



Integration Challenges in a Healthcare Organization

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ABSTRACT

The integration of EPIC, KRONOS, and Workday in healthcare organizations presents a transformative opportunity to enhance operational efficiency, streamline workforce management, and improve patient care. EPIC serves as a robust electronic health record (EHR) system, facilitating the comprehensive management of patient information and clinical workflows.

KRONOS optimizes workforce management through effective scheduling and labor analytics, while Workday addresses human capital management and financial processes.

This paper explores the synergies achieved through the integration of these platforms, highlighting benefits such as enhanced data sharing, improved reporting and analytics, and better compliance with regulatory standards. Additionally, the challenges of interoperability, data security, and change management are examined to provide a holistic understanding of the integration process. API based integrated approach aims to foster a more coordinated, efficient, and patient-centered healthcare environment. This paper delves into the synergies achieved through the integration of these platforms, highlighting the significant benefits, including enhanced data sharing, improved reporting and analytics, and increased compliance with regulatory standards.

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Introduction: Integrating software systems like EPIC, KRONOS, and Workday in healthcare organizations demands a comprehensive understanding of each platform's functions, strengths, and interconnections.

This expertise is vital for creating smooth integrations that maximize the benefits of these systems and ensure seamless data flow. By understanding each platform's functionalities and interdependencies, organizations can enhance efficiency, reduce errors, and improve overall operational performance. Each integration presents unique challenges, akin to the distinct implementation issues found in various healthcare settings. Just as mechanical engineers must consider the unique dynamics of each machine—such as type, operating conditions, and specific requirements—healthcare professionals must navigate the distinct dynamics of their organizations.

This includes understanding workflows, regulatory requirements, and the needs of both patients and staff to ensure effective integration and optimal performance of their systems.

The difference between application knowledge and integration knowledge is crucial to this process. Application knowledge involves understanding how to effectively use a specific software system to accomplish tasks, including familiarity with its features and best practices for optimizing processes like patient care, scheduling, Human Capital Management and financial management.

In contrast, integration knowledge focuses on how different systems can work together seamlessly.

It emphasizes interconnections, data flow, and communication between multiple software platforms, aiming to create a cohesive system where applications function harmoniously. This knowledge is essential for ensuring data consistency and interoperability.

In healthcare, factors such as organizational culture, regulatory requirements, provider capabilities, and patient demographics play a significant role in shaping the implementation process. Each setting may have different resources, financial constraints, and stakeholder expectations, necessitating tailored strategies for the successful integration of systems like EPIC, KRONOS, and Workday.

These parallel underscores the importance of adapting general knowledge and best practices to meet the specific needs of each context. Both engineers and healthcare professionals must leverage local insights while applying established principles to develop effective, sustainable solutions that address the challenges they face. EPIC is a leading electronic health record (EHR) system used widely in healthcare to manage patient information, streamline clinical workflows, and enhance care quality. It integrates various functions, such as patient scheduling, documentation, billing, and data analytics, allowing clinicians to track patient records, access medical histories, lab results, and treatment plans. With features like patient portals, EPIC enables patients to view their health information, schedule appointments,

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and communicate with their providers. Additionally, its robust reporting and analytics capabilities support quality improvement and regulatory compliance.

KRONOS is a premier workforce management solution for healthcare organizations. It helps manage staffing, scheduling, and labor data, ensuring that the right staff is available when needed. KRONOS automates scheduling by considering staff availability, skills, and patient demand, reducing administrative burdens and scheduling conflicts. The system also accurately tracks employee time and attendance, aiding compliance with labor laws and simplifying payroll processes. Furthermore, KRONOS provides advanced tools for analyzing labor costs, productivity, and staffing efficiency, empowering organizations to make informed decisions.

Workday is a comprehensive human capital management (HCM) and financial management system widely used in healthcare. It supports various HR functions, including payroll, recruitment, performance management, and financial planning, helping streamline operations and improve workforce efficiency. Workday offers tools for managing employee data, tracking performance, and facilitating talent acquisition, ensuring healthcare organizations can attract and retain skilled professionals. It automates payroll processes for timely and accurate compensation, critical for maintaining staff satisfaction and regulatory compliance. Workday's financial capabilities enable effective budget and expense management, while its robust reporting tools facilitate strategic planning by analyzing workforce and financial data. With an intuitive interface, Workday enhances user experience, making it easier for employees and managers to navigate its functionalities.

After integrating software systems, the crucial next step is ensuring that all users understand how the new solution works and how it can enhance the company's workflow.

