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Influence of Digital Accounting System Usage on SMEs Performance: The Moderating Effect of COVID-19

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Citation: Lutfi, A.; Alkelani, S.N.; Al-Khasawneh, M.A.; Alshira'h, A.F.; Alshirah, M.H.; Almaiah, M.A.; Alrawad, M.; Alsyouf, A.; Saad, M.; Ibrahim, N. Influence of Digital Accounting System Usage on SMEs Performance: The Moderating Effect of COVID-19. *Sustainability* **2022**, *14*, 15048. <https://doi.org/10.3390/su142215048>

Academic Editors: Fabrizio D'Ascenzo and Donato Morea

Received: 15 September 2022

Accepted: 8 November 2022

Published: 14 November 2022

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Abstract: In the literature, studies have evidenced the efforts adopted by firms to develop digital technology with the hope of achieving sustainable decisions and competitive performance. However, studies have yet to provide an extensive explanation of the mechanisms used by firms in their digital technology adoption to impact and enhance value, particularly among small and medium enterprises (SMEs). In this regard, accounting information has served as a fundamental basis for business decision-making and the extensive use of digital technology has paved the way for the efficiency and effectiveness of accounting functions in modifying information relating to such functions. More specifically, a digital accounting system (DAS) enables the reporting and processing of large transaction amounts and generates the data required for analysis. However, despite these advantages, SMEs have been slow in their adoption and usage of DASs. Accordingly, this study drew upon resource-based view theory and the technology-organization-environment framework to propose an integrated model for examining the determinants and impact of using DAS among SMEs. The proposed model encapsulates the use and performance aspect of DAS. The study utilized a self-administered survey questionnaire as the primary data collection instrument. Data from 183 SMEs in Jordan were analyzed using partial least squares-structural equation modeling. The findings reveal that compatibility, organizational readiness, top management support and government support all had significant effects on DAS usage, which, in turn, had a positive and significant effect on DAS performance. With regard to the moderating effects, COVID-19 was found to have a moderating role on the DAS usage–DAS performance relationship. The study findings explain the way firms can enhance their DAS use to obtain optimum performance, thereby contributing to the literature on the antecedents and effects of using current information technology/information systems. The study recommends that the government of Jordan prepare and carry out a campaign concerning the importance of DASs for SMEs.

Keywords: SMEs; digital-based accounting system (DAS); DAS usage; DAS performance; resource-based view; technology-organization-environment framework; COVID-19

1. Introduction

Businesses have been largely affected by the COVID-19 pandemic, which has forced them to transform their processes and rethink business elements and technology use to remain sustainable while at the same time adapting to changing guidelines and current procedures [1]. Organizational leaders and managers have found COVID-19 to be disruptive, world changing and the ultimate test of their decision-making; this notion holds true for political leaders, senior business management, healthcare operational-level managers and the like. Evidently, the pandemic is the biggest challenge so far when it comes to making decisions in a manner that is timely and accurate [2,3]. For businesses, COVID-19 has led to the emergence of novel challenges in how to handle the repercussions brought on by the crisis and how to make decisions for efficiently and effectively managing the pandemic. Decision-making and system usage comprise the top challenges, which if ignored could lead to catastrophic outcomes [4,5].

Since 2020, researchers such as Lohapan [6], Ainasrallah and Saleem [7] and Hasbolah et al. [8] have indicated the use of technology, such as digital accounting systems (DAS), in addressing difficult and uncertain situations brought on by the COVID-19 pandemic all over the world. Technology use is actually deemed one of the top strategies that businesses can adopt [9,10]. In a world where the COVID-19 pandemic is viewed as a reason to develop and use appropriate technology, demand is met by businesses through their use of effective and up-to-date technology [11,12]. This has resulted in novel business models, online businesses and e-commerce platforms [12]. The pandemic has also led to the promotion and upgrade of technology and automation infrastructure systems such as the DAS infrastructure [13].

Businesses need accounting information to tackle issues in the long and short term, providing them with the required knowledge to reinforce their functioning (control and monitoring) in different areas, including costing, expenditures and cash flow [14,15]. Accounting information is also invaluable for the long-term strategic planning of businesses in a market environment that is characterized by high competition and dynamism [16,17]. The launching of information technology (IT) and IT-based solutions to support the gathering and relaying of accounting information needs to be central to any business initiative so that business productivity and competitiveness become sustainable [18–21]. In current times, IT functions as an extensive and integrated process in the performance of accounting processes [22].

In fact, IT contributes immense value to businesses in general and small and medium enterprises (SMEs) in particular owing to its ability to enhance accounting functions [23]. Effective IT use ensures that accounting reports are timely and accurate and that financial data can be accessed—both of which are great contributors to the decision-making and performance of firms [24–26]. Owing to the significance of SMEs in national economic development, enterprises' survival remains a top concern. As major pillars of economies, SMEs should also be more proactive in enhancing and sustaining their productivity and competitiveness [27]. In relation to this, Dyt and Halabi [28] pointed out that one major difference between the success and failure of an SME is the way that it uses accounting information.

Past literature on accounting and financial reports indicated their role as information sources for enterprises. For instance, DAS may be described as an information system (IS)/IT tool that contributes to the collection, processing and storage of financial and accounting information for the informed decision-making of managers [29]. In other words, using accounting information and a financial reporting system would enable the effective and efficient achievement of objectives [30,31]. IT-expanded potentialities have led to the

introduction of DASs and, in turn, such systems have made it possible to manage and provide accounting and financial information to enterprises.

Similar to other developing economies, Jordanian SMEs likewise leverage the potentialities of DASs but at a low level, though they may be extensively utilized in day-to-day business functions and processes. Notably, only around 14% of the SMEs in Jordan have made a DAS the go-to system for their internal business reporting [32]. This limited use of IS/IT to support operations, specifically accounting processes, has prevented firms from taking advantage of their assets to enhance their competitiveness [33]. Moreover, the low DAS use among enterprises has resulted in the poor quality of data, which negatively affects the decision-making process. In other words, the low level of adoption of IT/IS related-solutions has confined the ability of SMEs in Jordan to enhance both their competitiveness and productivity [4,26]. According to Ismail and Ali [34], when it comes to SMEs, a critical factor is the insufficient financial information and accounting records available and the lackadaisical management of such records. Some authors have contended that poor financial management and poor accounting records are the top two reasons for failure among SMEs [25,29].

Researchers mentioned that the major solution to the failure among SMEs is enhancing their financial management and accounting records by updating their accounting systems [35]. According to Dyt and Halabi [28], the main difference between successful and failed SMEs is their methods of using accounting data and, certainly, accounting information plays a key role in business function enhancement and support. Specifically, DASs have been adopted to effectively bring about sustainable competitiveness and survival [7,10]. A DAS enables the provision and generation of accounting reports in a timely and proper manner as well as the smooth process of obtaining financial information to promote information among managers regarding the effects of business decisions and processes on the performance of the whole organization [6,36].

When used effectively, DAS becomes an essential element in firms for cost savings and income/revenue in the long term, competitiveness creation and productivity enhancement [8,37]. In other words, the effective use of a DAS may meet user satisfaction of the system and positively impact the overall operations of a firm. While there are several benefits in using a DAS, several studies in the Jordanian context revealed that SMEs do not always generate accounting reports. For instance, Ahmad, Ayasra et al. [35] found poor-quality data were collected using DASs among SMEs in Jordan, while Smirat [31] reported that only a small percentage of SMEs in Jordan (14%) make use of accounting software in their accounting information preparation.

Case studies have been dedicated to examining DAS from the viewpoint of organizations [17,38], but a consensus has yet to be reached on the way firms can weigh the potential effects and value of DASs [38,39]. Identifying the potential of a DAS calls for a justification and validation of its impacts, viability and usefulness for businesses [38], particularly SMEs. Hence, further studies are needed to highlight the potentials of and issues related to the influence of using a DAS and its performance among such enterprises [39] as well as to examine the effects of the DAS in light of its value [40]. In this regard, little effort has been directed to the post-adoption issues relating to DAS performance, particularly in developing countries [17,41]. The full impact of DAS use in SMEs may only be wholly understood at the post-adoption stage by investigating the effects of DAS performance development in a developing country like Jordan.

Past literature has also largely ignored the interconnection between usage and impact. To fill this void, this study examines the way contingencies are connected to the external environment and their effect on IS/IT use, as suggested by Melville et al. [40] and Wade and Hulland [41]. When it comes to the COVID-19 pandemic, technology has been transformed in light of the relationship between DAS use and effects [42] in an issue that remains open according to Thuan et al. [43]. COVID-19 has transformed the impact of technology in a way that needs increasing attention. This study thus determines the way that several factors affect IS performance to validate past inconsistent findings [25,44,45]. Under-utilization

or neglect of technologies is thought to negatively affect businesses, resulting in a lack of competitive status and strategical weakness [44]. However, there is scant evidence that technologies' investment expenses result in an improvement in business processes [45]. Hence, technologies may not have an impact on a firm's operations in certain cases; in fact, sometimes the costs associated, such as capital, training and extra staffing, exceed profits. Inconsistencies in the results regarding the impact (value) of an investment in technologies are due to misunderstandings regarding the skills and resources available to a business and the timeframe involved. In addition, prior studies have shown that a business's investment level is not an accurate indicator of its investment intensity in technologies and information security. Furthermore, the study found that technologies' capabilities, including DASs, are essential resources that cannot be substituted or imitated.

The growth of the DAS environment calls for an in-depth recognition of its value creation and impact on firm outcomes. This study addresses the critical issue by developing and examining a comprehensive research model of DAS use and its impact. Accordingly, the research questions of this study are as follows: (1) What are the antecedents of DAS use? (2) What is the impact of DAS use on DAS performance? (3) Does the COVID-19 pandemic moderate the relationship between DAS usage and DAS performance?

2. Literature Review

The several advantages contributed by DASs have motivated firms to take advantage of their use, but the SME sector is still lagging behind on this [10]. DAS refers to a system that gathers, stores, records and processes data to generate valuable information for managers and decisions-makers to make effective and informed decisions [38]. Such information can be utilized to mitigate decision-making uncertainty and improve activities related to control and planning.

Literature on the factors influencing DAS use and studies that investigated such use's influence on system performance among SMEs are scarce [8,17,36,46,47]. The present study develops a research model based on resource-based view (RBV) theory and the technology-organization-environment (TOE) framework. It formulates hypotheses on the effective use of DAS among Jordanian SMEs and its relationship with their performance, with the consideration that studies of this caliber in literature are still lacking, thus creating a gap. Only a few of the past studies have explained the effect of DAS use on performance [6,7,48].

According to Lutfi [49], the factors that influence DAS use include competitive pressure, commitment of owner/manager, compatibility, government support and business advantages. The specific use of DAS was also found to affect DAS performance. Lohapan [6] revealed two major predictors of DAS performance: management involvement in the system implementation and management accounting knowledge.

