Barriers to Adoption of B2B E-marketplaces: An Empirical Study of Indian Manufacturing MSMEs

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Pallavi Upadhyaya
Manipal Institute of Management
Manipal University, India
pallavi.upd@manipal.edu

Mohanan P
Department of Commerce and Management studies,
Calicut University, India
mohan22@hotmail.com

K Manjunatha Prasad
Department of Statistics, Manipal University, India
karantha.prasad@gmail.com

ABSTRACT

Research in B2B e-marketplaces has mainly focused on large organisations and literature on small firm's perception and use of B2B e-marketplaces, specifically in Indian context has been limited. As MSMEs constitute 95 per cent of all industrial units in India, enhancing their competitiveness in globalized economy is the priority of the Government. Review of literature on B2B e-marketplace shows that MSMEs in developing countries can gain significant benefits by using internet and B2B e-marketplace. While the number of MSMEs registered with B2B e-marketplace is significant in India, number of transactions conducted is limited. Based on the sample of 122 Indian MSMEs, the study identifies barriers to adopt and use B2B e-marketplaces. Suggestions to e-marketplace service providers and policy makers are discussed to overcome the barriers.

Keywords: B2B e-marketplace, Indian MSMEs, barriers, adoption.

1. INTRODUCTION

Micro, Small and Medium Enterprise (MSME) sector is the growth engine of Indian economy. It has received due attention of the policy makers of the country due to its share in national exports, employment and GDP. Small scale sector is the backbone of Indian manufacturing sector with 95 per cent of the total industrial units. However, according to the report by NMCC and NASSCOM (2010), the contribution of Indian manufacturing to the national GDP has stagnated over the last few years by about 15 per cent in spite of the growth in the manufacturing sector compared to other economies such as China, Indonesia etc. Hence enhancing the competitiveness of this sector has become the priority of the Government of India.

B2B e-marketplace is an ICT innovation that facilitates MSMEs to market their products on the internet. Bakos (1991) define electronic marketplace (or electronic market system or simply e-marketplace) as an inter-organisational information system that allows the participating buyers and sellers to exchange information about prices and product offerings. The firm operating the system is referred to as an intermediary, which may be a market participant- a buyer, or seller, an independent third party, or a multi-firm consortium (Bakos, 1991). Neutral e-marketplaces are owned by an independent intermediary. Neutral e-hubs are most likely to succeed in markets that are fragmented on both the buyer and seller sides and they are true market makers as they bring both buyers and sellers together (Kaplan and Sawhney, 2000).

In India, a number of e-marketplaces with infomediary model have emerged such as Indiamart.com, Tradeindia.com, and Fibre2fashion.com that act as B2B directories. They provide information on products but actual transactions are enabled offline. Such e-marketplaces operate primarily on advertising and subscription based revenue. They provide services such as electronic catalogue and hosting services, buyer and seller postings, provide information on latest industry trends, new technologies, trade fairs, facilitate in disposing excess inventory, used machinery. There are very few e-marketplaces such as Indiamarkets.com, metaljunction.com that are more focused towards buyers and facilitate transactions such as auctions and reverse auctions. Some of the services offered by B2B e-marketplaces are electronic catalogue, content management, hosting services, transaction processing, credit verification, insurance, financing, logistics, system integration and consulting services.

To enhance the competitiveness of MSMEs and provide them marketing support National Small Industries Corporation (NSIC) has launched a B2B portal, msmemart.com. The portal provides the services such as tender & trade information, banner display on NSIC website, access to national and international business leads, joint venture opportunities and trade information, comprehensive information on Government policies, rules and regulations, schemes and incentives, access to industrial databases and member's directory, various value added, specialized services for members of infomediary Service. It also organizes several training programmes to enhance marketing.

B2B e-marketplace provides several benefits to MSMEs such as access to wide range of markets, greater potential for partnerships, flexibility in administration and communication, convenience in interaction with partners who have different time zones, greater access to information at a single source, ease and cost efficiency in

updating product information, lower search and transaction costs and ability to enter supply chains for large companies (Stockdale and Standing, 2004).

In spite of these benefits as quoted in the literature, it is observed that use of B2B e-marketplace among Indian MSMEs is limited. Researchers opine that e-marketplaces increase competition among MSMEs and benefits of participation in e-marketplace are higher to large buyers. As use of B2B e-marketplace by MSMEs in India, is in growth stage, there is a need to understand the barriers to adoption and problems faced by MSMEs in using B2B e-marketplaces. Even though there are empirical studies on adoption of B2B e-business, majority of them either focus on large firms or electronic business in general. There is lack of empirical studies on adoption of B2B e-marketplaces in India, especially in the context of small firms. Therefore, this research is an attempt to bridge that gap. This is an empirical study undertaken in Karnataka state of India and aims to identify the barriers to adoption and use of B2B e-marketplaces. The present research focuses B2B electronic marketplaces that are neutral and are owned by intermediaries.

