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Decision support systems: Detecting factors influencing on export activities

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A B S T R A C T

Decision support system (DSS) normally consists of a set of related computer programs and the data required to help with analysis and decision-making within an organization. Many software vendors claim their decision support, analytics or business intelligence applications may provide a competitive advantage by providing different facilities such as business intelligence tools, business performance management software, data mining tools, etc. This paper presents an empirical investigation to determine different DSS factors influencing on development of export activities on selected firms which are active in Tehran Stock Exchange. The study designs a questionnaire consists of 35 questions and distributes it among 211 randomly selected managers who were involved in export activities. Cronbach alpha has been calculated as 0.817, which is well above the minimum desirable level. Using principle component analysis, the study has detected five factors including internal resources, management approach, quality of data, efficiency of data and organizational approach, which influence the most on export activities.

1. Introduction

There are literally many studies on learning the effects of various factors on export activities (Leonidou & Katsikeas, 1996). Stöttinger and Schlegelmilch (1998) performed an empirical investigation on the usefulness of the psychic distance concept on export development in US and compared the results with Japan, Germany, Finland and Austria. Wiedersheim-Paul et al. (1978) developed a model that emphasizes on the relative importance of a business activities and “pre-export” behavior for the export start. The model was based both on more “traditional” research in international business and recent developments in location theory. Bhagwati (1988) evaluated some arguments against the adoption of an export-promoting (EP) trade strategy. The study considered past experiences with trade strategies, and distinguished between the old and new export pessimism. They reported that an EP policy could remain the preferred option provided developing countries forcefully join with the industrial countries in strategies to contain protectionist threats and to preserve and expand an open trading system. One of the most popular techniques for handling different sorts of data for making managerial decision is to use Decision Support Systems for analysing the data.

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Decision support system (DSS) normally consists of a set of related computer programs and the data required to help with analysis and decision-making within an organization. Many software vendors claim their decision support, analytics or business intelligence applications may provide a competitive advantage by providing different facilities such as business intelligence tools, business performance management software, data mining tools, etc. Information technology has created the relationships among firms and their suppliers, channels, and buyers. Information systems, on the other hand, may cross firm boundaries (Sharma et al., 2015). These inter-organizational systems have become common boundaries of several industries. Specific decision support systems may also reduce the power of buyers and/or suppliers. Sophisticated decision support systems may remove some barriers that reduce the threat of entrants. For instance, data and the system for learning it becomes a corporate asset that is hard to build for new entrants. Knowledge in a knowledge-driven DSS may only be achieved through a deep experience in the industry. A specific DSS may assist to differentiate a product or improve service and it can reduce the threat from substitute products. In addition, some DSS may help managers reduce the cost of rivalry actions by targeting expenditures and in some cases DSS may reduce the requirements for competitive actions and reactions.

Carmignani and Avom (2010) measured social development by a combination of health and education outcomes and resource intensity by the share of primary goods in total merchandise exports. They reported that, after controlling for per-capita income and other macroeconomic factors, a higher dependence on primary commodity exports was negative for social development. Silva et al. (2014) developed a Web-based Multi-criteria Spatial DSS for the assessment of environmental sustainability of dairy farms. They used a Web based methodological framework for a fully integrated system of GIS and a specific multiple criteria decision making attribute (MCDA) method – ELECTRE TRI to make appropriate managerial decisions. Ben-Zvi (2012) investigated DSS by evaluating the factors that enhance their perceived effectiveness and their effect on performance using a simulation exercise with 652 senior graduate students who developed DSS and reported on the systems created. They reported that DSS users who perceive the system as effective correlate to improved firm performance. However, investing significant human resources in developing a system would not necessarily guarantee enhanced performance.

Azad et al. (2013) presented an empirical investigation to determine important factors influencing DSSs and detected system, analysis and transaction as important issues. Azad et al. (2014), in other survey, performed an empirical investigation to determine important factors influencing data security in Municipality is city of Tehran, Iran and determined six factors influencing feasibility study, organizational learning, management strategy, enterprise resource management, process approach and the acceptance.

