

Research Article

Enhancing HR Technology Through Traceability and Auditing: Navigating Challenges and Legal Complexities for Operational Efficiency

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Abstract

This comprehensive study emphasizes the crucial need for holistic Human Resources (HR) management systems. These systems should ensure transparency, traceability, and alignment with strict regulatory standards, promoting organizational growth. The study highlights the essential role of time and attendance systems in managing hourly employees, ensuring compliance with wage laws and efficient payroll processes. By examining recent legal issues, including class-action lawsuits and key Supreme Court decisions, it illuminates the complex legal framework surrounding HR technology. The study promotes a solution-focused approach, advocating for improvements in data integrity, user interface design, and system interoperability. Additionally, it underlines the importance of including robust reporting and analytics features in time and attendance systems. These suggested strategic changes aim to reduce compliance liabilities, increase productivity, improve data retention practices, and promote a streamlined, legally compliant HR operational framework. This research plays a pivotal role in contributing to the ongoing discourse about enhancing technological infrastructures within Human Resources (HR). It provides insightful perspectives and robust data, serving as a valuable resource for HR professionals, leaders, and decision-makers. The ultimate objective of this study is to attain unparalleled operational excellence and rigorous legal compliance. This not only elevates the standard of HR management systems to new heights but also paves the way for future advancements in this critical field. By fostering a culture of continuous improvement and innovation, this research can inspire the development of more efficient, effective, and legally compliant HR management systems.

Keywords

HR Management Systems, Regulatory Compliance, Legal Risks, Financial Risks, Reporting Capabilities, Analytical Insights, Operational Excellence, Legal Compliance

1. Introduction

Human Resources (HR) technologies are essential in the digital age for managing the employee lifecycle, from recruitment to retirement. Yet, the sector faces significant challenges due to a lack of adequate traceability and auditing

mechanisms. These issues not only complicate HR operations but also lead to legal risks, potentially causing financial losses and damaging reputations [14]. As businesses grow, the scalability of HR systems and the security of data transfer and

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storage have become crucial. Additionally, managing hourly employees through time and attendance systems requires thorough attention to ensure wage law compliance and efficient payroll processing. This paper explores these challenges, using legal case studies to emphasize the need for improved traceability and auditing in HR technologies. It suggests a comprehensive solution framework, incorporating advanced data capture, validation, and security measures, along with user-centric design principles for system interfaces. By combining these elements, this paper outlines a way to simplify HR operations, strengthen legal compliance, and enhance overall organizational efficiency.

2. Challenges and Legal Complexities in HR Technology

In the USA, a lack of traceability and auditing in HR technologies often results in costly and time-consuming IT support, the management of multiple vendors, scalability issues, insecure data storage or transfer, and compliance issues. To overcome these challenges, businesses need to implement comprehensive HR management systems. They should ensure transparency and traceability within the HR system to comply with regulations, and support scalability as they grow. Addressing these issues is crucial for streamlining HR operations [1].

Recent legal issues related to HR technology and traceability involve a class-action lawsuit against HR tech company Paylocity in Illinois. The issue pertains to the use of worker biometrics, particularly fingerprint scans for timekeeping [8].

Additionally, cases like *Epic Systems v. Lewis* have significantly influenced HR policies. In this case, according to VensureHR, the Supreme Court supported the use of arbitration clauses in employment contracts [7]. These ruling impacts class-action lawsuits and individual arbitration processes.

Another notable case is *Paine v. IKEA Holdings*, where IKEA was accused of age discrimination for allegedly denying an employee promotion opportunity due to age.

These cases highlight the legal intricacies of HR technology, data management, auditing, traceable data, compliance, and employee rights in the workplace.

They involve the data collected from HR technologies, and employers have spent millions of dollars arranging this data to make it comprehensible for audit.

A time and attendance system is an integral part of HR technologies and is particularly important. These systems manage hourly employees by accurately tracking work hours, ensuring wage compliance, and supporting efficient payroll processing [13]. Integrating auditing and traceability into these solutions can mitigate several risks:

Compliance Risks The lack of comprehensive traceability in HR technology, particularly in time and attendance systems, increases compliance risks. This occurs when policies are not

enforced, wage disbursements are inaccurately completed, and compliance training is not readily accessible.

