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Influence of Modern Office Technology Skills on Information Security in Public Establishments in South East, Nigeria

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Abstract: The study ascertained influence of modern office technology skills on information security in public establishments in South East, Nigeria. Four research questions and four null hypotheses guided the study. Survey research design was adopted for the study and 386 secretaries in 91 ministerial departments in the five states of South-East, Nigeria were studied without sampling. Two instruments namely: Modern Office Technology Skills Questionnaire (MOTSQ), and Information Security Questionnaire (ISQ) structured in four-point scales were used for data collection. Pilot-testing was used to establish the reliability of the instruments. Cronbach Alpha method was used to obtain the reliability co-efficient and to determine the internal consistency. The values obtained was an overall reliability of 0.77 for MOTQ, while coefficient value of 0.73 was obtained for cluster D named ISQ. Mean and standard deviation were used to answer the research questions, while independent t-test was used to test the null hypotheses at 0.05 alpha level. The study concluded based on the findings that majority of modern office technology skills on information security in public establishments in South East, Nigeria mentioned were rated to high extent. The low extent rated on cloud computing skills showed that secretaries were unable to use it to reduce security hazards in public establishments. It was recommended among others that public establishments should provide secretaries with training and retraining programmes from time to time to help them learn new modern office technology skills like cloud computing or update existing ones that would improve their performance on information security.

Keywords: Modern Office, Technological Skills, Information, Information Security and Public establishments.

I. Introduction

Information is one of the resources that an organization is heavily dependent on; if the critical information of an organization is compromised, the organization can suffer serious consequences that may come in the form of loss of income, loss of customers' trust and maybe legal action among others. Therefore, information should be protected and secured. Information security refers to the protection of the confidentiality, integrity and access to information (Kruger & Kearney, 2016). Information security is the state of being protected against the unauthorized use of information; electronic data, software applications and hardware (Lundgren & Möller, 2017). Information security commonly known as InfoSec, encompasses a range of practices aimed at safeguarding data against unauthorized access, disclosure, disruption, modification, or destruction. It plays a vital role in maintaining the security and integrity of both personal and organizational information system within the broader context of cyber security strategies (NIST, 2023).

Information security is the practice of defending information and information bearing materials from unauthorized access, use, disclosure, disruption, modification, perusal, inspection, recording or destruction. It is a general term that can be used regardless of the form the data may take (electronic, physical, etc...). The definitions of InfoSec suggested in different sources are summarized below: Preservation of confidentiality, integrity and availability of information. The main goal of Information Security is to achieve information confidentiality, integrity and availability (Lundgren & Möller, 2017). Thorwat, 2018; Arbanas & Hrustek (2019) all noted that in a case where the security of Information Systems is compromised, the organization faces risks such as information breaches, data loss, cyber-attacks and even the loss of business. It is estimated that the loss of resources due to poor Information Security will cost the world about US$ 10.5 trillion by 2025 (Sausalito, 2020). This loss is greater than the GDP (Nominal) earned in Africa, which is 2.49 Trillion US$ (International Monetary Fund, 2021). Therefore, it is indisputable that resources that could be used to enrich the standard of living of people are wasted through criminal schemes due to inadequate electronic protection.

Modern office technology as a universal information technology is the new science of information collection, storage, processing and transmission. Modern office technologies connote an ensemble of technologies which covers computer and storage technologies, to store and processing information known as information processing, connected together with telecommunication technologies, which are capable of transmitting information to distances. Information technology covers all aspects of arts, or science of processing data to produce information (Ekere et-al., 2019). The emergence of computers and telecommunication technology has popularized electronic access to information Oguejiofor and Okem (2021). noted that modern office automation has revolutionised the secretarial procedures in modern offices and has greatly improved the way secretaries carry out their duties. Modern technologies comprise of both Information Technology (IT) and Information Communication Technology (ICT). Modern office technologies are resources, products or process with an underlying technology base composed of computers (both hardware and software) workstations or computerized, communication networks of all types including Local Area Network (LANs), Wide

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Area network (WANs) intranets, internet, robotics and smart chips (Chukwukelu & Ile, 2018). One of the byproducts of Information Communication Technology (ICT) advances across the world is electronic publishing (e-publishing), also known *as* digital publishing. E-publishing is a broad term used to describe all forms of electronic aids to authors and publishers, from simple word processing capabilities to actually designing, publishing and selling printed matter in soft instead of hard format (Renu, 2018). In many countries, therefore, electronic resources such as CD-ROMs, CDs, DVDs, PDFs are replacing the traditional paper copies of books, journals, newspapers and magazines (Adesina, 2019). Electronic publishing skills also refers to the abilities and expertise required to create, design, edit and distribute digital content across various electronic platforms. These skills are essential for publishing content in digital formats, such as e-books, online magazines, and websites and multimedia presentations rather than through traditional print media.