2. The proposed study

This paper presents an empirical investigation to determine different DSS factors influencing on development of export activities on selected firms which are active in Tehran Stock Exchange. The study designs a questionnaire consists of 35 questions and distributes it among 211 randomly selected managers who were involved in export activities. Cronbach alpha has been calculated as 0.817, which is well above the minimum desirable level. In addition, Bartlett's Test of Sphericity yields a Chi-Square value of 2596.94 with Sig. = 0.000. Table 1 demonstrates the summary of some basic statistics associated with the data. As we can observe from the results of Table 1, all data are within desirable levels and we can therefore proceed the next step. Table 2 shows the results of Total variance for all components. Moreover Fig. 1 shows the results of Scree plot.

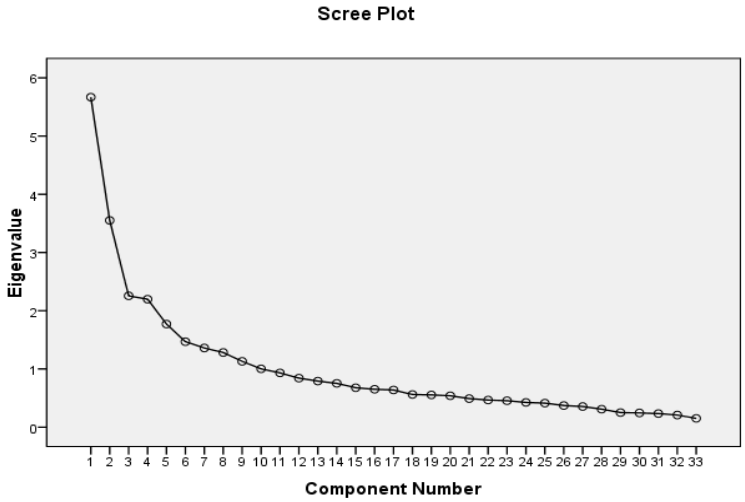

Fig. 1. The results of Scree plot

Table 1
The summary of some basic statistics

					Skewness		Kurtosis	
		N Statistic	Minimum Statistic	Maximum Statistic	Statistic	Std. Error	Statistic	Std. Error
1	User satisfaction	211	1	5	-0.446	0.167	-0.572	0.333
2	Technical equipment	211	1	5	-0.386	0.167	-0.588	0.333
3	Organizational infrastructure	211	1	5	-0.275	0.167	-0.75	0.333
4	knowledge-based systems	211	1	5	-0.373	0.167	-0.417	0.333
5	*Specialized training*	211	1	5	-0.234	0.167	-1.06	0.333
6	Internal control systems	211	1	5	-0.67	0.167	-0.419	0.333
7	Knowledge management (KMP)	211	1	5	-0.245	0.167	-1.341	0.333
8	Sensitivity analysis market	211	1	5	-0.261	0.167	-1.087	0.333
9	Software agents	211	1	5	-0.477	0.167	-0.736	0.333
10	implementation monitoring	211	1	5	-0.716	0.167	0.11	0.333
11	Senior management support	211	1	5	-0.615	0.167	-0.164	0.333
12	Perceived usefulness	211	1	5	-0.033	0.167	-0.82	0.333
13	Resource allocation manager	211	1	5	-0.54	0.167	-0.232	0.333
14	Trust	211	1	5	-0.443	0.167	-0.635	0.333
15	Analyzing problems	211	1	5	-0.785	0.167	0.133	0.333
16	Emergency situations	211	1	5	-0.427	0.167	-0.256	0.333
17	efficiency	211	1	5	0.006	0.167	-0.899	0.333
18	rule-based system	211	1	5	-0.87	0.167	0.323	0.333
19	Human Resources	211	1	5	-0.436	0.167	-0.451	0.333
20	Decision making processes	211	1	5	-0.671	0.167	1.013	0.333
21	complex situations	211	1	5	-0.658	0.167	-0.66	0.333
22	Efficient and timely control	211	1	5	-0.508	0.167	1.052	0.333
23	market prediction	211	1	5	-0.398	0.167	0.52	0.333
24	Creativity	211	1	5	0.073	0.167	-1.199	0.333
25	Complexity of structure	211	1	5	-0.202	0.167	-0.957	0.333
26	Negotiation Support Systems	211	1	5	-0.786	0.167	0.121	0.333
27	Assessment Information	211	1	5	-0.326	0.167	-0.937	0.333
28	Overcome human limitations	211	1	5	-0.64	0.167	-0.242	0.333
29	Crew scheduling problem	211	1	5	-0.924	0.167	0.752	0.333
30	Flexibility to Change	211	1	5	-0.887	0.167	0.512	0.333
31	Decision-making team	211	1	5	-0.723	0.167	0.271	0.333
32	Operating expenses	211	1	5	-0.28	0.167	-0.497	0.333
33	long term horizon	211	1	5	-0.667	0.167	-0.377	0.333
34	Management of information	211	1	5	-0.884	0.167	0.843	0.333
35	Quick access to detailed	211	1	5	-0.783	0.167	1.082	0.333

