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Review

Driving Efficiency and Competitiveness: Trends and Innovations in ERP Systems for the Wood Industry

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Abstract: Enterprise Resource Planning (ERP) systems offer various functionalities to support an organization's core functions. However, many anticipated benefits often need to materialize due to business context changes and users' high expectations. Continuous adaptation and improvement are necessary to address user disappointments. This research focuses on ERP systems, exploring key factors influencing the success of their implementation. Recognizing challenges in ERP system implementation, this study provides a comprehensive literature review, identifying essential and contemporary Critical Success Factors (CSFs) influenced by technological advancements. Addressing challenges specific to the wood industry, this research introduces additional industry-adapted CSFs, including industry adaptability, integration with production machinery, effective warehouse management, and supply chain tracking. Furthermore, this paper emphasizes the need for continuous adaptation and improvement of ERP systems, especially in light of current trends and technological achievements. This study recommends a holistic approach, considering traditional or essential CSFs while adapting to new trends. Critical success factors in ERP implementation in the next decade involve considering cloud technology, artificial intelligence and machine learning, data security, mobile access, IoT integration, user experience, and training. The main objective of this paper is to identify the latest CSFs in ERP implementation. This research highlights essential success factors in ERP implementation, and contemporary trends in ERP implementation with a particular focus on the specifics of wood industry. While organizations should aim to maximize the potential of ERP systems, they should also acknowledge the crucial role played by human intervention in the effective and responsible implementation of artificial intelligence.

Keywords: enterprise resource planning; wood industry; artificial intelligence; critical success factors

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Citation: Vukman, K.; Klarić, K.; Greger, K.; Perić, I. Driving Efficiency and Competitiveness: Trends and Innovations in ERP Systems for the Wood Industry. *Forests* **2024**, *15*, 230. https://doi.org/10.3390/f15020230

Academic Editor: Donald G. Hodges

Received: 15 December 2023
Revised: 13 January 2024
Accepted: 23 January 2024
Published: 25 January 2024

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1. Introduction

Enterprise Resource Planning (ERP) applications are generally programmed and designed outside the client companies by provider organizations (software vendors). In modern business, applications are developed based on various models and best practices to optimize processes and improve performance. Organizations adopt models that align with their needs and objectives while adhering to standards and benchmarks to remain competitive [1]. As a result, ERP implementation often represents positive returns [2], contributing to the firm's growth and revenue through strategic contributions that can afford significant and compelling advantages.

ERP is a term created (and first employed by Wylie in 1990 [3]) as a continuation of earlier phrases of Material Requirements Planning (MRP) and Manufacturing Resource Planning (MRP II) [3]. By integrating various computer software and hardware components, an ERP system facilitates the smooth flow of information across an entire enterprise [4]. According to authors Saade and Garača [5,6], ERP refers to a particular marketplace segment of enterprise software regarding integrated, integral, and modular application software

packages that improve process efficiency by providing real-time data. ERP software packages integrate a company's information requirements into a single computer system [7,8] for management to better overview all of the company's administrative and operational activities. The necessity of efficient and open information between the enterprise, suppliers, distributors, and customers was a constitutional initiator for implementing ERP systems. While manufacturing resource planning focuses on the resources needed for production, ERP should consider all resources necessary for the business's success [9]. Given the restrained time and budget, the managers must apprehend strategies that could result in a more significant advantage.

Furthermore, ERP system implementations are regularly characterized by considerable difficulties, resulting in the need to research factors to ensure more meaningful information on achieving implementation success [6]. Implementation is expected to result in savings of money and time and rationalization of organizational processes. The wood industry is adopting ERP systems to streamline business processes, improve efficiency, and gain insights from data analytics. ERP systems provide visibility into the supply chain for efficient inventory management, reduced lead times, and customer relationship management [10]. Huang et al. [11] noted that many companies still need ERP implementation and identified 28 risk factors affecting the implementation. They calculated that 90% of implementations are over budget (or delivered late), and 67% are considered harmful and have an unsuccessful fail rate in achieving enterprises' goals. The reason for this kind of results lies in the fact that during the implementation of the ERP system, a large number of expertise, technological, and technical areas must be managed. The leaders of enterprises must realize the reengineering process and system development. However, they must also master the human and organizational domains such as end-user involvement, adaptation, and workers' resistance to new business solutions and change management. They are endangering the organization's core activity because of a low and challenging understanding of the benefits of a new ERP software, and Hong et al. [12], also highlighted an unusually high failure rate. Numerous studies [13–19] have demonstrated that measuring implementation success can involve both business and project success. The success of an ERP project implementation is measured by whether the ERP system is delivered on time, on budget, and meets the specified goal. In contrast, the business case is measured by inventory reduction, time to market, and labor savings.

Implementing an ERP project involves three phases: pre-implementation, implementation, and post-implementation. An organization must prepare well during pre-implementation to ensure a successful ERP implementation [20]. This includes acquiring adequate employee skills, vendor support, and resources and addressing Critical Success Factors (CSFs) optimally during implementation. According to authors Kremzar and Wallace [21], implementing an ERP system revolutionizes business operations. Therefore, the management and stakeholders need to appreciate the magnitude of the implementation's impact on the organization. They must have a complete understanding of the CSFs that will help them ensure the success of the ERP system implementation [22]. While technology forms the backbone of an ERP system, its successful implementation is not solely about installing software; it is about transforming the organization's processes, culture, and structures [11,15]. Organizational resistance to change has been identified as one of the critical factors in the success of ERP implementations [11]. It is crucial to have a strategic approach that considers these factors and involves all stakeholders to ensure a smooth transition and successful integration of the ERP system into the organizational framework. This holistic approach maximizes the potential benefits of the ERP system and enables the organization to achieve its intended business outcomes [16,19].

Ronald Daniel [16] introduced the concept of Critical Success Factors (CSF) in the early 1960s. This research provided one of the problems that organizational managers face in the operational management of their organizations. As organizations grew and changed rapidly, it became increasingly difficult for managers to determine which projects, departments, or decisions impacted the organization's success most. In his study, Ronald

Daniel [16] emphasized that "Careful analysis of the facts and circumstances of an industry is often needed to identify the basic requirements for success—namely, those few things that management must do exceedingly well if the company is to prosper." CSFs are pivotal factors or areas in business that, when executed exceptionally well, empower an organization to achieve success and prosperity. These factors constitute critical elements essential for outstanding organizational performance in reaching its goals [16–18]. However, concerning CSFs in IT implementation, Rockart [19] pioneered a research method explicitly designed to elicit CSFs. In his study, he provided an explanatory definition, indicating that CSF refers to the limited number of specific areas which where achieving satisfactory results how this will lead to successful competitive performance for the organization. Rockart [19] also explains that CSF formation can be viewed from four angles: those shaped by the industry, operational strategies, managerial perceptions, and environmental changes.

