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The Influence of Customer-Vendor Communication and Power Relations on Successful Implementation of Enterprise Resource Planning (ERP): The Mediation Role of ERP Fit

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Abstract

The study investigates the influence of power relations and effective communication between ERP customers and vendors, on ERP fit and implementation success. Explanatory research involving a survey of 297 manufacturing firms in Tanzania was conducted. The data collected were analysed using partial least square structural equation modelling. The results indicate that manufacturers with higher levels of customer-vendor power relationships have a positive impact on ERP fit; at the same time, higher levels of ERP fit have a positive impact on implementation success. The results further show that effective communication between ERP customers and vendors has a positive relationship with ERP fit and ERP implementation success. ERP fit was also found to mediate ERP customer-vendor power relationships and ERP implementation success. A complementary partial mediation of ERP fit was found between effective ERP customer-vendor communication and ERP implementation success. The findings of this study extend the theoretical understanding of the interdependence of strategic alignment, power relations and relationship marketing in a long-term ERP customer-vendor relationship. This study departs from normative enactments that addressed task-technology fit, ease of use of technology and system relevance, and considers the governance of the customer-vendor relationship as important to ERP implementation and success. The study recommends that sustainable relationships are indeed the precursor to ERP fit and implementation success. Otherwise, one-off, rushed purchases of off-the-shelf enterprise systems could result into implementation problems. Therefore, companies need to prioritize long-term, sustainable communication and relationships with vendors over short-lived acquisition, implementation and conversion strategies.

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Keywords: Power Relations, Effective Communication, Implementation Success, ERP Customer-Vendor, Manufacturing Industry

Introduction

In conjunction with mountains of information that need to be processed in an expanded business organization, Enterprise Resource Planning (ERP) has emerged as one of the critical breakthrough information systems that can reshape business practices (Al-Sabri *et al.,* 2018). Many businesses have invested in ERP solutions since the emergence of SAP, Oracle, and other ERP software in the late 1990s, and this trend is anticipated to continue (Alkraiji, et al., 2020). In fact, the global market for ERP increased from $28.8 billion in 2006 to $47.5 billion in 2011, and is projected to increase to $947.3 billion by 2026 (Lucintel, 2013; Laurie, Shelly, Gupta, & Lisa, 2022). According to a recent survey by the Aberdeen Group (2021), nearly three-quarters of manufacturers are currently utilizing ERP to increase operating efficiency and spur organizational growth. Previous research has examined the success of ERP systems in manufacturing companies (Saygili *et al.,* 2017; Weerakkody *et al.,* 2019). However, there is a dearth of studies that theorize the relationship between customer-vendor power relationships and communication as drivers of ERP implementation success. Ideally, ERP customers enter into a long-term relationship with the ERP vendor, as the average life span of an ERP system is between 10 and 15 years (Claybaugh *et al.,* 2021). Fundamentally, the goal of ERP customers is to maximize the benefits of the system in order to achieve the expected performance, while a key goal of a vendor is to retain its customers by ensuring a satisfactory relationship with them (Ali & Miller, 2017; Lee, 2011; Cheng, 2020). Following previous research, this paper examines the factors that influence the success of an ERP implementation from the perspective of customers and vendors.

Software upgrades and functionality are vendor dependent as ERP systems are embedded in best practice solutions that have been developed in advance to meet a wide range of manufacturing needs (Fischer et al., 2017; Chang et al., 2013; Swan et al., 1999). These best practices result from vendors working with the requirements of the only leading ERP customers and therefore do not reflect the majority of other customers who may have specific requirements (Zhou et al., 2008). Furthermore, the ERP implementation philosophy is process-based rather than function-based; its success requires proper management of a range of activities rather than just software installation (Volkoff et al., 2017). These activities entail a high degree of manifestation of power relations between actors to resolve conflicts of interest arising from traditional role perceptions between ERP customers and vendors (Sørensen, 2014). Similarly, ERP vendors do not necessarily act in the best interest of the ERP customer as they focus on providing the standardized ERP solutions (Fryling, 2015). Such conflict of interest has led to ERP mismatches where an ERP customer is dissatisfied because the vendor either did not fully understand the customer's requirements or provided a solution that was too inflexible and difficult to customize (Fischer et al., 2017; Swan et al., 1999). Swan et al. (1999) confirmed that companies that are able to achieve ERP fit (ERP features align with business expectations) have a wide range of options to realize a successful implementation. However, ERP fit depends on both technical and social factors. To date, research has focused on the technical specification of ERPs, neglecting the social perspective of the customer-supplier relationship (Fischer *et al.*, 2017; Ranjan *et al.*, 2018) in general and effective communication between supplier and buyer as antecedents to ERP implementation success.

Furthermore, one of the fundamental goals of an ERP vendor is to build a good relationship with its customers and prospects (Lee, 2011, Victor *et al*., 2021). A long-term relationship that requires effective communication between the parties involved. This relationship is characterized by several features, including willingness to discuss relevant information with the partner and a general concern for the partner's well-being (Kharouf *et al.,* 2018). Members in high-quality relationships are more satisfied with the roles assumed and performed by each partner and are more engaged in the relationship because of their commitment. According to Kharouf *et al.* (2018), the ability of customers and vendors to communicate effectively is important in creating good working relationships during ERP implementation. Unlike other information systems with specialized functions, an ERP system is complex and requires continuous and collaborative efforts to streamline and integrate all business modules and data (Volkoff *et al.,* 2017). Therefore, successful implementation of an information system depends on a thorough exchange of information and knowledge between the client and the vendor. In ERP implementation, effective communication is critical to consider (Alkraiji, et al., 2020).

