Aligning E-Business Capabilities in SMEs: The Role of Owner/Manager Characteristics and IT Sophistication

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Abstract: *As Internet technology has electronically transformed substantial aspects of today's business operation, organisations have started to view e-business solutions as possible mean to enable various parts of their business functions. Due its unique characteristic, considerable works have reported possible explanation on factors influencing Small and Medium-sized Enterprises (SMEs) to embrace e-business. While extensive works have examined determinants of e-business usage amongst SMEs, little works have reported on how e-business capabilities support various aspect of firms operations (e-business alignment) and factors that explain varying degree of e-business alignment among firms. In response, this paper reports the current state of e-business alignment as well as the different characteristics of owner/manager and IT sophistication between highly-aligned firms and less-aligned firms. A self-administered survey on 140 firms reveals varying degree of e-business alignment amongst firms across various business functions. A t-test results comparing highly-aligned and less-aligned firms suggest that owner/manager support, owner/manager IT knowledge, and IT sophistication are significantly higher for firms in highly-aligned group in relative to those in low-aligned group.*

Keywords: E-business, Alignment, Small-Medium-Enterprises (SMEs)

1. BACKGROUND

Owing to intense competition, firms keep searching for an effective strategy to survive in its industry, particularly for firms operating in net-enabled environment. Hence, the firms start to consider various e-business solutions to deal with constantly changing business landscape. Regardless of promised potential of e-business, Small Medium Enterprises (SMEs) either struggle to reap those benefits (Fuller, 1996) or have limited attempt to exploit those potentials (Kim et al., 2008). Lack of alignment between e-business with firm's strategic focus as well as its business processes emerges as one of the factors contributing to ineffective use of e-business (Raymond & Bergeron, 2005). As firms are operating in different intensity, complexity and embrace different kind of uncertainties, hence, it is anticipated that the firms need different level of e-business capabilities to support their operation. Moreover, due to inherent constraints of SMEs i.e. lack of financial resources or unavailability of IT/IS staffs, firms selectively invest on e-business solution that highly correspond to the most crucial business functions (Melville & Ramirez, 2008). This accentuates to the need to view e-business deployment from a fit perspective to understand how different e-business capabilities correspond to different intensity of firm's operation.

Despite considerable works that explain factors leading to adoption of e-business solutions and intensity of its use amongst SMEs, there have been limited effort to examine the degree of alignment between e-business capabilities and various business processes of the firm. This is particularly crucial due to the fact that while many firms perceive huge potential of e-business, not all firms are successful in the alignment process. Responding to this argument, this paper reports the current state of e-business alignment across SMEs business processes. Next, authors examine how

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owner/manager characteristics and IT sophistication differs for in firms with varying level of e-business alignment.

This study examines the issues from fit perspective (Chan et al., 1997) as extended from Strategic Alignment Model (SAM) (Henderson & Venkatraman, 1989). SAM proposition lies on two primary components of functional fit namely business strategy and IT strategy alignment (external domain fit) and 'business infrastructure and processes' and 'IT/IS infrastructure and processes' alignment. These components are also referred as external domain fit and internal domain fit respectively. This study, however, concentrates on internal domain fit by examining how e-business capabilities enable various functions of the firms.

The framework has considerable application on large organisations (e.g. Tallon et al., 2016; Chan et al., 2006) as well as SMEs (e.g. Hussin & Suhaimi, 2011). In other respect, several studies have employed the model either to examine overall alignment (e.g. Chan et. al., 2006) or specific business function such as accounting (Ismail & King, 2005) and marketing (Hooper et al., 2010).

For this present paper, e-business alignment is conceptualised as the interaction effect between 'e-business capabilities' and 'business process importance', which is in line with SAM's contention. Focusing on business process alignment is getting paramount, particularly within SMEs as most of these firms are not strongly guided by the strategic direction (Cataldo & McQueen, 2014).

Apart from understanding current state of alignment, there have been initiatives in earlier works to explain process of aligning IT with business strategy. The primary concern of these studies are to provide empirical evidence on factors that describe varying degree of IT/IS alignment amongst firms. Various background and foreground factors have been considered to understand alignment among large organisation (Coltman et al., 2015) as well as SMEs (Hussin et al., 2002; Ismail & King, 2007). More importantly, factors affecting alignment in large organisations might differ substantially from SMEs (Padukkage et al., 2015). Adapting the framework from previous works, this current study examines variation of owner/manager support, owner/manager knowledge of IT and

level of IT sophistication among firms with different degree of e-business alignment.

