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E-business enabled customer service management and its performance: evidence from Indian micro, small and medium enterprises

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Abstract: Globalised business environment has led to the adoption of e-business systems by large enterprises (LE) as well as micro, small and medium enterprises (MSMEs) to remain competitive and for business sustainability. E-business enables integration of key supply chain activities to increase efficiency and responsiveness along end-to-end supply network. Customer service management is one of the key components of supply chain management. Efficient and highly responsive customer service management is needed to attract and retain customers. To have a deeper understanding on the same, the study unearthed e-business enabled customer service management decision factors that influence performance of customer service management. Stepwise regression is performed on the data collected from micro, small and medium enterprises in India. The results highlighted that of the eight identified decision factors, four were found to significantly impact performance of customer service management. The study has implications for both entrepreneurs/managers of MSMEs as well as academicians.

Keywords: e-business; customer service management; CSM; supply chain management; SCM; Indian MSME; performance metrics.

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1 Introduction

Globalised business environment has led to the adoption of information and communication technologies (ICT) and e-business systems by large enterprises (LE) as well as micro, small and medium enterprises (MSMEs) to remain competitive and for business sustainability. Small and medium enterprises (SMEs) are considered to be the backbone of any economy and account for more than 95% of global enterprises (Alibhai et al., 2017). The performance of MSMEs impacts growth of an economy as it reduces poverty and significantly contributes to gross domestic product (GDP) of a nation (Priti and Thakur, 2017). In India, the MSME sector is very dynamic and accounts for around 32% of gross value added (GVA) and contributes 30% towards GDP (MSME Annual Report, 2018–19). However, MSMEs in India have not fully adopted ICT and e-business tools in their key business areas and still employ traditional and outdated technologies (Mishra and Pal, 2017). The adoption of e-business is influenced by the attitude, subjective norm and behavioural control exercised by the owners/managers of Indian MSMEs (Sarmah et al., 2017).

E-business is a business process that uses internet and/or other electronic medium to enable business transactions. E-business activities can be categorised into three types:

- 1 consumer-oriented
- 2 business-oriented
- 3 the e-business technology infrastructure.

Consumer-oriented activities consist of business-to-consumer (B2C), consumer-to-consumer (C2C), and government-to-consumer (G2C) activities. Business-to-business (B2B), business-to-government (B2G), and government-to-business (G2B) activities form part of business-oriented activities. Technology infrastructure consists of network infrastructure, network applications, decision technologies and software tools and applications (Geoffrion and Krishnan, 2001). The efficient transfer of information, the timely availability of information, the openness and transparency of appropriate business information are a few of the benefits of adopting e-business (Hakansson and Snehota, 1995).

Firms managed by professionally qualified entrepreneurs adopt more advanced e-business tools to elevate their business processes (Lal, 2005). SMEs do recognise and acknowledge the significance of information systems (IS) in day-to-day operations of the dynamic and complex business environment. However, they are yet to fully exploit IS in a formal and professional manner in order to get maximum gains out of it (Sharma and

Bhagwat, 2006). Today, large organisations integrate business intelligence (BI) tools that enable managers to evaluate business environment through business process reengineering, customer relationship management, marketing research, and competitor analysis (Koupaei and Khamseh, 2017). Hence, the MSME sector in India is left with no choice to adopt ICT and e-business tools to be more competitive, improve efficiency and productivity, and overall business performance (Gayen and Roy, 2018). In this paper, we try to explore as to how e-business tools and systems enables the performance of customer service in the overall supply chain management (SCM) of Indian MSMEs. The present study is a part of the major study that was conducted to understand the impact of various e-business enablers on different performance metrics of an organisation.

2 Literature review

Enterprises are enhancing supply chain competencies through improved product/service quality, reduced cycle time, better after-sale service and responsiveness to customer needs (Carter et al., 1997). Application of e-business leads to the management of different processes of SCM like customer relationship management, customer service, order and demand management, production and material management, and purchasing (Lambert et al., 1998). Simon (2005) arrived at a five-stage evolutionary model while trying to explore the impact of e-business systems on SCM in UK. Customer acquisition and customer management evolved as the first and second stages, respectively. The rapid developments in information technology (IT) and e-business lead to automation of customer service activities on the internet (Cheung et al., 2003). E-business enables customer service component of SCM by integrating all customer service and order processing activities with the help of ICT. It enables real-time tracking of orders and responds to customer inquiries and order processing. Successful business enterprises have integrated e-business systems and solutions for improving key customer service functions that are significant to their business (Auramo et al., 2005). E-business systems are becoming more dynamic and complex in today's competitive environment. It is gearing towards multi-perspective knowledge-based system (MPKBS) for customer service management (CSM) with the incorporation of artificial intelligence (AI) technologies (Cheung et al., 2003).

