</b>				<b>2.09</b>	<b>Fairly Agree</b>

In Table 12, from among the three indicators, timeliness is perceived to be the least efficient in the current FSMS. A system is said to be timely if it can deliver the needed task in a short period of time.

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**Table 12. Summary of Results on Efficiency of the Current FSMS**

Indicators	Composite Mean	Interpretation
Timeliness	2.02	Less Efficient
Accessibility	2.14	Less Efficient
Security	2.09	Less Efficient
<b>Overall Composite Mean =</b>	<b>2.08</b>	<b>Less Efficient</b>

The current FSMS is local. Thus, it is offline. An offline system cannot deliver tasks as timely as possible since files management is purely dependent on the local machine.

**FEATURES OF A GOOD FILES STORAGE AND MANAGEMENT SYSTEM (FSMS) AS PERCEIVED BY THE RESPONDENTS**

On a given researchers-made questionnaire, respondents were asked to choose at least one of the features of a good or ideal FSMS. The features listed are based on ideal features of a cloud-based file

hosting service. The researchers believed that the features of a good FSMS as perceived by the respondents will help develop a cloud-based file storage and management system for Asian College of Technology employees.

Table 13 shows that online and offline access, and centralized administration are the most and least preferred feature, respectively. Respondents believed that a cloud-based FSMS that provides both offline and online facilities can help them accomplish their tasks effectively and efficiently.

**Table 13. Perceived Features of a Good FSMS**

Features of a Good FSMS	F	%
1. Online and offline access	38	88.37
2. Store files of any size	37	86.05
3. File and folder permissions based on access levels	32	74.42
4. Centralized administration	31	72.09
5. User authentication	37	86.05

A file storage and management system that supports both online and offline access provides flexibility for the users. This means that files can be managed even without the Internet connection, and that online syncing is available for better and timely accessibility. Moreover, it is revealed that respondents want to have a dynamic storage system – capable of storing files in any type and size. User authentication must also be present since this ensures security of file access. Centralized administration is the least perceived feature of a good FSMS because it is assumed by the users that they are given full

autonomy and control of their own files when using the cloud-based FSMS.

**RELATIONSHIP BETWEEN FEATURES AND EFFICIENCY OF FSMS**

The gathered data were processed further to determine if there is a significant relationship between the efficiency of the current FSMS and the perceived features of a good FSMS. Pearson’s r coefficient of correlation was used to test the relationship at significance level of 0.05. The following are the details of the hypothesis testing.

**Table 14. Correlation between Features and Efficiency of FSMS**

Respondent #	Features		Efficiency		XY
	X	X <sup>2</sup>	Y	Y <sup>2</sup>	
1	1.67	2.78	5.20	27.04	8.67
2	2.06	4.23	4.07	16.54	8.36
3	2.11	4.46	3.93	15.47	8.30
4	2.39	5.71	4.13	17.08	9.87
5	1.92	3.67	4.13	17.08	7.92
6	1.69	2.87	3.87	14.95	6.55



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	<b>GIF (Australia) = 0.564</b>	<b>ESJI (KZ) = 9.035</b>	<b>IBI (India) = 4.260</b>
	<b>JIF = 1.500</b>	<b>SJIF (Morocco) = 7.184</b>	<b>OAJI (USA) = 0.350</b>

7	2.03	4.11	4.27	18.20	8.65
8	1.78	3.16	4.40	19.36	7.82
9	2.64	6.96	4.80	23.04	12.67
10	2.58	6.67	4.53	20.55	11.71
11	2.39	5.71	4.67	21.78	11.15
12	2.00	4.00	4.20	17.64	8.40
13	2.19	4.82	4.20	17.64	9.22
14	2.25	5.06	4.07	16.54	9.15
15	2.58	6.67	4.80	23.04	12.40
16	2.25	5.06	4.07	16.54	9.15
17	2.67	7.11	4.53	20.55	12.09
18	1.94	3.78	4.40	19.36	8.56
19	2.78	7.72	5.00	25.00	13.89
20	2.50	6.25	4.40	19.36	11.00
21	2.25	5.06	4.20	17.64	9.45
22	2.81	7.87	4.93	24.34	13.84
23	2.00	4.00	3.73	13.94	7.47
24	1.92	3.67	3.73	13.94	7.16
25	2.11	4.46	3.20	10.24	6.76
26	2.39	5.71	4.40	19.36	10.51
27	1.42	2.01	2.93	8.60	4.16
28	1.42	2.01	2.47	6.08	3.49
29	1.69	2.87	3.40	11.56	5.76
30	1.11	1.23	2.67	7.11	2.96
31	2.00	4.00	3.13	9.82	6.27
32	2.58	6.67	4.47	19.95	11.54
33	1.78	3.16	4.07	16.54	7.23
34	2.19	4.82	4.33	18.78	9.51
35	2.33	5.44	3.47	12.02	8.09
36	2.08	4.34	4.27	18.20	8.89
37	1.50	2.25	3.07	9.40	4.60
38	2.67	7.11	5.67	32.11	15.11
39	2.00	4.00	4.33	18.78	8.67
40	2.39	5.71	3.00	9.00	7.17
41	2.11	4.46	4.00	16.00	8.44
42	1.14	1.30	2.80	7.84	3.19
43	1.25	1.56	3.20	10.24	4.00
<b>Sum =</b>	<b>89.56</b>	<b>194.51</b>	<b>173.13</b>	<b>718.26</b>	<b>369.78</b>
<b>Mean =</b>	<b>2.08</b>		<b>4.03</b>		

**Null Hypothesis (H<sub>0</sub>):** *There is no significant relationship between the efficiency of the current FSMS and the perceived features of a good FSMS.*

**Alternative Hypothesis (H<sub>a</sub>):** *There is a significant relationship between the efficiency of the current FSMS and the perceived features of a good FSMS.*

Level of Significance ( $\alpha$ ): 0.05

Pearson's r correlation:

**r = 0.707233586**

Critical r value at 41 df ( $\alpha$ ) = **0.3008**

**Result and Interpretation:**

Using Pearson's r correlation coefficient to test the hypothesis, the computed r value is **0.707233586** is greater than the critical r value (**0.3008**) at 41 df and

$\alpha = 0.05$ . **Therefore, the null hypothesis is rejected.**

As perceived by the respondents, there the features of FSMS create a positive impact on its efficiency.

**Findings**

Based on the gathered data, the study revealed the following major findings.

There is **no custom-built and cloud-based File Storage and Management System (FSMS)** in Asian College of Technology. The FSMS is **partially computerized**. The school deployed a **localized, isolated and offline FSMS using the basic office suite and productivity tools**. This file storage and management mechanism is **less efficient and less effective** as perceived by the users of the current FSMS.

## Impact Factor:

ISRA (India) = 6.317  
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OAJI (USA) = 0.350

### Conclusion

Anchored on the major findings of the study, it can be concluded that there is a need to design and develop a cloud-based File Storage and Management

System for Asian College of Technology employees. The cloud-based FSMS would help the employees of the said school function their tasks effectively and efficiently.

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