This paper is structured in five interrelated sections. The second section describes the research framework and related hypotheses. The next section explains research methodology employed. The fourth section reports descriptive analysis of the current state of e-business alignment amongst firms and factors distinguishing firms with varying degree of alignment. Authors reserve the final section for conclusion and future extension of the present study.

2. RESEARCH MODEL AND HYPOTHESES DEVELOPMENT

2.1 Research Model

This study examines business process alignment and factors affecting the alignment in e-business setting, with the focus are on owner/manager support, owner/manager level of IT knowledge, and IT sophistication as illustrated in Figure 1. This present study facilitates firms to align e-business investment by identifying business areas that deserve further e-business support. It further highlights how to ensure higher e-business alignment by concentrating on factors contribute most to the alignment effort.
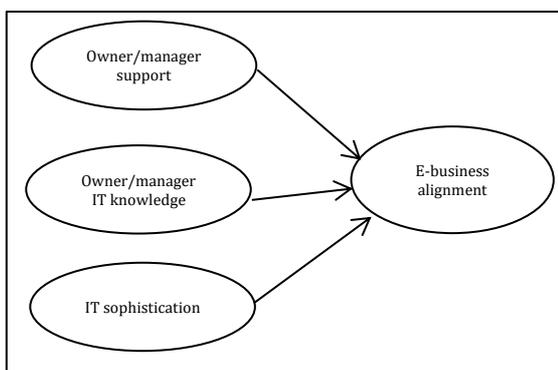

Figure 1. Research Model

2.2 Hypotheses Development

IT/IS alignment could be achieved when the top management and IT executives have considerable knowledge about firm's operation and IT/IS capabilities (Reich & Benbasat, 2000). Nevertheless, due to its dominant roles in most SMEs operation, owner/manager usually has extensive knowledge on firm's strategic focuses and nature of operation and better facilitate

them to align e-business with the business functions. Based on the above argument, this study anticipates that firm with extensive owner/manager support or participation would report higher degree of e-business alignment. It is therefore appropriate to posit that:

H1: Level of owner/manager's support positively influence the degree of e-business fit

Viewing the limited resources availability within SMEs, firms rarely afford to hire external consultants to manage any e-business related projects. By having appropriate IT competencies facilitate owner/manager to progress in e-business usage, to evaluate potentials of e-business and to minimise technical barriers for engaging e-business (Schubert et al., 2007; Wilson et al., 2008). Being IT literate also enable them to liaise confidently with external experts in finding the best e-business solutions for the firms. In short, blending owner/manager's understanding on firm's needs and his/her IT/IS knowledge fosters better e-business alignment process across all functions of the firm. Hence, the following hypothesis is proposed:

H2: Level of owner/manager's IT knowledge will positively influence degree of e-business fit

Finally, studies have demonstrated that the present level of IT sophistication facilitates firm's progress to a more advanced types of IT applications (Corrocher & Fontana, 2008). Firms continuous exposure and experience of using IT/IS in managing business operation would develop firms with greater IT maturity. Having appropriate IT infrastructure in place would also minimise cost and time incurred to deploy more sophisticated and complicated e-business technologies (Pflugheoft et al., 2003). Hence, firms with higher IT maturity tend to have more extensive e-business capabilities, which then resulted to greater demand for alignment effort so that the deployed e-business technologies correspond highly to their business needs as the next hypothesis describes:

H3: Level of firm's IT sophistication will positively influence degree of e-business fit

Next section elaborates further on the research methodology employed for this study.

3. RESEARCH METHOD

This study sent out a mail survey to owner/manager of 1,430 firms identified from SME Corporation (Malaysia) directory. The survey collected information on firms' profile, perceived importance and perceived Internet support on 32 business processes, level of owner/manager support and IT knowledge, firm's level of IT sophistication, and finally the respondent's profiles.

Authors have shortlisted list of the business processes supported by the Internet from prior works (Lefebvre et al., 2005; Magal & Kosalge, 2006). The initial list of the items were validated by 25 e-business academic experts and SMEs representatives. As a result, 32 items were retained for data collection purpose. The items were then became a basis to assess firms perception on 'business process importance' and 'e-business capabilities' corresponding to each of the 32 business processes. The finalised items are classified into five major dimensions namely; sales & after sales, procurement, accounting & financial, information searching and in-house operation.