Electronic publishing skills and internet application skills has a mutual focus on digital content creation and distribution. Effective electronic publishing requires an understanding of how to leverage the internet's infrastructure such as websites, applications and social media to disseminate and optimize content. Conversely, internet application skills enhance the reach, visibility and functionality of published content, ensuring it can be effectively interacted with by online audiences. In essence, electronic publishing focuses on content creation, while internet application skill emphasize content delivery and engagement by secretaries in public establishments. Internet is as an acronym for international network for communication, and it is the fastest growing part of the age of information and communication technology; it can be described as a worldwide connection of computers that is interconnected, and utilizes Internet Protocol (IP) to support communication (Ameyaw and Asante, 2019). Internet has become the largest and most important network today and has evolved into a global information super high way. In the opinion of Malaki and Phiri (2020), the internet is a global collection of many different types of computers, computer operators and computer networks that are linked together through telephone lines, satellites, microphones, and all other possible devices. Similarly, Laudon and Traver (2020) asserted that the internet is a global collection of many different types of computers, computer operators and computer networks that are linked together through telephone lines, satellites, microphones to communicate between networks and devices. The internet is used in diverse fields, such as business, entertainment, education, communication, medicine, reference, engineering and sports (Van Deursen et-al, 2016; Diaz et-al, 2018). The internet has become the largest and most important network today and has evolved into a global information super high way.

Internet application skills can be seen as the abilities and knowledge required to effectively use internet-based tools, services and platforms for communication, research, business and personal activities.Oguejiofor and Ikedimma (2021) opined that internet application skills is a mixture of skills and knowledge of using the internet to improve performance. These skills enable individuals to interact with the online world in a productive, secure and informed manner. Mota and Cilento, (2020) described internet skills to include using the World Wide Web (WWW), sending email messages, using a word to find specific information, taking part in an on-line discussion or chatting (video conferencing), and sending attachments with email. Also, included are, having the World Wide Web skills which include – using search engines like Google, Yahoo, MSN, using keywords or phrases to search for information on the www, using more advanced search techniques than key words or phrases. Longworth and Davies in Oguejiofor and Iyoha (2023) noted that changes in the work regime involve not only individuals who have several jobs in a lifetime, but also having several careers.The implication is that individuals need to be continuosly updating and upgrading their skills throughout their working life. Electronic publishing, internet applications and electronic information processing skills are interconnected in the digital ecosystem. While electronic publishing focuses on content creation, internet application skills addresses distribution and engagement strategies, electronic information processing skills underpins the analytical foundation needed to evaluate and improve content effectiveness in both publishing and online applications (Meyer, 2017).

Information processing consists of locating and capturing information, using software to manipulate it into a desired form, and outputting the data. Electronic information processing (EIP) is also called Electronic data processing (EDP), is a generic term that describes a system of hardware, software, procedures, and personnel that work together to sort and process data so that it can be used for a variety of purposes. Electronic information processing skills is therefore defined as the ability and competences to process information in such a way that non-relevant data are excluded while relevant information is profound (Fordjour et-al., 2020). Electronic information processing skills to refer to essential abilities that enable efficient handling of digital data and information using modern technology. These skills help secretarial professionals manage administrative tasks, streamline communication and ensure accurate record-keeping. They are crucial for organizing office workflows and improving productivity in their various workplaces. Odede and Zawedde (2018) highlighted some of the electronic information processing skills to include ability to use word processors to improves the accuracy of information produced, reduces the cost of information processes, reduces the amount of time spent on processing data, reduces the amount of resources utilized while processing information, simplifies the management of stored data and information, facilitates the storage of large amount of files that would have occupied large office spaces, improves the speed with which copies of files are produced, reduces the workload of secretaries, carry out multiple task at a given time, and boosts the feasibility of task performed. Cloud computing creates integrated ecosystem where electronic publishing, internet application and electronic information processing skills can converge. By leveraging cloud technologies, secretaries and their organizations can streamline workflows, enhance collaborations and improve the efficiency of digital content creation and distribution processes.