This phase can be time-consuming, as familiarity with previous components does not always guarantee ease of use with the new system.

For example, when EPIC sends account data to Workday, users need to understand the flow of information and how to effectively utilize this integration. Once the data is in Workday, analysts can create income and trial balance reports, allowing them to analyze the financial position of the organization.

Another example is when KRONOS sends payroll inputs to Workday. In this integration, KRONOS generates a file containing the necessary payroll data, which is then read by Workday. Once the data is loaded into Workday, it can be processed for payroll, ensuring that employees are compensated accurately and on time.

Another example is sending item data from Workday to EPIC's Supply Chain Management (SCM) system for daily hospital operations. In this integration, Workday generates and exports essential item data, including inventory levels, pricing, and supplier information. This data is then imported into EPIC SCM, enabling hospital staff to efficiently manage supplies, maintain accurate inventory tracking, and streamline procurement processes for day-to-day operations. This integration not only enhances operational efficiency but also supports better decision-making in inventory management, ensuring that resources are available when needed.

This process ensures that healthcare providers have accurate and up-to-date information about their supplies, enabling them to manage inventory efficiently and make informed purchasing decisions. Proper training is essential for users to understand how to monitor the data flow, troubleshoot any issues, and ensure that the item information is accurately reflected in EPIC.

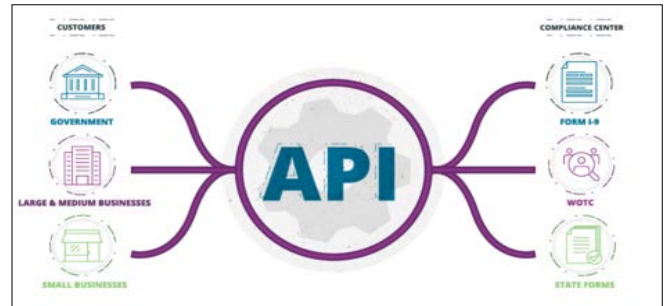


Image: Direct Communication between two Systems through API. | Source: Equifax Workforce Solutions

All these systems support file-based integrations and real-time data communications through APIs. This flexibility allows healthcare organizations to connect their various software platforms efficiently, ensuring seamless data flow and timely access to critical information. By leveraging these integration methods, organizations can enhance operational efficiency, improve patient care, and streamline administrative processes.

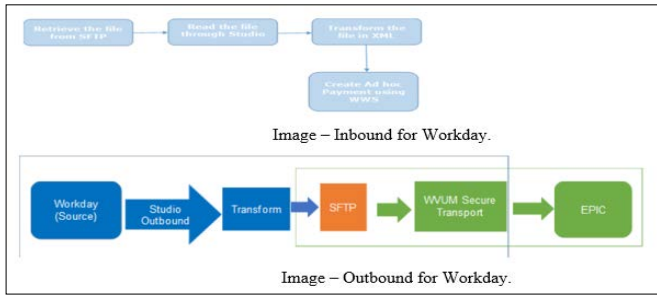
In today's digital landscape, businesses need seamless connectivity between software systems for efficient operations and informed decision-making. Application Programming Interfaces (APIs) are the preferred integration solution because they enable real-time data exchange, streamline processes, and enhance operational efficiency. Unlike traditional methods that depend on file transfers or complex middleware, APIs allow for direct communication between systems, reducing errors and improving response times. This flexibility helps organizations quickly adapt to changing needs while maintaining data integrity and security. Overall, APIs are the ideal choice for businesses looking to optimize workflows and enhance their technology ecosystems.

Application Analysis, Issues and Performance Monitoring

In this section, we will discuss a common use case faced by healthcare organizations when integrating systems like Workday, EPIC, and KRONOS. We will explore the challenges associated with errors in data transfer and how to reduce these errors while minimizing the number of middleware systems to enhance data processing speed and accountability.

A healthcare organization is experiencing frequent errors during the integration of item data between Workday and EPIC's Supply Chain Management (SCM) system. These errors often stem from data formatting issues, incorrect mappings, and communication failures between middleware systems.

As a result, staff struggles with inaccurate inventory levels, leading to inefficient supply management and delayed purchasing decisions.



This situation creates dependencies on IT staff to investigate the root causes of these issues. They must determine whether the problems originate from network delays, performance issues within Workday, the absence of data leading to missing files, or complications within the target system. This reliance on IT can slow down resolution times and hinder operational efficiency, underscoring the need for improved integration strategies and user training to empower staff in managing these challenges effectively.

