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SOCIAL NETWORKING IN SMALL BUSINESS: VALIDATION OF A RESEARCH MODEL

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ABSTRACT

Information technology has spawned social networking – a phenomenon widely embraced by big business to increase contact with customers, identify new markets and to obtain feedback on products and services. Small businesses, slower to adopt the new technology, risk being left behind. This paper takes a theoretical research framework developed to study how technological fit and viability affect the decision to deploy, and subsequent performance evaluation, and tests it as a research model for adoption of social networking by small business. Extensive use of Structural Equation Modeling using PLS enabled verification of significant components of the model and suggested certain variations for further research.

Keywords: Social Networking, Small Business, PLS, Structural Equation Modeling

INTRODUCTION

Social networks on the Internet have changed the way we work and live. Many of these networks are business oriented and can create business opportunities – perhaps the most notable of these is *LinkedIn* which concentrates on job placements and business opportunities, however business has taken advantage of *Facebook*, *MySpace*, *Second Life* and other such social networks to promote their institutions, their products their brands, and to obtain feedback.

The Web 2.0 technologies, which include discussion forums, blogs, and wikis, have been used by many companies to achieve varying business objectives. These range from promoting products to increasing market share, developing new markets, training of staff, development of a knowledge base for use by staff and customers, and testing of economic viability. In recent times we have seen most major corporations asking that customers and contacts "friend "them on *Facebook* – they can be expected to become involved in other social networking tools. In this paper the terms social media and social networking are used interchangeably and refer to interactions among people in which they create, share, and exchange information and ideas using virtual communities.

Some research has been conducted on big business's use of social networking [2, 12, 16, 21]. This study attempts to test the suitability of a research framework for small business, an area of the economy that is in danger of losing market share as big business exploits the available technology, and to some extent utilizes resources differently to small business – think big chain supermarkets using logistics and customer focus to kill the corner store, online book-sellers using e-commerce to threaten the demise of the local bookshop. An essential question that this study aims to address is can social networking help small business?

BACKGROUND

Burnoff [2] makes the point that the potential benefits of customer relationships, both direct and intimate, that social applications provide a business are too important for them to ignore. The groundswell in social networking (Facebook is claiming over 6 billion "active" members) while not providing a panacea for business deficiencies, does force business to promote customer-centric thinking. A customer focus has long been a strength of small business – now social networking is allowing big business to compete more strongly in this area. Sinclaire [21] suggests that there is an increased use of social media and social networking sites by organizations resulting in various uses from the passive to the active, proactive to reactive, and tactical or strategic uses. Put another way this suggests that business has seen a wide range of possibilities and is looking for ways to exploit them. Larson and

Watson develop this further into multiple layers of actions by the firm and by the customer in an attempt to provide a theoretical understanding of what these entities aim to achieve by the use of social media [17].
Nevertheless it is not a panacea in other ways too: ROI is difficult to measure and may require different measures [11, 16, 17, 28] and social networking can be used against the organization [2, 15]. The role of the product manager is changing, in that it is moving from control and promotion of the brand to facilitate sharing. If the expected package around the brand (download speeds, website experience and navigation, information about the product, delivery choices and performance are examples), does not eventuate, this can be a serious setback for the business [5].

The issues of customer generated content and collaboration can be considered against the social media Web 2.0 tools of blogs, social networks, content communities, and the opportunities offered by content aggregators [6]. This underlines the array of enabling technologies embedded in social networking and Web 2.0 enabling not only Internet retailing but the use of the Internet to promote retail opportunities and be used as a marketing tool.

Workplace productivity can be improved by social networking technology. Enhanced communications and the collaboration of employees aiding in knowledge transfer will allow organizations to become more agile. In an age where many employees use a form of telecommuting or work in different locations, social networking can provide enhanced levels of employee satisfaction by reducing the social isolation of teleworkers and making them feel part of organizational culture [1]

In the last year or two there have been two other significant technological developments that have had a significant impact on these issues. The first is cloud computing [9] providing an opportunity for most organizations have access to the computing technology needed in order to compete. The other is business intelligence, providing new insights into customer activities such as enabling companies to search past purchasing patterns to predict future purchases [8] – while it is possible this technology will assist all organizations, big business is probably best placed to exploit the opportunity and continue the developing focus on customer-centricity.

