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The relationships between firm size, prospector strategy, architecture of information technology and firm performance

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Abstract

Previous studies have investigated the effects of the use of information technologies with organizational variables on firm performance. Some of these organizational variables are the firm size, the business strategy and the architecture of information technology. The main contribution of this study is to investigate the impact of firm size, information system and the technological architecture associated with prospector strategy on performance of firms operating in Isparta, in Turkey. The technological architecture was identified for the profiles of technological deployment by Croteau and Bergeron (2001). This study also focuses on the interactions between firm size, prospector strategy, technological architecture and firm performance. The main aim of this study is to identify the relationships between firm size and the technological architecture on prospector strategy that support the firm performance best. In this study the technological architecture was identified. The firm size has been measured in terms of employment. Today, environmental conditions (rapid change, technological development, globalization, etc.) offer many opportunities to firms. For this reason, the strategic activity has been taken as prospector. The firm performance is based on the sales growth and profitability.

Keywords: Information systems, Firm size, Architecture of information technology, Prospector strategy, Firm performance

1. Introduction

Information has become the most important power needed by the firms due to the rapid change, technology, competition and globalization. Information systems play an important strategic role in

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organizations. They support and shape business strategy. Information systems shaping and supporting the competitive strategy of the firms affect the speed and flexibility of decision-making and make it easier to adapt to environmental conditions. For this reason, information systems have become indispensable system for modern businesses. Moreover, information systems become a strategic tool for organization when used in innovations.

Today, we are witnessing the rapid evolution of information systems and accelerated investment in information systems by organizations. Since information technology investment is related to company strategy, the relationship between information systems and firm performance should be studied within a strategic management framework. Many researchers believe that the purpose of investment in information systems is to achieve competitive advantages and better firm performance.

Various business strategic activities take place in organizations over time. These activities help build competitive advantages that cannot otherwise be obtained via the market.

This study explores the relationships between the prospector strategy, the architecture of information technology and the organizational performance of firms operating in Isparta. The empirical results, based on a multiple linear regression modeling approach, provided preliminary evidence supportive of the hypotheses advanced in this paper.

2. Literature Review And Hypotheses

2.1. Information Systems

Before starting the definition of information technologies, if a differentiation between datum, informatics and information needed; data are raw fact, numbers and details; informatics is the meaningfully organized state of data; information is the understanding of every informatics groups and the most relevant use of this informatics.

Information technology, in short, can be summarized as “A computer-based information systems from hosts to microcomputers” or “gathering, processing, storing and distributing of the information by the help of computers”. It is not necessary to use of advanced systems for an information technology. Because the information technology system is used for communication of information amongst the individuals in an organization, a sophisticated technology is not required for this [1].

In general terms, information technology can be defined as “a technology that provide gathering, processing, storing and conducting or making that information reachable when needed “ or “technologies, applications and services [2] or all the information on that system serving for collection, storing, processing reaching and distribution of information” [3]. Information technology is an information technology that collect the info needed for the administrators to decide, process, store and report that data [4].

Information technology, actually, covers a whole system. System refers to terms, which are hardware, consisting of instruments and devices, software that is designed to be used on this hardware and the access, usage and sharing via these two concepts. Seen above, information technology covers a holistic formation not for only a specific application or hardware but it enables an efficient connection between all these components [5].

Information technology has a vital importance for strategic success in business. According to M. Porter, information technology is a part of general business strategy since they are in a position for the administration of businesses by information technologies applications in competitive businesses nowadays. Information technology has a key role in change in business administration. Information technology has a lot of advantages such as decreasing the bureaucratic activities in administration of businesses, improving the communication in-ex business, supervision of the employees and maintaining the efficiency of administrative decisions [2].

Strategic information technology is a computer system, which is used for bringing in a strategic advantage to organization and changing the relationships with the environment, goal, and product, service in every level. Strategic information technology is used for a decisive manner for long term in every level and it causes some changes in carrying on business. Thus, businesses have to change the relations between their own processes and supplier and customer to benefit from the advantages of information technologies.

Strategic information technologies are systems that shape the organizations' competition strategy or support them. On the other hand, it changes objectives, processes, products or environmental relations to bring in the advantage for competition. Advancements in data processing, communication and automation bring about some changes in informatics activities, combinations and trading methods inter-businesses. Furthermore, improvements in hardware, decline in costs and easy use of software made the information technologies' strategic use easier. The effects of information technology on businesses' strategies can be considered in three headings [6].

