

**THE ROLE OF KNOWLEDGE MANAGEMENT SYSTEMS ON THE  
EXPORT PERFORMANCE OF MANUFACTURING FIRMS: EVIDENCE  
FROM ZIMBABWE**

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**-Abstract –**

There is a general acceptance that Knowledge Management Systems (KMS) are a primary source of value and have taken a center stage in the definition, operation and performance of most business organisations. However, their use within the manufacturing sector in developing countries remains inconsistent. This article investigated the role of KMS in enhancing the export performance of firms operating within the manufacturing sector in Zimbabwe. The study used a quantitative approach in which a survey questionnaire was distributed to 555 managers drawn from 185 manufacturing firms based in Harare. Data analyses involved the use of descriptive statistics, Spearman correlations and regression analysis. The results of the study showed that combined IT/social driven KMS exerted the greatest impact on export performance. The availability of both information technology centered and social centered KMS influences export performance by improving the firm's export strategy, export commitment, export orientation, export growth, export sales, export profits and export market share.

**Key Words:** *Knowledge management systems, export performance, manufacturing firms, Zimbabwe*

JEL Classification: M10

## 1. INTRODUCTION AND BACKGROUND

Despite being endowed with a wide array of natural resources, most developing countries continue to face economic challenges (Vijil & Wagner, 2012). As noted in a report by the World Economic Forum (2013) most countries in Asia, South America and Africa have remained as net importers of finished and capital goods. The report further indicates that 31 percent and 34 percent of exports from the European and American manufacturing sector respectively, end in developing countries. According to the Bertelsmann Stiftung's Transformation Index (2016), these imports normally result in a high trade deficit amounting to billions of United States dollars within most developing countries. The report further reveals that in Southern Africa, Zimbabwe had a trade deficit of USD3.9 billion in the 2015-2016 fiscal year whilst Zambia had a trade deficit of USD1.24 billion within the same year. Likewise, Botswana had a trade deficit of P176 million in 2016 (United States Census Bureau, 2017) and South Africa had a trade deficit of ZAR9.5 billion by May 2017. Another report by the Namibia Statistics Agency (2016) indicates a N29.8 billion trade deficit in 2016 for Namibia (Trading Economics, 2017).

According to the United States Census Bureau (2017), most of the trade deficits in the above countries were as a result of poor export performance. To counter their unsatisfactory export performance, some countries have resorted to economic integration by becoming members of regional economic blocs (Hartzenberg, 2011). Regional economic integration is aimed at improving on export performance through market expansion (Felix, 2007). An example of a country that has resorted to the adoption and implementation of regional economic integration as a strategy of boosting its export performance is Zimbabwe. The country became a signatory to a number of regional and international economic blocs such as the Common Market for Eastern and Southern Africa (COMESA), Southern Africa Development Committee Preferential Trade Area (SADC PTA) and World Trade Organization (WTO) (Mapuva & Muyengwa-Mapuva, 2014). However, this strategy has not yielded any positive results, particularly in the manufacturing sector. In 2013, the Zimbabwean government acknowledged that the country had been turned into an import-based economy and attributed this development to global competition which had increased in response to the country's enlarged bloc membership (Bimha, 2013). The situation calls for the implementation of other strategies that augment current efforts to turnaround the economic fortunes of the country.

Both individual corporates and countries of today cannot avoid global competition, which may in part, be linked to the increased use of Information Communication Technologies (ICT) all over the world (Kotler, 2011)). Even most notable multi-national corporations such as Nestle, Coca Cola and Toyota have embraced ICT models based information technology (IT) driven knowledge management systems (KMS) as tools for improving performance (Edward & Alves, 2009). Various authors (Argote & Ingram, 2000; Malik & Malik, 2008; Pawlowski & Bick, 2012) support the use of KMS as vehicles for the improvement of corporate performance at micro level, which translates to economic performance at macro level. A study conducted by Man Li (2012) concluded that there were great gains in competitive advantage to be realised by corporations utilising ICT infrastructure as KMS to manage knowledge. Malik and Malik (2008) also found out that there is a general acceptance that knowledge management is a primary source of value, which is an indication that knowledge has taken a center stage in the definition, operation and performance of corporates. Pawlowski and Bick (2012) suggest that as corporates develop globally, their need for KMS increases. Other authors (Barney, 1991; Singer & Czinkota, 1994; Coff, 1997; Shamsuddoha, Ali & Ndubisi, 2009) have also highlighted the importance of KMS in export marketing. These researches seem to suggest the existence of a relationship between KMS and export performance, although not explicitly.

