

## **Algorithm Human Resource Management and Collective Bargaining Power in Nigerian Public Universities: A Study of Asuu-management Relations in the Digital Era**

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### **ABSTRACT**

This study examined the relationship between algorithmic human resource management systems and collective bargaining power in Nigerian public universities, with specific focus on ASUU-Management relations in the digital era. Grounded in Walter Korpi's Power-Resources Theory, the research adopted a qualitative design and employed content analysis of secondary data drawn from academic journals, policy documents, ASUU agreements and communiqués, NUC statistical digests, and the Nigerian Workplace Report 2024. The analysis tested three null hypotheses on the influence of algorithmic HRM on bargaining subjects and negotiation procedures, on procedural justice and trust, and on centralized HRM in relation to bargaining power and dispute resolution strategies. One key finding of the study is that bargaining subjects remain largely centered on funding, conditions of service, and university autonomy, while issues relating to algorithmic transparency, data access, and joint audit of HR systems have yet to be

integrated into the formal negotiation agenda. In light of this, the study recommends that ASUU and university management should broaden the bargaining agenda to formally include digital governance concerns such as algorithmic transparency, data access rights, and participatory oversight of centralized HR platforms. This integration is critical for ensuring that the adoption of algorithmic HRM enhances transparency, fairness, and a balanced distribution of power as Nigerian public universities transition further into the digital era.

**Keywords:** Algorithmic HRM, Collective bargaining, ASUU-Management relations, Procedural justice, Nigerian public universities, Digital governance

## INTRODUCTION

Nigerian public universities have experienced a fundamental shift in how personnel decisions are made since federal authorities mandated the adoption of automated payroll and HR platforms. Between 2020 and 2025, digital control over academic staff records, salary computation, and workload documentation intensified, moving administrative discretion away from campus offices and concentrating it within federal data systems (Odukoya & Salami, 2024). This shift altered the traditional balance between university management and the Academic Staff Union of Universities, and the consequences are visible in the frequency of disputes and the new strategies both parties deploy during negotiations (Adeyemi et al., 2024). Historically, ASUU and university management resolved issues through direct engagement involving registrars, bursars, deans, and union executives. Decisions on promotion, leave, and salary adjustments relied on human judgment and contextual interpretation of collective agreements (Chukwu & Ibrahim, 2023). The introduction of centralized systems disrupted this pattern by standardizing procedures and removing room for case-by-case flexibility. Matters that were once settled internally now require system audits, federal validation, and technical corrections that campus management cannot execute independently, leading to prolonged resolution timelines (Nwosu & Okoro, 2024). The persistence of industrial action in Nigerian universities after 2020 cannot be explained solely by funding or wage disagreements. A significant dimension of the conflict stems from disputes over data accuracy, system access, and the logic embedded in automated decision-making (ASUU, 2023). Lecturers report salary stoppages linked to biometric validation errors, while management officials cite inability to override federal system controls (Federal Ministry of Finance, 2024). These technical issues have become central bargaining subjects, even though they were absent from earlier ASUU-Federal Government agreements signed before digitalization became policy (Ibrahim & Musa, 2023).

ASUU's response to exclusion from system design was the development of the University

Transparency and Accountability Solution between 2020 and 2023. The union positioned UTAS as a platform that would preserve academic control over personnel data and align payroll processes with university-specific conditions of service (ASUU, 2023). The Federal Government’s decision to retain IPPIS as the primary payment system, citing concerns about national financial integration, highlighted the political dimensions of technological choice (Federal Ministry of Finance, 2024). Control over the platform that determines salary payment has become a proxy for control over labor relations in the sector (Olanrewaju & Bello, 2024). Algorithmic management has also introduced new mechanisms for monitoring academic work. Digital records of course uploads, student interaction logs, and research output metrics are now used as inputs for promotion and performance assessment (UNESCO, 2023). While management views these metrics as tools for accountability, academic staff perceive them as intrusions that undermine professional autonomy (Yusuf & Danjuma, 2024). Empirical findings from University of Ibadan and Ahmadu Bello University between 2022 and 2024 show that automated workload allocation reduces departmental discretion but also eliminates contextual considerations for staff on research leave or medical grounds (Chukwu & Ibrahim, 2023).

The concept of transparency has become contested in this digital context. For management, transparency means audit trails that satisfy federal financial regulations, while for ASUU it requires access to source code and rule parameters that determine how deductions and scores are calculated (Okereke, 2023). The absence of consensus on this definition has prolonged disputes and eroded trust between the parties (Odukoya & Salami, 2024). Judicial records from 2023 involving salary-related cases indicate that courts lack clear statutory guidance on rights to algorithmic explanation, forcing judges to apply principles from analog labor law to digital disputes (Legal Defence Centre, 2023). Centralization of personnel data has weakened the influence of campus-based union branches. Previously, ASUU chapters could pressure specific university administrations to resolve local issues, but with federal control over validation and payment, local management lacks authority to intervene (World Bank, 2023). ASUU has adapted by shifting its strategy toward national policy advocacy, as demonstrated during the 2022 eight-month strike where system adoption became as critical as funding demands (ASUU, 2023). This strategic adjustment shows that bargaining power now depends on capacity to influence federal digital policy rather than only on membership mobilization (Adeyemi et al., 2024). Procedural justice has emerged as a critical concern for academic staff. Automated sanctions for failure to complete biometric validation or data uploads are applied without immediate human review, and grievance channels now depend on digital ticketing systems and backend data audits (Ibrahim & Musa, 2023). Many academic staff find these processes opaque and inaccessible, and a 2023 survey across six federal universities reported that over 65% of respondents believed algorithmic HRM had reduced management’s willingness to resolve issues informally (Nwosu & Okoro,

2024).

University management operates in a constrained position because registrars and bursars implement federal directives but cannot alter system logic or bypass validation rules (Olanrewaju & Bello, 2024). This structural limitation reduces their ability to offer concessions during negotiations, forcing them to defer to directives from Abuja (Federal Ministry of Finance, 2024). ASUU recognizes this constraint and directs pressure toward federal agencies while urging management to advocate for institutional flexibility, creating a three-way interaction that complicates traditional bilateral bargaining models (Chukwu, 2024). The timing of system operations creates additional tension because salary deductions are applied instantly across all affected staff, while corrections require batch processing and federal approval (Chukwu, 2024). This asymmetry produces immediate financial hardship that forces rapid union response, and ASUU’s use of strike action in cases of system-wide failure reflects the inability of incremental negotiation to address large-scale technical disruptions (Yusuf & Danjuma, 2024). Management contends that industrial action further delays data correction, creating a feedback loop that destabilizes the academic calendar (Media Trust, 2024). Comparative evidence from other African higher education systems shows that unions with technical expertise can negotiate limits on automated decision-making and secure rights to contest algorithmic outputs (UNESCO, 2023). ASUU’s technical committee for UTAS mirrors this approach, indicating adaptation rather than rejection of digital tools (ASUU, 2023). However, limited funding for university-based ICT infrastructure restricts the union’s ability to maintain alternative platforms, so bargaining now includes demands for resources to support technological development (TETFund, 2024). Trust between ASUU and management has declined as algorithms replace interpersonal negotiation, and academic staff who previously resolved issues through direct appeals now receive automated responses (Yusuf & Danjuma, 2024). Management officials express frustration at their inability to assist staff due to system restrictions, and this mutual frustration weakens cooperative aspects of industrial relations (Odukoya & Salami, 2024). Rebuilding trust will require agreed mechanisms for human review, transparent error reporting, and defined timelines for correction that are currently absent (Legal Defence Centre, 2023).

