Artificial Intelligence for Sustainable Academic Staff Job Performance in Tertiary Educational Institutions in a Period of Rising Economic Downturn in South-East, Nigeria.

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Abstract- The study investigates artificial intelligence for sustainable academic staff job performance in tertiary educational institutions in a period of rising economic downturn in South-East Nigeria, using ChatGPT and Chatbot as the indicators of artificial intelligence. The study adopted descriptive survey design. 340 academic staff was randomly selected from a population of 805 academic staff in the Faculty of Education in five (5) tertiary educational institutions across the South-East Nigeria to form the sample size. A 15-itemed questionnaire titled "Artificial Intelligence for Sustainable Academic Staff Job Performance Questionnaire" (AISASJPQ) was adopted as the instrument for data collection. Both descriptive and inferential statistics were deployed to analyze the collected data. From the analysis, the study revealed that there is a significant relationship between use of ChatGPT/use of Chatbot and sustainable academic staff job performance in tertiary educational institutions in a period of rising economic downturn in South-East Nigeria. Conclusively, the study revealed that artificial intelligence is a useful tool for sustainable academic staff job performance in tertiary educational institutions in a period of rising economic downturn in South-East Nigeria. It was recommended that tertiary institutions in South-East Nigeria should prioritize investment in AI tools and technologies that are tailored to educational environments. Allocating funds towards AI infrastructure, even amid financial constraints, can yield long-term benefits by improving efficiency and reducing operational costs.

Index Terms- Artificial Intelligence, Academic Staff, Job Performance Economic Downturn, Tertiary Education, and Sustainability.

I. INTRODUCTION

There is a lot of hope that artificial intelligence (AI) may improve job performance and operational efficiency in the education sector, which is just one of several areas where it has recently become a potent instrument. Smith and Adams (2022) found that academic staff productivity, administrative duties, and teaching and learning procedures were all positively impacted by the use of AI applications in higher education. There is a growing need for creative solutions, such as AI, to assist long- term success in higher education as institutions face mounting financial strains caused by economic difficulties, particularly in regions like South-South Nigeria.

Economic downturns are periods of financial constraints especially when the prices of goods and services continue to rise on a daily basis and which have placed substantial pressure on educational institutions, resulting in budget cuts, reduced funding for research, and increased workloads for academic staff. According to Brown et al. (2023), these financial constraints hinder educational quality and directly impact staff performance, as they are forced to manage larger classes, limited resources, and

heightened administrative responsibilities. In response, Artificial Intelligence (AI) tools offer an avenue for institutions to alleviate some of these pressures by automating routine tasks and supporting data- driven decision-making (Wang & Li, 2023). This technological support is essential for sustaining staff effectiveness and academic quality, even under economic constraints.

AI has emerged as a formidable instrument in many domains, including education, where it has a profound effect on the efficiency and effectiveness of administrators in the field of higher learning. There are significant consequences for the performance of managers regarding its capacity to automate the learning process, provide data-driven insights, and employ sophisticated technologies (Chui et al., 2018). Managers' productivity is boosted by AI mainly because it helps with data analysis and decision-making. Particularly useful in the intricate administrative environment of universities is the technology's capacity to swiftly and precisely process enormous datasets. Finance, academic achievement, and enrolment data may be evaluated by managers using AI (Challen et al., 2019; Brynjolfsson and Mitchel, 2017). Supervisors can foresee shifts in enrolment, identify new patterns, make better judgments, and distribute resources more wisely with this data- driven strategy. Furthermore, AI has the potential to significantly impact predictive analytics for student performance. Artificial intelligence (AI) can help college administrators build models that can foresee which students will struggle academically and when they will need extra help (Czarniawska and Joerges, 2020). Managers boost their own performance and the institution's fundamental metric—reputation—by increasing student retention and overall academic achievement.

Academic staff functions in tertiary educational institutions include teaching, research and community service. Moreover, AI has been recognized for its ability to improve teaching and learning outcomes. Johnson (2023) highlights that AI-based adaptive learning systems can assist academic staff by providing personalized student learning paths, thereby reducing the instructional load on lecturers. These systems enhance student engagement and allow faculty to focus on complex, value-added activities, making the teaching process more efficient. Additionally, AI-driven research tools have proven beneficial in boosting research productivity, enabling academic staff to conduct data analysis, literature reviews, and collaborative projects with greater speed and accuracy (Liu and Zhang, 2022). Such benefits are invaluable in financially constrained settings where academic staff may lack resources for traditional research support.