Cloud computing refers to services in the Cloud that provides computation, software, data access and storage (Brayan, 2020). Software-as-a-Service (SaaS), Platform-as-a-Service (PaaS), and Infrastructure-as-a-Service (IaaS) are the three most popular cloud computing services (Idris, Audu & Abiola, 2022). Ouma and Gitonga (2023) observed that the use of cloud-computing

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services by businesses has grown exponentially over the years. In line with this view, Thobejane et al (2022), noted that business organizations are taking advantages of these models and services. But there is a problem concerning the preparation of people to work in cloud environments. The question is what competencies they must have in order to be prepared to work in such an environment to be competitive in the labor market in the coming years. Thobejane et al further stated that students' competences in cloud computing are ability to work with remote services in internet, co-work with different types of documents; share data and files, and ability to share screen. Others are knowledge and skill for usage of digital repositories and ability to acquire main terms and concepts of cloud computing. Some important cloud computing competencies for record managers include; ability to; apply retention and disposition specifications to aggregations of records, lock down records for viewing only, retain records indefinitely in the cloud, destroy at a future date records not in an aggregation, transfer at a future date records not in an aggregation, delete records according to the retention/disposition schedule, delete backups according to the retention/disposition schedule, alert users to conflicts related to links from records to be deleted to other records aggregations that have different records disposition requirements. Others are ability to: use cloud archiving applications such as Mimecast cloud, and microsoft exchange online platform to safely and securely store data, document disposal actions in process metadata, automatically record and report to the administrator all disposal actions, mark records for destruction in the cloud, store in metadata all decisions made during review, and use cloud to generate reports on the disposition process (Franks, 2018).

Public establishments are the operational arm of government established as instrument for implementing the economic or social development programmes or for providing essential services to the populace. Furthermore, public establishment plays key roles in promoting socio-economic development by providing a wide range of products and services to the nation. The amount of sensitive information gathered and disseminated among public establishments is currently expanding at a near-constant rate because of the evolvement of technology, decreased information storage charges, and the advent of big information warehousing organizations. Nevertheless, as the sheer amount of information usage increases so do criminal activities on information systems (Makeri, 2019 and Nwabueze et al, 2022). In actuality, numerous Nigerian public establishments' information has been illegally accessed by cyber thieves, and their sensitive information compromised, resulting in information loss, public lack of confidence and financial damages (Aliyu, 2022). In a comparable manner, Aliyu further noted that there exists an ongoing kind of cyber-crime perpetrated that has severely affected numerous public establishments in Nigeria. Thorwat (2018) earlier reported that cyber criminals particularly in Nigeria are developing novel strategies of stealing information from public establishments on a daily basis, and existing information security measures were inadequate to deal with their new tricks. In the context of this study, public establishments refer to government owned establishments where secretaries can be found such as Civil service commission of each state in South-East, Nigeria.

Secretaries are part of the most significant factors that contribute to the achievement of strategic goals in any public establishments. Secretarial staff are the office staff needed in both private and public organization to assist employers or superiors in achieving the organization's goals or objectives (Odusina et-al., 2022). Male or female administrative staff who oversee the day-to-day information management of businesses are required to have extensive knowledge and skills in using modern office technologies to achieve information security. As technological advancements bring new information security challenges to public establishments, secretarial staff are expected to shift their focus from time to time to meeting these challenges. Financial scandals, corruption, deliberate destruction of information after misappropriation of funds to cover up cases, continued loss of information by both managers and employees, and hacking of vital information of public establishments however indicate a gap in modern office technology skills applied by secretarial staff for information security. Furthermore, it has been observed that some Nigeria's organizations do not have a developed information security management culture. These have been linked to knowledge gaps, the high expense of acquiring modern office technology, a lackluster information architecture, and a shortage of staff members who are educated to install, operate, and use electronic information management systems (Alshaikh, 2020). Similar to this, the researcher's observations of a few public establishments in South East Nigeria revealed that information generated appears to be subject to ongoing security issues. This may be linked to the secretarial staff's inadequate use of current office technology skills, as they are responsible for maintaining the organization's office information. The integrity of the establishments could be harmed by this scenario in public establishments by exposing crucial or private organizational information to online criminals for use in their nefarious activities.

The secretarial staff may hold varying views on modern office technology skills on information security in public establishments based on gender, and age. Gender is the state of being male or female, especially when considered with reference to social and cultural differences, rather than biological ones. Male administrative staff may possess modern office technologies skills more than their female counterparts which could lead to differences in their opinions on the influence of office technologies skills and record management on information security. As noted by Nwabueze et-al. (2022), gender influences the new technologies skills possessed by employees for effective office performance. Due to the high frequency of information breaches and theft in Nigerian public establishments, it is necessary for this study to investigate the influence of modern office technology skills on information security in public establishments in South East, Nigeria.

