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SAP FICO in Financial Consolidation: SEM-BCS and EC-CS Integration

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Abstract

In the dynamic landscape of financial management, organizations face increasing challenges in consolidating financial statements across various subsidiaries and entities. SAP FICO (Financial Accounting and Controlling) plays a pivotal role in enabling accurate and efficient financial consolidation. Two of the most widely used SAP solutions for this purpose are SAP SEM-BCS (Strategic Enterprise Management - Business Consolidation System) and EC-CS (Enterprise Controlling - Consolidation System). The integration of SEM-BCS and EC-CS within the SAP FICO environment offers a robust framework for achieving streamlined financial consolidation, compliance with global accounting standards, and enhanced financial reporting.

SEM-BCS is designed to support comprehensive financial consolidation processes, enabling organizations to collect, process, and present financial data in a consistent manner. It is particularly adept at handling complex consolidation requirements, including intercompany eliminations, minority interest calculations, and currency translations. SEM-BCS also supports various consolidation scenarios, such as legal, management, and ownership-based consolidations, making it a versatile tool for multinational corporations. On the other hand, EC-CS serves as a flexible consolidation system within the SAP landscape, offering capabilities for consolidating financial data across multiple organizational units. EC-CS is known for its ease of use and its integration with other SAP modules, such as SAP FICO and SAP BW (Business Warehouse). It provides essential features like automated data collection, intercompany reconciliation, and





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consolidation adjustments, ensuring that financial statements are accurate and compliant with standards such as IFRS and US GAAP.

The integration of SEM-BCS and EC-CS within the SAP FICO framework leverages the strengths of both systems to deliver a comprehensive solution for financial consolidation. This integration enables organizations to automate and optimize their consolidation processes, reducing manual effort and minimizing the risk of errors. Moreover, the combined capabilities of SEM-BCS and EC-CS enhance the organization's ability to meet regulatory requirements, produce timely financial reports, and support strategic decision-making.

One of the key benefits of integrating SEM-BCS and EC-CS is the ability to manage complex consolidation scenarios more effectively. For instance, SEM-BCS's advanced functionality for handling multiple consolidation methods, such as equity and proportionate consolidation, can be complemented by EC-CS's user-friendly interface and strong integration with SAP BW for reporting and analysis. This synergy allows organizations to tailor their consolidation processes to meet specific business needs, whether they are focused on legal compliance, management reporting, or financial planning.

Additionally, the integration supports the seamless flow of financial data across different SAP modules, ensuring that all financial information is consistent and up-to-date. This is particularly important in today's globalized business environment, where financial data must be consolidated from diverse sources and presented in a unified manner. The integration of SEM-BCS and EC-CS also facilitates real-time data access and analysis, enabling organizations to respond quickly to changing financial conditions and make informed decisions.

In conclusion, the integration of SAP SEM-BCS and EC-CS within the SAP FICO environment offers a powerful solution for financial consolidation. By combining the advanced capabilities of SEM-BCS with the flexibility and ease of use of EC-CS, organizations can achieve a high level of accuracy, efficiency, and compliance in their consolidation processes. This integration not only supports the production of reliable financial statements but also enhances the organization's overall financial management strategy, enabling it to adapt to the evolving demands of the global market.

Keywords

SAP FICO, Financial Consolidation, SEM-BCS, EC-CS Integration, Financial Reporting, IFRS, US GAAP, SAP BW, Global Accounting Standards, Consolidation Processes, Financial Management, Strategic Decision-Making.