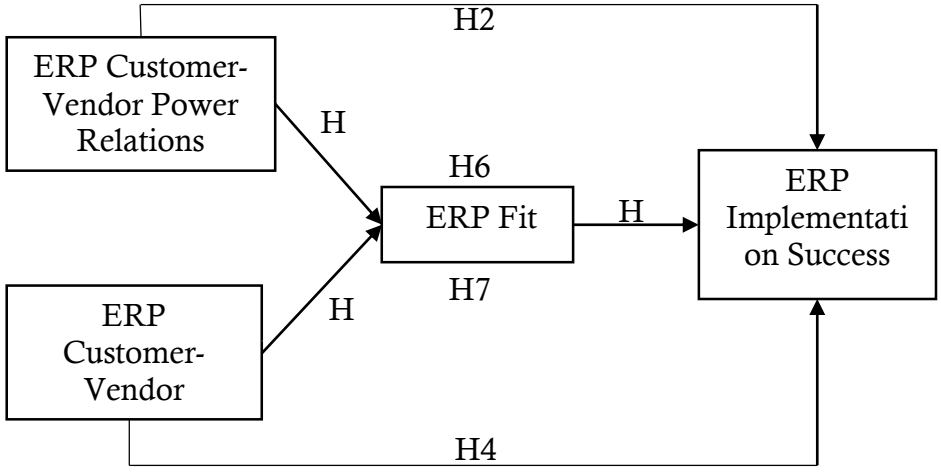
Research on the success of ERP implementation has mainly focused on the service sector (Saygili, *et al*., 2017), while the industrial sector has been neglected (Ranjan*, et al*., 2018). Moreover, there are a number of studies that examine the success factors of ERP implementation from the customer perspective (Fryling, 2015; Reitsma & Hilletofth, 2018; Saygili, *et al*., 2017), while the engagement between the customer and the provider is ignored (Garg & Garg, 2013; Claybaugh, *et al.,* 2021). The literature suggests that vendors play a critical role in the implementation of ERP systems in industrial companies due to the complexity involved (Chang, et al., 2013; Weerakkody *et al*., 2019). Unfortunately, previous studies on ERP implementation have focused on the customer perspective, while Vargas and Comuzzi (2020) emphasized the importance of understanding the influence of internal and external stakeholders that contribute to a long-term relationship in ERP implementation. As Swan *et al.* (1999) argue, the success of ERP implementation depends on the extent to which the conflict of interest between the ERP customer and the vendor is bridged. The ERP customers are looking for customized business solutions while the ERP vendors are looking for a perfect generic solution for a large market. This is an issue related to power-relations and communication. To bridge the divergence between the two, the ERP vendor and its customer, communication is essential to achieve ERP fit. Little attention has been paid to this objective. To address this knowledge gap, this study investigate the extent to which power relations and effective communication influence implementation success.

Literature Review

The appropriateness of ERP fit is well captured through the lens of the strategic alignment model (SAM). SAM seeks to refine the strategic choices managers make to achieve strategic alignment. The choices are divided into business and information technology (IT) domains and capture both external and internal factors. SAM separates the external and internal levels of IT (Ahriz *et al.,* 2018). Thus, elevating IT beyond its traditional position as an internal support mechanism and recognizes its ability to support and transform business processes to achieve desired business objectives. The relationship between the choices is conceptualized using two building blocks: strategic fit and functional integration. These building blocks enable the analysis of the interactions between the choices that need to be made to achieve strategic alignment (Goepp & Avila, 2015).

Three different lines of research are discussed in this paper. As in Avison *et al*. (2004), Luftman (1996) and Luftman *et al.* (2017), the first stream operationalizes SAM, prescribing its use by top management.. The second research stream focuses on expanding the domains and levels of the model. This is the case with Goepp & Millet (2011). The addition of domains and dimensions allows for their explicit consideration. However, these studies do not include procedures for applying the newly developed model. The third and final stream of research focuses on the application of SAM and its philosophy to specific domains, such as inter-organizational alignment or manufacturing information systems (MAIS) development (Goepp & Avila, 2015). This study addresses the third stream and structures, the upstream phases of MAIS design and development using the SAM model. MAIS are usually implemented as ERP systems (Goepp & Avila, 2015). This is particularly critical as MAIS are often integrated with business strategy to achieve business objectives (Goepp *et al.,* 2015). According to research conducted based on SAM, the majority of studies have focused on the alignment within the enterprise, while relatively few studies address alignment between enterprises, especially in collaborative networks where achieving alignment requires collaboration between different actors, which in this work refers to the ERP customer and the vendor (Goepp *et al.,* 2015; Claybaugh *et al*., 2021; Venkatraman & Fahd, 2016). To address some of these issues, this work designed and tested an alignment model, as shown in Figure 1.