II. Statement of the Problem

The rapid advancement of modern office technology has significantly transformed information management in public establishments, enhancing efficiency, accessibility, and data security. However, in South East, Nigeria, the extent to which

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employees possess and apply modern office technology skills to safeguard information security remains a concern. Despite efforts to modernize office operations with digital tools, gaps persist in the proper handling of electronic records, secure communication and adherence to cyber security best practices. weaknesses in employees' ability to use modern office technologies effectively has led to poor password management, exposure to phishing attacks, improper data storage and compliance failures, ultimately compromising information security in public establishments. Furthermore, the researcher is concerned that failing to recognize the contemporary office technology competencies that influence information security of public establishments will worsen the incidence of information privacy breaches that reveal the establishments' private information to the public, giving cyber criminals opportunity to hack into their databases to carry out well-planned illegal activities. It might also make it impossible to stop fraud, which is increasingly committed through computers in public establishments Therefore, this study is essential to determine the influence of modern office technology skills of secretarial staff on information security in public establishments in South East, Nigeria.

III. Methods

The survey design was adopted for the study and 386 secretaries in 91 ministerial departments in the five states of South-East, Nigeria were studied without sampling. Two instruments namely: Modern Office Technology Skills Questionnaire (MOTSQ) and Information Security Questionnaire (ISQ) structured on four-point scales were used for data collection. Face and construct validity of the instrument were established by three experts in the Department of Vocational Education and Educational Foundations of Chukwuemeka Odumegwu Ojukwu University. Four research questions and four null hypotheses guided the study Pilot-testing was used to establish the reliability of the instruments. Cronbach Alpha method was used to obtain the reliability co-efficient and to determine the internal consistency. The values obtained were 0.81, 0.80, 0.74 and 0.72 for clusters B1 to B4 with an overall reliability of 0.77 for MOTQ, while coefficient value of 0.73 was obtained for Cluster D named ISQ. The researcher and five research assistants were involved in administering 386 copies of the questionnaires to the respondents and 274 copies were correctly filled and retrieved, which indicated 97 percent return rate. Mean and standard deviation were used to answer the research questions, while independent t-test was used to test the null hypotheses at 0.05 alpha level. Responses to the research questions was based on the cluster mean relative to the real limits of numbers below:

Responses	**Rating Scale**	**Real Limits of Number**
Very High Extent (VHE)	4	3.50 – 4.00
High Extent (HE)	3	2.50 – 3.49
Low Extent (LE)	2	1.50 – 2.49
Very Low Extent (VLE)	1	1.00 – 1.49

Research Questions

The following research questions guided this study:

1. What is the extent of influence of electronic publishing skills of administrative staff on information security in public establishments in South East, Nigeria?
2. What is the extent of influence of internet application skills of administrative staff on information security in public establishments in South East, Nigeria?
3. What is the extent of influence of electronic information processing skills of administrative staff on information security in public establishments in South East, Nigeria?
4. What is the extent of influence of cloud computing skills of administrative staff on information security in public establishments in South East, Nigeria?

Null Hypotheses

The following null hypotheses were tested at 0.05 level of significance:

H_{O1}: There is no significant difference in the mean ratings of administrative staff on the extent of influence of electronic publishing skills on information security in public establishments in South East, Nigeria based on gender.

H_{O2}: There is no significant difference in the mean ratings of administrative staff on the extent of influence of internet application skills on information security in public establishments in South East, Nigeria based on gender.

H_{O3}: There is no significant difference in the mean ratings of administrative staff on the extent of influence of electronic information processing skills on information security in public establishments in South East, Nigeria based on gender.

H_{O4}: There is no significant difference in the mean ratings of administrative staff on the extent of influence of cloud computing skills on information security in public establishments in South East, Nigeria based on gender.

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IV. Results

Research Question 1: What is the extent of influence of electronic publishing skills of secretaries on information security in public establishments in South East, Nigeria?

Table 1: Secretaries' mean ratings on the extent of influence of electronic publishing skills on information security in public establishments in South East, Nigeria. N =374

S/N	Electronic Publishing Skills on Information Security	Mean ($\bar{X}$)	SD	Remarks
1	Performing tasks such as working through a document	2.68	0.7	High Extent
2	Performing tasks such as deleting	2.57	0.73	High Extent
3	Storing office documents without much stress	3.7	0.48	Very High Extent
4	Generating Hypertext Markup Language	2.39	0.75	Low Extent
5	Formatting ideas electronically in multimedia form	2.54	0.74	High Extent
6	Using proofread created office documents	2.7	0.68	High Extent
7	Designing and producing office documents	2.8	0.66	High Extent
8	Using modern office gadgets for job performance	3.14	0.61	High Extent
9	Formatting ideas electronically in textual form	3.48	0.52	High Extent
10	Creating content in blogs for different audiences	3.23	0.59	High Extent
11	Performing tasks such as working through inserting information	3.29	0.56	High Extent
12	Publishing ideas electronically in multimedia form	2.55	0.74	High Extent
13	Publishing ideas electronically in textual form	3.23	0.58	High Extent
14	Creating content in YouTube for different audiences	2.34	0.78	Low Extent
15	Creating content in personal web pages for different audiences	2.43	0.76	Low Extent
Cluster Mean	-	**2.89**	-	**High Extent**

