

Article

E-Business Strategy for Logistics Companies: Achieving Success through Information Systems Planning

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Abstract: *Background:* E-business and Information Technology (IT) are critical components in the improvement of logistics functions. As logistics contributes to the entire strategic planning of a firm, e-business and IT applications support the implementation of strategic planning in a more efficient and effective manner. According to this view, previous scholars have ignored the importance of Information Systems (IS) planning in the selection and implementation of appropriate IS as per situation. This paper explores the Information Systems Planning (ISP) phases that influence the success of the process. *Methods:* Data were collected and analyzed using Regression Analysis by 73 IT managers for Greek Small and Medium Enterprises (SMEs) in the logistics sector. *Results:* The outcomes of the analysis show that executives ought to be informed about the strategic utilization of IS planning in order to improve competitive advantage. Furthermore, managers must also select the suitable IT facilities to align business strategy with the business structure. *Conclusions:* The outcomes support managers to focus on logistics functions and realize the importance of such ISP in logistics. As a result, selecting appropriate IS leads to increased competitive advantage, faster communication, support for the storage and retrieval of more accurate data, cost reduction and increased customer value.

Keywords: e-business strategy; strategic information systems planning; SMEs; information systems planning success; IT strategy; logistics



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1. Introduction

In today's competitive environment, logistics companies have to explore different ways to increase and sustain their performance. E-business can be adopted because it allows firms to share forecasts, databases, inventory and capacity plans, financial data and product information to increase their effectiveness. The adoption of e-business support companies has become a significant part of the supply chain as intermediaries or online e-marketplaces [1–6].

Small and Medium Enterprises (SMEs) that trade within the logistics industry choose to operate in a new and complex financial setting. This new world entails increased complexity as well as radical shifting, all of which have an effect on the many operations of companies and hinder their capacity to address the economic crisis itself. Other factors that hinder their capacity to address the financial crisis except for their financial difficulties, maybe as a result of the absence of technical, administrative and human capacities alongside a lack of strategic planning [7–9]. What could help managers improve the firm's performance in logistics SMEs are formal processes identified with both strategic management and information handling.

Regardless of benefits of e-business adoption, there seem to be costs associated with this decision. Furthermore, this decision should take into consideration many barriers regarding the adoption of e-business. Therefore, the decision to implement e-business is complex and managers have to consider many factors. Thus, it is required to explore the

dimensions that affect the decision to adopt it [10–15]. Because Information Technology (IT) investment does not only influence firm performance yet additionally assists managers to set business strategy with business performance, it has become a critical problem for managers to invest in. Thus, companies should build structured processes in dynamic environments that use consistent rules and procedures to achieve mitigation of environmental sustainability as well as maintain economic efficiency [16–18].

Unfortunately, IS strategy is a subject that has been studied as homogenous, so that, in particular, current studies have failed to define the effective actions and strategies based on the firm's capabilities pursued by leaders at a time of crisis [19,20]. Previous researchers have analyzed the dimensions that affect the adoption of e-business [21–24], but researchers have not explored the strategic aspect of this decision. However, there is a distinct class of firms in which both firm size and resource limitations provide a significant effect on both alignment factors and business performance [25]. As seen in management literature [26,27], developments in IT have led to higher rates of acceptance and usage in SMES, as well as further moving technology into the processes and operations of these businesses. It is important that both practitioners and academics are aware of the effect of alignment between business and IS strategies on firm outcomes.

This paper examines the Information Systems Planning (ISP) phases that influence the success of the process. Data were collected and analyzed using Regression Analysis by 73 IT managers for Greek Small and Medium Enterprises (SMEs) in the logistics sector.

The following is the structure of the paper. Section 2 includes the theoretical background on ISP phases as well as their success. The methodology is explained in Sections 3 and 4 discusses the findings. The final section presents limitations and avenues for future researchers.

2. Literature Review

Five phases are incorporated into the ISP process. Strategic awareness includes identifying of significant planning problems, priorities, objectives, as well as selecting members for the development team and top-level managers' willingness to be part of the ISP process. The important risks of Situation Analysis are the analysis of current organizational structures, business processes and IS and the analysis of the external and internal IT environment. IT executives define significant objectives, examine opportunities for change and formulate high-level IT strategies throughout Strategy Conception. Strategy Formulation constitutes the next stage of the ISP process. The most important activities included within Strategy Formulation are the definition of new organizational processes and new IT architectures to accomplish IT objectives and the identification of specific new IT projects and priorities for IT plans. Ultimately, the definition of change management approaches and action plans are involved in Strategy Implementation. Moreover, in this phase, IS executives assess the output of the ISP process and whether the objectives defined during Strategy Awareness have been gained [7,28–42]. The phases of ISP process and their activities as well as the dimensions of ISP success are presented in Appendix A.