E-business benefits enterprises by integrating customers and trading partners to increase their loyalty and performance through ease of use, greater transaction efficiencies and personalisation. In a competitive business environment, an organisation must implement CSM process to proactively respond to various customer encountered situations. CSM is an important SCM component that endorses a firm's face to the customer. CSM refers to effective management of customer service activities of an enterprise in terms of quality and productivity (Khong and Richardson, 2003). It provides a service-oriented management interface between service providers and customers (Langer et al., 1999). CSM is the key customer contact point for governing product and service agreements (PSAs) as part of the CRM process. The process is also the single source of information to customers, such as product availability, shipping schedules and order status (Bolumole and Lambert, 2004).

Khong (2005) illustrated that successful outsourcing effort will lead to improved CSM that will in turn lead to increased customer satisfaction and relationship. CSM can increase customer repeat purchases leading to improved customer satisfaction, customer

retention and customer relations (Khong and Richardson, 2003). Customer complaints handling is an essential component of e-CRM as proposed by Yooncheong et al. (2002). The study suggested that e-businesses' customer service centres should handle customer complaints effectively and provide faster and accurate responses in a polite manner. According to this study, complaint management is an effective e-business tool that facilitates further business activity and customer loyalty. Resolution of customer complaints also results in long term relationship with customers. The research evidence indicate that an appropriate CSM should include variables such as source of customer information that address availability of quality product, delivery schedules, order status, effective outsourcing of customer service functions, providing sales support and technical service, and complaint management.

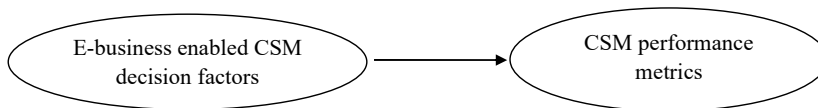
3 Research hypothesis and theoretical model

The objective of the present study is to identify decision factors of e-business enabled CSM that influence CSM performance in Indian MSMEs. Based on the objective the following hypothesis is framed.

H1 CSM performance is influenced by e-business enabled CSM decision factors.

The proposed theoretical model for the above objective and hypothesis is shown in Figure 1.

Figure 1 Theoretical model



4 Research methodology

Influence of e-business in CSM decision is an important aspect. As per the study of Richard et al. (2000), Shrikantha et al. (2008), Rahman (2004), the following factors were identified for measuring the level of influence of e-business in CSM: customer promising time and order status, helping customers to purchase items online through catalogues and lists, receipt of customer complaints, providing technical service, notifying customers of emergencies in the supply chain strikes, fires, etc, and managing the outsourcing of customer service functions. To measure the level of influence e-business in CSM, a five point scale (1-not at all, 2-little, 3-average, 4-greatly, 5-a lot) adopted. It is an important aspect as MSMEs view customer service as a necessary investment to reinforce customer loyalties and assuring maximum customer value. Four metrics related to customer performance were adopted from Bhagwat and Sharma (2007) that include: improved customer orders, service level, rapid handling of customer complaints and reduced lead time.

The primary data for the present study was collected from the middle level executives of the MSMEs in Chennai, India. A pilot study was conducted with a sample of 30

respondents randomly chosen with the preliminary questionnaire. The design of the questionnaire was also discussed with a few industrial experts for further improvement and validation. Cronbach's coefficient (α) calculated to test the reliability of the constructs of e-business enabled customer service factors was found to be 0.888 and customer service performance metrics was found to be 0.7839. After the questionnaire revision, around 400 MSMEs were randomly approached to collect data of which only 131 middle level executives responded. The questionnaire was administered by the researcher as well as trained persons. The respondents answered on a five-point rating scale for the questions related to the above factors. The data collected were scrutinised and for its authenticity and analysed with the help of SPSS software version 18. The results of the analysis are presented in the next section for further deliberation.