Key-VHE=Very High Extent; HE= High Extent; LE= Low Extent; VLE= Very Low Extent.

In Table 1, the analysis shows that the respondents rated one item (3) out of the 15 electronic publishing skills as very high extent with mean score ranged of 3.70. Eleven items (1, 2, 5, 6, 7, 8, 9, 10, 11, 12 and 13) have mean score ratings from 2.55 to 3.29 as high extent, while the remaining 3 items (4, 14 and 15) as low extent and have mean score rating from 2.34 to 2.43 as electronic publishing skills of secretaries on information security in public establishments in South East, Nigeria. The standard deviation of 0.48 to 0.78 showed that respondents are not wide apart in their mean ratings which indicate homogeneity. The cluster mean score of 2.89 indicates that electronic publishing skills of secretaries on information security was rated as high extent in public establishments in South East, Nigeria.

Research Question 2: What is the extent of influence of internet application skills of secretaries on information security in public establishments in South East, Nigeria?

Table 2: Secretaries' mean ratings on the extent of influence of internet application skills on information security in public establishments in South East, Nigeria. N =374

S/N	Internet Application Skills on Information Security	Mean ($\bar{X}$)	SD	Remarks
1	Preventing data breaches	3.43	0.48	High Extent
2	Blocking access to irrelevant websites	2.26	0.65	Low Extent
3	Managing incoming e-mail	2.54	0.56	High Extent
4	Opening websites by entering the Uniform Resource Locator (URL) in the browser's location bar	2.34	0.64	Low Extent

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5	Navigating between pages using the browser buttons	3.45	0.46	High Extent
6	Saving files to the hard drive	3.24	0.52	High Extent
7	Organizing e-mail into folders	2.26	0.65	Low Extent
8	Preventing office information theft	3.27	0.5	High Extent
9	Using antivirus to protect office computers from network attacks	2.52	0.56	High Extent
10	Applying safety principles to protect the office computers	3.24	0.52	High Extent
11	Blocking access to irrelevant materials	3.46	0.44	High Extent
12	Managing outgoing e-mail	2.42	0.59	Low Extent
13	Preventing office information plagiarism	2.56	0.52	High Extent
14	Using spyware to protect office computers from network attacks	3.12	0.54	High Extent
15	Applying safety principles to protect the office computers' networks from virus attack	2.5	0.57	High Extent
Cluster Mean	**-**	**2.84**	**-**	**High Extent**

Key-VHE=Very High Extent; HE= High Extent; LE= Low Extent; VLE= Very Low Extent.

In Table 2, the analysis shows that the respondents rated 4 item (17, 19, 22 and 27) out of the 15 internet application skills as low extent with mean score ranging from 2.26. to 2.42. The remaining eleven items (16, 18, 20, 21, 23, 24, 25, 26, 28, 29 and 30) have mean score ratings from 2.50 to 3.45 was high extent on internet application skills of secretaries on information security in public establishments in South East, Nigeria. The standard deviation of 0.44 to 0.64 showed that respondents are not wide apart in their mean ratings which indicate homogeneity. The cluster mean score of 2.84 indicates that internet application skills of secretaries on information security was rated as high extent in public establishments in South East, Nigeria.

Research Question 3: What is the extent of influence of electronic information processing skills of secretaries on information security in public establishments in South East, Nigeria?

Table 3: Secretaries' mean ratings on the extent of influence of electronic information processing skills on information security in public establishments in South East, Nigeria. N =374

S/N	Electronic Information Processing Skills on Information Security	Mean ($\bar{X}$)	SD	Remarks
1	Using word processors to improve the accuracy of information produced	3.25	0.63	High Extent
2	Reducing the cost of information processes	3.2	0.65	High Extent
3	Reducing the amount of time spent on processing data	3.27	0.6	High Extent
4	Reducing the amount of resources utilized while processing information	3.49	0.44	High Extent
5	Simplifying the management of stored data	3.44	0.41	High Extent
6	Facilitating the storage of a large amount of files that would have occupied large office spaces	3.24	0.46	High Extent
7	Improving the speed with which copies of files are produced	3.26	0.61	High Extent
8	Reducing the workload of secretaries	3.2	0.46	High Extent
9	Carrying out multiple tasks at a given time	3.7	0.4	Very High Extent
10	Boosting the feasibility of tasks performed	3.39	0.46	High Extent
11	Simplifying the management of stored information	3.34	0.5	High Extent
Cluster Mean	**-**	**3.34**	**-**	**High Extent**

Key-VHE=Very High Extent; HE= High Extent; LE= Low Extent; VLE= Very Low Extent.

