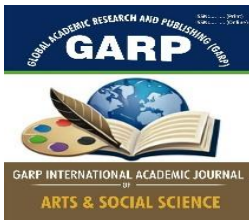


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ICT INFRASTRUCTURE AND STUDENT RECORDS MANAGEMENT IN POSTGRADUATE COLLEGES OF AHMADU BELLO UNIVERSITY, ZARIA

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ABSTRACT

This study examined Information and Communication Technology (ICT) infrastructure and student records management in the College of Postgraduate Studies, Ahmadu Bello University. The study aimed to determine the availability of ICT infrastructure, examine the extent of its utilization in managing student records, and identify the challenges affecting effective utilization. A descriptive survey research design was adopted using a quantitative research approach. The population of the study consisted of twenty-nine staff members involved in records management activities, and a census sampling technique was used to include all respondents. Data were collected through a structured questionnaire and analyzed using frequencies and percentages. The findings revealed that computers, printers, internet facilities, and backup power supply systems were available and frequently utilized for student records management. However, facilities such as scanners, storage devices, and database management systems were inadequately utilized. The study further identified hardware and software problems, inadequate ICT infrastructure, poor funding, and lack of ICT skills among staff as major challenges affecting effective ICT utilization. The study recommended improved ICT infrastructure, staff training, adequate funding, and regular maintenance of ICT facilities.

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Introduction

Information and Communication Technology (ICT) has become an essential component in the administration and management of higher educational institutions across the world. Information and Communication Technology (ICT) refers to the collection of technological tools and resources used for the creation, storage, processing, retrieval, transmission, and dissemination of information. These technologies include computers, software applications, internet facilities, databases, multimedia systems, networking tools, and other digital devices that support effective communication and information management. According to Akpan (2018), Information and Communication Technology (ICT) enhances institutional efficiency by improving the methods through which information is stored, managed, and disseminated within organizations.

In recent years, educational institutions have increasingly adopted Information and Communication Technology (ICT) facilities to improve administrative operations due to the growing volume of information generated daily. The transition from manual to digital systems has significantly transformed the management of student records in higher institutions. Information and Communication Technology (ICT) tools are now widely utilized for storing and processing academic records, admission details, examination results, registration data, and students' personal information. Ubogu (2011) defined Information and Communication Technology (ICT) as computer-based technologies used to meet the communication and information needs of organizations and individuals. Information and Communication Technology (ICT) facilities include hardware and software applications, networking systems, storage devices, multimedia resources, scanners, photocopiers, and other electronic technologies used for managing information effectively.

The application of Information and Communication Technology (ICT) in records management has introduced major improvements in educational administration. Jankowski (2012) observed that ICT has transformed the collection, storage, retrieval, and analysis of data in various sectors, including education. In higher institutions, ICT enables quick access to student records, minimizes errors associated with manual record keeping, improves data security, and enhances institutional productivity. Student records are important documents generated and maintained by

institutions as evidence of academic activities, decisions, and transactions. These records include admission files, registration forms, examination results, transcripts, graduation records, and other administrative documents. Records may exist in paper or electronic formats and serve as an important source of institutional memory.

Hulme (2012) and Toyo (2017) explained that records can appear in several forms such as files, databases, electronic messages, photographs, audiovisual materials, and documentary evidence. Traditionally, educational institutions relied heavily on paper-based records management systems. However, the increasing student population and complexity of administrative operations have made manual record keeping ineffective and difficult to maintain. Paper records are vulnerable to physical damage, misplacement, unauthorized access, and delays in retrieval. Consequently, many institutions are adopting electronic records management systems to improve efficiency and ensure long-term preservation of institutional information.

The emergence of digital technologies has further expanded the scope of records management. The National Archives and Records Administration (NARA) (2021) highlighted the role of emerging technologies such as artificial intelligence, cloud storage, and automation in improving records management practices. These technologies support faster classification, retrieval, storage, and protection of institutional records. Similarly, Chen and Chen (2020) emphasized that effective records management contributes significantly to organizational knowledge management by supporting information sharing, decision-making, and institutional efficiency.

