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Article

The Impact of Enterprise Resource Planning on Business Performance: With the Discussion on Its Relationship with Open Innovation

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Abstract: Small and medium enterprises (SMEs) have played an important role in economic development. The increasing number of SMEs have resulted in the business landscape to become more and more competitive. This has made SMEs to also undergo great challenges to be able to maintain their existence and expand their businesses. It is argued that the enterprise resource planning system (ERPs) can improve business performance. Therefore, the primary purpose of this study is to examine the impact of an ERPs usage on the financial and non-financial performance of the Saudi SMEs. An exploratory study has been used to identify the factors contributing to the effective and successful use of an ERP system. The findings indicate seven contingency factors. Based on the exploratory study results, three hypotheses have been developed and tested in a quantitative study. A survey is constructed and sent to 200 Saudi SMEs that adopted the ERP systems. About 120 valid responses have been received. For data analysis and hypothesis testing, a structural equation modelling (SEM) tool has been adopted. The results depict that management support, user satisfaction, and training significantly impact the ERPs usage. Another significant finding is that ERP systems enhance SMEs' performance.

Keywords: enterprise resource planning system; usage; contingency; business performance; Saudi Arabia

1. Introduction

In the era of the dynamic business environment, organizations and especially SMEs face various challenges such as fierce competition, prominent market power, continuous information technology (IT) advancements, and the relevant innovative usage of that technology in order to gain a competitive advantage. These challenges are affecting the way that organizations are managed. According to Liem et al. [1] there are various limitations SMEs might face that make their ability to innovate very difficult such as absence of advantaged information from experts, human resources, and technology particularly in developing countries. In fact, the universal nature of the new marketplace needs active players to globalize their operations [2]. To subsist with these challenges, organizations have adopted numerous strategies and change initiatives. Some of these initiatives are designed to make their internal procedures more efficient. For instance, IT has provided numerous tools to businesses in order to assist in their management tasks. However, there is a call for more evidence, including studies that prove the investment in IT will provide firms a positive value. According to Hunton et al. [3], several studies have sought to discover a positive association between IT investments and firm performance. For instance, Melville et al. [4] stated that IT is beneficial, offering a wide range of prospective advantages such as productivity enhancement, flexibility, cost reduction, quality improvement.

The last three decades showed heightened advancements in the field of IT. This started with the evolution of the Internet, electronic data interchange, and the world wide web (WWW). In addition,

IT innovation continued with a new generation such as materials enterprise planning, customer relationship management (CRM), supply chain management (SCM), and ERP systems. According to Costa et al. [5], in the mid-1990s, ERP systems started to appear and were used by firms to determine and organize business procedures throughout the organization. ERP is "an integrated information system that can be used to manage all the resources, data, and functions of a firm from shared data stores" [6] (p. 21). Studies show that many researchers have been very active in studying ERP systems. After becoming successful globally, ERP systems have not only attracted researchers who are specialized in IT/IS but also those who are specialized in management and accounting [7]. Most of the studies investigate the influence of ERP systems on the performance for large organizations. Thus, it is important to focus on the impact of ERP systems for SMEs.

Currently, ERP vendors are seeking alternative markets among SMEs. In the past, only large enterprises could bear the cost of adopting ERP systems because of the economic and technological constraints [8]. However, ERP adoption is now possible for SMEs as there are ERP software for small entities. Zafar et al. [9] argued that, in Saudi Arabia, SMEs represent about 93% of all organizations and provide about 24.7% of total employment. Thus, SMEs provide a massive prospective market for ERP adoption [8]. The Saudi government has recently emphasized the contribution to the economy of SMEs in its Vision 2030 initiative. Saudi SMEs have witnessed rapid developments in the last four decades. Despite this rapid development, studies conducted on this type of firms are rare in Saudi Arabia. The need for new systems is increasing, given the strong competition in the marketplace, and SMEs in Saudi Arabia are required to start an IT transformation to enhance their everyday work practices. By looking at ERP systems from an SMEs enterprises perspective, Saudi SMEs are quick to implement ERP systems, yet they do face some problems. Zafar et al. [9] intended to study the challenges of adopting IS on SMEs. They found that IS plays a significant role in the growth and survival of SMEs in Saudi Arabia. They noticed an absence of the structures and technical skills that can support the SMEs to achieve their objectives in the future.

However, studies conducted on SMEs are rare in Saudi Arabia and most of the research studies investigate the influence of ERP systems on the performance of large organizations. Zafar et al. [9] noted that most of previous papers on SMEs in the KSA examined how an enterprise is considered either as a small business or as a medium-sized enterprise. Thus, it is important to focus on the impact of ERP systems for SMEs. Additionally, most prior researches focus on the implementation stage of ERP systems, and concentrated specifically on identifying the critical success factors (CSFs) related to ERP system implementation [10–14]. One of the areas that has not been widely studied in the literature is the usage of ERP systems.

Costa et al. [5] analyzed the existing literature related to ERP systems from 1990–2015 in order to obtain an inclusive understanding of ERP system development. They found that the studies related to ERP systems have been increased during the last 25 years, yet, most of these studies focus on the implementation stage. According to Eid and Abbas [15], focusing on user acclimation to ERP systems and their impact on ERP outcome elements has received little interest from researchers. In addition, there are other factors that can affect the influence of ERP systems on the organizations, yet few studies have investigated these factors ([16,17]).

Ultimately, much ambiguity still exists about the influence of ERPs usage on business performance and the factors affecting this relationship for SMEs. Identifying factors affecting the users while using ERP systems is critical to making the most effective use of ERP systems, which in turn should lead to better business performance. Hence, this study makes a significant contribution to the ERP literature by developing a framework to provide an understanding of factors that support the effective use of ERPs in SMEs. This study aims to focus on the factors affecting ERP system usage and examine the relationship between ERP system use and business performance for Saudi's SMEs. Particularly, we developed research model that links contingency factors and the effective use of ERPs to business performance. An exploratory study has been used mainly to identify the factors. Based on the exploratory study finding, three hypotheses are developed and tested in a quantitative study. About 120 valid responses

are received. Partial least squares structural equation modelling (PLS-SEM) is adopted for data analysis and hypothesis testing. The findings suggest that management support, user satisfaction, and training significantly impact the ERPs usage. Another significant finding is that ERP systems enhance SMEs business performance.

The remainder of this paper is structured as follows: in Section 2, the related previous studies are critically reviewed and discussed. The basic concepts and notations employed in the paper are elaborated, in Section 3. The employed research approach is discussed and illustrated in Section 4, and data analysis and results are explained and discussed in Section 5. The discussion and conclusion are displayed in Section 6. Finally, the implementation of the study and the future research are illustrated in Section 7.

2. Literature Review

2.1. ERP Revolution

The use of ERP systems has increased in the past decade. In 2013, the worldwide ERP market was worth €22.4 billion [5]. ERP systems have become a very useful software for corporate management, and it is also a pre-requisite for competitive and modern firms [18]. According to Selchert [19] in the early stages of ERP systems, only the manufacturing sector adopted these systems. However, things have changed, now ERP systems have been used broadly in different sectors such as non-profit organizations, government agency, and non-governmental organizations. The ERP system has been considered as a software package; these packages come in a set of software units. Each of these units is responsible for processing and collecting the information for a unit of operations or a set of work functions. Muscatello et al. [20] suggested that the ERP system is a set of integrated software units, alongside with the main database that enables firms to manage the use of resources (such as assets and human resources, etc.,) efficiently and effectively. According to Al-Muharfi [21], the legacy information systems were not integrated. For example, the customer management system was not linked to the finance system. Kang et al. [22] argued that legacy information systems have always been characterized by the absence of integration. ERP systems moved to be support business processes rather than functions. Veljanoska and Axhiu [23] argued that investing in an ERP system maintains the data needed in one single database for a variety of business processes such as finance and CRM. Thus, the information will be able to be obtained by all the members of the organization and will always be up to date [24]. Kang et al. [22] stated that many organizations have used ERPs for a different reason, for example, to comply with the government's rules or just to follow competitors who invested in ERP systems. ERP systems are known to be complex and different from legacy systems [25]. Researchers like Thomas [26], Yusuf et al. [2], and Al-Turki [27] suggested that the ERP requires huge changes in the way businesses operate, and it has an impact on a company's culture. Veljanoska and Axhiu [23] argued that IS may alter the culture, structure, and procedures of the firm.

