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Information systems success: the quest for the dependent variable

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ABSTRACT

This paper presents an empirical investigation to identify and rank the factors of information market development systems influencing on the market share development. The population of this survey includes all managers who work for SMEs in city of Tehran, Iran. The study selects a sample of 230 people randomly and a questionnaire is distributed among them in Likert scale. Cronbach alpha has been calculated as 0.814, which is well above the minimum desirable level. Using structural equation modeling the study has determined seven factors including valid data, information, strategic information, organizational information, supportive information, customer information, development information and data analysis, which influence market share development.

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1. Introduction

One of the most important and strategic action for stimulating economy is to boost small and medium businesses (SMEs) and there are several studies to detect important factors influencing on development of SMEs. Abid et al. (2012) explored the authentic leadership styles of an entrepreneurs and its effect on employee's commitment and satisfaction. They looked to give a tentative test of the connection among employees' awareness of the business creator as an authentic leader and the employees' attitudes. Zarandi (2012) investigated key-factor analysis of elements affecting women's employment in small and medium enterprises (SME) among women living in Tehran. Basu et al. (2011) attempted to identify and prioritize the factors influencing proper implementation of Enterprise resources planning (ERP) systems in a business organization particularly for Indian SMEs. The research presented here is specifically targeted the Indian SMEs, which have already accomplished the process of implementing ERP system. Noudoostbeni et al. (2009) evaluated important success factors and failure factors in Malaysian SME firms and attempted to recognize the most effective ones. The implementation of critical issues determined for successful implementation were proper team composition and effective training of users. Besides, two issues identified responsible for the failure of the implementation were poor project planning and inappropriate training method.

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Upadhyay and Dan (2009) proposed a survey for Indian SME's and reported that certain critical factors could lead to positive implementation of ERP. Özgener and İraz (2006) analyzed the factors influencing the implementation of customer relationship management (CRM) at small and medium-sized tourism enterprises in Cappadocia. They reported that communication-distribution infrastructure, business dynamics, customer relations and innovation-quality factors affect CRM. Business dynamics played essential role in customer relations. They also concluded that the most important barriers to small and SMEs in the tourism sector were inadequate supporting budgets, lack of senior management commitment to CRM and poor communication.

Gounaris et al. (2007) designed and empirically validated an instrument for measuring the effectiveness of a marketing intelligence system (MkIS). Exploratory and confirmatory factor analysis indicated that the proposed measuring instrument could meet acceptable criteria of reliability and validity. The effectiveness of MkIS was determined to comprise both internal and external components, related on the one hand to the extent to which the user organization improves functional effectiveness and corporate climate and on the other to its adaptability to market conditions and its customer responsiveness.

Salavou et al. (2004) considered determinants of organizational innovation in SMEs, as expressed by the number of product innovation adoptions. Using some data from 150 manufacturing firms in Greece, the study tried to identify the importance of strategic orientation and competitive structure. First, strategy-driven characteristics, such as market orientation and learning, seemed to increase SMEs' innovative performance. Second, competition-related characteristics, and more specifically industry concentration and barriers to entry, seemed to have substantial impacts on SMEs' innovative activity. The study suggested that market- and learning-oriented SMEs facing strong competition appeared to be more innovative. These results were discussed in the context of Greek SMEs in food, beverages and textile sectors, taking into account the specific conditions prevailing.

Lu and Beamish (2001) investigated the effects of internationalization, an entrepreneurial strategy employed by SMEs, on firm performance. Using concepts derived from the international business and entrepreneurship literatures, the study developed four hypotheses associated with the extent of foreign direct investment (FDI) and exporting activity, and the relative use of alliances, to the corporate performance of internationalizing SMEs. Based on a sample of 164 Japanese SMEs to test these hypotheses, they determined that the positive effect of internationalization on performance extends primarily from the extent of a firm's FDI activity. They also determined some evidence consistent with the perspective that companies face a liability of foreignness. When organizations first begin FDI activity, profitability declines, but bigger levels of FDI were associated with higher performance. Exporting moderates the relationship FDI maintained with performance, as pursuing a strategy of high exporting concurrent with high FDI was less profitable than one, which involved lower levels of exports when FDI levels were high. Finally, they determined that alliances with partners with local knowledge could be an effective strategy to overcome the deficiencies SMEs face in resources and capabilities, when they could expand into international markets.