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In Table 3, the analysis shows that the respondents rated 1 item (39) out of the 11 electronic information processing skills as very high extent with mean score ranged of 3.70. The remaining ten items (31, 32, 33, 34, 35, 36, 37, 38, 40 and 41) have mean score ratings from 3.20 to 3.49 was rated to be high electronic information processing skills of secretaries on information security in public establishments in South East, Nigeria. The standard deviation of 0.40 to 0.65 showed that respondents are not wide apart in their mean ratings which indicate homogeneity. The cluster mean score of 3.34 indicates that electronic information processing skills of secretaries on information security was rated as high extent in public establishments in South East, Nigeria.

Research Question 4: What is the extent of influence of cloud computing skills of secretaries on information security in public establishments in South East, Nigeria?

Table 4: Secretaries' mean ratings on the extent of influence of cloud computing skills on information security in public establishments in South East, Nigeria. N =374

S/N	Cloud Computing Skills on Information Security	Mean ($\bar{X}$)	SD	Remarks
1	Creating information using Google Docs	2.45	0.54	Low Extent
2	Saving information using Google Docs	2.22	0.59	Low Extent
3	Storing information using Dropbox	2.37	0.58	Low Extent
4	Storing information using Google Drive	2.89	0.45	High Extent
5	Marking information for deletion in the cloud	1.64	0.65	Low Extent
6	Restricting information to viewing only	2.74	0.48	High Extent
7	Storing information in the cloud indefinitely	1.7	0.63	Low Extent
8	Removing information in accordance with the retention/disposition plan	2.5	0.52	High Extent
9	Erasing backups in accordance with the retention plan	3.47	0.4	High Extent
10	Enhancing information disaster recovery	2.38	0.62	Low Extent
11	Erasing backups in accordance with the disposition plan	2.46	0.53	Low Extent
Cluster Mean	-	**2.44**	-	**Low Extent**

Key-VHE=Very High Extent; HE= High Extent; LE= Low Extent; VLE= Very Low Extent.

In Table 4, the analysis shows that the respondents rated 4 items (45, 47, 49 and 50) out of the 11 cloud computing skills as high extent with mean score ranging from 2.74 to 3.47. The remaining seven items (42, 43, 44, 46, 48, 51 and 52) have mean score ratings from 1.64 to 2.46 was low extent on cloud computing skills of secretaries on information security in public establishments in South East, Nigeria. The standard deviation of 0.40 to 0.65 showed that respondents are not wide apart in their mean ratings which indicate homogeneity. The cluster mean score of 2.44 indicates that cloud computing skills of secretaries on information security was rated as low extent in public establishments in South East, Nigeria.

Hypothesis 1: There is no significant difference in the mean ratings of secretaries on the extent of influence of electronic publishing skills on information security in public establishments in South East, Nigeria based on gender.

Table 5: Summary of t-test analysis on the mean ratings of secretaries on the extent of influence of electronic publishing skills on information security in public establishments in South East, Nigeria based on gender.

Gender	N	$\bar{X}$	SD	α	df	t-cal	p-value	Decision
Male	96	21.83	3.89	0.05	372	2.932	.000	Significant
Female	278	19.05	2.60					

$P < .05$

The results in Table 8 shows that the mean score for male secretaries (***X****=21.83, SD=3.89*) is significantly higher than that of female secretaries (***X****=19.05, SD=2.60*); *t(372)* = 2.932, *p= 0.000*. The null hypothesis of significant difference between the two groups was observed on the extent they influence electronic publishing skills on information security in public establishments in South East, Nigeria was therefore rejected.

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Hypothesis 2: There is no significant difference in the mean ratings of secretaries on the extent of influence of internet application skills on information security in public establishments in South East, Nigeria based on gender.

Table 6: Summary of t-test analysis on the mean ratings of secretaries on the extent of influence of internet application skills on information security in public establishments in South East, Nigeria based on gender.

Gender	N	$\bar{X}$	SD	α	df	t-cal	p-value	Decision
Male	96	19.18	3.18	0.05	372	2.134	.003	Significant
Female	278	17.11	1.01					

$P < .05$.