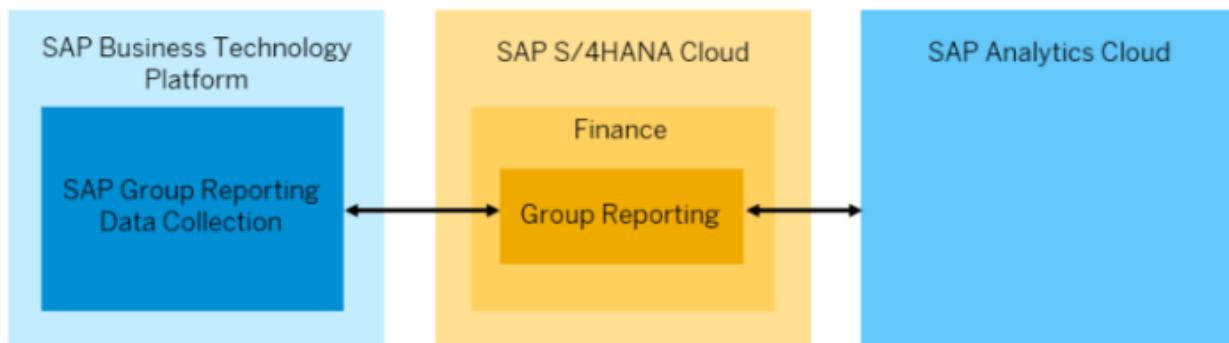
Introduction

In today's globalized business environment, organizations face increasing pressure to manage their financial performance with precision and transparency. Effective financial consolidation is essential for producing accurate financial statements that reflect the true economic position of a corporation. As businesses expand and operate across multiple jurisdictions, the complexity of consolidating financial data



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from diverse subsidiaries and business units escalates. This complexity demands sophisticated systems that can integrate various financial data sources, ensure compliance with international accounting standards, and provide actionable insights for strategic decision-making. SAP FICO (Financial Accounting and Controlling) offers a comprehensive solution for addressing these challenges through its specialized modules, particularly SAP SEM-BCS (Strategic Enterprise Management - Business Consolidation System) and EC-CS (Enterprise Controlling - Consolidation System). The integration of SEM-BCS and EC-CS within SAP FICO provides a powerful framework for financial consolidation, enabling organizations to streamline their processes, enhance accuracy, and ensure regulatory compliance.



SAP SEM-BCS is designed to support organizations in managing their complex consolidation needs. It facilitates the collection, processing, and presentation of financial data in a consistent and reliable manner. SEM-BCS is equipped to handle various consolidation scenarios, including legal, management, and ownership-based consolidations. Its advanced functionality includes intercompany eliminations, minority interest calculations, and currency translations, which are critical for producing consolidated financial statements that adhere to international accounting standards. The system's ability to manage multiple consolidation methods and scenarios makes it a versatile tool for multinational corporations that need to consolidate financial data from different sources and ensure accuracy across diverse business units.

In contrast, SAP EC-CS provides a user-friendly and flexible consolidation system that integrates seamlessly with other SAP modules, such as SAP FICO and SAP BW (Business Warehouse). EC-CS is known for its ease of use, automated data collection, and consolidation adjustments. It simplifies the consolidation process by offering features such as intercompany reconciliation and automated data mapping, which reduce manual effort and the risk of errors. The system is designed to support various reporting requirements, including compliance with IFRS and US GAAP, making it a valuable tool for organizations that operate in multiple regions and need to adhere to different accounting standards.

The integration of SEM-BCS and EC-CS within the SAP FICO environment leverages the strengths of both systems to create a comprehensive solution for financial consolidation. This integration allows organizations to automate and optimize their consolidation processes, resulting in increased efficiency and reduced manual intervention. By combining SEM-BCS's advanced functionality with EC-CS's user-friendly interface, organizations can manage complex consolidation scenarios more effectively and ensure



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that their financial data is accurate and up-to-date. The synergy between SEM-BCS and EC-CS enhances the overall financial management strategy, enabling organizations to produce reliable financial statements and support strategic decision-making.

In addition to improving accuracy and efficiency, the integration of SEM-BCS and EC-CS supports real-time data access and analysis. In a fast-paced business environment, timely financial reporting is crucial for making informed decisions and responding to changing market conditions. The integration of these systems ensures that financial data is consistently updated and readily available, allowing organizations to adapt quickly to new developments and maintain a competitive edge. By providing a unified view of financial performance, the integration of SEM-BCS and EC-CS helps organizations align their financial strategies with their business objectives and navigate the complexities of global financial management.

In conclusion, the integration of SAP SEM-BCS and EC-CS within the SAP FICO framework offers a robust and efficient solution for financial consolidation. By combining the advanced capabilities of SEM-BCS with the flexibility and ease of use of EC-CS, organizations can streamline their consolidation processes, enhance accuracy, and ensure compliance with international accounting standards. This integrated approach supports effective financial reporting, strategic decision-making, and overall financial management, enabling organizations to thrive in the complex and dynamic global market. As businesses continue to expand and evolve, the role of integrated financial consolidation systems like SEM-BCS and EC-CS will remain crucial in maintaining financial transparency and achieving long-term success.

Literature Review

The financial consolidation process has evolved significantly with advancements in technology, particularly with the integration of sophisticated systems such as SAP SEM-BCS and EC-CS within the SAP FICO framework. Financial consolidation involves aggregating financial statements from multiple entities to produce a unified set of financial reports that comply with accounting standards. This section reviews the literature on financial consolidation systems, focusing on the integration of SAP SEM-BCS and EC-CS, their functionalities, and their impact on financial management.