The above would indicate a number of opportunities, and risks, for small business. Noting the spread of social networks Turban *et al* 2011 [26] proffered a research framework to enable study of the opportunities that the Web 2.0 tools and social networks provided to organizations. These opportunities as noted by Turban *et al* are around the areas of information dissemination and sharing, communication, collaboration and innovation, training and learning, knowledge management activities and problem-solving. Arising out of a comprehensive examination of the existing literature they proposed a framework for research. Their proposed research framework (shown in figure 1 below) is adapted from the Tjan 2001[25] viability-fit model and takes into account the features of the technology as it matches the requirements of the task. In other words, for social networking to be useful it will need to be able to be applied to appropriate tasks – how can we use the technology to achieve the objectives of those tasks? The model suggests that "fit" is determined by task related activities and the use of available technology; "viability" is determined by economic decisions, the readiness of the organization to deal with what the technology offers from both technological and organizational standpoints. The fit and viability will determine decisions regarding deployment, which can be evaluated by performance.

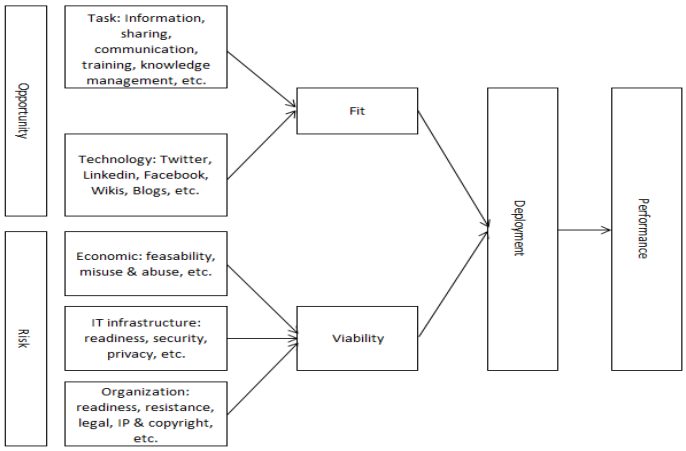

Figure 1: Proposed Research Model (Turban *et al*)

This study is an attempt to validate the research framework by testing it against the use of social networking by small business in the South East United States. Validation of the framework will allow a more substantial study and should highlight areas for modification. The outcome of this research should provide small business with some guidance as to "what works" and some indication of the pitfalls they may encounter.

The following research questions are proposed:

1. Can the (untested) framework proposed by Turban *et al* [26] be used as a research model to determine whether small businesses can take advantage of social networking to enhance their performance?
2. To what extent do the various factors related to tasks, technology, economics and organizational readiness influence the decision to deploy social networking and its ultimate performance?

Accordingly, and based on the Turban et al framework it is hypothesized that:

1. Tasks related to the opportunity factors of *knowledge management, communication, sharing* and *training* will have a positive influence on task *fit*
2. *Technology* will have a positive influence on task *fit*
3. The risk factors of *organizational readiness, infrastructure* and *economics* will have a positive influence on *viability*
4. *Fit* and *viability* will influence *deployment*
5. *Deployment* will influence *performance*

(Note that these are summarized into groups here, there are 11 in total, full details are given in the Conclusion)

RESEARCH METHODOLOGY

The measurement constructs were developed by researchers with considerable experience in scale construction and with the benefit of a previous exploratory study of social networking in small business and based upon scales used in the IS literature. The initial instruments were pretested for content and face validity by obtaining feedback from other scholars in the related field. In addition practitioners proficient in the field were asked to comment on the questionnaire as it related to structure, clarity, ambiguity, appropriateness & completeness [20].