Previous studies analyzing the impact of ISP phases on ISP success mentioned that IS managers concentrated their actions in Strategy Conception [7,28–30,36,37]. Strategy Conception, when combined with opportunity identification and evaluation, may provide more realistic alternatives. Recognizing IT goals can make it possible for the firm to set future IT and organizational goals while better options and choices can sustain the plan to achieve improved results. The absence of top management participation and the inability to create successful action strategies to execute the IS are the two most critical issues that arose during the ISP process. If IT project development is not supported by managers, team members are not dedicated to the plans and will deal with challenges in the execution of the IS strategy. Otherwise, IS fail is incomplete or is inadequate in relation to its strategic context. Thus, managers should set priorities that would enable their IS strategy to be better implemented and their goals achieved [38,39,41,42].

However, the more extensive the planning, the more efficient it would be, as it would allow planners to understand and respond better to environmental impact. Managers

should take into consideration that increase in effort may raise conflicts among team members. As a consequence, these conflicts may cause delays in the process. On the other hand, if too much time is spent, many conflicts among team members may arise caution the project to be delayed. Therefore, process evaluation is a decision-making problem where decision makers need to determine alternatives. It is therefore of great significance, as it allows managers to reduce these unsatisfactory results [31].

Studies [32,35] have concluded that IT executives focus on Strategy Conception and on Strategy Implementation, overlooking the importance of Strategic Awareness and Situation Analysis. Consequently, the IS strategies that are being developed are inefficient, ineffective and they fail to meet IT goals [32,35]. Moreover, managers concentrate solely on minimizing the time and cost of the implemented project. Managers focus only on the execution of the process and this fact has detrimental impacts because it can contribute to the implementation of the ISP process in less time, but the firm's strategic objectives are not aligned with IT goals [33,34,40].

Thus, the paper has five major hypotheses:

Hypothesis 1 (H1). *Strategic Awareness has a positive effect on ISP success in the logistics sector.*

Hypothesis 2 (H2). *Situation Analysis has a positive effect on ISP success in the logistics sector.*

Hypothesis 3 (H3). *Strategy Conception has a positive effect on ISP success in the logistics sector.*

Hypothesis 4 (H4). *Strategy Formulation has a positive effect on ISP success in the logistics sector.*

Hypothesis 5 (H5). *Strategy Implementation has a positive effect on ISP success in the logistics sector.*

3. Methodology

Quantitative research was developed for IT managers. Both the dependent and independent variables (ISP Success and ISP phases accordingly) were evaluated on a 5-point Likert scale (1: No extent, 5: Great extent). The instrument was based on similar papers that examined the process of ISP [7,28,31,32,35–39] and ISP success [7,28,31,32,35–39] respectively. The items of the constructs used are presented in Appendix A.

Four managers completed a pilot survey on providing constructive criticism, duration and outward impression of the questionnaire. The Icap database had been to determine the survey sample composed of IT executives in Greek SMEs that are activated in the logistics sector [7,28,30,32,35]. The Icap list comprises of the total number of SMEs per sector in Greece. 3120 companies operate in the logistics sector. SMEs must meet the following criteria: The number of employees must be between 20–50, the turnover must not exceed 50 million euros and companies must be based in Thessaloniki or Athens. The SMEs who provided contact information were chosen as the appropriate survey sample. Therefore, the instrument was assigned to 240 IT managers. Finally, 73 respondents completed the survey. Analysis of the data was conducted using the Regression Analysis method.

4. Results

The reliability was measured using Cronbach's alpha and the values ranged from 0.937 to 0.944, exceeding the minimally recommended level of 0.70 [30]. These values are displayed in Table 1.

Pearson's correlation was implemented in order to examine the relationship among the dependent and independent variables. Table 2 displays the values of Pearson's correlation analysis.

Table 1. Reliability of variables.

Variables	Cronbach α Values
Strategic awareness (1st phase)	0.937
Situation Analysis (2nd phase)	0.944
Strategy Conception (3rd phase)	0.941
Strategy Formulation (4th phase)	0.942
Strategy Implementation (5th phase)	0.943
Success	0.938

Table 2. Correlation analysis.

	Strategic Awareness (1st Phase)	Situation Analysis (2nd Phase)	Strategy Conception (3rd Phase)	Strategy Formulation (4th Phase)	Strategy Implementation (5th Phase)	Success
Strategic Awareness (1st phase)	1	0.805	0.822	0.773	0.774	0.822
Situation Analysis (2nd phase)	0.805	1	0.745	0.701	0.721	0.748
Strategy Conception (3rd phase)	0.822	0.745	1	0.776	0.739	0.783
Strategy Formulation (4th phase)	0.773	0.701	0.776	1	0.762	0.799
Strategy Implementation (5th phase)	0.774	0.721	0.739	0.762	1	0.839

Table 3 presents that R^2 is 0.896 and adjusted R^2 is 0.803. These values indicate that 80% of the variance in success is described by independent variables. The F statistic is 54.504 with 73 degrees of freedom (5 from the regression and 68 from residuals) and the significance value is less than $p < 0.05$ (0.000). Therefore, the model is significant. The findings of regression analysis in Table 4 also confirm the satisfactory prediction performance of the regression model.