5 Analysis and findings

5.1 E-business enabled CSM decision factors

To find out the level of influence of e-business in CSM decision factors in MSMEs, Friedman test was applied to establish the mean rank and standard deviation for the factors considered. A total of eight factors were considered in this analysis. The range of mean rank values to identify the significance of CSM decision factors in MSMEs was calculated based on the average value as interval width. In this case the minimum rank value is 1, the maximum rank is 5 and the interval width is 0.8. Totally five class intervals were used based on the five point rating scale. Table 1 shows the results of Friedman test.

Table 1 Mean rank of E-business enabled CSM decision factors

<i>S. no.</i>	<i>CSM decision factors</i>	<i>Number</i>	<i>Mean rank</i>	<i>Std. deviation</i>
1	Customer promising time	131	3.49	0.788
2	Receipt of customer complaints	131	3.46	0.862
3	Providing technical service	131	3.43	0.860
4	Customer order status	131	3.34	0.821
5	Providing details of products to customers to purchase items online through catalogues and lists	131	3.32	0.879
6	Managing the outsourcing of customer service functions	131	3.3	0.848
7	Notifying customers of emergencies in the supply chain strikes, fires, etc.	131	3.22	0.947
8	Use of internet to sell to customers	131	3.18	0.965

Notes: Range of mean rank: (1–1.8) – Not at all; (1.9–2.7) – Little; (2.8–3.5) – average; (3.6–4.2) – greatly; (4.2–5) – a lot.

From Table 1, it is clear that all the decision factors of CSM in MSMEs have mean rank between 2.8 to 3.5 indicating their influence is only average. However, the factor customer promising time secured a mean rank of 3.49, may be considered as having somewhat greater influence.

5.2 CSM performance metrics

For establishing the emphasis of CSM performance metrics in MSMEs, the Friedman test was applied taking into account the mean rank and standard deviation. Four customer-related performance metrics were considered for this analysis. They include improvement in customer orders, increase in customer service level, rapid handling of customer complaints and reduction in delivery time. The range of mean rank values to identify emphasis on customer related performance metrics was calculated based on the average value as interval width. The minimum and the maximum rank values are 1 and 5 respectively, and the interval width is 0.8. Totally five class interval adopted since a five point rating scale was used. The mean rank with standard deviation based on the results of Friedman test is given in Table 2. From Table 2, it is clear that the four CSM performance metrics have mean rank between 2.8 to 3.5. Hence, the significance of these four factors in Indian MSMEs remains average.

Table 2 Mean rank and standard deviation of CSM performance

<i>S. no.</i>	<i>CSM performance metrics</i>	<i>Number</i>	<i>Mean rank</i>	<i>Std. deviation</i>
1	Improvement of customer orders	131	3.47	0.611
2	Increase in customer service level	131	3.4	0.838
3	Improvement of rapid handling of customer complaints	131	3.34	0.884
4	Reduction in delivery lead time	131	3.11	0.709

Notes: Range of mean rank: (1–1.8) – not at all; (1.9–2.7) – little; (2.8–3.5) – average; (3.6–4.2) – greatly; (4.2–5) – a lot.

5.3 Impact of e-business enabled CSM decisions factors on CSM performance metrics

Stepwise multiple regression analysis was performed to establish the relationship between CSM performance and e-business enabled CSM decision factors. All the eight CSM decision factors were introduced as independent variables stepwise and after running the analysis in SPSS software, only four independent factors were found to influence the dependent variable, CSM performance. The details are given below:

- Dependent variable: CSM performance (Y)
- Independent variables:
 - 1 managing the outsourcing of customer service functions (X_1)
 - 2 notifying customers during emergencies (X_2)
 - 3 receipt of customer complaints (X_3)
 - 4 customer promising time (X_4).

Table 3 Model fit coefficient value

<i>Model</i>	<i>R</i>	<i>R Square</i>	<i>Adjusted R square</i>	<i>F value</i>	<i>P value</i>
1	0.552	0.304	0.299	56.466	<0.001**
2	0.607	0.369	0.359	37.362	<0.001**
3	0.639	0.408	0.394	29.181	<0.001**
4	0.657	0.432	0.414	23.967	<0.001**

