

Transforming Legacy Enterprise Resource Planning Systems through SAP Fiori Expansion and Embedded Analytics to Enhance User Experience and Operational Performance in SAP ECC

Rajendra Asuri*

Senior SAP Integration Consultant

ABSTRACT

Legacy enterprise resource planning systems remain essential to business operations, yet their conventional interfaces and limited analytical capabilities often reduce user efficiency, increase operational complexity, and delay informed decision making. This study investigates the enhancement of user experience in SAP ECC through the expansion of SAP Fiori applications and the integration of embedded analytics, with the objective of improving system usability, operational performance, and information accessibility while preserving the stability of existing enterprise processes. The research addresses the challenge of modernising established ERP environments without requiring extensive system replacement or significant disruption to organisational workflows. A mixed research methodology is adopted, combining qualitative analysis of implementation practices with quantitative evaluation of usability, task efficiency, and user satisfaction collected from organisational users and system stakeholders. The findings demonstrate that the adoption of role based SAP Fiori applications and integrated analytical features simplifies business transactions, reduces navigation effort, improves data visibility, and supports faster operational decisions across core business functions. The study further identifies practical implementation considerations that influence successful deployment and user acceptance within legacy ERP environments. The research contributes to enterprise information systems by presenting a structured framework for extending the capabilities of SAP ECC through user centred interface design and embedded analytical functionality. The study concludes that strategic enhancement of legacy ERP platforms provides measurable organisational value by improving productivity, supporting informed decision making, and extending the operational relevance of existing SAP investments, offering practical guidance for organisations and valuable insights for future academic research.

Keywords: SAP ECC, SAP Fiori, SAP Fiori Expansion, Embedded Analytics, Enterprise Resource Planning, Legacy ERP Systems, User Experience, Operational Performance, Business Intelligence, Enterprise Applications, Decision Support, Role Based Access, User Interface Design, Dashboard Analytics, Business Process Optimisation, System Integration, Data Visualisation, Enterprise Mobility, Digital Transformation, ERP Modernisation, SAP Technologies

SAMRIDDHI : A Journal of Physical Sciences, Engineering and Technology (2019);

DOI: 10.18090/samriddhi.v11i02.13

INTRODUCTION

Enterprise Resource Planning systems have become an essential component of organisational information management by integrating business functions into a unified operating environment. These systems support finance, procurement, production, sales, human resources, and logistics through a common database and standardised business processes. Organisations across manufacturing, retail, healthcare, and service industries have relied on ERP platforms to improve operational consistency, data integrity, and organisational coordination. As business operations expanded in complexity, ERP solutions evolved to provide greater process automation and information accessibility while maintaining enterprise wide control over critical business activities.

Corresponding Author: Rajendra Asuri, Senior SAP Integration Consultant

How to cite this article: Asuri, R. (2019). Transforming Legacy Enterprise Resource Planning Systems through SAP Fiori Expansion and Embedded Analytics to Enhance User Experience and Operational Performance in SAP ECC. *SAMRIDDHI : A Journal of Physical Sciences, Engineering and Technology*, 11(2), 176-190.

Source of support: Nil

Conflict of interest: None

Among the leading ERP platforms, SAP ECC established itself as one of the most widely adopted enterprise solutions for supporting large scale business operations. Its modular

architecture enabled organisations to integrate multiple functional areas while maintaining flexibility for diverse business requirements. Over time, SAP ECC became the operational backbone for many enterprises due to its reliability, process standardisation, and comprehensive transaction processing capabilities. The platform provided stable support for mission critical operations and became deeply embedded within organisational workflows across numerous industries.

Despite its operational strengths, the conventional SAP Graphical User Interface presented several usability challenges for business users. The interface primarily relied on transaction codes, complex menu structures, and multiple navigation paths that often required extensive user training and technical familiarity. Daily business activities frequently involved repetitive navigation and manual data retrieval, increasing task completion time and reducing overall user efficiency. These limitations affected employee productivity, particularly among occasional users who required simple access to business information without extensive knowledge of underlying system transactions.

Growing organisational expectations for intuitive software applications increased the demand for improved enterprise user experiences without replacing existing ERP investments. Business users increasingly expected interfaces that offered simplified navigation, role based access, and immediate visibility of operational information similar to modern consumer applications. At the same time, organisations sought to preserve the stability and business value of their existing SAP ECC environments while extending system usability. This situation created a practical requirement for solutions capable of modernising the user experience within established enterprise infrastructures.

SAP Fiori introduced a user centred design philosophy that focused on simplicity, consistency, and accessibility across business processes. By delivering role based applications designed around specific business activities, SAP Fiori reduced unnecessary system complexity and improved interaction with enterprise functions. Embedded Analytics further enhanced operational capabilities by providing integrated reporting and analytical information directly within business processes. Together, these technologies offered organisations an opportunity to improve usability, operational visibility, and decision support while continuing to leverage existing SAP ECC platforms.

Although numerous studies have examined ERP implementation success, system integration, and organisational performance, comparatively limited attention has been given to the combined influence of SAP Fiori Expansion and Embedded Analytics within legacy SAP ECC environments. Existing discussions often address these technologies independently rather than examining their collective contribution to improving enterprise user experience and operational effectiveness. Furthermore, practical implementation considerations and enterprise level

performance implications remain insufficiently explored from both academic and industry perspectives. This gap provides the primary motivation for the present study.

This study investigates how SAP Fiori Expansion and Embedded Analytics can enhance user experience and operational performance within legacy SAP ECC systems. The research seeks to identify the factors influencing successful implementation, evaluate improvements in business process usability, and examine the contribution of integrated analytical capabilities to organisational decision support. The study also explores whether modern interface technologies can increase productivity while preserving existing enterprise investments and minimising operational disruption. These objectives are intended to provide a balanced evaluation of technological enhancement within established ERP environments.

The scope of this research is limited to SAP ECC environments where SAP Fiori applications and Embedded Analytics are employed to improve user interaction and business process efficiency. The investigation considers architectural integration, usability improvements, operational performance, implementation considerations, and enterprise level outcomes. Technical aspects unrelated to SAP ECC enhancement, including complete ERP replacement strategies and cloud native ERP platforms, remain outside the scope of this study. This focused approach enables a detailed examination of practical modernisation strategies suitable for organisations maintaining legacy ERP infrastructures.

The significance of this study extends to both academic research and enterprise practice by presenting an integrated perspective on enhancing legacy ERP systems through user centred technologies and operational analytics. The findings are expected to support organisations seeking practical approaches for improving system usability without extensive infrastructure replacement while also contributing to the broader understanding of enterprise application modernisation. The remainder of this paper is organised into seven additional sections covering user experience challenges in SAP ECC, SAP Fiori Expansion, Embedded Analytics integration, research methodology, analysis of implementation outcomes, strategic implications for enterprise modernisation, and concluding observations with recommendations for future research.