Legal uncertainty continues to shape outcomes because the Nigerian Labour Act and Trade Disputes Act do not specify rights related to automated decisions, data access, or algorithmic explanation (Okereke, 2023). This gap leaves bargaining parties to negotiate technological terms in each agreement, producing inconsistent provisions across institutions (Legal Defence Centre, 2023). Legal analysts argue that codifying digital rights in collective agreements could reduce litigation and clarify expectations for both parties (Adeyemi et al., 2024). Public discourse influences bargaining dynamics as media coverage of payroll anomalies generates sympathy for

ASUU, while reports of payroll fraud justify government insistence on strict digital controls (Media Trust, 2024). University management navigates this contested narrative by emphasizing compliance, often at the expense of advocacy for staff concerns, and the digital era thus introduces public communication as a component of bargaining strategy (Olanrewaju & Bello, 2024). The evidence indicates that algorithmic HRM functions as more than an administrative tool; it is a site of contested authority where systems embed preferences for centralization and control that favor federal agencies over institutional actors (Odukoya & Salami, 2024). For collective bargaining to remain effective, agreements must address technological governance, including design responsibility, audit access, and error correction protocols, otherwise disputes will continue to focus on system failures rather than substantive labor conditions (World Bank, 2023). This study examines the reconfiguration of collective bargaining power in Nigerian public universities under algorithmic HRM by analyzing ASUU-management interactions from 2020 to 2025, focusing on changes in bargaining subjects, procedures, and outcomes resulting from IPPIS, UTAS, and related digital platforms (Chukwu & Ibrahim, 2023).

## **STATEMENT OF THE PROBLEM**

The implementation of algorithmic HRM systems in Nigerian public universities was designed to address administrative inefficiencies and improve financial accountability, with federal directives mandating IPPIS and proposing UTAS that introduced biometric validation, automated salary computation, and centralized personnel records for all academic staff from 2020 onward (Federal Ministry of Finance, 2024). Despite these objectives, industrial disputes between ASUU and university management have persisted and, in some cases, intensified, suggesting that automated systems have altered decision-making structures in ways not anticipated by existing collective agreements (Odukoya & Salami, 2024). A primary problem is the transfer of administrative authority from university management to federal control centers, leaving campus administrators without access to system architecture needed to correct errors when salary deductions occur due to biometric failures or data mismatches (Nwosu & Okoro, 2024). Management cannot resolve these issues without federal intervention, which creates financial hardship for academic staff and shifts grievance resolution outside the institutional context, while collective agreements negotiated before 2020 do not specify procedures for correcting automated errors (Adeyemi et al., 2024).

Another problem is the disagreement over transparency in algorithmic decision-making, as management claims that centralized systems improve accountability by standardizing payroll and eliminating manual discretion, while ASUU argues that opaque algorithms prevent meaningful negotiation because staff cannot verify how deductions or promotion scores are computed (Okereke, 2023). The union’s development of UTAS was intended to address this opacity, yet

federal preference for IPPIS reflects competing priorities over data control, and the lack of agreement on what constitutes transparency undermines trust and prolongs disputes (ASUU, 2023; Federal Ministry of Finance, 2024). Procedural justice has also deteriorated under algorithmic management because automated sanctions for non-compliance are applied without immediate human explanation, and grievance processes require technical steps that many academic staff cannot easily follow (Ibrahim & Musa, 2023). Survey data from 2023 indicate that most lecturers believe management is less willing to grant exceptions or resolve issues informally under digital systems, and this shift from flexible, human-mediated resolution to standardized rules reduces individual bargaining power and increases reliance on union officials (Nwosu & Okoro, 2024). Legal ambiguity constitutes a further problem since Nigerian labor legislation does not address automated decision-making, data access rights, or the right to explanation for algorithmic outputs, and court cases in 2023 involving IPPIS-related salary stoppages demonstrate judicial difficulty in applying existing laws to digital contexts (Legal Defence Centre, 2023). Without statutory clarification, bargaining parties must negotiate technological terms in each memorandum, resulting in inconsistent provisions and repeated conflicts across universities (Okereke, 2023).

Finally, the temporal dynamics of algorithmic systems create operational problems because deductions occur instantly across all staff, while corrections require extended processing time at federal level, producing immediate economic distress that compels ASUU to adopt strike action quickly (Chukwu, 2024). Management argues that strikes delay the data updates needed to fix errors, creating a cycle that destabilizes academic activities, and current bargaining procedures do not account for these time-based challenges, making dispute resolution less effective (Yusuf & Danjuma, 2024). The cumulative effect is a transformation of ASUU-management relations from bilateral negotiation to a triangular contest involving the union, management, and federal agencies, where management's bargaining capacity is limited by its intermediary role while ASUU's influence increasingly depends on technical expertise and policy advocacy (Olanrewaju & Bello, 2024). If these structural issues are not addressed, algorithmic HRM will continue to generate disputes that distract from the core academic responsibilities of Nigerian public universities, hence the need to investigate how algorithmic HRM reconfigures collective bargaining power and to identify mechanisms that can restore procedural fairness and effective negotiation in the digital era (World Bank, 2023).

## **RESEARCH QUESTIONS**

1. In what ways have algorithmic HRM systems changed the subjects and procedures of collective bargaining between ASUU and university management in Nigerian public universities?

2. To what extent does the use of algorithmic HRM affect procedural justice and trust in ASUU-management relations in Nigerian public universities?
3. How has centralized algorithmic HRM influenced the bargaining power and dispute resolution strategies of ASUU and university management in Nigerian public universities?

### **OBJECTIVE OF THE STUDY**

The broad objective of this study is to examine how the adoption of Algorithmic Human Resource Management systems has reconfigured collective bargaining power in Nigerian public universities by analyzing ASUU-management relations in the digital era from 2020 to 2025. While the specific objectives are as follows:

1. To assess the extent to which algorithmic HRM systems have altered the bargaining subjects and negotiation procedures between ASUU and university management in Nigerian public universities.
2. To determine the effect of algorithmic HRM on procedural justice and trust in ASUU-management relations in Nigerian public universities.
3. To evaluate the influence of centralized algorithmic HRM on the bargaining power and dispute resolution strategies of ASUU and university management in Nigerian public universities.

### **HYPOTHESES**

- 1: Algorithmic HRM systems have no significant effect on the bargaining subjects and negotiation procedures between ASUU and university management in Nigerian public universities.
- 2: Algorithmic HRM has no significant effect on procedural justice and trust in ASUU-management relations in Nigerian public universities.
- 3: Centralized algorithmic HRM has no significant influence on the bargaining power and dispute resolution strategies of ASUU and university management in Nigerian public universities.

## **OPERATIONAL DEFINITION OF KEY VARIABLES**

### **Algorithmic HRM**

For this study, Algorithmic HRM means the application of computer-based systems and automated decision rules to handle personnel functions such as staff records, payroll computation, biometric verification, workload assignment, and promotion processes in Nigerian public universities from 2020 to 2025 (Odukoya & Salami, 2024). It is measured by the degree of system automation in salary administration, the extent of central control over staff data, and the use of digital metrics to monitor academic duties.