The results in Table 9 shows that mean score of male secretaries (***X****=19.18, SD=3.18*) is significantly higher than that of female secretaries (***X****=17.11, SD=1.01*); *t(372)= 2.134, p= 0.003*. The null hypothesis of significant difference between the two groups was observed on the extent they influence internet application skills on information security in public establishments in South East, Nigeria was therefore rejected.

Hypothesis 3: There is no significant difference in the mean ratings of secretaries on the extent of influence of electronic information processing skills on information security in public establishments in South East, Nigeria based on gender.

Table 7: Summary of t-test analysis on the mean ratings of secretaries on the extent of influence of electronic information processing skills on information security in public establishments in South East, Nigeria based on gender.

Gender	N	$\bar{X}$	SD	α	df	t-cal	p-value	Decision
Male	96	23.14	3.14	0.05	372	3.981	.102	Not Significant
Female	278	19.11	2.13					

$P > .05$.

The results in Table 10 shows that mean score of male secretaries (***X****=23.14, SD=3.14*) is significantly higher than that of female secretaries (***X****=19.11, SD=2.13*); *t(372)= 3.981, p= 0.102*. The null hypothesis of no significant difference between the two groups was observed on the extent they influence electronic information processing skills on information security in public establishments in South East, Nigeria was therefore not rejected.

Hypothesis 4: There is no significant difference in the mean ratings of secretaries on the extent of influence of cloud computing skills on information security in public establishments in South East, Nigeria based on gender.

Table 8: Summary of t-test analysis on the mean ratings of secretaries on the extent of influence of cloud computing skills on information security in public establishments in South East, Nigeria based on gender.

Gender	N	$\bar{X}$	SD	α	df	t-cal	p-value	Decision
Male	96	24.48	6.65	0.05	372	-0.456	.003	Significant
Female	278	23.52	4.62					

$P < .05$

The results in Table 11 shows that mean score of male secretaries (***X****=24.48, SD=6.65*) is significantly higher than that of female secretaries (***X****=23.52, SD=4.62*); *t(372)= -0.456, p= 0.003*. The null hypothesis of significant difference between the two groups was observed on the extent they influence cloud computing skills on information security in public establishments in South East, Nigeria was therefore rejected.

V. Discussion of Findings

Findings of the study revealed that electronic publishing skills of secretaries on information security was rated at high extent in public establishments in South East, Nigeria. This implies that secretaries' high extent responses revealed positive influence of electronic publishing skills on information security in public establishments. This finding is in line with Ternenge and Kashimana

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(2019) study which stated that electronic publishing skills of students in University of Agriculture, Makurdi were to a high extent. This means that electronic publishing skills of secretaries could be used in performing tasks such as working through a document and deleting, inserting, and replacing text, as well as producing, formatting, printing, and storing office documents without much stress and provide effective information security in public establishments. The findings of the study further revealed a significant difference in the mean ratings of secretaries on the extent they influence electronic publishing skills on information security in public establishments in South East, Nigeria based on gender. This agreed with the findings of Abah (2023) who stated that there was a significant difference in the views of secretaries regarding influence of electronic publishing skills on information security when grouped according to gender. The finding is in line with the studies of Eremie and Agi (2020) and Nwabueze et al (2022) who revealed that gender influences the ICT skills possessed by employees for effective office performance. This points to potential gender differences in specific technological competencies within secretarial roles; the reason for the similarities in test of hypotheses may be because females often feel less confident and more anxious about using technologies. This anxiety contributes to lower confidence among women in using digital technologies.

Findings of the study further revealed that internet application skills of secretaries on information security was rated at high extent in public establishments in South East, Nigeria. This implies that secretaries' high extent responses reveal positive influence of internet application skills on information security in public establishments. This finding is in line with Adeleke and Nwalo (2017) who revealed that internet application skills of secretaries on information security were to a great extent and ranked most available and used in the university. This means that internet application skills of secretaries could be used to prevent security hazards in public establishments and their information systems can come under attacks from variety of sources, such as computer-assisted fraud, sabotage, vandalism, theft, fire, or flood. Furthermore, the internet enables the secretary to get information, to provide information, and to compile information. It is through the internet the secretary will be able to get information about people, products, organizations, research data and results among others. The internet also offers one of the best media of letting people know who one is, what one is doing or have done and how. Therefore, internet application skill is an important competency required by secretaries to function effectively and efficiently in an ICT-application compliant office. The findings of the study further revealed a significant difference in the mean ratings of secretaries on the extent they influence internet application skills on information security in public establishments in South East, Nigeria based on gender and age. This agrees with the findings of Adeleke and Nwalo (2017) who stated that there was a significant difference in the views of secretaries regarding influence of internet application skills on information security according to gender. The finding is in line with that of Nwabueze et-al. (2022) who revealed that gender influences new technological skills possessed by employees for effective office performance. The reason for the similarities in test of hypotheses may be because male secretaries' were found to have reported higher levels of internet or computer self-efficacy and lower levels of computer anxiety when compared to women.