This study also branched out to authors who included extensively deployed variables from commonly used theories, such as attitude, pre-satisfaction and intention to continue, as well as base line variables in the model and effect of money on behavior. Attitudes and utility were taken as mediating variables and relative advantage coming on top was taken as the most significant antecedent of attitude toward DAS and satisfaction, with both variables affecting intention to retain [17,50]. In the same caliber of study, findings showed that the right system deployed serves as a competitive advantage and that causal relationships exist between DAS and performance [10,17]. Alnasrallah and Saleem [7] also revealed that service quality, information quality and system quality constitute the success factors of DAS and, eventually, the performance of the organization. Culture within organizations contributes to performance enhancement through information quality, data quality and system quality and therefore it is crucial for organizations to facilitate an environment that promotes happiness, motivation and diligent work among employees. Meanwhile, Hasbolah et al. [8] found that both management support and self-efficacy affected perceived ease of use and perceived usefulness, while the perceived usefulness and perceived ease of use affected behavioral intention toward DAS usage.

Evidently, DAS performance has been a core issue among researchers and practitioners alike [51] and studies in literature, including those of Lohapan [6], Hasbolah et al. [8] and Khassawneh [32], revealed that several factors do have significant impacts on DAS use value. Regardless of such research, a gap exists in the literature when it comes to studies focusing on the influence of DAS use on DAS performance. Thus, the present study does so in the context of Jordanian SMEs, with the moderating impact of COVID-19 pandemic on the relationship.

Previous studies in IS use are mainly grounded on theories that investigate as well as analyze the usage from the individual perspective, such as the Technology Acceptance Model [TAM] [40,48,52], Theory of Reasoned Action [TRA] [39] and the Unified Theory of Acceptance and Use of Technology [UTAUT] [49,53]. Some studies that focus on the organizational level employed only related theories such as the Diffusion of Innovation (DOI) Theory [17,23], the TOE framework [27,34], the Resource-Based View [RBV] Theory (Ismail, 2009) and Contingency Theory [30]. However, Ramdani and Kawalek (2008) concluded, after reviewing previous literature, that IS usage research typically assesses several technological, organizational and environmental factors that either accept or reject the usage of a IS innovation.

A number of previous studies have utilized a multi-perspective framework in order to analyze the use of IS, but the most representative and influential framework was the TOE framework [54]. In several empirical studies on different types of innovation, the framework has been tested [10,19,26]. Furthermore, the TOE framework has been suggested as a valuable tool for understanding the use of complex information system technologies [19]. With this framework, the potential determinants of a firm's usage decisions for a specific IS technology have been examined from a technological, organizational and environmental perspective. This provides a richer and more robust explanation.

The TOE framework, in contrast to Rogers' model [55], helps to distinguish between and among innovations, capabilities and the environmental contexts of their use within organizations. It does this by overruling the dominance of technological and organizational perspectives.

In spite of the lack of clear evidence, it remains unclear whether the use of DAS and IS leads to improved firm performance. A critical part of IS research is understanding how investments in DAS/IS are related to their value (impact). In recent years, researchers have focused their attention on determining how DAS/IS applications within businesses contribute to the business's value (impact). Prior research indicates that these associations are multifaceted and complex. The results of this field of study have demonstrated that DAS/IS can significantly enhance productivity, competitiveness and, therefore, performance.

In order to describe the impact of DAS/IS performance, the term business value is typically used. Among the organizational impact measures used are profitability improvement, productivity enhancement, inventory reduction, cost reduction and competitiveness [44]. Organizational impact measures may differ in meaning and importance depending on the type of organization. As a result, each measure requires in-depth fieldwork and a deeper understanding of the specific organization context [44]. As a result, this study will examine the relationship between DAS usage and DAS performance. This is because several studies have concluded that utilization of DAS/ISs is associated with organizational productivity, competitiveness and performance [30,40].

Considering the fact that the TOE framework does not provide a theoretical rationale for whether causal relationships can be established, it is not considered to be a well-developed theory. Nonetheless, the scope of variables in individual theories does not adhere to the TOE framework, despite the fact that it is a simple and elegant classification. Mishra et al. [45] have revealed that several researchers have attempted to combine the TOE framework with other theories in order to investigate the effect of the use of information systems technology.

Scholars have attempted to combine the most promising features of the TOE framework with other theories in the IS literature. This combination has the main objective of

providing the theoretical context for the establishment of a causal relationship between innovation usage and impact [45,56] as well as explaining the relationship previously discussed. IT researchers have extensively studied RBV theory when examining the business impacts of IT-related resources and the use of IT.

Furthermore, the pertinent literature indicates that the impact gained from IS depends on an individual's ability to leverage it [23]. Thus, the value of IS business is determined by the degree of IS implementation in the company's main activities [56]. There has been an argument that a higher proportion of users indicates that a company has unique competencies derived from its primary information system. In accordance with Idris [36], knowledge and experience of information systems can help firms to leverage information systems more effectively. Both streams of research have been combined while the application of IS technologies and the business impact implications of previously mentioned applications have been considered.

In recent years, IS researchers have increasingly agreed that firms can achieve benefits from IS by modifying the processes of intermediate businesses [40]. It has thus been proposed that the impact of information systems on intermediate processes should be the focus of study. This is the same level at which information systems are deployed [23]. As a result, it is possible to move beyond the correlation between IS and the impact of business. As a matter of fact, this approach has been adopted by researchers who study the RBV theory. They study the use of information systems and their impact on a variety of technologies. Idris [23] investigates the application of information systems to business strategies and value chains. Lutfi et al. [36] explores the application of information systems in accounting information systems and Ray et al. (2005) discuss the impact of information systems in the customer service process. Zhu and Kraemer [56] discuss the impact of e-business, Salwani et al. [43] examine the impacts of e-commerce applications and Picoto et al. [57] examine the impacts of mobile business applications. Therefore, based on the above examples, this study utilized RBV in an effort to investigate the effectiveness of AIS applications.

An application of the TOE framework and the RBV will provide a solid theoretical framework for exploring the antecedents and impacts (post-adoption) of using DAS. Additionally, a researcher could better categorize resources by identifying the antecedents of DAS usage. It would also be possible to develop a theoretical rationale for associating DAS's use with search and ordering procedures, as well as with the performance of AIS. This would be the case if a researcher were to understand the impacts of DAS usage. There are wide discrepancies between firms in terms of skill levels and resources, despite the fact that they consistently invest large amounts of money in technology. Thus, it is likely that firms' adoption of DAS and their ability to leverage these applications are inextricably linked to their skills and resources. An overview of studies examining the impact of information and information technology innovations on user behavior is presented in Table 1. It is evident from the table that previous studies have examined the antecedents and impacts of utilizing various kinds of information and communication technologies using the TOE Framework and RBV Theory.

Table 1. IS/IT Innovations Usage and Impacts Studies Using TOE Framework and RBV Theory.

| Innovations | Innovations Impacts | Author (s) |
|------------------------|----------------------------------|------------|
| ERP Adoption | ERP performance | [27] |
| Mobile Business Use | M-Business Value | [57] |
| E-commerce Usage | E-commerce impact | [58] |
| AIS Implementation | Business Sustainability | [26] |
| E-commerce usage | Business performance | [43] |
| Big Data (BD) Adoption | BD Impact | [59] |
| Internet usage | Procurement- process performance | [45] |
| E-Business (EB) Usage | EB value | [56] |
| AIS Usage | AIS Effectiveness | [47] |

In summary, prior discussions have shown that former works used a variety of approaches and theories to examine the antecedents and impact of technology use. It is possible to categorize most of the influencing antecedents into four different categories. Among these approaches, the innovation diffusion approach is the most prominent. In these studies, the focus was primarily on perceptions regarding innovation characteristics, namely relative advantages and compatibility. The second category consists of works that are influenced by organizational factors. In the third category, works focus on factors related to the institutional environment. Last but not least, most research discusses the impact of technologies' use based on the RBV.

The current study examines the antecedents and impact of AIS usage from the perspective of all perspectives. All of these perspectives can be explained by TOE, DOI and RBV. Those theories and their application to AIS will be discussed in the following sections.

3. Theoretical Understanding and Foundation

In this study, the post-adoption stage and effects of DAS from the perspective of the organization are examined. Literature dedicated to this domain has examined the issue from two approaches: the first approach focuses on the variables affecting innovation use decisions, whereas the second examines the antecedents of the innovation use impacts.

In the former approach, the literature shows that the TOE framework serves as a stepping-stone in the initial examination of using DAS [54]. The framework is suitable for use in identifying three factor categories influencing the process of using technologies among firms, namely, technological dimension, organizational dimension and environmental dimension. TOE framework is reconcilable with the diffusion of innovation theory, as it concentrates on both internal and external features of organizations in terms of technological, organizational and environmental elements. The technological dimension provides a description of the perceived attributes of the innovation, including complexity, compatibility, observability, relative advantage and trialability. According to the meta-analysis conducted by Tornatzky and Fleischer [54], the most relevant, positive and significant characteristics from the above attributes are relative advantage and compatibility; thus, they are included in this study's examination. The organizational dimension refers to the number of slack resources that are internally available, with the main factors being top management support (TMS) and organizational readiness, both of which have a significant effect on the innovation use/adoption and are hence examined in this study. Lastly, the environmental dimension is the area within which the industry and its business, rivals and government dealings take place [54]. The above conceptualization is aligned with the diffusion of innovation theory (DOI) proposed by Rogers [55] that emphasizes the technological and organizational characteristics of a firm as the antecedents of diffusing technology within it.

In the same line of research, ref. [23] included the impact of technology use in the TOE framework based on the RBV premise that a firm creates value and impacts through the combination of resources that would be difficult for another firm to imitate. Added to this, the resources' impact trumps the ability of the organization to utilize the innovation rather than the innovation itself [57,60]. In other words, the impact of the innovation depends on the level at which it is used in the major activities in the firm's value chain. The higher the use level, the higher the likelihood of generating distinct effects [56]. This approach has resulted in a branch of research focusing on the antecedents and outcomes of innovation use [46,61,62].

In short, TOE is the main framework that has inspired most of the earlier literature on the drivers of IS/IT use [59,63]. Meanwhile, the value and impact of IS/IT use in view of previous research were grounded on RBV [23,47]. However, despite the significant contribution of these theories in understanding the drivers and impacts of IS/IT and innovations, they still have limitations that need further investigation to enhance our understanding.

4. The Research Model and Hypotheses

The research model in this study combines the TOE framework and RBV theory, which are the most common theories in IS/IT studies [46] and their theoretical perspectives are adopted in this study to examine the impact of DAS in SMEs. The literature reviewed highlighted the need to examine factors that affect DAS use in SMEs in various contexts as well as the impact of such use on its performance and effectiveness. Prior variables in the literature were reviewed to develop the model (Figure 1). The study factors are categorized under three contexts, technological, organizational and environmental. The next section is dedicated to explaining the contexts in detail, after which the hypotheses are formulated.