## **2. PURPOSE AND EXISTING RESEARCH GAPS**

The aim of the current study is to test the relationship between KMS and export performance from a context of manufacturing firms in Zimbabwe. A literature search shows that most previous studies on KMS included one focusing on definitions (Edwards, 2011) challenges and benefits (Alavi & Leidner, 1999); practices and theories (Dalkir, 2005). Other studies focused on limitations (Swan, Newell & Robertson, 2000); formulation of theoretical frameworks (Gallupe, 2001; Maier & Lehner, 2003); evolution (Halverson, Ericson & Ackerman, 2004); KMS in product development (Hidiyanto & Efendy, 2010); KMS in Business (Thierauf, 1999); and requirements of a KMS (Mau & Mau, 2008). In addition, Plessis and Boon (2004) examined the role of knowledge management in customer relationship management in South Africa. Kaniki and Mphahlele, (2002) and Ngulube (2002) focused on knowledge management related approaches to the preservation of indigenous knowledge. Jain (2007) conducted a survey to establish the level of knowledge management practices in east and southern Africa. Although these studies gave an insight into the subject of knowledge

management, none of them investigated its link to export performance, which leaves an important research gap. This study suggests that the adoption and implementation of KMS could be a vehicle for the improvement of export performance by manufacturing firms in Zimbabwe. Hence the study investigates the relationship between KMS and export performance.

### **3. LITERATURE REVIEW**

The review of literature discusses export performance and knowledge management systems.

#### **3.1.Export Performance**

Export performance is defined as either the relative success or failure of the efforts of an entity to sell its goods and services in other nations (Lages & Lages, 2004). There are several reasons why superior export performance is important for firms. Through exporting, firms are able to increase their sales potential by ensuring that their markets have been expanded beyond national borders (Lages, Silva & Styles, 2009). Since the average orders from international customers are often larger than those from domestic buyers, exporting can be a useful way of increasing firm profits (Sousa & Bradley, 2008). Exporting is also an important approach to diversification, which assists in avoiding risks or exposures due to fluctuations in local markets (Carneiro, da Rocha & da Silva, 2011). In addition, exports are essential in putting redundant production capacity to work, leading to more efficient utilisation of the existing factories, equipment and employees (Freeman, Styles & Lawley, 2012). Exporting may further be a useful means to offset seasonal fluctuations in sales (Boehe & Cruz, 2010). For instance, when an unfavourable season in one country begins, certain product sales take a knock. However, in the same period, the same products can be exported to markets in another country where the season is favourable to sales. Still, some domestic markets are either too small or saturated, creating the need for expansion to other untapped markets (Brouthers, Nakos, Hadjimarcou & Brouthers, 2009). These reasons, amongst others, demonstrate the importance of maximising export performance to both firms and the economy.

#### **3.2.Knowledge Management Systems**

Several authors (Thierauf, 1999; Alavi & Leidner, 2001; Hidayanto & Efendy, 2010; Assegaf & Hussin, 2012) define KMS as the IT technology that supports or facilitates knowledge management. There are various categorisations of KMS.

However, in this study, a categorisation of KMS developed by Nielsen and Michailova (2007), which divided KMS into three classes namely IT driven KMS, social driven KMS and combinations of IT driven and social driven KMS, was adopted. IT driven KMS are based on information technologies whereas social driven KMS are based on interactions of people. Examples of IT driven KMS include decision support systems, data mining and warehousing, simulations, intranet and the internet. Examples of social driven KMS include organisational structure, organisational culture and communities of practice. To counteract the strengths and weaknesses of IT and social driven KMS, the two can be combined, creating a robust and often more effective hybrid system (Hidiyanto & Efendy, 2010).