In their research on Critical Success Factors (CSFs), Paul et al. [23] stated that research and development, supplier relations, and the use of eco-friendly technology are the top-ranked CSFs in Bangladesh's wood industry. Establishing beneficial supplier relationships is a key strategic objective for modern organizations, contributing to long-term success. CSFs supporting this objective include product quality, resource management, health and safety, supplier relations, and eco-friendly technology [23]. Consequently, organizations may find it challenging to allocate the required resources, time, and focus to implement them in their competitive strategy [23]. To overcome this challenge, top management must actively support the implementation of these CSFs. According to recent academic research by Quereshi [24], the wood sector's implementation of ERP systems is driven by many factors. These include a focus on operational efficiency and cost reduction, comprehensive inventory and product management capabilities, adherence to industry standards, access to real-time data and analytics for informed decision-making, modernized operations for enhanced global competitiveness, improved customer responsiveness, and alignment with global market trends. Small and medium-sized enterprises (SMEs) face unique challenges during ERP implementation due to project complexity, tight schedules, and limited resources. Cloud-based ERP systems have enabled SMEs to reduce upfront costs while experiencing the benefits of an ERP package [25,26]. However, a cloud-based ERP solution must meet the exact critical requirements of an on-premises ERP implementation for success. CSFs identified for on-premises ERP implementation also apply to cloud-based ERP implementation [26]. Additionally, the ERP project manager must prioritize CSFs at each stage and allocate limited resources to address them. The lack of quantitative measurement of CSFs' performance and their contributions to overall ERP implementation has led to a fragmented and partial understanding of how to address selected CSFs to implement and improve performance in ERP projects [25,26].

Wood-based industries, particularly those involved in the manufacture of wood and wood products, are of vital importance to the entire production sector. In 2021, the wood industry saw significant recovery and peak production levels for key products. Wood pellets and agglomerates, tracked since 2012, experienced steady growth, reaching a record 51 million tons in 2021, a 120% increase since 2012. Global sawn wood production rebounded strongly in 2021, rising by 29% compared to 2000. Wood-based panels, which faced a dip in 2020, resumed growth, with 2021 production at 402 million m^3, marking a significant 126% increase from 2000 levels [27]. Eurostat data from 2020 [28] show that in the European Union, wood-based industries accounted for 19.00% of all manufacturing enterprises and are mostly SMEs. The term "SMEs" or small and medium enterprises is defined as enterprises having less than 250 employees and an annual turnover of up to EUR 50 million or a balance sheet total of no more than EUR 43 million [29]. Despite being largely composed of low-tech [Keller] small and medium enterprises (SMEs) [28], these industries contribute significantly to the European economy, generating a total Gross Value Added of EUR 136 billion, representing about 7.20% of the overall manufacturing industry. Furthermore, the wood-based sector plays a pivotal role in employment, providing jobs for 3.1 million people, which accounts for approximately 10.50% of the total manufacturing

workforce in the EU [28]. Furthermore, given the limited adoption of ERP systems in the wood or furniture industry [30–32], mainly due to the associated need for investments in computer hardware, network configurations, and a database as an information repository. A shortage of skilled workers further constrains ERP adoption [32]. Implementing ERP systems in this industry is complex, requiring careful planning and execution, considering factors such as implementation stages and costs, training duration, data migration, top management, and consultant support [33]. These systems cover financial control, manage costs, and forecast financial situations while incorporating a robust supply chain system to ensure timely raw material supply and handle orders from diverse locations [34]. Despite these challenges, the potential benefits and enhanced operational efficiency make ERP implementation a strategic consideration for companies in the wood or furniture sector. Furthermore, operational structure is crucial for the successful implementation of ERP system. The operational structure in the wood industry encompasses the procurement of raw wood materials, their processing into manufacturing materials, packaging of finished products, inventory management, distribution, and delivery to end customers. For example, the operational structure of a sawmill in the wood industry involves sourcing raw wood materials such as logs, processing them into wooden planks and beams, packaging the products, efficient inventory management of wood materials, distribution of products to retailers, and final delivery to end customers. Each step in the wood industry's operational structure is carefully monitored through an ERP system. For detailed information or tracking of a specific work order, the ERP system link should be used, providing essential details about the current status, progress, and resources in a particular production activity. This integrated system can ensure transparency and efficiency in every stage of the production process.

This study focuses on reviewing the academic literature concerning Critical Success Factors (CSFs) in Enterprise Resource Planning (ERP) implementation. Literature review is structured into three chapters. The first chapter comprises a literature review of the essential factors for effective ERP implementation. The second chapter explores contemporary trends in ERP implementation, while the last chapter is focused on the literature related to practical implications and implementation in the wood industry. This approach allows for the identification of essential, traditional factors that are crucial for organizations and the recognition of new critical success factors which are emerging due to technological advancements. Understanding essential factors helps maintain established practices, while analyzing newer factors contributes to adapting implementation methods in the evolving technological and business landscape in wood industry. This combined insight emphasizes the importance of continuously evaluating and adapting ERP strategies to ensure their relevance and effectiveness in modern business environments.

This study's significance lies in its attempt to provide a comprehensive understanding of the evolving landscape of ERP implementation in the wood industry by identifying both enduring and emerging critical success factors. By analyzing the changes in these factors over time, this study aims to contribute insights that can assist organizations in adapting their strategies for successful ERP implementation in contemporary business environments.

2. Essential Factors for Effective ERP Implementation: A Comprehensive Review

Numerous studies have been conducted to identify the factors that affect the success and failure of Enterprise Resource Planning (ERP) implementation. Early researchers in this field [14–16] were focused mainly on CSFs in ERP implementation. In their studies, the authors Françoise et al., Patnaik et al., Jacobs and Wesron, Malhotra and Temponi, Saade and Nijher, Garača, Koch et al., Ehie and Madsen, Kurbel, Huang et al., Hong and Kim, Wong and Tein, and Bingi et al. [1–14] mentioned that critical success factors are often used to identify and determine the key elements necessary for a company to succeed. They can also be described as a small number of easily identifiable operational objectives defined by the industry, the company, the managers, and the environment to ensure the organization's success.

Table 1 represents an overview of the literature on Critical Success Factors (CSFs) in ERP implementation. When considering top management, their commitment is crucial.

Top management needs to demonstrate a genuine interest in participation, employ both managerial and professional steering committees, and be ready to use contemporary technologies. Top managers should have a comprehensive understanding of the company's requirements, potential, and IT limitations. Decision-making should be holistic, involving all management levels during the ERP implementation process. Choosing the right ERP software and hardware is crucial. Customization, integration, reliable databases, adaptability, and system-wide compatibility are all essential factors. In ERP implementation, the significance of consultants is emphasized, as this factor is the most frequently cited in the reviewed literature. Engaging in honest and transparent dialogue with professionals in the field can aid businesses in accurately estimating the cost of implementing ERP. The management and accuracy of the database also play a significant role. Formulating a comprehensive plan for data analysis, ensuring the quality and accuracy of data, and establishing a strategy for data conversion are imperative steps in the process. Strategies for interface testing, particularly with integrated legacy systems, are essential for maintaining software integrity. Developing effective troubleshooting methods and skills, conducting testing during the software development phase, creating suitable troubleshooting tools, and collaborating closely with software experts and vendors are essential phases in the process. Furthermore, project management emerges as important CSF, as evidenced by the cited literature in Table 1. Education and training are pivotal in ERP implementation. This entails training technical staff, support staff, and end users, emphasizing interdepartmental communication, understanding future business processes, and outlining a clear educational and training roadmap. Choosing the right ERP system and undergoing business process reengineering requires collaboration between ERP professionals and end users. Lastly, change management is essential to ERP success. This requires users to be involved in strategic processes, develop new procedures, collaborate across teams, and build confidence in using the ERP system, especially across functional areas.