Information systems seem to have critical importance for most organizations in many respects: They are basic to most business processes, they are integral parts of many products and services, they support decision making at the operational and strategic level and whole industry sectors are dependent on them for their very existence [7]. Information systems may be an effective way to provide timely and relevant information to top managers and thus to help reduce uncertainty.

Technologies permit functional integration by linking various functional departments' information systems. Information technologies help facilitate the storage and exchange of information among process, product, and logistics technologies [8].

Today, information technology infrastructures are increasingly challenged in terms of responsiveness to scientific/technical, customer satisfaction and administrative information needs. To achieve requisite responsiveness, the information technology infrastructure is evolving in its ability to connect professionals to one another and to deliver timely information within and among functional departments.

Information technology is an important differentiating factor between high and low quality performance in departments. Hardware, software networks, and databases comprise the major components of information technology that gather, store, and disseminate information about quality. The integration, standardization, and sophistication of these components significantly improve the capabilities of organizational information systems [9].

Tenkasi and Boland (1996) state that information technologies are increasingly playing an integrative role in knowledge-intensive firms as a way of achieving mutual learning. The information systems field has predominantly been driven by the notion of integration as a rational design process and an end state to be achieved through a static incorporation of knowledge domains [10].

The adoption and use of information technologies in modern organizations is viewed as critical to improve performance and benefit from market opportunities. The use of information technologies lead to superior performance via improved competitive ability.

It is generally accepted that one of the key factors for successful Information System planning and implementation is the close linkage of the Information System strategy with business strategy. However in practice this linkage is not yet well established. It is the conventional wisdom that this linkage problem is solved by analyzing the corporate strategy and integrating Information System issues and solutions [11].

2.2. Firm Size

It has been noted by researchers that firm size is a contextual or enabler variable in the use of technologies and that it is common for small manufacturers to lag behind larger manufacturers in implementing new technologies. There are many reasons why large firms began using flexible manufacturing systems more rapidly than small ones. They have more resources and are better able to take the risks than their smaller rivals. A flexible manufacturing system often costs several million dollars, and specialized engineering personnel are required to introduce and operate such a system [8].

In previous empirical studies, firm size has been frequently measured in terms of employment. The literature shows that the use of conventional technology increases with firm size. In other words, the relationship between the use of conventional technology and firm size is non-linear. In order to evaluate the relationship in the context of information technology, this study maintains employment as the measure of firm size and tests the relations between firm size, architecture of information technology, prospector strategy and firm performance.

Firm size was measured using employment figures provided by respondents. Swamidas and Kotha also argue that, while size has an independent effect on performance, it also moderates or enhances the effect of technology on performance. Because larger plants have the resources to hire and train expensive skilled labor and professionals for the purpose of exploiting these technologies and larger firms have a wider product range to more completely exploit today's technologies [8].

2.3. Technological Deployment

The advent of communications networks and internet access brought greater speed and agility, knowledge sharing, collaboration, lower costs and greater satisfaction through customer and supplier integration and self- services. In its natural progression, technology moves from supporting functional systems to process oriented systems. This helped to lead a technology-enabled revolution dominated by the perceived efficiencies of process reengineering [10].

McDermott (1999) reports that leveraging knowledge involves a unique combination of human and information systems. Haldin-Herrgard (2000) state that a great deal can be done through modern IT to diffuse explicit knowledge, but tacitness is hard to diffuse technologically. Perhaps today and in the future high technology will facilitate this diffusion in an artificial face-to-face interaction, through different forms of meetings in real-time and with images and different forms of simulations [10].

The explosion in information in the twentieth century, created by the revolution in micro technology, presented the possibility of new organizational forms. These have been referred to as knowledge-centered, knowledge-intensive and virtual organizations. In business, this is particularly critical since the

leverage of knowledge becomes central in shaping the sharable and reusable interdisciplinary decisions. In more recent business models, there is a great tendency for infusion of knowledge management concepts in the business process relating to marketing and sales. These resulted in the consolidation of back-office systems such as enterprise resource planning systems and front-office systems such as customer relationship management [10].