Regardless of the size, companies implementing an ERP system will see both tangible and intangible benefits. Previous studies have reported widespread confirmation of the valuable benefits of implementing ERP systems. ERP systems help in managing a company's processes in a short time [3,28]. ERP systems also support companies in sharing information and decrease the time to complete business processes. ERP involves also benefits such as business processes enhancement, best practices implementation, and enterprise assimilation and combination. ERP systems also support companies in sharing information and decreasing the time to complete business processes. ERP involves also benefits such as business processes enhancement, best practices implementation, and enterprise assimilation and combination. Because the potential benefits are enormous, organizations are willing to start investing in this type of system [29]. According to Kullunki et al. [6], over last ten years, ERP has become a well-known system in both large and mid-sized organizations.

Concerning the implementation of ERP systems for SMEs, Qureshi and Abdulkhalaq [30] state that, to handle global growth, SMEs need to adopt ERP systems. Equey and Fragnière [31] noted

that ERP systems were implemented mainly in large enterprises. Before, traditional management and legacy systems were unable to help SMEs to be competitive, especially larger competitors have the advantage of more advanced systems. Today, there are more and more varieties of systems that SMEs can use to improve their performance. Esteves and Jose [32] concurs that, to become more efficient and more competitive, SMEs need to adopt ERP systems. Veljanoska and Axhiu [23] noted that small companies can use information systems to gain some of the power that the larger organizations have. Doom et al. [33] examined the differentiation of CSFs in ERP implementation in Belgian SMEs. They showed that SMEs need to alter their businesses speedily to take advantage of their position to the maximum extent. To achieve that, they need to streamline and innovate their processes, and continuously review their infrastructure. However, several challenges may arise in applying technologies like ERP systems [33] and large organizations are different from SMEs [34]. The literature has shown substantial differences between SMEs and large companies, for example, implementing ERP systems at large organizations may come with a comparatively lower cost than for SMEs [35].

Muscatello et al. [20] and Christofi et al. [36] note that the odds of small enterprises to survive or to recover quickly after the unsuccessful implementation of ERP systems are less than larger enterprises because of their reduced resources. In general, small enterprises possess fewer resources and have a minimum capability to come up with further resources than large firms. Hunton et al. [3] state that organizations that intend to implement an ERP system must have enough resources to do so. Additionally, a lack of long-term planning and having adequate training are some of the problems that may be faced by SMEs. It is because extensive training is often expensive for SMEs [34,37] and they may, therefore, face problems by paying high rates for consulting support [38]. Installing an ERP system into SMEs involves extra efforts because of a number of reasons, for example, for having to undergoing change management, business process innovation, data migration, and user training. These changes may not likely to be easy in practice, resulting in higher probability in failure in adopting such systems.

Therefore, the adoption of ERP systems in SMEs should be studied extensively because they possess unique characteristics which are different from large companies [39]. It is important to understand how SMEs utilize ERP systems to enhance their related business processes and their overall system performance [40]. Consequently, the following section will focus on the stage of ERP usage.

2.2. ERP System Usage

"ERP use" is considered to be the stage of using ERP systems in their everyday business activities [41]. Venkatesh et al. [42] stated that in technology adoption models, the system usage is considered to be the dependent variable in the IS literature, and, as noted by [43], system usage is considered as the main factor in IS success models. Shaikh and Karjaluoto [44] argued that the benefits of investing in IT/IS can be gained by the usage of these systems. To increase the benefits after implementing the ERP system, firms need to enable and support users to use these systems [45]. Using ERP systems in the wrong way may cause an unsuccessful adoption of these systems. According to Nah and Teh [46] and Umble et al. [11], the user's attitude towards the ERP systems is directly proportional to the success or failure of the ERP system. Chou et al. [25] stated that it is crucial to recognize how users learn to successfully use ERP systems. From a technical perspective, implementing ERP systems might be successful, but ERP system success depends on the user behavior when making full use of these systems [47,48]. Unfortunately, most of the companies that have implemented ERP systems have paid very little attention to the importance of the system's usage stage. Hence, it is very important to explore the factors that influence ERP system usage to recognize how to motivate users to use the system successfully. According to Garson [49], the failure of taking advantage of technology in an organization is commonly by the users, it is infrequently the technology. Al-Gathani [50] argued that it is imperative to determine the factors that make individuals either consent or refuse IT because it is the first step in the solution of ensuring the successful usage of the system. From the authors' acknowledgment,

these factors have received attention in western countries but in the context of SMEs in Saudi Arabia, they have not received any attention. So far, there has been little discussion about the ERP system usage stage in Saudi Arabia. According to Basahel et al. [51], the studies specifically on the stabilization (use) stage are rare.

2.3. Factors Affecting ERP System Usage

The literature identifies several factors that are affecting the usage of ERP systems. For example, Bokhari [52] studied the relationship between system usage and user satisfaction using the IS success model of Delone and McLean. The findings of a meta-analysis claimed that there is a significant but weak relationship between system usage and user satisfaction.

Chang et al. [53] studied the factors affecting ERPs usage. Surveys were distributed to 600 ERP system users in Hong Kong in both the service and manufacturing industries. Their analysis results revealed that complexity does not have any effect on ERP system usage. Lin [54] surveys large Taiwanese corporations, developed an empirical model to examine the consequences of IS quality and management support on ERPs usage. They found that management support affects the ERP usage. Ruivo et al. [41] developed a research model based on two theories, namely the diffusion of innovation theory (DOI) and resource-based value theory (RBV). They used a survey for data collection and their cross-country analysis concluded that for Portuguese firms, complexity, compatibility was significant, these were not so for Spanish firms. Their findings regarding the Portuguese firms were contradictory with the work of Chang et al. [53] which reveals that the complexity is a significant factor in ERP system usage. For both Portuguese and Spanish firms training was considered an important determinant of ERP usage. Similarly, Ruivo et al. [55] conducted a study via a large scale web-survey where they discussed the differences between Iberian and Scandinavian SMEs with regard to ERP value and ERP use. They found that the training factor was not significant for ERP usage among Scandinavian SMEs, but it was a vital factor for ERP usage among Iberian SMEs. Their results were comparable to those attained by Ruivo et al. [41], which showed that training factors are a vital factor in ERP system usage among Portuguese and Spanish SMEs.

Compatibility is found to be significant for both regions, which is consistent with work of [41], which demonstrates that the compatibility has a substantial influence on ERP system use among Portuguese firms. Their results were comparable to those attained by Ruivo et al. [41], which reveals that the complexity is a vital factor in ERP system usage among Portuguese SMEs. Likewise, Nwankpa and Roumani [56] published a paper based on a study of numerous industries in which they assessed the factors that influence ERPs usage and user satisfaction via an online survey. Their findings were comparable to those attained by Baroudi et al. [57] and Bokhari [52]. Their study revealed that user satisfaction is a vital factor in ERPs usage. Similarly, a recent study by Costa et al. [5] pioneered the research on finding the major factors affecting ERP user satisfaction and adoption. The study was based on data collected from 260 companies, which were randomly selected. The data was collected by a questionnaire. Their results were compatible with Lin [54], which demonstrated that top management support has a substantial influence on the usage of the ERP system. In addition, based on the unified theory of acceptance and use of technology framework and innovation literature, Uddin et al. [58] studied the impact of intention to use ERPs on the actual use of ERPs and other factors. They found a significant effect on the actual use of ERPs. They also found the intention to use ERPs as a mediating variable between performance expectancy, effort expectancy, social influence and the actual use of ERPs.