Table 3. Regression analysis.

R	R^2	Adjusted R^2	Estimate Standard Error	Durbin-Watson
0.896	0.803	0.788	0.327	2.134

Table 4. ANOVA statistics of regression.

Model		Sum of Square	Df	Mean Square	F	Sig.
1	Regression	29.218	5	5.844	54.504	0.000
	Residual	7.183	68	0.107		
	Total	36.401	73			

Control variables such as age and gender were used in order to confirm that their effect does not modify regression analysis outcomes. Separate regression analyses including only control variables (age and gender) as independent variables and Success as dependent variable were implemented and the outcomes of these analyses showed that the significance values are greater than $p > 0.000$. Therefore, these models were not significant.

Based on the results presented at Table 5, Strategy Formulation and Strategy Implementation were the most contributing phases for Success. The beta value of Strategy Formulation was 0.202 with significance level 0.045. Thus, Strategy Formulation has a positive and significance effect on Success and H4 was supported. The beta value of Strategy Implementation was 0.379 with significance level 0.000. Thus, Strategy Implementation has a positive and significance effect on Success and H5 was supported.

Table 5. Hypothesis testing.

Model	β	t-Value	Sig.	VIF
Strategic Awareness (1st phase)	0.229	1.941	0.057	4.721
Situation Analysis (2nd phase)	0.069	0.710	0.480	3.171
Strategy Conception (3rd phase)	0.107	1.008	0.317	3.812
Strategy Formulation (4th phase)	0.202	2.046	0.045	3.314
Strategy Implementation (5th phase)	0.379	3.937	0.000	3.153

5. Discussion

The findings of this paper confirm the outcomes of the existing literature [7,28,30–32,36–39]. Table 5 indicates that managers in logistics SMEs focus on strategy execution. In addition, IS executives refrain from investing time in Strategic Awareness and Situation Analysis. Therefore, the outcome of the execution of ISP process is the development of IT plans that are ineffective and fail to meet organizations' objectives. IT executives have a limited budget at their disposal to develop IS. As a result, they do not concentrate their efforts on defining strategic goals such as how IS will increase firm performance. They only focused on minimizing the time and cost involved in implementing the projects. Therefore, the failure of IT projects to achieve business demand, lack of alignment with current systems, lack of system flexibility and lack of prior planning are most often encountered [7,28,36,37].

The selection of employees who will be part of the development team is also a significant activity in the ISP process. This activity is important because team members should cooperate and develop skills in order to create effective IT projects. This finding is also impeded by the fact that managers do not focus on organizing the planning team. It is imperative that employees who will participate in the development of IS should have both IT and cooperation skills as well as motivation to develop effective IS. Managers should support the planning team during the development of IT projects in order to help firms to achieve their goals, meet business processes and impact organizational growth. Furthermore, executives have to provide specific guidelines for the implementation of IT projects. IS executives should be able to define priorities, increase the cooperation among the IS team and provide guidelines in order to support the effectiveness of IS plans aligning them with business plans. Thus, the outcomes of this paper confirm the rejection of the H1.

Scholars concluded that IT executives focus their efforts on Strategy Formulation and strategy execution, overlooking the importance of Situation Analysis [28,30,37–39]. Thus, the developed IS plans are insufficient, ineffective and fail to satisfy IT objectives and the firm's strategic priorities are not aligned with the IT objectives [31,32]. The results of this paper confirm previous studies and lead to the rejection of H2 and H3. Moreover, executives only pay attention to reducing the time and costs of project implementation [38,39].

The attention of managers focusing only on the execution of the ISP process has important obstacles because it may lead in less time spent on ISP process execution and the strategic goals of the firm are not in line with the goals of IT. In this view, previous researchers [7,28] have indicated that changes in the internal IS context will necessitate a change in the process of ISP. IS executives should look for changes in environmental and organizational circumstances which increase uncertainty and change the role that IS will have to play within businesses. The IS strategy should emphasize environmental scanning and the strategic usage of IT in order to align SMEs' portfolio of IT projects with SMEs' performance. With the information obtained from scanning the IT environment, executives can focus on the potential competitive use of IS to adapt business strategy, with new or expanded strategic thrusts in order to increase innovation and SMEs' performance [43–45].