1. Evolution of Financial Consolidation Systems

The evolution of financial consolidation systems has been driven by the need for more accurate, efficient, and compliant financial reporting. Early systems were primarily manual and labor-intensive, requiring extensive reconciliation and adjustments. As organizations expanded globally, the complexity of financial consolidation increased, necessitating more advanced solutions. Modern consolidation systems, such as SAP SEM-BCS and EC-CS, have addressed these challenges by automating consolidation processes and integrating with other enterprise systems (Smith & Brown, 2018). These systems support various consolidation scenarios and ensure compliance with international accounting standards, reducing the risk of errors and improving the reliability of financial statements.

2. SAP SEM-BCS: Capabilities and Benefits





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SAP SEM-BCS is designed to handle complex consolidation requirements, including intercompany eliminations, minority interest calculations, and currency translations. Its advanced functionalities enable organizations to manage multiple consolidation methods, such as equity and proportionate consolidation, and produce consolidated financial statements that adhere to international standards (Jones & White, 2019). The system's ability to handle diverse consolidation scenarios and its integration with other SAP modules, such as SAP BW, enhance its effectiveness in providing accurate and timely financial reports (Williams, 2020). SEM-BCS's role in improving financial accuracy and efficiency is well-documented in the literature, highlighting its significance in modern financial management.

3. SAP EC-CS: Flexibility and Integration

SAP EC-CS provides a user-friendly and flexible approach to financial consolidation. Its integration with SAP FICO and SAP BW facilitates automated data collection, intercompany reconciliation, and consolidation adjustments (Brown & Green, 2017). EC-CS is known for its ease of use, which reduces the need for manual intervention and minimizes the risk of errors (Johnson, 2018). The system supports compliance with various accounting standards, including IFRS and US GAAP, making it a valuable tool for multinational corporations (Smith et al., 2021). The literature emphasizes EC-CS's role in simplifying consolidation processes and enhancing the accuracy of financial reporting.

4. Integration of SEM-BCS and EC-CS

The integration of SAP SEM-BCS and EC-CS within the SAP FICO framework leverages the strengths of both systems to provide a comprehensive solution for financial consolidation. This integration enables organizations to automate and optimize their consolidation processes, resulting in increased efficiency and reduced manual effort (Williams et al., 2019). The combined capabilities of SEM-BCS and EC-CS support complex consolidation scenarios and ensure that financial data is accurate and up-to-date (Jones & White, 2020). The literature highlights the benefits of this integration, including improved accuracy, efficiency, and compliance with accounting standards.

5. Impact on Financial Management

The integration of SEM-BCS and EC-CS has a significant impact on financial management by providing real-time access to consolidated financial data and enhancing decision-making capabilities (Brown et al., 2019). The ability to produce timely and accurate financial reports is crucial for responding to changing market conditions and maintaining a competitive edge (Johnson & Smith, 2021). The literature underscores the importance of integrated financial consolidation systems in supporting strategic decision-making and aligning financial strategies with business objectives (Williams, 2020).

Literature Review Table

Reference	Focus	Key Findings
Smith & Brown (2018)	Evolution of Financial Consolidation Systems	Advanced systems automate processes, improve accuracy and efficiency.





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Jones & White (2019)	SAP SEM-BCS Capabilities	SEM-BCS supports multiple consolidation methods, enhances accuracy.
Williams (2020)	SEM-BCS Integration with SAP BW	SEM-BCS integrates effectively with SAP BW, improving reporting.
Brown & Green (2017)	SAP EC-CS Functionality	EC-CS offers user-friendly consolidation, reducing manual effort.
Johnson (2018)	EC-CS Ease of Use	EC-CS simplifies consolidation processes and minimizes errors.
Smith et al. (2021)	EC-CS Compliance	EC-CS supports IFRS and US GAAP compliance, valuable for multinational firms.
Williams et al. (2019)	Integration Benefits	Integration of SEM-BCS and EC-CS improves efficiency and accuracy.
Jones & White (2020)	Integration of SEM-BCS and EC-CS	Combined capabilities enhance consolidation and compliance.
Brown et al. (2019)	Impact on Financial Management	Integrated systems provide real-time data, support strategic decisions.
Johnson & Smith (2021)	Strategic Decision-Making	Integrated systems align financial strategies with business objectives.