2. The proposed study

This paper presents an empirical investigation to identify and rank the factors of information market development systems influencing on the market share development. The population of this survey includes all managers who work for SMEs in city of Tehran, Iran. The study selects a sample of 230 people randomly and a questionnaire is distributed among them in Likert scale. Cronbach alpha has been calculated as 0.814, which is well above the minimum desirable level. The study uses principal component analysis with Varimax rotation. Kaiser-Meyer-Olkin Measure of Sampling Adequacy is equal to 0.74 and Bartlett's Test of Sphericity yields Chi-Square = 4130.930 with Sig. = 0.000. Table 1 demonstrates some basic statistics associated with the questionnaire. According to the results of Table 1, all data are within desirable levels and we normality assumption may hold on the data.

Table 1
The summary of some basic statistics

		N	Minimum	Maximum	Skewness		Kurtosis	
					Statistic	Statistic	Std. Error	Statistic
q1	Customer needs	230	1	5	-0.491	0.16	-0.469	0.32
q2	The global competition	230	1	5	-0.42	0.16	-0.529	0.32
q3	Analysis of competitors	230	1	5	-0.307	0.16	-0.654	0.32
q4	Competitive marketing advantage	230	1	5	-0.404	0.16	-0.4	0.32
q5	Attitudes to information systems	230	1	5	-0.202	0.16	-1.136	0.32
q6	Opportunities created by the IS / IT	230	1	5	-0.665	0.16	-0.447	0.32
q7	The role of managers in implementing systems	230	1	5	-0.175	0.16	-1.437	0.32
q8	Sales forecast	230	1	5	-0.177	0.16	-1.209	0.32
q9	Customer Management	230	1	5	-0.802	0.16	0.409	0.32
q10	Support of the marketing mix	230	1	5	-0.54	0.16	-0.633	0.32
q11	Ensure environmental	230	1	5	-0.739	0.16	0.162	0.32
q12	Access to high quality information	230	1	5	-0.641	0.16	-0.1	0.32
q13	Pattern discovery for each cluster of customers	230	1	5	0.072	0.16	-0.845	0.32
q14	Wide range of information	230	1	5	-0.551	0.16	-0.269	0.32
q15	Market Information	230	1	5	-0.49	0.16	-0.552	0.32
q16	Staff involved in the implementation of systems	230	1	5	-0.781	0.16	0.017	0.32
q17	Understanding the need for change	230	1	5	-1.073	0.16	1.889	0.32
q18	Remove redundant environmental information	230	1	5	-0.46	0.16	-0.21	0.32
q19	Development of Decision Support System	230	1	5	-0.005	0.16	-0.954	0.32
q20	Competitive Advantage	230	1	5	-0.854	0.16	0.239	0.32
q21	Problems distributors	230	1	5	-0.47	0.16	-0.456	0.32
q22	Management Support Systems	230	1	5	-0.571	0.16	0.997	0.32
q23	Data Conversion	230	1	5	-0.517	0.16	-1.012	0.32
q24	Decentralization	230	1	5	-0.495	0.16	1.078	0.32
q25	High-level output	230	1	5	-0.47	0.16	0.625	0.32
q26	Access to buyers	230	1	5	0.005	0.16	-1.178	0.32
q27	Distribution of Information	230	1	5	-0.229	0.16	-0.898	0.32
q28	Respond quickly to customer needs	230	1	5	-0.819	0.16	0.214	0.32
q29	Assist management decision making	230	1	5	-0.334	0.16	-0.552	0.32
q30	Customer Satisfaction	230	1	5	-0.401	0.16	-0.236	0.32
q31	Predict consumer behavior	230	1	5	-0.381	0.16	-0.893	0.32
q32	Privacy	230	1	5	-0.639	0.16	-0.344	0.32
q33	Establish a relationship between functional units	230	1	5	-0.9	0.16	0.718	0.32
q34	Timely information	230	1	5	-0.894	0.16	0.45	0.32
q35	Cost-effectiveness	230	1	5	-0.753	0.16	0.231	0.32
q36	Determine the responsibilities of senior officials	230	1	5	-0.302	0.16	-0.417	0.32
q37	The complexity of information systems	230	1	5	-0.728	0.16	-0.239	0.32
q38	Accuracy of Information	230	1	5	-0.864	0.16	0.763	0.32
q39	Culture system using	230	1	5	-0.791	0.16	1.087	0.32
q40	Understanding the current situation	230	1	5	-0.642	0.16	-0.879	0.32
q41	Information support of managers	230	1	5	-0.655	0.16	0.153	0.32
q42	Discover new opportunities	230	1	5	-0.426	0.16	-0.73	0.32
q43	Efficiency	230	1	5	-1.077	0.16	0.518	0.32
q44	Proper analysis of	230	2	5	-0.32	0.16	-0.444	0.32
q45	Domain Information	230	1	5	-1.153	0.16	2.544	0.32
q46	Currency	230	2	5	-0.682	0.16	2.226	0.32
q47	Develop the ability to organize	230	2	5	-0.359	0.16	-0.37	0.32
q48	Downsizing business	230	1	5	-0.252	0.16	0.095	0.32
q49	Life Cycle	230	1	5	-0.731	0.16	0.534	0.32
q50	Access to strategic information	230	2	5	-0.781	0.16	0.103	0.32
q51	Classification of customer transactions	230	1	5	-0.51	0.16	0.173	0.32
q52	Design of Information Systems	230	1	5	-1.018	0.16	1.284	0.32