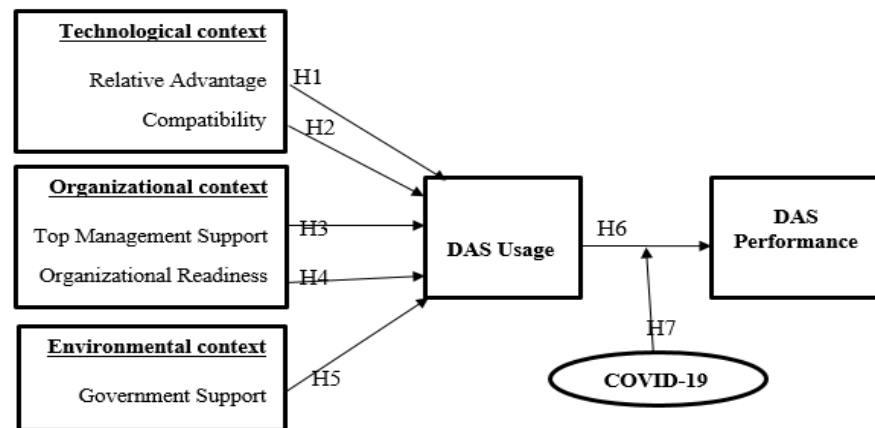


Figure 1. Model of the Study.

This study uses the TOE framework to assess DAS. The framework is prevalent in scrutinizing issues related to IS technology usage, such as the usage of DAS [54]. The framework was developed to be a consolidative framework, which offers a general theoretical foundation in the usage/adoption of ISs. It generally measures different technological, organizational and environmental factors that assist the process of usage/adoption of various IS technology [59,63].

Several reasons support the choice of applying the TOE framework in this research. Firstly, the framework includes the environmental characteristics that were ignored by DOI. The integration of the environmental characteristics increases the predictability and power of TOE framework to be superior to the latter and discusses intra-organization IS technology much better than others [58]. Secondly, TOE framework explains how the technological, organizational and environmental characteristics influence IS technology usage and also how these three characteristics affect the companies' decisions makers [19]. Thirdly, TOE is a flexible contextual theory that can be applied in diverse settings and allows excluding and including of the technology, organization and environment variables that are in line with multiple contexts [17]. Fourthly, TOE framework considers as a resilient theoretical basis and supports strongly the organizational level research [27]. Finally, the TOE framework has been acknowledged as the most frequently-applied IS and innovations theory among researchers [26,64]. Hence, the TOE framework is the most applicable theory (outstanding theoretical framework) for the SMEs context, as it provides a vibrant and rich viewpoint from which to deal with SMEs [36].

The current study also draws on the capability building view by using RBV theory to investigate the influence of DAS usage on performance. RBV theory is suitable in recognizing businesses' technological activities through the theoretical standpoints of organization capabilities and resources [51]. A focal point of RBV is that values and performance are influenced highly by the qualities or elements of a business's resources or/and capabilities [58]. Grounded in the RBV theory, DAS denotes the intangible resources or capabilities for businesses by which firms achieve value and develop their performance. Thus, the causality TOE framework will be adapted in this research to explain the drivers of DAS use. Accordingly, the authors have developed a theoretical framework grounded on

the TOE and RBV. The factors involved in the present study were grouped into technological, organizational and environmental factors. Compatibility and relative advantage are the technological factors that determine the degree of DAS appropriateness to the business. Meanwhile, top management support and Organizational Readiness are organizational factors that reflect a business's ability in DAS usage. In addition, Government Support is considered as an environmental factor that represents the extent to which businesses face an external necessity regarding DAS usage. Nonetheless, as the current research also attempts to investigate the impact of DAS usage on DAS performance, the causality of RBV will also be perused, as proposed by several previous studies [26,57]. Taking the aforementioned into consideration, the RBV theory is leveraged in this study to validate the existence of a relationship between DAS usage and DAS performance. In accordance with the RBV theory, the more profound and extensive the usage of DAS, the greater the possibility of a business in creating DAS that is valuable, almost inimitable and sustainable. Therefore, this study contends that a theoretical linkage exists between DAS usage and DAS performance.

4.1. Technological Factors and DAS Usage

Technological factors refer to the technological attributes to be employed during innovation use [47]. According to Rogers [55], innovation has several features that may affect its usage and this may be exemplified by relative advantage, which is the level at which an innovation is perceived to provide higher benefits than others similar to it [52,59]. DAS possesses several distinct features that are distinctive from its innovation counterparts, including the gathering, storage and processing of accounting and financial data useful for decision-making among managers [65–67]. Past literature on the subject indicated that relative advantage is the top antecedent of using IS/IT [61,68] and has a positive influence on adopting IS/IT [69,70]. Hence, the present study formulates the following hypothesis:

H1: *Relative advantage has a positive significant effect on DAS use.*

Compatibility is the level at which an innovation is perceived to be aligned with existing practices and values [55,71]. Thus, technology compatibility is the way the system is similar to existing processes that are required for DAS use and implementation [53]. The use of new technology calls for new skills and methods of implementation and use and, in case of incompatibility, the use of technology may be hindered [72]. Accordingly, this study proposes the following:

H2: *Compatibility has a positive significant effect on DAS use.*

4.2. Organizational Factors and DAS Usage

The firm's characteristics that affect technology/innovation implementation and use are covered under organizational factors [73] and they constitute the organization itself, its policies for resources management and the work environment for achieving the mission and objectives set out by the organization [54,74]. In relation to this, organizational readiness has been acknowledged as a major factor that affects the use of IS/IT in SMEs [58,75]. Owing to the firms' lack of financial resources for using IS/IT and the knowledge to do so, specifically when it comes to complex technologies [75], this factor can affect such use. Past studies have shown organizational readiness to be an important factor in the adoption and use of technological innovations [61,64]. For example, Rahayu and Day [68] revealed that organizational readiness leads to IS/IT adoption success, which is consistent with this study. Hence, this study proposes the following hypothesis:

H3: *Organizational readiness has a positive significant effect on DAS use.*

Another organizational factor, TMS, refers to the support, commitment and active engagement directed by management toward technology planning and implementation in the organization and its use among the staff [74,76,77]. The main decision-makers in SMEs are the managers and so they have to ensure that the resources critical to DAS use are available and the hurdles to such use are minimized or eliminated to overcome resistance

to use [72,78]. Studies of this caliber indicated that successful IS/IT largely depends on manager support and commitment, both of which have a positive influence on IS/IT success and performance among SMEs. Such dependency highlights the role of TMS in DAS use [70,73]. Accordingly, this study formulates the following hypothesis for testing:

H4: *Top management support has a positive significant effect on DAS use.*

4.3. Environmental Factors and DAS Usage

These factors are factors that exist externally to management control of SMEs [79]. Government support comes in its promotion and encouragement of technology use and implementation within the organization [54,80]. In relation to this, the regulations and guidelines established by the government may confine a specific industry from using technology and innovation, a result of which may limit such use, while in another industry the same regulations and guidelines may motivate the use of innovations [54]. Such government regulations, guidelines and policies also differ from one country to the next and from one industry to another [54]. Refs. [81,82] examined this factor and found it to have a crucial role in the use of innovation, as both were found to be positively related. In line with this argument, the present study examines the factor as a predictor of DAS use in SMEs in Jordan in light of the following hypothesized relationship:

H5: *Government support has a positive significant effect on DAS use.*

4.4. DAS Usage and DAS Performance

In the IS/IT literature, system performance is among the most highly considered dependent latent variables [23,59,83,84]. DAS performance is the level at which DAS contributes to achieving the aims and objectives of an organization [10,85]. In the same line of study, authors are still attempting to clarify the construct that has the most significant influence on DAS because of the difference in the conceptualization of DAS performance from one study to the next [10].

The benefits of DAS use among SMEs have been acknowledged in some studies. For instance, Esmeray [83] revealed that DAS assists the increase in revenues and sales and customer services among SMEs, while Ismail and Zin [33] reported that DAS is useful in providing the information of external and internal users and has a positive effect on the efficiency of business management. More extensively, authors have also attempted to identify the nature of the influence of DAS use on enterprise performance. Ramli [40] found that DAS use improved user satisfaction, mitigate errors and enhance the availability of information. However, studies dedicated to investigating the effects of DAS use on DAS performance remain lacking.

DAS use refers to the level at which DAS is used with other activities to increase efficiencies. According to Apriyanti and Yuvasari [10], firms using DAS in an effective manner have a higher likelihood of reporting its positive impacts on their performance compared to those that limit their use. On the basis of TOE, technology impact depends on the amount of its use in conducting activities [36]. In other words, using DAS is the first step in acknowledging the impact of such use on its performance. This study uses RBV theory to relate DAS use and its effects in a way that, when DAS is extensively used, it has a higher possibility of creating effects on business, given that rivals will find it difficult to emulate and it will remain valuable and sustainable throughout time. Hence, this study proposes the following:

H6: *DAS usage has a positive significant effect on DAS performance.*

4.5. Moderating Effect of COVID-19 on the Relationship between DAS Usage and DAS Performance

The havoc that the COVID-19 pandemic has caused for businesses is unprecedented, affecting their operations and environment and creating threats [86,87]. The consensus is that the pandemic will reshape the business landscape within organizations and external

to them [88] and, in the case of SMEs, they have more flexibility compared to their larger counterparts [89]. To handle restrictions and control measures (e.g., strict isolation measures, travel restrictions, home isolation), SMEs will likely depend on digital technologies, such as artificial intelligence and DAS, to minimize the pandemic's impact. Additionally, the COVID-19 pandemic has brought about an uncertain recovery of the economy, which is predicted to end in 2025 in the face of extensive life loss and an unclear pattern of recovery [90], threatening the survival of SMEs. Such a mutated, uncertain environment can be addressed by SMEs through innovative new value creation and logic depending on information sources and digital technologies. SMEs should thus leverage DASs in examining new value sources, making a significant relationship between DAS use and its impact (86).

Thus far, the COVID-19 pandemic represents the biggest challenge to the leadership and management of businesses, with one of the top issues being the inaccurate information sourced that may be lacking completeness, precision, certainty, reliability, clarity and authenticity. Leaders and managers are faced with the task of making critical decisions without the required information and data [91]. On the one end, there is a lack of data owing to the nature of the virus and the speed of its proliferation and, on the other, decision-makers possess a large amount of unreliable data and information that need to be filtered and cleaned.

Owing to the unfamiliarity of the COVID-19 pandemic, decision-makers are at a loss; uncertainty prevails concerning the reliability of information sources [91], unpredictability and uncharacteristic human behavior, irrational response of the financial markets, economic volatility, lack of accurate data to gauge the impact of lockdowns, unclear patterns of outbreaks and many others. Decision-making in a timely manner using incomplete information within a high-outcome environment is unprecedented in its level of uncertainty.

In businesses, decision-makers at different levels have to contend with the risks that arise and the extreme outcomes from their wrong decisions; this is clear from the leaders, healthcare managers and professionals who are required to make life-or-death decisions daily in the face of uncertainties [91]. Such decision-makers need to assess the risks and adopt the right actions while minimizing these risks they may face. In the case of the current pandemic, decision-making is made in uncertain circumstances, where wrong decisions can potentially lead to irreversible harm in light of the number of deaths and economic turmoil [91].