Findings of the study also revealed that electronic information processing skills of secretaries on information security was rated as high extent in public establishments in South East, Nigeria. This implies that secretaries' high extent responses reveal positive influence of electronic information processing skills on information security in public establishments. This finding is in line with Ejomafuvwe (2017) who revealed that electronic information processing skills on information security were to a high extent in the university. This means that electronic information processing skills of secretaries could be used to improve the accuracy of information produced, reduces the cost of information processes, reduces the amount of time spent on processing data, reduces the amount of resources utilized while processing information, simplifies the management of stored data and information, facilitates the storage of large amount of files that would have occupied large office spaces, improves the speed with which copies of files are produced, reduces the workload of secretaries, carry out multiple task at a given time, and boosts the feasibility of task performed. The findings of the study further revealed no significant difference in the mean ratings of secretaries on the extent they influence electronic information processing skills on information security in public establishments in South East, Nigeria based on gender. The finding of the study disagreed with the findings of Nwabueze et-al. (2022) and Eremie and Agi (2020) who stated that there was a significant difference in the views of respondents on the influence of online information resources skills on information security according to gender. The reason for the dissimilarities in test of hypotheses may be because male secretaries possessed modern office technologies skills and record management skills more than their female counterparts which could lead to differences in opinions on the influence of office technologies skills on information security in public establishments.

Findings of the study further revealed that cloud computing skills of secretaries on information security was rated at low extent in public establishments in South East, Nigeria. This implies that secretaries' low extent responses revealed low influence of cloud computing skills on information security in public establishments. This finding is in line with Adeleke and Nwalo (2017) whose study showed low level of usage of cloud computing skills in University of Ibadan. The findings disagreed with Eremie and Agi (2020) who revealed that cloud computing skills were needed to a high extent among school principals in Rivers State. This means that the extent of usage of cloud computing skills by employee may vary depending on the need and the type organization.

The findings of the study further revealed significant difference in the mean ratings of secretaries on the extent they influence cloud computing skills on information security in public establishments in South East, Nigeria based on gender. The finding is in line with that of Nwabueze et-al. (2022) who revealed that gender influences the new technologies skills possessed by employees for effective office performance. The reason for the similarities in test of hypotheses may be because male secretaries may likely be more eager to occupy roles that involve advanced technological tasks, while women likes to remain in positions requiring routine technological use. Further, it may also be that organizational culture and management practices play significant roles in either mitigating or exacerbating gender disparities in technology use.

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VI. Conclusion

The study concluded that majority of modern office technology skills on information security in public establishments in South East, Nigeria were rated at high extent. The low extent rated on cloud computing skills showed that secretaries were unable to use it to reduce security hazards in public establishments and that their information systems were not properly managed. It is therefore imperative that efforts should be made by secretaries in public establishments to use cloud computing skills in other to secure their organizations information especially in South East. However, gender of secretaries differed significantly in the mean ratings on the extent they influenced electronic publishing skills, internet application skills, and cloud computing skills on information security in public establishments in South East, Nigeria.

VII. Recommendations

Based on the findings and conclusion of the study, the following recommendations were made:

1. Public establishments should encourage capacity building for their secretarial staff. Secretaries need to be equipped with up-to-date knowledge and skills in modern office technologies and records management practices. This involves regular professional development workshops focused on emerging technologies and security needs. This will enable secretaries in public establishments to leverage modern office technology skills when utilizing these technologies for information security.
2. Government should ensure the provision of standards and guidelines to regulate information security and privacy breaches that reveals the establishments' private information to the public, giving cyber criminals opportunity to hack into their databases to carry out well-planned illegal activities.
3. Public establishments should incorporate cloud computing technology practices in their everyday activity most especially on information security in order to help foster secretarial effectiveness and comprehensive performance.
4. Proper mechanisms should be put in place to ensure the realization of cloud computing services in public establishments. These include: increase in internet services and power supply for constant accessibility of information in the public establishments by secretaries.
5. Strong partnerships between educational institutions and public establishments are necessary to bridge skills gap. Public establishments can share real-world challenges, help educators design programs that address current and future workplace needs.

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