Note: **Denotes significance at 1% level

Table 4 β -coefficient, t-value and significance

Model	Variable	Unstandardized coefficients		Standardized coefficients		t-value	Sig.	Collinearity statistics		Condition index
		Beta	Std. error	Beta				Tolerance	VIF	
1	(Constant)	8.183	0.706	-		11.594	<0.001**	-	-	1.000
	(X ₁)	1.558	0.207	0.552		7.514	<0.001**	1.000	1.000	7.937
2	(Constant)	7.267	0.721	-		10.075	<0.001**	-	-	1.000
	(X ₁)	1.087	0.237	0.385		4.580	<0.001**	0.698	1.433	8.526
3	(X ₂)	0.766	0.212	0.303		3.606	<0.001**	0.698	1.433	10.107
	(Constant)	6.285	0.778	-		8.077	<0.001**	-	-	1.000
4	(X ₁)	0.764	0.256	0.271		2.985	0.003**	0.567	1.765	9.300
	((X ₂))	0.687	0.208	0.272		3.297	0.001**	0.686	1.458	11.169
4	(X ₃)	0.666	0.229	0.240		2.909	0.004**	0.686	1.457	12.593
	(Constant)	5.322	0.871	-		6.108	<0.001**	-	-	1.000
4	(X ₁)	0.628	0.259	0.223		2.430	0.017**	0.537	1.861	10.182
	(X ₂)	0.604	0.208	0.239		2.907	0.004**	0.666	1.502	11.363
4	(X ₃)	0.610	0.226	0.220		2.695	0.008**	0.679	1.473	13.546
	(X ₄)	0.536	0.232	0.176		2.310	0.023**	0.772	1.295	14.868

Note: **Denotes significance at 1% level

Table 3 gives the details of correlation coefficients and p-value for the various models, while Table 4 gives details on β -coefficient, significance and multi-collinearity statistics.

From Table 3, it is evident that for model 1, the multiple correlation co-efficient (R value) is 0.552. It measures the degree of relationship between managing the outsourcing of customer service functions (X_1) with the predicted values of CSM performance (Y). The positive value shows a strong relationship between the dependent variable and the independent variable. In model 2, the next variable, notifying customers during emergencies (X_2) was added. Now the multiple correlation co-efficient has increased to 0.607, which measures the degree of relationship between the independent variables viz., managing the outsourcing of customer service functions (X_1) and notifying customers during emergencies (X_2) with the dependent variable, CSM performance (Y). The R value (0.607) indicates a strong positive relationship between the dependent variable and the independent variables.

A third variable, receipt of customer complaints (X_3) was included in model 3. For this, the multiple correlation co-efficient is 0.639, which gives the degree of relationship between managing the outsourcing of customer service functions (X_1), notifying customers during emergencies (X_2) and receipt of customer complaints (X_3) with the predicted value of CSM performance (Y). As the R value (0.639) is positive, there exists a strong positive relationship between the dependent variable and the independent variables. In the 4th model, the fourth variable close partnership with customers (X_4) was added and the multiple correlation co-efficient for this model is 0.657. It measures the degree of relationship between management of outsourcing of customer service functions (X_1), notifying customers during emergencies (X_2), receipt of customer complaints (X_3) and customer promising time (X_4) with the predicted value of CSM performance (Y). Since the R value is 0.657, it indicates a strong positive relationship between the dependent variable and the independent variables. The co-efficient of determination, R-square value for the final model with four independent variables is 0.432. This indicates that 43.2% of the variation in CSM performance (Y) is due to the four independent variables included in the model. Moreover, the R square value is significant at 1% level. The final multiple regression equation of model established as follows:

$$Y = 5.322 + 0.628X_1 + 0.604X_2 + 0.610X_3 + 0.536X_4$$

The β -coefficient of X_1 is 0.628. It represents the partial positive effect of managing the outsourcing of customer service functions (X_1) on CSM performance (Y) holding X_2 , X_3 , X_4 constant and this coefficient value is significant at 1% level. For X_2 , the β -coefficient of X_2 is 0.604 indicating the partial positive effect of notifying customers during emergencies (X_2) on CSM performance (Y) holding X_1 , X_3 , X_4 constant and this coefficient value is significant at 1% level. The β -coefficient of X_3 is 0.610 establishing the partial positive effect of receipt of customer complaints (X_3) on CSM performance (Y) holding X_1 , X_2 , X_4 constant and this coefficient value is significant at 1% level. For variable X_4 , the β -coefficient is 0.536 representing the partial positive effect of customer promising time (X_4) on CSM performance (Y) holding X_1 , X_2 , X_3 constant. The coefficient is significant at 1% level. Also, it may be noted that from Table 4 that all the condition index values are less than 30 and the VIF values are also less than 10, indicating no multi-collinearity in this analysis.