Evolution of Legacy SAP ECC and User Experience Challenges

Enterprise Resource Planning solutions evolved to address the growing demand for integrated business management across functional departments. Organisations increasingly required a unified platform capable of connecting finance, procurement, sales, production, inventory, and human resource activities within a common information environment. SAP ECC emerged as a comprehensive enterprise solution by providing modular functionality, consistent data management, and standardised business processes. Its

ability to support large scale transaction processing enabled organisations to achieve greater operational control while reducing information duplication across departments.

The architecture of SAP ECC was designed around a three-tier structure consisting of the presentation layer, application layer, and database layer. This architecture enabled secure communication between business users and enterprise applications while maintaining data consistency throughout organisational operations. Business logic was processed within the application server, whereas the database layer maintained master data and transactional records. Such an architectural arrangement provided scalability, reliability, and flexibility for organisations operating across multiple business units and geographical locations.

The traditional SAP Graphical User Interface served as the primary interaction platform for business users within SAP ECC. Users accessed business functions through transaction codes, structured menus, and multiple navigation paths designed to support complex enterprise operations. Although the interface offered extensive functionality, it often required considerable technical knowledge and practical experience before users could perform routine business activities efficiently. Consequently, organisations invested significant time and resources in user training to ensure operational consistency across departments.

Despite its technical robustness, the conventional interface presented several usability limitations that influenced employee productivity. The extensive use of transaction codes, multiple data entry screens, and repetitive navigation increased the cognitive effort required to complete daily business activities. Users frequently encountered information overload due to numerous fields, menu options, and system commands that were not directly relevant to their assigned responsibilities. These characteristics often reduced operational efficiency, particularly for employees who performed occasional or role specific transactions.

Navigation complexity represented another significant challenge within legacy SAP ECC environments. Business

processes frequently required users to move across several interconnected transaction screens before completing a single operational task. Retrieving supporting information often involved opening multiple windows and manually searching different functional modules. Such navigation patterns increased processing time, reduced workflow continuity, and contributed to higher probabilities of user errors during transaction execution. As organisational workloads increased, these challenges became more evident in daily operational activities.

Transaction centric workflows formed the foundation of traditional SAP ECC operations, where each business activity was associated with specific transaction codes and predefined processing sequences. While this approach ensured procedural consistency and process control, it also limited flexibility for users who required quick access to business information. Employees were expected to memorise numerous transaction codes and understand relationships among multiple enterprise functions before efficiently completing operational responsibilities. This dependency on technical familiarity created additional learning barriers for new system users.

Productivity challenges extended beyond navigation and transaction processing to include reporting, information retrieval, and decision support activities. Business users often relied on separate reporting tools or manually generated reports to obtain operational insights because analytical information was not consistently integrated into daily business transactions. Decision makers therefore experienced delays in accessing current operational information, affecting responsiveness to changing business conditions. These circumstances highlighted the need for interfaces capable of combining transactional processing with immediate business visibility.

User adoption became another important consideration as organisations expanded ERP usage across departments with varying levels of technical expertise. Employees increasingly expected enterprise applications to provide

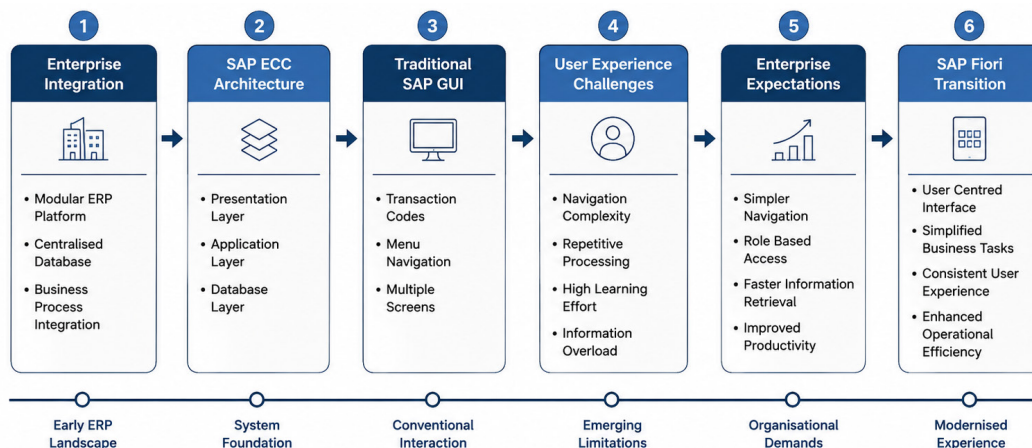


Figure 1: Evolution of SAP ECC User Interaction Framework



intuitive navigation, simplified screen layouts, and role based access similar to widely used software applications. Meeting these expectations required improvements that extended beyond technical functionality and focused on overall user experience. SAP Fiori addressed this requirement by introducing a simplified interface philosophy centred on business roles, streamlined workflows, and consistent interaction patterns while preserving the operational strengths of SAP ECC.

The evolution from the traditional SAP GUI environment towards SAP Fiori represented a strategic progression in enterprise application usability rather than a replacement of core ERP functionality. Organisations were able to retain the stability of SAP ECC while introducing modern interface capabilities that simplified navigation, improved accessibility, and supported more efficient business operations. This transition reflected the growing recognition that enterprise systems should combine operational reliability with user centred design principles. The integration of SAP Fiori therefore established an important foundation for enhancing user experience while extending the long term value of existing SAP ECC investments.

SAP Fiori Expansion Framework for Legacy SAP ECC Environments

The increasing demand for simplified enterprise applications encouraged organisations to improve the usability of SAP ECC while preserving the stability of existing business processes. Rather than replacing the underlying ERP platform, SAP Fiori introduced an expansion framework that extended the capabilities of SAP ECC through a modern user interface and role oriented application design. This approach enabled organisations to improve accessibility, simplify navigation, and enhance user interaction without disrupting established enterprise operations. As a result, SAP Fiori became an important component in modernising legacy ERP environments while maintaining compatibility

with existing system investments.

SAP Fiori was developed around a set of design principles intended to improve the overall user experience within enterprise applications. These principles emphasised simplicity, consistency, responsiveness, and role relevance across business activities. Instead of presenting users with numerous technical functions, SAP Fiori focused on delivering applications aligned with individual business responsibilities. This design philosophy reduced unnecessary interface complexity and enabled users to complete routine tasks through intuitive screens that supported operational efficiency without compromising functional capability.

A key component supporting SAP Fiori deployment was the SAP Gateway architecture, which acted as the communication layer between the presentation interface and SAP ECC business logic. SAP Gateway exposed business functions as secure services, allowing SAP Fiori applications to retrieve and update enterprise data without altering the core ERP system. This architectural arrangement preserved system integrity while enabling flexible interaction through web based technologies. The separation of presentation and application processing also simplified maintenance and encouraged controlled system enhancement.

The concept of role based applications represented one of the defining characteristics of SAP Fiori Expansion. Individual applications were designed to support specific organisational responsibilities rather than presenting a comprehensive collection of unrelated business functions. Employees therefore accessed only the transactions, reports, and information required for their assigned roles, reducing unnecessary navigation and improving operational focus. This approach simplified business activities while supporting greater productivity and reducing the learning effort associated with traditional transaction oriented interfaces.