Figure 1. Research Model



In order to understand power relations between actors, Avelino and Rotmans (2011) and Avelino and Wittmayer (2016) proposed a framework for power in transition to examine relations, practices and changes and to improve understanding of the roles of the actors involved. According to Choksy (2015), power transitions can take a structural or relational form. Structural power is embedded in the most influential companies, while relational power results from the interactions of actors involved in a relationship. Cullen *et al*. (2014) analyzed the levels of power manifestation in terms of cubes, while Swan and Scarbrough (2005) examined the three dimensions of power (resources, processes and meaning) to assess how

policies affect the innovation network of firms. Authors such as Kholeif *et al*. (2010) used institutional perspectives of power relations to analyze how power emerges and influences actors with different interests. On the other hand, researchers have looked at power relations from the perspective of the resources used by actors in manifesting power to resolve conflicts and thus change existing perceived roles and power relations (Turner *et al*., 2020; Avelino & Wittmayer, 2016).

In this work, power is not construed as the force exercised over others, but as the force that influences the outcome (Hardy, 1996). Most scholars in the field of power dynamics and IT recommend Hard's (1996) conceptualization of power (Claybaugh *et al.,* 2021; Chang *et al.,* 2013; Choksy, 2015; Swan & Scarbrough, 2005). Differences in power relations between actors then result from differences in their mobilization capabilities and manifestation of power (Cullen *et al.,* 2014). The direction of power relations between actors also depends on their ability to create resources and manifest power. For example, when vendors view ERP customers as implementers rather than co-creators, a one-sided dependency is created (Cullen *et al.,* 2014). According to Avelino and Rotmans (2011), the classification of power relationships into the perspectives of power over, power with and power is not mutually exclusive, but is dynamic and can occur in combination. This classification of power relations provides a reasonable basis for explaining conflicts of interest in ERP customer-supplier relationships.

The source of conflict of interest in ERP implementation arises from the different roles of the actors involved in the transaction due to competing objectives. When a point is reached where the actors experience a change in their role perception, the conflict becomes transformative and allows them to reconceptualize their relationships (Sørensen, 2014; Chang *et al*., 2013). The best possible resolution of the conflict depends on the extent to which actors can mobilize the necessary resources to manifest their power and challenge dominant role perceptions (Turner *et al.,* 2020; Sørensen, 2014). These role perceptions are the actors' traditional perceptions of themselves and each other in the existing relationship (Sørensen, 2014; Choksy, 2015). Aspects of the relationship between actors are reproduced by parties in different roles. These parties may support the existing relationship in some contexts, but want to change it in others (Rossi & Marsden 2019). Traditionally, vendors have the power to create the generic specifications of the ERP solution. At the same time, the ERP customer accepts some of the best practices of the ERP solution, but wants a software solution that better fits their production needs (Alkraiji *et al.*, 2020; Cheng, 2020; Claybaugh *et al.,* 2021). A company that has high resource mobilization capabilities in exercising power relationships is more likely to win in resolving such conflicts of interest based on the ERP-customer-supplier relationship. The transactional outcome of a balanced power relationship forces the ERP supplier to provide solutions that are better suited to the needs of a particular manufacturing company. Therefore, it is hypothesized that:

H1: ERP customer-vendor power relations has a positive influence on ERP fit

H2: Manufacturers' level of ERP customer-vendor power relations positively influence ERP implementation success

Effective bidirectional communication is crucial for the development of relationships between two parties (Martin, 2016). It involves efficient exchange of information at different levels on a regular basis and as needed. In this context, communication is an empathetic exchange of critical and timely information between the customer/user and the ERP vendor. This is supported by casual persuasion strategies that include information sharing and components of satisfaction and dissatisfaction (Martin, 2016). On the other hand, bidirectional communication does not always lead to more pleasure, as excessive communication in relationships can lead to conflict between the vendor and the user (Lee, 2011). In this case, communication would be an important component in the process of relationship enjoyment (Claybaugh *et al.,* 2021). Other aspects of the relationship, such as timely and accurate information, targeted resources and trust, should also be considered. Perhaps the most important feature of the relationship is trust, both in terms of its impact on maintaining long-term relationships and on other part of the relationship. Therefore, it is considered that the central aim of active communication is to develop trust and commitment, which has a direct impact on satisfaction. ERP vendors are required to communicate with their customers continuously and proactively (Chang *et al.,* 2013). The vendor is responsible for explaining and communicating the benefits of the new system to the customer, both in the initial phase and on an ongoing basis. This type of communication is likely to help build a direct relationship with the customer and a positive perception of the customer's use of the ERP solution. This is similar to the priming effect that occurs when the user of the system confirms the expected benefits (Choksy, 2015; Rossi & Marsden, 2019). In the context of business relationships, communication is described as a series of information exchange cycles that enhance the accuracy and depth of the relationship. Comprehensive, effective, bi-directional communication between the two parties is a non-coercive, conflict-reducing influence strategy that reduces conflict. Based on relationship marketing theory, which requires a shift from transactional to relational exchanges, from customer acquisition to customer satisfaction and retention, and in some cases relationship termination (Morgan & Hunt, 1994), the paper hypothesized that:

H3: ERP customer-vendor effective communication has a positive influence on ERP fit

H4: Manufacturers' level of ERP customer-vendor communication positively influence ERP implementation success