3. The results

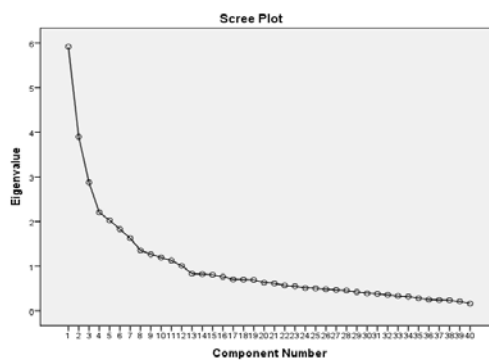
In this section, we present details of the implementation of principal component analysis. We first present the results before rotation in Table 2.

Table 2

The summary of principal component analysis

Item	Initial Eigen values			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.916	14.79	14.79	5.916	14.79	14.79	3.626	9.065	9.065
2	3.898	9.746	24.536	3.898	9.746	24.536	3.624	9.059	18.124
3	2.876	7.189	31.725	2.876	7.189	31.725	2.679	6.698	24.821
4	2.203	5.508	37.233	2.203	5.508	37.233	2.643	6.607	31.429
5	2.03	5.074	42.308	2.03	5.074	42.308	2.462	6.156	37.585
6	1.831	4.578	46.885	1.831	4.578	46.885	2.334	5.835	43.42
7	1.626	4.064	50.949	1.626	4.064	50.949	1.743	4.357	47.776
8	1.356	3.391	54.34	1.356	3.391	54.34	1.695	4.238	52.014
9	1.267	3.167	57.507	1.267	3.167	57.507	1.667	4.168	56.182
10	1.196	2.99	60.497	1.196	2.99	60.497	1.467	3.668	59.85
11	1.13	2.824	63.322	1.13	2.824	63.322	1.224	3.059	62.909
12	1.01	2.525	65.846	1.01	2.525	65.846	1.175	2.937	65.846
13	0.831	2.078	67.924						
14	0.82	2.051	69.975						
15	0.802	2.006	71.981						
16	0.762	1.905	73.886						
17	0.701	1.752	75.638						
18	0.697	1.742	77.38						
19	0.688	1.719	79.099						
20	0.633	1.583	80.682						
21	0.615	1.538	82.22						
22	0.565	1.412	83.632						
23	0.548	1.371	85.003						
24	0.512	1.279	86.282						
25	0.504	1.261	87.543						
26	0.482	1.205	88.748						
27	0.467	1.168	89.916						
28	0.452	1.13	91.046						
29	0.421	1.052	92.098						
30	0.392	0.981	93.078						
31	0.381	0.953	94.031						
32	0.357	0.892	94.924						
33	0.329	0.822	95.746						
34	0.317	0.794	96.54						
35	0.283	0.709	97.248						
36	0.252	0.63	97.878						
37	0.241	0.602	98.48						
38	0.236	0.59	99.07						
39	0.207	0.519	99.589						
40	0.164	0.411	100						

Fig. 1 also shows the results of Scree plot to extract the number of components.