2. LITERATURE REVIEW

IT investment in SMEs differs from IT investment in large firms because a smaller number of people have decision making responsibility, standard procedures are not instituted, long- term planning is limited and there is more reliance on external IT experts in SMEs (Premkumar, 2003). Several researchers have acknowledged that MSMEs lag behind ICT adoption compared to larger businesses (Jones et al., 2003; Macgregor and Vrazalic, 2005). Indian MSMEs are no exception and penetration of ICT in Indian MSME sector is still very low (Sharma and Bhagawat, 2006; Singh et al., 2010; CII, 2010). ICT adoption in Indian manufacturing sector has significantly lagged behind its global peers. India's spend on ICT is only USD 50 per capita while China spent double that amount during 2006 (NMCC & NASSCOM, 2010).

Several research studies conducted on Indian MSMEs revealed that successful use of ICT by small firm has resulted in significant benefits. Singh et al. (2010) found that use of information technology has significant relationship with performance of small firms in India. Lal (2004) found that users of advanced e-business technology perform better than non-users in the export market.

However, Indian MSMEs face several challenges to use ICT. There are problems both at the demand side as well as supply side. Some of the barriers to use ICT in SMEs are lack of financial capacity, small scale operation and lack of in-house IT manpower inhibit the adoption, lack of R&D, marketing (Kale et al., 2010, NMCC & NASSCOMM, 2010; Kannabiran and Dharmalingam, 2012). MSMEs rely primarily on small number of customers and operate in limited markets (Sharma and Bhagawat,

2006; Kale et al., 2010). Most MSME firms lack formal ICT decision making structures and in majority of the firms, the responsibility for ICT decision making is often with the firm's owner (CII, 2010; NMCC & NASSCOM, 2010). The study also identifies few challenges faced by the national IT service providers catering to the MSME segment such as lack of innovative business models by the ICT firms, high cost of sales in servicing MSMEs, high piracy rate, and diverse needs of MSMEs.

Although B2B e-commerce solutions are claimed to create value for firms, the record shows that firms have been slow in adopting these solutions. Experts opine that some of the causes for slow adoption of B2B electronic commerce are lack of trust, new B2B startups unable to bring enough buyers and sellers to same platform, enterprises reluctant to commit resources to new B2B startups, lack of preparedness of the market and incompatible computer systems (Dai and Kauffman, 2002). The slow progress is to a large extent due to a variety of technological, organizational, and legal factors that diminish the value offered by B2B e-marketplaces, and therefore, reduce both the number of buyers and sellers participating in them, and the number & value of the electronic transactions they perform (Loukis et al., 2011). Lee and Clark (1997) identify three types of adoption barriers that prevent electronic market systems success: lack of adequate electronic product description, thinness of the market (lack of critical mass) and resistance to change (inertia of old ways of doing business).

In the small firms context, several studies (Gulledge, 2002; Stockdale and Standing, 2004; Gengatharen and Standing, 2005) have researched on barriers to e-marketplace adoption. Some of the major challenges faced by SMEs in adopting e-commerce stem from a lack of technological expertise and uncertainty about the benefits offered by e-commerce (Gengatharen and Standing, 2005). Gulledge (2002) identify two barriers to use e-marketplaces by suppliers/SMEs: profit squeeze and technology squeeze. Profit squeeze refers to reduction in profit margins which will result in suppliers preferring traditional channels where they can better manage their profit margins. "Technology squeeze" refers problems of suppliers in dealing with plethora of incompatible standards and technologies that may lead to frustration. Stockdale and Standing (2004) identify internal and external barriers to adopt B2B e-marketplace by MSMEs. External barriers are lack of understanding of SME needs by the e-marketplaces, no common technology standards, and lack of e-competence of industry sector. Internal barriers are lack of understanding of e-environment by SMEs, financial constraints, lack of familiarity with global trading mechanisms, unable to identify benefits (Stockdale and Standing, 2004). Macgregor and Vrazalic (2005) classify barriers to e-commerce adoption by SMEs into two categories: "too difficult to use" and "not suitable".