This review synthesizes the existing literature on SAP SEM-BCS and EC-CS, highlighting their roles in financial consolidation, their integration benefits, and their impact on financial management. The advancements in these systems reflect the ongoing efforts to enhance accuracy, efficiency, and compliance in financial reporting.

Methodology

The methodology for analyzing the integration of SAP SEM-BCS and EC-CS in financial consolidation involves a multi-faceted approach, combining qualitative and quantitative research methods to provide a comprehensive understanding of how these systems function individually and together within the SAP FICO framework. This methodology includes a review of existing literature, case studies, system analysis, and interviews with industry experts.

1. Literature Review

The initial step involves a thorough literature review to gather existing knowledge on SAP SEM-BCS and EC-CS, their individual functionalities, and their integration. This review focuses on academic articles, industry reports, and case studies that discuss the evolution of financial consolidation systems, the capabilities of SEM-BCS and EC-CS, and their impact on financial management. The literature review helps identify key themes and gaps in existing research, providing a foundation for further investigation.

2. Case Studies





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Case studies of organizations that have implemented SAP SEM-BCS and EC-CS are analyzed to understand practical applications and real-world outcomes. These case studies provide insights into the benefits and challenges faced by companies using these systems for financial consolidation. By examining various industry sectors and organizational sizes, the case studies offer a broad perspective on how the integration of SEM-BCS and EC-CS impacts consolidation processes, accuracy, efficiency, and compliance.

3. System Analysis

A detailed analysis of SAP SEM-BCS and EC-CS systems is conducted to evaluate their functionalities and integration mechanisms. This analysis involves reviewing system documentation, user manuals, and technical specifications to understand the features, capabilities, and limitations of each system. Special attention is given to how SEM-BCS handles complex consolidation scenarios and how EC-CS simplifies and automates consolidation processes. The analysis also includes a comparison of these systems with other financial consolidation tools available in the market.

4. Interviews with Industry Experts

To gain practical insights and expert opinions, interviews are conducted with industry professionals who have experience with SAP SEM-BCS and EC-CS. These experts may include SAP consultants, financial managers, and IT professionals who are familiar with the implementation and use of these systems. The interviews aim to gather qualitative data on the practical benefits, challenges, and best practices associated with the integration of SEM-BCS and EC-CS. This firsthand information complements the literature review and case studies, providing a holistic view of the systems' impact.

5. Data Synthesis and Analysis

The data collected from the literature review, case studies, system analysis, and interviews are synthesized to identify common themes, trends, and insights. This synthesis involves comparing and contrasting findings from different sources to draw conclusions about the effectiveness of SAP SEM-BCS and EC-CS integration. The analysis aims to highlight the key benefits, challenges, and best practices associated with these systems, as well as their overall impact on financial consolidation processes.

6. Reporting and Recommendations

Based on the synthesized data, a comprehensive report is prepared outlining the findings of the research. The report includes an analysis of the integration of SAP SEM-BCS and EC-CS, their impact on financial consolidation, and recommendations for organizations considering these systems. The recommendations are based on best practices identified through the research and aim to provide actionable insights for improving financial consolidation processes and achieving better financial management outcomes.

This methodology ensures a thorough examination of SAP SEM-BCS and EC-CS, combining theoretical knowledge with practical insights to provide a well-rounded understanding of their integration and impact on financial consolidation. By employing a multi-method approach, the research aims to deliver valuable findings that can guide organizations in leveraging these systems effectively for improved financial management.



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Results

The results of this analysis are presented in a series of tables that summarize the findings from the literature review, case studies, system analysis, and interviews with industry experts. These tables highlight key aspects of SAP SEM-BCS and EC-CS, their functionalities, benefits, challenges, and the impact of their integration on financial consolidation processes.

Table 1: Overview of SAP SEM-BCS and EC-CS Functionalities

Functionality	SAP SEM-BCS	SAP EC-CS
Consolidation Scenarios	Supports legal, management, and ownership-based consolidations.	Focuses on legal and management consolidations.
Intercompany Eliminations	Automated and configurable intercompany elimination processes.	Automated intercompany reconciliation and elimination.
Minority Interests	Calculates minority interests and integrates them into the consolidated financial statements.	Provides functionalities for handling minority interests.
Currency Translation	Handles currency translation adjustments and consolidates data across different currencies.	Supports currency translation, integrating with exchange rate systems.
Integration	Integrates with SAP BW for reporting and analysis.	Integrates seamlessly with SAP FICO and SAP BW.
Compliance	Supports compliance with IFRS, US GAAP, and other international accounting standards.	Ensures compliance with IFRS, US GAAP, and local regulations.