Owing to the nature of the pandemic, timely decisions are needed and so critical decisions need to be made in a timely manner as any delay could mean loss of lives and damage to economic development. It is important for decision-makers to maintain their focus in identifying and assessing tipping points and triggers of escalation for the steps to be taken. Timely decisions are quite impossible with these uncertainties, because high risks and pressure abound.

In an environment characterized by high uncertainty, additional information and data are needed for decision-making and this can be met through the information-processing capability of a firm [85]. DAS deployment is a mechanism that extends the processing capabilities of firms and firms with high DAS use are more adept at gathering, analyzing and relaying information, leading to their higher likelihood of reporting a high level of DAS performance. According to Wade and Hulland [41], a significant relationship exists between firm resources (DAS use) and its effect on the functioning of the firm in an uncertain environment. Aligned with this argument, this study proposes the following:

H7: *COVID-19 moderates the positive relationship between DAS use and DAS performance.*

5. Methodology

Aligned with the study objective to examine the effect of various factors (technological, organizational and environmental) on DAS use among manufacturing SMEs in Jordan, the sampling frame of the study was obtained from a list provided by the Amman Chamber Industry Directory [92]. There are 8000 firms listed in the directory, of which 941 met the

definition of SMEs adopted in this study. Specifically, a small firm is defined as one with 10–49 full-time employees (FTEs) and a medium firm as one with 50–249 FTEs. This study aimed to obtain the viewpoint of the firm on DAS use and, thus, the unit of analysis is the firm and the target respondents are their owners/managers. Such respondents hold knowledge of the IS/IT practices of the firm and have a significant influence over its strategic decision-making [59,93].

Questionnaire survey was the main instrument of data collection used and the questionnaire was categorized into four main sections (demographic information, items measuring the impact of DAS use, items measuring the extent of DAS use and respondents' profile); the results summary of the participant's profile is presented in Table 2. The questionnaires were developed in English based on tested and validated measurements from the earlier research in the context of innovation/technology and information systems. Since the respondents had Arabic language as their mother tongue, the questionnaire was translated from English language to Arabic through the use of a professional translator applying a sequential linguistic method in order to ensure the reliability and validity of the measuring scales utilized. The items of the main variables were measured on a five-point Likert scale and were adapted from the literature (refer to Appendix A). To ensure an adequate response, 200 copies of the questionnaire were distributed to potential respondents in SMEs. Of the 200, 34 were returned.

Table 2. Demographic characteristics.

| Characteristic | | Frequency | Percent |
|---------------------------|--------------------|-----------|---------|
| Position | CEOs | 88 | 48.1% |
| | Senior managers | 49 | 26.8% |
| | Managers | 47 | 25.1% |
| Experience | 3 years or less | 48 | 26.2% |
| | 4–7 years | 42 | 22.9% |
| | 8–11 years | 49 | 26.8% |
| | More than 11 | 44 | 24.1% |
| Gender | Male | 105 | 57.4% |
| | Female | 78 | 42.6% |
| Age | 20–29 years | 39 | 21.3% |
| | 30–39 years | 46 | 25.1% |
| | 40–49 years | 66 | 36.1% |
| | 50 years and above | 32 | 17.5% |
| Education | Diploma or below | 29 | 15.8% |
| | Bachelor degree | 81 | 44.3% |
| | Master's degree | 59 | 32.2% |
| | PhD | 14 | 7.6% |
| Number of Years Using DAS | 2 years or less | 72 | 39.3% |
| | 3–5 years | 62 | 33.9% |
| | 6–8 years | 33 | 18.1% |
| | More than 8 years | 16 | 8.7% |

The study's survey targets, which are DAS adopters in the position of decision-makers, were surveyed over a span of two-months (14 June 2021–19 August 2021). The current study obtained responses only from a single participant (owner/manager) for each SME. The use of a single participant to represent a company's view helps to improve and increase the response rate, and this has been a relative common practice for studies involving SMEs [73]. The current work's purpose, predictable completion time and survey link were all included in the email invitations. Participants could only participate if they agreed to take part in the survey in the first place.

More specifically, copies of an online questionnaire were distributed to 741 firms for the actual data collection and, after follow-up procedures, 204 responses were retrieved. From the retrieved questionnaire copies, 183 were found to be suitable for analysis, indicating a response rate of 25.2%, which met the minimum requirement for analysis in partial least squares-structural equation modeling (PLS-SEM) (70 responses with 7 independent variables) [94].

6. Data Analysis

PLS-SEM was employed in this study for hypothesis testing. PLS-SEM is a multivariate statistical approach that allows for the evaluation of several variables at the same time in one model. The approach is suitable even with complex models that involve several latent variables, moderating variables and lower-sized samples [94,95]. This study thus used PLS to test the formulated hypotheses, preferring it over other approaches of data analysis. The proposed model had a moderating variable that contributes to its complexity and the size of the sample was 186, which is lower than the threshold size required for other approaches. Lastly, PLS-SEM was the best choice as this explorative study applied both the TOE and RBV models, which required a path modeling approach suitable for a prediction-oriented study or an extension of an existing theory [96].

7. Results and Interpretation

7.1. Assessment of Measurement Model

Following the recommendation brought forward by Hair et al. [94], the measurement model/outer model was evaluated in PLS-SEM to determine if the observed indicator constructs possess reliability. Since unreliable constructs would restrict the evaluation of the structural model (inner model), the validity and reliability of the items and constructs of the measurement model required testing.

In order to obtain the indicators' loading, cross-loading, Cronbach alpha, composite reliability and AVEs were used. Ideally, several researchers have suggested and recommended that the cut-off point for individual items loading should be 0.40 and above; that is, any indicator with an outer loading of less than 0.4 should be removed from the measurement model [94]. Accordingly, the first time the PLS-SEM algorithm was calculated, one item loaded extremely poorly, i.e., COVID-19 3 was 0.378. One of the 38 items that had loaded poorly was removed based on the aforementioned criteria. One item was deleted (COV3) because the loading was below the threshold value of 0.40. Hence, after removing poor loading items, 37 items were retained for the final model. Table 3 provides a list of items retained for further analysis.

The relevant indicators representing the tested measurement model are shown in Table 3. Based on the table, the constructs were all valid and reliable, with values higher than those of the suggested threshold value for Cronbach's alpha, composite reliability and average variance extracted (AVE) (0.70, 0.70 and 0.50, respectively) [94]. The items met the requirements of convergent and discriminant validity, as all of the factor loadings on their corresponding constructs exceeded 0.40 [94,97]. Finally, the Fornell–Larcker criterion was used to establish the discriminant validity of the variables by comparing the AVE squared with the constructs' correlation coefficients.

The squared AVEs (Table 4) on the diagonal line exceeded the values of correlation coefficients between constructs, which established the discriminant validity of the constructs. In consideration of the indicators presented, it can be concluded that the measurement model met all the requirements for discriminant validity, convergent validity and reliability at both levels (construct and item). Thus, the study proceeded with the assessment of the structural model involving the hypothesis testing.

7.2. Assessment of the Structural Model

Following the analysis of the measurement model using PLS-SEM, the next step involved the assessment of the structural model, where the focus was on the effects of independent variables on the dependent one, with the effects differing from a model with a moderating variable and one without [94]. This study aimed to determine the main effects between DAS use and DAS performance. Accordingly, PLS was executed without the moderating variable and with the interaction effects identified using an additional model as recommended by past studies [94,98]. Thus, two distinct models were assessed: the direct relationship model and the moderating relationship model.

7.2.1. Direct Relationship Model

The direct relationship model was tested by using the PLS algorithm and bootstrapping method using 5000 resamples; this was carried out to determine the level and significance of the path coefficients for hypothesis testing. The standardized path coefficients (β -values), critical ratios (t-values) and p-values (supported hypotheses) of the formulated hypotheses are displayed in Table 5. In sum, from the eight formulated hypotheses, six obtained 90% or 95% confidence levels, among which the effects of DAS use on DAS performance ($\beta = 0.383$, $t = 6.977$, $p < 0.01$) had the highest significant effect, indicating support for H6. Beginning with the technological factors, compatibility's positive relationship with DAS use was supported ($\beta = 0.194$, $t = 2.588$, $p < 0.05$), but that of relative advantage was not ($\beta = 0.009$, $t = 0.110$), indicating support for H2 but not for H1. For organizational factors, the significant and positive effect of organizational readiness on DAS use was supported (H3) ($\beta = 0.127$, $t = 1.816$, $p < 0.05$) and so was that of TMS (H4) ($\beta = 0.095$, $t = 1.450$, $p < 0.10$). Lastly, for the environmental factors, government support's significant effect on DAS use was also supported (H5) ($\beta = 0.089$, $t = 1.394$, $p < 0.10$).

Table 3. Relevant Indicators of the Measurement Model.

| Latent Construct | Item | Item Loading | Cronbach's Alpha | Composite Reliability | AVE |
|-------------------------------|-------|--------------|------------------|-----------------------|-------|
| | | >0.4 | >0.7 | >0.7 | >0.5 |
| DAS Performance (DASP) | DASP1 | 0.873 | 0.837 | 0.879 | 0.553 |
| | DASP2 | 0.799 | | | |
| | DASP3 | 0.734 | | | |
| | DASP4 | 0.751 | | | |
| | DASP5 | 0.692 | | | |
| | DASP6 | 0.567 | | | |
| DAS Use (DASU) | DASU1 | 0.647 | 0.719 | 0.826 | 0.545 |
| | DASU2 | 0.772 | | | |
| | DASU3 | 0.698 | | | |
| | DASU4 | 0.822 | | | |
| Relative Advantage (RA) | RA1 | 0.503 | 0.836 | 0.874 | 0.541 |
| | RA2 | 0.707 | | | |
| | RA3 | 0.803 | | | |
| | RA4 | 0.796 | | | |
| | RA5 | 0.816 | | | |
| | RA6 | 0.741 | | | |
| Compatibility (CO) | CO1 | 0.756 | 0.717 | 0.835 | 0.631 |
| | CO2 | 0.901 | | | |
| | CO3 | 0.713 | | | |
| Top Management Support (TMS) | TMS 1 | 0.830 | 0.853 | 0.894 | 0.627 |
| | TMS 2 | 0.844 | | | |
| | TMS 3 | 0.842 | | | |
| | TMS 4 | 0.725 | | | |
| | TMS 5 | 0.709 | | | |
| Organizational Readiness (OR) | OR1 | 0.653 | 0.849 | 0.893 | 0.628 |
| | OR2 | 0.836 | | | |
| | OR3 | 0.877 | | | |
| | OR4 | 0.853 | | | |
| | OR5 | 0.720 | | | |
| COVID-19 (COV) | COV1 | 0.455 | 0.767 | 0.845 | 0.538 |
| | COV2 | 0.511 | | | |
| | COV4 | 0.801 | | | |
| | COV5 | 0.888 | | | |
| | COV6 | 0.889 | | | |
| | GS1 | 0.719 | | | |
| Government Support (GS) | GS2 | 0.605 | 0.810 | 0.866 | 0.523 |
| | GS3 | 0.838 | | | |
| | GS4 | 0.825 | | | |
| | GS5 | 0.734 | | | |
| | GS6 | 0.576 | | | |