The SAP Fiori Launchpad served as the central access point through which users interacted with enterprise applications. The Launchpad organised business functions into structured

Table 1: Comparison of Traditional SAP GUI and SAP Fiori User Experience Characteristics

<i>Evaluation Aspect</i>	<i>Traditional SAP GUI</i>	<i>SAP Fiori</i>
User Interface	Complex and transaction driven	Simple and role based
Navigation	Multiple menus and transaction codes	Tile based navigation
Learning Requirement	High training requirement	Reduced learning effort
Screen Layout	Dense information presentation	Clean and simplified screens
Business Access	Function oriented	Role oriented
Mobility Support	Primarily desktop access	Desktop, tablet and mobile support
Information Visibility	Separate reporting activities	Integrated operational information
Task Completion	Multiple navigation steps	Streamlined business processes
User Productivity	Moderate due to interface complexity	Improved through simplified workflows
Overall User Experience	Technical and process focused	User centred and intuitive

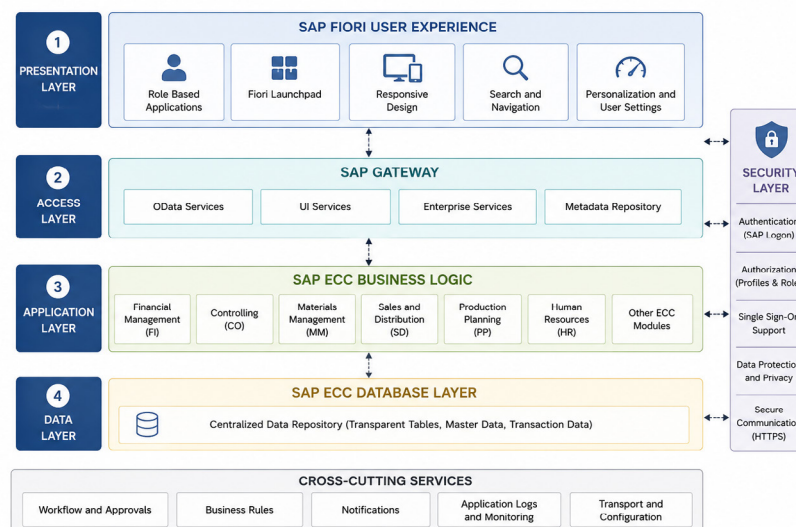


Figure 2: SAP Fiori Expansion Architecture for SAP ECC

tiles representing individual tasks and responsibilities. Personalisation features enabled users to arrange frequently used applications according to operational requirements, thereby improving accessibility and workflow continuity. Integrated search capabilities further reduced navigation effort by allowing users to locate applications and business information quickly within a consistent working environment.

Successful deployment of SAP Fiori required an architecture capable of integrating presentation services with existing SAP ECC infrastructure while maintaining system reliability. The deployment environment typically combined SAP Gateway, application services, enterprise network connectivity, and backend SAP ECC modules to support secure communication between users and business processes. This layered deployment strategy allowed organisations to introduce modern interface capabilities gradually while preserving operational continuity across finance, procurement, sales, production, and other enterprise functions. Consequently, implementation risks remained manageable during progressive system enhancement initiatives.

Integration between SAP Fiori and SAP ECC depended upon standard communication mechanisms that enabled real time interaction with enterprise data and business logic. Existing master data, transactional information, and business rules remained within the SAP ECC environment, while SAP Fiori provided a simplified presentation layer for user interaction. This integration approach minimised duplication of business information and ensured that operational activities continued to follow established organisational procedures. Such compatibility enabled enterprises to modernise user experience without extensive redevelopment of existing ERP processes.

Security remained an essential consideration throughout SAP Fiori Expansion because enterprise applications

managed sensitive organisational information and business transactions. Authentication, authorisation, secure communication protocols, and role based access controls protected enterprise data while ensuring that users accessed only approved business functions. Integration with established SAP security mechanisms enabled organisations to preserve governance standards and maintain compliance with internal operational policies. Effective security management therefore supported both user confidence and organisational reliability throughout SAP Fiori implementation.

The expansion framework presented by SAP Fiori demonstrates that meaningful improvement of legacy SAP ECC environments can be achieved through carefully planned interface modernisation rather than complete system replacement. Business process simplification, structured deployment architecture, secure integration, and role based application design collectively enhance operational performance while preserving the proven capabilities of SAP ECC. This study argues that SAP Fiori Expansion provides organisations with a practical pathway for extending the long term value of existing ERP investments while establishing a stronger foundation for improved enterprise user experience and future analytical capabilities.

Embedded Analytics Integration for Operational Intelligence

Embedded Analytics has become an important capability for improving the effectiveness of enterprise information systems by integrating analytical functions directly within operational business processes. Unlike conventional reporting approaches that often depend on separate analytical environments, Embedded Analytics enables business users to access relevant information while performing routine transactions. This approach reduces the delay between



transaction processing and information analysis, allowing organisations to improve operational awareness without introducing unnecessary system complexity. Within SAP ECC environments, Embedded Analytics supports informed business decisions while preserving existing enterprise processes.

The concept of Embedded Analytics is founded on the integration of operational data, business rules, and analytical presentation within a unified enterprise environment. Rather than extracting information into separate reporting applications, analytical content is presented alongside operational activities using the same underlying enterprise data. This integration enables users to review business performance while executing daily responsibilities, thereby improving consistency between operational execution and managerial evaluation. As a result, analytical information becomes a natural component of business operations instead of a separate organisational activity.

Operational reporting plays a significant role in supporting business continuity by providing timely information regarding enterprise activities across functional departments. Traditional reporting methods frequently required manual report generation or scheduled processing before information became available for business review. Such practices often delayed managerial responses to changing operational conditions. Embedded Analytics improves this process by presenting operational reports directly within enterprise applications, enabling users to obtain relevant business information without interrupting established workflows or navigating multiple reporting environments.

Analytical dashboards further strengthen enterprise decision making by presenting critical business indicators

through structured visual summaries. Instead of reviewing extensive tabular reports, managers and operational users can evaluate organisational performance through consolidated analytical views that highlight significant operational measures. Dashboards improve information interpretation by organising business metrics according to functional priorities and user responsibilities. This simplified presentation enables decision makers to identify operational trends more efficiently while maintaining direct access to supporting transactional information within SAP ECC.

An important advantage of Embedded Analytics is the improvement of business visibility across enterprise operations. Business users gain immediate access to current operational information while performing procurement, sales, inventory, finance, and production activities. The availability of integrated analytical information reduces dependency on separate reporting cycles and supports timely evaluation of business conditions. Improved visibility enables organisations to recognise operational variations earlier, allowing corrective actions to be initiated before minor issues develop into larger organisational challenges.