Thus, based on the above studies, complexity, compatibility, training, user involvement, user satisfaction, and top management support have been shown to have consistent associations with ERP system usage.

2.4. ERP and Business Performance

The relationship between ERP systems and business performance has been widely investigated and diverse results have been reported. From the studies, it can be reported that the influence of ERPs

on firm performance is both positive as well as negative. However, many research studies found a positive influence of ERP systems on firm performance and delivered measured changes in business elements. Li [59] proposed that, despite the numerous studies on ERP implementation, the main problem with ERPs studies is that there are very few investigations relating to their failure; possibly, because firms resist sharing their disappointments. For instance, Dell Computer canceled its ERP system implementation project. They argued that it was not flexible enough to handle their increasing global operations [20]. Improving business performance through IT arrangements is a common procedure. Therefore, there is growth in the number of organizations that invest in IS in order to improve their performance. As noted by Li [59] many organizations have invested in ERP systems for their ability to enhance entity decision-making capabilities and business performance. Hailu [60] indicated that an IS plays a significant role when it influences the enterprise functions, performance, and productivity of a company. Chien and Tsaur [61] claimed that because of the adoption of an ERP system, organizations stated significant performance enhancement in numerous areas e.g., the capability to provide real-time information to consumers and quicker production cycle. Hunton et al. [3] also highlighted the benefits of the ERPs, in that ERPs are capable of enhancing both market value and business performance. Kallunki et al. [6] found that ERPs are considered to be a long-lasting strategic investment that affects the firm as a whole, but that the impact of this type of system does not appear until several years. In addition, Ağaoğlu et al. [14] found that ERP investment has a high positive influence on business process outcomes. Likewise, Ruivo et al. [41] stated that any firms using ERP systems should expect a firm performance enhancement. On the other hand, Kang et al. [22] suggested that ERP investment does not always have a positive influence on business performance. Ref. [3] stated that researchers did not offer reliable confirmation that information technology investments had a favorable value for companies. Ref. [62] argued that despite the operational benefits that might be provided by an ERP system, they were unable to make quantitative evaluations of its effect on the firm financial performance.

Ref. [63] focused on ERPs implementation and its negative impact on business performance. They investigate the post-implementation performance of a sample of 50 firms adopting an ERP system for over three years. They concluded that over these three years there was no considerable enhancement in the remaining revenue or the ratio of selling, general, and managerial cost to revenue. Moreover, they discovered a substantial decline in the employees' ratio to income in all the three years and a significant enhancement in the cost ratio of goods sold to revenue in the previous year. Overall, they found that firms who adopted ERP systems gained efficiency in several areas, yet, increased expenses somewhere else to offset such earnings.

Another study conducted by Hunton et al. [3] matched the 63 organizations identified by Hayes (2001) with peer organizations that had not implemented an ERPs. Hunton et al. [3] report that the performance of the ERP system adopters was higher than that of ERP system non-adopters. Wieder et al. [7] studied the adoption of ERP systems and their influence on organizational performance. Their study provided significant implications for the association between supply chain management, ERP systems, and performance. They conducted a questionnaire-based survey of 2170 Australian firms that implemented SCM systems, ERP systems, and/or the respective control units. They found that of the firms that adopted ERP and SCM systems, only those with knowledge and experience with ERP systems increased their performance.

There is obviously growing attention to the subject of ERP systems in the literature; however, very few studies have investigated ERP system usage in SMEs in the Kingdom of Saudi Arabia. Thus, this study will fill the gap in the literature of the factors affecting ERP system usage in Saudi SMEs, as well as, to examine the relationship between ERP systems and business performance

3. Theoretical Framework

3.1. Contingency Theory

This study examines the relationship between the contingency factors, ERP system usage, and business performance for SMEs in Saudi Arabia. After reviewing different theoretical frameworks, the contingency theory framework developed by some researchers such as Lawrence and Lorsch [64] are found to be the best-suited to this study. The essence of the contingency theory is that there are situational factors that can influence the study of organizational behavior and the expectations and behavior of a workforce. In the IS literature, the contingency theory has been applied by many researchers. For example, Tait and Vessey [65] made a survey-based field study of thirty Australian private firms. They examined the potential of using a contingency approach to investigate the relationship between factors affecting the employment of user involvement and user involvement in computer-based information systems (CBIS) and the final success of the CBIS. They found that contingency theory was a valuable means of studying the effect of user involvement on system success. Similarly, surveys conducted by Ifinedo and Nahar [66] investigated the effect of some organizational IT factors and the impact on two contingency factors (structure and size) on the ERP's success. Based on the contingency theory, Ifinedo and Nahar [66] argued that matching organizational features with related contingencies, management in organizations can gain greater success with their ERP systems. Abdel-Maksoud et al. [67] also built a model in line with the contingency theory based on the work of Otley [68] and Ittner and Larcker [69]. They proposed that the contingent variables e.g., environmental factors, managerial, technological factors, and organizational structure, are important in understanding the performance measurement systems. The theoretical perspective of Abdel-Maksoud et al. [67] emphasized how these contingent factors affect the design and functionality of organizations. Consistent with previous findings and the literature reviewed, this research study proposes to use a theoretical framework derived from the contingency theory to examine six contingency factors (user satisfaction, complexity, training, user involvement, top management support, and compatibility) and the association between ERP system usage and firm performance, as shown in Figure 1.

According to Fiedler [70], the contingency theories are a class of behavioral theories that argued that there is no best method of organizing or leading an organization. It is because a leadership style that is useful in some conditions may not be successful in others. Donaldson [71] argued that using the contingency theory of organizational structure helps in developing a framework for the study of organizational design. It is very important to examine some of the contingency factors that might influence the usage of the ERP system in order to fill the gap in the literature.

Therefore, in this study we examine the relationship between six contingency factors (user satisfaction, complexity, training, user involvement, top management support, and compatibility) and the ERP system usage at SMEs in Saudi Arabia. These factors were selected because previous research on ERP adoption [5,41,52–57] found them to be significant and can change the basic relationship considerably. Also, we examine the impact of ERP system usage on business performance. Figure 1 presents the proposed theoretical framework for the current study, and the following section would explain the model in detail.

3.2. Contingency Factors

Figure 1 shows the study factors are grouped into two main sub-groups, organizational factors consisting of top management support, and ERP-related usage factors consisting of complexity, compatibility, user satisfaction, user involvement, and training. This grouping is based on previous literature, which has been discussed in earlier sections and the above arguments. The importance of these factors are investigated in the exploratory study. Based on the results of this study, two new factors are added: knowledge sharing and vendor. The following section illustrates the importance of the exploratory study and the results for developing the study's framework.