Table 4. AVE Squared Root Values (Correlations among Latent Constructs).

| | DAS P | DAS U | Co | COV | RA | GS | TMS | OR |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| DAS P | 0.743 | | | | | | | |
| DAS U | 0.383 | 0.738 | | | | | | |
| Co | 0.451 | 0.347 | 0.794 | | | | | |
| COV | 0.288 | 0.386 | 0.317 | 0.733 | | | | |
| RA | 0.261 | 0.371 | 0.211 | 0.305 | 0.828 | | | |
| GS | 0.146 | 0.160 | 0.196 | 0.025 | 0.128 | 0.723 | | |
| TMS | 0.372 | 0.306 | 0.247 | 0.659 | 0.280 | 0.088 | 0.832 | |
| OR | 0.086 | 0.277 | 0.165 | 0.425 | 0.603 | 0.061 | 0.293 | 0.793 |

Table 5. Results of the Direct Relationship Model.

| Hypothesis No. | Relationship | Path Coefficient | T-Value | p-Value | Decision |
|----------------|---------------|------------------|---------|-----------|---------------|
| H1 | RA → DAS U | 0.009 | 0.110 | 0.457 | Not Supported |
| H2 | CO → DAS U | 0.194 | 2.588 | 0.013 ** | Supported |
| H3 | TMS → DAS U | 0.095 | 1.450 | 0.088 * | Supported |
| H4 | OR → DAS U | 0.127 | 1.816 | 0.049 ** | Supported |
| H5 | GS → DAS U | 0.089 | 1.394 | 0.096 * | Supported |
| H6 | DAS U → DAS P | 0.383 | 6.977 | 0.000 *** | Supported |

Note: Significant at * $p < 0.10$, ** $p < 0.05$ and *** $p < 0.01$ (one-tailed test).

7.2.2. Moderating Relationship Model

The study also tested the moderating relationship model, where the latent constructs of DAS use and COVID-19 were examined through the use of bootstrapping method with 5000 resamples. The p-value was calculated and the moderating effect was determined. Table 6 presents the results. Based on the values ($\beta = 0.204$, $t = 2.132$, $p < 0.05$), H7 was supported, indicating that COVID-19 moderated the DAS use–DAS performance relationship.

Table 6. Results of the Moderating Relationship Model.

| Hypothesis No. | Relationship | Path Coefficient | T-Value | p-Value | Decision |
|----------------|------------------------|------------------|---------|----------|-----------|
| H9 | DASU * COVID-19 → DASP | 0.202 | 2.132 | 0.028 ** | Supported |

Notes: Significant at * $p < 0.10$, ** $p < 0.05$. DAS U = DAS Use and DAS P = DAS Performance.

8. Discussion

Owing to the lack of theoretical foundation of DAS use from the perspective of the organization, this study aimed to explore DAS performance (perceived impact) and its constructs from this context by developing and presenting an integrated model combining the TOE framework and RBV theory. The statistical analysis results showed the relationship among the TOE factors (compatibility, TMS, organizational readiness and government support) and DAS use.

To begin with, in the technological dimension, the findings found compatibility having the highest effect on DAS use among all the TOE factors, showing that DAS needs to be highly compatible with business practices, work processes and IT infrastructure. However, when it comes to relative advantage, the result did not support a significant impact on DAS use, contradicting the prediction of DOI theory and the results of past studies that supported a significant effect from relative advantage to the implementation and use of IS/IT applications [23,61]. Some other studies found no significant effect [25,99]. This outcome may be attributed to the argument that, regardless of the varying affordability of SMEs, the current DAS appears to be easily obtainable because of its low cost and strong competitive market. Hence, low cost, easy possession of DAS and the inclination to imitate competitors would have led to boosting SMEs to accept a system regardless of its pros and cons.

Moving on to the organizational dimension, based on the obtained findings, the positive effects of TMS and organizational readiness on DAS use among Jordanian SMEs were supported. In other words, firms with higher TMS levels have a higher tendency to use

DAS, as supported by former studies that asserted that the level of manager involvement in DAS use and their knowledge of the system would lead to smooth acceptance of IS/IT in SMEs. The findings supported that high organizational readiness in firms tends to lead to extensive DAS use, which is supported by past studies [23,61] that found a significant effect of the same on IS/IT use. Perceive compatibility gives the firms an impetus to use DAS and the readiness of available resources (financial, technical, etc.) ensures that DAS is effectively deployed. The study result highlights SMEs' readiness and the availability of human and technical resources to leverage DAS.

Lastly, in the environmental dimension, the findings supported the significant influence of government support on DAS use on the basis of the assessment of path coefficient values. This result may be related to the preference of SMEs for formal support types (governmental support) rather than informal support when seeking advice and support on matters related to DAS. The government of Jordan has been exerting efforts to bring about the use of accounting-related software (e.g., DAS) in different programs and initiatives and with concomitant affordable costs, promoting consultation from government-related agencies to mitigate the low reliance of establishments on informal support.

Notably, the findings revealed that using DAS contributes to its effective performance and, based on RBV theory, SMEs using DAS extensively have a tendency to obtain higher value from it. This finding is important to prior studies in different IS/IT domains [46,61] that indicated the significant influence of IS/IT use on technology impact. Businesses sustainability could be successfully improved through DAS usage, which subsequently catalyzes performance and global competitiveness [100,101]. Based on Lutfi et al. [26], DAS-implementing business tends to document positive and significant implications on businesses' sustainability compared to counterparts with restricted DAS use. Likewise, technology impacts rely on the degree to which it is used and utilized to conduct businesses events and activity under the TOE framework. SMEs must first incorporate DAS to ascertain its influences on performance and sustainability.

This study tested the moderating role of COVID-19 on the relationship between DAS use and DAS performance and the result showed support for the significant moderating effects. The advent of the pandemic during a period of technological development when activities are primarily being carried out through the Internet led to the opportunity to leverage the technologies' optimal efficiencies and this holds true for DAS. Studies of this caliber also showed the positive impact of COVID-19 on DAS use and performance [6–8,26,43]. Using digital technologies such as DAS is one of the top success factors among SMEs [10,102]. Overall, COVID-19 pushed enterprises to upgrade their technologies and automate their infrastructure for secure and effective business interactions and processes [103].

9. Implications

In this study, the author provided information on the influencing factors of DAS use among SMEs in Jordan and, in turn, its effect on DAS performance, with COVID-19 taken as the moderating variable. Studies in the literature on the same topic are scarce and thus this study contributes to both theory and practice in the area of DAS use among SMEs, particularly in Jordan.

The study contributes to theory by proposing a validated model containing the antecedents of DAS use and their effects. The research supports the TOE framework and RBV theory in the perception of organizations. It also supports the use of RBV as a theoretical basis for studies focusing on the effects and value of DAS. In this study, past works were extended on the evaluation of IS/IT usage, which has remained within the use of the overall impact of technological innovations. The combination of TOE and RBV and their use in a single research model to examine technology use and impacts contribute to the explanatory and predictive powers of the models as well as generates findings that have implications to practitioner and academic circles.

Another notable theoretical contribution of this study is the argument made connecting DAS usage and DAS performance, contingent upon the COVID-19 pandemic. The

pandemic moderated the effect of DAS use on its performance—a finding that provides insight into a theoretical phenomenon and its implications. Regardless of the COVID-19 effect mentioned in literature, as an antecedent of DAS use and DAS performance, empirical findings on the same has been rare. Thus, this study contributes by providing information on the impact of the pandemic on SMEs' activities, which were ravaged by the pandemic. This calls for an in-depth understanding of such effects in this digital era. DAS implementation to enhance the sustainability and competitive performance of establishments is highly recommended, with the findings supporting the focus of SMEs on the promotion of DAS use in times of uncertainty.

As for the contributions of the findings to practice, managers and leaders of SMEs, policy makers and industry leaders who are inclined to gain information on the reason why SMEs lag behind their larger counterparts in using DAS can benefit from the study findings. Respondents showed that informal networking and relative advantage had no significant roles and thus firms should be more focused on using formal networking in the form of government agencies, SME advisory centers, financial institutions, IT consultants and others to promote and bring about high-level DAS usage. Added to this, the proposed model of this study can assist SME managers and owners in being concerned about the important factors that promote extensive DAS use and, in turn, its influence on DAS performance. The model can be used to discern the potential effects of DAS use on firms and evaluate such use for supporting decision-making when it comes to initiatives. This study's findings also highlighted that small firms appear to expect lower benefits from using DAS compared to their medium-sized counterparts, which is why their proportion is lower than that of the latter in using DAS.

Furthermore, policy-makers and the government can take advice from the findings by cementing their role in assisting and promoting DAS technology use among SMEs. The Jordanian government can enhance the use of DAS among smaller firms to obtain benefits and value and it should be active in encouraging such firms to adopt and use innovation.

Finally, this study supported the moderating effect of the COVID-19 pandemic on the relationship between DAS use and DAS performance, highlighting for enterprises the importance of focusing on the impact of exogenous shocks on stimulating positive DAS use. In an environment rife with uncertainty, managers and owners of SMEs are recommended to promote DAS use in their firms as a cost-saving strategy. The positive moderating role of COVID-19 on the relationship between the variables indicates the need for SMEs to develop DAS use for sustainability and competitive performance.

10. Limitations and Recommendations for Future Studies

In any research work, limitations are difficult to avoid, but these can be used to pave the way for future opportunities. With regard to this study, the focus was placed on Jordanian manufacturing SMEs, indicating that the findings may not be applicable or generalizable to other sector's SMEs or, for that matter, to the SMEs in other countries. Future studies can replicate the study in other sectors, firm types and countries to obtain comparable findings and increase the understanding of the topic. Future studies can likewise validate the measurement scales, conceptualizations and generalizability of results. Another limitation relates to the response rate of the study; regardless of the different follow-up efforts, the study findings were based on 186 responses, which are sufficient to test the fit of the model and conduct statistical inferences, despite the low rate of response. In this regard, future studies can verify the findings on a larger-sized sample to allow the use of covariance-based SEM and pave the way for more robust findings. Similarly, using large-sized samples would enrich the understanding of the relationship between latent variables with higher confidence values.

Still another limitation is the use of cross-sectional data, where the relationships between the factors were not accurately ascertained because the data were gathered at one point in time and not throughout different periods. Using longitudinal data would deal with such a drawback. Additionally, Jordan is a unique country with characteristics distinct from

those of other developed and developing nations in light of transition and digitalization. The Jordanian market is also significantly influenced by the policies established by the government, a phenomenon that is not as prominent in developed nations. Thus, the conclusions of the findings may not be generalizable to other countries. In this regard, future research can replicate the study and obtain comparative findings. Finally, this study tested the effects of TOE variables on DAS use and the relationship between DAS use and DAS performance. Future studies may test the direct influence of TOE variables on IS/IT to clarify potential direct effects.