Decision support capabilities are substantially enhanced when analytical information becomes available within routine enterprise processes. Managers no longer depend exclusively on periodic management reports because operational indicators can be reviewed continuously throughout daily activities. Business decisions therefore become increasingly evidence based through direct access to current enterprise information. This study argues that integrating analytical capabilities within operational workflows strengthens managerial confidence, improves planning accuracy, and encourages more consistent organisational decision making across functional departments.

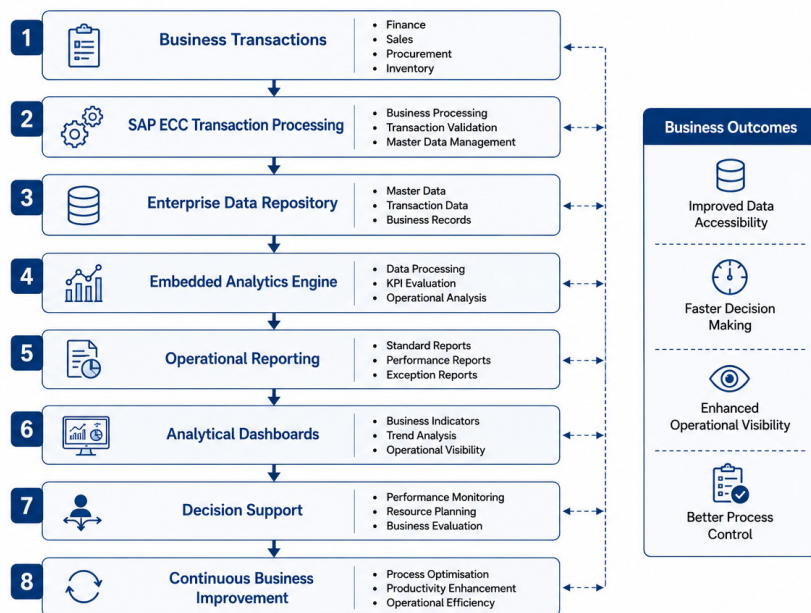


Figure 3: Embedded Analytics Information Flow Model

Business process monitoring represents another important contribution of Embedded Analytics within legacy SAP ECC environments. Continuous observation of operational activities allows organisations to evaluate transaction progress, identify process delays, monitor resource utilisation, and measure business performance against organisational objectives. Performance indicators integrated into operational screens provide users with immediate awareness of process conditions without requiring separate monitoring applications. Such continuous observation contributes to greater operational control while supporting more efficient enterprise management practices.

Practical integration of Embedded Analytics within SAP ECC depends upon effective coordination between enterprise data, business applications, reporting services, and user interfaces. Existing transactional data serves as the foundation for analytical processing, while integrated reporting components present meaningful business information through familiar operational screens. This integration approach avoids unnecessary duplication of enterprise data and preserves the consistency of business information across departments. Consequently, organisations can extend analytical capabilities while maintaining the reliability and stability of established SAP ECC environments.

The integration of Embedded Analytics within legacy SAP ECC demonstrates that operational intelligence can be strengthened without replacing existing enterprise infrastructure. Improved reporting, accessible analytical dashboards, enhanced business visibility, continuous process monitoring, and reliable performance measurement collectively support greater organisational effectiveness. The combination of operational transactions and embedded analytical functionality creates an enterprise environment where information, analysis, and decision making function together as an integrated business capability. Such an approach provides organisations with practical opportunities to improve productivity, operational responsiveness, and long term value from existing ERP investments.

Research Methodology and Enterprise Evaluation Framework

This study adopts a structured research methodology to examine the contribution of SAP Fiori Expansion and Embedded Analytics towards improving user experience and operational performance within legacy SAP ECC environments. The methodology has been designed to ensure systematic investigation of enterprise practices while maintaining consistency between research objectives and analytical outcomes. A combination of empirical observation and practical evaluation provides the foundation for examining technological enhancement within established ERP infrastructures. Such an approach enables the study to generate findings that are relevant to both academic research and organisational practice.

The research philosophy is primarily based on pragmatism because the investigation focuses on addressing practical enterprise challenges through evidence based evaluation. Rather than concentrating exclusively on theoretical interpretation or statistical measurement, the study combines practical organisational observations with measurable performance indicators. This philosophical perspective supports a balanced understanding of how technological improvements influence both business users and enterprise operations. Consequently, the research emphasises solutions that can be implemented within existing SAP ECC environments while preserving operational stability.

A descriptive and analytical research design has been adopted to investigate the implementation and organisational impact of SAP Fiori Expansion and Embedded Analytics. The descriptive component examines the characteristics of legacy SAP ECC environments and the usability challenges experienced by enterprise users. The analytical component evaluates how modern interface technologies and integrated analytical capabilities contribute to improved operational performance. This combination provides a comprehensive understanding of both existing organisational conditions and the effectiveness of proposed enhancement strategies.

Table 2: Operational Performance Indicators Before and After Embedded Analytics Adoption

<i>Performance Indicator</i>	<i>Before Embedded Analytics</i>	<i>After Embedded Analytics</i>
Report Preparation Time	High manual effort	Reduced preparation time
Business Information Availability	Periodic reporting	Immediate operational visibility
Decision Making Speed	Moderate	Faster and more informed
Data Accessibility	Multiple reporting tools	Integrated within business processes
Process Monitoring	Limited operational tracking	Continuous operational monitoring
User Productivity	Moderate	Improved task efficiency
Information Accuracy	Dependent on manual reporting	Improved through integrated enterprise data
Operational Responsiveness	Delayed reaction to business events	Faster response to operational changes
Management Visibility	Separate reporting environment	Unified operational and analytical view
Overall Operational Performance	Acceptable	Significantly enhanced