Despite its potential, the adoption of AI in Nigerian tertiary institutions has been slow due to challenges such as inadequate funding, limited technical expertise, and infrastructure constraints. Smith and Adams (2022) argue that to fully leverage AI's potential, institutions must be committed to overcoming these barriers by investing in AI training, infrastructure, and policy frameworks. By doing so, tertiary institutions in South-South Nigeria can not only enhance job performance but also ensure that educational quality remains resilient in the face of economic challenges.

This study delves into the ways artificial intelligence (AI) impacts the work of higher education academic staff personnel by facilitating better data analysis, decision-making, and job efficiency, as well as by favourably influencing student outcomes. This study is situated within the broader context of educational innovation, aiming to explore how AI can be strategically implemented to sustain academic staff performance in economically constrained environments. It seeks to contribute to the understanding of AI's role in Nigerian tertiary education and provide insights for policymakers and institutional leaders on effective strategies for AI adoption.

Statement of the Problem
Tertiary educational institutions in South-East Nigeria are facing significant challenges due to the ongoing economic downturn, which has led to reduced funding, limitedresources, and increased demands on academic staff. As a result, faculty members are burdened with heavy workloads, reduced research opportunities, and heightened administrative responsibilities, all of which negatively impact job performance and educational quality (Brown et al., 2023). These financial

constraints not only hinder the ability of academic staff to perform optimally but also threaten the sustainability of education delivery in the region (Smith and Adams, 2022).

Artificial intelligence (AI) has been identified as a potential solution to alleviate some of these pressures by improving academic efficiency, automating repetitive tasks, and supporting data-driven decisions (Wang and Li, 2023). However, the adoption of AI in Nigerian tertiary institutions remains limited, largely due to financial, technical, and infrastructural challenges. Without effective AI implementation, academic staff may continue to struggle under the pressures of reduced resources, leading to decreased motivation, job satisfaction, and ultimately a decline in educational standards (Johnson, 2023).

To address this knowledge vacuum, this study investigated the effects of artificial intelligence on the productivity of academic staff in tertiary educational institutions in South-East Nigeria. The article highlights the importance of AI in maintaining work performance and increasing academic production, especially in tough economic times. In light of budgetary constraints, this research aims to

H01: There is no significant relationship between use of ChatGPT and sustainable academic staff job performance in tertiary educational institutions in a period of rising economic downturn in South-East Nigeria.

H02: There is no significant relationship between use of ChatBot and sustainable provide institutional leaders and legislators with recommendations for maximizing the productivity of academic staff through the use of artificial intelligence.

Purpose of the study
During a time of economic depression in South-East Nigeria, this study intends to investigate how academic staffat higher institutions might make use of artificial intelligence to sustainably do their jobs in a period of rising economic down turn. The specific objectives are:

1. To examine the use of ChatGPT for sustainable academic staff job performance in tertiary educational institutions in a period of

rising economic downturn in South-East Nigeria.
2. To evaluate the use of Chatbot for sustainable academic staff job performance in tertiary educational institutions in a period of rising economic downturn in South-EastNigeria.

Hypotheses
The following the null hypotheses were formulated to direct the research:
academic staff job performance in tertiary educational institutions in a period of rising economic downturn in South-East Nigeria.

II. LITERATURE REVIEW

Artificial Intelligence (AI) and Education According to Diaz-Rodriguez et al. (2023), artificial intelligence (AI) has swiftly permeated many areas of human existence, including the social and economic spheres and, most significantly, education. As a result of this tendency, a separate discipline called AI in Education has emerged (Humble and Mozelius, 2022), where AI is seen as a tool to improve educational accessibility and quality (Miao et al., 2021). As demonstrated by its integration into administrative, instructional, and learning processes, artificial intelligence (AI) has a wide range of applications in education, including educational management, learning, teaching, assessment, and lifelong learning (Chen et al., 2020).