According to Malik and Malik (2008) KMS are an important tool for driving export performance. In support, Pawlowski and Bick (2012) adds that KMS manage the intangible asset of intellectual capital within organisations thus creating distinct competencies. Lowry (2014) reports that the European Union and the USA have embraced KMS as tools for improving export marketing. This contributed significantly to the European Union and USA's success in exporting to international markets. In Zimbabwe, the National Trade Development and Promotion Organisation of Zimbabwe (ZimTrade) was established to provide the relevant knowledge and support structures to stakeholders at national level (Chigumira, 2013). ZimTrade implemented IT driven KMS by launching a website in 2007 to enhance national exports as suggested by Malik and Malik (2008). However, regardless of having implemented KMS strategies that have worked elsewhere, Zimbabwe's export promotion reports from Zimbabwe National Statistics Agency indicate a continuously downward trend. Based on the literature review, the following hypotheses were formulated and put forward to guide this investigation:

***H1:*** *There is a positive relationship between IT driven KMS and export performance*

***H2:*** *There is a positive relationship between social driven KMS and export performance*

***H3:*** *There is a positive relationship between combined IT driven and social driven KMS and export performance*

#### **4. RESEARCH DESIGN**

The research adopted a quantitative survey design, based on the need to generalise the study to other environments of manufacturing firms in developing countries. In addition, a review of previous literature showed that previous studies on both KMS and export performance (Zou, 1998; Alavi & Leidner, 2001; Kautz & Mahnke, 2003; Abdullah, Selamat, Sahibudin & Alias, 2005; Pawlowski & Bick, 2012) were conducted using quantitative surveys.

##### **4.1. Sample Design**

The target population in this study was composed of firms operating within the Zimbabwean manufacturing sector. This included eleven industries, namely food, drink, textile, wood, clothing, paper, chemicals, metals and automotive, as categorised by Zimbabwe National Statistics Agency (2016). The names of the firms were drawn from the Confederation of Zimbabwe Industries (CZI) and ZimTrade databases.

To select the sample, a combination of the cluster and a purposive techniques were used. Firms were clustered according to their respective industries. Thereafter, within each cluster three key professionals with the relevant information were selected using the purposive sampling technique. The professionals that were considered as respondents were marketing managers, human resources managers and information technology. The purposive sampling technique was used since the field of study was a technical one which required individuals possessing the required information in each situation. The final sample was composed of 555 respondents drawn from 185 firms.

##### **4.2. Instrumentation and Data Collection Procedures**

Data were collected by means of a questionnaire. The questionnaire was divided into four sections. Section A elicited information on the demographic profile of respondents and their firms. Section B sought responses on three KMS sub-elements, namely IT driven KMS, Social driven KMS and Combined IT and Social driven KMS based on measures developed by Nielsen and Michailova (2007) and Malik and Malik (2008). Section C sought information on export performance based on measures developed by Zhou, Taylor and Osland (1998). Response options in Section B of the questionnaire were presented on Likert-type scales anchored by 1=strongly disagree and 5= strongly agree.

Data were gathered from manufacturing firms between June and December 2015. Questionnaires were either emailed to respondents, or administered in person by the principal researcher. Out of a total of 410 questionnaires emailed to respondents, 271 usable questionnaires were retained after the process of screening the questionnaires. Moreover, out of a total of 145 questionnaires that were administered using the drop and collect method, 96 were retained after the screening of the questionnaires. This culminated in a total of 555 questionnaires that were used in the final data analysis. Respondents were given a period of two weeks to complete the questionnaire. During the process of data collection, several ethical considerations, namely participant's rights to anonymity, voluntary participation, confidentiality and protection from victimisation were followed.

#### **4.3.Data Analysis**

Data were analysed using the Statistical Packages for the Social Sciences (version 22.0). The strengths and direction of associations between KMS and export performance were measured using Spearman Correlation analysis, whilst predictive relationships between constructs were measured using regression analysis.