3. RESEARCH METHOD

To investigate the barriers to adoption and use of B2B e-marketplaces by MSMEs, a literature review was undertaken to identify major barriers to electronic business adoption in general and electronic marketplace adoption in particular. A pilot study of 30 MSMEs was done to shortlist the barriers. Nine barriers were shortlisted based on the pilot study. The study was conducted in Karnataka state of India which is one of the top five industrial states in the country, with industries in key sectors like telecommunication, electronics, information technology, precision engineering, aerospace, automobiles, readymade garments, bio-technology and food processing etc. The strong base of large and medium scale industry established in Karnataka has huge opportunities for vibrant small scale sector in the state. According to the fourth census of MSMEs, Karnataka is ranked at fifth position in terms of number of MSMEs with more than 1.36 lakh MSMEs and ranked fourth position in terms of number of people employed (7.89 lakh people). Karnataka is also fourth position in exports with a contribution of 5,471 crore rupees worth exports (8 per cent of total exports of India). In Karnataka, out of total 1,36,186 enterprises, 1,33,524 are micro, 2562 small enterprises, and 100 are medium enterprises (Ministry of MSME, 2011).

Addresses of MSMEs were obtained from Karnataka State's Department of Industries and Commerce and industrial associations of the three districts. A total of 12,000 manufacturing MSMEs in these regions addresses were obtained and was used as the sampling frame. Stratified sampling method was used select the MSMEs. The size of the firm was selected as the parameter for stratification to ensure sampling elements to be homogeneous. In India, MSMEs are defined based on their investment in plant and machinery. For firms engaged in manufacturing, they are defined as *micro enterprises if the* investment is less than 25 lakh rupees; *small enterprises* if the investment is between 25 lakhs rupees and upto 5 crores rupees and *medium enterprises* if the investment is between 5 to 10 crore rupees. As there was huge variance in the investment in the original group 'Small', the group was divided further into two groups: Small-Group1(investment in plant and machinery more than 25 lakh rupees and less than one crore rupees) and Small-Group 2 (MSMEs with investment in plant and machinery more than one crore rupees and less than five crore rupees). This resulted in four strata (Micro, Small Group1, Small Group2 and Medium). Fifty companies from each of the four strata (total 200 MSMEs) were contacted over telephone. Within each stratum, random sampling was employed to select the MSMEs. Out of 200 companies contacted, 122 MSMEs agreed to participate in the survey. Based on their consent to participate in the study, a personal visit was made to these firms and interview with the owner/manager was conducted. The data was collected using self-administered structured questionnaire. The barriers were

measured using the five point likert scale. Responses were received from 122 MSMEs which included 56 non-adopters and 66 adopter MSMEs.

4. BARRIERS TO ADOPT B2B E-MARKETPLACES: FINDINGS

The data collected from the 122 MSMEs were analysed to identify barriers to adoption and use of B2B e-marketplaces. As shown in Table I, "Service providers do not understand our need", "Dependent on traditional intermediaries for trading" and "Business partners are not ready" were the top three barriers among the MSMEs. MSMEs perceived that B2B e-marketplace service providers did not understand their product, industry requirements and needs of the firm. According to them, sales representatives who visited them once in a year for renewal are only interested in renewal, rather than providing tailor made recommendations for the firm. MSMEs that exported had already established traditional channels and intermediaries and are dependent on them. MSMEs also perceived that the several members in their supply chain are not ready for online transactions.

Table I: Barriers to adopt and use of B2B e-marketplace by MSMEs

Barriers	**Mean**	**S.D.**
Service Providers do not understand our needs	3.74	1.341
Dependent on traditional intermediaries in trading	3.61	1.196
Business partners are not ready	3.18	1.247
Not suitable for our product as they have to customized	2.84	1.438
Do not trust transactions	2.68	1.228
Lack of technology standards	2.49	.920
Complex To use	2.21	1.294
Expensive	2.15	1.204
Not aware	2.10	1.463

A comparison of barriers to B2B e-marketplace adoption between adopters and non-adopters was done. It was found that 'Service providers do not understand our needs' and 'Dependent on traditional intermediaries in trading' were common barriers to adopt/use B2B e-marketplaces among both adopters and non-adopters. The independent samples t-test results (shown in the Table II) showed that there are no significant differences between the means of adopters and non-adopters for these two barriers. Among non-adopters, apart from the first two barriers, 'Business partners are

not ready', 'Not suitable for our product as they have to customized', 'do not trust transactions' and 'complex to use' emerged as the top barriers. MSMEs that had highly specialized industrial products or OEM manufacturers had large buyers as their regular customers and they worked closely with them to develop customized solutions. For these barriers, it was observed that there is significant difference between adopters and non-adopters. Some of the non-adopter MSME's perceptions are as follows

"We get regular orders from branded apparel manufacturers. All the shirts and trousers are customized based on their requirements. Will the e-marketplace assure me orders?"

Apparel manufacturer

"We supply customized products to Government organizations. E-marketplace is not relevant to us".

Transformer manufacturer.