Table 2

The summary of total variance

	Initial Eigen values			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Component	Total	% of	Cumulative	Total	% of	Cumulative	Total	% of	Cumulative
1	5.668	17.177	17.177	5.668	17.177	17.177	3.8	11.514	11.514
2	3.551	10.761	27.938	3.551	10.761	27.938	3.702	11.219	22.733
3	2.256	6.836	34.774	2.256	6.836	34.774	2.191	6.639	29.372
4	2.198	6.66	41.434	2.198	6.66	41.434	2.132	6.459	35.831
5	1.771	5.368	46.802	1.771	5.368	46.802	2.115	6.409	42.24
6	1.468	4.45	51.252	1.468	4.45	51.252	1.725	5.228	47.469
7	1.36	4.12	55.372	1.36	4.12	55.372	1.617	4.9	52.368
8	1.282	3.885	59.257	1.282	3.885	59.257	1.602	4.854	57.223
9	1.13	3.425	62.683	1.13	3.425	62.683	1.592	4.824	62.046
10	1.002	3.035	65.718	1.002	3.035	65.718	1.212	3.672	65.718
11	0.932	2.825	68.543						
12	0.842	2.552	71.095						
13	0.792	2.399	73.494						
14	0.753	2.282	75.775						
15	0.678	2.054	77.829						
16	0.651	1.973	79.802						
17	0.639	1.936	81.738						
18	0.561	1.701	83.439						
19	0.554	1.679	85.118						
20	0.539	1.634	86.752						
21	0.49	1.485	88.238						
22	0.466	1.413	89.65						
23	0.454	1.376	91.026						
24	0.424	1.286	92.313						
25	0.413	1.253	93.565						
26	0.372	1.127	94.692						
27	0.355	1.075	95.767						
28	0.309	0.936	96.703						
29	0.25	0.758	97.461						
30	0.245	0.741	98.202						
31	0.234	0.708	98.91						
32	0.208	0.631	99.541						
33	0.151	0.459	100						

As we can see from the results of Scree plot, there are five DSS items, which influence the most on the development of export activities. Table 3 also shows the results of principle component analysis after rotation.

3. Discussion and conclusion

According to the results of principal component analysis with rotation, the study has detected five important factors influencing the most on development of export activities including internal resources, management approach, quality of data, efficiency of data and organizational approach. The first and the most important factor in terms of factor loading is associated with internal resources and it includes five sub-components including Technical equipment, Human Resources, Software agents, Organizational infrastructure and Resource allocation manager with factor loadings of .867, .856, .825, .812 and .495, respectively. The second factor is related to management approaches and it includes six sub components including Flexibility to Change, Decision-making team, Management of information systems, Senior management support, implementation monitoring and Emergency situations with factor loadings of .801, .778, .694, .694, .671 and .574, respectively. The third component is associated with quality of data with four components including Assessment Information, Trust, User satisfaction and Negotiation Support Systems and the factor loadings of .816, .645, .554 and .548, respectively. The fourth factor, efficiency of data, consists of four factors including Quick access to detailed information, Decision making processes, Efficient and timely control and Analyzing problems with factor loadings

of .722, .709, .701 and .566, respectively. The last factor, organizational approach, also consists of Complexity of structure, Internal control systems, Perceived usefulness, knowledge-based systems and Crew scheduling problem with factors loading of .757, .668, .606, .565 and .380, respectively.