The exploratory study involved 25 small businesses each with less than 50 employees. The collection of data, achieved by using a research assistant to visit each of the small businesses, did not reveal major concerns as it related to the clarity of instructions, response formats, or survey length. All 25 questionnaires were completed by the research assistant in the presence of the business representative. Non-response bias is not considered to be an issue here as only a small number of businesses were unwilling to complete the survey due to work-pressure at the time.

Partial Least Squares (PLS) analysis was chosen as the primary analysis tool for testing the hypotheses. The PLS model is shown below in Figure 2.

PLS is a component based structural equation modeling technique which is an appropriate method when current research deals with emerging theory and/or sample size is limited [22]. In addition, PLS is a preferred method when the research is interested in the ability to predict endogenous variables [3, 13]. In addition, PLS is robust regarding violations of multivariate normality, which are typical in small sample sizes [19]. However, the major determinant for selecting a component base structural equation model over a covariance one, lies in the ability of PLS to estimate more conservative path coefficients estimates [3, 20]. All 12 latent constructs are composed of reflective indicators. The latent construct indicators were selected based on the IS literature, academic experience and practitioner feedback.

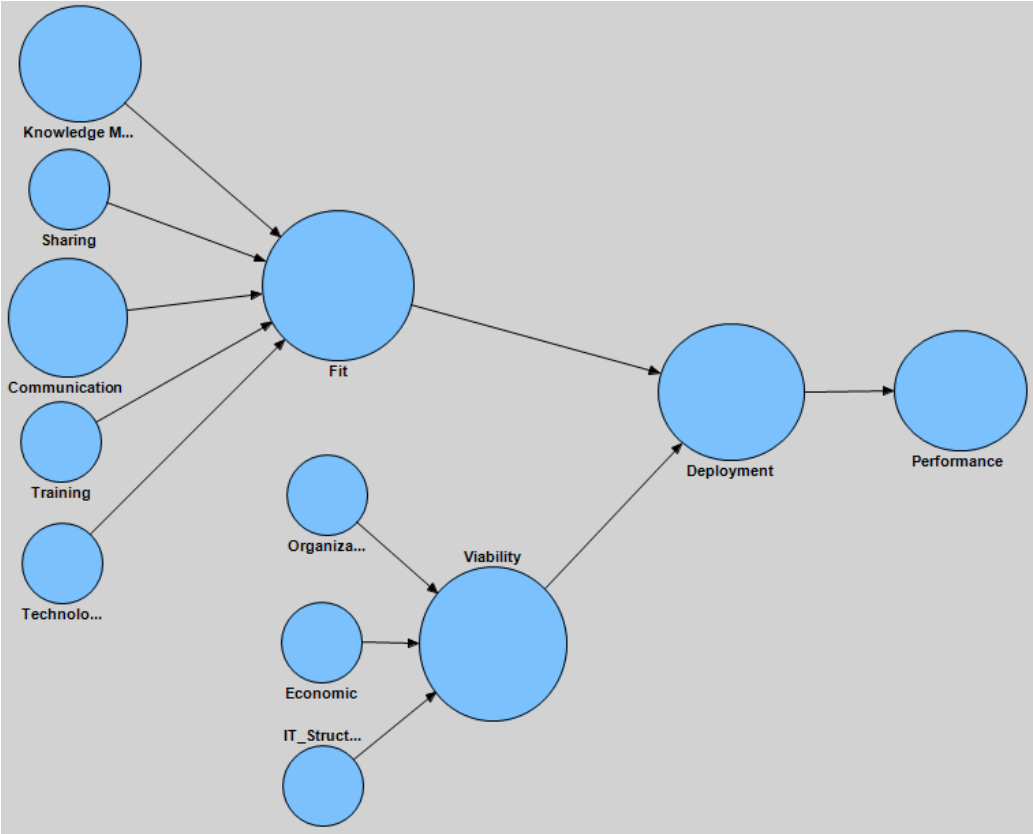

Figure 2: PLS Research Model

RESULTS

For this study the PLS guidelines prescribed by Peng & Lai [19] and Hair *et al*. [13] were followed. SmartPLS 2.0.M3 was used to estimate our research model. The item loadings, composite reliability (CR), average variance extracted (AVE) and variance inflation index (VIF) of the reflective constructs are shown in Table 1. Five measurement items and three exogenous variables were dropped due to low loadings. All other loadings were above the .70 threshold (Hair *et al*. 2011). The complete model is shown in Appendix A. A X^2 difference test was also conducted which allows for a comparison between a general model where all paths are correlated and a nested model where a path is constrained. A significant result from the X^2 difference test indicates discriminant validity. The X^2 results indicate there is discriminant validity between Economic, Fit and Performance.