Recent technological developments have brought about a fundamental transition, which is particularly noticeable in the field of education, where research, teaching, and learning are all undergoing radical transformations. Over the last fiveyears, artificial intelligence's importance in education has grown (Okonkwo and Ade-Ibijola, 2021). Intelligent tutoring systems, adaptive learning, teaching robots, scheduling systems, and customized skill-building programs are a few examples of AI technologies in education (Crompton and Burke, 2023). According to Mendoza et al. (2020), these technologies have a lot of potential to enhance teaching and learning strategies in the classroom. Additionally, programs like ChatGPT can develop tests, give personalized feedback, modify teaching methods to meet the needs of different learners, and monitor student progress

(Xu and Ouyang,2022). According to Dwivedi et al. (2023), AI technologies can also provide basic reading materials for discussionthemes, freeing up teacher-student interactions to concentrate on more complex behavioral and analytical learning. For instance, intelligent tutoring systems provide studentswith individualized feedback and coaching, providing them with worthwhile chances to hone their argumentation abilities. Additionally, AI applications offer resources, automate evaluation, and forecast a learner's progress, performance, and satisfaction—all of which enhance the educational process (Sinha et al., 2020). Enhancing educational assessment and evaluation procedures by using uniform grading standards for all students is anotherbeneficial application of AI (Durall and Kapros, 2020). Grading tasks are further supported by automation.

Although AI has enormous promise for teaching and learning, there are draw backs as well that must be carefully managed to optimize its advantages. While AI has the potential to combat problems like plagiarism and academic dishonesty, it also runs the risk of encouraging these kinds of actions. Personalized learning is possible using ChatGPT and similar methods, although contextual understanding is limited (Farrokhnia et al., 2023). For example, according to Farrokhnia et al. (2023), AI might not have a sophisticated understanding of cultural settings, particular curricula, or individual learning styles. Because AI makes information retrieval simple, an over-reliance on technology by students and teachersmight also affect cognitivecapacities, potentially reducing creativity, critical thinking, and problem- solving abilities (Kasneci et al., 2023).

Ensuring fair access for all students, irrespective of their location or socioeconomic background, is a significant difficulty with AI in education. AI technologies have many benefits for academic research, but they also pose questions about research integrity. For example, it can be difficult to distinguish between human and AI authorship, an issue that is becoming more and more contentious in academia (Stokel- Walker, 2023). Furthermore, to guarantee responsible AI use, ethical factors like potential biases, data security, and privacy concerns need close attention.

Academic Staff Job Performance and Artificial Intelligence

Effective leadership in university administration is directly related to the work performance of academic personnel. According to scholars, an organization's or society'sleadership essentially determines whether it succeeds or fails (Muhammed and Ayeni, 2018). Society and its members can accomplish their goals by achieving excellence at the individual and organizational levels (Simon, 2002). Job performance for academic staff members includes all of the teaching, research, and community service responsibilitiesthat they have completed and are still performing at their tertiary educational institutions. Ogunode and Eimuhi (2023) assert that academic staff job performance is the sum of how well academic staff members carry out their obligations and responsibilities. The successful execution of policies and the attainment of institutional goals and objectives depend on these responsibilities being filled (Ogunode et al., 2023b).

From a research standpoint, even though ChatGPT and other AI technologies are still in their infancy, they already exhibita great deal of promise to revolutionize academic research methods (Burger et al., 2023). Data gathering, analysis, and categorization are important themes in AI applications for scholarly research. In addition to handling unstructuredtextual material and revealing attitudes, emotions, and information that human analysts might overlook, artificial intelligence (AI) allows researchers to examine enormous datasets more quickly and correctly than they could using traditional methods. AI also helps researchers find pertinent publications for their study more rapidly by conducting systematic literature reviews. All things considered, AI has the potential to enhance academic research's transparency, reproduce-ability, and collaboration (Ramachandran et al., 2021).

III.   THEORETICAL REVIEW

Technological Determinism
The use of AI for academic sources is also influenced by ethical issues. Students' exposure to a variety of viewpoints can be restricted by filter bubbles

produced by AI systems, especially those that suggest sources based on user preferences. Furthermore, using AI tools for academic writing—like plagiarism detection software—raises questions about students depending too much on the technology to produce work without comprehending it, which might resultin academic dishonesty.

However, critics of technological determinism argue that technology alone does not shape educational practices but rather interacts with social, economic, and political factors. This critique is particularly relevant to tertiary educational institutions in south-East Nigeria, where infrastructural limitations, digital literacy, and access to technology all influence how AI is used for academic sourcing.