Table 1. An Overview of Literature on Critical Success Factors (CSF) in ERP implementation (source: authors research).

Critical Success Factors (CSFs)	References
Top management commitment Top management's interest in participation. Use of managerial and professional steering committees. Readiness to use contemporary technologies. Gaining knowledge of the company's requirements, potential, and IT limits. Involvement of all levels of management in decision-making during the implementation process.	Brown and Vessey 1999 [35]; Holland and Light 1999 [15]; Bingi et al., 1999 [14]; Sumner 1999 [36]; Davenport 2000 [37]; Esteves and Pastor 2000 [38]; Al-Mudimigh et al., 2001 [39]; Somers and Nelson 2001 [40]; Nah et al., 2001 [41]; Akkermans and van Helden 2002 [42]; Al-Mashari et al., 2003 [43]; Brown and Vessey 2003 [44]; Somers and Nelson 2003 [45]; Somers and Nelson 2004 [46]; Yusuf et al., 2004 [47]; Ehie and Madsen 2005 [8]; O'Leary 2005 [48]; Wong et al., 2005 [49]; Ifinedo and Nahar 2007 [50]; Finney and Corbett 2007 [51]; Ngai et al., 2008 [52]; Françoise 2009 [1], Ahmad et al., 2013 [22], Kiran et al., 2019 [53], Barth and Koch 2019 [54], Huang et al., 2019 [55], Kurnia et al., 2019 [56], Perić et al., 2019 [33], Vargas and Comuzzi 2019 [57], Kirmizi et al., 2022 [26].
ERP software compatibility Suitable software and hardware considerations. Customization level. Integrating systems and ensuring their database dependability. Providing system adaptability to shifting circumstances. Ensuring the compatibility of systems. Technology Infrastructure.	Holland and Light 1999 [15]; Davenport 2000 [37]; Esteves and Pastor 2000 [38]; Al-Mudimigh et al., 2001 [39]; Nah et al., 2001 [41]; Lee and Lee 2001 [58]; Hong and Kim 2002 [12]; Al-Mashari et al., 2003 [43]; Kumar et al., 2003 [59]; Yusuf et al., 2004 [47]; Zhang et al., 2005 [60]; Wong et al., 2005 [49]; Finney and Corbett 2007 [51]; Ngai et al., 2008 [52]; Françoise 2009 [1], Esteves 2013 [61], Kiran et al., 2019 [53], Barth and Koch 2019 [54], Huang et al., 2019 [55], Kurnia et al., 2019 [56], Vargas and Comuzzi 2019 [57]; Kirmizi et al., 2022 [26].

Table 1. *Cont.*

Critical Success Factors (CSFs)	References
Consultant support Honest and transparent dialogue. Estimating the cost of implementing ERP. Specific performance metrics and planning to ensure adequate time for implementation. A systematic approach to making decisions. IT and company's strategic coordination.	Welti 1999 [62]; Sumner 1999 [36]; Holland and Light 1999 [15]; Buckhout et al., 1999 [63]; Brown and Vessey 1999 [35]; Bingi et al., 1999 [18]; Davenport 2000 [37]; Esteves and Pastor 2000 [38]; Somers and Nelson 2001 [40]; Nah et al., 2001 [41]; Lee and Lee 2001 [58]; Al-Mudimigh et al., 2001 [39]; Akkermans and van Helden 2002 [42]; Hong and Kim 2002 [12]; Brown and Vessey 2003 [44]; Al-Mashari et al., 2003 [49]; Yusuf et al., 2004 [47]; Zhang et al., 2005 [60]; Wong et al., 2005 [49]; Gargeya and Brady 2005 [64]; Ehie and Madsen 2005 [8]; O'Leary 2005 [48]; Ifinedo and Nahar 2007 [50]; García-Sánchez and Pérez-Bernal 2007 [65]; Finney and Corbett 2007 [51]; Ngai et al., 2008 [52]; Françoise 2009 [1], Ahmad et al., 2013 [22], Esteves 2013 [61], Ram et al., 2013 [66], Kiran et al., 2019 [53], Phaphoom et al., 2018 [67], Huang et al., 2019 [55], Kurnia et al., 2019 [56], Moeuf et al., 2019 [68], Perić et al., 2019 [1], Vargas and Comuzzi 2019 [57]; Kirmizi et al., 2022 [26].
Data management Creating a plan for data analysis. Data quality assurance and accuracy. Creating a data conversion strategy, creating a plan for data accuracy. Effective communication within the entire company. Data Conversion and Integration.	Brown and Vessey 1999 [35]; Bingi et al., 1999 [18]; Welti 1999 [62]; Sumner 1999 [36]; Somers and Nelson 2001 [40]; Nah et al., 2001 [41]; Hong and Kim 2002 [12]; Zhang et al., 2005 [60]; Esteves and Pastor 2006 [38]; Finney and Corbett 2007 [51]; Ngai et al., 2008 [52]; Jafari et al., 2009 [1], Ahmad et al., 2013 [22], Esteves 2013 [61], Phaphoom et al., 2018 [67], Barth and Koch 2019 [54], Huang et al., 2019 [54], Kurnia et al., 2019 [56], Moeuf et al., 2019 [68], Vargas and Comuzzi 2019 [57].
Software maintenance Formulating a strategy for interface testing with integrated legacy systems. Developing effective troubleshooting methods and skills. Testing and troubleshooting in Software development time. Creating suitable troubleshooting tools. Working closely with software experts and vendors.	Holland and Light 1999 [15]; Esteves and Pastor 2000 [38]; Somers and Nelson 2001 [40]; Nah et al., 2001 [41]; Al-Mashari et al., 2003 [43]; Loh and Koh 2004 [69]; Ifinedo and Nahar 2007 [50]; Finney and Corbett 2007 [51]; Ngai et al., 2008 [52]; Françoise 2009 [1], Kiran et al., 2019 [53], Phaphoom et al., 2018 [67], Moeuf et al., 2019 [68], Perić et al., 2019 [1], Vargas and Comuzzi 2019 [57]; Mahraz et al., 2020 [70], Kirmizi et al., 2022 [26], Brandtner 2023 [71].
Project Management A well-defined project plan with tight control over change requests. Planning required upgrades and choosing realistic deadlines. Knowledge transfer management. Management of conflicts. Management of legacy systems. Risk and expectation management.	Buckhout et al., 1999 [63]; Holland and Light 1999 [15]; Welti 1999 [62]; Bingi et al., 1999 [18]; Brown and Vessey 1999 [35]; Sumner 1999 [36]; Davenport 2000 [37]; Esteves and Pastor 2000 [38]; Somers and Nelson 2001 [40]; Nah et al., 2001 [41]; Lee and Lee 2001 [58]; Akkermans and van Helden 2002 [42]; Kumar et al., 2003 [59]; Yusuf et al., 2004 [47]; Dowlatshahi 2005 [72]; Zhang et al., 2005 [58]; Wong et al., 2005 [49]; O'Leary 2005 [48]; Ifinedo and Nahar 2007 [50]; Finney and Corbett 2007 [51]; Ngai et al., 2008 [52]; Françoise 2009 [1], Ahmad et al., 2013 [22], Phaphoom et al., 2018 [67], Barth and Koch 2019 [54], Huang et al., 2019 [55], Vargas and Comuzzi 2019 [57]; Mahraz et al., 2020 [70], Kirmizi et al., 2022 [26].
Education and training Education and training of technical and support staff. Management for interdepartmental communication and coordination. Education and training of end users. Education on future business processes. Developing a clear education and training plan.	Brown and Vessey 1999 [35]; Bingi et al., 1999 [18]; Sumner 1999 [36]; Davenport 2000 [37]; Esteves and Pastor 2000 [38]; Al-Mudimigh et al., 2001 [39]; Somers and Nelson 2001 [40]; Lee and Lee 2001 [58]; Kumar et al., 2003 [59]; Dowlatshahi 2005 [72]; Gargeya and Brady 2005 [64]; Wong et al.,ć 2005 [49]; Zhang et al., 2005 [58]; Ifinedo and Nahar 2007 [50]; Finney and Corbett 2007 [51]; Ngai et al., 2008 [52], Esteves 2013 [61], Phaphoom et al., 2018 [67], Barth and Koch 2019 [54], Huang et al., 2019 [55], Kurnia, et al., 2019 [56], Moeuf et al., 2019 [68], Perić et al., 2019 [1], Vargas and Comuzzi 2019 [57]; Mahraz et al., 2020 [70], Kirmizi et al., 2022 [26].