11. Conclusions

The objectives of the current study were to investigate the drivers of DAS adoption and the role of DAS adoption on the performance of system, as well as the moderation influence of COVID-19 on the relationship between DAS adoption and performance. The low adoption level and performance found in prior research motivated the present study. The low level of adopting DAS and system value were also found to explain weak IMPACT (performance). This empirical research presents a distinguished contribution by examining the role of DAS adoption in enhancing system impacts and value.

The topic of DAS adoption in the Jordanian context is becoming more important, particularly considering the agenda of the Jordanian government in moving toward a contemporary and digital business environment. The effective usage of DAS is critical for every business in every industry. With the purpose of accomplishing effective adoption, SMEs must consider the potential drivers that might influence the adoption processes, given that several digital systems have failed owing to a low-level of usage.

Almost a majority of hypotheses proposed have an impact on the use of DAS. Furthermore, this plays a significant role in enterprises' decision to implement DAS. DAS has undoubtedly been beneficial to organizations that have implemented it, including reducing labor costs, saving time, providing useful information to leaders and improving professional qualifications. In almost all cases, they are satisfied with the quality of services provided by DAS. Those respondents to the survey who are willing to utilize all resources and encourage their employees to work with DAS are positive indicators for the Jordanian economy. Furthermore, DAS has proven to be a superior technology for managing large amounts of data. DAS will therefore become more widely used in the future. As a result of the complex COVID situation, many office workers, especially those in the accounting, auditing and management departments, are required to work from home. As a result, they are unable to communicate directly with each other. Additionally, organizations must maintain and protect data at all times. As a result of this trend, the use of DAS is on the rise.

The present research provided additional evidence to the growing body of knowledge concerning the drivers of DAS adoption and value in Jordanian SMEs, where the DAS adoption level is still low. This study improved and enhanced the understanding of the antecedents affecting DAS adoption and their influence on DAS performance among SMEs. It likewise investigated the moderating role of COVID-19 on the association between DAS adoption and DAS performance.

The analysis of survey data showed that only five out of six factors have a significant impact on DAS adoption. Furthermore, DAS adoption significantly influences DAS performance. This research also revealed that COVID-19 influences the relationship between DAS adoption and DAS performance, indicating the need for SMEs to develop their use of DAS for sustainability performance and competitiveness. Finally, the hope is that the current study will motivate more theory building and additional studies in this area of research.

Author Contributions: Conceptualization, S.N.A. and M.S.; Data curation, A.F.A.; Formal analysis, M.H.A., M.A.A. and N.I.; Funding acquisition, A.L.; Investigation, S.N.A. and M.A.; Methodology, A.L. and M.A.A.; Project administration, M.A.A.-K. and A.A.; Resources, A.F.A.; Software, M.H.A.; Supervision, M.S.; Validation, A.A.; Writing—original draft, A.L.; Writing—review & editing, M.A.A.-K., M.A. and N.I. All authors have read and agreed to the published version of the manuscript.

Funding: This research was funded through the annual funding track by the Deanship of Scientific Research, vice presidency for graduate studies and scientific research, King Faisal University, Saudi Arabia [GRANT803], and Al-Hussein Bin Talal University Project Number (166/2022).

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: The data presented in this study are available on request from the corresponding author.

Conflicts of Interest: The authors declare no conflict of interest.

Appendix A

| Measurement Items | Source |
|---|--------|
| DAS Usage Our business use DAS Our business intends to use DAS in regular bases in the future. Our business would highly recommend DAS for others to adopt. | [23] |
| Relative advantage DAS enables our business to appropriately manage supply chain risks. DAS enables our business to provide useful information to make decisions. DAS would enable our business to respond faster than competitors to changing environments. DAS would enable our business to reduce our operation cost. DAS would enable our business to reduce our operation time. | [47] |
| Top Management Support Our top management promotes the use of DAS in the business. Our top management creates support for DAS initiatives within the business. Our top management promotes DAS as a strategic priority within the business. Our top Management is interested in the news about DAS adoption. Our top Management overcome the hurdles present due to natural resistance to technology usage. | [47] |
| Organizational Readiness Lacking capital/financial resources has prevented my business from fully exploit BD. Lacking needed IT infrastructure has prevented my business from exploiting BD. Lacking analytics capability prevent the business fully exploit BD. Lacking skilled resources prevent the business fully exploit BD. | [23] |
| Government Support The governmental policies encourage our business to adopt new ITs (e.g., BDA). The government provides incentives for adopting BD. Government procurements and contracts such as offering technical support, training, and funding for BD adoption. Standards or laws support adoption of BD technologies. Adequate legal protection supports BD technology adoption. There are some business laws to deal with the security and privacy concerns over the BD technologies. | [47] |
| DAS Performance DAS is a processing system to generate information for decision managers. DAS minimize uncertainty in decision-making and improve the ability to plan and control activities. DAS supports our business growth in terms of sales, revenue and customers provide information to internal and external audiences. DAS improve user satisfaction, reduce errors, and improve information availability. DAS reduce costs reduce time, save human resources for businesses to use. DAS is a connection tool for management systems and operational systems. | [47] |
| COVID-19 COVID-19 has had an adverse impact on our organization. COVID-19 has made daily work even more challenging. COVID-19 has added to concerns about their future development. COVID-19 has inspired our organization to take the initiative to expand business. COVID-19 has caused me to work longer hours. COVID-19 has made work more demanding. | [100] |
| Compatibility Using DAS is compatible with our business culture. Using DAS is compatible with our business values. Using DAS is compatible with our preferred work practices. | [23] |

References

- Almaiah, M.A.; Ayouni, S.; Hajjaj, F.; Lutfi, A.; Almomani, O.; Awad, A.B. Smart Mobile Learning Success Model for Higher Educational Institutions in the Context of the COVID-19 Pandemic. *Electronics* **2022**, *11*, 1278. [\[CrossRef\]](#)
- Alsmadi, A.A.; Alzoubi, M. Green Economy: Bibliometric Analysis Approach. *Int. J. Energy Econ. Policy* **2022**, *12*, 282–289. [\[CrossRef\]](#)

3. Alsyouf, A.; Lutfi, A.; Al-Bsheish, M.; Jarrar, M.; Al-Mugheed, K.; Almaiah, M.A.; Alhazmi, F.N.; Masa'deh, R.; Anshasi, R.J.; Ashour, A. Exposure Detection Applications Acceptance: The Case of COVID-19. *Int. J. Environ. Res. Public Health* **2022**, *19*, 7307. [[CrossRef](#)] [[PubMed](#)]
4. Janssen, M.; van der Voort, H.; Wahyudi, A. Factors influencing big data decision-making quality. *J. Bus. Res.* **2017**, *70*, 338–345. [[CrossRef](#)]
5. Alshira'h, A.F.; Abdul-Jabbar, H.; Samsudin, R.S. Sales tax compliance model for the Jordanian small and medium enterprises research. *J. Adv. Res. Soc. Behav. Sci.* **2018**, *10*, 115–130.
6. Lohapan, N. Digital accounting implementation and audit performance: An empirical research of tax auditors in Thailand. *J. Asian Financ. Econ. Bus.* **2021**, *8*, 121–131.
7. AlNasrallah, W.; Saleem, F. Determinants of the Digitalization of Accounting in an Emerging Market: The Roles of Organizational Support and Job Relevance. *Sustainability* **2022**, *14*, 6483. [[CrossRef](#)]
8. Hasbolah, F.; Rosli, M.H.; Hamzah, H.; Omar, S.A.; Bhuiyan, A.B. The digital accounting entrepreneurship competency for sustainable performance of the rural Micro, Small and Medium Enterprises (MSMES): An empirical review. *Int. J. Small Medium Enterp.* **2021**, *4*, 12–25.
9. Cokins, G.; Oncioiu, I.; Türkeş, M.C.; Topor, D.I.; Căpuşneanu, S.; Paştiu, C.A.; Deliu, D.; Solovăstru, A.N. Intention to use accounting platforms in Romania: A quantitative study on sustainability and social influence. *Sustainability* **2020**, *12*, 6127. [[CrossRef](#)]
10. Apriyanti, H.W.; Yuvtasari, E. The role of digital utilization in accounting to enhance MSMEs' performance during COVID-19 pandemic: Case study in Semarang, Central Java, Indonesia. In *Conference on Complex, Intelligent, and Software Intensive Systems*; Springer: Cham, Switzerland, 2021; pp. 495–504.
11. Ashraf, M.; Watto, W.A.; Alrawad, M. Do Uncertainty and Financial Development Influence the FDI Inflow of a Developing Nation? A Time Series ARDL Approach. *Sustainability* **2022**, *14*, 12609. [[CrossRef](#)]
12. Bani-Khalid, T.; Alshira'h, A.F.; Alshirah, M.H. Determinants of Tax Compliance Intention among Jordanian SMEs: A Focus on the Theory of Planned Behavior. *Economies* **2022**, *10*, 30. [[CrossRef](#)]
13. Alsyouf, A.; Masa'deh, R.; Albugami, M.; Al-Bsheish, M.; Lutfi, A.; Alsubahi, N. Risk of Fear and Anxiety in Utilising Health App Surveillance Due to COVID-19: Gender Differences Analysis. *Risks* **2021**, *9*, 179. [[CrossRef](#)]
14. Oudat, M.S.; Alsmadi, A.A.; Alrawashdeh, N.M. Foreign direct investment and economic growth in Jordan: An empirical research using the bounds test for cointegration. *Rev. Finanz. Y Politica Econ.* **2019**, *11*, 55–63. [[CrossRef](#)]
15. Son, D.D.; Marriot, N.; Marriot, P. Users' perceptions and uses of financial reports of small and medium companies in transitional economies: Qualitative evidence from Vietnam. *Qual. Res. Account. Manag.* **2006**, *3*, 218–235. [[CrossRef](#)]
16. Alshirah, M.H.; Rahman, A.A.; Mustapa, I.R. Board of directors' characteristics and corporate risk disclosure: The moderating role of family ownership. *EuroMed J. Bus.* **2020**, *7*, 423–440. [[CrossRef](#)]
17. Ali, A.; Rahman, M.; Ismail, W. Predicting continuance intention to use accounting information systems among SMEs in Terengganu, Malaysia. *Int. J. Econ. Manag.* **2012**, *6*, 295–320.
18. Alghusain, N.; Alsmadi, A.A.; Alkhatib, E.; Alqtish, A.M. The impact of financial policy on economic growth in Jordan (2000–2017): An ardl approach. *Ekon. Pregl.* **2020**, *71*, 97–108. [[CrossRef](#)]
19. Hameed, M.A.; Counsell, S. Establishing relationships between innovation characteristics and IT innovation adoption in organizations: A meta-Analysis Approach. *Int. J. Innov. Manag.* **2014**, *18*, 1450007. [[CrossRef](#)]
20. Owoseni, A.; Twinomurinzi, H. Mobile apps usage and dynamic capabilities: A structural equation model of SMEs in Lagos, Nigeria. *Telemat. Inform.* **2018**, *35*, 2067–2081. [[CrossRef](#)]
21. Wang, Y.; Shi, X. Thrive, not just survive: Enhance dynamic capabilities of SMEs through IS competence. *J. Syst. Inf. Technol.* **2011**, *13*, 200–222. [[CrossRef](#)]
22. Elbashir, M.Z.; Collier, P.A.; Sutton, S.G. The role of organizational absorptive capacity in strategic use of business intelligence to support integrated management control systems. *Account. Rev.* **2011**, *86*, 155–184. [[CrossRef](#)]
23. Lutfi, A.A.; Idris, K.M.; Mohamad, R. The influence of technological, organizational and environmental factors on accounting information system usage among Jordanian small and medium-sized enterprises. *Int. J. Econ. Financ. Issues* **2016**, *6*, 240–248. [[CrossRef](#)]
24. Alrawashdeh, N.; Alsmadi, A.A.; Anwar, A.L. FinTech: A Bibliometric Analysis for the Period of 2014–2021. *Qual. Access Success* **2022**, *23*, 176–188.
25. Almaiah, M.A.; Alfaisal, R.; Salloum, S.A.; Al-Otaibi, S.; Shishakly, R.; Shishakly, R.; Alrawad, M.; Mulhem, A.A.; Al-Marroof, R.S. Integrating Teachers' TPACK Levels and Students' Learning Motivation, Technology Innovativeness, and Optimism in an IoT Acceptance Model. *Electronics* **2022**, *11*, 3197. [[CrossRef](#)]
26. Al-Khasawneh, A.L.; Almaiah, M.A.; Alsyouf, A.; Alrawad, M. Business Sustainability of Small and Medium Enterprises during the COVID-19 Pandemic: The Role of AIS Implementation. *Sustainability* **2022**, *14*, 5362. [[CrossRef](#)]
27. Alsyouf, A. Self-efficacy and personal innovativeness influence on nurses beliefs about EHRS usage in Saudi Arabia: Conceptual model. *Int. J. Manag. (IJM)* **2021**, *12*, 1049–1058.
28. Dyt, R.; Halabi, A.K. Empirical evidence examining the accounting information systems and accounting reports of small and micro business in Australia. *Small Enterp. Res.* **2007**, *15*, 1–9. [[CrossRef](#)]