Table 1: Overview of Reliability and Validity

	Outer Loadings	
	Point Estimation	***t*-Value**
Technology (α = 1, AVE = 1, CR = 1, VIF = 2.19)		
A12	1.000	-
Sharing (α = .799, AVE = .703, CR = .876, VIF = 1.72)		
B1	0.747	2.428
B5	0.864	4.048
B6	0.897	3.861
Knowledge_Management (α = .939, AVE = .942, CR = .970, VIF = 2.64)		
B11	0.973	25.804
B12	0.968	13.418
Communication (α = .587, AVE = .705, CR = .827, VIF = 1.57)		
B2	0.798	2.337
B7	0.880	3.061
B8		
Training (α = .767, AVE = .704, CR = .868, VIF = 2.18)		
B3	0.9304	4.169
B9	0.8174	3.150
Economic (α = .823, AVE = .561, CR = .863, VIF = 1.49)		
B16	0.836	5.351
B21	0.686	3.462
IT Structure (α = .668 AVE = .492, CR = .794, VIF = 1.67)		
B17	0.714	4.050
B24	0.717	2.044
B26	0.642	1.696
B27	0.727	4.364
Organizational Readiness (α = .674, AVE = .515, CR = .806, VIF = 1.30)		
B18	0.732	4.000
B19	0.785	4.176
B22	0.800	4.327
B25	0.519	1.820

α - Cronbach's alpha; AVE - average variance explained; CR = composite reliability
VIF - variance inflation factor

The bootstrapping procedure was employed to estimate errors and the significance of parameter estimates [4, 19]. A bootstrapping resample of 500 was utilized [4]. Results indicate that all reflective items had a significance level greater than .01. In addition, a VIF test was run to determine if multi-collinearity was present. All results were below 3.3, which indicate no multi-collinearity is present [7].

Construct reliability was assessed by Cronbach's alpha and Composite Reliability (CR). Cronbach's alpha was above .7 for all constructs except for Training. Nevertheless, all CR values were greater than .80 which is well above the suggested .60 when conducting exploratory studies (Hair *et al* 2011). Convergent validity was assessed by AVE. All AVE values were above the recommended value of .50 [10, 13].

Stone-Geisser Q^2 was used to assess the predictive significance of the exogenous variables [11, 23]. Blindfolding is the recommended technique for assessing Q^2 when running a PLS model. The omission distance (D) parameter should range from 5 to 10 [27]. In this study an omission distance of 6 and a mean case replacement option were used to run the blindfolding procedure. All Q^2 values were greater than zero indicating sufficient predictive power of the structural model exists [19].