6 Discussion

The mean rank values as a result of the Friedman test towards significance of CSM performance in Indian MSMEs are influenced by improvement of customer orders (3.47), increase in customer service level (3.4), improvement of rapid handling of customer complaints (3.34) and reduction in delivery lead time (3.11). As per the Friedman test results, the factor improvement of customer orders is having an average influence by e-business as a CSM performance factor. This result is somewhat related to the results of the study by Xiao and Li (2007) which states that coordination and optimisation related to the customer orders are having influence with e-supply chain integration. Also, the customer service level is having average influence by e-business. Similarly handling customer complaint is a factor of CSM performance, influenced averagely by the e-business. It may be observed that handling customer complaints regarding inventory level, on-time shipments, backorders, cycle time for delivery and number of units shipped, using e-business system improve the CSM performance. This is in agreement with the findings of Tarantilis et al. (2008) who has reported that delivery performance of the supply chain directly influences handling customer complaints.

Analysis of the mean rank revealed that the following CSM decision factors exercise average influence; customer promising time (3.49), receipt of customer complaints (3.46), providing technical service (3.43), checking customer order status (3.34), providing product details to customers (3.32) and managing the outsourcing of customer service functions (3.3). The Friedman test results show that the CSM factors maintaining customer promising time and customer complaints are influenced averagely by the e-business systems. This result agrees with the result of the study by Tarantilis et al. (2008); that ERP system influences the maintenance and handling of customer complaints. Further, the influence of e-business system on CSM factor providing technical service is only average. According to Richard et al. (2000), e-business influences the factor providing technical service, which confirms the result of the present study.

To test the relationship between e-business enabled CSM decision factors and CSM performance, stepwise multiple regression analysis was performed. The analysis revealed that the dependent variable CSM performance (Y) is significantly influenced by the independent variables such as management of outsourcing of customer service functions (X1), notifying customers during emergencies (X2), receipt of customer complaints (X3), and customer promising time (X4). The R square for the regression model is 0.432 indicating that 43.2% of the variations in CSM performance are explained by the variation in independent variables. It is noted from the results of multiple regression analysis mentioned above, the β_1 -coefficient and its p value point out that there is a significant relationship between CSM performance and management of outsourcing of customer service functions. This confirms with Lenny Koh et al. (2007) that there exists a significant relationship between e-business enabled supply chain activities and outsourcing of customer service functions. A significant relationship exists between notification to customers during emergencies and CSM as evident from the results β_2 coefficient and the p value of multiple regressions. This is similar to the finding of Richard et al. (2000) that e-business has significant relationship with notification customers during emergencies and CSM. Similarly the β_3 coefficient and the corresponding p value provide evidence that a significant relationship exists between receipt of customer complaints and CSM. This is confirmed by the results of the study by

Li et al. (2006); that customer service has significant contributions to handling customer complaints. The β_4 coefficient and the corresponding p value provide evidence that a significant relationship exists between adhering to customer promising time and CSM.

7 Conclusions

CSM is an important component of supply chain. An improvement in the CSM metric will proportionately increase the SCM metric in enterprises. This research highlights the influence of e-business enabled customer service factors on the key performance metrics of CSM in Indian MSMEs. Stepwise regression was performed on the data indicated the influence of e-business enabled CSM decision factors on the performance of CSM. However, out of the eight customer service factors of e-business system, only four factors were found to significantly improve the performance of CSM. These factors include, managing the outsourcing of customer service functions (X1), notifying customers during emergencies (X2), Receipt of customer complaints (X3) and customer promising time (X4). Hence, any deviation in these activities will definitely lead to serious impact on customer related performance in the supply chain of MSMEs.

The outcome of this research has useful implications for entrepreneurs/managers of MSMEs as well as academicians. The limitation of the study is its limited sample size and the sample is randomly chosen within a small geographical area. This research paper throws light on only the CSM component of SC, whereas, there are also other components like inventory management, supplier management, etc. which need in depth investigation. The study is also limited to MSMEs engaged in manufacturing activities alone and other sectors are not taken in to consideration. Hence, it may be difficult to generalise the findings. Future research could be undertaken to compare the influence of e-business in different segments of MSMEs and also with LEs to get better comprehension of the level of influence of the e-business systems. Samples could be taken across different regions for comparison.

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