Despite the importance of Information and Communication Technology (ICT) infrastructure in records management, several educational institutions still face significant challenges in adopting and utilizing modern technologies. Eguwunyenga (2009) argued that many registry personnel still depend on outdated manual filing systems and lack adequate ICT knowledge and competencies. In some institutions, student records are still processed manually, resulting in delays, inaccuracies, and poor service delivery. Mazoya et al. (2015) and Ngeze (2017) observed that manual management of academic records contributes to errors in result processing, loss of records, delays in retrieving information, and unethical examination practices.

The College of Postgraduate Studies may also face challenges related to inadequate ICT infrastructure, insufficient technological resources, lack of trained personnel, and limited Information and Communication Technology (ICT) literacy among staff. These problems can negatively affect the management of student records and reduce administrative efficiency. Although significant investments have been made in ICT facilities in many institutions, the effective utilization of these technologies remains a challenge due to poor implementation strategies and inadequate technical support.

Therefore, the adoption and utilization of ICT infrastructure in postgraduate colleges is essential for improving the management of student records. ICT facilities can enhance efficiency, accuracy, security, accessibility, and overall service delivery in higher educational institutions. This study seeks to examine the availability and utilization of ICT infrastructure in the management of student records in postgraduate colleges and identify the challenges affecting its effective implementation.

Objectives of the Study

1. To examine the availability of ICT infrastructure for the management of student records in postgraduate colleges.
2. To determine the extent of utilization of ICT infrastructure in managing student records in postgraduate colleges.
3. To identify the challenges affecting the effective utilization of ICT infrastructure in the management of student records in postgraduate colleges.

Research Questions

1. What are the available ICT infrastructures for the management of student records in postgraduate colleges?
2. To what extent is the utilization of ICT infrastructure in managing student records in postgraduate colleges?
3. What are the challenges affecting the effective utilization of ICT infrastructure in the management of student records in postgraduate colleges.

Literature Review

Information and Communication Technology (ICT) refers to technological tools and infrastructure used for the creation, processing, storage, retrieval, transmission, and management of information within institutions and organizations. Information and Communication Technology (ICT) has transformed many sectors including education,

administration, business, and governance. According to Nwaomah (2012), ICT encompasses technologies used for gathering, storing, modifying, and transmitting information in different forms. Similarly, Okute (2011) described ICT as the application of electronic computers and software systems for processing, storing, protecting, transmitting, and retrieving information for effective organizational management.

ICT plays an important role in improving communication, administrative efficiency, teaching, learning, and records management in educational institutions. Information and Communication Technology (ICT) tools such as computers, databases, internet facilities, cloud storage, mobile technologies, and electronic management systems are increasingly integrated into institutional operations. Kozma (2018) noted that ICT improves learning opportunities, promotes active student engagement, and facilitates knowledge construction through access to digital educational resources. ICT also provides students and educators with opportunities to access multimedia materials, online textbooks, and interactive learning platforms, thereby improving educational outcomes.

The application of Information and Communication Technology (ICT) has transformed records management from traditional paper-based systems to electronic and digital systems. Manual methods of records management were often associated with problems such as loss of documents, poor accessibility, delays in retrieval, and inadequate storage facilities. However, ICT has introduced more reliable and efficient approaches to records management. According to Idowu et al. (2020), ICT has enhanced the creation, storage, retrieval, and preservation of records in a transparent and efficient manner. The integration of ICT into records management systems has enabled institutions to maintain large volumes of records electronically while ensuring accessibility, accuracy, and data security.

Digital records management has become increasingly important in higher educational institutions due to growing student populations and administrative activities. Information and Communication Technology (ICT) enables institutions to move from paper-based systems to digital platforms that facilitate easy storage, retrieval, sharing, and preservation of information. Ahmad and Rana (2019) asserted that digital records management reduces storage space challenges, minimizes physical handling of

records, and improves record preservation. Similarly, Nalini and Bala (2015) emphasized that electronic records management systems improve record retrieval, reduce maintenance costs, enhance security, and promote effective information management. Nwalo and Adebayo (2020) further explained that electronic document management systems enable institutions to create, store, retrieve, and share digital records efficiently, thereby improving organizational productivity and accessibility to information.