### **Collective Bargaining Power**

Collective Bargaining Power in this study refers to the ability of ASUU and university management to shape negotiation outcomes on wages, service conditions, and administrative policies within Nigerian public universities (Adeyemi et al., 2024). It is assessed through the capacity of each party to determine what issues are discussed, access data during talks, obtain concessions, and influence final resolutions under automated personnel systems.

### **ASUU-Management Relations**

ASUU-Management Relations is operationally defined as the nature of communication, cooperation, and conflict between ASUU branches and the administrative leadership of Nigerian public universities between 2020 and 2025 (ASUU, 2023). It is measured by the frequency of industrial disputes, types of grievances raised, degree of joint problem-solving, and the results of negotiations involving digital HR systems.

## **LITERATURE REVIEW**

### **Adoption and effects of algorithmic HRM in public universities globally and in Nigeria**

The period between 2020 and 2025 marked a rapid expansion of algorithmic HRM systems in higher education institutions worldwide, driven by pressures for financial transparency and administrative efficiency (Odukoya & Salami, 2024). In Nigeria, federal directives compelled public universities to migrate personnel and payroll functions to centralized digital platforms, fundamentally changing how staff data was stored, accessed, and processed. This shift replaced manual registers and departmental files with automated databases that linked biometric records to salary disbursement. Globally, universities in Europe and Asia adopted algorithmic tools for workload allocation, promotion scoring, and performance monitoring earlier than Nigerian

institutions (UNESCO, 2023). These systems used machine learning models to analyze teaching loads, research outputs, and student feedback. The intent was to reduce administrative delays and standardize evaluations across departments. However, early adopters reported mixed outcomes, with gains in processing speed offset by concerns about accuracy and fairness. In Nigeria, the Integrated Personnel and Payroll Information System became the dominant platform for salary administration in federal universities after 2020 (Federal Ministry of Finance, 2024). IPPIS centralized payment control in Abuja, removing discretion previously held by university bursars and registrars. The effect was immediate: salary computation became uniform, but delays in correction of errors increased because local management lacked backend access. Academic staff began to experience pay irregularities linked to biometric validation failures.

The Academic Staff Union of Universities responded by developing the University Transparency and Accountability Solution between 2020 and 2023 (ASUU, 2023). UTAS was presented as an alternative that would retain university control over personnel data while meeting federal accountability requirements. The disagreement over which platform to adopt became a central administrative conflict, showing that technology choices carried political implications for autonomy. Effects of algorithmic HRM extended beyond payroll to academic work monitoring. Digital systems began tracking course content uploads, learning management system activity, and research publication records (Yusuf & Danjuma, 2024). University management viewed these metrics as objective evidence for promotion and appraisal, while academic staff described them as intrusive and reductive of professional judgment. This tension altered how performance was understood and assessed. Studies from University of Ibadan and Ahmadu Bello University between 2022 and 2024 found that automated workload systems reduced departmental flexibility in assigning courses (Chukwu & Ibrahim, 2023). Lecturers on sabbatical or medical leave were still assigned teaching loads by the system until manual override was approved by federal authorities. The rigidity of algorithms therefore created new administrative burdens that did not exist under manual systems.

The centralization of HR data also changed record-keeping practices. Previously, discrepancies in staff records could be resolved within the institution through consultation with registrars and deans (Nwosu & Okoro, 2024). Under algorithmic systems, corrections required submission to federal verification portals, extending resolution time from days to months. This procedural change increased staff frustration and contributed to repeated industrial actions. The adoption of algorithmic HRM in Nigerian public universities produced dual effects. On one hand, it introduced standardization and audit capacity that addressed historical payroll fraud concerns (Olanrewaju & Bello, 2024). On the other hand, it concentrated control, reduced institutional discretion, and generated technical disputes that became embedded in labor relations. The

literature shows that effects were not purely technical but relational, reshaping power dynamics between federal authorities, university management, and academic staff.

### **Changes in collective bargaining subjects, procedures and outcomes due to digitalization**

Digitalization has expanded the scope of collective bargaining beyond traditional wage and condition-of-service issues to include technical matters related to data governance (Adeyemi et al., 2024). In Nigerian public universities, ASUU now negotiates over system access rights, timelines for error correction, and transparency of algorithmic rules that determine salary deductions. These subjects were absent from pre-2020 agreements but have become recurrent demands since IPPIS implementation. Bargaining procedures have also shifted from face-to-face meetings dominated by registrars and union executives to multi-level negotiations involving federal finance agencies and technical teams (Ibrahim & Musa, 2023). University management often acts as an intermediary without authority to alter system parameters, which weakens its bargaining position. This structural change forces ASUU to direct pressure toward Abuja rather than campus administration. The timing of dispute resolution has changed significantly under digital systems. Automated deductions are applied instantly across all affected staff, while corrections require batch processing and federal approval (Chukwu, 2024). This asymmetry creates immediate financial hardship that accelerates union response. Consequently, strike action is now used more quickly when system-wide failures occur, because incremental negotiation cannot address large-scale technical disruptions. Outcomes of bargaining have become less predictable because algorithms embed policy preferences into code. When promotion or salary rules are encoded into a system, management cannot easily grant concessions without federal system updates (Olanrewaju & Bello, 2024). This reduces management’s ability to offer interim solutions, which previously helped sustain industrial peace during negotiations.

Digitalization has also introduced new forms of documentation in bargaining. Memoranda of understanding now include clauses on data accuracy, audit access, and error reporting protocols (Legal Defence Centre, 2023). These technical provisions require both parties to develop digital literacy, a requirement that was not central to traditional labor negotiations. The absence of such expertise has delayed agreement implementation.

The locus of bargaining power has shifted upward to federal agencies that control system architecture (World Bank, 2023). University management, once a direct party to disputes, now operates with constrained authority. This triangular relationship complicates resolution because ASUU must negotiate with an actor that is not physically present on campus but controls the technical outcomes. Empirical evidence from 2022 and 2024 strikes shows that duration of industrial action increased when disputes centered on system issues rather than monetary

demands (ASUU, 2023). Resolving technical disagreements requires coordination between software developers, finance officials, and union representatives, which lengthens negotiation timelines compared to wage disputes. In sum, digitalization has redefined what is negotiable, who negotiates, and how agreements are reached in Nigerian universities (Odukoya & Salami, 2024). The literature indicates that collective bargaining models designed for manual HR administration are inadequate for algorithmic environments, and new procedural frameworks are needed to address the realities of automated personnel management.

### **Impact of automated HR systems on procedural justice, trust and dispute resolution strategies between academic unions and Management**

Procedural justice refers to the perceived fairness of decision-making processes, and automated HR systems have altered this perception among academic staff (Okereke, 2023). When salary deductions occur due to biometric mismatches, staff report that automated responses lack explanation and human consideration. The inability to speak directly with a decision-maker reduces perceptions of fairness, even when the technical outcome is correct. Trust between ASUU and management has declined as algorithms replaced direct communication (Yusuf & Danjuma, 2024). Previously, academic staff could appeal to registrars or deans for informal resolution of personnel issues. Under automated systems, requests are submitted through digital tickets and responses depend on backend data audits. This shift creates distance and reduces confidence in management's willingness to assist. Automated sanctions are applied without immediate human review, which violates expectations of voice and representation in procedural justice theory (Ibrahim & Musa, 2023). A 2023 survey across six federal universities found that over 65% of academic staff believed algorithmic HRM had reduced opportunities to explain personal circumstances before penalties were applied. This perception weakened cooperative attitudes during negotiations. Dispute resolution strategies have adapted to the technical nature of grievances. ASUU increasingly uses system audits, data analysis, and policy advocacy as tools alongside traditional strikes (ASUU, 2023). The union's technical committee for UTAS represents a strategic shift toward acquiring expertise needed to contest algorithmic outputs, rather than rejecting technology entirely.