ERP fit aims to reduce the gaps between the actual requirements of the implementing company and what the generic off-the-shelf ERP solution offers (Grabis, 2019). ERP customization includes various typologies such as screen templates, configuration, workflow development, reporting, interface and package code modification (Cheng, 2020). Garg and Garg (2013) consider ERP fit of interfaces, workflows, reports, forms, extensions and portals. ERP fit has received increased attention in the implementation literature (Fryling, 2015; Ali & Miller, 2017; Al-Sabri *et al.,* 2018, Fischer *et al.,* 2017). Research suggests that ERP fit takes a lot of time and requires complicated system maintenance (Kholeif *et al.*, 2010). Nonetheless, others have shown a strong interest in ensuring ERP fit, arguing that ERP fit has been shown to be critical to maintaining the value creation capability of companies with software solutions (Volkoff *et al.,* 2017; Venkatraman et al., 2016). Research has also reported a high number of unsuccessful ERP implementation projects related to ERP system fit (Mamoghli *et al.,* 2017). This suggests that alignment and customization of IT positively influences business

performance (Bhatt & Grover, 2005; Fischer *et al.,* 2017; PCG, 2020). It is therefore reasonable to expect that the better the ERP fits the functions and business processes in a manufacturing organization, the greater the success of ERP implementation. Therefore, the following hypothesis is put forward:

H5: Manufacturers' level of ERP fit positively influence ERP implementation success.

Basically, ERP implementation starts with the decisions about adoption, vendor selection, implementation, use, maintenance and change (Chang *et al.,* 2013). To be successful, the implementing company should select a suitable ERP system, a competent vendor, the actual installation of the system, the management of corporate and business process changes, and the testing of the system's compatibility (Fryling, 2015). These attributes require strong power relations between the parties involved and are important to achieve a functional and process fit (Fischer *et al.,* 2017; Claybaugh *et al.,* 2021). Research has found that some manufacturers go through a post-implementation 'shakedown' phase where they face challenges as they simultaneously implement new system functionality and realign business processes (Garg & Garg, 2013; Claybaugh *et al.,* 2021). This can lead to business disruption or reduced productivity for a period of time. In the literature, there are cases of premature ERP withdrawals and project cancellations due to wrong selection and lack of fit between the system and the specific business processes (Fryling, 2015). Furthermore, it is essential for successful software implementation that the infrastructures of the business and the information system are aligned (Grabis, 2019; Venkatraman, 1989). In general, organizations may face challenges in implementation because they do not know how an enterprise system aligns with or meets the needs of the organization. Therefore, developing strong power relations is the best strategy that precedes system alignment. Therefore, we hypothesize the following:

H6: The level of ERP fit mediate the relationship between the ERP customer-vendor power relations and ERP implementation success

A regular and demand-oriented exchange of information at different levels and in different areas can have a positive impact on customer and supplier satisfaction. This technique is supported by a large body of research on the use of non-coercive persuasion strategies, which includes information sharing (Ali & Miller, 2017; Alkraiji *et al.,* 2020; Chang *et al.*, 2013). On the other hand, bidirectional communication does not always correlate with success, as high levels of interorganizational communication are occasionally the result of high levels of conflict (Martin, 2016). Therefore, when using communication as a means of conflict resolution, other variables should be considered to ensure that an information system is aligned with the implementing company to achieve the necessary successes. According to the literature, effective communication requires two things: the partner's honesty, i.e. the company's belief that the partner will fulfil its obligations, and the partner's benevolence, i.e. its genuine interest in the company's welfare (Kharouf *et al.*, 2018). Although effective communication is critical to a firm's success in adopting information systems, research does not seem to clearly clarify the causal relationship. ERP adoption success seems to be a precursor, outcome or consequence of ERP fit as a result of effective communication. In the long run, the causal relationship is certainly bidirectional.

The greater the conflict of interest between the customer and the provider, the more complex the implementation of the information system (Sørensen, 2014). Disagreements within a relationship and the perception of one partner that the other is hindering the achievement of their goals lead to tension, frustration and mistrust. As a result of extended, effective, bi-directional communication, the level of conflict between the two parties decreases. It is to be expected that a company would see trusting communication with a supplier as one of the benefits of the relationship and useful for resolving disagreements and ultimately achieving mutual long-term goals. We therefore hypothesize the following:

H7: The level of ERP fit mediate the relationship between the ERP customer-vendor effective communication and the ERP implementation success

Methodology

This study was conducted in Tanzanian involving manufacturing companies between 2020 and 2021. Simple random sampling was used to select a sample of 483 manufacturing firms from a sampling frame of 672 manufacturing firms, from the National Bureau of Statistics (NBS) (URT, 2018) and the Confederation of Tanzanian Industries (CTI) database. The IT managers/officials were the appropriate respondents as they were well versed with all issues related to ERP systems and IT in businesses. The approach is in line with Huber and Power (1985) who recommend that one respondent per unit should be the most informed respondent. The approach is consistent with previous approaches used in IT literature (Ghobakhloo, 2018, Elly, 2011). A questionnaire was developed to investigate the most important and relevant practices that influence customer-vendor engagement and ERP fit and ultimately affect implementation success.