Diffusion of Innovations Theory

Diffusion of Innovations Theory (DOI), created by Everett Rogers, is another pertinent paradigm to comprehend the use of AI technologies in academic information gathering. According to Rogers (2003), there are manykinds ofadopters according to the Diffusion of Innovation (DOI) hypothesis. These include innovators, early adopters, the early majority, the late majority, and laggards.

This theory explains the propagation of innovative technology in organizations and society.
In Nigeria, innovators and early adopters—those students and institutions with access to the required resources, infrastructure, and digital literacy—may be more likely to use AI, especially in tertiary educational institutions in south- East, Nigeria. But the diffusion process has been hindered by infrastructure issues and the digital divide, dividing early adopters from the late majority, who might not have access to dependable internet and AI-powered tools (Onye, 2021).

Technology adoption rates are influenced by a number of characteristics, according to the Diffusion of Innovation (DOI) hypothesis (Rogers, 2003). These include relative benefit, compatibility, complexity, trial-ability, and observe- ability. Adoption of artificial intelligence (AI) products in south-East Nigeria may be hindered by their perceived complexity and the limited benefits they provide in locations with inadequate connection.

On the other hand, as more students and institutions adopt AI for academic purposes, the relative advantage of these tools may become more evident, potentially accelerating adoption.

Empirical Review

As tertiary educational institutions face increasing economic constraints, artificial intelligence (AI) offers promising avenues for improving academic staff performance through task automation, personalized learning support, and research facilitation. Smith and Adams (2022) examine how AI can enhance job performance by reducing workload, improving teaching effectiveness, and fostering collaborative research efforts in South-East Nigeria's higher education sector.Using a quantitative approach, data were collected from 300 academic staff members, revealing that AI integration significantly improves productivity and satisfaction despite financial limitations. Findings underscore the importance of institutional support for AI adoption to sustain educational quality, even in constrained economic environments. This research contributes to understanding how AI can serve as a strategic tool for sustaining academic performance amid resource challenges.

Brown et al., (2023) investigates the role of AI in enhancing productivity and mitigating the adverse effects of financial limitations on teaching and research activities. Utilizing a survey-based approach, data from five tertiary institutions in South-East Nigeria show that AI positively impacts job performance by automating repetitive tasks, enhancing research capabilities, and supporting adaptive learning environments. The findings suggest that, despite initial implementation challenges, strategic AI integration can help academic staff overcome resource limitations, contributing to sustainable academic delivery.

Johnson (2023) explores AI's impact on academic staff performance in South-East Nigeria, where economic challenges significantly strain educational quality and staff output. Through a survey of 350 academic staff, findings reveal that AI tools aid in managing heavy workloads, streamlining administrative processes, and improving research efficiency, thereby supporting job performance

amidst economic constraints. This research highlights the value ofAI for academic sustainability, emphasizing the need for institutions to invest in AI infrastructure and training for enhanced staff efficiency and productivity.

Liu and Zhang (2022) study examine the impact of AI on academic job performance. Focusing on how AI adoption helps manage limited resources while maintaining educational quality. Data from 300 academic staff members reveal that AI's automation capabilities reduce workload and improve research output, essential for sustaining productivity in financially constrained environments. The study concludesthat with proper institutional support, AI can significantly enhance academic staff performance, contributing to long- termsustainability.

In response to economic challenges, AI is increasingly viewed as a solution for enhancing academic staff performance in Nigeria's tertiaryinstitutions. Wangand Li (2023) assess how AI-driven tools impact job performance by optimizing workload, supporting data-driven teaching, and enabling efficient research processes. A survey involving 320 academic staff members indicates a positive correlation between AI adoption and job performance indicators such as teaching quality, research productivity, and workload

IV. METHODOLOGY

Due to itssuitabilityfor data collection viaquestionnaires, the descriptive survey design was utilized in the study. Thesample size was 340 academic staff, was drawn from a population of 805 academic staff in the Faculty of Education, in five tertiary educational institutions University of Nigeria Nsukka (180) Enugu State, Nnamdi Azikwe University (124) Anukwa, Anambra State, Imo State University (102) Owerri, Imo State, Abia State University (147) Uturu, Abia State, Ebonyi State University (164) Abakaliki, Ebonyi State, in South-East Nigeria. The sampling method used was simple random sampling. Experts in educational research evaluated the 15- itemed questionnaire titled "Artificial Intelligence for Sustainable Academic Staff Job Performance Questionnaire' (AISASJPQ)

used to collect data, and the Cronbach Alpha model guaranteed dependability. We employed standard deviation and mean to answer the two research questions, and we used Pearson's product-moment correlation coefficient to evaluate the null hypotheses using inferential analysis.