Pend and Lai [19] recommend testing the overall quality of the model by utilizing the goodness-of-fit proposed by Tenenhaus *et al*. [24]. Its calculation is as follows (it essentially takes into account measurement variability and variance explained) and provides some assurance around the model, even though sample size is small:

$$GOF = \sqrt{(\text{Average Communality} \times \text{Average } R^2)} = \sqrt{(.75 \times .53)} = .63$$

This omnibus test does incur some criticism by some scholars such as Hair *et al* (2011). One of the arguments against this test is the fact that R^2values depends on the research context. For example, if the research is exploratory, lower values of R^2 are accepted; while this may not be the case for testing established theory. However, the average communality for the reflective models is above the threshold of .7 and the average R^2 for the endogenous variables has a moderate value. So, .65 is a moderate value when considering the context of this exploratory study. The individual endogenous variable range from moderate to substantial based on the recommendations of Chin [3] and Peng & Lai [19]. The variables with a moderate R^2 are Fit (.586) Deployment (.437) and Viability (.438) while Performance (.657) had a substantial R^2.

In order to test path stability bootstrapping was run with 200, 500 and 1,000 times of resampling to assess the magnitude and significance path of the structure model are consistent [19]. Results from the 500-bootstrapping run can be found in Table 2. Additionally, the effect size (f^2) was calculated for each of the exogenous variables. The effect size provides the impact an exogenous variable has as it relates to the endogenous variable R^2. This helps asses the substantive impact the exogenous variable has with respect to the endogenous [14]. Results indicate we have between small to large effect (see Table 3). The results indicate that four out of the eleven hypotheses are supported, of which H9 and H11 are significant at the .01 level, H1 is significant at the .05 while H4 is significant at the .10 level.

Table 2: Path Coefficients and R-squared values

Path coefficients and R^2 of structural model

Constructs and indicators	Path coefficient		Hypothesis		Cohen f^2	Q^2
	Point estimate	t-Value				
Fit (R^2=.586) R^2						0.321
Knowledge Management	0.385	2.509	H1	Supported	0.27	
Communication	0.376	1.386	H2	Rejected	0.18	
Sharing	(0.316)	0.941	H3	Rejected	0.06	
Technology	(0.666)	1.775	H4	Supported*	0.43	
Training	(0.188)	0.535	H5	Rejected	0.03	
Viability (R^2= .438) R^2						0.328
Organization_Readines	0.237	0.905	H6	Rejected	0.03	
IT_Structure	0.330	0.941	H7	Rejected	0.10	
Economic	0.197	0.612	H8	Rejected	0.05	
Deployment (R^2= .437)						0.351
Fit	0.526	2.611	H9	Supported	0.32	
Viability	0.196	0.905	H10	Rejected	0.05	
Performance (R^2= .657)						0.391
Deployment	0.811	15.693	H11	Supported		

* Supported at significance of P < .10

Table 3 : Effect size and Predictive Relevance

		Cohen f^2	Q^2
Fit			0.321
	Knowledge Management	0.27	
	Communication	0.18	
	Sharing	0.06	
	Technology	0.43	
	Training	0.03	
Viability			0.328
	Organization_Readines	0.03	
	IT_Structure	0.10	
	Economic	0.05	
Deployment			0.351
	Fit	0.32	
	Viability	0.05	
Performance			0.391
	Deployment		-

CONCLUSIONS

The study to date has clear limitations – first the sample size is small and in many cases at the borderline where meaningful statistical analysis can be conducted. Secondly, the model goodness of fit statistic is marginal, so only limited confidence can be place in its predictive value at this point. Technology was measured by the relatively crude method of a count of the number of types of social media in use – further work in this is clearly needed. Nevertheless, in essence the authors believe the structural equation modeling analysis employed to evaluate the framework gives it considerable support, especially given the small sample size. A revised model showing the significant is shown in Figure 3.