Cloud computing has also revolutionized records management practices by enabling institutions to store records remotely and access them through internet-enabled devices. This technology reduces dependence on physical storage facilities and improves flexibility in records management. Okello-Obura and Kabanda (2020) observed that cloud computing solutions have gained popularity because of their reliability, accessibility, and cost-effectiveness. Adomi and Anie (2019) highlighted the contribution of cloud computing and mobile technologies to modern records management practices. These technologies provide secure and affordable methods of storing and managing records while promoting quick access to information irrespective of location.

The adoption of Information and Communication Technology (ICT) in records management has contributed to improved data security and institutional accountability. Digital record systems provide password protection, backup facilities, encryption, and access control mechanisms that reduce the risk of unauthorized access and information loss. Oyewumi (2020) explained that cloud-based electronic record systems provide efficient methods for storing and accessing information electronically. Similar benefits can be achieved in educational institutions through the digitization of student records.

Despite the numerous benefits associated with ICT utilization in records management, several challenges continue to affect its effective implementation in educational institutions. One major challenge is the inadequate knowledge and technical skills required for operating ICT systems. Other challenges include resistance to change, poor implementation strategies, lack of institutional support, and insufficient ICT infrastructure. Educational institutions often operate multiple ICT systems such as student information systems, library databases, and learning management systems, making integration difficult. Elizondo et al. (2020) observed that inconsistent data formats

and lack of standardized integration protocols often result in data inconsistencies and management difficulties.

Another major challenge affecting ICT utilization in records management is poor system performance and downtime. ICT infrastructure used in managing student records must be reliable and continuously available to support institutional operations. Alqahtani et al. (2020) stated that slow response times, system failures, and data unavailability can negatively affect administrative processes and service delivery. Poor system performance may lead to delays in record retrieval, reduced efficiency, and loss of productivity. Furthermore, system errors and data inconsistencies may compromise the accuracy and integrity of records, thereby affecting institutional decision-making and administrative effectiveness.

Research Design

This study adopted a quantitative research approach to examine Information and Communication Technology (ICT) Infrastructure and Student Records Management in the College of Postgraduate Studies, Ahmadu Bello University. A descriptive survey research design was employed to collect relevant data from the administrative staff of the College of Postgraduate Studies. The descriptive survey design was considered appropriate because it enabled the researcher to obtain firsthand information from respondents regarding the availability and utilization of ICT infrastructure in managing student records.

The population of the study comprised all staff involved in records management activities in the College of Postgraduate Studies, Ahmadu Bello University, totaling twenty-nine (29) staff members. Due to the relatively small size of the population, the study adopted a census sampling technique in which all members of the population were included in the study. This ensured adequate representation and improved the reliability of the findings. The instrument used for data collection was a structured questionnaire designed by the researcher. The questionnaire contained close-ended items aimed at obtaining information on the availability of ICT infrastructure, the extent of ICT utilization in student records management, and the challenges associated with the use of ICT facilities in the College of Postgraduate Studies. The use of a questionnaire was considered suitable because it allowed for the collection of reliable, standardized, and quantifiable data from the respondents.

The researcher personally administered the questionnaires to the respondents and subsequently retrieved the completed copies to ensure a high response rate. A total of twenty-nine (29) questionnaires were distributed, and all were successfully completed and returned, representing

a 100% response rate. The data collected from the respondents were organized and presented in tables for clarity and ease of analysis. Descriptive statistical tools, particularly frequencies and percentages, were used to analyze the data and interpret the findings of the study.

Data Analysis

Table 1: Response Rate

Bar Chart

Response Rate of Respondents

Senior Staff | ██████████ 18 (62%)
 Junior Staff | ████████ 11 (38%)

Table 1: Response Rate

Respondents	Questionnaire distributed	Questionnaire returned	Percentage
Senior staff	18	18	62%
Junior staff	11	11	38%
Total	29	29	100%

Table 1 presents the response rate of respondents involved in the study. Out of the 29 questionnaires distributed, all 29 were successfully completed and returned, representing a **100% response rate**. Senior staff constituted the majority of respondents with **18 participants (62%)**, while junior staff accounted for **11 respondents (38%)**. The high

response rate indicates a strong level of participation and cooperation among the respondents, thereby enhancing the reliability and validity of the study findings. Furthermore, the larger proportion of senior staff suggests that the responses were obtained from personnel with substantial experience and knowledge relevant to the subject under investigation.