A total of 483 respondents were invited to respond and a total of 297 IT managers/officials duly completed the survey, representing a response rate of 74.25%. The follow-up activities helped to avoid a low response rate, which is common in information systems studies (Bhatt & Grover, 2005). The profile of respondents was similar to the population of IT managers/officials in previous studies (Wilson *et al.*, 2021). 55.9% of the respondents were men and 44.2% were female. Of the 161 respondents, 70.4% were between 18 and 40 years old, and 29.6% had more than 10 years of work experience. Rank within their companies varied: 13.1% of respondents were IT officers; 67.4% were junior managers, 13.1 were middle managers and 6.4 were senior managers. The respondents were from different sectors of the manufacturing industries in Tanzania.

The measurements were adapted from the literature, with each statement consisting of responses on a 7-point Likert scale, where 1 means "strongly disagree" and 7 means "strongly agree". The variables used in this study are power relations between ERP clients and vendors, effective communication between ERP clients and vendors, ERP fit and ERP implementation success. The variables are measured using multiple indicators. The use of multiple indicators to measure the implementation of IT was suggested to improve the results using the SAM model (Luftman *et al.*, 2017) and relationship marketing theory (Kharouf *et al.,* 2018).

Therefore, the data were analyzed using partial least squares structural equation modelling (PLS-SEM) (Hair *et al.*, 2019). PLS-SEM addresses the multiple indicators used to measure the latent variables and the hypothesized relationship between the latent variables.

Table 1: Construct Reliability and Validity

Construct	Indicators	Standardized Loading	Composite Reliability	Average Variance Extracted
Power Relations (PR)	PR1	0.802	0.902	0.643
	PR2	0.786		
	PR3	0.770		
	PR4	0.814		
	PR5	0.836		
	PR6	0.752		
	PR7	0.829		
	PR8	0.769		
	PR9	0.854		
Effective Communication (EF)	EC1	0.870	0.916	0.687
	EC2	0.833		
	EC3	0.812		
	EC4	0.816		
	EC5	0.813		
ERP Fit (EF)	EF1	0.731	0.845	0.610
	EF2	0.812		
	EF3	0.799		
	EF4	0.783		
	EF5	0.805		
	EF6	0.819		
	EF7	0.805		
	EF8	0.782		
	EF9	0.791		
	EF10	0.804		
	EF11	0.642		
ERP Implementation Success (IS)	IS1	0.79	0.901	0.647
	IS2	0.774		
	IS3	0.792		
	IS4	0.805		
	IS5	0.857		

In PLS-SEM structural models use an iterative procedure that maximizes the explained variance predicted in the dependent variables (Schade et al., 2016). Unlike other methods, SEM allows researchers to easily evaluate measurement models that include both reflective and formative measures (Hair *et al.*, 2014). In this study, SmartPLS 3 (Ringle *et al.,* 2015) was used to compute the path model, followed by parameter estimation based on path weighting scheme (Henseler *et al.,* 2015). The measurement model was evaluated before the structural model was evaluated (Ringle *et al.,* 2019).

Results

Measurement Model Assessment

All indicators in the measurement model were reflexive. Hair *et al*. (2019) provides the criteria for assessing and accepting the reliability and validity of the partial least squares measurement models. The reliability of the indicators is considered adequate if an item has an outer loading of at least 0.70 for its construct. All indicators with standardize outer loadings between 0.40 and 0.70 are considered for removal unless their retention does not result in an increase in composite reliability and average value extracted (AVE) above the threshold of 0.5 suggested for AVE (Hair *et al.*, 2014). The model included a total of thirty reflective indicators. All indicators met this requirement except one, which was retained due to the fact that it had no effect on increasing the values of composite reliability (CR) and AVE (Table I).

Table II: Heterotrait-Monotrait Correlation Ratios

	EC	EF	IS	PR
EC				
EF	0.731			
	$CI_{0.90}$[0.646; **0.805**]			
IS	0.608	0.576		
	$CI_{0.90}$[0.500; **0.706**]	$CI_{0.90}$[0.467; **0.674**]		
PR	0.737	0.648	0.439	
	$CI_{0.90}$[0.639; **0.820**]	$CI_{0.90}$[0.548; **0.737**]	$CI_{0.90}$[0.316; **0.549**]	

CR was used to assess construct reliability. All constructs met the minimum required threshold values as they were in the range of 0.60 and 0.70 (Hair *et al.,* 2019. Thus, demonstrating the presence of construct internal consistency reliability (Table I). In addition, AVE was used to measure convergent validity. All reflective constructs showed convergent validity with values above 0.5. Next, the heterotrait-monotrait correlation ratio (HTMT) was used to assess the discriminant validity of the constructs. HTMT is superior to the traditional

Fornel-Lacker and cross-loading criteria for measuring discriminant validity (Henseler *et al*., 2015). The key criterion for the HTMT test is whether the HTMT ratio approaches 1.0, so values close to 1.0 would imply a violation of discriminant validity. Henseler *et al*. (2015) suggest 0.85 and 0.90 as useful starting points. Table 2 shows that the maximum HTMT value is 0.737. This value is below 0.85, which is the most conservative critical HTMT value. Furthermore, the results from bootstrapping routine show that all upper confidence interval limits are well below 1. In this case, the HTMT criterion indicates that all HTMT values are significantly different from 1. Therefore, the HTMT 0.85 and HTMT 0.90 criteria indicate discriminant validity between independent constructs and the dependent construct was met.