Authors conceptualises 'business process importance' as level of firm's perception on strategic importance on each of the business process (Cragg, Tagliavini & Mills (2007). In contrast, 'e-business capabilities' represents firms' perception on the extent to which Internet-technologies currently support each of the respective business process (Raymond & Bergeron, 2008).

This study employed bi-variate alignment approach in assessing perceived 'business process importance' and 'e-business capabilities' by asking two sets of questions (Ismail & King, 2007). 'Perceived business process importance' was measured using a five-point scale in which '1' represents 'not important at all' while '5' represents 'highly important'. Consistently, a five-point scale was also considered for measuring 'e-business capabilities' with '1' represent 'not supported at all' and '5' indicates 'highly supported'.

Meanwhile, e-business alignment is a derive score as computed from a score specified for 'perceived business process importance' and 'perceived e-business capabilities'. Hooper et al. (2010) approach was adopted to compute the alignment score as represented by the

following formula. The formula produce a score of between 0 (indicates very low fit) and 20 (indicates very high fit).

E-business alignment score = [(4 - l x – yl) * (x + y)/2]

Where x represents firm's rating of perceived 'business process importance' and y represents firm's rating of current 'e-business capabilities' of a particular business process'

The factors affecting e-business alignment examined in this study were adapted from related studies namely; owner/manager support (Ismail & King, 2007), owner/manager IT knowledge (Hussin et al., 2002; Ismail, 2009), and IT sophistication (Pflugheoft et al., 2003). All constructs were measured using a five-point scale. While the survey received155 responses, only 140 responses applicable for further analysis (9% response rate). Overall, there is relatively equal number of small and medium-sized firms with more than 67% of the firms are operating in manufacturing business. More than 92% of the respondents are either managers, senior manager, CEO or owner of the firms with at about 60% have more than five years industrial experience.

4. RESULTS AND DISCUSSION

Table 1 reports mean score of e-business alignment (maximum score is 20) and rank order by business process dimensions based on 140 responses received. The results indicate tighter e-business alignment in sales and after sales, information searching, and in-house operation. In other words, firms perceive these functions of business as relatively important and at the same time, the Internet extensively supports these functions. Considering diversity of e-business alignment across firms, thus, it is essential to examine varying level of owner/manager and IT characteristics across the firms.

Table 1. E-business alignment score by business process dimensions

Dimension (no. of items)	Mean*	Rank**
Sales and after sales service (13)	11.16	2
Purchase related (8)	9.37	4
In-house operation (4)	10.95	3
Information searching (4)	12.89	1
Financial-related (3)	8.67	5

*Based on e-business alignment score between 0 and 20
**Based on alignment score (from highest to lowest score)

For comparison purpose, authors compute cumulative e-business alignment score for all 32 items to represent overall alignment score. The overall e-business alignment score was computed by totalling up the fit score for all 32 business process items (Cragg et al., 2011) Descriptive statistics of e-business alignment score are presented in Table 2.

Table 2. Descriptive statistics of e-business alignment score

Item	Mean*	Min	Max	SD
E-business alignment score	341.60	110.5	624.00	94.83

*Maximum score value of 640 (32 items multiply with maximum score for each item i.e. 20).

For the purpose of comparing perception of highly-aligned firms with less-aligned firms, this study has considered 50% percentile value (344.75) as a cut-off point between the two groups (Hussin et al., 2002) with 70 firms representatives in each group. Responses with e-business fit score exceeding 344.75 were classified as highly-aligned firms.

Next section then compares perception of firms on owner/manager support and IT knowledge as well as level of IT sophistication between the two groups.

Owner/manager support

Descriptive information in Table 3clearly shows significant difference on perception between both groups. As indicated, owner/manager of highly-aligned group reported more active involvement than those firms in low-aligned group in almost all aspects examined, particularly on determining e-business need and e-business future planning.

Table 3. Mean comparison between groups: Perceived owner/manager support

	Low-aligned	Highly-Aligned	Sig*.
Determine e-business need	3.08	3.84	.000
Hardware and software selection	3.14	3.66	.004
Implementing e-business	3.01	3.51	.005
Solving e-business problem	2.84	3.45	.001
e-business future planning	3.23	3.86	.001

*Significant at 95% confidence level

Owner/Manager IT knowledge

Based on the results reported in Table 4, owner/managers collectively reported between moderate to high level of knowledge of unsophisticated IT/IS applications (Word, spreadsheet, e-mail and Internet, and AIS). Meanwhile, they perceived relatively lower level of technical competencies on more advanced applications (e.g. database and web development). The results further indicate that highly aligned firms reported relatively greater level of IT knowledge on all kind of applications.