Table 1. *Cont.*

Critical Success Factors (CSFs)	References
ERP selection and reengineering Teamwork between ERP and end users. ERP Vendors Relations and Choice. The professional and wary package selection procedure. Planning the package selection process. ERP system and business process compatibility. Business process reengineering and change. Process adaptation level. Alignment of the business with the new system.	Holland and Light 1999 [15]; Bingi et al., 1999 [18]; Brown and Vessey 1999 [35]; Sumner 1999 [36]; Esteves and Pastor 2000 [38]; Somers and Nelson 2001 [40]; Akkermans and van Helden 2002 [42]; Hong and Kim 2002 [12]; Al-Mashari et al., 2003 [43]; Kumar et al., 2003 [59]; Gargeya and Brady 2005 [64]; Wong et al., 2005 [49]; Garcia-Sanchez and Perez-Bernal 2007 [65]; Finney and Corbett 2007 [51], Kiran et al., 2019 [53], Phaphoom et al., 2018 [67], Barth and Koch 2019 [54], Huang et al., 2019 [55], Kurnia et al., 2019 [56], Moeuf et al., 2019 [68], Vargas and Comuzzi 2019 [57]; Mahraz et al., 2020 [70], Kirmizi et al., 2022 [26].
End user's ERP involvement User involvement in the overall process strategy. Participation of users in developing new procedures. Cooperation among workers. Increasing user confidence. Encouraging user use of ERP to fulfill cross-functional areas.	Holland and Light 1999 [15]; Bingi et al., 1999 [18]; Markus and Tanis 2000 [73]; Davenport 2000 [37]; Esteves and Pastor 2000 [38]; Somers and Nelson 2001 [40]; Lee and Lee 2001 [58]; Akkermans and van Helden 2002 [42]; Somers and Nelson 2003 [46]; Yusuf et al., 2004 [47]; Somers and Nelson 2004 [45]; Dowlatshahi 2005 [72]; O'Leary 2005 [48]; Garcia-Sanchez and Perez-Bernal 2007 [65]; Finney and Corbett 2007 [51]; Ngai et al., 2008 [52]; Françoise 2009 [1], Esteves 2013 [61], Mahmud et al., 2017 [1], Perić et al., 2019 [33], Vargas and Comuzzi 2019 [57]; Mahraz et al., 2020 [70], Kirmizi et al., 2022 [26].
Change Management Program of Change Management. Reasonable expectations with a definite target. Organizational resistance to change. Conflicts between user departments. Managing conflicts and arguments for change.	Brown and Vessey 1999 [35]; Buckhout et al., 1999 [63]; Davenport 2000 [37]; Esteves and Pastor 2000 [38]; Somers and Nelson 2001 [40]; Nah et al., 2001 [41]; Lee and Lee 2001 [58]; Akkermans and van Helden 2002 [42]; Hong and Kim 2002 [12]; Al-Mashari et al., 2003 [43]; Brown and Vessey 2003 [44]; Yusuf et al., 2004 [47]; Wong et al., 2005 [49]; Zhang et al., 2005 [58]; Ifinedo and Nahar 2007 [50]; Finney and Corbett 2007 [51]; Ngai et al., 2008 [52]; Françoise 2009 [1].

Based on the literature review of Critical Success Factor (CSF) presented in Table 1, it can be seen that the success of an ERP system implementation is the result of a combination of various elements. Table 1 shows the significant involvement and use of consultants and top management commitment. However, other factors, like user education, change management, and the accuracy of the information, also play a crucial role in ensuring a successful implementation. Therefore, considering all the factors mentioned in Table 1, a holistic approach is essential for achieving optimal results when introducing an ERP system into a business environment.

It is crucial to examine CSFs throughout the ERP lifecycle for several reasons [37]. The first way the ERP lifecycle is different from trying to define CSFs for each stage of the implementation lifecycle is that it is more comprehensive [38]. Second, it identifies, foresees, and distributes time and resources across those areas that need attention in effective project monitoring. Thirdly, it guides all stakeholders during the implementation process by grasping the elements, their meanings, and their significance over the entire ERP implementation lifecycle [40]. Fourthly, by doing so, one can better understand how to ensure that the ERP installation is successful. Studying previous research on CSFs in implementing ERP in companies, Table 1 identifies ten factors identified as essential. Sub-factors within each critical factor are listed.