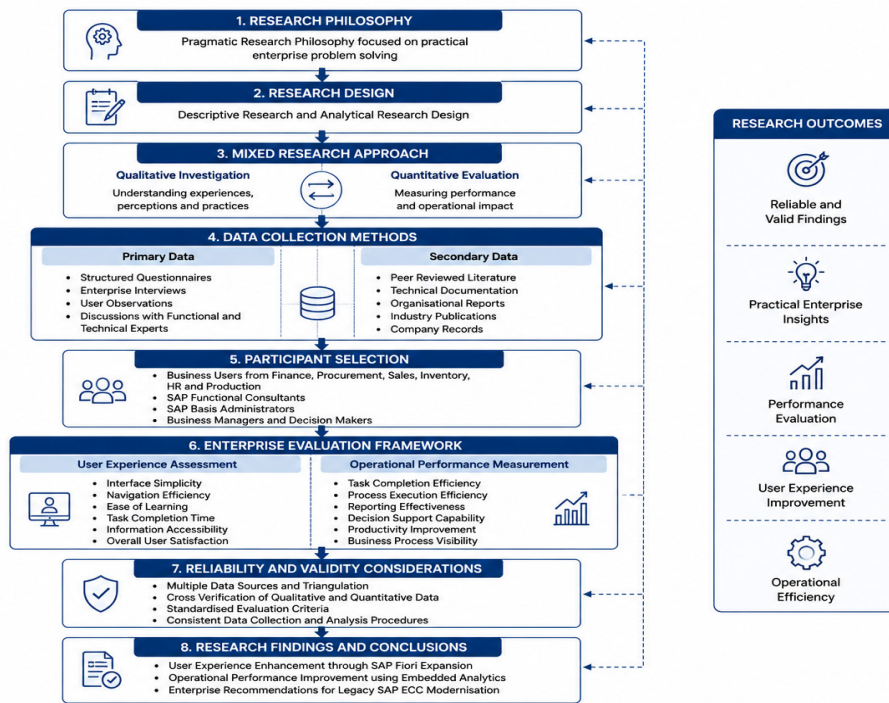


Figure 4: Research Methodology Framework

The investigation follows a mixed research approach by integrating qualitative observations with quantitative evaluation techniques. Qualitative information is obtained through organisational practices, implementation experiences, and user perspectives regarding system usability and business processes. Quantitative analysis focuses on measurable performance indicators including task completion efficiency, navigation effectiveness, reporting accessibility, and operational responsiveness. The integration of these complementary approaches strengthens the overall quality of the research by providing both practical insights and measurable evidence supporting the study findings.

Data collection is performed through multiple sources to improve the completeness and reliability of the investigation. Primary information is obtained using structured questionnaires, interviews with enterprise users, and discussions with functional consultants, system administrators, and business managers involved in SAP ECC operations. Secondary information is collected from peer reviewed journals, enterprise information system literature, technical documentation, and organisational reports relevant to ERP implementation and user experience improvement. Combining multiple information sources reduces dependence on a single perspective and supports balanced interpretation of research findings.

Participant selection follows a purposive sampling approach by identifying individuals with direct experience in SAP ECC implementation, operational management, and daily system utilisation. Participants include business

users representing finance, procurement, sales, inventory management, human resources, and production functions together with technical professionals responsible for SAP administration and system support. This selection strategy ensures that the collected information reflects practical enterprise experiences from both operational and technical viewpoints. Such diversity strengthens the credibility of observations regarding system usability and organisational performance.

The enterprise evaluation framework is developed around clearly defined assessment parameters that reflect both user centred and organisational performance objectives. User experience is evaluated through interface simplicity, navigation efficiency, task completion time, ease of learning, accessibility of business information, and overall user satisfaction. Operational performance is assessed using process execution efficiency, reporting effectiveness, decision support capability, business process visibility, productivity improvement, and information accessibility. These evaluation parameters provide measurable criteria for analysing the effectiveness of SAP Fiori Expansion and Embedded Analytics within legacy SAP ECC environments.

Reliability and validity are maintained throughout the research by applying consistent data collection procedures, standardised evaluation criteria, and comparison of information obtained from multiple organisational sources. Cross verification of qualitative observations with quantitative performance measures improves the consistency of research findings while reducing potential

interpretation bias. Although every effort has been made to ensure methodological rigour, certain limitations remain. The investigation is restricted to organisations operating SAP ECC environments and focuses primarily on enterprise modernisation through SAP Fiori Expansion and Embedded Analytics. Differences in organisational size, implementation strategy, business processes, and industry characteristics may influence the general applicability of the findings. Nevertheless, the proposed research methodology provides a systematic and dependable framework for evaluating user experience enhancement and operational performance improvement within legacy ERP environments.

Analysis of SAP Fiori Expansion and Embedded Analytics Implementation

The implementation of SAP Fiori Expansion and Embedded Analytics within legacy SAP ECC environments demonstrates a measurable improvement in enterprise usability and operational effectiveness. The analysis indicates that modern interface technologies contribute not only to enhanced user interaction but also to more efficient execution of business processes. Organisations adopting these capabilities experience improved accessibility to enterprise information while maintaining the reliability of existing SAP ECC infrastructure. The combined implementation therefore represents a practical approach to extending the operational value of legacy ERP systems without extensive system replacement.

User productivity was evaluated by examining the efficiency with which employees completed routine enterprise activities across finance, procurement, sales, inventory management, production planning, and human resource functions. Business users reported that role based applications reduced the time required to locate relevant transactions and operational information. The simplified interface eliminated unnecessary navigation through multiple menu structures, allowing employees to concentrate on business responsibilities rather than system operations. These observations suggest that productivity improvements are closely associated with reduced interface complexity and greater accessibility to business functions.

Navigation efficiency showed considerable improvement following the introduction of SAP Fiori applications. Traditional SAP GUI environments frequently required users to memorise transaction codes and navigate multiple sequential screens before completing operational activities. The SAP Fiori Launchpad simplified this process by providing organised access to business applications according to individual organisational roles. Users therefore completed routine activities through fewer navigation steps, improving workflow continuity and reducing interruptions during daily enterprise operations.

Task completion performance was analysed by comparing operational activities before and after implementation of SAP Fiori Expansion and Embedded Analytics. Business

processes involving approvals, procurement requests, inventory enquiries, financial reporting, and sales monitoring required fewer procedural steps following implementation. The availability of integrated analytical information within operational screens further reduced the need to access separate reporting applications during transaction execution. Consequently, business activities were completed more efficiently while maintaining consistency with existing organisational procedures and enterprise governance policies.

User satisfaction formed an important component of the enterprise evaluation because technological improvements are meaningful only when accepted by operational users. Participants consistently expressed positive perceptions regarding interface simplicity, screen organisation, information accessibility, and reduced learning requirements. Employees with limited technical experience adapted more rapidly to role based applications than to conventional transaction oriented interfaces. These findings indicate that user centred application design contributes significantly to higher levels of system acceptance and sustained utilisation within enterprise environments.

Operational performance evaluation demonstrated that the combined implementation of SAP Fiori Expansion and Embedded Analytics strengthened organisational responsiveness across multiple business functions. Managers obtained improved visibility into operational activities through integrated reporting and analytical dashboards, enabling earlier identification of process variations and resource utilisation issues. Enhanced information accessibility supported more effective planning, monitoring, and decision making while preserving transactional consistency within SAP ECC. The enterprise therefore benefited from improved coordination between operational execution and management oversight.

Business reporting capabilities experienced notable improvement because Embedded Analytics integrated analytical information directly within enterprise processes. Traditional reporting methods often required manual report generation and separate analytical environments before business information became available for evaluation. Integrated reporting reduced these delays by presenting operational indicators alongside routine business transactions. Decision makers therefore obtained faster access to performance information, allowing business conditions to be evaluated more efficiently without interrupting operational workflows or relying on independent reporting activities.

Enterprise implementation observations indicate that successful deployment depends upon effective planning, structured change management, user training, and appropriate system governance. Organisations that clearly defined business objectives before implementation achieved greater user acceptance and operational benefits than those focusing solely on technical deployment.



Continuous communication among business users, functional consultants, and system administrators further supported successful adoption by ensuring that technological improvements aligned with organisational requirements. These practical observations reinforce the importance of combining technical preparation with organisational readiness throughout implementation activities.