University management faces a credibility challenge because officials cannot override system decisions, even when they acknowledge errors (Federal Ministry of Finance, 2024). This limitation reduces management's ability to demonstrate goodwill during disputes, which is critical for maintaining trust. Management officials have expressed frustration at their intermediary role, caught between staff demands and federal system constraints. Legal uncertainty further affects procedural justice because Nigerian labor laws do not specify rights to algorithmic explanation or data access (Legal Defence Centre, 2023). Without statutory

guidance, courts apply analog labor principles to digital disputes, leading to inconsistent rulings. This gap leaves bargaining parties without clear rules for resolving technology-related grievances.

The absence of transparent error-reporting mechanisms has prolonged conflicts. When staff cannot see why a deduction occurred or how long correction will take, suspicion increases and trust erodes (Nwosu & Okoro, 2024). Studies recommend that automated systems include dashboards showing decision logic and correction timelines to improve procedural fairness. The literature shows that automated HR systems impact relational dimensions of labor relations as much as technical ones. Procedural justice and trust are now mediated by software design, data access, and correction protocols (Odukoya & Salami, 2024). Effective dispute resolution therefore requires agreements that address not only wages but also technological governance, human review, and communication standards in digital environments.

### **Gap in Literature**

Studies on collective bargaining in Nigerian public universities have largely centered on ASUU’s strike actions and their effect on university management, funding, and academic calendar stability. Recent work by Ugbede, Idoko & Ogah (2024) examined how ASUU disputes impact management in North Central Nigeria, concluding that incessant strikes have significant implications for university proliferation and revitalization. However, this line of research treats collective bargaining power as a function of traditional industrial actions such as strikes, negotiations, and protests, without considering how digital HR systems alter the leverage available to both union and management. The literature therefore remains anchored in pre-digital era frameworks of bargaining power. Empirical work on human resource management in Nigerian universities has documented recruitment, workload, and remuneration challenges through surveys of employees and HR professionals. The Nigerian Workplace Report 2024 highlights employee experience, AI relationships at work, and HR priorities, but focuses on general workforce trends rather than academic staff unions. Within the university context, NUC’s Statistical Digest provides data on staffing, ICT infrastructure, and efficiency in Nigerian universities, yet it stops at descriptive statistics of digital infrastructure. The intersection between these ICT systems and union bargaining dynamics has not been systematically explored, leaving a gap in understanding how management’s adoption of digital HR platforms reshapes negotiation tables.

The emerging discourse on algorithmic or digital HRM internationally points to the use of HR analytics, automated scheduling, performance dashboards, and data-driven decision-making in employment relations. In African higher education, however, studies on digital HRM remain

scarce and those that exist do not extend to collective bargaining. My search found no indexed studies linking digital HRM with academic unions in Africa. Consequently, there is little empirical evidence on whether algorithmic HR tools strengthen management's control over academic staff data, workload allocation, and promotion metrics, or whether unions like ASUU have developed counter-strategies to monitor, contest, or co-govern these systems. This omission limits theoretical development on power asymmetries in the digital era. ASUU's own documented focus remains on integrity, transparency, regulation of employer-employee relations, and just conditions of service. The union's public communications emphasize traditional bargaining issues such as funding, revitalization funds, and autonomy. While these remain central, the shift toward ERP systems, IPPIS, UTAS, and other digital payroll and HR platforms in Nigerian public universities has introduced new technical dimensions to bargaining that are absent from ASUU's stated objectives and from scholarly accounts of its strategy. The literature has not interrogated how ASUU engages with algorithmic transparency, data access, or audit rights when management deploys HR software, creating a conceptual gap between union doctrine and digital practice.

### **Empirical Studies on Algorithm Human Resource Management and Collective Bargaining Power in Nigerian Public Universities: ASUU-Management Relations in the Digital Era**

Recent scholarship situates ASUU-Management relations within Nigeria's accelerating digital transformation of public universities, where algorithmic human resource management tools are increasingly deployed for payroll processing, workload allocation, and performance monitoring through platforms like IPPIS. Collective bargaining remains the formal mechanism for dispute resolution, yet studies from the last decade document persistent breakdowns due to government non-implementation of agreements, particularly the 2009 FGN/ASUU Agreement and its renegotiation provisions. Nwokike and Ndu-Anunobi (2025) found that the Nigerian government's failure to address grievances promptly has led to recurrent conflicts and strikes by academic staff, resulting in disruptions to the academic calendar, delayed graduations, and a decline in education quality. These structural conflicts create the context in which digital HRM systems are introduced, often without joint consultation, thereby reshaping traditional bargaining dynamics. Empirical work emphasizes entrenched power asymmetry as a defining feature of FG-ASUU relations. Weinoh (2024) established a strong, statistically significant positive relationship between renegotiation practices and industrial harmony ( $r = 0.721$ ,  $p < 0.05$ ), but noted that repeated failures by successive governments to honor the mandatory three-year renegotiation clause have coincided with systemic instability in the university sector. Dunmade et al. theorize that structural state power, fiscal volatility, and weak enforcement mechanisms generate recurring instability even where collective agreements exist. This asymmetry is

intensified when algorithmic HRM tools are unilaterally implemented by management, as such systems can automate decisions on earned allowances, promotions, and disciplinary actions without union input, thereby weakening ASUU’s bargaining leverage.

Algorithmic HRM has become a direct contestation point in the digital era. The adoption of IPPIS as a centralized, algorithm-driven payroll system triggered major ASUU strikes, with the union contending that it undermines university autonomy and violates existing collective agreements on remuneration and conditions of service. While Uzoh (2016) documented how ASUU’s historical struggles shaped wage structures and funding through TETFund, the current shift to digital HRM introduces opacity into processes once subject to negotiation. The lack of transparency in how algorithms compute workloads or flag “irregular” payments compounds trust deficits already documented in collective bargaining literature, creating new sources of grievance outside traditional welfare demands. Assessments of collective bargaining’s effectiveness reveal both its necessity and its limits. Mohammed’s study of FUT Minna concluded that collective bargaining is the most effective strategy for industrial conflict management, yet delays in government compliance significantly fuel conflict and undermine outcomes. Similarly, a University of Lagos case found collective bargaining to be a “veritable instrument for the management of conflict” with established procedures that positively affect productivity when honored. However, Bello and Isah (2015) argue that government insincerity, poor funding, and weak institutional autonomy repeatedly derail bargaining outcomes, leading to brain drain and protracted industrial action. These findings suggest that introducing algorithmic HRM without co-determined governance frameworks risks reproducing and amplifying historical patterns of conflict.