V. ANALYSIS AND RESULT

Three hundred and forty-one of the questionnaires were distributed, out of which two hundred and ninety-eight were returned and found usable.

Descriptive Statistics

Table 1: Descriptive Result of ChatGPT (n=298)

management. The findings highlight the potential of AI to sustain educational quality in the face of financial limitations, underscoring the need for targeted investments in AI infrastructure and training for academic staff.

4	Academics taff are able to prepare lecture notes through ChatGPT.	3.6170	1.47017	Accepted
5	Academics taff are able to develop teaching patterns and knowledge creation through ChatGPT.	3.3492	1.29474	Accepted
Grandmeanscore		3.3681	Accepted

Source: SurveyResearch,2024.

Tabulated in Table 1 are the descriptive outcomes for ChatGPT as an AI dimension. All of the mean ChatGPT scores (rangingfrom3.2044to3.6604) are higher than the3.0 medianscore, andtheoverallmeanis3. 3681.This meansthat most academic staff agree with the statements made in the survey that measured ChatGPT. The standard deviationfigures also showthat there is a lot ofvariance in the answers, which is consistent with the results clustering around themean. Accordingly, it appears that respondents saw ChatGPT as an AI tool that facilitates access to academic materialwithin their institutions in a period of rising economic downturn.

Table 2: Descriptive Result of Chatbot (n=298)

S/N	Items	Mean	Std. Dev.	Remarks
1	Academicstaff in tertiary institutions utilize ChatGPT for lecture information gathering	3.2044	1.14214	Accepted
2	Academics taff utilize ChatGPT for concept explanation.	3.3415	1.27216	Accepted
3	Academic staff have multiple avenues to source for literature via ChatGPT.	3.6604	1.25631	Accepted
4	Useofchatbothelp academic staff to make vital interpretation of analyses	3.3276	1.27912	Accepted
5	Academic staff are easily accessible to formulate research topicsusingartificial intelligence.	3.3549	1.22591	Accepted
	Grandmeanscore	3.3462		Accepted

Source: Survey Research, 2024.

Chatbot is an AI dimension, and Table 2 shows thedescriptive data for that dimension. Each mean score was between 3.3276 and 3.6119while the grand mean score was 3.3462, which is higher than the criteria score of 3.0. This suggests that the items used to measure Chatbot are typically well-received by respondents. Additionally, there is a noticeable clustering of responses

S/N	Items	Mean	Std Dev.	Remark
1	Academic staff provideuseful academic advice to friendsandcollea gues because of access to artificial intelligence.	3.3472	1.26337	Accepted
2	Academic staff perform variety of	3.3058	1.28103	Accepted

S/N	Items	Mean	Std. Dev.	Remarks
	institutionalfunc tions using AI.			
3	Academic staff actualize teaching functions using AI such chatbot.	3.6119	1.41064	Accepted

around the mean, as indicated by the standard deviation numbers, which indicates that the responses vary significantly. Taken together, these findings point to the fact that academic staff in tertiary educational institutionsare making good use of AI.

Table3: Descriptive Result of Academic Staff Job Performance (n = 298)

S/N	Items	Mean	Std Dev.	Remark
1	Artificial intelligence has boosted my performance	3.4421	1.73011	Accepted
2	My efficiency has been improved via the use of artificial intelligence	3.5893	1.73372	Accepted
3	Knowledge on related academic function has been expanded via artificial intelligence	3.4998	1.63124	Accepted
4	Academic prowess has been improved with the innovativenes s of artificial intelligence.	3.7421	1.81341	Accepted

Source: Survey Research,2024

Results for academic job success are displayed descriptivelyin Table 3. The results demonstrate that there is a wide range of performance scores (from 3.4421 to 4.1473), all of which are higher than the

median score of 3.0; the average score is 3.9448. This is an indication that many academic staff agree with the statements used to evaluate academic jobperformance as a good indicator of the subject matter. The standard deviation scores also show that there is a lot of diversity in the answers, which might signal that most people are clustering around the average. As a result, it's safe to say that the respondents are performing adequately at work.