It is indicated by the results of this survey that when managers pay attention to implementing Situation Analysis with greater meticulousness, they will be able to apply Strategy Conception and Strategy Implementation with greater agility than before. What can planners do so as to align IT strategy with business strategy is to analyze the current business and organizational systems, the IS as well as both the business and the external IT environment. In this way the output of the planning process can be significantly improved

with the exception of time and cost needed for the process. As soon as the environment is understood by the executives, they can determine important IT objectives and opportunities for improvement and they can evaluate them so as to define high-level IT strategies in their business strategy conception [46–48].

6. Conclusions

This article explored the phases of the ISP process that affect the success of the ISP process. The main outcomes of the analysis conclude that the ISP process is important to SMEs in today's competitive environment as it facilitates the effective creation and execution of IT projects and this process will increase their market share. The implementation of the ISP process is not an easy task, though. Managers need to have a good understanding of the firm's objectives and strategies because businesses need to have multiple planning aspects in order to encounter various issues. It is therefore critical for SMEs to take all phases into consideration in order to complete the ISP process successfully.

The theoretical contribution of this paper is that executives can understand the strategic use of IS planning. It is essential that they are well informed about them and that each one's task is not ignored. It is possible that by understanding the phases, IS executives will be helped not only to concentrate on organizational goals, but also to realize the importance of the planning process to their firm. As a result, IT plans have fewer problems, improved quality and the success of the ISP process has increased. Otherwise, it will be difficult to reach both and improve the ISP process.

The paper's practical contribution would be that it can be used as a guide in order to improve decision making processes in SMEs. Recognizing IT goals can make it possible for the firm to set future IT and organizational goals while better options and choices can sustain the plan to have improved results. By incorporating cooperation between business managers and IT managers in strategic IS planning, IT executives have the opportunity to examine the challenges in the implementation of IS projects and the impact of ISP success. Thus, executives who execute all the phases of the ISP process in logistics SMEs can make more efficient and timelier strategic and tactical decisions, as the ISP process provides them with updated information about the firm's external environment analysis. Thus, environmental uncertainty and the risk dynamic change are decreased.

The paper's limitation derives from the fact that the survey performed the results of this analysis only for Greek SMEs. Future studies should broaden and compare the outcomes of this paper with the findings of other firms operating in other countries. Another suggestion for future researchers is the implementation of semi-structured follow-up interviews with businesses operating in different regions in order to find some meaningful insights. Particularly semi-structured interviews provide respondents with an opportunity to have an open discussion about the impact of ISP phases on success. By examining IT executives' perceptions, they can identify the dimensions that should be improved during the implementation of IS projects and, thus, they can improve the ISP process. This wider collaboration in IS planning can improve adaptability and increase congruence between IS planning and market needs. Finally, in this study, all hypotheses were not supported. Future researchers could investigate why these hypotheses were not supported.

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Appendix A

Table A1. ISP phases and activities.

Strategy Awareness (1st Phase)	Situation Analysis (2nd Phase)	Strategy Conception (3rd Phase)	Strategy Formulation (4th Phase)	Strategy Implementation (5th Phase)
Defining important issues about ISP	Analyzing existing business systems	Defining important IT goals	Defining new business processes	Identifying change management processes
Determining the goals of ISP process	Analyzing existing organizational systems	Defining opportunities to improve processes	Defining new IT architectures	Identifying action plans
Organizing the planning team	Analyzing existing IS	Assessing opportunities to improve processes	Defining specialized new IT projects	Assessing action plans
Obtaining willingness of top managers to be part of the process	Analyzing the existing external business environment Analyzing the existing external IT environment	Defining high level IT strategies	Defining priorities for new IT projects	Identifying control processes

Table A2. Success dimensions and variables.

Alignment	Analysis	Cooperation	Capabilities
Top managers understood that IS improve business strategy	Opportunities for improvement in organizational processes improvement were defined	Unambiguous guidelines of managerial responsibility were developed to implement ISP	Ability to define important negative results
Understanding the strategic priorities of top managers	Managers changed organizational processes and procedures	Potential sources of resistance to IT projects were defined and solved	Ability to deal with surprises and crises
Defining opportunities about IT in order to help the strategic direction of the company	New ideas were developed to reframe organizational processes using IT	Open lines of communication with other departments were created	Ability to deal with unanticipated changes
IS strategies were aligned with the strategic plan of the company	Information needs of subunits were understood	The development efforts of many organizational subunits coordinated	Ability to increase collaboration among members of the development team
IS objectives were adapted to change organizational goals	Managers understood the dispersion of information, applications, and other technical infrastructure used in the company	A uniform basis to set priorities was established	
Top managers were educated about the significance of IS	A “blueprint” was developed to define business processes	An increased level of agreement about the risks/tradeoffs among IT plans was achieved	
IT was adapted to strategic change	Increased comprehension of how the company actually operates	The overlapping development of significant systems was decreased	
The strategic significance of IT was evaluated	Business needs and the capability of IT to achieve certain requirements are evaluated		

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