According to the Vargas and Comuzzi [57], CSFs differ between large, medium, and small companies. Effective leadership, innovation, financial management, human resource management, networking, technology adoption, marketing, and customer focus are critical success factors for SMEs [22,53,56,68,74]. These factors are interdependent and require a strategic approach for successful implementation. Effective leadership entails setting clear goals and objectives, inspiring and motivating employees, and fostering a culture

of innovation and continuous improvement [22,53,56]. Financial management involves efficient budgeting, cash flow management, and financial reporting. Human resource management requires effective recruitment, training, and development of employees to maximize their potential and productivity [22,53,56,68,74]. Networking involves building healthy relationships with suppliers, customers, and other stakeholders to leverage opportunities and minimize risks. Technology adoption is crucial for SMEs to remain competitive and improve efficiency [22,53,56,68,74]. Customer focus involves understanding customer needs and preferences and delivering high-quality products and services to exceed their expectations [68,74]. By prioritizing and implementing these factors effectively, SMEs can achieve sustainable success in today's complex business environment. SMEs often need more resources and motivation to handle all critical success factors thoroughly. Compared to large enterprises, SMEs need more significant constraints regarding resources for information gathering, leading to compromises in implementation and increased risks [75]. Proper documentation is essential before implementing an ERP system. The team in charge of installation and the appropriate system must be selected [51]. In the 1990s, ERP technical elements included client–server architecture, relational databases, graphical user interface, and open system portability [73]. The market potential for SMEs was recognized, leading vendors to offer simplified and cheaper versions of their products [12]. The adoption curve flattened for large companies, revealing difficulties for ERP vendors to penetrate the market further [74]. ERP systems require integrating hardware, software, applications, and supply chains. They must be updated and maintained like traditional information systems [42]. CSFs become more critical at each stage of implementation. Some companies mainly focus on ERP maintenance activities, such as upgrades [26].

The study by Somers and Nelson (Table 1), confirmed that factors "Database management and accuracy of Information", "ERP system selection process and business process reengineering", and "Upkeep of software" have little impact on enterprises as they often conduct in-house ERP development and tend to be more autonomous than service providers [40]. The installation stage of the ERP lifecycle continues to be the main focus of ERP studies [54,67,76–78]. However, interest is growing in the other phases, particularly the operation and enhancement. The environmental elements affecting an organization's decision to deploy an ERP system have received little attention in research until recently. According to Huang et al. [11], the implementation of ERP in business processes can lead to a rise in process effectiveness and profitability, typically observed in the fourth or fifth year following implementation. This suggests that organizations should anticipate a period of adjustment before realizing the full benefits of process implementation. It is important to note that this timeline may vary based on the specific nature of the implementation and the industry in which the organization operates. Thus, the long-term advantages of ERP are more likely to be realized.

Expanding on the challenges faced by the wood products industry in developing production systems, emphasis is placed on additional critical success factors specific to the wood processing industry, further highlighting the vital role of ERP systems in achieving efficiency and success in this sector. Taking into account the specificities of the wood processing industry, several additional critical success factors are essential for the successful implementation of ERP systems [33,79,80]:

- Industry Adaptability: ERP systems specifically tailored to the needs of the wood processing industry can play a crucial role in increasing process efficiency, inventory management, and cost tracking. For example, functionalities specific to tracking raw material movement, batch tracking, and quality management support can be critical for success in this sector;
- Integration with Production Machinery: Various production machinery is used for material processing in the wood processing industry. Integrating ERP systems with these machines enables automatic data collection on production, performance monitoring, and optimization of manufacturing processes;

- Warehouse Management: For the wood processing industry, effective warehouse management is crucial due to the wide range of different materials involved, such as basic wooden materials, finished products, wooden residues, waste materials, and auxiliary, non-wood materials such as glue, varnish, sandpaper, and similar. ERP systems that provide advanced inventory tracking and management capabilities can help minimize losses, optimize inventory, and improve production planning;
- Supply Chain Tracking: The wood processing industry often involves complex supply chains with multiple raw material suppliers, distributors, and end users. ERP systems that enable supply chain tracking and provide real-time data on inventory status, delivery, and planning can enhance efficiency and reduce the risk of supply disruptions.

The results of recent works [22,68] regarding CSFs in ERP implementation of the wood processing industry in SMEs are consistent with those results presented in the paragraph above [33,79–81]. Determining the factors that contribute to its success, considering the characteristics of developed countries, and the use of ERP systems in Croatian companies was examined by Hornung [81]. The study [81] revealed that the perspectives of SMEs regarding the key success factors for ERP system implementation are the same. Small and medium-sized enterprises in Croatia prioritize the user interface and functionality, but they lack a methodology for evaluating and selecting an ERP system. Additionally, they consider the duration of implementation to be a key success factor. On the other hand, larger companies consider these factors less critical. Nevertheless, the study suggests that these findings can still provide insight for researchers and practitioners interested in understanding how ERP systems are implemented in Croatian companies.

3. Discussion on Contemporary Trends in ERP Implementation

Anticipating the contemporary trends in Enterprise Resource Planning (ERP) implementation is marked by technological advancements, with cloud-based ERP systems taking center stage. These systems offer scalability, adaptability, and cost-effectiveness, making them attractive to businesses of all sizes. Critical features like mobility, integration capabilities, data security, user experience, flexibility, customization, and artificial intelligence (AI) play pivotal roles. Companies will carefully assess the advantages and challenges associated with ERP system implementation, anticipating continued evolution influenced by innovations.

According to [22,33,53,56,79] in the last 10 years, in addition to factors shown in Table 1, special attention has been placed on securing adequate support from suppliers and consultants, as well as the meticulous selection of ERP packages, IT infrastructure, communication, and data accuracy (data analysis and conversion). Accordingly, adaptability, company IT infrastructure, and software prices are identified as factors specific to SMEs and one of the reasons for implementation. A fragmented and incomplete understanding of how to address selected CSFs to achieve successful implementation and performance improvement of ERP projects arose from the need to quantitatively measure the impact of CSFs and their contributions to overall ERP implementation performance [26,75]. Even in the era of cloud computing, the discussion of CSFs dominates ERP writing, leading to the migration of ERP systems to cloud platforms [68]. Cloud-based solutions make ERP adoption more reasonable for SMEs by eliminating the need to deploy IT hardware on-premises and keeping IT staff within organizations. In the past decade, ERP systems have evolved significantly, becoming essential tools for organizations to optimize their processes and gain a comprehensive view of their operations. They have incorporated advanced analytics, AI, and the Internet of Things (IoT), providing valuable insights and automating routine tasks [26]. These systems are now essential for businesses that aim to improve efficiency, resource management, and adaptability to changing market conditions.

3.1. Cloud-Based ERP

Cloud-based ERP systems are popular due to their scalability, adaptability, and cost-effectiveness. These systems are hosted on remote servers and accessed online, reducing

IT infrastructure expenses. Mobile access to ERP systems is vital for many organizations, providing convenience and increasing productivity [82]. Scalability is a critical advantage of cloud-based ERP systems, allowing companies to adjust their computing resources easily. These systems also offer flexibility, enabling modification to meet the specific requirements of various firms. From a cost perspective, cloud-based ERP systems eliminate the need for substantial upfront investments in hardware and software. However, businesses must consider potential challenges, such as data security and internet connectivity issues, and carefully select a vendor with robust security measures and a contingency plan. Despite potential challenges, cloud-based ERP systems remain attractive for businesses due to their scalability, flexibility, and cost-effectiveness [82].