Case Study 1: Item Data from Pyxis to Workday

When data from Pyxis is unavailable for Workday, no file is generated, causing the Workday integration to fail. This triggers notifications to the integration team and SCM staff, who then spend significant time emailing various teams—Workday, networking, and Pyxis—to investigate the cause of the issue, whether it's a data problem or a networking issue.

Transitioning to an API-based integration instead of a file-based interface can reduce the reliance on SFTP, streamline communication, and ensure faster and more accurate data flow.

Case Study 1

This integration retrieves the file in HL7 v2.6 format and perform inventory depletion (Create Inventory Stock Request + Pick Inventory) at Workday. File Inbound into Workday: Uses retrieval service to fetch the incoming data file from the SFTP server. HL7 file is transformed to fetch required fields from MSH, ORC and RQD records and update the Workday System.

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Case Study 2

EPIC requires data in HL7 format, which makes writing and mapping these files a complex and time-consuming task. Integration engineers often rely on Core point to facilitate this process, adding another layer of software to the integration.

Consequently, this involves multiple systems—Workday, SFTP, Core point, and EPIC—leading to increased dependencies and potential delays due to the involvement of various stakeholders.

This complexity highlights the need for a more streamlined approach to integration.

Case Study 3

Workday sends employee demographics data which acts as an input to Kronos. The file that is sent across from Workday to Kronos consists of basis employee demographics, job data for the employees such as Employee Status, Job Title, etc.

Solution

To minimize dependencies on third-party systems and enhance data sharing, the healthcare organization should implement API integration. This approach offers several key advantages.

Faster Data Transfer: APIs enable quick and efficient data exchanges between Workday, Kronos and EPIC’s Supply Chain Management (SCM) system, significantly reducing the time it takes to update inventory and item data. API integration allows for real-time data updates, ensuring that staff have immediate access to the most current inventory levels and information. This leads to more informed decision-making.

By utilizing APIs, the organization can avoid the complexities and delays associated with Secure File Transfer Protocol (SFTP), streamlining data transfer processes. Invest in training IT staff to learn advanced tools and technologies that facilitate seamless data integration and management.

This knowledge will enable them to efficiently handle integration tasks and troubleshoot issues independently. Direct API communication reduces the likelihood of data formatting errors and incorrect mappings, ensuring that the data transferred between systems is accurate and reliable.

Reducing reliance on multiple middleware systems minimizes complexity, decreasing potential points of failure and enhancing overall system reliability.

API integration can solve common healthcare challenges by enabling real-time access to patient data, streamlining billing and claims processing, and enhancing inventory management for medical supplies. Here are some Example to illustrates this strategy and approach

Example 1 API Based Interface

OnBase AP Automation captures invoices at their source, whether scanned or received electronically. It automates data extraction for quick processing, eliminating the need for manual entry or file processing. Documents are accessible through the Workday interface for decision-making and can be instantly routed to the right individuals for review, approval, and coding.

Workday integrates with the OnBase imaging system through APIs, resulting in a fast, reliable, and low-error process. OnBase accesses the necessary information from Workday to create invoices efficiently using APIs based Integration, significantly speeding up operations and improving accuracy.



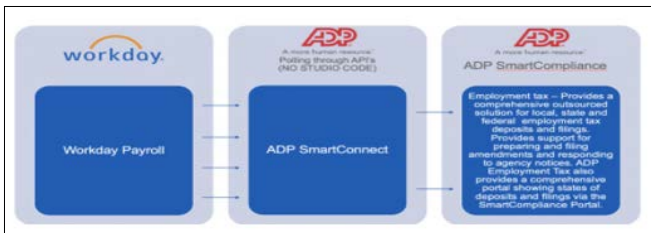
Image- OnBase Integration | Source: rpic.com

By focusing on API integration and enhancing IT staff capabilities, the healthcare organization can significantly reduce dependencies on third-party systems, improve data accuracy and speed, and create a more efficient operational environment

Example 2 ADP and Workday connection through API

ADP integrates with Workday through APIs, enabling seamless data exchange between the two systems. This integration allows for efficient access to ADP's data services. By using APIs, organizations can automate processes, reduce manual data entry, and enhance accuracy, ensuring that employee information is up-to-date and accessible for HR and payroll functions.

This streamlined approach improves overall operational efficiency and supports better decision-making.