29. Alshir'ah, A.F.; Abdul Jabbar, H.; Samsudin, R.S. Determinants of sales tax compliance in small and medium enterprises in Jordan: A call for empirical research. *World J. Manag. Behav. Stud.* **2016**, *4*, 41–46.
30. Ismail, N.A.; King, M. Factors influencing the alignment of accounting information systems in small and medium sized Malaysian manufacturing firms. *J. Inf. Syst. Small Bus.* **2007**, *1*, 1–20.
31. Smirat, B.Y.A. The use of accounting information by small and medium enterprises in south district of Jordan, (An empirical study). *Res. J. Financ. Account.* **2013**, *4*, 169–175.
32. Khassawneh, A.A.L. The influence of organizational factors on Accounting Information Systems (AIS) effectiveness: A study of Jordanian SMEs. *Int. J. Mark. Technol.* **2014**, *4*, 36–46.
33. Ismail, N.A.; Mat Zin, R. Usage of accounting information among Malaysian Bumiputra small and medium non-manufacturing firms. *J. Enterp. Resour. Plan. Stud.* **2009**, *2009*, 101113.
34. Ismail, W.; Ali, A. Conceptual model for examining the factors that influence the likelihood of Computerized Accounting Information System (CAIS) adoption among Malaysian SMEs. *Int. J. Inf. Technol. Bus. Manag.* **2013**, *15*, 122–151.
35. Ahmad, M.; Ayasra, A.; Zawaideh, F. Issues and problems related to data quality in AIS implementation. *Int. J. Latest Res. Sci. Technol.* **2013**, *2*, 17–20.
36. Idris, K.M.; Mohamad, R. AIS usage factors and impact among Jordanian SMEs: The moderating effect of environmental uncertainty. *J. Adv. Res. Bus. Manag. Stud.* **2017**, *6*, 24–38.
37. Alsmadi, A.A.; Sha'ban, M.; Al-Ibbini, O.A. The relationship between E-banking services and bank profit in Jordan for the period of 2010–2015. Pervasive Health: Pervasive computing technologies for healthcare. In Proceedings of the 2019 5th International Conference on E-Business and Applications, Bangkok, Thailand, 25–28 February 2019; pp. 70–74.
38. Bruwer, J.P.; Smit, Y. Accounting Information Systems—A value-adding phenomenon or a mere trend? The situation in Small and Medium financial service organizations in the Cape Metropolis. *Expert J. Bus. Manag.* **2015**, *3*, 38–52.
39. Alamin, A.; Yeoh, W.; Warren, M.; Salzman, S. An empirical study of factors influencing accounting information systems adoption. In Proceedings of the 23rd European Conference on Information Systems, ECIS, Münster, Germany, 26–29 May 2013; Available online: <http://dro.deakin.edu.au/eserv/DU:30073613/yeoh-anempiricalstudy-2015.pdf> (accessed on 14 August 2022).
40. Melville, N.; Kraemer, K.; Gurbaxani, V. Review: Information technology and organizational performance: An integrative model of IT business value. *MIS Q.* **2004**, *28*, 283–322. [[CrossRef](#)]
41. Wade, M.; Hulland, J. Review: The resource-based view and information systems research: Review, extension, and suggestions for future research. *MIS Q.* **2004**, *28*, 107–142. [[CrossRef](#)]
42. Sila, I. Do organizational and environmental factors moderate the effects of Internet-based Interorganizational systems on firm performance quest? *Eur. J. Inf. Syst.* **2010**, *19*, 581–600. [[CrossRef](#)]
43. Thuan, P.Q.; Khuong, N.V.; Anh, N.D.C.; Hanh, N.T.X.; Thi, V.H.A.; Tram, T.N.B.; Han, C.G. The Determinants of the Usage of Accounting Information Systems toward Operational Efficiency in Industrial Revolution 4.0: Evidence from an Emerging Economy. *Economies* **2022**, *10*, 83. [[CrossRef](#)]
44. Devaraj, S.; Kohli, R. Performance impacts of information technology: Is actual usage the missing link. *Manag. Sci.* **2003**, *49*, 273–289. [[CrossRef](#)]
45. Mishra, A.N.; Konana, P.; Barua, A. Antecedents and consequences of internet use in procurement: An empirical investigation of US manufacturing firms. *Inf. Syst. Res.* **2007**, *18*, 103–120. [[CrossRef](#)]
46. Henderson, D.; Sheetz, S.D.; Trinkle, B.S. The determinants of inter-organizational and internal in-house adoption of XBRL: A structural equation model. *Int. J. Account. Inf. Syst.* **2012**, *13*, 109–140. [[CrossRef](#)]
47. Lutfi, A.; Al-Okaily, M.; Alsyouf, A.; Alsaad, A.; Taamneh, A. The Impact of AIS Usage on AIS Effectiveness among Jordanian SMEs: A Multi Group Analysis of the Role of Firm Size. *Glob. Bus. Rev.* **2020**, *21*, 0972150920965079. [[CrossRef](#)]
48. Lutfi, A. Understanding the Intention to Adopt Cloud-based Accounting Information System in Jordanian SMEs. *Int. J. Digit. Account. Res.* **2022**, *22*, 47–70. [[CrossRef](#)]
49. Lutfi, A. Factors Influencing the Continuance Intention to Use Accounting Information System in Jordanian SMEs from the Perspectives of UTAUT: Top Management Support and Self-Efficacy as Predictor Factors. *Economies* **2022**, *10*, 75. [[CrossRef](#)]
50. Alsmadi, A.; Alrawashdeh, N.; Al-Dweik, A.; Al-Assaf, M. Cryptocurrencies: A bibliometric analysis. *Int. J. Data Netw. Sci.* **2022**, *6*, 619–628. [[CrossRef](#)]
51. Ismail, N.A. Factors influencing AIS effectiveness among manufacturing SMEs: Evidence from Malaysia. *Electron. J. Inf. Syst. Dev. Ctries.* **2009**, *38*, 1–19. [[CrossRef](#)]
52. Almaiah, M.A.; Al-Otaibi, S.; Lutfi, A.; Almomani, O.; Awajan, A.; Alsaaidah, A.; Alrawad, M.; Awad, A.B. Employing the TAM Model to Investigate the Readiness of M-Learning System Usage Using SEM Technique. *Electronics* **2022**, *11*, 1259. [[CrossRef](#)]
53. Alraja, M.N.; Imran, R.; Khashab, B.M.; Shah, M. Technological innovation, sustainable green practices and SMEs sustainable performance in times of crisis (COVID-19 pandemic). *Inf. Syst. Front.* **2022**, 1–25. [[CrossRef](#)]
54. Tornatzky, L.G.; Fleischer, M. *The Processes of Technological Innovation*; Lexington Books: Lexington, MA, USA, 1990.
55. Rogers, E.M. *Diffusion of Innovations*, 5th ed.; Free Press: New York, NY, USA, 2003.
56. Zhu, K.; Kraemer, L. Post-adoption variations in usage and value of e-business by organizations: Cross-country evidence from retail industry. *Inf. Syst. Res.* **2005**, *16*, 61–84. [[CrossRef](#)]
57. Picoto, W.N.; Bélanger, F.; Palma-dos-Reis, A. An organizational perspective on m-business: Usage factors and value determination. *Eur. J. Inf. Syst.* **2014**, *23*, 571–592. [[CrossRef](#)]