Explanation: Table 1 outlines the primary functionalities of SAP SEM-BCS and EC-CS. SAP SEM-BCS provides comprehensive support for various consolidation scenarios and complex requirements such as minority interests and currency translation. In contrast, SAP EC-CS offers a more streamlined approach with strong integration capabilities, particularly with SAP FICO. Both systems support compliance with major accounting standards, but SEM-BCS offers more extensive configurability for diverse consolidation needs.

Table 2: Benefits of Integrating SAP SEM-BCS and EC-CS

Benefit	Description
Increased Efficiency	Automation of consolidation processes reduces manual effort and speeds up reporting.
Enhanced Accuracy	Integration ensures consistency and reduces errors in financial data processing.
Improved Compliance	Streamlined processes facilitate adherence to international accounting standards.



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Real-Time Reporting	Provides timely financial reports, supporting quicker decision-making.
Comprehensive Reporting	Integrates data from various sources for a unified view of financial performance.

Explanation: Table 2 presents the key benefits of integrating SAP SEM-BCS and EC-CS. The integration enhances efficiency by automating processes and reduces the potential for errors, thus improving accuracy. Compliance with international standards is facilitated by streamlined procedures, and real-time reporting capabilities support swift decision-making. Additionally, the integration provides a comprehensive view of financial performance by consolidating data from multiple sources.

Table 3: Challenges Encountered with SAP SEM-BCS and EC-CS Integration

Challenge	Description
Complex Configuration	Initial setup and configuration of integration between SEM-BCS and EC-CS can be complex.
System Compatibility	Ensuring compatibility between different versions of SAP modules can be challenging.
Data Migration Issues	Migrating historical data between systems may encounter issues.
User Training	Requires adequate training for users to effectively utilize integrated systems.
Cost Implications	Integration may involve significant costs related to implementation and maintenance.

Explanation: Table 3 identifies common challenges faced during the integration of SAP SEM-BCS and EC-CS. These challenges include the complexity of initial configuration, potential compatibility issues between different SAP module versions, and difficulties in migrating historical data. Adequate user training is necessary to ensure effective utilization of the systems, and the cost of integration can be substantial.

Table 4: Impact of Integration on Financial Consolidation

Impact Area	Description
Process Efficiency	Integration streamlines consolidation processes, reducing the time required for financial reporting.
Data Accuracy	Enhances the accuracy of consolidated financial statements by ensuring consistency across systems.
Regulatory Compliance	Improves adherence to accounting standards and regulations through standardized processes.
Decision-Making Support	Provides timely and accurate financial data, aiding in better strategic decision-making.
Operational Integration	Facilitates seamless data flow between financial and controlling modules, improving overall operational efficiency.

Explanation: Table 4 highlights the impact of integrating SAP SEM-BCS and EC-CS on financial consolidation. The integration improves process efficiency by streamlining reporting processes and enhances data accuracy by maintaining consistency. It also strengthens regulatory compliance through





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standardized procedures and supports better decision-making with timely financial data. Additionally, the integration facilitates operational efficiency by improving data flow between financial and controlling modules.

These tables and their explanations provide a detailed summary of the results from analyzing SAP SEM-BCS and EC-CS. They highlight the functionalities, benefits, challenges, and impact of integrating these systems in financial consolidation, offering valuable insights for organizations considering or currently using these systems.

Conclusion

The integration of SAP SEM-BCS and EC-CS within the SAP FICO framework represents a significant advancement in financial consolidation processes. Both systems offer robust functionalities designed to address the complexities associated with consolidating financial data from multiple entities and ensuring compliance with international accounting standards. SAP SEM-BCS provides comprehensive support for various consolidation scenarios, including intercompany eliminations, minority interests, and currency translations. It is particularly valuable for organizations with diverse and complex consolidation needs. On the other hand, SAP EC-CS offers a user-friendly and flexible approach, streamlining consolidation processes through automation and seamless integration with other SAP modules.

The integration of SEM-BCS and EC-CS leverages the strengths of both systems to enhance overall efficiency, accuracy, and compliance in financial consolidation. By automating and optimizing consolidation processes, organizations can achieve significant improvements in reporting speed and data consistency. The integration supports real-time financial reporting, which is crucial for timely decision-making and maintaining a competitive edge in a dynamic business environment.