Table 3
The summary of principle component analysis after rotation

	Factor	Rotated Component Matrix[a]									
		1	2	3	4	5	6	7	8	9	10
q2	Technical equipment	0.867									
q19	Human Resources	0.856									
q9	Software agents	0.825									
q3	Organizational infrastructure	0.812									
q13	Resource allocation manager	0.495	0.346								
q30	Flexibility to Change		0.801								
q31	Decision-making team		0.778								
q34	Management of information		0.694								
q11	Senior management support		0.694								
q10	implementation monitoring		0.671								
q16	Emergency situations		0.574								
q27	Assessment Information			0.816							
q14	Trust			0.645							
q1	User satisfaction			0.554							
q26	Negotiation Support Systems		0.352	0.548			-				
q35	Quick access to detailed				0.722						
q20	Decision making processes				0.709						
q22	Efficient and timely control				0.701						
q15	Analyzing problems				0.566						
q25	Complexity of structure					0.757					
q6	Internal control systems					0.668					
q12	Perceived usefulness					0.606		0.52			
q4	knowledge-based systems					0.565					
q29	Crew scheduling problem					0.38					0.379
q5	Specialized training						0.743				
q8	Sensitivity analysis market	0.36					0.669				
q17	efficiency							0.791			
q28	Overcome human limitations		0.365					0.365	-0.36		
q32	Operating expenses								0.699		
q18	rule-based system	0.345							0.541		
q21	complex situations									0.835	
q7	Knowledge management (KMP)									0.675	
q23	market prediction										0.774

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References

Azad, N., Sadeghi, M., Zarifi, S., & Farkian, M. (2013). An exploration study to find important factors influencing on decision support systems. *Management Science Letters*, *3*(9), 2517-2520.

Azad, N., Abbasi, N., & Zarifi, S. (2014). A study to determine influential factors on data security. *Decision Science Letters*, *3*(1), 57-64.

Ben-Zvi, T. (2012). Measuring the perceived effectiveness of decision support systems and their impact on performance. *Decision Support Systems*, *54*(1), 248-256.

Bhagwati, J. N. (1988). Export-promoting trade strategy: issues and evidence. *The World Bank Research Observer*, *3*(1), 27-57.

Carmignani, F., & Avom, D. (2010). The social development effects of primary commodity export dependence. *Ecological Economics*, *70*(2), 317-330.

Leonidou, L. C., & Katsikeas, C. S. (1996). The export development process: an integrative review of empirical models. *Journal of international business studies*, 517-551.

Sharma, R. N., Chand, N., Sharma, V., & Yadav, D. (2015). Decision support system for operation, scheduling and optimization of hydro power plant in Jammu and Kashmir region. *Renewable and Sustainable Energy Reviews*, *43*, 1099-1113.

Silva, S., Alçada-Almeida, L., & Dias, L. C. (2014). Development of a Web-based Multi-criteria Spatial Decision Support System for the assessment of environmental sustainability of dairy farms. *Computers and Electronics in Agriculture*, *108*, 46-57.

Stöttinger, B., & Schlegelmilch, B. B. (1998). Explaining export development through psychic distance: enlightening or elusive?. *International Marketing Review*, *15*(5), 357-372.

Wiedersheim-Paul, F., Olson, H. C., & Welch, L. S. (1978). Pre-export activity: The first step in internationalization. *Journal of International Business Studies*, 9(1), 47-58.