Source: Workday.com

Example 3 GHX and Workday Integration through API

GHX integrates with Workday through APIs to streamline supply chain management and procurement processes. This integration allows organizations to automate the exchange of data related to purchasing, inventory management, and vendor relationships directly within the Workday platform. By leveraging APIs, GHX facilitates real-time access to critical supply chain information, reduces manual data entry, and minimizes errors. This enhances operational efficiency and ensures that procurement teams can make informed decisions quickly, ultimately improving overall supply chain performance.

GHX and Workday have created a cloud-based, out-of-the-box EDI solution that integrates seamlessly with Workday's ERP system. This solution enhances usability and provides the benefits of GHX Exchange Services—such as process automation, visibility, and communication—directly within the Workday applications.

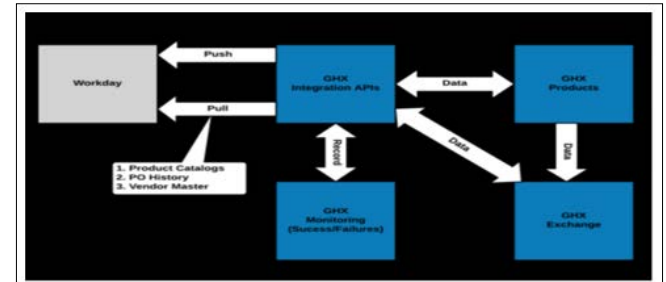
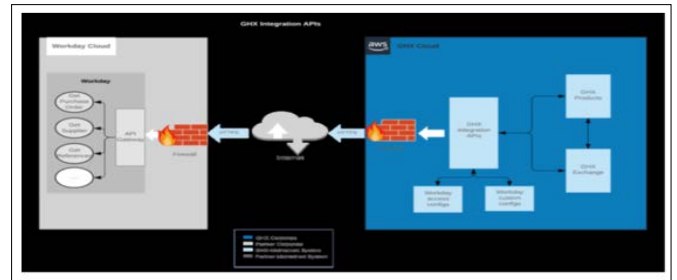


Image- Workday and GHX integration through APIs | Source: Workday.com

1. Conclusion

In conclusion, API integrations stand out as the superior choice for healthcare organizations compared to traditional file-based systems. APIs enable real-time data exchange, reduce errors, and streamline processes, ultimately enhancing operational efficiency and patient care. In contrast, file-based integrations often lead to delays, data inconsistencies, and increased complexity. By embracing API integration, healthcare organizations can better meet the demands of modern care delivery, ensuring seamless connectivity and accurate information flow across their systems [1-7].

Traditional file-based systems, which often rely on third-party solutions like SFTP or middleware, APIs reduce dependencies on these intermediaries, minimizing complexity and potential points of failure.

References

- [1] Pete Nelson. "GHX and Workday Align in the Cloud for Healthcare". 2019; <https://www.ghx.com/the-healthcare-hub/ghx-and-workday-align-in-the-cloud-for-healthcare/>.
- [2] Bryan Robertson. "Integrated Healthcare & Technology". 2016; <https://www.mindyra.com/blog/integrated-healthcare-and-technology#:~:text=In%20primary%20care%2C%20examples%20of,evidence%2Dbased%20treatment%20plan%20decisions.>
- [3] Bhumi Shah, John Lee Y. Allen, Hassan Chaudhury, James O'Shaughnessy, Carina S.B. Tyrrell "The role of digital health in the future of integrated care". 2022; 100131 <https://doi.org/10.1016/j.intcar.2022.100131>.
- [4] Corey M Angst, Sarv Devaraj, Carrie C Queenan, Brad Greenwood. "Performance Effects Related to the Sequence of Integration of Healthcare Technologies". 2011; <https://doi.org/10.1111/j.1937-5956.2011.01218.x>.

- [5] Solution Summary “Integrating OnBase and Workday reduces manual AP work and increases visibility”. 2018; <https://www.kiriworks.com/wp-content/uploads/2019/04/Solution-Summary-OnBase-and-Workday.pdf>.
- [6] Mishaal M. Almutairi, Mohammad Yamin, George Halikias “An Analysis of Data Integration Challenges from Heterogeneous Databases”. 2021; <https://ieeexplore.ieee.org/document/9441138>.
- [7] Michael David Myers, Jiunn Chieh Lee. “The Challenges of Enterprise Integration: Cycles of Integration and Disintegration Over Time”. 2004; https://www.researchgate.net/publication/221598847_The_Challenges_of_Enterprise_Integration_Cycles_of_Integration_and_Disintegration_Over_Time.