Recent research underscores that credibility and transparency in the digital era depend on enforceable renegotiation and algorithmic accountability. Weinoh (2024) concludes that industrial harmony is driven less by the existence of bargaining structures and more by their credibility, predictability, and enforceability. Integrating Dunlop’s Industrial Relations System Theory with Follett’s Conflict Management Theory, he argues that institutionalized renegotiation frameworks are critical for sustainable peace. Dunmade et al. propose incorporating fiscal political economy and power-resource theory to explain enforcement failures, urging future audits of algorithmic systems and the negotiation of “algorithmic transparency clauses” within collective agreements.

## **THEORETICAL FRAMEWORK**

A suitable framework for this study is Power-Resources Theory of Collective Bargaining, originally developed by Walter Korpi in the 1970s and 1980s. Korpi’s work explained how labor

unions mobilize structural, associational, institutional, and societal power to influence employment outcomes, moving analysis beyond economics to politics and social relations. In its classic form, the theory argues that union bargaining power rests on the ability to disrupt production, maintain internal solidarity, access legal institutions, and shape public opinion. For Nigerian public universities, this has historically meant ASUU's capacity to declare strikes and mobilize academic staff, as recent studies on ASUU disputes in North Central Nigeria confirm that strike actions continue to shape management decisions on proliferation and revitalization. However, the spread of algorithmic HRM systems such as IPPIS, UTAS, and university ERP platforms alters the resource base Korpi described, because control over staff data, automated workload calculations, and performance dashboards becomes a new form of institutional power held by management. The framework therefore provides a lens to examine how digital HR tools reconfigure the balance between ASUU's traditional disruptive power and management's growing informational power.

Extending Korpi's framework to the digital era shows that bargaining power is shifting from labor withdrawal to data control. Algorithmic HRM continuously generates information on teaching load, research output, attendance, and payroll, making information asymmetry central to negotiations. Management's access to real-time analytics can strengthen institutional power by presenting algorithmic outputs as objective evidence during bargaining, while unions may lose associational power if member activities are tracked and predicted by systems. This shift matters in Nigeria where ASUU has long relied on collective solidarity and public mobilization, but now faces HR platforms that individualize performance metrics and reduce the opacity that unions previously leveraged. The Nigerian Workplace Report 2024 documents how employees' interactions with AI and workplace data are already shaping HR priorities across sectors, indicating that similar dynamics are emerging in universities even if studies on academic unions remain limited. Korpi's framework directs attention to which resources are enhanced or diminished when HR decisions move from human discretion to algorithmic processing.

Korpi's Power-Resources Theory also accommodates both conflict and cooperation under technological change. It does not assume that digitalization only weakens unions; instead it allows analysis of how unions build new resources such as technological expertise, data auditing capacity, and alliances with tech-professional groups to counter algorithmic control. For ASUU, this implies a shift beyond strike-based disruption toward developing capacity to interrogate HR algorithms, demand transparency, and negotiate rights over data access. The gap in recent Nigerian literature is clear: NUC's Statistical Digest shows expanding ICT infrastructure in universities, yet there is little empirical work on how ASUU engages these systems as bargaining resources. By applying Korpi's categories of power resources, the study can ask whether

algorithmic HRM increases management’s structural and institutional power, or whether it opens new institutional resources that ASUU can appropriate to strengthen bargaining outcomes in the digital era.

Finally, Korpi’s framework fits the Nigerian public university context because it recognizes the state, statutory recognition, and bureaucratic regulation as institutional resources. Unlike corporate models of algorithmic management, Nigerian universities operate under government ownership, NUC oversight, and legally recognized unions. Power-Resources Theory treats the state and regulatory bodies as arenas where power is contested, not only the workplace. In practice, government policies around IPPIS and UTAS form part of the institutional power balance, and algorithmic HRM becomes the mechanism through which state policies are implemented. By mapping how ASUU and management each draw on structural, associational, institutional, and societal resources in relation to digital HR systems, Korpi’s theory offers a coherent way to analyze shifts in bargaining power without reducing the issue to technology alone. It provides a theoretically grounded and context-sensitive approach for understanding ASUU-Management relations as they evolve in Nigeria’s digitalized university system.

## **METHODOLOGY**

The study employed a qualitative research design, using content analysis as the primary analytical technique to interpret patterns, themes, and meanings in documents related to ASUU-Management relations in the digital era. Secondary sources of data were used for collection, including peer-reviewed journal articles, NUC Statistical Digests, government policy documents, ASUU communiqués and agreements, the Nigerian Workplace Report 2024, and credible media reports on HR technology in universities. Documents were purposively selected based on relevance to algorithmic HRM, bargaining subjects, procedural justice, trust, and dispute resolution strategies between 2020 and 2024 to ensure currency and context. Content analysis was conducted by coding the selected materials for recurring ideas, comparing interpretations across sources, and synthesizing evidence to answer the research questions. This approach was suitable because it allowed the researcher to examine existing records without primary fieldwork while capturing how digital HR systems shape negotiations and power relations. One finding from the analysis was that bargaining subjects remain centered on funding and conditions of service, with algorithmic transparency and data access rarely raised at the bargaining table. In line with this, one recommendation is that ASUU and university management should expand bargaining subjects to formally include algorithmic transparency, data access rights, and joint audit of HR systems to address emerging digital governance issues.

## DISCUSSION

**Hypothesis 1: Algorithmic HRM systems have no significant effect on the bargaining subjects and negotiation procedures between ASUU and university management in Nigerian public universities.**

The null hypothesis assumes that bargaining subjects and procedures in ASUU-Management relations remain defined by long-standing issues such as funding, conditions of service, university autonomy, and welfare, regardless of technology adoption (Ugbede, Idoko & Ogah, 2024). Ugbede, Idoko & Ogah (2024) found that ASUU disputes continue to impact university management mainly through strike actions and concerns about proliferation and revitalization. If algorithmic HRM platforms are treated as administrative tools, then the agenda of negotiations and the sequence of tabling demands, joint meetings, and communiqués would remain unchanged (Ugbede, Idoko & Ogah, 2024). This perspective implies that digital systems do not introduce new subjects like algorithmic transparency or data audit rights because parties already address employment conditions through existing collective bargaining channels (Ugbede, Idoko & Ogah, 2024). A second basis for H01 is that negotiation procedures in Nigerian public universities are institutionalized by labor law, NUC regulations, and collective agreements (NUC, 2023). These rules prescribe notice periods, composition of negotiating teams, and dispute resolution steps that are not contingent on the HR technology deployed (NUC, 2023). The NUC Statistical Digest shows expanding ICT infrastructure in universities but does not report changes in statutory procedures for labor negotiations (NUC, 2023). If procedures are legally anchored, then the rollout of ERP systems, IPPIS, or UTAS would not alter the formal steps of negotiation, because the regulatory framework overrides technological influence (NUC, 2023).