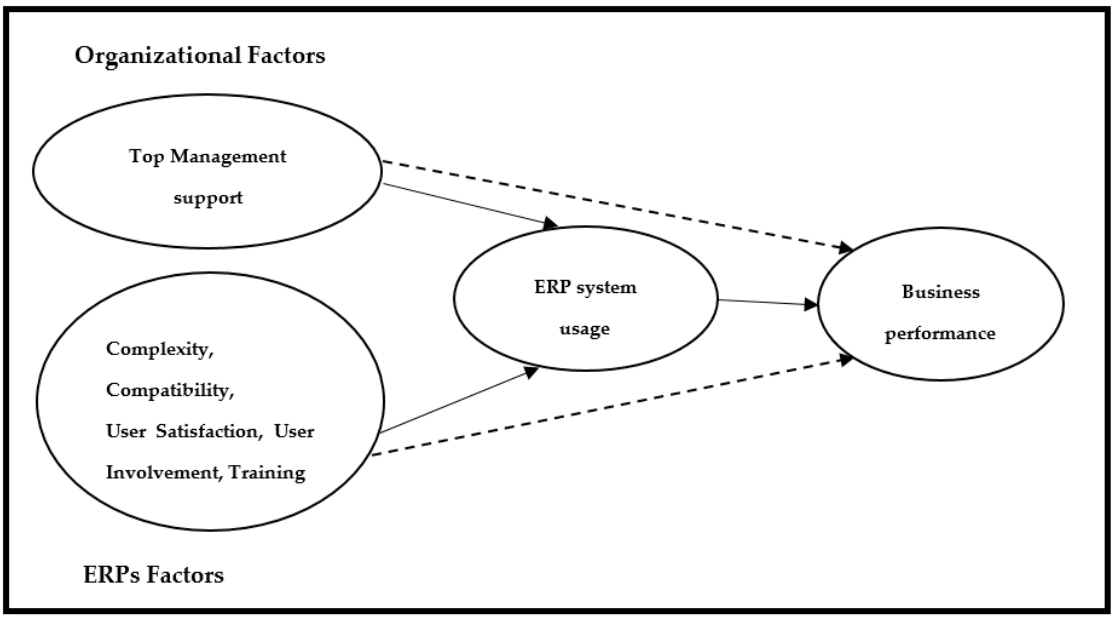

Figure 1. The proposed theoretical framework.

3.3. The Exploratory Study

An exploratory study is needed to understand the research context similar to previous studies [72] and to develop research hypotheses based on the three main relationships. To achieve this, ERP users who hold different positions (e.g., IT manager, and ERP section head) have been invited to participate in the study, regardless whether their respective firms have ERP systems in place or not. The targeted SMEs were from both the manufacturing and service sectors and were chosen to review a variety of ERP software (e.g., SAP, Oracle, etc.,). Different sources have been utilized to get contacts from SMEs. The sources were mainly the Saudi Chamber of Commerce in Eastern Province and Riyadh, and from the Saudi Industrial Property Authority website. The sources were also from different individuals working for software companies and had previously assisted SMEs in adopting ERP systems. The interviews were semi-structured in nature. The semi-structured model allows the researcher to explore any issues that may arise during the interviews. The interview questions were translated from English into Arabic to enable Arabic-speaking language respondents to participate in the interview. The interviews were conducted with five ERP system users, and interviewees were asked about their opinion on the appropriateness of the factors (those chosen by the researcher during the literature search: top management support, compatibility, complexity, user satisfaction, user involvement, and training). The researcher also asked the interviewees for their suggestions of other critical factors, based on their experience, which would contribute to successful ERP usage (NB: further details on the "Results of the exploratory study are provided in the results section").

The analysis of the interviewees' responses resulted in the following:

The interviewees agreed on the relationship between the factors of top management support, training, and user involvement, and ERP system usage. All companies except Company One agreed on the relationship between user satisfaction and ERP system usage. Regarding the relationship between complexity and ERP system usage, all companies supported this relationship except for Company One.

In addition, all companies agreed that compatibility does not influence on ERP system usage. Interestingly, some companies added some factors like vendor support and knowledge sharing. Therefore, based on the exploratory study results, the following factors are examined in this study: complexity, knowledge sharing, top management support, training, user involvement, user satisfaction, and vendor support.

Here is a brief description of the two new factors: knowledge sharing and vendor support.

3.3.1. Knowledge Sharing

Lin [73] (p. 315) has defined knowledge sharing in a business context as "a social interaction culture, referring to individuals exchanging knowledge, experiences, and skills within organizations." Many studies in the ERP system literature have argued for the significance of organizational culture regarding ERP [74,75]. According to Krumbholz and Maiden [75] company culture can affect the way people work, use technology, and deal with others. Park et al. [76] argued that, for a company to work successfully, employees with competencies and specific knowledge need to share their knowledge. Knowledge sharing between employees in the organization is considered to be a vital procedure for a firm to gain numerous advantages [77]. Previous research has found that knowledge sharing is associated with a wide range of positive results [73,78,79], such as faster achievement of new product progress developments, group performance, company innovation capabilities, and business performance. Regarding the ERP systems and knowledge sharing, several studies have focused on this area. Lee and Lee [80] noted that users must gain knowledge about the processes and business guidelines embedded in the ERP system. Shao et al. [81] stated that tacit knowledge sharing is associated indirectly with the success of the ERP system, interceded by explicit knowledge sharing. A Korean study conducted by Park et al. [82] examined the impact of absorptive capacity of employees on three components, including applying knowledge, assimilating, and understanding ERP system usage, on ERP system usage. They found that the absorptive capacities of employees for applying knowledge have a significant effect on the performance of ERP system usage.

Besides, Chou et al. [25] developed a conceptual model to examine the influence of knowledge sharing on an ERP system. Besides examining the factors that may affect the employee's knowledge sharing after the initial implementation of the ERP system. They found that knowledge sharing is positively associated with ERP system usage.

3.3.2. Vendor Support

Once the company decides to implement an ERP system, they try to find the right supplier. Since the vendors play a critical role in the overall outcome of the software implementation, the company should select them very carefully, especially SMEs [83]. This is because the right supplier also has a role in enhancing the quality of ERP products, thereby further ensuring user knowledge and involvement [84]. According to Wu and Wang [85], ERP systems success is influenced by external facilitators, including supplier consultants. Most previous studies focused on the importance of vendors in the ERP system implementation stage. Dezdar and Sulaiman [86] concentrated on factors affecting ERP implementation success. Their study aimed to examine the factors related to system environment including vendor support and system quality which in turn, influenced the success of ERP implementation in Iranian companies. Their results demonstrated that vendor support has an impact on the success of ERP implementation. Thong et al. [87] compared levels of information system effectiveness in two groups of companies that had implemented information systems: the first group comprised of small companies with vendors who provided consultancy service, the second group comprised of companies with separate consultants and vendors. They found that the first group of companies had more effective information systems in relation to the organizational impact, user satisfaction, and overall information system effectiveness than the second group. Besides, the level of vendor support was found to have a positive influence on both overall information system effectiveness and user satisfaction, while previous studies have highlighted the importance of vendor support in the context of ERP implementation. Based on the literature review thus far, to date research examining the role of vendor support on ERP system usage is scarce, particularly in the context of Saudi Arabia context. This study concurs with the findings of previous studies regarding the shortage of studies investigating the importance of vendor support on ERP system usage. However, as mentioned previously, from the interviewee's point-of-view, vendor support was considered to be one of the important factors affecting ERP system usage. Thus, it is important to assess the effect of vendor support on ERP usage.

3.4. Research Framework and Hypotheses

Based on the above arguments and the analysis of the results of the exploratory study, the following hypotheses have been proposed.