Challenges in Auditing Integrations Deploying new HR technologies without considering audits can affect various aspects of HR tech, including time and attendance, payroll benefits, and employee life events [4].

Particularly, events such as hiring, transfers, leaves of absence, and terminations can impact payroll and benefits along with other interconnected systems. It becomes difficult to audit and trace any issue when multiple systems are involved.

Productivity Losses Outdated HR technologies lack audit and traceability automation, especially in time tracking [5]. This lack impedes productivity by requiring manual tasks when employees reach out to HR, thereby reducing HR employee efficiency and detracting from strategic objectives.

Disengaged Employees Inefficient HR tools, such as poor transparency in time and attendance systems, can lead to disengagement among HR personnel [6].

HR technologies encompass the management of the entire employee lifecycle, from recruitment to internal transitions. An emphasis on the management of hourly employees and the integration of time tracking systems is essential for a holistic HR technology strategy.

Key Components for Enhancing Traceability in HR Time and Attendance System

Improving the traceability of a Time and Attendance T&A system involves enhancing the system's ability to accurately capture, record, and report employee work hours [10]. A focus on data integrity and user interface UI design can significantly contribute to this goal. Here are several key considerations to keep in mind:

Accurate Data Capture Ensure the system can accurately capture time entries, whether they're clock-ins and clock-outs, breaks, or overtime. Consider integrating biometric systems (like fingerprint or facial recognition) to minimize buddy punching and other forms of time theft. When selecting an employee management system, it's mandatory to understand how each event's timestamp is captured. Additionally, the system should be able to identify who made changes and what changes were made. Capturing the time and reason for each event is mandatory, in addition to recording the event itself.

Data Validation Implement checks to validate data at the point of entry [9]. For instance, the system should flag or reject improbable entries, such as clocking in for more than 24 hours. The system should also have the capability to check different types of modules within the system and provide data validation. In this scenario, clock punches are cross-referenced with the policy anomalies module to trigger the policy.

Audit Trails Maintain detailed logs of all system interactions, including time entry modifications and administrative actions. This transparency is crucial for auditing and compliance purposes.

Tracking Causes of Deviations in Time and Attendance

Systems: In the time and attendance system, it's important to track and maintain the events or reasons that cause deviations.

Policy Gap: The time and attendance system should offer an option to provide policy explanations for why outputs are generated as they are.

Data Security Protect sensitive employee data through encryption, secure access controls, and regular security audits. Compliance with local data protection regulations, like GDPR in Europe or the IT Act in India, is essential. When the organization expose traceability data to various people within the organization, it should consider role-based access to this data. This ensures that not all administrators are exposed to sensitive data [2].

3. Solution Approach

3.1. Data Layer Event Sequencing in HR Technologies

In this example, we use time, attendance, and punch data to illustrate the concept of traceability. When an employee clocks in, the system should have the capability to track the timestamp of the punch and the method used by the employee. For instance, if an employee uses a mobile phone app to clock in, the system should also store the location from where the employee punched in.