The above hypothesis rests on the argument that ASUU's bargaining subjects are driven by material conditions rather than by technology (Ugbede, Idoko & Ogah, 2024). Empirical work by Ugbede, Idoko & Ogah (2024) emphasizes funding gaps and revitalization as the core drivers of disputes in North Central Nigeria. These issues predate digital HR systems and persist because of fiscal constraints and policy shifts (Ugbede, Idoko & Ogah, 2024). If the material interests of academic staff remain constant, then algorithmic HRM would not expand or contract the bargaining agenda (Ugbede, Idoko & Ogah, 2024). ASUU's stated objectives still center on just conditions of service and regulation of employer-employee relations, which are not inherently technological concerns (ASUU, 2020). This implies that negotiation procedures depend on human interaction, trust-building, and political strategy rather than on software (Nigerian Workplace Report, 2024). ASUU-Management bargaining has historically involved closed-door meetings, press engagement, and government mediation, all social processes that are not

automated (Nigerian Workplace Report, 2024). The Nigerian Workplace Report (2024) notes evolving employee relationships with AI at work but does not document changes to core negotiation procedures. If procedures rely on interpersonal dynamics, then algorithmic HRM would have limited capacity to alter meeting schedules, argument presentation, or agreement formation (Nigerian Workplace Report, 2024). The hypothesis assumes that algorithmic HRM operates at the operational level and does not reach the strategic level where bargaining subjects are defined (NUC, 2023). Payroll automation and workload calculation affect daily administration, but they do not redefine what counts as a negotiable issue (NUC, 2023). University management may still present the same agenda items, and ASUU may respond with the same demands, because the fundamental structure of employment relations in public universities has not shifted (Ugbede, Idoko & Ogah, 2024). If technology remains confined to implementation, its effect on bargaining subjects and procedures would be negligible (NUC, 2023). The null hypothesis is supported by evidence of continuity in conflict tactics (Ugbede, Idoko & Ogah, 2024). ASUU has contested government HR platforms like IPPIS and proposed UTAS, yet the process of contestation still follows traditional routes: negotiation, strike threat, and government intervention (Ugbede, Idoko & Ogah, 2024). This suggests that algorithmic HRM has been absorbed into existing strategies rather than creating new procedural pathways (Ugbede, Idoko & Ogah, 2024). The persistence of these tactics indicates that bargaining subjects and procedures remain stable despite digitalization (Ugbede, Idoko & Ogah, 2024). The hypothesis assumes symmetrical adaptation, meaning that if management adopts algorithmic HRM, ASUU also gains access to data and can use it within current procedures (Nigerian Workplace Report, 2024). When both sides consult the same dashboards or payroll records, information asymmetry does not increase and the negotiation process is not distorted (Nigerian Workplace Report, 2024). Algorithmic HRM would then function as a neutral record-keeping system rather than a factor that reshapes bargaining subjects (Nigerian Workplace Report, 2024). The hypothesis holds if technology merely digitizes existing information without changing control or use at the bargaining table (Nigerian Workplace Report, 2024).

The hypothesis aligns with institutional inertia in public sector labor relations (NUC, 2023). Public universities operate under bureaucratic rules that change slowly, and bargaining subjects are embedded in decades of precedent (NUC, 2023). NUC regulations and government policies maintain standardized procedures, so the introduction of HR analytics may be insufficient to disrupt this inertia (NUC, 2023). If institutional rules anchor the negotiation process, then algorithmic HRM would not significantly affect what is discussed or how discussions proceed (NUC, 2023). Bargaining subjects are politically determined rather than technically determined (Ugbede, Idoko & Ogah, 2024). Issues such as budget allocations and university autonomy are decided at the level of government policy, not at the level of HR software (Ugbede, Idoko &

Ogah, 2024). Therefore, algorithmic HRM would not alter the scope of negotiations because the real determinants lie outside the university's HR system (Ugbede, Idoko & Ogah, 2024). Ugbede, Idoko & Ogah (2024) confirm that political and fiscal factors drive bargaining content, which suggests technology plays a secondary role. The hypothesis would be valid if empirical evidence shows no measurable difference in bargaining subjects or procedures before and after the adoption of algorithmic HRM (Ugbede, Idoko & Ogah, 2024). If universities that implemented ERP and payroll systems continue to negotiate the same issues using the same steps as those without such systems, then the null cannot be rejected (Ugbede, Idoko & Ogah, 2024). Current literature has not provided comparative data on negotiation records linked to HR technology, so H01 remains plausible until new evidence emerges (Ugbede, Idoko & Ogah, 2024). Hence, the discussion above support hypothesis 1 which states that algorithmic HRM systems have no significant effect on the bargaining subjects and negotiation procedures between ASUU and university management in Nigerian public universities.

**Hypothesis 2: Algorithmic HRM has no significant effect on procedural justice and trust in ASUU-management relations in Nigerian public universities.**

The null hypothesis proposes that perceptions of fairness and trust in bargaining are shaped by historical relationships, leadership conduct, and outcomes rather than by the technology used for HR management (Nigerian Workplace Report, 2024). Procedural justice depends on voice, consistency, bias suppression, and accuracy of information (Nigerian Workplace Report, 2024). If algorithmic HRM systems improve accuracy and consistency, they could enhance procedural justice without harming trust (Nigerian Workplace Report, 2024). From this view, technology is a neutral tool that does not change how fair the process feels, because relational dynamics remain the same (Nigerian Workplace Report, 2024). A second basis for H02 is that trust in ASUU-Management relations has been low for decades due to repeated disputes and government interventions (Ugbede, Idoko & Ogah, 2024). The Nigerian Workplace Report (2024) shows that employees' trust is affected more by remuneration and work-life balance than by AI at work. If trust is already shaped by material and political factors such as delayed salaries and unilateral policy changes, then adding HR analytics would not create a significant shift (Nigerian Workplace Report, 2024). Technology would therefore be peripheral to the main drivers of trust (Nigerian Workplace Report, 2024). The hypothesis assumes that procedural justice is judged by participation and outcomes, not by the medium of information (Nigerian Workplace Report, 2024). If ASUU representatives are still invited to meetings, allowed to present evidence, and given explanations for decisions, then the use of algorithmic data does not reduce their sense of voice (Nigerian Workplace Report, 2024). Data-driven decisions may even appear less arbitrary than managerial discretion, which could preserve perceptions of fairness (Nigerian Workplace

Report, 2024). When both parties accept data as a common reference, trust can be maintained (Nigerian Workplace Report, 2024).

H02 implies that trust is built over time through repeated interactions and fulfillment of agreements, not through software features (Ugbede, Idoko & Ogah, 2024). ASUU-Management relations follow cycles of negotiation, strike, and resolution that build institutional memory (Ugbede, Idoko & Ogah, 2024). Algorithmic HRM does not alter this cycle unless it disrupts agreement implementation (Ugbede, Idoko & Ogah, 2024). If systems are used only to record agreed terms, they do not affect the trust that comes from keeping promises (Ugbede, Idoko & Ogah, 2024). Trust would therefore remain stable regardless of digital tools (Ugbede, Idoko & Ogah, 2024). The null hypothesis suggests that bias suppression is not reduced by algorithms (Nigerian Workplace Report, 2024). If HRM systems apply rules uniformly in workload allocation or promotion calculations, they may be perceived as less biased than manual processes (Nigerian Workplace Report, 2024). In that case, procedural justice could improve marginally, but the hypothesis of “no significant effect” would still hold if the change is small (Nigerian Workplace Report, 2024). Current literature on Nigerian universities has not documented widespread perceptions that HR software increases managerial bias (Nigerian Workplace Report, 2024). This rests on the assumption that both ASUU and management interpret algorithmic outputs similarly (Nigerian Workplace Report, 2024). If data from IPPIS or UTAS are treated as factual by both parties, disagreements are less likely to be attributed to procedural unfairness (Nigerian Workplace Report, 2024). Shared acceptance of data reduces conflicts over facts and allows focus on policy interpretation (Nigerian Workplace Report, 2024). When factual disputes decline, trust in the process can be preserved, meaning algorithmic HRM does not damage procedural justice (Nigerian Workplace Report, 2024).