Table 4. Mean comparison between groups: Perceived owner/manager IT knowledge

	Low-aligned	Highly-Aligned	Sig*.
Word processing	3.66	4.23	.000
Spreadsheet	3.76	4.39	.000
Presentation	3.29	4.00	.000
Email application	2.39	3.19	.000
Internet and search engine	3.09	3.64	.003
Database management	2.31	3.16	.000
Accounting information system	4.13	4.56	.003
Production and Procurement Management	4.0	4.50	.000
Web development	2.47	3.17	.000

*Significant at 95% confidence level

It is interesting to note that firms view unsophisticated IT/IS knowledge (e.g. word processing, presentation, and spreadsheet and accounting applications) as commonplace. They perceive these IT applications as mandatory for managing day-to-day administrative tasks. However, the higher mean score for highly-aligned firm with respect to a more advanced IT applications suggests that having adequate knowledge of advanced IT/IS assists owner/manager to plan and to facilitate firms towards more meaningful use of e-business. The result is in line with several works that reported crucial role of knowledgeable owner/manager to facilitate alignment (Hussin & Suhaimi, 2011; Ismail & King, 2007). To sum up, the result implies that by having relevant knowledge and competencies, owner/manager could easily recognise e-business applications that are most suited with their business requirements. On top of that, such competencies would be very useful for them to negotiate and to collaborate with external IT experts pertaining to e-

business development projects. More importantly, IT knowledge can be a potential competitive edge for the firm as it is viewed as tacit knowledge resides in owner/manager and hardly to be codified (Chao & Chandra, 2012). Ultimately, such capabilities facilitate owner/manager to align e-business with their business needs.

IT Sophistication

The descriptive information in Table 5generally shows higher mean scores for general/administrative function and accounting functions. In fact, these are the most common areas of SMEs operation that are highly supported by IT/IS. Meanwhile, other complicated areas such as personnel, database management, sales, and procurement receive somewhat lower IT/IS support. The table further indicates that highly-aligned firms perceived significantly greater level of sophistication on all aspects examined except accounting function.

Table 5. Mean comparison between groups: Perceived IT sophistication level

	Low-aligned	Highly-Aligned	Sig.*
General and administrative	4.16	4.56	.013
Database management	3.00	3.53	.019
Accounting	4.13	4.41	.052
Personnel	3.56	4.04	.010
Sales and Marketing	3.09	3.97	.000
Procurement	2.99	3.92	.000

*Significant at 95% confidence level

The results imply that firms with extensive IT/IS deployment would face less technical glitch while integrating Internet-based innovation. Intensity of IT/IS deployment within firms operation would facilitate firms to embrace more advanced solution such as Internet-based applications. Having supportive IT/IS infrastructure would reduce time and cost of integrating e-business related technologies for firms to progress into higher e-business capabilities. Additionally, having extensive IT/IS infrastructure prior the integration of e-business related solutions indirectly develop firms' competency in managing e-business in more effective manner. The results corroborate previous findings in a great deal (Hussin et al., 2002; Hussin & Suhaimi, 2011; Ismail & King, 2007).

5. CONCLUSION

E-business sets new landscape for today's business that enable various internet-based solutions for firms to consider. Despite its potential, e-business does not equally fit all SMEs in the same manner considering its heterogeneous characteristics and thus demand for a different degree of Internet support of their business operation. This study examines different level of e-business alignment at various business processes. The study further reports descriptive comparison of owner/manager support, owner/manager IT knowledge and IT sophistication on highly-aligned firms in relative to low aligned firms. Concisely, this study suggest that firms in highly-aligned group have greater IT maturity, more IT literate owner/manager and considerable owner/manager support.

Finally, in line with government concern to promote SMEs to embrace digital economy, as part of the strategic move to extend SMEs productivity, initiative of this present study to explore the current state of e-business fit and factors describing firms with different level of alignment would enrich present understanding of e-business practices among Malaysian SMEs.

This study merely employed descriptive analysis to examine the factors influencing e-business alignment amongst firms. Despite its usefulness to have in-depth analysis by item level, future works may employ advanced statistical analysis to assess interaction effect amongst the factors that affecting e-business alignment.

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