**Fig. 1.** The summary of Scree plot

As we can observe from the results of Scree plot, we may extract 7 factors to describe all necessary components of information market development systems influencing on the market share development. Table 3 and Table 4 present the results of principal component analysis before and after rotation.

Table 3

The summary of principal component analysis before rotation

	Factor	Component Matrix											
		1	2	3	4	5	6	7	8	9	10	11	12
q3	Analysis of competitors	0.691				0.336							
q2	The global competition	0.683				0.38							
q21	Problems distributors	0.647				0.464							
q20	Competitive Advantage	0.61											
q10	Support of the marketing mix	0.587	-0.363			0.337							
q14	Wide range of information	0.522					-0.348						
q38	Accuracy of Information	0.516	0.478										
q15	Market Information	0.514			0.479	-0.334							
q41	Information support of managers	0.474						-0.426				0.347	
q12	Access to high quality information	0.467											
q35	Cost-effectiveness	0.462	0.387										
q33	Establish a relationship between functional units	0.442											
q37	The complexity of information	0.406											
q17	Understanding the need for change		0.579										
q22	Management Support Systems		0.549										
q24	Decentralization		0.541					0.339					
q34	Timely information	0.458	0.477										
q18	Remove redundant environmental information	0.413	0.471										
q11	Ensure environmental	0.428	0.466										
q28	Respond quickly to customer		0.434					-0.421					
q16	Staff involved in the implementation of systems		0.41									0.341	
q48	Downsizing business		-0.401	0.608									
q47	Develop the ability to organize		-0.385	0.6									
q49	Life Cycle		-0.394	0.536									
q50	Access to strategic information		-0.391	0.469									
q4	Competitive marketing advantage			-0.412									
q31	Predict consumer behavior	0.351			0.616								
q6	Opportunities created by the IS/IT				-0.492								
q13	Pattern discovery for each cluster of customers			-0.399	-0.426			0.333					
q40	Understanding the current	0.34				-0.607							
q8	Sales forecast	0.392						0.491					
q7	The role of managers in implementing systems							0.46					
q5	Attitudes to information systems							0.446	0.399			0.375	
q39	Culture system using		0.414						0.444				
q36	Determine the responsibilities of senior officials	0.417							0.466				
q23	Data Conversion							0.351	-0.343	0.586			
q19	Development of Decision Support System											-0.39	
q27	Distribution of Information	0.333									0.374		
	Design of Information Systems			0.464								0.494	
q44	Proper analysis of										0.51		0.56

In our survey, we have used structural equation modeling and Fig. 2 shows details of the implementation.

Table 4
The summary of principal component analysis after rotation

	Factor	Rotated Component											
		1	2	3	4	5	6	7	8	9	10	11	12
q35	Cost-effectiveness	0.794											
q34	Timely information	0.777											
q12	Access to high quality information	0.766											
q11	Ensure environmental	0.666											
q38	Accuracy of Information	0.664											
q18	Remove redundant environmental information	0.532											
q41	Information support of	0.436								0.399			
q2	The global competition		0.878										
q21	Problems distributors		0.86										
q3	Analysis of competitors		0.807										
q10	Support of the marketing mix		0.803										
q48	Downsizing business			0.798									
q49	Life Cycle			0.763									
q47	Develop the ability to organize			0.755									
q50	Access to strategic information			0.699									
q17	Understanding the need for change				0.752								
q24	Decentralization				0.716								
q39	Culture system				0.684								
q22	Management Support Systems				0.671								
q16	Staff involved in the implementation of systems				0.528							-0.427	
q31	Predict consumer behavior					0.789							
q15	Market Information					0.716							
q40	Understanding the current situation					0.599	0.343					-0.357	
q28	Respond quickly to customer	0.34				0.491							
q13	Pattern discovery for each cluster of customers						0.807						
q6	Opportunities created by the IS						0.698						
q4	Competitive marketing						0.578						
q19	Development of Decision					0.385	0.48						-0.379
q33	Establish a relationship						0.391				0.361		
q36	Determine the responsibilities of senior officials							0.735					
q20	Competitive Advantage							0.624					
q23	Data Conversion								0.811				
q7	The role of managers in implementing systems								0.679				
q5	Attitudes to information									0.842			
q8	Sales forecast								0.332	0.685			
q52	Design of Information Systems			0.383								0.581	
q37	The complexity of information		0.338									0.539	
q14	Wide range of information		0.41									0.508	
q27	Distribution of Information						0.449						0.576
q44	Proper analysis												0.815