A few examples in the wood production industry illustrate how cloud-based ERP systems can benefit wood processing businesses by improving efficiency, increasing visibility into operations, reducing costs, and improving collaboration between departments. Boise Cascade, Roseburg Forest Products, Interfor Corporation, IKEA Industry, Metsä Wood, and Egger are among the wood products companies that have adopted cloud-based ERP systems to enhance their operations and efficiency. These systems have proven effective in optimizing production processes, minimizing waste, managing supply chains, and promoting department collaboration. As a result, the companies have experienced significant cost savings, higher customer satisfaction levels, and better overall organizational performance [70,83–93]. Furthermore, businesses can customize cloud-based ERP systems to meet their needs by configuring workflows, adding custom fields, and integrating other software applications. That degree of customization enables organizations to adjust the system to their distinct requirements, ultimately enhancing overall efficiency and productivity. According to several authors, Brown and Vessey [35], Buckhout et al. [63], Chang et al. [94], Davenport [37], Dowlatshahi [72], Ehie and Madsen [8], Esteves and Pastor [38], Finney and Corbett [51], Gargeya and Brady [64], Garcia-Sanchez and Perez-Bernal [65], Kumar et al. [59], Lee and Lee [58], Nah, et al. [41], Ngai, et al. [52], O'Leary [48], Safari, et al. [95], Somers and Nelson [46], Sumner [36], Vargas and Comuzzi [57], Yusuf, et al. [47], referenced in Table 1 and within this study, customization is a crucial feature of cloud-based ERP systems, allowing businesses to adapt these systems to their specific requirements. Cloud-based ERP systems offer various customization options enabling businesses to meet their needs. One option is the ability to customize workflows, which allows companies to automate processes and adapt the system to their unique requirements. Another option is integrating with other software, such as CRM (Customer Relationship Management) and SCM (Supply Chain Management) systems, to create a unified system that provides a comprehensive business view. Customized reports can be made to track specific metrics and KPIs (Key Performance Indicators) critical to business operations. In contrast, customized fields and forms enable businesses to capture and track data specific to their organization.

3.2. Mobility Available

Mobile access has become a crucial feature for ERP systems due to the widespread use of remote work [1]. It enables employees to access ERP data from any location with internet connectivity, facilitating collaboration, and better awareness of pertinent information. Ensuring data availability in the field through mobile access enables prompt decision-making and enhances data accuracy, ultimately leading to increased customer satisfaction [90]. Mobile ERP systems offer several benefits to businesses by improving data accuracy, productivity, and efficiency. These systems enable real-time updates, validate data, and seamlessly integrate with mobile devices [93]. Norbord, a leading global manufacturer of wood-based panels, has implemented a mobile ERP system that has improved efficiency, transparency, and data quality in their business operations [90]. Implementing mobile access for ERP systems may pose challenges, such as additional development work and implementing security measures to protect sensitive data. However, the benefits can enhance productivity and efficiency, leading to better business outcomes by providing

remote access to critical information, streamlining workflows, and fostering collaboration among team members, enabling quick responses to customer needs [93].

3.3. Integration Capabilities

Integrating an ERP system with other business systems and external data sources is crucial for businesses to improve decision-making and achieve better outcomes. One of the main advantages of integration capabilities for ERP systems is the ability to link with other methods, such as CRM, SCM, and HR (Human Resources) systems, providing a comprehensive view of business operations for informed decision-making [96]. For example, integrating an ERP system with a CRM system can improve understanding of customer requirements and preferences, enhancing customer satisfaction. This interconnectivity enhances data accuracy and speed and provides insights into industry trends and performance metrics [96]. However, integrating different systems and data sources poses significant and complex challenges, such as data harmonization and differences in data transmission formats. Combining an ERP system with other business systems creates challenges and benefits. Real-time updates and shipment tracking improve operations and inventory decisions. Automating critical processes reduces errors and increases productivity [97]. Customer satisfaction improves with timely updates and cost reductions from streamlined procedures [97]. Careful planning and integration solutions are necessary for success. Companies can overcome these challenges using data mapping tools, standard data transmission protocols, integration solutions, or customized integrations. Effective integration strategies are essential for optimizing operational efficiency and driving business success [96,97].

3.4. ERP Data Security

According to Doe [98] and Smith [99], ERP systems store practical financial, customer, and employee data, making them attractive targets for cyberattacks. Data security has become increasingly crucial for ERP systems as businesses rely more on technology. Cyberattacks are rising, and protecting sensitive company information, such as customer and employee records and financial data, is essential [100]. By implementing comprehensive security measures, companies can reduce the risk of unauthorized access to confidential information and maintain data integrity [100]. Though implementing security measures can be expensive and time-consuming, it is essential to safeguard valuable data to protect customers and maintain business reputation [101,102]. Breaches can result in financial losses, identity theft, and erosion of trust. Compliance with data privacy laws is crucial, and organizations must implement robust security measures, including encryption, access controls, and employee training, to mitigate risks and safeguard sensitive data.

3.5. User Experience

The importance of user experience (UX) in ERP systems has become increasingly recognized. Eid [103] claims that it is vital to ensure that ERP systems are user-friendly, effective, and enjoyable. Prioritizing UX has multiple business advantages, including improved user adoption rates and satisfaction. Moreover, a user-friendly system can enhance efficiency and productivity, improving business outcomes [103]. However, challenges may be associated with prioritizing UX, such as investing additional resources. Despite this, considering UX is crucial when implementing an ERP system since it can lead to competitive advantages and better business results [103]. ERP challenges regarding UX in the wood industry, outlined by Landscheidt and Kans [104], involve manual interventions in inventory management, including time-consuming inspections due to quality issues with incoming goods. Additionally, the absence of an efficient material planning system leads to periodic stocktaking, causing shortages during high-demand periods. Addressing these challenges is essential for improving user experience and optimizing operational efficiency in wood industry ERP implementations. The focused evaluation criteria for evaluating software for production engineering in furniture industry, ranked by their

importance, are documentation, machining and cutting plans, budgets and calculations, parametric furniture, atypically shaped furniture, possibility of changes, and construction and technology [105].

3.6. Flexibility and Customization

ERP systems can be customized to meet the specific needs of a business and integrate with other applications, enhancing business agility. The advantages of a flexible system are numerous, from quick responses to changes in the market to increased efficiency and productivity [106,107]. However, customization can lead to higher costs and increased complexity. Despite these challenges, flexibility and customization are critical factors in implementing an ERP system. Choosing the right system for a business can increase competitiveness and differentiation from competitors while enhancing user satisfaction through tailored interfaces and workflows [106–108]. Effective change management practices are necessary to ensure smooth transitions and minimize resistance to change. A thorough analysis of business requirements is essential for informed decision-making during ERP implementation and customization [107].

3.7. Artificial Intelligence (AI)

The integration of AI into ERP systems offers several benefits to businesses [108–110]. Firstly, it enhances decision-making processes by analyzing large volumes of data and providing valuable insights and recommendations. This enables companies to make informed and data-driven decisions, improving overall business outcomes and a competitive edge in the market. Secondly, AI automates repetitive tasks and processes, increasing efficiency and productivity, which frees up employees' time. That allows employees to focus on more strategic and high-value activities, ultimately optimizing resource allocation within the organization. AI enables ERP systems to provide a personalized customer experience by offering tailored recommendations and seamless interactions, enhancing customer satisfaction, loyalty, and retention. Lastly, AI leverages predictive analytics to forecast new trends, demand patterns, and customer behavior, proactively enabling businesses to plan and optimize their operations [109,111].