Table 2: Gender Distribution of Respondents

Bar Chart

Gender Distribution

Male | ██████████ 22 (76%)
 Female | ████████ 7 (24%)

Table 2: Gender

Sex	Frequency	Percentage
Male	22	76%
Female	7	24%
Total	29	100%

Table 2 shows the gender distribution of the respondents. The results reveal that 22 respondents (76%) were male, while 7 respondents (24%) were female. This indicates that male respondents constituted the majority of the study population. The dominance of male respondents may reflect the gender composition of the organization or department under study.

However, the inclusion of both male and female respondents provides a broader perspective and contributes to the representativeness of the data collected. The findings suggest that the opinions expressed in the study were largely influenced by male participants, although female respondents also made meaningful contributions to the research.

The analysis of Tables 1 and 2 shows that:

1. The study achieved an excellent 100% response rate, indicating strong respondent participation.
2. Senior staff constituted the majority of respondents (62%), suggesting that the study benefited from experienced participants.
3. Male respondents dominated the sample (76%), while female respondents accounted for 24%.
4. The high response rate and involvement of experienced staff enhance the credibility and reliability of the study findings.

Table 3: Availability of ICT Infrastructure for Student Records Management

Bar Chart

Availability of ICT Infrastructure

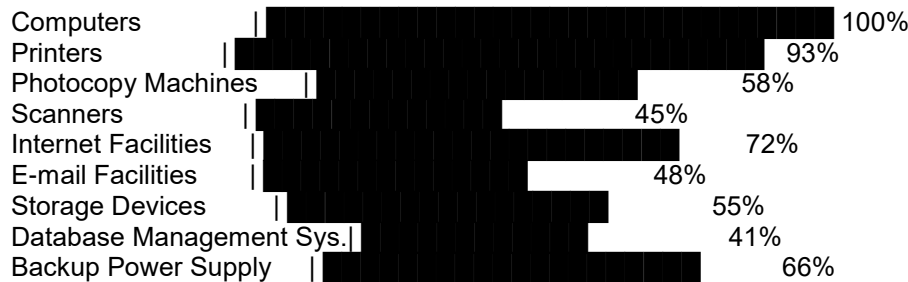


Table 3: Availability of ICT Infrastructure for Student Records Management

ICT Infrastructure	Available		Not Available		Total	
	Freq	%	Freq	%	Freq	%
Computers	29	100	0	0	29	100
Printers	27	93	2	7	29	100
Photocopy Machines	17	58	12	42	29	100
Scanners	13	45	16	55	29	100
Internet Facilities	21	72	8	28	29	100
E-mail Facilities	14	48	15	52	29	100
Storage Devices	16	55	13	45	29	100
Database Management Systems	12	41	17	59	29	100
Backup Power Supply (UPS/Generator)	19	66	10	34	29	100

Table 3 presents the availability of ICT infrastructure for managing student records. The findings indicate that computers were fully available (100%), making them the most accessible ICT resource in the institution. Printers were also highly available, with 93% availability, suggesting adequate support for printing and documentation activities. Internet facilities recorded 72% availability, while backup power supply systems such as UPS and generators recorded 66% availability, indicating moderate provision of supporting infrastructure.

Photocopy machines (58%) and storage devices (55%) were also available to a reasonable extent. However, scanners (45%), e-mail facilities (48%), and database management systems (41%) recorded lower levels of availability. The relatively low availability of database management systems is particularly noteworthy because such systems are essential for efficient electronic records management. Overall, the results suggest that while basic ICT facilities such as computers and printers are adequately available, more specialized technologies required for effective student records management are insufficiently provided.