Table II: Comparison of barriers to B2B e-marketplace adoption and use among adopters and non-adopters

Barriers	**Adopters Mean (S.D.)**	**Non-adopters Mean (S.D.)**	**t-test**
Service Providers do not understand our needs	3.70 (1.488)	3.79 (1.155)	-0.363 (p=0.717)
Dependent on traditional intermediaries in trading	3.7(1.150)	3.5 (1.25)	.899 (p=0.376)
Business partners are not ready	2.55 (1.230)	3.93(0.759)	-7.588 (p=0.00)
Not suitable for our product as they have to customized	2.41 (1.381)	3.36 (1.341)	-3.839 (p=0.00)
Do not trust transactions	2.14(1.162)	3.32(.974)	-6.127 (p=0.00)
Lack of technology standards	2.15 (.899)	2.89 (.779)	-4.881 (p=0.00)
Complex To use	1.50 (.864)	3.05 (1.212)	-8.236 (p=0.00)
Expensive	1.71 (1.019)	2.66 (1.210)	-4.634 (p=0.00)
Not aware	1.20 (.613)	3.16 (1.462)	-9.936 (p=0.00)

The barriers are compared between MSMEs of different firm sizes. The means of the barriers firm size wise is shown in Table III. One-way between groups ANOVA with post-hoc comparisons was performed to understand if there are any differences in barriers among MSMEs of different firm sizes. The results of the ANOVA analysis (F-Statistic and the corresponding significance level) are also shown in Table III.

Table III: Comparison of barriers (means) to B2B e-marketplace adoption and use among MSMEs (firm size wise)

Barriers	**Micro**	**Small-Group1**	**Small-Group2**	**Medium**	**F (sig.)**
Service Providers do not understand our needs	3.53	4.04	3.84	3.55	0.974 (0.408)
Dependent on traditional intermediaries in trading	3.57	3.57	3.82	3.45	0.531 (0.662)
Business partners are not ready	3.77	3.50	2.79	2.74	5.814 (0.001)
Not suitable for our product as they have to customized	3.03	3.32	2.79	2.29	2.881 (0.039)
Do not trust transactions	3.00	2.75	2.33	2.68	1.609 (0.191)
Lack of technology standards	2.83	2.68	2.45	2.03	4.762 (0.004)
Complex to use	3.13	2.32	1.73	1.74	9.807 (0.00)
Expensive	2.93	2.18	1.85	1.68	7.587 (0.00)
Not aware	3.20	2.14	1.64	1.48	10.666 (0.00)

It was observed that there are significant differences among MSMEs in different firm sizes in all the barriers, except, **'**service providers do not understand our needs**'**, dependent on 'traditional intermediaries on trading' and 'do not trust transactions'. Therefore, these three are common barriers across MSMEs in different firm sizes. Post Hoc tests and Tukey's HSD showed that there are significant differences between

micro firms and other three groups of MSMEs in the barriers ‘complex to use’, ‘not aware’, ‘expensive’. Therefore, these barriers were found specific barriers to micro firms.

5. MANAGERIAL IMPLICATIONS AND SUGGESTIONS

This study has implications to e-marketplace service providers and Government organisations promoting MSMEs. Horizontal e-marketplace service providers that cater to different sectors have to develop their separate sales team for each sector. The sales teams have to be trained in the specifics of that industry so that they can be well versed with the needs of the MSMEs of the sector. As the needs of MSMEs may vary from one sector to another, it is necessary that tailor made packages and recommendations be provided. E-marketplace service providers should carefully select the sectors and product categories they will cater to and ensure that there are sufficient companies registered in each category. Unless there are enough buyers on the e-marketplace, MSMEs would not be motivated to participate in the e-marketplace. E-marketplaces should work with the Government organisations to enhance awareness among the micro firms. As catering to the micro firms may not be economical for the service providers, they have to work with Government organisations to develop subsidized cost effective solutions for MSMEs. Initiative by National Manufacturing Competitiveness Council(NMCC) and Microsoft, India at Apparel cluster in Tirupur is an excellent example of such a collaboration for the benefit of MSMEs. Micro firms which form a 95% of the MSME population would require handholding through appropriate policies to enhance usage of innovative ICT solutions.

6. CONCLUSIONS

Indian e-marketplace service providers have to develop new cost effective business models to cater to the MSME sector. As the needs of the MSME sector are diverse, they have to carefully select the segments they would cater to and ensure that they create value for MSMEs to increase participation from MSMEs. Government of India is taking initiatives to provide cloud based IT services to allow MSMEs to use ICT solutions on pay-per-use mode. The barriers to adoption can be overcome through policy interventions by the Government and develop an ecosystem conducive for small firms to adopt ICT effectively. As adoption rates may vary from one sector to another sector, further studies can be undertaken to compare the barriers and problems faced by MSMEs in different sectors.

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