Common method variance

The collection of most measures through questionnaires may raise concerns about common method variance (CMV) in the measures. The nature of the variance is attributed to the data collection method rather than the constructs being measured. Sources of CMV may include the measurement items themselves and their placement in the questionnaire, as well as obtaining the predictor and criterion variables from the same source. Podsakoff, MacKenzie, Lee and Podsakoff (2003) mention several ex-ante and post ante approaches and statistical techniques to control for method bias. The design and pre-testing of the questionnaire helped to reduce the risk of common method variance. As part of the post-ante approach, the study conducted the variance inflation factor generated by a full collinearity test (Kock, 2015). The procedure, which placed each variable as a dependent variable in four models whose VIFs were tested, and showed that the maximum VIF value of 2.224, which is below the threshold of 3.3. This procedure indicates that common method variance was not a problem.

Structural model

The results of the structural model are shown in Table 3. The propositions, path coefficients and their significance are given. R^2 measures the variance explained in the given endogenous construct for a given model. It is ultimately affected by the number of predictor constructs (Hair *et al.,* 2019).

Table 1: Significance Testing Results

Path	Path coefficient (β)	t-values	p-value	95% CI	R^2
PR -> EF	0.286	4.350	0.000	[0.156;0.414]	0.449
EC -> EF	0.483	7.742	0.000	[0.353;0.596]	
PR -> IS	-0.038	0.588	0.557	[-0.170;0.087]	0.345
EC -> IS	0.361	4.860	0.000	[0.211;0.503]	
EF -> IS	0.316	3.949	0.000	[0.154;0.462]	

Notes: CI = Confidence interval;

This study had two endogenous constructs. The R^2 value for IS as an endogenous construct was 0.345, which means that EF, EC and PR explained more than 34% of the variance in IS. For EF as an endogenous latent variable, the R^2 value was 0.499, indicating that the constructs EC and PR explained about 50% of the variance in EF, which according to Chin (1998) is between moderate (above 0.33) and substantial (above 0.67). The study finds that PR had significant effects on EF (β = 0.286, [0.156;0.414]), EC had a significant effect on EF (β = 0.483, [0.353;0.596]), EC had a significant effect on IS (β = 0.361, [0.211;0.503]), and EF had

a significant effect on IS (β = 0.316, [0.154;0.462]), therefore hypotheses 1, 3, 4 and 5 are supported. Moreover, bootstrapping results show that PR does not exert a significant influence on ERP implementation success, rejecting Hypothesis 2 which is attributed from the data that the *β* value was not significant difference from zero [-0.170;0.087] and the t-value does not meet the threshold value at *P<0.05,* t>1.96 (Wong, 2013).

Mediation Analysis

The study followed the updated mediation analysis procedures described by Hair *et al.* (2014). The direct and indirect effects in the model were tested for significance (Nitzl *et al.,* 2016; Hair *et al.*, 2017). The significance of the indirect effect was tested by bootstrapping with 5000 bootstrap samples and a significance level of 0.05. The results presented in Table 4 show that the indirect path PR to IS was significant as its CI did not contain a zero value, supporting hypothesis 6 as partial complementary mediation (β = 0.130, [0.028;0.182]). Similarly, the indirect path from EC to IS was significant with a t-value of 3.938, and the CI for the β-value was significantly different from zero, supporting hypothesis 7. In addition, the direct path from PR to IS was significantly weak and not statistically significant. This means that EF fully mediates the path from PR to IS (see Table 3 for the β-value).

Table 2: Significance testing results for indirect path

Path	Path coefficients (β)	t-values	*p-value*	95% Confidence interval
PR -> EF -> IS	0.130	3.576	0.004	[0.028;0.182]
EC -> EF -> IS	0.213	3.938	0.001	[0.054;0.284]

Robustness Check

The work investigated the robustness of the data using unobserved heterogeneity (Sarstedt, *et al.*, 2019; Svensson *et al.*, 2018). The Finite Mixture Partial Least Square (FIMIX-PLS) was used to check if unobserved heterogeneity does not affect the outcome. The data of the study could be analysed in the aggregate and not in segments. The study used a one to four segment solution and the results of the fit indices (Hair *et al.*, 2017) are presented in Table 5.

Table 5: Fit Indices for the One to four Segments Solutions

	Segments			
Criteria	**1**	**2**	**3**	**4**
AIC (Akaike's Information Criterion)	1293.123	1238.912	1218.702	***1212.593***
AIC3 (Modified AIC with Factor 3)	1299.123	1251.912	***1238.702***	1239.593
AIC4 (Modified AIC with Factor 4)	1305.123	1264.912	**1258.702**	1266.593
BIC (Bayesian Information Criteria)	1315.285	***1286.931***	1292.577	1312.324
CAIC (Consistent AIC)	1321.285	***1299.931***	1312.577	1339.324
HQ (Hannan Quinn Criterion)	1301.995	1258.136	***1248.277***	1252.519
MDL5 (Minimum Description Length with Factor 5)	***1451.935***	1583.005	1748.075	1927.247
LnL (LogLikelihood)	-640.561	-606.456	-589.351	-579.296
EN (Entropy Statistic (Normed))	*na*	0.594	0.670	0.520
NFI (Non-Fuzzy Index)	*na*	0.543	0.572	0.676