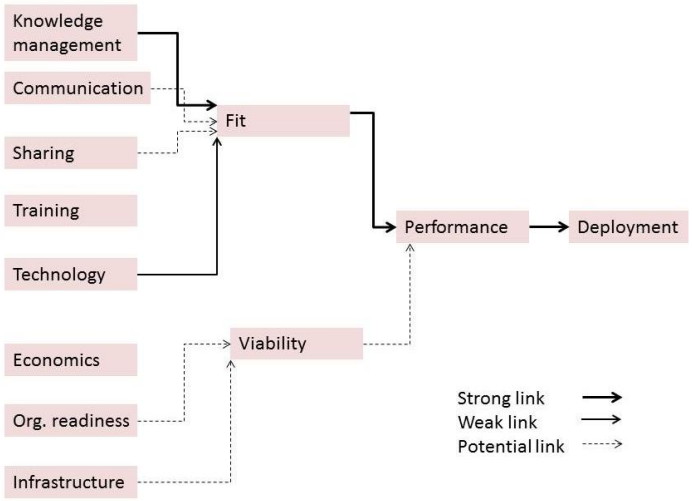

Figure 3: Revised Model

The authors are encouraged to continue this research with a larger data set and expect to see stronger path coefficients and predictive ability, suggesting the framework developed by Turban *et al* [26] has significance and implications for small business use of social networking. As such the data is expected to contribute to theory by validating the model and providing a sound framework for further more applied research.

The paper has also demonstrated the usefulness of Structural Equation Modeling in analysis of small data sets and in exploratory research. The authors hope that the methodology employed here will provide a useful guide for similar data sets requiring analysis. PLS-SEM is a recommended method when a theory is under development such as the study conducted here [13]. This study has employed the practices put forth by Hair *et al*. [14], Peng & Lai [19], and Vinzi *et al*, (2010).

The findings, with implications for practice, suggest that the knowledge management tasks of providing information about the business and products on offer, and technology are driving the fit of social networking to the enterprise and that the degree of fit is the predominant force in the decision to deploy which is validated by performance. There is also some indication in the model that communication and sharing of information with customers may affect fit and that the viability in terms of infrastructure and organizational readiness may also influence the decision to deploy. These results suggest that small business owners and managers who feel that their organizations are ready to embrace the technology and have the infrastructure in place will benefit from engaging stakeholders in the areas of providing information with them, be they staff, customers or suppliers. In turn this may provide small business with a way to compete more effectively with larger organizations by enabling them to exploit the data and technology in a similar way and use it to enhance the strategic advantage small business – a focus on customer-centricity.

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Appendix A

Correlations and square Correlations between Constructs

	Communication	Deployment	Economic	Fit	IT_Structure	Knowledge Management	Organization Readines	Performance	Sharing	Technology	Training	Viability
Communication	**0.705**	0.154	0.053	0.121	0.005	0.005	0.005	0.278	0.449	0.155	0.321	0.036
Deployment	0.392	**0.900**	0.544	0.411	0.101	0.453	0.332	0.657	0.316	0.488	0.219	0.256
Economic	0.230	0.737	**0.561**	0.675	0.408	0.523	0.473	0.607	0.145	0.460	0.149	0.325
Fit	0.348	0.641	0.822	**0.987**	0.211	0.306	0.232	0.634	0.144	0.409	0.116	0.348
IT_Structure	(0.069)	0.318	0.639	0.460	**0.492**	0.143	0.313	0.224	0.031	0.189	0.008	0.346
Knowledge Management	0.072	0.673	0.724	0.553	0.378	**0.942**	0.268	0.263	0.081	0.199	0.124	0.028
Organization Readines	(0.072)	0.576	0.687	0.481	0.560	0.518	**0.515**	0.264	0.011	0.142	0.001	0.310
Performance	0.528	0.811	0.779	0.796	0.474	0.513	0.514	**0.667**	0.393	0.503	0.332	0.569
Sharing	0.670	0.562	0.381	0.379	0.175	0.284	0.103	0.627	**0.703**	0.518	0.602	0.130
Technology	(0.393)	(0.698)	(0.678)	(0.639)	(0.434)	(0.447)	(0.377)	(0.709)	(0.720)	**1.000**	0.404	0.200
Training	0.567	0.469	0.386	0.340	0.088	0.353	0.027	0.576	0.776	(0.636)	**0.767**	0.042
Viability	0.189	0.506	0.571	0.590	0.588	0.169	0.557	0.755	0.361	(0.447)	0.206	**0.778**