The comparative evaluation of implementation outcomes demonstrates that SAP Fiori Expansion and Embedded Analytics collectively provide greater organisational benefits than either capability implemented independently. SAP Fiori improves user interaction by simplifying navigation and supporting role based business activities, whereas Embedded Analytics enhances operational intelligence through integrated reporting and performance visibility. Together, these technologies strengthen productivity, improve decision support, and increase enterprise operational effectiveness while preserving the stability of legacy SAP ECC systems. The findings therefore support the argument that incremental modernisation through interface enhancement and integrated analytics represents a practical strategy for extending the long term value of established enterprise resource planning environments.

Strategic Implications and Enterprise Modernisation Framework

The findings of this study indicate that SAP Fiori Expansion and Embedded Analytics provide strategic value beyond improvements in interface design and reporting capabilities. Their implementation contributes to a broader enterprise modernisation strategy by strengthening operational

efficiency, improving user engagement, and increasing the practical value of existing SAP ECC investments. Rather than pursuing complete system replacement, organisations can adopt a structured enhancement approach that extends the operational life of established ERP environments. This strategy enables enterprises to respond to changing business expectations while maintaining the stability of proven operational processes.

The business value of SAP Fiori adoption is reflected in the improvement of daily operational activities across multiple functional areas. Role based applications simplify business transactions, reduce unnecessary navigation, and provide users with quicker access to enterprise information. Employees therefore spend more time completing productive business activities and less time interacting with complex system functions. Improved usability also encourages greater consistency in process execution, contributing to higher operational quality and stronger organisational performance over time.

Organisational benefits extend beyond individual productivity improvements because simplified enterprise applications strengthen collaboration among departments. Finance, procurement, inventory management, sales, production planning, and human resource functions can access information through consistent interface principles that improve communication and operational coordination. Standardised user experiences reduce variations in business process execution while supporting enterprise wide information sharing. These improvements enable organisations to achieve greater process transparency and more effective coordination across functional boundaries.

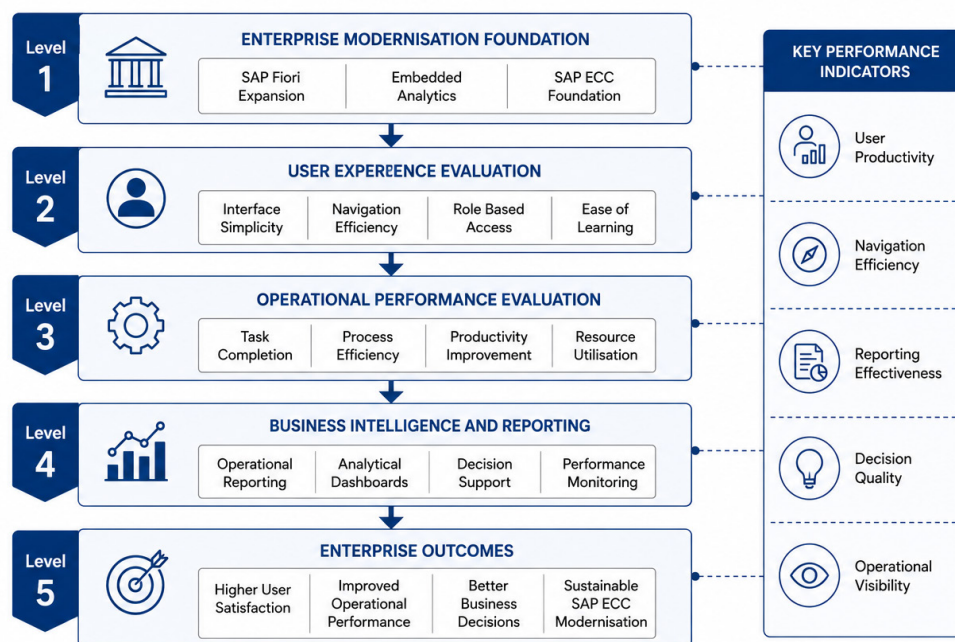


Figure 5: Enterprise Performance Evaluation Model

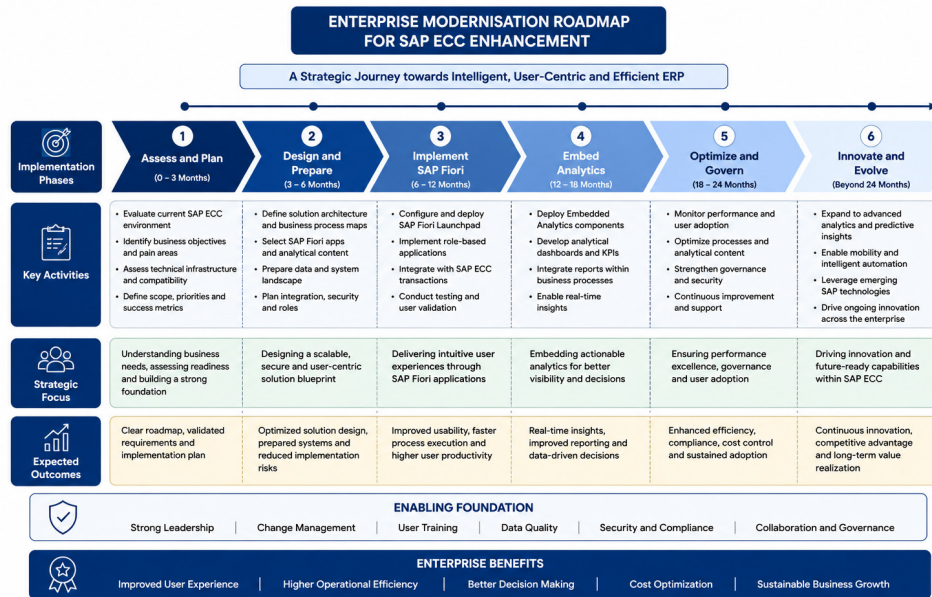


Figure 6: Enterprise Modernisation Roadmap for SAP ECC Enhancement

Cost optimisation represents another important strategic consideration for organisations maintaining legacy SAP ECC environments. Implementing SAP Fiori Expansion allows enterprises to modernise user interaction without incurring the financial and operational risks associated with complete ERP replacement. Existing business processes, enterprise data, and organisational knowledge remain preserved while targeted interface enhancements improve system effectiveness. Training costs may also decline because simplified applications reduce learning requirements for new and occasional users. Consequently, organisations obtain measurable business value while protecting previous investments in enterprise infrastructure.

Successful enterprise modernisation depends upon effective change management practices that encourage user acceptance and minimise operational disruption. Organisational leadership should communicate implementation objectives clearly and involve business users throughout planning, testing, and deployment activities. Comprehensive user training and continuous technical support further contribute to successful adoption by increasing user confidence and reducing resistance to organisational change. This study suggests that technological improvement should always be accompanied by structured organisational preparation to achieve sustainable implementation outcomes.