Regarding technology, Stankosky and Baldanza (2000) find that technology must support the business strategy, add value, and be measured. Levett and Guenov (2000) propose eight metrics for knowledge management analysis motivation, knowledge capture, stored knowledge, personal training, knowledge transfer, creative thinking, knowledge identification, and knowledge access. It is obvious that information technology can significantly contribute to all of these metrics [10].

Technological deployment corresponds to the way companies plan and manage information technology to benefit from its potential and effectiveness. Henderson and Venkatraman (1999) indicated that to realize a successful strategic alignment of information technology with the business strategy, companies should address components such as business strategy, information technology strategy, organizational infrastructure and technological infrastructure. The model of strategic management of information technology from Bergeron and Raymond (1995) includes five major concerns of the Chief Information Officers (CIO) related to the management of information systems: The positioning and role of information system, the strategic use of information system, new technological applications, the planning of architecture, and the security. The expression "technological deployment" emerges from these five conceptual models [12].

2.4. Technological Architecture

Overall, seven components emerge from these frameworks. First, the strategic use of information technology refers to the information technology applications used to help the organization gain a competitive advantage, reduce competitive disadvantage, or meet other strategic enterprise objectives. Second, the management of information technology looks at the activities of the information technology department such as the usage of current and new technologies, the development of specific information technology applications and the degree of information technology usage practiced by the employees. Third, the role of the Information System department concerns the organizational importance of information technology planning, the quality of the information technology alignment with organizational structure, the effectiveness of software development, and the management of communication networks. Fourth, the technological infrastructure addresses the information technology architecture and the formalized procedures used to guide and control the firm's information technology resources. Fifth, the organizational infrastructure refers to the internal functioning of the Information System department such as formal structure, processes, reporting relationships, support groups, and skills. Sixth, the administrative infrastructure deals with the managerial policies and actions that influence and guide the work of employees involved with the Information System department. Finally, technological scanning refers to the managed acquisition, analysis, and diffusion of information technology information by members of the Information System department to increase the competitiveness of the company [12].

As explained by Henderson and Venkatraman (1999), it is important that information technology be aligned with business strategy. Therefore, firms could adopt different types of technological deployment depending on their various business strategies. According to Das et al. (1991), the information technology activities of organizations of the prospector type would be characterized by a more intensive use of information technology, better management of information technology, a more important role of the information system department, more decentralized and flexible technological, organizational and

administrative infrastructures, and more intensive technological scanning than the ones associated with the defender type [12].

Croteau and Bergeron (2001) exposed seven components from these frameworks in their study. One of these components is the technological infrastructure addresses the information technology architecture and the formalized procedures used to guide and control the firm's information technology resources.

Lefebvre et al. identified four categories of factors that influence adoption of a new technology by SMEs. These factors are the characteristics of the firm, the competitiveness and management strategies of the firm, the influences of internal and external parties on the adoption decision process, and the characteristics of new technologies adopted [13].

The findings of the research conducted by Li and Ye suggest that firms need to make greater investment in information technology if they are in more dynamic environments and are also pursuing more externally oriented strategies. Furthermore, making investment in information technology itself is not sufficient. Firms must integrate information technology into their strategic management process [14].

2.5. Business Strategy

Information technology can change the nature of the products and services in a sector. Making the product innovation and distribution period shorter can change products 'and services' quality. Another effect on sector is manufacturing economics. Information technology enables the easy distribution of products and services domestic and international and consequently a profit by setting up wide range communication network in sector level [1].

All of the competition factors that a business faces can be affected by information technology in different measures. M. Porter's competition factors are buyers, suppliers, replacing products, potential opponents and existing opponents. Information technology enables businesses to integrate with supplier industries & customers and exchange information very fast and efficient. Furthermore, the use of new methods to differentiate from others, the emergence of new technologies new businesses and the adaptation of new technologies in ongoing competition would affect businesses drastically [1].

Information technology in strategic level has important effects on low cost leadership, product differentiation and running in special markets. The use of information technology for office automation and planning in production progress and control is important in lowering the costs and improving efficiency. Computer-assisted design and ex-business communication networks contributes product differentiation and improving processes. By this, businesses have the advantage of product differentiation both physically and in the process of presentation and latter services. Businesses can have a strategic dominance by concentrating on certain product or market. Information technology is beneficial for collecting and analyzing the detailed data of the consumers in certain markets [1].