3.4.1. Organizational Factors and ERPs Usage

Costa et al. [5] and Lin [54] argued that top management support is a significant factor that influences ERP system usage and. Park et al. [82] found that absorptive capacities of employees for applying knowledge have a significant influence on the performance of ERP system usage. Chou et al. [25] also found that knowledge sharing has an impact on ERP system usage. Hence, this study hypothesize that:

Hypothesis 1 (H1). *There is a significant relationship between the given Organizational factors and ERPs usage.*

3.4.2. ERPs Factors and ERPs Usage

As mentioned earlier, Chang et al. [53] found that complexity did not have any significant impact on ERP system usage. However, Ruivo et al. [41] found that complexity influenced ERP system usage in Portuguese firms but not in Spanish firms. Ruivo et al. [55] indicated that only in Iberian SMEs it has been identified that complexity is an important determinant affecting the ERP usage. Baroudi et al. [57] and Nwankpa and Roumani [56] both suggested that user satisfaction has a positive impact on system usage. Bokhari [52] also found that there is a medium impact of user satisfaction on ERP system usage. Previous studies have also confirmed that involving users in designing and developing systems will help increase system usage [57]. Ruivo et al. [41] added that employees training is one of the important factors affecting ERP system usage. Ruivo et al. [55] found that employees training was only a significant factor for Iberian firms. For the vendor support, Dezdar and Sulaiman [86] found that vendor support has an influence on the success of ERP system implementation, and therefore, this study hypothesize that:

Hypothesis 2 (H2). *There is a significant relationship between the given ERPs factors and ERPs usage.*

3.4.3. ERPs Usage and Business Performance

Many studies have addressed the impact of ERP systems on organizational performance. Poston and Grabski [63] found that there was no significant effect of ERP systems on firm performance, but Wieder et al. [7] indicated that the greater the experience of an organization with ERP systems, the higher their overall performance was. Hunton et al. [3] found that regarding the financial performance, ERP system adopters performed better than non-ERP adopters. Thus, in line with contingency theory and the above arguments, this study proposes the following hypotheses:

Hypothesis 3 (H3). *There is a significant relationship between ERPs usage and business performance.*

4. Methodology

4.1. Research Design and Data Collection Procedures

The current research adopts the positivist paradigm, which regularly is related to the employment of the deductive approach (i.e., theory and hypotheses are established first, then collecting the required data to test hypotheses) [88]. This paradigm allows the adopted theory (i.e., Contingency theory) to address the study objectives and to develop the research hypotheses. Also, this paradigm is appropriate to the research aim and objectives, as this study intends to develop an empirically based theoretical framework of effective business performance.

There is a wide range of methods or techniques for data collecting. According to Saunders et al. [89] a researcher can use either single or multiple data collection methods. Ittner and Larcker [90], indicated that using more than one data collection method can help the researcher to provide a constant body of evidences, and this can influence the reader's confidence of the study's results.

Because the complexity of the research theoretical model and the research context, this research uses two successive methods to collect data collection: interview (for the exploratory study), and questionnaire (to test the study hypotheses) [91].

4.1.1. The Exploratory Study

According to Sekaran [92], the exploratory study is undertaken in a situation where there is no information available and no related problems have been solved earlier. For the current study, an interview was chosen as an instrument for this study. Five SMEs in Saudi Arabia were selected randomly. Table 1 shows a summary of the company profiles

Table 1. A summary of companies' profile.

	Company. I	**Company. A**	**Company. S**	**Company. N**	**Company. J**
ERP Brand	SAP	SAP	Oracle	SAP	SAP
Sector	Services	Manufacturing	Manufacturing	Manufacturing	Manufacturing
Company Size	Medium	Medium	Small	Medium	Medium
Respondent Position	Director of administration &personnel affairs	ERP section Head	IT Manager	Director of Accounting Department	SAP Technical Consultant
Impl. period	5–6 years	6 months	2 years	9 months	6–9 months

A semi-structured interview format was used as part of a qualitative approach to get feedback from ERP users relating to their background, position, and their experience with the system. Also, this is to understand their perception of the study factors and their significance to the ERP system usage success. This step was taken in order to gain more information about the factors that highly influence the success of ERP systems used by Saudi SMEs.

At the end of analyzing this preliminary data, the study built a body of knowledge and gained insights into ERPs' success for Saudi SMEs. Generally, we found that the three propositions could be tested in order to construct hypotheses.

4.1.2. Hypotheses Testing (Questionnaire)

In this study, a survey questionnaire has been used to collect the data for hypothesis testing. According to Saunders et al. [89], the survey is a well-known strategy in both management and business studies. In this study, a structured questionnaire involved close-ended questions.

SMEs located in Saudi Arabia that has implemented ERP systems were considered as the frame sample of this study. In other words, all accessible SMEs in the study field were selected as the study's sample. However, there is not any database in Saudi Arabia that contains the information of all SMEs that adopted ERP. So various sources were used, which include some previous studies on Saudi Arabia companies such as [21,27,93]. Additionally, some websites were searched, for instance: top ERP systems vendors, Minister of Commerce and Industry, and the websites of some SMEs. Finally, a list of 201 SMEs that implemented ERP systems in Saudi Arabia were identified. The research questionnaire was distributed to the study sample, and 120 responses were received. The SmartPLS software's used for analyzing the quantitative data. The software is programmed by Ringle et al. [94] and is popularly used in management science for the last four decades [58].

Table 2 describes the study. It shows that the majority of the respondents hold a director position, 53 (44%), which implies that most of the study's participants are conversant with the day-to-day operations. Therefore, they could provide the needed information on organizational characteristics and operations. Also, company size is one of the essential characteristics of the study. So, three size classifications (small, medium, and large) were used to describe the study's sample. The size of the

company has been measured by using the number of employees. Table 3 shows that 78 (65%) of the companies are medium-size companies, whereas the rest of the study's sample is small-size companies with less than 49 employees.

The table also shows that 68 (56.6%) of the study sample spent less than two years to implement their ERP system, whereas around 46 (43.3%) of the sample took more than two years for implementing the ERP system.

The study findings illustrate that there are more than 20 brands of ERP systems used by Saudi SMEs. Some of them are well-known, such as Oracle, SAP, and Microsoft-Dynamics and others are quite new, such as Sage, Onyx, and Wengs. Table 3 shows that Oracle and SAP are the most popular ERP systems with 66 (50%) of the study's sample, followed by Delta and Microsoft-Dynamics with 18 (8%) among the study's companies.

Table 2. Sample description.

Characteristic		N	N%
Participant Position	General Manager	15	12.5%
	Accounting manager	13	10.8%
	CIO	7	5%
	IT manager	53	44%
	HR manager	9	7.5%
	Financial manager	10	8%
	Other	14	11.6%
Size	6 to 49	42	35%
	50 to 249	78	65%
	More than 250	0	0.0%
Implementation duration	Less than 1 year	16	13.3%
	1–2 years	52	43.3%
	3–4 years	18	15.0%
	5 years and above	34	28.3%
ERP Brand	Oracle	34	28.3%
	SAP	26	21.7%
	Delta	9	7.5%
	Microsoft Dynamic AX	9	7.5%
	Inbuilt ERP application	8	6.7%
	PeopleSoft	5	4.2%
	Other ERP brand	20	16%

4.2. The Measures

In order to measure the nine constructs of this study framework, a questionnaire was developed. The aim of the study and the confidentiality of any information provided was stated at the top of the questionnaire in order to keep the responses unbiased. The questionnaire was available in Arabic and English to enable wide responses. The questionnaire consisted of four sections: The first section assessed the success of the current ERP system usage; the second section assessed business performance; the third section assessed the contingency factors of management support, knowledge sharing, user involvement, user satisfaction, training, complexity, and vendor support; the last section collected demographic data (ERP software name, implementation duration, number of employees in the organization, and participant role). The items that measure the factors were selected based on the

ERP system usage context and based on previous research (see Table 3). All items were measured using a five-point Likert scale, Strongly Disagree, Disagree, Somewhat Disagree, Agree, and Strongly Agree.

Table 3. Questionnaire items.