Enterprise readiness plays a significant role in determining the success of SAP Fiori Expansion and Embedded Analytics implementation. Before introducing new interface technologies, organisations should evaluate existing business processes, technical infrastructure, network capacity, security policies, and workforce capabilities. Readiness assessments assist decision makers in identifying implementation

priorities and allocating resources effectively throughout the modernisation programme. Careful preparation reduces implementation risk while ensuring that technological improvements align with long term organisational objectives and operational requirements.

A long term enhancement strategy for SAP ECC should focus on gradual and controlled system evolution rather than large scale transformation initiatives. Organisations may introduce SAP Fiori applications according to business priorities, beginning with frequently used operational processes before extending deployment to additional enterprise functions. Embedded Analytics can be incorporated progressively to improve operational reporting and decision support across functional departments. This phased implementation strategy enables organisations to evaluate performance improvements continuously while maintaining uninterrupted business operations and preserving system reliability.

The enterprise modernisation framework proposed in this study combines technological enhancement, organisational readiness, user centred application design, integrated analytics, and structured governance into a unified implementation approach. Best practice recommendations include establishing clear business objectives, selecting appropriate business processes for initial deployment, maintaining strong project governance, encouraging collaboration between business and technical teams, and performing continuous performance evaluation throughout implementation. These practices strengthen the likelihood of achieving sustainable operational improvements while supporting long term enterprise development.

Future opportunities within legacy ERP modernisation extend beyond interface improvement and operational

reporting by establishing a stronger foundation for continued enterprise innovation. Organisations adopting structured enhancement strategies will be better positioned to incorporate additional analytical capabilities, improved mobility, enhanced process automation, and more responsive business services as enterprise requirements continue to evolve. This study therefore concludes that SAP Fiori Expansion and Embedded Analytics should be regarded not merely as technical enhancements but as strategic components of an enterprise modernisation framework capable of extending the long term business value, operational relevance, and organisational effectiveness of legacy SAP ECC environments.

CONCLUSION AND FUTURE WORK

This study examined the enhancement of legacy SAP ECC environments through the expansion of SAP Fiori applications and the integration of Embedded Analytics with the objective of improving enterprise user experience and operational performance. The investigation demonstrated that meaningful improvements can be achieved without replacing existing Enterprise Resource Planning infrastructure. By combining simplified user interaction with integrated analytical capabilities, organisations can strengthen business process efficiency while preserving the reliability and operational stability of established SAP ECC systems. The findings therefore support the view that enterprise modernisation can be successfully accomplished through structured system enhancement rather than complete technological replacement.

The research objectives established at the beginning of the study have been successfully addressed through systematic analysis of architectural integration, user experience improvement, operational performance evaluation, and enterprise implementation practices. The investigation confirmed that SAP Fiori Expansion simplifies navigation, reduces transaction complexity, and improves accessibility to enterprise functions through role based applications. Embedded Analytics complements these improvements by providing operational reporting and business information directly within enterprise processes, thereby supporting faster and more informed organisational decision making. Together, these technologies contribute to measurable improvements in enterprise productivity and operational effectiveness.

The findings also contribute to the academic understanding of Enterprise Resource Planning modernisation by presenting an integrated perspective that combines interface enhancement and analytical capability within legacy SAP ECC environments. Existing studies frequently examine usability improvement and business intelligence independently, whereas this research demonstrates the value of evaluating these technologies as complementary components of enterprise transformation. The proposed enterprise modernisation framework provides a structured

basis for future academic investigation into user centred ERP enhancement while extending current knowledge relating to enterprise application usability and operational intelligence.

From an organisational perspective, the practical implications of this study are equally significant. Enterprises maintaining long established SAP ECC environments often face increasing business expectations regarding system usability, operational visibility, and information accessibility while remaining constrained by existing technology investments. The findings demonstrate that carefully planned implementation of SAP Fiori Expansion and Embedded Analytics enables organisations to improve business operations without extensive disruption to established enterprise processes. Such an approach supports greater operational continuity while allowing organisations to respond more effectively to changing business requirements.

The study further indicates that successful implementation depends upon organisational readiness, effective project governance, and continuous collaboration between business users and technical specialists. Modern interface technologies alone cannot guarantee successful enterprise outcomes unless accompanied by comprehensive user training, structured change management, and clearly defined implementation objectives. Organisations should therefore establish phased deployment strategies, monitor performance throughout implementation, and continuously evaluate user feedback to ensure that technological improvements remain aligned with business priorities and operational objectives. These recommendations provide practical guidance for organisations planning long term enhancement of legacy ERP environments.

Although the investigation provides valuable insights into enterprise modernisation, several limitations should be recognised when interpreting the findings. The study concentrates primarily on SAP ECC environments employing SAP Fiori Expansion and Embedded Analytics and therefore does not examine alternative Enterprise Resource Planning platforms or complete system replacement strategies. Organisational differences in business processes, implementation maturity, industry characteristics, and technical infrastructure may influence the extent to which the reported outcomes can be generalised across different enterprise environments. These limitations provide opportunities for broader investigation within future research.

Future research may extend the proposed framework by examining additional enterprise scenarios involving different organisational sizes, industrial sectors, and implementation strategies. Comparative investigations involving multiple ERP platforms may further improve understanding of user centred enterprise application modernisation. Additional studies may also explore advanced analytical techniques, enterprise mobility, business process automation, and evolving interface technologies while maintaining compatibility with established ERP infrastructures. Such investigations would

strengthen both theoretical understanding and practical implementation guidance for enterprise information systems.

The overall findings of this study demonstrate that SAP Fiori Expansion and Embedded Analytics represent complementary technologies capable of significantly improving the usability and operational value of legacy SAP ECC environments. Their combined implementation strengthens enterprise productivity, enhances business reporting, supports informed decision making, and extends the useful life of existing Enterprise Resource Planning investments. This study concludes that organisations seeking sustainable enterprise modernisation should adopt a structured enhancement strategy that combines user centred interface design, integrated analytical capabilities, effective governance, and continuous organisational evaluation. Such an approach provides a practical and strategically balanced pathway towards improving enterprise performance while preserving the long term business value of established SAP ECC systems.