This accounts for leadership mediation (NUC, 2023). Vice-chancellors and union leaders shape how decisions are communicated and how concerns are addressed (NUC, 2023). If leaders maintain transparent communication, the presence of algorithmic HRM does not alter perceptions of fairness (NUC, 2023). The NUC Statistical Digest documents increasing ICT use but does not link it to changes in leadership behavior, suggesting human agency remains central to procedural justice (NUC, 2023). H02 assumes that trust is rooted in professional identity and shared commitment to academic values (Ugbede, Idoko & Ogah, 2024). Academic staff and management both value teaching, research, and academic freedom, which provide common ground that technology cannot erode (Ugbede, Idoko & Ogah, 2024). Algorithmic HRM automates administrative tasks but does not alter professional norms that underpin trust (Ugbede, Idoko & Ogah, 2024). If professional norms dominate, the effect of technology on relational trust would be insignificant (Ugbede, Idoko & Ogah, 2024). This hypothesis is plausible if there is no

empirical evidence of increased grievances directly attributed to algorithmic HRM (Ugbede, Idoko & Ogah, 2024). Recent studies of ASUU disputes focus on funding and policy rather than complaints about HR software fairness (Ugbede, Idoko & Ogah, 2024). If unions have not raised procedural justice concerns about algorithmic systems in bargaining, it is reasonable to conclude that the effect is not significant (Ugbede, Idoko & Ogah, 2024). The absence of documented cases supports H02 (Ugbede, Idoko & Ogah, 2024). Thus, this hypothesis would hold if algorithmic HRM is implemented with consultation and training, allowing both parties to understand how data are generated and used (Nigerian Workplace Report, 2024). Participatory implementation reduces fears about opaque algorithms and preserves procedural justice (Nigerian Workplace Report, 2024). The literature has not shown that Nigerian universities are implementing HR systems in secrecy, which means the process may maintain trust (Nigerian Workplace Report, 2024). Under such conditions, technology would not create a significant effect on procedural justice or trust (Nigerian Workplace Report, 2024). The above analysis supports the hypothesis which states that, algorithmic HRM has no significant effect on procedural justice and trust in ASUU-management relations in Nigerian public universities.

**Hypothesis 3: Centralized algorithmic HRM has no significant influence on the bargaining power and dispute resolution strategies of ASUU and university management in Nigerian public universities.**

This hypothesis assumes that bargaining power, as framed by Korpi’s Power-Resources Theory, is determined by structural, associational, institutional, and societal resources that are not altered by centralization of HR data (Ugbede, Idoko & Ogah, 2024). If government centrally controls payroll and HR data through IPPIS, both ASUU and management operate within the same constraints (NUC, 2023). Centralization would not shift power because management does not gain resources beyond what the state provides, and ASUU retains its capacity for collective action (Ugbede, Idoko & Ogah, 2024). Dispute resolution strategies such as negotiation, mediation, and strike would therefore remain unchanged (Ugbede, Idoko & Ogah, 2024). A second argument for H03 is that centralized algorithmic HRM standardizes information across universities, reducing management’s ability to use data as a local advantage (NUC, 2023). If all public universities use the same government platform, no single management can leverage data asymmetrically against ASUU (NUC, 2023). Bargaining power would remain balanced at branch level, and dispute resolution would continue through national negotiations (NUC, 2023). The NUC Statistical Digest shows system-wide ICT adoption, which suggests uniformity rather than localized power shifts (NUC, 2023). The hypothesis also assumes that ASUU’s primary bargaining resource is the ability to mobilize members and disrupt academic activities, not access to HR data (Ugbede, Idoko & Ogah, 2024). Centralized algorithmic HRM does not remove

ASUU’s structural power to declare strikes or its associational power to maintain solidarity (Ugbede, Idoko & Ogah, 2024). Ugbede, Idoko & Ogah (2024) confirm that strikes remain the main strategy despite technological changes, indicating continuity in dispute resolution.

This implies that centralized data may reduce conflict by limiting management’s discretion to make unilateral decisions (NUC, 2023). If payroll and workload calculations are controlled centrally, local management has less scope to deviate from agreed rules, which can prevent disputes (NUC, 2023). Dispute resolution would then focus on policy-level issues rather than local data conflicts (NUC, 2023). In this case, centralization would not influence bargaining power because it constrains management as much as it constrains the union (NUC, 2023). The null hypothesis rests on the idea that dispute resolution in Nigerian public universities is political and involves government agencies beyond the university (Ugbede, Idoko & Ogah, 2024). Centralized algorithmic HRM is a government policy tool, so disputes about it are taken to federal negotiation tables (Ugbede, Idoko & Ogah, 2024). Bargaining power is exercised at the national level, where ASUU’s societal power and political alliances matter more than local data control (Ugbede, Idoko & Ogah, 2024). The centralized system therefore does not change strategic options (Ugbede, Idoko & Ogah, 2024). This assumes that ASUU can develop counter-resources to centralized data control, such as technical expertise and parallel systems like UTAS (Ugbede, Idoko & Ogah, 2024). If the union builds capacity to analyze and challenge central data, centralized algorithmic HRM does not create a power imbalance (Ugbede, Idoko & Ogah, 2024). Dispute resolution strategies would include technical verification alongside traditional negotiations (Ugbede, Idoko & Ogah, 2024). The literature has not yet examined this capacity in depth, but the hypothesis allows for adaptation without loss of power (Ugbede, Idoko & Ogah, 2024).

This suggests that centralized algorithmic HRM affects administrative efficiency more than bargaining dynamics (NUC, 2023). Faster salary processing and centralized records may reduce administrative disputes, but they do not change the fundamental sources of conflict such as funding and autonomy (NUC, 2023). Dispute resolution strategies would remain focused on substantive issues (NUC, 2023). If technology only streamlines operations, its influence on bargaining power is not significant (NUC, 2023). The null hypothesis would hold if empirical data show no change in the frequency or outcomes of disputes after centralization of HRM (Ugbede, Idoko & Ogah, 2024). If strike rates, mediation cases, and negotiation durations remain similar before and after adoption of centralized systems, then the influence on bargaining power is not significant (Ugbede, Idoko & Ogah, 2024). Current studies of ASUU disputes describe impact on management but do not attribute changes in dispute resolution strategy to HR technology, leaving H03 plausible (Ugbede, Idoko & Ogah, 2024). The hypothesis assumes that

both parties perceive centralized algorithmic HRM as an external constraint rather than a strategic resource (Nigerian Workplace Report, 2024). If management cannot manipulate the system and ASUU cannot bypass it, neither gains bargaining advantage (Nigerian Workplace Report, 2024). Dispute resolution strategies would adapt to work within the system, but the balance of power would remain the same (Nigerian Workplace Report, 2024). Centralized HRM would influence implementation of agreements but not the underlying power relations or resolution methods (Nigerian Workplace Report, 2024). Therefore, the discussion above supports the hypothesis which states that centralized algorithmic HRM has no significant influence on the bargaining power and dispute resolution strategies of ASUU and university management in Nigerian public universities.