Construct	Number of Measures	Source
1.User satisfaction	4 items	[95]
2. Top Management Support	4 items	[96]
3. Training	4 items	[97]
4. Vendor support	4 items	[17]
5. User involvement	4 items	[98,99]
6. Complexity	4 items	[100]
7. Knowledge sharing	4 items	[101]
8. ERPs usage Success	6 items	[43]
9.Business Performance	9 items	[102,103]

5. Analysis

5.1. The Exploratory Study's Results

As mentioned above, this study adopts a more critical discussion through integrating survey data with the qualitative information gained from interviews conducted with a subgroup of the survey respondents. Table 1 shows a summary of the company profiles

From this exploratory study, the researchers built a body of knowledge and gained insights into the Saudi's SMEs. In addition, three hypotheses have been constructed. The researchers achieved a better understanding of the organizational characteristics that may affect ERP systems usage. However, there are some limitations to this study. The number of interviews was small. The study used qualitative data to answer the question of the impact of the organization characteristic on the ERP system, which cannot achieve generalizable results. Therefore, the researchers left the exploratory study with the task of measuring the effect of these variables on the ERP system usage quantitatively.

5.2. The Quantitative Study Finding

To analyze the study's quantitative data, the partial least squares (PLS) technique is used, which utilizes a principle component base for estimation [104]. Essentially, PLS is a statistical method that is similar to regression analysis and it is appropriate for small sample size and exploratory models. Both the measurement model and structural model are evaluated in the following section [105].

5.2.1. The Measurement Model

Before assessing the significance of the study's components' relationships, it is important to determine if the study's measures have a satisfactory level of reliability and validity [106]. Consequently, the first step is to evaluate the measurement model. Four processes have been used to assess the study's measurement model that includes indicter reliability, internal consistency reliability, convergent, and discriminant validities. Cronbach alpha and composite reliability measures, as provided by the SmartPLS software, were used in order to assess internal consistency.

The finding for the indicator reliability of the study's constructs in Table 4 shows that all indicators are highly reliable (loading level is greater than 0.7) after removing all the indicators below 0.7 [107]. Additionally, the value of Cronbach alphas and composite reliability shown in Table 4 is greater than 0.7. Estimates showed the minimum Cronbach's alpha score is 0.778 for vender support, whereas the minimum composite reliability score is 0.878 for the business performance. Thus, it indicates the study's constructs are internally consistent and have acceptable reliability [108].

For assessing the validity, the convergent validity and discriminant validity are used. According to Hulland [107], for a sufficient level of convergent validity, the average variance extracted (AVE) should be greater than 0.5.

Our tested score showed that the minimum AVE is 0.591 (business performance), which indicates a reasonable level of convergent validity for the study's constructs.

The next step is to assess the discriminant validity, which refers to whether each construct measure is sufficiently distinct or diverge from one another [105]. Two techniques can be used to measure discriminant validity: Fornell-Larcker's and the cross-loading technique. Ref. [106] technique is based on comparing the AVE of each construct with the square of the coefficient of correlation between this construct and any other construct. The AVE should be larger for acceptable discriminant validity [109]. All of the square roots for the AVE of the study constructs that are highlighted in Table 5 are higher than all other cross-correlations.

Table 4. Validity and reliability for the constructs.

Constructs	Items	Lading	AVE	CA	CR
Management support	- The top management is highly interested in using ERP	0.904	0.797	0.915	0.940
	- The top management believes the cost of ERP is a long-term investment.	0.909			
	- The top management is aware of the benefits ERP for the future success of a firm	0.888			
	- The top management has allocated adequate financial and other resources for the development and operation of ERP.	0.868			
Knowledge Sharing	- Our approaches to sharing knowledge are very flexible in time and place	0.864	0.776	0.904	0.933
	- Overall, we can conduct knowledge sharing conveniently	0.919			
	- I think that knowledge sharing is beneficial to my study	0.885			
	- My feeling toward knowledge sharing is favorable.	0.856			
User Satisfaction	- The ERP system provides the precise information needed for my job	0.870	0.825	0.893	0.934
	- The ERP system provides sufficient information.	0.958			
	- The ERP system provides reports that exactly match my needs	0.894			
Complexity	- Working with the ERP system is complicated; it is difficult to understand what is going on.	0.894	0.728	0.878	0.914
	-. It takes too long to learn how to use the ERP system	0.866			
	- Using the ERP system involves much time doing mechanical operations (e.g., data input)	0.757			
	- In general, the ERP system is very complex to use	0.889			
User Involvement	- I had different responsibilities during different stages of ERP implementation	0.825	0.751	0.837	0.901
	- I was informed of problems occurring during different stages of ERP implementation.	0.904			
	- The organization involves employees when it develops or introduces new systems.	0.870			
Vender Support	- Our ERP vendor/consultant has good relationships with my organization	0.937	0.814	0.778	0.897
	- Our ERP vendor/consultant is experienced and provides quality training and support services	0.870			
Training	- My level of understanding was substantially improved after going through the training program	0.921	0.837	0.903	0.939
	- The training gave me confidence in using ERP.	0.922			
	- Training programs precede effectively IS usage.	0.902			
ERPs usage	- Our ERP improves individual productivity	0.821	0.673	0.838	0.892
	- Our ERP system is beneficial for me for performing all the tasks assigned to me in a timely fashion	0.842			
	- Our ERP reduces organizational costs	0.762			
	- Our ERP system improved overall productivity	0.854			
Business Performance	- The reputation of our company in the eyes of the customers has improved	0.718	0.591	0.826	0.878
	- We consider our relations with suppliers to be excellent because we maintain genuine partnerships with them	0.719			
	- We retain existing clients and manage to attract new ones.	0.732			
	- Quality of our products is well above the industry average	0.865			
	- The profitability of the firm increases faster compared to the industry average	0.800			

In addition, the constructs' cross-loadings technique is also used in this study to assess discriminant validity. According to Vinzi et al. [105], a construct indicated to be of satisfactory discriminant validity when each construct is more correlated with its indicators than with any other constructs' indicators. The results in Table 6 illustrate that all indicators have a high correlation with their particular constructs comparing with their correlation to the other constructs' indicators. All the constructs have an acceptable level of discriminant validity. Therefore, from the above results, it can be approved that the measurement model evaluation indicates a good fit in terms of reliability and validity.

Table 5. Discriminant validity.

	BP	ERPs Usage	Training	Complex.	KS	MS	User Inv.	User Sati.	VS
BP	0.769								
ERPs usage	0.631	0.820							
Training	0.444	0.503	0.915						
Complex.	−0.119	−0.207	−0.194	0.854					
KS	0.586	0.418	0.493	−0.166	0.881				
MS	0.484	0.536	0.405	−0.177	0.545	0.893			
User Inv.	0.276	0.372	0.339	−0.006	0.496	0.415	0.867		
User Sati.	0.608	0.548	0.391	−0.236	0.517	0.531	0.316	0.908	
VS	0.298	0.294	0.242	−0.045	0.287	0.327	0.435	0.375	0.902

BP = business performance, KS = knowledge sharing, MS = management support, User Inv. = user involvement, User Sati. = user satisfaction, VS = vender support.

Table 6. The Item loading and cross-loading of measures.