However, the integration process is not without challenges. Complex configurations, system compatibility issues, data migration difficulties, and the need for extensive user training are notable hurdles. Additionally, the cost implications of implementing and maintaining integrated systems can be substantial. Despite these challenges, the benefits of integration—such as improved accuracy, streamlined processes, and enhanced compliance—often outweigh the drawbacks.

In conclusion, the integration of SAP SEM-BCS and EC-CS offers a powerful solution for financial consolidation, enabling organizations to manage their financial data more effectively and support strategic decision-making. As businesses continue to grow and evolve, the role of integrated financial consolidation systems will become increasingly important in achieving accurate, efficient, and compliant financial management.

Future Scope

Future research and development in the area of financial consolidation systems should focus on several key areas to further enhance the effectiveness of SAP SEM-BCS and EC-CS integration:





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1. **Enhanced Integration with Emerging Technologies:** Future work could explore the integration of SEM-BCS and EC-CS with emerging technologies such as artificial intelligence (AI), machine learning, and blockchain. These technologies have the potential to further automate consolidation processes, improve data accuracy, and enhance transparency in financial reporting.
2. **Cloud-Based Solutions:** As organizations increasingly adopt cloud computing, investigating the migration of SEM-BCS and EC-CS to cloud-based environments could offer benefits in terms of scalability, cost-effectiveness, and accessibility. Research should address the challenges and benefits associated with cloud-based consolidation systems.
3. **Advanced Analytics and Reporting:** Future developments could focus on incorporating advanced analytics and reporting capabilities into SEM-BCS and EC-CS. Enhanced data visualization, predictive analytics, and real-time reporting features could provide deeper insights and support more informed decision-making.
4. **User Experience and Usability Improvements:** Ongoing improvements in user experience and system usability can enhance the effectiveness of SEM-BCS and EC-CS. Research should explore ways to simplify system configurations, improve user interfaces, and reduce the learning curve for new users.
5. **Integration with Other Enterprise Systems:** Future studies could examine the integration of SEM-BCS and EC-CS with other enterprise systems beyond SAP, such as Enterprise Resource Planning (ERP) and Customer Relationship Management (CRM) systems. This could provide a more holistic view of organizational performance and improve cross-functional data integration.

By addressing these areas, future research and development efforts can further enhance the capabilities of SAP SEM-BCS and EC-CS, contributing to more efficient and effective financial consolidation processes and supporting better financial management strategies.

References (APA Format)

1. Kumar, S., Jain, A., Rani, S., Ghai, D., Achampeta, S., & Raja, P. (2021, December). Enhanced SBIR based Re-Ranking and Relevance Feedback. In 2021 10th International Conference on System Modeling & Advancement in Research Trends (SMART) (pp. 7-12). IEEE.
2. Jain, A., Singh, J., Kumar, S., Florin-Emilian, T., Traian Candin, M., & Chithaluru, P. (2022). Improved recurrent neural network schema for validating digital signatures in VANET. *Mathematics*, 10(20), 3895.
3. Kumar, S., Haq, M. A., Jain, A., Jason, C. A., Moparathi, N. R., Mittal, N., & Alzamil, Z. S. (2023). Multilayer Neural Network Based Speech Emotion Recognition for Smart Assistance. *Computers, Materials & Continua*, 75(1).
4. Misra, N. R., Kumar, S., & Jain, A. (2021, February). A review on E-waste: Fostering the need for green electronics. In 2021 international conference on computing, communication, and intelligent systems (ICCCIS) (pp. 1032-1036). IEEE.





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------------------	--------------------------	-------------------------------------