REFERENCES

- [1] Wong, W. P., Veneziano, V., & Mahmud, I. (2016). *Usability of Enterprise Resource Planning software systems: An evaluative analysis of the use of SAP in the textile industry in Bangladesh*. Information Development, 32(4), 1027–1041. <https://doi.org/10.1177/0266666915585364>
- [2] Bahsas, D. M., AlBar, A. M., & Hoque, R. (2015). *Enterprise Resource Planning (ERP) Systems: Design, Trends and Deployment*. The International Technology Management Review, 5(2), 72–81. <https://doi.org/10.2991/itmr.2015.5.2.2>
- [3] Costin, B., & Cojocaru, D. (2017). *Integration of metrology applications in the calibration reservoir suites using SAP Fiori, portal and cloud: A study case*. Proceedings of the 21st International Conference on System Theory, Control and Computing (ICSTCC), pp. 297–302. <https://doi.org/10.1109/ICSTCC.2017.8107050>
- [4] Romero, D., Flores, M., Herrera, M., & Reséndiz, O. (2018). *Business Software Offer for Industry 4.0: The SAP Case*. IFAC-PapersOnLine, 51(11), 1200–1205. <https://doi.org/10.1016/j.ifacol.2018.08.427>
- [5] Pattanayak, A. (2017). *SAP S/4HANA Embedded Analytics: An Overview*. Journal of Computer and Communications, 5(9), 1–16. <https://doi.org/10.4236/jcc.2017.59001>
- [6] Singh, K., & Best, P. J. (2015). *Design and Implementation of Continuous Monitoring and Auditing in SAP Enterprise Resource Planning*. International Journal of Auditing, 19(3), 307–317. <https://doi.org/10.1111/ijau.12051>
- [7] Shi, Z., & Wang, G. (2018). *Integration of Big Data ERP and Business Analytics (BA)*. Journal of High Technology Management Research, 29(2), 141–150. <https://doi.org/10.1016/j.hitech.2018.09.004>
- [8] Lu, X., Nagelkerke, M. Q. L., van de Wiel, D., & Fahland, D. (2015). *Discovering Interacting Artifacts from ERP Systems*. IEEE Transactions on Services Computing, 8(6), 861–873. <https://doi.org/10.1109/TSC.2015.2474358>
- [9] Al-Sabri, H. M., Al-Mashari, M., & Chikh, A. (2018). *A comparative study and evaluation of ERP reference models in the context of ERP IT-driven implementation*. Business Process Management Journal, 24(4), 943–964. <https://doi.org/10.1108/BPMJ-07-2016-0139>
- [10] Beheshti, H. M., Blaylock, B. K., Henderson, D. A., & Lollar, J. G. (2014). *Selection and critical success factors in successful ERP implementation*. Competitiveness Review, 25(4), 371–388. <https://doi.org/10.1108/CR-10-2013-0082>
- [11] Côte-Real, N., Oliveira, T., & Ruivo, P. (2017). *Assessing business value of Big Data Analytics in European firms*. Journal of Business Research, 70, 379–390. <https://doi.org/10.1016/j.jbusres.2016.08.011>
- [12] Queiroz, M. M., & Telles, R. (2018). *Big Data Analytics in Supply Chain and Logistics: An empirical approach*. International Journal of Logistics Management, 29(2), 767–783. <https://doi.org/10.1108/IJLM-05-2017-0116>
- [13] Nandi, M. L., & Kumar, A. (2018). *Absorptive capacity and ERP assimilation: The influence of company ownership*. Business Process Management Journal, 24(3), 695–715. <https://doi.org/10.1108/BPMJ-11-2016-0228>
- [14] Marciniak, R., Amrani, R. E. L., Rowe, F., & Adam, F. (2014). *Does ERP integration foster Cross-Functional Awareness? Challenging conventional wisdom for SMEs and large French firms*. Business Process Management Journal, 20(6), 865–886. <https://doi.org/10.1108/BPMJ-05-2013-0056>
- [15] Rialti, R., Marzi, G., Silic, M., & Ciappei, C. (2018). *Ambidextrous organization and agility in big data era: The role of business process management systems*. Business Process Management Journal, 24(5), 1091–1109. <https://doi.org/10.1108/BPMJ-07-2017-0210>
- [16] Sonneberg, C., & vom Brocke, J. (2014). *The missing link between BPM and accounting: Using event data for accounting in process-oriented organizations*. Business Process Management Journal, 20(2), 213–246. <https://doi.org/10.1108/BPMJ-12-2012-0136>
- [17] Elmonem, M. A. A., Nasr, E. S., & Geith, M. H. (2016). *Benefits and challenges of cloud ERP systems: A systematic literature review*. Future Computing and Informatics Journal, 1(1–2), 1–9. <https://doi.org/10.1016/j.fcij.2017.03.003>
- [18] Al-Jabri, I. M. (2015). *Antecedents of user satisfaction with ERP systems: Mediation analyses*. Kybernetes, 44(1), 107–123. <https://doi.org/10.1108/K-05-2014-0101>
- [19] Mu, E., Kirsch, L. J., & Butler, B. S. (2015). *The assimilation of enterprise information systems: An interpretation systems perspective*. Information & Management, 52(3), 359–370. <https://doi.org/10.1016/j.im.2015.01.004>
- [20] Hwang, Y. (2014). *User experience and personal innovativeness: An empirical study on the Enterprise Resource Planning systems*. Computers in Human Behavior, 34, 227–234. <https://doi.org/10.1016/j.chb.2014.02.002>
- [21] Shim, S. J., & Shim, M. K. (2018). *How User Perceptions of SAP ERP System Change with System Experience*. Proceedings of the First International Conference on Data Science, E-learning and Information Systems (DATA 2018), pp. 1–4. <https://doi.org/10.1145/3279996.3280016>
- [22] Anaya, L., Dulaimi, M., & Abdallah, S. (2015). *An investigation into the role of enterprise information systems in enabling business innovation*. Business Process Management Journal, 21(4), 771–790. <https://doi.org/10.1108/BPMJ-11-2014-0108>
- [23] Ram, J., & Corkindale, D. (2014). *How “critical” are the critical success factors (CSFs)? Examining the role of CSFs for ERP*. Business Process Management Journal, 20(1), 151–174. <https://doi.org/10.1108/BPMJ-11-2012-0127>
- [24] Abdallah, S., & Jaleel, B. (2014). *Development of an Integrated Framework to Investigate Enterprise Information Systems Adoption: Managers’ Insights*. The International Technology Management Review, 4(3), 158–169. <https://doi.org/10.2991/itmr.2014.4.3.4>



- [25] Grabot, B. (2014). *ERP 2.0, what for and how?* Computers in Industry, 65(6), 976–1000. <https://doi.org/10.1016/j.compind.2014.02.017>
- [26] vom Brocke, J., Mathiassen, L., & Rosemann, M. (2014). *Business Process Management*. Business & Information Systems Engineering, 6(4), 189–189. <https://doi.org/10.1007/s12599-014-0330-8>
- [27] Hsu, P. F., Yen, H. J. R., & Chung, J. C. (2015). *Assessing ERP post-implementation success at the individual level: Revisiting the role of service quality*. Information & Management, 52(8), 925–942. <https://doi.org/10.1016/j.im.2015.06.009>
- [28] De Toni, A. F., Fornasier, A., & Nonino, F. (2015). *The impact of implementation process on the perception of enterprise resource planning success*. Business Process Management Journal, 21(2), 332–352. <https://doi.org/10.1108/BPMJ-08-2013-0114>
- [29] Fadelelmoula, A. A. (2018). *The Impacts of the Quality Dimensions of the ERP System on the Realization of the Fundamental Business Objectives and Perceived Usefulness*. International Journal of Enterprise Information Systems, 14(4), 89–107. <https://doi.org/10.4018/IJEIS.2018100107>
- [30] Huang, T., & Yokota, A. (2018). *Inventing a business-ERP alignment assessment model through three Japanese companies*. Business Process Management Journal, 25(4), 738–756. <https://doi.org/10.1108/BPMJ-03-2017-0068>