58. Ramanathan, R.; Ramanathan, U.; Hsiao, H.L. The impact of e-commerce on Taiwanese SMEs: Marketing and operations effects. *Int. J. Prod. Econ.* **2012**, *140*, 934–943. [[CrossRef](#)]
59. Maroufkhani, P.; Ismail WK, W.; Ghobakhloo, M. Big data analytics adoption model for small and medium enterprises. *J. Sci. Technol. Policy Manag.* **2020**, *11*, 483–513. [[CrossRef](#)]
60. Zhu, K. The complementarity of information technology infrastructure and e-commerce capability: A resource-based assessment of their business value. *J. Manag. Inf. Syst.* **2004**, *21*, 167–202. [[CrossRef](#)]
61. Garg, A.K.; Choou, T. The adoption of electronic commerce by small and medium enterprises in Pretoria East. *Electron. J. Inf. Syst. Dev. Ctries.* **2015**, *68*, 1–23. [[CrossRef](#)]
62. Shanmugam, J.K. The Impact of Information Technology (IT) Adoption towards Small Medium Enterprises (SMEs) Performance in Malaysia: The Role of IT Governance as Moderator. 2016. Available online: https://www.researchgate.net/publication/305865357_The_Impact_of_Information_Technology_IT_Adoption_Towards_Small_Medium_Enterprises_SMEs_Performance_In_Malaysia_The_Role_of_IT_Goverance_as_Moderator (accessed on 3 September 2022).
63. Hossain, M.B.; Wicaksono, T.; Nor, K.M.; Dunay, A.; Illes, C.B. E-commerce adoption of small and medium-sized enterprises during COVID-19 pandemic: Evidence from South Asian Countries. *J. Asian Financ. Econ. Bus.* **2022**, *9*, 291–298.
64. Cruz-Jesus, F.; Pinheiro, A.; Oliveira, T. Understanding CRM adoption stages: Empirical analysis building on the TOE framework. *Comput. Ind.* **2019**, *109*, 1–13. [[CrossRef](#)]
65. Al-Omouh, K.S.; Al Attar, M.K.; Saleh, I.H.; Alsmadi, A.A. The drivers of E-banking entrepreneurship: An empirical study. *Int. J. Bank Mark.* **2020**, *38*, 485–500. [[CrossRef](#)]
66. Căpușneanu, S.; Mateș, D.; Túrkes, M.C.; Barbu, C.M.; Staras, A.I.; Topor, D.I.; Stoenică, L.; Fülöp, M.T. The impact of force factors on the benefits of digital transformation in Romania. *Appl. Sci.* **2021**, *11*, 2365. [[CrossRef](#)]
67. McMahan, R.G.P. Growth and performance of manufacturing SMEs: The influence of financial management characteristics. *Int. Small Bus. J.* **2001**, *19*, 10–28. [[CrossRef](#)]
68. Rahayu, R.; Day, J. Determinant factors of E-commerce adoption by SMEs in developing country: Evidence from Indonesia. *Procedia-Soc. Behav. Sci.* **2015**, *195*, 142–150. [[CrossRef](#)]
69. Al-Alawi, A.I.; Al-Ali, F.M. Factors affecting E-commerce adoption in SMEs in GCC: An empirical study of Kuwait. *Res. J. Inf. Technol.* **2015**, *7*, 1–21. [[CrossRef](#)]
70. Kim, S.; Baek, T.H. Examining the antecedents and consequences of mobile app engagement. *Telemat. Inform.* **2018**, *35*, 148–158. [[CrossRef](#)]
71. Almaiah, M.A.; Hajjej, F.; Al-Khasawneh, A.; Shehab, R.; Al-Otaibi, S.; Alrawad, M. Explaining the Factors Affecting Students' Attitudes to Using Online Learning (Madrasati Platform) during COVID-19. *Electronics* **2022**, *11*, 973. [[CrossRef](#)]
72. Meri, A.; Hasan, M.; Danaee, M.; Jaber, M.; Jarrar, M.; Safei, N.; Dauwed, M.; Abd, S.K.; Al-Bsheish, M. Modelling the utilization of cloud health information systems in the Iraqi public healthcare sector. *Telemat. Inform.* **2019**, *36*, 132–146. [[CrossRef](#)]
73. Thong, J.Y.; Yap, C.S.; Raman, K.S. Top management support, external expertise and information systems implementation in small businesses. *Inf. Syst. Res.* **1996**, *7*, 248–267. [[CrossRef](#)]
74. Mehrtens, J.; Cragg, P.B.; Mills, A.M. A model of Internet adoption by SMEs. *Inf. Manag.* **2001**, *39*, 165–176. [[CrossRef](#)]
75. Chwelos, P.; Benbasat, I.; Dexter, A.S. Research report: Empirical test of an EDI adoption model. *Inf. Syst. Res.* **2001**, *12*, 304–321. [[CrossRef](#)]
76. Al-Khasawneh, A.L.; Barakat, H.J. The role of the Hashemite leadership in the development of human resources in Jordan: An analytical study. *Int. Rev. Manag. Mark.* **2016**, *6*, 654–667.
77. Alsyouf, A.; Ishak, A.K.; Alhazmi, F.N.; Al-Okaily, M. The Role of Personality and Top Management Support in Continuance Intention to Use Electronic Health Record Systems among Nurses. *Int. J. Environ. Res. Public Health* **2022**, *19*, 11125. [[CrossRef](#)]
78. Al-Khasawneh, A.L.; Al-Zoubi, M.R.; Alnajjar, F.J. Quality between the contemporary management & Islamic thought perspectives: Comparative study. *J. Emerg. Trends Econ. Manag. Sci.* **2013**, *4*, 281–290.
79. Lutfi, A. Investigating the moderating effect of Environment Uncertainty on the relationship between institutional factors and ERP adoption among Jordanian SMEs. *J. Open Innov. Technol. Mark. Complex.* **2022**, *6*, 91. [[CrossRef](#)]
80. Alrawad, M.; Alyatama, S.; Elshaer, I.A.; Almaiah, M.A. Perception of Occupational and Environmental Risks and Hazards among Mineworkers: A Psychometric Paradigm Approach. *Int. J. Environ. Res. Public Health* **2022**, *19*, 3371. [[CrossRef](#)]
81. Verkijika, S.F. Factors influencing the adoption of mobile commerce applications in Cameroon. *Telemat. Inform.* **2018**, *35*, 1665–1674. [[CrossRef](#)]
82. Lutfi, A. Understanding Cloud Based Enterprise Resource Planning Adoption among SMEs in Jordan. *J. Theor. Appl. Inf. Technol.* **2021**, *99*, 5944–5953.
83. Esmeray, A. The Impact of Accounting Information Systems (AIS) on Firm Performance: Empirical Evidence in Turkish Small and Medium Sized Enterprises. *Int. Rev. Manag. Mark.* **2016**, *6*, 233–236.
84. DeLone, W.H.; McLean, E.R. Information systems success: The quest for the dependent variable. *Inf. Syst. Res.* **1992**, *3*, 60–95. [[CrossRef](#)]
85. De Guinea, A.O.; Kelley, H.; Hunter, M.G. Information systems effectiveness in small businesses: Extending a Singaporean model in Canada. *J. Glob. Inf. Manag.* **2005**, *13*, 55–79. [[CrossRef](#)]
86. Tan, L.F.; Seetharaman, S. Preventing the spread of COVID-19 to nursing homes: Experience from a Singapore geriatric centre. *J. Am. Geriatr. Soc.* **2020**, *68*, 942. [[CrossRef](#)]

87. Kraus, S.; Clauss, T.; Breier, M.; Gast, J.; Zardini, A.; Tiberius, V. The economics of COVID-19: Initial empirical evidence on how family firms in five European countries cope with the corona crisis. *Int. J. Entrep. Behav. Res.* **2020**, *26*, 1067–1092. [[CrossRef](#)]
88. Montani, F.; Staglianò, R. Innovation in times of pandemic: The moderating effect of knowledge sharing on the relationship between COVID-19-induced job stress and employee innovation. *RD Manag.* **2022**, *52*, 193–205. [[CrossRef](#)]
89. Miroshnychenko, I.; Strobl, A.; Matzler, K.; de Massis, A. Absorptive capacity, strategic flexibility, and business model innovation: Empirical evidence from Italian SMEs. *J. Bus. Res.* **2021**, *130*, 670–682. [[CrossRef](#)]
90. McKinsey, G.L.; Lizama, C.O.; Keown-Lang, A.E.; Niu, A.; Santander, N.; Larphaveesarp, A.; Chee, E.; Gonzalez, F.F.; Arnold, T.D. A new genetic strategy for targeting microglia in development and disease. *eLife* **2020**, *9*, e54590. [[CrossRef](#)] [[PubMed](#)]
91. Lodge, M.; Boin, A. Great easing? Leaders face a tragic dilemma but they should not hide behind the backs of experts. *LSE COVID-19 Blog*, 14 May 2020; 1–3.
92. Amman Chamber of Industry. 2014. Available online: <http://www.aci.org.jo/development/en/> (accessed on 1 March 2022).
93. Alshira'h, A.; Alsqour, M.; Alsyouf, A.; Alshirah, M. A Socio-Economic Model of Sales Tax Compliance. *Economies* **2020**, *8*, 88. [[CrossRef](#)]
94. Hair, J.F.; Hult, J.G.T.M.; Ringle, C.M.; Sarstedt, M. *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)*; SAGE Publications: Newbury Park, CA, USA, 2014.
95. Almaiah, M.A.; Hajje, F.; Shishakly, R.; Amin, A.; Awad, A.B. The Role of Quality Measurements in Enhancing the Usability of Mobile Learning Applications during COVID-19. *Electronics* **2022**, *11*, 1951. [[CrossRef](#)]
96. Henseler, J.; Ringle, C.M.; Sinkovics, R.R. The use of partial least squares path modeling in international marketing. In *New Challenges to International Marketing*; Emerald Group Publishing Limited: Bingley, UK, 2009; pp. 277–319.
97. Saad, M.; Almaiah, M.A.; Alsaad, A.; Al-Khasawneh, A.; Alrawad, M.; Alsyouf, A.; Al-Khasawneh, A.L. Actual Use of Mobile Learning Technologies during Social Distancing Circumstances: Case Study of King Faisal University Students. *Sustainability* **2022**, *14*, 7323. [[CrossRef](#)]
98. Henseler, J.; Fassott, G. Testing moderating affects in PLS path models: An illustration of available procedures. In *Handbook of Partial Least Squares*; Springer: Berlin/Heidelberg, Germany, 2010; pp. 713–735.
99. Alkhater, N.; Walters, R.; Wills, G. An empirical study of factors influencing cloud adoption among private sector organisations. *Telemat. Inform.* **2018**, *35*, 38–54. [[CrossRef](#)]
100. Song, J.; Xia, S.; Vrontis, D.; Sukumar, A.; Liao, B.; Li, Q.; Tian, K.; Yao, N. The Source of SMEs' Competitive Performance in COVID-19: Matching Big Data Analytics Capability to Business Models. *Inf. Syst. Front.* **2022**, 1–21. [[CrossRef](#)]
101. Lan, N.T.N.; Yen, L.L.; Ha, N.T.T.; Van, P.T.N.; Huy, D.T.N. Enhancing Roles Of Management Accounting And Issues Of Applying Ifrs For Sustainable Business Growth: A Case Study. *J. Secur. Sustain. Issues* **2020**, *10*, 709–720.
102. Phuong, N.T.T.; Huy, D.T.N.; van Tuan, P. The evaluation of impacts of a seven factor model on nvb stock price in commercial banking industry in vietnam-and roles of Disclosure of Accounting Policy In Risk Management. *Int. J. Entrep.* **2020**, *24*, 1–13.
103. Almaiah, M.A.; Al Mulhem, A. Thematic analysis for classifying the main challenges and factors influencing the successful implementation of e-learning system using NVivo. *Int. J. Adv. Trends Comput. Sci. Eng.* **2020**, *9*, 142–152. [[CrossRef](#)]