#### **4.4.Validity and Reliability**

To establish face validity, the questionnaire was reviewed by four faculty members at a Zimbabwean military university who are experts in ICT. Three staff members of ZimTrade who are experts in export marketing were also given the opportunity to review the questionnaire. Feedback obtained from the two panels was used to modify the questionnaire in order to establish face validity. To establish content validity, a pilot study was conducted using a conveniently selected sample of 50 respondents. Further modifications were made to the questionnaire, using feedback obtained from the pilot sample. The pilot sample was excluded from the main survey. To establish construct validity, Spearman's correlations were used. The results of the correlation analysis (Table 2) showed positive correlations between the constructs, thereby providing evidence of acceptable construct validity. Predictive validity was tested using regression analysis. The results of the regression analysis showed statistically significant relationships between the constructs (Table 3), which attests to satisfactory predictive validity within the scales. Reliability was tested using the Cronbach alpha coefficient. All measurement scales attained alpha values above the

recommended threshold of 0.7 (Table 1), thereby providing evidence of satisfactory reliability in the study.

## 5. Research Results

### 5.1. Demographic Profile of Respondents

An analysis of the demographic profile of the respondents shows that 29.7 percent of the respondents were marketing professionals, 48.5 percent were IT professionals and 21.8 percent were HR professionals. With respect to their age groups, 54.2 percent of respondents were aged between 31 and 49 years of age. The racial profile showed that all but three respondents who were of the mixed race, were black. At least 72.6 percent of the respondents were male. In terms of the distribution of respondents per manufacturing industry, 22.1 percent of the respondents were in the chemical industry, 42.8 percent in the beverages industry and 35.1 percent in the metals industry. Further analysis revealed that 39.8 percent of the firms had been in operation for up to 15 years; 52.3 percent had been in operation for periods ranging between 16 and 30 years and 7.9 percent had been in operation for more than 45 years.

### 5.2. Mean Scores and Reliabilities

The mean-scores and reliabilities of the measurement scales used in the study are reported in Table 1.

**Table 1: Mean scores and Reliabilities**

<b>Dimension description</b>	<b>Number of items</b>	<b>Cronbach Alpha</b>	<b>Mean</b>	<b>Standard Deviation</b>
IT driven KMS	6	0.724	4.01	1.05
Social driven KMS	5	0.703	4.33	1.53
Combined IT and Social driven KMS	4	0.741	4.01	1.22
Export Performance	9	0.842	3.94	1.02
Scale 1=strongly disagree; 2= disagree; 3=neutral; 4= agree; 5=strongly disagree				



Mean scores for the four scales ranged between 3.94 and 4.44. These values depict an inclination towards the ‘agree’ point in the Likert-type scale. This implies that most respondents perceived that implementation of KMS was satisfactory within their firms. Respondents considered the implementation of combined IT and social driven KMS to be more important than implementing them separately. Cronbach alpha values ranged between 0.703 and 0.842, which were above the recommended minimum threshold of 0.7 (Malhotra, 2011), which confirms that the scales used in the study were reliable.

### 5.3. Correlation Analysis

Correlation analysis (Table 2) shows the strength and direction of association amongst the constructs under consideration in a research study (Genest, Kojadinovic, Nešlehov’a & Yan, 2011). In this study, the constructs were IT driven KMS, social driven KMS, Combined IT and Social driven KMS, and export performance. A two-tailed Spearman Correlation Analysis was undertaken at a significance level of  $p < 0.01$  to establish the level of association between the hypothesised associations.

**Table 2: Correlation Analysis**

Constructs	N	IT driven KMS	Social driven KMS	Combined IT and Social driven KMS	Export Performance
IT driven KMS	555	1.000	0.241*	0.473*	0.599*
Social driven KMS	555	0.241*	1.000*	0.372*	0.569*
Combined IT and Social driven KMS	555	0.473*	0.372*	1.000	0.623*
Export Performance	555	0.599*	0.587*	0.623*	1.000
** Correlations are significant at the 0.01 level (2-tailed)					

In this study, positive inter-factor correlations were observed between the constructs under consideration. The strongest correlation was observed between combined IT and social driven KMS and export performance ( $r = 0.623$ ;  $p < 0.01$ )

while the weakest correlation was observed IT driven KMS social driven KMS ( $r = 0.41$ ;  $p < 0.01$ ). This indicates that when one of these constructs either increases or decreases, the other constructs either increase or decrease correspondingly.