Based on the results of Table 4 we have determined seven factors including valid data, information, strategic information, organizational information, supportive information, customer information, development information and data analysis.

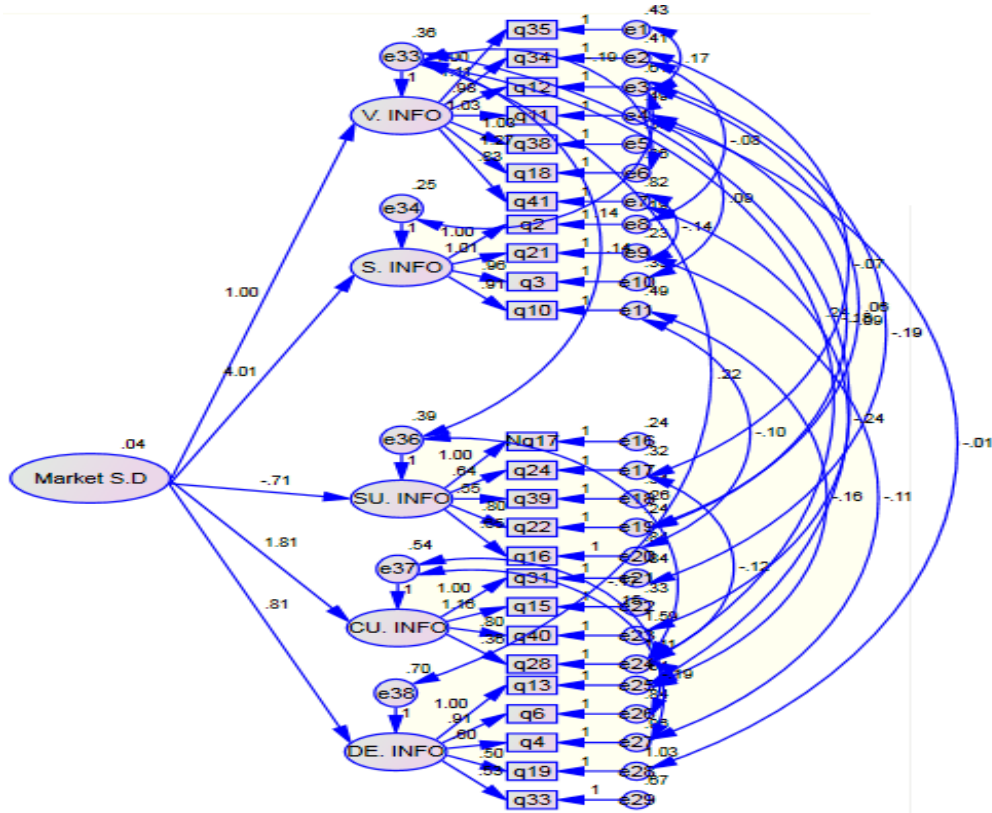


Fig. 2. The summary of standard values associated with structural equation modeling

In our survey, all statistical observations are meaningful when the level of significance is five percent.

4. Conclusion

We have presented an empirical investigation to identify and rank the factors of information market development systems influencing on the market share development. The population of this survey includes all managers who work for SMEs in city of Tehran, Iran. Using structural equation modeling the study has determined seven factors including valid data, information, strategic information, organizational information, supportive information, customer information, development information and data analysis. In our survey, strategic Information has been the most important followed by customer Information and valid date.

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