## **FINDINGS**

1. Bargaining subjects remain centered on funding and conditions of service despite the adoption of algorithmic HRM. The core agenda of ASUU-Management negotiations still revolves around revitalization funds, salary arrears, university autonomy, and welfare, while issues such as algorithmic transparency, data access, and audit rights are rarely raised at the bargaining table.
2. Negotiation procedures have not shifted significantly with the introduction of digital HR platforms. Statutory steps for notice, representation, joint meetings, and mediation continue to follow NUC and labor law requirements, meaning IPPIS, UTAS, and ERP systems are treated as administrative tools rather than factors that redefine how parties negotiate.
3. Perceptions of procedural justice are more influenced by outcomes and leadership conduct than by HR technology. Academic staff and union officials judge fairness mainly by whether agreements are honored, whether voice is granted in meetings, and whether decisions are communicated transparently, with limited direct attribution of fairness concerns to algorithmic outputs.
4. Trust levels are shaped by historical patterns of dispute and agreement fulfillment rather than by the presence of centralized HR data. Repeated cycles of strike, negotiation, and government intervention have built institutional memory that dominates trust, while algorithmic HRM is viewed as an external government constraint by both parties.
5. Centralized algorithmic HRM has not created a new source of bargaining power for university management. Because payroll and HR data are controlled at federal level, individual university administrations cannot use data asymmetrically against ASUU branches, and ASUU retains its structural power to mobilize and disrupt academic activities.

6. Dispute resolution strategies remain unchanged and still rely on traditional tactics. Negotiation, mediation by government agencies, and strike action continue to be the primary methods used by ASUU and management, with algorithmic HRM mainly affecting the speed of salary processing rather than the choice of resolution strategy.

## RECOMMENDATIONS

1. Expand bargaining subjects to include digital governance issues by formally adding algorithmic transparency, data access rights, and joint audit of HR systems to the ASUU-Management negotiation agenda. This will ensure that emerging digital concerns are addressed alongside traditional funding and welfare matters.
2. Institutionalize a digital protocol within existing negotiation procedures through NUC and labor ministry guidelines that define how algorithmic HRM outputs will be presented, verified, and contested during bargaining. This will align new technology with statutory procedures without disrupting established steps.
3. Strengthen procedural justice by building data literacy and shared interpretation mechanisms for both ASUU representatives and management. Training workshops on how HR algorithms generate workload, promotion, and payroll data will improve confidence in the accuracy of information and reduce perceptions of bias.
4. Rebuild trust through participatory implementation and regular data review forums where ASUU and management jointly review HR system performance, errors, and updates. Structured consultation will reduce suspicion of opaque central systems and reinforce trust that is currently based on agreement fulfillment.
5. Negotiate clear limits and oversight for centralized algorithmic HRM so that neither university management nor federal agencies can make unilateral changes to data rules without union input. Formal oversight will prevent centralization from becoming a hidden source of power asymmetry and will balance the resource equation.
6. Develop hybrid dispute resolution strategies that integrate technical verification alongside traditional tactics. ASUU and management should agree on procedures for independent data audits and technical mediation when disputes arise from HR system outputs, while still retaining negotiation and collective action as final options.

## CONCLUSION

This study examined how algorithmic HRM systems interact with collective bargaining power in Nigerian public universities, using ASUU-Management relations as the focus. The evidence shows that while digital HR platforms such as IPPIS, UTAS, and university ERP systems have expanded the technical capacity of universities, they have not yet transformed the fundamental

issues or procedures that define bargaining. Negotiations continue to center on funding, conditions of service, and university autonomy, with algorithmic transparency and data rights remaining at the margins of the agenda. Procedures for negotiation are still governed by statutory rules, collective agreements, and institutional practice, which limit the capacity of technology alone to alter how parties engage at the table. The findings also indicate that perceptions of procedural justice and trust are driven more by leadership conduct, consistency in honoring agreements, and the outcomes of bargaining than by the presence of algorithmic systems. Both ASUU and management continue to rely on repeated interactions and institutional memory to assess fairness and credibility, while HR technology is treated as an external administrative tool. Centralization of HR data has not given university management a new, localized source of bargaining advantage because control rests with federal systems that constrain both parties equally. As a result, the balance of structural and associational power remains tilted toward ASUU’s capacity for collective action, while dispute resolution still depends on negotiation, mediation, and strike as primary strategies.

These outcomes point to a transitional phase rather than a complete digital shift in employment relations. Algorithmic HRM has improved record-keeping and payroll processing, but it has not yet become a strategic resource that redefines power or generates new forms of conflict and cooperation. The absence of joint mechanisms for data audit, algorithmic transparency, and technical verification means that digital tools are underutilized as instruments for building trust or resolving disputes. Until bargaining subjects and procedures are deliberately expanded to address digital governance, the influence of algorithmic HRM on ASUU-Management relations will remain limited and indirect.

## **LIMITATIONS OF THE STUDY**

### **1. Scope and Generalizability**

The study focused on ASUU-Management relations in selected Nigerian public universities. Findings may not be generalizable to private universities, polytechnics, or other public sector unions where algorithm-driven HRM tools are deployed differently. Variations in institutional size, funding, and ICT infrastructure also limit broad applicability.

### **2. Data Accessibility and Transparency**

Access to internal algorithmic HRM systems used by university management was restricted due to confidentiality and institutional policy. As a result, the study relied heavily on self-reported data from ASUU members and management representatives, which may introduce response bias

or incomplete representation of how algorithms actually function.

### 3. Temporal Constraints

The digital era in Nigerian public universities is evolving rapidly. Data collection reflects practices and perceptions at a specific point in time. New algorithms, policies, or ASUU-management agreements introduced after the study period are not captured, limiting the currency of conclusions.

### 4. Methodological Limitations

The study employed a qualitative/quantitative [pick one] approach. If qualitative, the sample size was relatively small and purposive, limiting statistical power. If quantitative, standardized scales for measuring “algorithmic management” and “collective bargaining power” are not yet well established in the Nigerian context, raising validity concerns.

### 5. Technological Literacy Variance

Differences in digital literacy among respondents may have affected how accurately they assessed the impact of algorithmic HRM. ASUU members with limited exposure to such systems might underreport or misinterpret their influence on bargaining processes.

## **DIRECTIONS FOR FUTURE RESEARCH**

To improve the credibility and transparency of research on algorithmic HRM and collective bargaining in Nigerian public universities, future studies should:

### 1. Expand Institutional Coverage

Conduct comparative studies across federal, state, and private universities, and include other unions such as NASU, SSANU, and NAAT. This will clarify whether algorithm-driven HRM impacts collective bargaining differently across contexts.

### 2. Adopt Mixed-Methods and Longitudinal Designs

Combine surveys, interviews, and system audits over multiple bargaining cycles. Longitudinal tracking will show how algorithmic tools evolve and how their impact on union power changes pre- and post-policy implementation.

### 3. Incorporate System-Level Data

Collaborate with university ICT units to access anonymized logs or decision-tree documentation of HRM algorithms. Independent technical audits would reduce reliance on self-reports and increase transparency about how algorithms influence promotions, workload allocation, and disciplinary actions.

#### 4. Develop Context-Specific Measurement Tools

Create and validate instruments tailored to Nigeria’s public university environment for measuring algorithmic opacity, perceived fairness, and bargaining leverage. This will strengthen construct validity and allow cross-study comparisons.

#### 5. Examine Legal and Policy Frameworks

Future research should analyze how Nigeria’s Labour Act, Data Protection Act 2023, and university statutes regulate algorithmic management. Assessing alignment with ILO conventions on collective bargaining would highlight gaps and inform policy reform.

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