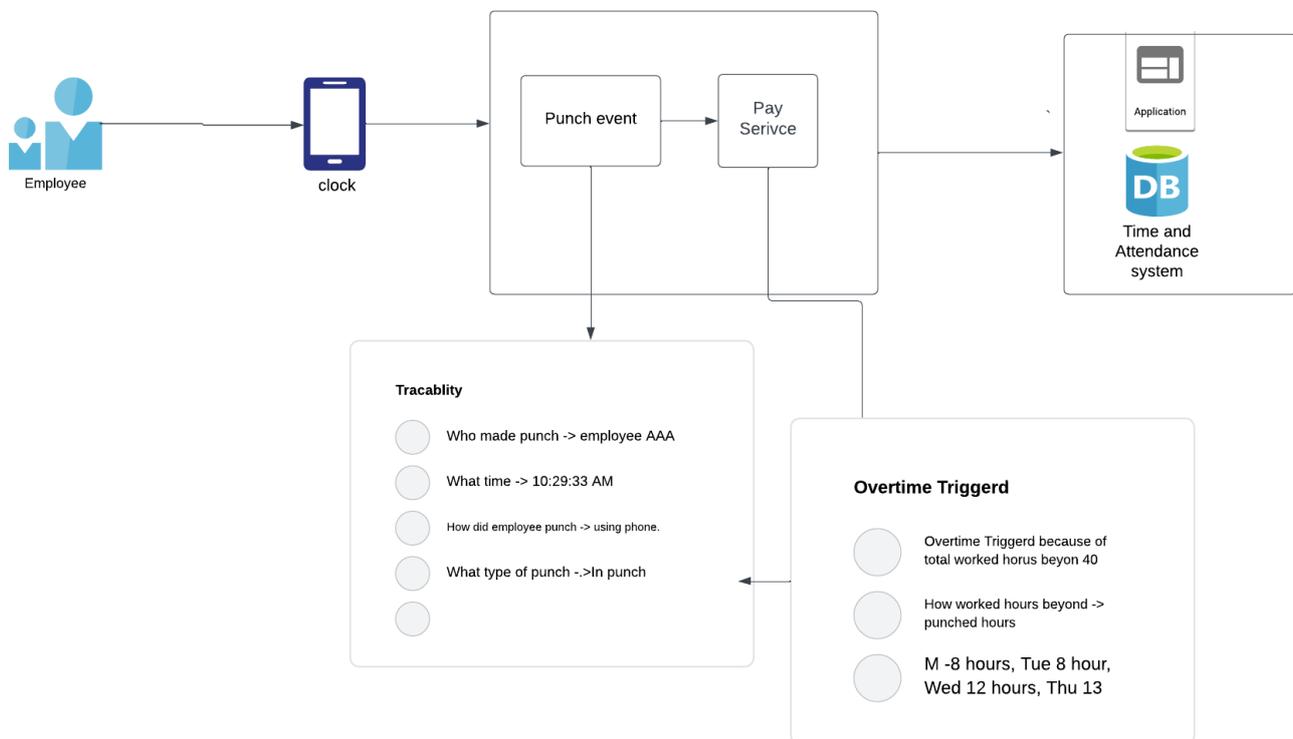


Figure 1. Time, Attendance, and Punch Traceability Illustrated Flow.

A punch event should trigger pay events in the pay services. The pay event service calculates the total hours worked by the associate and ensures they receive overtime pay when applicable. The pay service should be able to trace back to a particular punch event. It should also provide the option to refer back to the punch service and backtrack each of its events, including tracking each day's worked hours and punched hours. This traceability information should be tracked in the data layer instead of the logs.

3.2. Data Models for Traceability

Entity-Relationship Model: Essentially, a time and attendance system may use an entity-relationship model to represent the relationships between different data entities,

such as employees, punches, and pay events.

Employee Entity: This includes personal and employment information. Each employee record can be uniquely identified by an employee ID.

Punch Entity: This records every clock-in and clock-out event. Attributes may include punch ID, employee ID, timestamp, punch type (in/out), method (app, biometric), and location.

Pay Event Entity: Each record in this entity represents a pay calculation event. It links to one or more punch events. The attributes may include pay event ID, associated punch IDs, total hours, overtime hours, and pay date.

Relational Model: This can be further converted into a relational database schema, where each entity becomes a table and relationships are established through foreign keys.

3.3. Implementing Traceability in the Data Model

Tracking and Storing Data:

Each punch event generates a unique record in the punch data table, linked to the employee by their ID. The punch method (e.g., mobile app) and location are also stored as part of this record.

Relating Punch Events to Pay Events:

A pay event is generated based on one or more punch events. Through relational mapping, it can be linked back to individual punch records, enabling traceability.