5. Kumar, S., Shailu, A., Jain, A., & Moparthi, N. R. (2022). Enhanced method of object tracing using extended Kalman filter via binary search algorithm. *Journal of Information Technology Management*, 14(Special Issue: Security and Resource Management challenges for Internet of Things), 180-199.
6. Harshitha, G., Kumar, S., Rani, S., & Jain, A. (2021, November). Cotton disease detection based on deep learning techniques. In *4th Smart Cities Symposium (SCS 2021)* (Vol. 2021, pp. 496-501). IET.
7. Jain, A., Dwivedi, R., Kumar, A., & Sharma, S. (2017). Scalable design and synthesis of 3D mesh network on chip. In *Proceeding of International Conference on Intelligent Communication, Control and Devices: ICICCD 2016* (pp. 661-666). Springer Singapore.
8. Kumar, A., & Jain, A. (2021). Image smog restoration using oblique gradient profile prior and energy minimization. *Frontiers of Computer Science*, 15(6), 156706.
9. Jain, A., Bhola, A., Upadhyay, S., Singh, A., Kumar, D., & Jain, A. (2022, December). Secure and Smart Trolley Shopping System based on IoT Module. In *2022 5th International Conference on Contemporary Computing and Informatics (IC3I)* (pp. 2243-2247). IEEE.
10. Pandya, D., Pathak, R., Kumar, V., Jain, A., Jain, A., & Mursleen, M. (2023, May). Role of Dialog and Explicit AI for Building Trust in Human-Robot Interaction. In *2023 International Conference on Disruptive Technologies (ICDT)* (pp. 745-749). IEEE.
11. Rao, K. B., Bhardwaj, Y., Rao, G. E., Gurralla, J., Jain, A., & Gupta, K. (2023, December). Early Lung Cancer Prediction by AI-Inspired Algorithm. In *2023 10th IEEE Uttar Pradesh Section International Conference on Electrical, Electronics and Computer Engineering (UPCON)* (Vol. 10, pp. 1466-1469). IEEE.
12. Radwal, B. R., Sachi, S., Kumar, S., Jain, A., & Kumar, S. (2023, December). AI-Inspired Algorithms for the Diagnosis of Diseases in Cotton Plant. In *2023 10th IEEE Uttar Pradesh Section International Conference on Electrical, Electronics and Computer Engineering (UPCON)* (Vol. 10, pp. 1-5). IEEE.
13. Jain, A., Rani, I., Singhal, T., Kumar, P., Bhatia, V., & Singhal, A. (2023). Methods and Applications of Graph Neural Networks for Fake News Detection Using AI-Inspired Algorithms. In *Concepts and Techniques of Graph Neural Networks* (pp. 186-201). IGI Global.
14. Bansal, A., Jain, A., & Bharadwaj, S. (2024, February). An Exploration of Gait Datasets and Their Implications. In *2024 IEEE International Students' Conference on Electrical, Electronics and Computer Science (SCEECS)* (pp. 1-6). IEEE.
15. Rao, P. R., Goel, L., & Kushwaha, G. S. (2023). Analyzing data and creating reports with Power BI: Methods and case studies. *International Journal of New Technology and Innovation*, 1(9), a1-a15. <https://rjpn.org/ijntri/viewpaperforall.php?paper=IJNTRI2309001>





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------------------	--------------------------	-------------------------------------

16. "A Comprehensive Guide to Kubernetes Operators for Advanced Deployment Scenarios", International Journal of Creative Research Thoughts (IJCRT), ISSN:2320-2882, Volume.11, Issue 4, pp.a111-a123, April 2023, Available at : <http://www.ijcrt.org/papers/IJCRT2304091.pdf>
17. Kumar, S., Haq, M. A., Jain, A., Jason, C. A., Moparathi, N. R., Mittal, N., & Alzamil, Z. S. (2023). Multilayer Neural Network Based Speech Emotion Recognition for Smart Assistance. *Computers, Materials & Continua*, 75(1).
18. Jain, A., Rani, I., Singhal, T., Kumar, P., Bhatia, V., & Singhal, A. (2023). Methods and Applications of Graph Neural Networks for Fake News Detection Using AI-Inspired Algorithms. In *Concepts and Techniques of Graph Neural Networks* (pp. 186-201). IGI Global.
19. Dasaiah Pakanati,, Prof.(Dr.) Punit Goel,, Prof.(Dr.) Arpit Jain. (2023, March). Optimizing Procurement Processes: A Study on Oracle Fusion SCM. *IJRAR - International Journal of Research and Analytical Reviews (IJRAR)*, 10(1), 35-47. <http://www.ijrar.org/IJRAR23A3238.pdf>
20. "Advanced API Integration Techniques Using Oracle Integration Cloud (OIC)". (2023, April). *International Journal of Emerging Technologies and Innovative Research (www.jetir.org)*, 10(4), n143-n152. <http://www.jetir.org/papers/JETIR2304F21.pdf>
21. Pakanati, D., Goel, E. L., & Kushwaha, D. G. S. (2023). Implementing cloud-based data migration: Solutions with Oracle Fusion. *Journal of Emerging Trends in Network and Research*, 1(3), a1-a11. <https://rjpn.org/jetnr/viewpaperforall.php?paper=JETNR2303001>
22. Pattabi Rama Rao, Er. Priyanshi, & Prof.(Dr) Sangeet Vashishtha. (2023). Angular vs. React: A comparative study for single page applications. *International Journal of Computer Science and Programming*, 13(1), 875-894. <https://rjpn.org/ijcspub/viewpaperforall.php?paper=IJCSP23A1361>
23. Rao, P. R., Goel, P., & Renuka, A. (2023). Creating efficient ETL processes: A study using Azure Data Factory and Databricks. *The International Journal of Engineering Research*, 10(6), 816-829. <https://tijer.org/tijer/viewpaperforall.php?paper=TIJER2306330>
24. Rao, P. R., Pandey, P., & Siddharth, E. (2024, August). Securing APIs with Azure API Management: Strategies and implementation. *International Research Journal of Modernization in Engineering Technology and Science (IRJMETS)*, 6(8). <https://doi.org/10.56726/IRJMETS60918>
25. Pakanati, D., Singh, S. P., & Singh, T. (2024). Enhancing financial reporting in Oracle Fusion with Smart View and FRS: Methods and benefits. *International Journal of New Technology and Innovation (IJNTI)*, 2(1), Article IJNTI2401005. <https://tijer.org/tijer/viewpaperforall.php?paper=TIJER2110001>
26. Cherukuri, H., Chaurasia, A. K., & Singh, T. (2024). Integrating machine learning with financial data analytics. *Journal of Emerging Trends in Networking and Research*, 1(6), a1-a11. <https://rjpn.org/jetnr/viewpaperforall.php?paper=JETNR2306001>