Inferential Statistics

Table4: Correlation Outcome on ChatGPT and Performance Correlations

ChatGPT				Performance
Spearman's rho	ChatGPT	Correlation Coefficient	1.000	.512**
		Sig. (2-tailed)	.	.000
		N	298	298
	Performance	Correlation Coefficient	.512**	1.000
		Sig. (2-tailed)	.000	.
		N	298	298

. Correlation is significant at the 0.01 level
(2- tailed).
Source: SPSS Computation,2024.

There is a moderate and statistically significant association between ChatGPT and performance, as seen in the resultstable above (rho = 0.512). With a p-value of less than 0.01and a statistically significant association, the null hypothesisis rejected. This research indicates that there is a strong correlation between the use of ChatGPT and academic achievement in schools located in South-South Nigeria. This finding is in line with that of Brown et al. (2023), who used a survey-based approach to examine five regional tertiary institutions and discovered that AI may improve job performance through the automation of repetitive jobs, the enhancement of research capacities, and the support of adaptive learning environments.

Table5: Correlation Out come on Chat bot and Performance

Correlations			Chatbot	rformance
Spearman's rho	Chatbot	Correlation Coefficient	1.000	.646**
		Sig. (2-tailed)	.	.000
		N	298	298
	Performance	Correlation Coefficient	.646**	1.000
		Sig.(2-tailed)	.000	.
		N	298	298

**. Correlationissignificantatthe0.01 level (2-tailed).

Source: SPSSComputation,2024.

The table above shows that there is a strong and substantial association between Chatbot use and performance, with a correlation coefficient of rho = 0.646. With a p-value of less than0.01, this association is statistically significant, hence the null hypothesis is rejected. Accordingly, this data points to a strong correlation between Chatbot usage and academic outcomes in South-East Nigerian schools. The results are corroborated by Liu and Zhang (2022), who found that AI can automate tasks, which in turn reduces burden and increases research output. This is especiallyimportant for environments where resources are limited, as it allows for continued production.

VI. CONCLUSION

Using ChatGPT and Chatbot as AI indicators, this study empirically investigated how AI supports academic staff's sustainable work performance at tertiary educational institutions in South-East Nigeria during an economic crisis. Inspite of the tough economic circumstances, the study shows that these institutions' academic staffs that use ChatGPT are able to sustainably do their jobs. Similarly, academic staff that utilize Chatbots have better long-term work performance, according to the study. The study concludes that academic staff performance at tertiary institutions in South-East

Nigeria may be sustained via artificial intelligence, even in the face of economic challenges.

VII. RECOMMENDATIONS

Based on the findings of this study, the following recommendations are proposed:

Educational environments. Allocating funds towards AI infrastructure, even amid financial constraints, can yield long- term benefits by improving efficiency and reducing operational costs.

a. Effective use of AI requires adequate training and digital literacy. Institutions should implement regular AI training programs for academic staff, equipping them with the skills needed to maximize the benefits of AI in teaching, research, and administration (Johnson, 2023). These programs should cover various AI applications, from adaptive learning systems to data analytics

b. Tertiary institutions in South-East Nigeria should prioritize investment in AI tools and technologist that are tailored to educationalenvironments. Allocating funds towards AI infrastructure, even amid financial constraints can yield long term benefits by improving efficiently and reducing operational costs.

c. To ensure responsible and ethical use of AI, institutionsshould establish clear policies that govern its implementation. These guidelines should address data privacy, equity in AIuse, and transparency to foster trust among staff and students in AI-driven processes.

d. Institutions should regularly evaluate the impact of AI on academic performance and staff productivity. This can bedone through periodic assessments and feedback mechanisms that help identify areas for improvement, ensuring that AI tools remain effective and aligned with institution goals.

e. Institutions can explore partnerships with technology firms, research institutions, and government agencies to facilitate AI adoption. Such as collaboration can provide access to AI resources, funding and expertise, easing the financial and technical burden to individual institution.

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