	BP	ERPs Usage	Training	Complex.	KS	MS	User inv.	User sati.	VS
Complex.1	−0.153	−0.173	−0.162	0.894	−0.12	−0.119	−0.02	−0.15	−0.03
Complex.2	−0.073	−0.184	−0.090	0.866	−0.07	−0.138	0.05	−0.18	−0.00
Complex.3	0.006	−0.097	−0.148	0.757	−0.16	−0.138	−0.02	−0.15	−0.03
Complex.4	−0.137	−0.218	−0.246	0.889	−0.20	−0.201	−0.02	−0.28	−0.07
ERPs usage 1	0.718	0.426	0.295	−0.062	0.46	0.367	0.23	0.42	0.26
ERPs usage 2	0.719	0.408	0.372	−0.084	0.47	0.328	0.21	0.50	0.21
ERPs usage 3	0.504	0.821	0.382	−0.191	0.37	0.360	0.37	0.42	0.17
ERPs usage 4	0.440	0.842	0.411	−0.148	0.31	0.482	0.34	0.47	0.28
KS1	0.506	0.313	0.341	−0.123	0.86	0.371	0.43	0.41	0.27
KS 2	0.563	0.425	0.496	−0.213	0.91	0.469	0.45	0.52	0.27
KS 3	0.534	0.387	0.448	−0.152	0.88	0.546	0.41	0.43	0.25
KS 4	0.450	0.328	0.433	−0.078	0.85	0.528	0.44	0.44	0.19
BP2	0.732	0.510	0.338	−0.111	0.38	0.317	0.21	0.54	0.31
BP 3	0.865	0.547	0.358	−0.083	0.51	0.429	0.22	0.44	0.14
BP 4	0.800	0.513	0.349	−0.114	0.43	0.413	0.18	0.42	0.22
BP5	0.550	0.762	0.417	−0.198	0.35	0.415	0.25	0.39	0.21
BP6	0.568	0.854	0.436	−0.147	0.32	0.495	0.26	0.50	0.28
MS1	0.481	0.516	0.414	−0.194	0.50	0.904	0.43	0.51	0.29
MS2	0.370	0.537	0.361	−0.212	0.51	0.909	0.38	0.45	0.26
MS 3	0.441	0.443	0.279	−0.055	0.41	0.888	0.33	0.41	0.26
MS4	0.446	0.395	0.389	−0.157	0.50	0.868	0.31	0.51	0.34
Training1	0.375	0.478	0.921	−0.234	0.39	0.341	0.29	0.36	0.20
Training2	0.410	0.433	0.922	−0.201	0.51	0.439	0.32	0.37	0.23
Training3	0.435	0.467	0.902	−0.097	0.45	0.337	0.31	0.33	0.22
UserInv.1	0.128	0.276	0.210	−0.022	0.31	0.314	0.82	0.22	0.36
UserInvo.2	0.225	0.290	0.274	−0.029	0.43	0.338	0.90	0.29	0.36
UserInvo.4	0.331	0.381	0.369	0.025	0.51	0.409	0.87	0.29	0.40
UserSati.1	0.631	0.451	0.435	−0.197	0.53	0.488	0.31	0.87	0.35
UserSati.3	0.553	0.556	0.341	−0.204	0.43	0.478	0.29	0.95	0.31
UserSati.4	0.481	0.480	0.299	−0.243	0.45	0.487	0.25	0.89	0.36
VS3	0.291	0.304	0.191	−0.026	0.25	0.323	0.37	0.38	0.93
VS4	0.240	0.213	0.261	−0.062	0.26	0.261	0.42	0.28	0.86

5.2.2. The Structure Model

After evaluating the measurement model in the previous section, the following phase is to evaluate the structure model. Information about the path significance of hypothesized relationships using the path coefficients i.e., beta (β), the squared R (coefficient of determination), Q^2 (predictive relevance), and f-square (the effect sizes) are presented in the structural model. Figure 2 highlights the SmartPLS results for the βs and the R^2. Path significance levels (*t*-values) were determined using a bootstrapping procedure with 1000 samples. According to Chin [104], the R^2 of the dependent construct is a predictive power used to assess the structural model, and normally it is the first value that researchers assess. For the current study, the value of the R^2 for the dependent constructs (ERPs usage and Business performance) is 0.458 and 0.398 respectively (see Figure 2). This means that the organization and ERPs factors explain 45.8% of the variance in the ERPs usage. In addition, the ERPs usage explains 39.8% of the variance in the business performance. Compared with other studies in the IS field e.g., [41,55], this value of R^2 falls within the acceptable range.

To assess the significance of the path coefficients, the t-statistics for each coefficient were used as a basis for testing the study's hypothesis. The summary of the study's results is shown in Table 7. Out of the 8 hypotheses, 4 were supported and 4 were unsupported by the data. The H2, H4, H5, and H7 were rejected as knowledge sharing, user involvement, complexity, and vendor support were not found to be positively related to ERP system usage ($\beta = -0.07$, $\beta = 0.118$, $\beta = -0.05$ and $\beta = 0.002$ respectively). Whereas, H1, H3, and H6 were supported as the other contingency factors (management support, user satisfaction, and training) and found to be positively related to ERPs usage ($\beta = 0.25$, $\beta = 0.297$ and $\beta = 0.271$ respectively). Also, H8 was confirmed to indicate that ERPs usage is positively related to business performance (financial and nonfinancial performance).

Table 7. Structural estimates (hypotheses testing).

Hypotheses	Beta	*T* Value	Decision	f Square
H1. Management support–→ ERPs usage	0.25 *	2.31	Sig.	0.067
H2. Knowledge Sharing–→ ERPs usage	−0.07	0.726	Non-Sig.	0.005
H3. User satisfaction–→ ERPs usage	0.297 *	2.43	Sig	0.096
H4. User Involvement → ERPs usage	0.118	1.525	Non-Sig	0.016
H5 Complexity → ERPs usage	−0.05	0.630	Non-Sig	0.005
H6. Training → ERPs usage	0.271 **	3.17	Sig	0.661
H7. Vender support → ERPs usage	0.002	0.02	Non-Sig	0.000
H8. ERPs usage → Business Performance	0.631 **	6.85	Sig.	0.661

Notes: Critical *t*-values. * 1.645 ($p < 0.1$); ** 2.58 ($p < 0.01$).

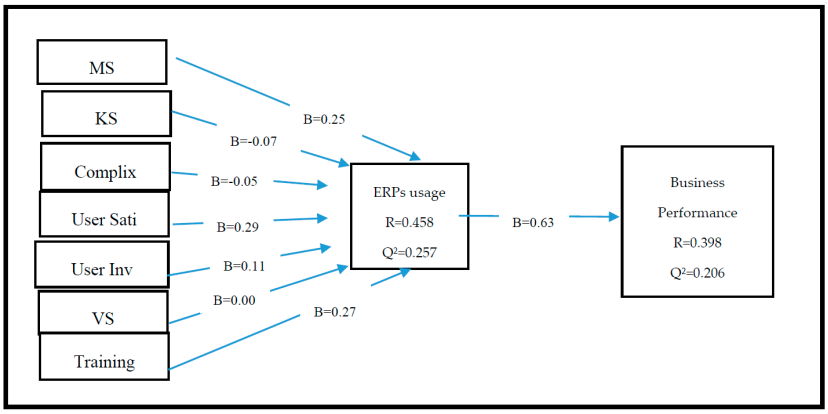

Figure 2. The partial least squares (PLS) model along with path estimates.

Besides looking at the R^2 technique to assess the structure model, other techniques called effect sizes (f^2) and predictive relevance (Q^2) can also be considered [105]. According to Cohen's (1988) guideline, the f^2 value of 0.02, 0.15, and 0.35 suggest small, medium, and large effects, respectively. Table 7 shows that all of the relationships had a small effect except the H6 and H8. In addition, the Q^2 technique can also be used to assess the structure model [105]. Based on the blindfolding procedure, using SmartPLS, Q^2 can assess the model's predictive capability. For the current study, Q^2 was calculated using cross-validated redundancy procedures. Overall, a Q^2 greater than zero indicates that the observed values have predictive relevance, whereas a value below zero indicates that the model lacks predictive relevance. Figure 2 shows positive Q^2 results for the ERPs usage as well as business performance, which indicates an acceptable predictive relevance.

6. Discussion

6.1. The Relation between ERP and Business Performance

The purpose of this study was to identify the factors that enhance the ERP system usage, and how these factors and its usage of ERPs affect business performance in Saudi SMEs. The study also enhances

our understanding of the significance of the usage stage of ERP systems, particularly in the context of Saudi Arabian SMEs. In this research, the researchers have provided a model to link the contingency factors and the effective use of ERPs to business performance. Empirical data have been provided to support the study's hypotheses. All the hypotheses have been tested and the study concludes that the empirical findings partially support our theoretical framework, as shown in Figure 2. The findings of this research support the idea that Saudi Arabian SMEs that use ERP systems need to know that their ERP systems can provide improved business performance if certain factors are applied. We have shown that some organizational, as well as ERPs factors, affect the successful usage of ERP systems.