Table 4: Extent of Infrastructure Utilized for Managing Student Records

Bar Chart (Based on "Very Often" + "Often" Responses)

Extent of ICT Utilization



Table 4: Extent of ICT Infrastructure Utilized for Managing Student Records

ICT Infrastructure	Very Often		Often		Not Often		Total	
	Freq	%	Freq	%	Freq	%	Freq	%
Computers	11	38	15	52	3	10	29	100
Printers	10	34	16	55	3	11	29	100
Photocopy Machines	5	17	9	31	15	52	29	100
Scanners	4	14	7	24	18	62	29	100
Internet Facilities	8	28	14	48	7	24	29	100
E-mail Facilities	6	21	12	41	11	38	29	100
Storage Devices	4	14	11	38	14	48	29	100
Database Management Systems	3	10	9	31	17	59	29	100
Backup Power Supply (UPS/Generator)	7	24	13	45	9	31	29	100

Table 4 examines the extent to which available ICT infrastructure is utilized in managing student records. The results show that computers are the most frequently utilized ICT resource, with 90% of respondents indicating that they use them either very often or often. Printers followed closely with 89%, demonstrating their importance in records processing and documentation. Internet facilities were also widely utilized, with 76% of respondents indicating regular usage. Backup power supply facilities recorded 69% utilization, reflecting their importance in ensuring continuity of ICT operations. E-mail facilities recorded a utilization rate of 62%, indicating moderate use for communication and information exchange. Storage devices were utilized by 52% of respondents, while photocopy machines recorded 48% utilization. The least utilized ICT resources were scanners (38%) and database management systems (41%). This finding suggests that electronic archiving, digitization, and database-driven record management practices are not yet fully integrated into the institution's records management processes.

The analysis reveals that:

1. Computers and printers are the most available and most frequently utilized ICT facilities for student records management.
2. Internet facilities and backup power systems are moderately available and widely used.
3. Database management systems, scanners, and e-mail facilities have relatively low availability and utilization rates.
4. The institution appears to rely heavily on basic ICT tools rather than advanced digital records management technologies.
5. Increased investment in database management systems, scanners, and electronic communication tools would significantly enhance the efficiency, accessibility, and security of student records management.

The findings indicate that although essential ICT infrastructure exists for student records management, the utilization of advanced technologies remains limited. Strengthening the availability and use of database management systems, scanners, and digital communication

platforms would improve record accuracy, retrieval speed, information security, and overall administrative efficiency.

Table 5: Challenges Affecting the Effective Utilization of ICT Infrastructure for Managing Student Records

Bar Chart

Challenges Affecting ICT Utilization

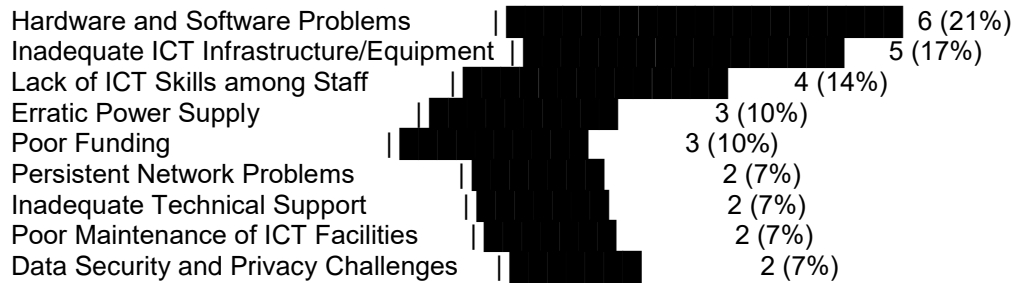


Table 5: Challenges Affecting the Effective Utilization of ICT Infrastructure for Managing Student Records

Challenges	Frequency (F)	Percentage (%)
Erratic Power Supply	3	10
Inadequate ICT Infrastructure/Equipment	5	17
Lack of ICT Skills among Staff	4	14
Hardware and Software Problems	6	21
Poor Funding	3	10
Persistent Network Problems	2	7
Inadequate Technical Support	2	7
Poor Maintenance of ICT Facilities	2	7
Data Security and Privacy Challenges	2	7
Total	29	100

Table 5 presents the challenges affecting the effective utilization of ICT infrastructure for managing student records. The findings reveal that hardware and software problems constitute the most significant challenge, accounting for 6 respondents (21%). This suggests that system malfunctions, outdated software, and equipment failures frequently hinder the efficient management of student records. The second major challenge identified was inadequate ICT infrastructure and equipment, reported by 5 respondents (17%). This indicates that insufficient computers, networking devices, and other ICT resources limit the effective implementation of electronic records management systems.