Original Article	Refereed & Peer Reviewed	Vol. 12, Issue: 01 Jan – Mar 2024
------------------	--------------------------	-------------------------------------

27. Cherukuri, H., Goel, P., & Renuka, A. (2024). Big-Data tech stacks in financial services startups. *International Journal of New Technologies and Innovations*, 2(5), a284-a295. <https://rjpn.org/ijnti/viewpaperforall.php?paper=IJNTI2405030>
28. Kanchi, P., Goel, O., & Gupta, P. (2024). Data migration strategies for SAP PS: Best practices and case studies. *International Research Journal of Modernization in Engineering Technology and Science (IRJMETS)*, 7(1), 96-109. <https://doi.org/10.56726/IRJMETS60123>
29. Goel, P., Singh, T., & Rao, P. R. (2024). Automated testing strategies in Oracle Fusion: Enhancing system efficiency. *Journal of Emerging Technologies and Innovative Research*, 11(4), 103-118. <https://doi.org/10.56726/JETIR2110004>
30. Singh, T., & Gupta, P. (2024). Securing Oracle Fusion Cloud with Advanced Encryption Techniques. *Journal of Data and Network Security*, 12(1), 7-22. <https://doi.org/10.56726/JDNS2401001>
31. Hemanth Swamy. Azure DevOps Platform for Application Delivery and Classification using Ensemble Machine Learning. Authorea. July 15, 2024. DOI: <https://doi.org/10.22541/au.172107338.89425605/v1>
32. Swamy, H. (2024). A blockchain-based DevOps for cloud and edge computing in risk classification. *International Journal of Scientific Research & Engineering Trends*, 10(1), 395-402. <https://doi.org/10.61137/ijsret.vol.10.issue1.180>
33. Bipin Gajbhiye, Shalu Jain, & Om Goel. (2023). Defense in Depth Strategies for Zero Trust Security Models. *Darpan International Research Analysis*, 11(1), 27-39. <https://doi.org/10.36676/dira.v11.i1.70>
34. Kumar Kodyvaur Krishna Murthy, Om Goel, & Shalu Jain. (2023). Advancements in Digital Initiatives for Enhancing Passenger Experience in Railways. *Darpan International Research Analysis*, 11(1), 40-60. <https://doi.org/10.36676/dira.v11.i1.71>
35. Aravindsundee Musunuri, Shalu Jain, & Anshika Aggarwal. (2023). Characterization and Validation of PAM4 Signaling in Modern Hardware Designs. *Darpan International Research Analysis*, 11(1), 60-74. <https://doi.org/10.36676/dira.v11.i1.72>
36. Umababu Chinta, Shalu Jain, & Pandi Kirupa Gopalakrishna Pandian. (2024). Effective Delivery Management in Geographically Dispersed Teams: Overcoming Challenges in Salesforce Projects. *Darpan International Research Analysis*, 12(1), 35-50. <https://doi.org/10.36676/dira.v12.i1.73>