#### 5.4. Regression Analysis

Since positive associations existed between KMS dimensions and export performance, it was necessary to establish whether KMS dimensions predicted export performance. This was achieved through application of the regression analysis procedure. Regression analysis is a statistical process for estimating predictive relationships amongst variables (Armstrong, 2012). To test predictive relationships, IT driven KMS, Social driven KMS, Combined IT and Social driven KMS were used as independent variables and export performance was used as a dependent variable. The results of the regression analysis are reported in Table 3.

**Table 3: Regression Model Summary**

<b>Model summary</b> <b>Dependent variable- Export Performance</b>	<b>Beta</b>	<b>T</b>	<b>Sig.</b>	<b>Tol</b>	<b>VIF</b>
IT driven KMS	0.267	3.414	0.000	0.326	2.418
Social driven KMS	0.143	3.012	0.002	0.712	1.732
Combined IT and Social driven KMS	0.577	3.124	0.000	0.442	3.411
R <sup>2</sup> 0.168      p<0.01					

Multicollinearity tests were conducted by calculating the tolerance value and variance inflation factor (VIF) associated with each independent variable. According to Tabachnick and Fidell, (2001) thresholds for testing for multicollinearity include a minimum of 0.1 for tolerance and a maximum of 10 for VIF. In the current study, tolerance and VIF values were within the recommended thresholds, indicating that multicollinearity did not constitute a problem in the study and the independent variables are not highly correlated ( $r = 0.90$  and above). The regression analysis showed an R<sup>2</sup> of 0.168 which demonstrates that nearly 17 percent of the variation in manufacturing firms export performance is attributable to adoption and implementation of KMS.

## 6. DISCUSSION OF RESULTS

The purpose of the study was to investigate the relationship between KMS and export performance in manufacturing firms in Zimbabwe. To achieve this purpose, three hypotheses were put forward. The first hypothesis (H1) suggested that there is a positive relationship between IT driven KMS and export performance. This hypothesis was accepted in this study because as revealed in Table 2, there was a strong positive correlation between IT driven KMS and export performance ( $r = 0.599$ ;  $p < 0.01$ ). Moreover, in the regression analysis, IT driven KMS were statistically significant in predicting export performance ( $\beta = 0.267$ ;  $t = 3.414$ ;  $p = 0.000$ ). The second hypothesis (H2) indicated that there is a positive relationship between social driven KMS and export performance. This hypothesis was supported because a strong positive correlation was observed between social driven KMS and export performance ( $r = 0.587$ ;  $p < 0.01$ ). Also, analysis of the regression model shows that social driven KMS were statistically significant in export performance ( $\beta = 0.143$ ;  $t = 3.012$ ;  $p = 0.002$ ). The third hypothesis (H3) stated that there is a positive relationship between combined IT and social driven KMS and export performance. This hypothesis was supported because there was a strong positive correlation existed between combined IT and social driven KMS and export performance ( $r = 0.623$ ;  $p < 0.01$ ). Regression analysis indicates that combined IT and social driven KMS problems were statistically significant in predicting export performance ( $\beta = 0.577$ ;  $t = 3.124$ ;  $p = 0.000$ ). These results illustrate that export performance is likely to increase with an increase in the use of KMS in Zimbabwean manufacturing firms. It is important then for manufacturing firms intending enhance their export performance to, amongst other things, adopt and implement effective KMS along the three dimensions proposed in this study.

## 7. CONCLUSIONS

The study concludes that firms in the Zimbabwean manufacturing sector could improve their export performance by adopting and effectively implementing KMS as part of their strategic ethos. The best model would be to use a combination of IT driven KMS and social driven KMS as this exerts a greater impact on export promotion when compared to applying the two systems separately. However, implementation of both IT driven and social driven KMS requires reliable ICT infrastructure backed by relevant information security policies. It is thus imperative that effective ICT policies and infrastructure be put in place to support

the transfer and utilisation of knowledge by the firms in the manufacturing industry. It would also be useful for the Zimbabwean government, through its trade-agency: ZimTrade, to embark on a nationwide KMS awareness program aimed at educating firms on the importance of adopting and implementing KMS.

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