Although integrating AI technology in ERP systems provides advantages, it also has high costs and complexity [109–111]. The latest research by the author Aktürk [110] indicates that using artificial intelligence techniques, such as genetic algorithms, fuzzy logic, and machine learning, in ERP systems can lead to effective decision-making by integrating business processes with machines and sensors in planning, production, and shipping.

Integrating artificial intelligence with ERP in the supply chain can result in reduced logistics costs, improved logistics business processes, reduced shipping times, and better customer satisfaction. The study [110] also highlights that artificial intelligence techniques in ERP systems can reduce logistics costs, improve logistics business processes, shorten shipping times, and better meet customer expectations. Upfront fees, including infrastructure, training, and integration expenses, can be substantial, and AI systems require specialized expertise and ongoing support for development, deployment, and maintenance [109–112]. Data privacy and security are crucial considerations as AI relies on large amounts of data, including sensitive business and customer information. Ethical concerns such as algorithmic bias, impact on jobs, and responsibility for AI-driven decisions must also be addressed. Additionally, the quality and accuracy of input data are essential for AI systems, as inaccurate or biased data can lead to flawed insights and decision-making. Therefore, organizations must carefully weigh the pros and cons of implementing AI technology in ERP systems and implement robust measures to protect against data breaches and unauthorized access [111].

3.8. Scalability

Scalability in ERP systems allows for easy incorporation of new users, functions, and features as a company expands, eliminating the need for system replacement. Cloud

deployment enhances scalability, enabling user adjustments without heavy hardware investments, and reducing deployment time [113]. According to Mollestad [113], scalability helps businesses stay competitive with industry trends and customer demands. Stora Enso, a European wood-based materials manufacturer, employed a scalable ERP system to integrate production facilities, manage inventory, optimize production, and handle the European supply chain [89].

4. Summary of ERP Implementation in the Wood Industry

In the context of the wood products industry (WPI), the integration of ERP systems presents a transformative opportunity to address the sector's challenges in automation, digitalization, and smart manufacturing. The wood industry companies are characterized by a low level of automation and digitalization [104]. Furthermore, technology maturity in the WPI varies widely, including the integration of partially outdated production processes and machinery combined with modern lean production principles. The WPI faces a lack of workforce knowledge on how to implement smart manufacturing, a shortage of a steady supply of high-quality raw materials, and a traditional perspective on manufacturing principles [114]. Landscheidt and Kans [104] advocate for a shift from mainly manual work to automated and digitized tasks, aligning with the changing skills required for wood machining operators. Various works by Teischinger [115], Gronalt and Teischinger [116], Landscheidt and Kans [117], and others emphasize the potential for advanced manufacturing systems in the WPI. However, the industry is estimated to be 20 to 30 years behind in comparison to other sectors like automotive and electronics. Theoretical suggestions on implementing Industry 4.0 and smart manufacturing principles exist, but their practical implementation is limited. Notably, the major impediment faced by WPI enterprises is their low level of digital infrastructure, a point underscored by Krontorad and Dlauhy [105]. To become a leading industry for sustainable manufacturing, Landscheidt and Kans [117] argue that WPI must urgently invest in digital infrastructure to enable seamless communication and high supply chain integration, aligning with the objectives of smart manufacturing. The study by Ratnasingam et al. [32] provides additional insights into the low adoption of ERP systems among wood product manufacturers, with only 31% utilization, mainly in large-sized companies. The constraints include the need for substantial investments in computer hardware, network configurations, and databases, as well as a shortage of skilled workers. To address these challenges, ERP systems can play a pivotal role in streamlining and optimizing production processes, facilitating seamless communication, and enhancing supply chain integration. The case study presented by Krontorad and Dlauhy [105] emphasizes the crucial role of software applications in meeting the diverse data processing requirements of furniture industry organizations, a perspective that can be extended to the wider WPI.

One of the most value-adding sectors in forest-based industries is the WPI, which is grappling with the development of its production systems and the implementation of smart manufacturing [117,118]. In this context, the importance of implementing an ERP system cannot be overstated, as it plays a crucial role in enhancing operational efficiency and facilitating seamless communication within the smart factories of the future. The integration of ERP systems is crucial for achieving a high degree of supply chain integration and ensuring the overall success of the industry's transition toward advanced and sustainable manufacturing practices. The research in the paragraph above collectively underlines the urgency for WPI enterprises to invest in digital infrastructure, embrace automation and digitization, and leverage ERP systems to propel the industry into a new era of efficiency, sustainability, and international competitiveness. The WPI stands at a crossroads, with the potential for substantial advancement through the adoption of ERP systems and smart manufacturing principles.

Integration of an ERP system that caters to the specific requirements of the wood product industry can offer several benefits. Firstly, it can optimize inventory levels, manage raw material sourcing, and ensure efficient utilization of wood resources. Research conducted by Quesenda et al. [119] on the sample of the US pallet industry has shown that

the application of this technology has a positive impact on business processes, leading to a reduction in inventory. This approach not only contributes to cost reduction but also promotes sustainability and environmental responsibility, which are increasingly important considerations for businesses today [120]. Secondly, it can assist in streamlining the supply chain by managing supplier relationships and transportation logistics and ensuring timely deliveries of raw materials and finished products [121]. Thirdly, ERP systems can help plan production schedules, optimize workflows, and ensure efficient use of machinery, material and labor. Fourthly, it can implement quality control measures, track production processes, and identify improvement areas to ensure consistent quality. In addition, ERP systems can integrate accounting, invoicing, and financial reporting functionalities, offering insights into cost structures and revenue streams. Compliance with environmental regulations and certifications like the Forest Stewardship Council (FSC) is critical. ERP systems can help monitor and ensure adherence to these standards throughout production [120]. Another major benefit is the ability to generate accurate and real-time data, which is crucial for effective reporting and analysis. Lastly, ERP systems with Customer Relationship Management (CRM) capabilities enable tracking of customer orders and preferences and provide better customer service [122]. Although an ERP system can offer many benefits to the wood product industry, its implementation can be challenging. One of the difficulties is the diversity of operations, which makes it complex to integrate with existing systems.

Implementing the new CSFs into various business systems can be achieved in numerous ways, as exemplified below. In the outsourcing system, focus on real-time collaboration and mobility for efficient communication. For inventory management, integrate the item number system with the ERP, ensuring flexibility and customization in codes and categories. In product structure management, leverage a cloud-based ERP for collaboration and incorporate AI for predictive modeling. For the purchasing system in cost management, prioritize scalability to handle increased transaction volumes and integrate it with the ERP for seamless communication. In the quality assurance system, integrate with the ERP for real-time data exchange and enhance user experience for quality personnel. Across all systems, prioritize ERP data security to protect sensitive information and ensure a positive user experience. Explore AI applications to improve decision-making and automate tasks. The overall goal is to create a cohesive environment that maximizes the benefits of cloud-based ERP, mobility, integration, security, user experience, flexibility, customization, AI, and scalability for business success.