To enhance traceability, consider implementing a many-to-many relationship between punches and pay events. This could be achieved through a junction table, accommodating scenarios where multiple punch events contribute to a single pay event and vice versa [12].

Enhancing Traceability:

Audit Trails: Implement audit trails for both punch and pay events. An audit trail can include fields such as `created_at`, `created_by`, `modified_at`, and `modified_by` for each record, enabling a detailed history of each event.

Queries for Traceability: Design ORM (Object-Relational Mapping) methods that can easily trace the link from a pay event back to all related punch events, including details like punch time and location.

3.4. User Interface

Traceable UI The goal is to design a user interface that is not only intuitive but also easy to navigate for all users. This should apply regardless of their level of technical knowledge or familiarity with similar systems. One of the key features that we aim to include is the option for traceability in each domain. This means providing individualized and tailored services for specific areas. For example, offering a distinct and dedicated interface for punch services and a separate one for payroll services. This approach ensures that each service is specifically catered to the needs of its users, providing a seamless, user-friendly experience [11].

3.5. Integration with Other Systems

The Time and Attendance (T&A) system must be designed for seamless integration with adjacent payroll, Human Resources (HR) management, and project management systems. Such integration is crucial to minimize manual data entry efforts and guarantee consistency across various platforms. This approach not only facilitates enhanced traceability but also ensures that data integrity is maintained throughout the HR information system. By enabling automated data flows between systems, organizations can achieve a unified view of employee data, thereby simplifying compliance and reporting processes [3].

3.6. Scalability

Scalability is a paramount consideration in the architecture of traceability systems within HR technologies. The design must account for potential future growth, both in terms of an expanding user base and the incorporation of new functionalities. A scalable system ensures that the organization can adapt to evolving business needs without the necessity for extensive modifications or system overhauls. This entails adopting modular designs and leveraging cloud-based technologies where appropriate, to facilitate easy scaling and integration of new features or modules, thereby ensuring that the system remains both robust and adaptable over time.

4. Reporting and Analytics for Enhanced HR Traceability

4.1. Customizable Reports

Robust reporting tools are essential for HR systems, especially in Time and Attendance (T&A). These tools should provide flexible report generation tailored to the specific needs of managers and HR personnel. This could include attendance summaries, tardiness analysis, and overtime tracking. Flexible reporting helps monitor employee performance and identifies areas for improvement, aiding in informed decision-making.

4.2. Analytics for Insights

Incorporating advanced analytics into the T&A system uncovers patterns and trends within the organization. This could involve analyzing data to identify habitual latecomers or departments with excessive overtime. These insights allow organizations to address underlying issues, enhancing productivity and ensuring compliance with labor regulations. Analytics is a powerful tool for optimizing HR operations, contributing to efficient and effective management strategies.

5. Conclusion

This paper systematically explored the critical challenges and legal complexities confronting HR technologies in the United States, with a focused lens on the absence of traceability and auditing functionalities. These gaps have not only precipitated a spectrum of operational issues, including costly IT support requirements, vendor management complications, scalability constraints, insecure data handling practices, and compliance shortfalls but have also positioned HR systems at the crosshairs of legal scrutiny. The discourse highlighted the imperative for a strategic revamp of HR management systems to embed comprehensive solutions that bolster transparency, traceability, and scalability. Through an analytical review of recent legal precedents and the nuanced examination of time

and attendance systems, this study proposed a multifaceted solution approach. This approach encapsulates enhancing data integrity, refining user interface design, ensuring seamless system integration, and leveraging advanced reporting and analytics. The culmination of these efforts is envisioned to mitigate compliance risks, elevate productivity, safeguard data security, and ultimately, champion a more streamlined, efficient, and legally compliant HR operational paradigm.

Abbreviations

GDPR: General Data Protection Regulation

HR: Human Resources

ID: Identification

IT: Information Technology

ORM: Object-Relational Mapping

T&A: Time and Attendance

UI: User Interface

Author Contributions

Karthikeyan Manikam Date is the sole author. The author read and approved the final manuscript.

Conflicts of Interest

The author declares no conflicts of interest.

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