NEC (Normalized Entropy Criterion)	*na*	179.853	157.281	142.691

***Note**: na = refers to not available; numbers in bold italics indicate the best outcome per segment retention criterion.*

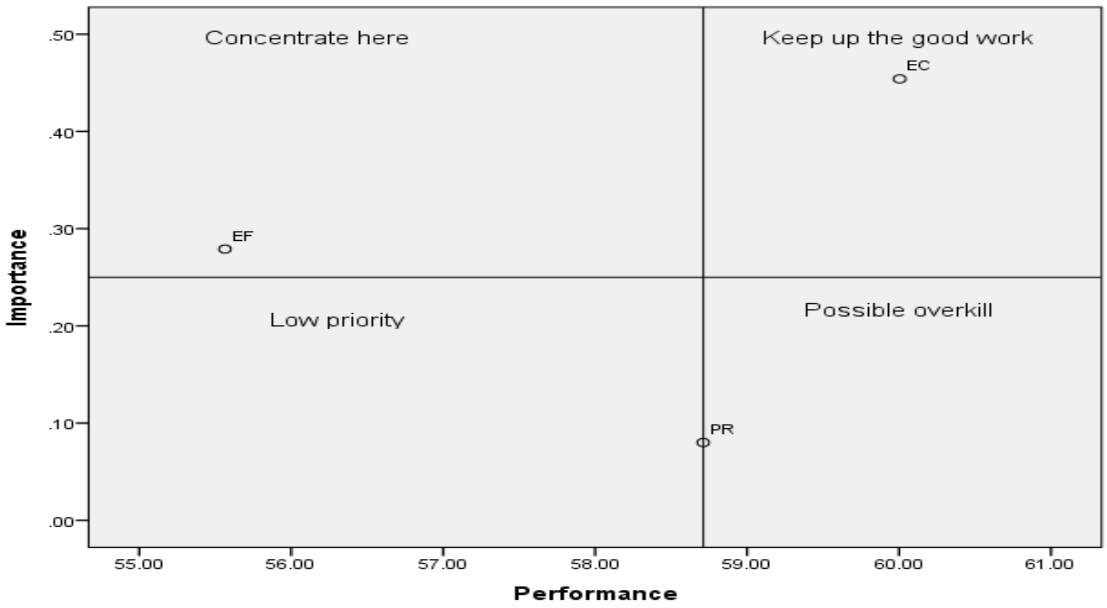
This was due to the complexity of the study model and the fact that it was unlikely to obtain an equal distribution in each segment, with segment 5 comprising less than 30 of the 297 samples in the study.

The paper investigated whether AIC3 and CAIC and AIC4 and BIC together indicated the same number. The results in Table 10 show that both have a different number of segments. In contrast, the value of the normalised entropy statistic (EN) is above 0.5 for segments 2, 3 and 4. As these results differ, it is concluded that unobserved heterogeneity does not significantly affect the data set of this study (Svensson *et al.,* 2018; Sarstedt *et al.,* 2019).

Importance-performance Map

The importance performance map is useful for a sound interpretation and further analysis of the PLS results. It identifies weaknesses that can be addressed to improve manufacturing performance. To increase the performance level of the dependent construct, measures were taken along the lines that had relatively high importance (or high path coefficients) and relatively low performance. Figure 2 shows the performance level of each independent latent variable along with its influence on implementation success. Figure 2 shows that EC is of great importance to implementation success due to its significant influence. Therefore, it is important for ERP customers and vendors to make efforts to maintain the performance level of this construct. In addition, customer and vendors should take initiatives to increase the relevance of ERP fit to success. EF is high and more important than power relations but its performance is below average. The research findings also suggest that both EF and EC are the most important antecedents of implementation success and that manufacturing companies must strive to focus and improve the above factors. In addition, care should be taken to resolve conflicts when it comes to exercising power relations.