This paper emphasizes the complexities of understanding and utilizing the diverse CSFs in ERP systems, with an emphasis on optimizing various processes. Despite the absence of a standalone optimization module, ERP relies on mining data, employing artificial intelligence tools like simulation systems or neural networks for optimization, rather than relying on a standalone module. For instance, this comprehensive use of AI methodologies aligns with the multifaceted nature of ERP systems and addresses optimization complexities. Furthermore, supply chain management encompasses a variety of disciplines, including marketing, manufacturing, transportation, etc. Therefore, various AI methods, such as Artificial Neural Networks, Genetic Algorithms, Modeling, Data Mining, etc., are used in various areas [123].

Enterprise Resource Planning (ERP) systems often fall short of anticipated benefits due to business environment changes and users' high expectations. It is essential to continuously adapt and improve ERP systems after their initial implementation to address disappointments and improve functionality. Successful ERP implementation over the next decade will require understanding current trends and technological advancements. Cloud technology, artificial intelligence, and machine learning will become increasingly important for efficient data management and informed decision-making. Organizations must prioritize data security, mobile access to ERP applications, and user experience to succeed. Integrating ERP systems with the IoT will bring significant benefits. Providing an intuitive and user-friendly interface and comprehensive training programs is necessary to enhance user adoption and satisfaction [108]. Prioritizing change management, stakeholder

engagement, and continuous improvement will also be critical for ERP success in the evolving technological landscape [124–127]. Effective ERP system implementation is crucial for improving wood processing companies' operational efficiency and competitiveness. Critical success factors like top management commitment, effective communication, and change management are essential for aligning the system with business goals and addressing challenges. Therefore, proper ERP implementation is vital for growth and success in the wood industry. The CSFs of ERP system implementation within the company are essential for further business and work in the ERP program.

5. Conclusions

This study critically examines the academic literature on Enterprise Resource Planning (ERP) implementation, focusing on reducing implementation failures and ensuring long-term success. This study of the literature encompasses traditional/essential and contemporary critical success factors (CSFs) in ERP implementation. The continuous evaluation and adaptation of ERP strategies are essential for their effectiveness in modern business, addressing both time-tested practices and emerging trends.

Essential factors for effective ERP implementation include top management commitment, comprehensive understanding of company requirements, strategic decision-making, suitable software and hardware selection, customization, consultant engagement, project management, education and training, end-user involvement, and change management. Recognizing challenges specific to the wood industry, additional CSFs such as industry adaptability and effective warehouse management are introduced. The success of ERP system implementation results from a combination of various elements, and a holistic approach considering all identified factors is essential.

Successful ERP implementation over the next decade will require understanding current trends and technological advancements. The discussion on the contemporary trends in ERP implementation underscores the significance of cloud-based systems, mobility, integration capabilities, data security, user experience, flexibility, customization, artificial intelligence, and scalability. These advancements are particularly relevant to the wood industry, addressing challenges in automation and digitalization, and providing solutions like adaptability and integration with production machinery. Examples from the wood production industry illustrate how cloud-based ERP systems benefit businesses by enhancing efficiency, reducing costs, and improving collaboration. This study emphasizes the transformative potential of ERP systems in addressing challenges in the wood products industry, urging enterprises to invest in digital infrastructure and embrace smart manufacturing principles to stay competitive and sustainable.

This research emphasizes continuous adaptation and improvement in ERP systems, recommending a holistic approach considering both traditional and contemporary CSFs. This study recommends that a combination of factors contributes to ERP success, requiring a holistic approach for optimal results. Recognizing the limitations of ERP systems, this study emphasizes the importance of addressing user expectations and business environment changes to enhance functionality continuously. To stay competitive over the next decade, organizations must embrace trends like cloud technology, artificial intelligence, machine learning, and the Internet of Things (IoT). In addition to technological considerations, this study underscores the vital role of human input in AI and decision-making. Despite the potential benefits of AI, human qualities such as creativity, moral values, and emotional intelligence remain irreplaceable.

This research provides practical implications for the successful implementation of ERP systems in the wood industry. In addition to the already mentioned aspects, this includes considering CSF for the wood industry, such as adaptability to the market, efficient wood storage, and integration with production equipment. Adoption of digital infrastructure, like cloud technology, is also recommended for enhanced collaboration and remote work. Furthermore, the application of remote work, including monitoring drying operations remotely to prevent potential damages. Additionally, remotely tracking the status of

semi-finished and finished product warehouses through ERP systems to quickly respond to customer demands is recommended. Implementing video surveillance systems for workplace safety and monitoring production are practical applications that enhance overall efficiency and work health and safety in the wood industry. The application of AI together with advanced technologies in the wood industry brings practical benefits across various aspects. For instance, AI can be utilized for predictive maintenance of machines through the analysis of sensor data for early detection of maintenance needs. Additionally, AI can be used to optimize manufacturing processes by analyzing data, adjusting work schedules, optimizing inventory, and reducing waste. Furthermore, AI can be applied in warehouse automation, improving the efficiency of material management. Big data analysis aids in monitoring product quality, while AI can be used for adaptation of production according to specific customer requirements. Additionally, AI can be employed in research and development through data analysis and simulations, contributing to products and innovations. The combination of these approaches enables improvement in operational processes and the creation of a competitive advantage in the wood industry. These tailored recommendations are aimed to assist practitioners in the wood industry in overcoming ERP implementation challenges, simultaneously maximizing benefits. Possible directions for future research could further explore practical experiences with ERP implementation in the specific context of the wood industry.

During the development of this study, several limitations were encountered and are essential to highlight. Despite the focus on the wood industry, the availability of the literature specifically related to this field was found to be limited. Additionally, the absence of recent literature on critical factors in the implementation of ERP systems further constrained our ability to track the latest trends and insights in this context. It is noteworthy that this paper is exclusively theoretical, representing an additional limitation in terms of lacking empirical data and real-world experiences from industrial practice. To address these limitations and provide a more comprehensive understanding, we recommend further research in the form of a survey. Such a research methodology would enable systematic data collection from the industry, facilitating a better understanding of current critical factors in ERP system implementation, particularly within the context of the wood Industry. This recommendation opens the door for future research endeavors that will contribute to a deeper exploration of this crucial area.

Author Contributions: Conceptualization, K.V., K.K. and I.P.; methodology, K.G.; software, K.V. and K.K.; validation, K.V., I.P. and K.K.; formal analysis, K.G.; investigation, K.V. and K.K.; resources, I.P. and K.G.; data curation, K.V. and K.K.; writing—original draft preparation, K.V. and K.K.; writing—review and editing, K.K., I.P. and K.G.; visualization, K.V. and K.K.; supervision, K.V., K.K., I.P. and K.G.; project administration, K.V. and K.K.; funding acquisition, K.V., K.K., I.P. and K.G. All authors have read and agreed to the published version of the manuscript.

Funding: The authors wish to thank the University of Zagreb Faculty of Forestry and Wood Technology, Fund for scientific and professional work for the financial support.

Data Availability Statement: No new data were created or analyzed in this study. Data sharing is not applicable to this article.

Conflicts of Interest: The authors declare no conflicts of interest. The funders had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript; or in the decision to publish the results.

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