Among the contingent factors, organizational factors of top management support were found to have significant influence on successful ERP systems usage as it was suggested by previous studies, such as Lin [54], and Costa et al. [5]. The ERPs factors of training and user satisfaction were similarly found to have a significant effect on successful ERP systems usage. Our findings regarding the significance of training are similar to those obtained by Ruivo et al. [41] for both Portuguese and Spanish firms, and to those of Ruivo et al. [55], in relation to ERP use among Iberian SMEs. Furthermore, our findings confirm the association between user satisfaction and ERP systems usage, which are consistent with the previous studies [52,56,57].

However, among the organizational factors, knowledge sharing was found to have no influence on ERP systems usage. In fact, these results are not consistent with those of Chou et al. [25] and Park et al. [82] who found that knowledge sharing is positively associated with ERP systems usage. There are various reasons that may explain this. One of the many reasons is the structure of SMEs, which is different than the large companies. Regarding the ERP's factors of vendor support, as seen from the exploratory study results, vendor support was found to be a significant element to a successful ERP systems usage from the interview participant's point-of-view. Previous studies [86,87] have primarily concentrated on how vendor support affects the implementation stage and information system effectiveness. They also found that vendor support has an impact on the success of ERP implementation, as well as the positive effect on information system effectiveness. However, contrary to expectations, the survey study did not support this relationship regarding the usage stage of the ERP system. To our belief, the main reason for the insignificant of this relationship it can be the ERPs brands. Looking to the study sample, it contains a number of unknown ERP system, which can affect the results. Thus, more investigation is required.

Similarly, the survey finding indicated that there is no significant positive correlation between the ERPs factors of user involvement and ERP systems usage. This finding is not in agreement with the finding of Baroudi et al. [57], which showed that user involvement has a positive influence on the use of ERP systems. In addition, the quantitative results did not show any evidence regarding the impact of the ERP's factors of complexity on ERP systems usage. Our findings match those observed in Chang et al. [53] study, which found that the complexity did not have any influence on ERP systems usage.

Finally and most importantly, the study finding shows a significant relationship between successful ERP systems usage and business performance. The results are consistent with the thoughts of earlier studies such as Wieder et al. [7] and Hunton et al. [3]. Therefore, the study concludes that the ERP system is significant to overall business performance in Saudi SMEs.

6.2. The Relation between ERP and Open Innovation

Nowadays, firms are under competitive pressure to innovate, while continuous innovation and successful implementation for the innovation are critical to achieving success and economic gains in today's rapidly changing environment.

When we hear the term innovation at the first glance, the word technology directly comes to our minds. According Chiaroni et al. [110] two issue needs to be further investigated by the researchers in open innovation. First, investigating the open innovation that is relevant to high-tech industries. Second, to assess how companies can implement open innovation in practice.

Organizations find themselves under pressure to cope with the ever demanding customers and the rapid developments in IT. The rapid improvements in IT have supported firms to increasingly on open innovation. Chiaroni et al. [110] noted that in the past decade, open innovation has been one of the most-argumentative subjects in management research, because of its deep effect on the firm systems and the management of the innovation firm.

Open innovation is a new way to create innovation where firms open their innovation processes to collaborate with others in order to develop new services and products [111,112]. Chesbrough [111] noted that open innovation means valued thoughts can come from inside or outside a company and can go to the market from inside and outside the organization.

However, organizations are like consumers, vary in their select to embrace innovations such as IS. One of these popular famously selected IT by firms is ERP. In recent years ERP systems have become increasingly significant and for many organizations, ERP considered a large its investment and very important to continuing operations of the firm.

When engaging a complex IT-based innovation such as ERP system to a firm, the implementation process needs to be achieved successfully so that the expected advantages are achieved. Miranda et al. [113] investigated the implementation process of ERP system with considering the diffusion of innovations and technologies. They found that through the implementation process of the ERP system there would be process and administrative innovations. Davenport et al. [114] indicated that ERP systems started as a back-office system eligible of integrating and automating a wide variety of transactions-intensive processes functions like human resources, finance, manufacturing, and maintenance. Further improvements on ERP was ERP II that enables firms implementing it in opening its boundaries to the outside world making it reasonable for the back-office functions to collaborate, communicate, and doing business with the outside world. Extended ERP systems enable firms to establish collaboration and communications with outside world, partners, customer, and competitors for generating ideas, new products, services or improvements. Organizations committing to open innovation view the outside world as a source of inspiration and accept the strategic potential of letting other organizations contribute to the innovation processes.

To embark on open innovation journey organizations need to adopt process changes. An Italian study conducted by Chiaroni et al. [110] addressed this issue through a detailed case study for an Italian leading cement manufacturer. The results of the case study show that the open innovation model is implemented in three stages of: unfreezing, moving, and institutionalizing. In addition, there are three changes occurred four main dimensions including: organizational structure, networks, knowledge management systems, and evaluation processes. However, this study based on a single case study, so quantitative study is needed for the generalization.

Also, firms need to implement a culture change project that begins by a change of mindset of top management. Further step, it is mandatory to build up a new believe and value system that recognize open innovation as a culture of survival. Following that it is mandatory to build a physical IT infrastructure and IS encompassing communication tools, knowledge management systems and necessary management informant systems [115,116].

7. Implication and limitations of the Study

7.1. Implication

This study used a theoretical framework derived from contingency theory to investigate the effect of several factors on the ERP systems usage and to discover whether this type of system influenced the performance of Saudi Arabian SMEs or not. The results show that some organizational and ERPs factors significantly influence successful ERP system usage and that ERP systems in SMEs enhance business performance. Thus, this research has implications for SME management in Saudi Arabia. The findings of this study provide insight to managers in SMEs on how they might efficiently manage the adoption and successful usage of ERP systems. Since ERP systems are considered to be complex,

organizations such as SMEs or those with few resources should take into account several factors if they wish to use these systems successfully. Managers in SMEs should focus on the usage stage of ERP systems, not just the implementation. We do not underestimate the implementation phase, but our study clearly shows the importance of the usage stage in system success.

7.2. Limitations of the Study and Future Research

Although the study's findings have significant implications for the successful usage of ERP systems, this study has a few limitations as well. the main limitation of this study was the sample size. This was due to time frame constraints. Also, there were various types of unknown ERP systems that had been implemented by several SMEs included in the study sample. From our point of view, well-known ERP systems (e.g., SAP and Oracle) are different from unknown system, such as Sage, Onyx, and Wengs because many aspects may vary in different ways for instance quality and the support from the vendor. Thus, the results of this study may vary when applying them to SMEs that use well-known systems rather than another brand of the systems.

Empirically, this study is limited to a sample of Saudi Arabia ERP adopted quoted firms, which may result in the findings being applicable only to this context. Future research can benefit from conducting comparative studies for different contexts, such as developed and developing context or conducting research using a longitudinal data. That would provide a better understanding of the relationship between the study's constructs, assessing the validity, and generalizability. Therefore, future research should attempt to replicate this study in other national settings.

It could be interesting to study further factors that may influence successful ERP system usage periciliary for SMEs. Future studies might benefit from including other factors, such as human resources, structure, strategy, and organizational cultural. Future research is also needed to examine the moderating influence of ERP system usage for the relationship between contingency factors and business performance. The result of this examination can derive the SMEs to take strategic decisions. A streamlined or adapted version of the theoretical framework used here could be developed and utilized to demonstrate the importance of these other factors.

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