Additionally, lack of ICT skills among staff accounted for 4 respondents (14%), highlighting the need for regular training and capacity-building programmes to enhance staff competence in the use of ICT facilities. Both erratic power supply and poor funding were identified by 3 respondents each (10%), indicating that unstable electricity supply and inadequate financial resources

continue to affect ICT operations and maintenance. Other challenges, including persistent network problems, inadequate technical support, poor maintenance of ICT facilities, and data security and privacy challenges, each accounted for 2 respondents (7%). Although these challenges were reported less frequently, they remain important factors that can negatively impact the effectiveness, reliability, and security of student records management systems.

The major challenges affecting the utilization of ICT infrastructure for managing student records include:

1. Hardware and software problems (21%).
2. Inadequate ICT infrastructure and equipment (17%).
3. Lack of ICT skills among staff (14%).
4. Erratic power supply and poor funding (10% each).
5. Network issues, inadequate technical support, poor maintenance, and data security concerns (7% each).

The findings indicate that technical, infrastructural, financial, and human-capacity challenges significantly affect the effective utilization of ICT infrastructure in student records management. To improve efficiency, institutions should invest in modern ICT equipment, provide continuous staff training, strengthen technical support services, ensure regular maintenance of ICT facilities, and allocate adequate funding for ICT development. Addressing these challenges will enhance the reliability, accessibility, security, and overall effectiveness of student records management systems.

Discussion of the Findings

The study revealed that Information and Communication Technology (ICT) infrastructure plays an important role in the management of student records in the College of Postgraduate Studies, Ahmadu Bello University. The findings showed that ICT facilities such as computers, printers, internet facilities, and backup power supply systems were available and frequently utilized in managing student records. Computers were identified as the most available facility, while printers and internet services were also widely utilized. This suggests that the institution has made considerable efforts toward integrating ICT infrastructure into administrative operations and records management.

However, the study further revealed that some important ICT facilities such as scanners, e-mail facilities, storage devices, and database management systems were either inadequate or poorly utilized. The low utilization of database management systems indicates that some records management activities still depend on manual procedures. Similarly, the inadequate use of scanners and storage devices may affect effective digitization and preservation of student records.

The findings also identified several challenges affecting effective ICT utilization, including hardware and software problems, inadequate ICT infrastructure, and lack of ICT skills among staff, erratic power supply, poor funding, network problems, inadequate technical support, and poor maintenance of ICT facilities. These challenges negatively affect the efficiency, security, accessibility, and reliability of student records management within the institution.

Conclusion

The study concluded that Information and Communication Technology (ICT) infrastructure plays a vital role in effective student records

management in the College of Postgraduate Studies, Ahmadu Bello University. The availability and utilization of ICT facilities such as computers, printers, internet services, and backup power systems have improved administrative efficiency, accessibility to records, and service delivery within the institution. ICT has enhanced the processing, storage, retrieval, and management of student records, thereby reducing the problems associated with manual record-keeping systems.

However, the study also revealed that the utilization of Information and Communication Technology (ICT) infrastructure remains inadequate in some areas due to several challenges. Facilities such as scanners, storage devices, and database management systems were either insufficient or underutilized. Challenges such as inadequate ICT infrastructure, hardware and software problems, lack of ICT skills among staff, erratic power supply, poor funding, and inadequate technical support continue to hinder effective ICT utilization. There is a need for improved investment in ICT infrastructure, regular staff training, proper maintenance of ICT facilities, and reliable technical support to ensure efficient and secure student records management.

Recommendations

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

1. The management of the College of Postgraduate Studies should provide adequate ICT infrastructure such as scanners, database management systems, storage devices, and modern electronic records management facilities to improve the efficiency of student records management.
2. Regular training and capacity-building programmes should be organized for staff to improve their ICT knowledge and technical skills in managing electronic student records effectively.
3. The institution should provide reliable internet services, stable power supply, and adequate backup systems to ensure uninterrupted access to electronic student records.
4. Adequate funding should be allocated toward the procurement, maintenance, and upgrading of ICT infrastructure used in managing student records.
5. Technical support personnel should be employed or strengthened to provide regular maintenance, troubleshooting, and

support services for ICT facilities within the College of Postgraduate Studies.

6. The College of Postgraduate Studies should adopt comprehensive database management systems and electronic document management systems to ensure proper storage, retrieval, security, and preservation of student records.

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