Figure 2: Importance-Performance Map matrix for IS



Discussion

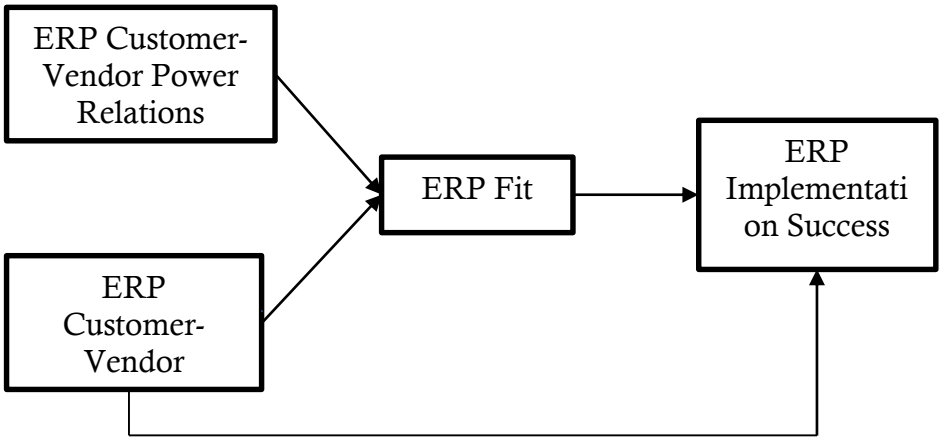
The statistical results for successful implementation of ERP reveal that PR influences ERP fit (Hypothesis 1). This could be attributed to the fact that by mobilizing resources to create strong power relations between actors, manufacturing firms gain opportunities to influence suppliers to meet the specific standard of their ERP requirements. This implies that manufacturing firms that are able to initiate power relations in terms of developing capabilities to build a good relationship with partners are better positioned to implement ERP than otherwise create strong manifestations of power relationships that lead to the reduction of role perceptions among partners (Swan *et al.*, 1999; Rossi & Marsden 2019; Turner *et al.*, 2020). Furthermore, research findings show that PR does not significantly influence implementation success (Hypothesis 2). This is a different result from the study by Wilson et al. (2021). This implies that power relations do not persist over a long period of time. This is supported by Turner *et al.*'s (2020) argument that too much power can be fruitful in the short term, whereas it can lead to failure if the trends become established in the long term and actors become comfortable with them. Furthermore, the research results show that EC exerts a significant influence on ERP fit (hypothesis 3) and implementation success (hypothesis 4). These results suggest that manufacturing companies with regular information sharing at multiple levels are well informed about any ERP developments that may be of interest. This means that vendors who strive to meet customer requirements as desired and with minimal difficulty create a space for resolving conflicts of interest and that agreements can be reached with common understandings. This is important as it helps the manufacturing company to ensure the suitability of the ERP fit and thus the success of the implementation. The findings are in line with previous studies (Morgan et al., 1994; Claybaugh *et al.*, 2021; Lee, 2011) which claim that effective vendor communication leads to shared understanding with buyers.

Again, in relation to hypothesis 5, the statistical results show that EF exerts a significant influence on implementation success. Similarly, previous studies (Wilson *et al.*, 2021; Cheng, 2020) show that ERP alignment of ERP systems are incremental to implementation success. This finding is also consistent with the findings of Fischer *et al*. (2017) that mutual alignment (fit) between the business and IT is critical to the success of an ERP implementation project. These findings imply that ERP fit in terms of functionalities, business processes and workflows is important to realize the success of ERP system implementation in an organization. In addition, the results show that employees in organizations that have achieved ERP fit have high confidence in their tasks, are able to receive notifications of urgent interventions that are due, and have IT skills to work well with ERP system functions. If companies experience that ERP systems provide the most up-to-date information at the time it is really needed to complete their tasks, they are sure to achieve greater implementation success. Finally, the statistical results also revealed that EF is a full and partial mediator of PR to IS (hypothesis 6) and EC to IS (hypothesis 7), respectively.

Conclusion

The results of the study culminate in a modified model in Figure 3 that illustrates the relationship between ERP customer vendor engagement and implementation success. From the modified model, this study infers that although the literature suggests that power relations play a major role in improving ERP implementation success, the study results suggest the opposite. These results suggest the mediating role of ERP fit rather than the direct relationship between PR and IS. This pattern gives IT managers/officials who want to engage ERP vendors an incentive to develop confidence and avoid over-reliance on best practices offered by ERP vendors and build strong ties with global lead firms in the manufacturing industry. This study borrows from Fischer *et al*. (2017) and concludes that manufacturing companies need to be able to mobilize resources to ensure that systems meet their needs, regardless of their size and engagement with the industry. Based on Figure 3, this research article therefore contributes to the understanding that the SAM model, the power relations framework and the theory of relationship marketing, as well as the associated company-specific orientations (PR, EF and EC) are the most important explanation for ERP implementation success.

Figure 3. Modified model of the ERP implementation success



The literature shows that several factors influence the success of ERP implementation (Aburub, 2015; Alkraiji *et al*., 2020; Bose *et al*., 2008). However, research has tended to focus on software features and top management support (Hustad *et al.,* 2020) and ignored other aspects such as communication and stakeholder relationships (Cheng, 2020; Venkatraman & Fahd, 2016; Mamoghli *et al*., 2017), especially the vendor-customer relationship. The findings of this study suggest that not only are software functionalities important, but also effective communication between the vendor and the customer is critical for success. This requires the implementing company to maintain good relationships with the vendor at all stages of the ERP implementation. The ERP lifecycle lasts over 15 years (Al-Sabri *et al.,* 2018) and is process-based rather than function-based; its success requires the management of a range of activities rather than just a software installation. Therefore, the power relations in existing customer-supplier relationships and the extent to which communication foundations are developed and sustained over time are important precursors to implementation success. The study recommends that sustainable relationships are the precursors to ERP fit and implementation success that ultimately influence performance. Otherwise, one-off, rushed acquisitions of off-the-shelf enterprise systems lead to poor performance and implementation problems. Therefore, companies need to prioritise long-term and sustained communication and relationship with vendors over short-lived acquisition, implementation and conversion strategies. In addition, this study uses importance-performance analysis to identify the most important constructs. Future studies could consider using a multi-group analysis to gain further insight into differences between target groups. Future studies could also consider some control variables, mediators and/or moderators that have been shown in previous studies to influence export manufacturers.

Conflict of interest declaration

All authors certify that they have no affiliation with or involvement in any organisation or entity that has a financial or non-financial interest in the subject matter or material covered in this manuscript.

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