Strategy is a mechanism through which a company makes sense of the world around it. It is a collection of ideas about how the company intends to win, the source code upon which everything else depends. Because strategy can only capture a company's best thinking at a given point in time, strategy (like a software program) needs to be refined and improved as people gain and distribute new experience and knowledge [15].

Strategic management plays an increasingly important role in today's business environment due to rapid globalization, advances in information technologies, disintegration in value chain, outsourcing and rapid change in consumers' taste and demands [16].

An effective strategy needs to magnify the efforts of people throughout the organization. It's much easier to do this if lots of people understand the strategy and are able to apply it to the various decisions they face each day. The best way to get people in the middle and on the front lines of an organization to understand and embrace the strategy is to involve them in creating it [15].

Miles and Snow argued that there are four general strategic types of organizations: Prospector, defender, analyzer, and reactor organizations [17].

2.6. Prospector Strategy

Prospector organizations face the entrepreneurial problem of locating and exploiting new product and market opportunities. These organizations thrive in changing business environments that have an element of unpredictability, and succeed by constantly examining the market in a quest for new opportunities. Moreover, prospector organizations have broad product or service lines and often promote creativity over efficiency. Prospector organizations face the operational problem of not being dependent on any one technology. Consequently, prospector companies prioritize new product and service development and innovation to meet new and changing customer needs and demands and to create new demands [17].

Organizations involved in prospector strategic activities tend to improve their organizational performance and deploy effectively their information technology. Such organizations are the first to react to signals of change in their branch of industry, and are the leading innovators in the development of new products or services. However, the technology is not the primary driver of organizational performance. This is understandable since these firms have more capabilities in finding new ideas, launching new products and are more open to taking risks than they have finding and applying information technology to gain a competitive advantage. It is their excellence in prospector strategic activities that makes them more effective and more performant, not their knowledge of technology. Firms involved in prospector strategic activities do not practice technological scanning on a regular basis. However, they recognize that it is important for members of the information system department to participate in strategic meetings. They ask their information system department to play the role of technological facilitator and to foster technological innovation. It is important for them that the technological architecture be flexible and open, and support the rapid changes required by a new project. Finally, new systems are assessed for their effectiveness and efficiency. The results indicate that prospector strategic activities are related to a higher organizational performance and are positively associated with an inward profile of technological deployment [12].

Firms adopting different strategies will tap into different benefits of information technology investment. For example, a firm pursuing a differentiation strategy may explore the operational functionality benefit of information technology, and a firm pursuing a cost leadership strategy may rely upon the operational efficiency benefit. Furthermore, a firm pursuing a product-market expansion strategy may tap into the pre-emptiveness benefit and realize its information technology impact on growth. Capturing a central dimension of strategy presented a challenge for us, as strategy is multidimensional in nature. Recent developments in strategic management practice seem to suggest that companies are combining both cost leadership and differentiation advantages [14].

2.7. Firm Performance

Firm performance can be measured in a variety of ways, including financial performance (e.g., profitability, return on investment), product performance (e.g., product reliability, number of unique product features), and market performance (e.g., market share, customer satisfaction). Some empirical evidence suggests that in certain cases both internal and external technology acquisition should lead to improved firm performance, along several performance measures. Zahra (1996[a]) studied the relationship between firm financial performance and technology strategy and found that while external technology sourcing is often beneficial, its effect on firm financial performance was moderated by the firm's operating environment and was negatively associated with financial performance in stable and homogeneous environments [18].

For business firms, two groups of measures may serve as a basis for performance assessment. They are growth measures such as sales growth, and profit measures such as return on assets (ROA) and return on sales (ROS). The former is indicative of how effectively a firm can open up new markets or expand in existing markets. The latter shows the efficiency of its operation [14].

The organizational literature (e.g. Miles and Snow) suggests that improved business performance requires an organizational structure, information systems and management style that are related to a specific-firm strategy [19].

Despite the difficulties in explaining the contribution of information technology to organizational performance, a few studies have concluded on the importance of the alignment among business strategy, information technology, and organizational performance. In a study on organizational performance, Bergeron and Raymond (1995) used both an objective (return on assets) and a subjective measurement (instrument of Venkatraman, 1989[b]); in each case, the results obtained were comparable and significant [12].

A strategic plan must specify goals, strategic objectives and actions and the final performance measures by which management and the stockholders will gauge success. Top management's performance can usually be measured in terms of sales volume, market share, cash flow, profit, ROI, dividends and market value [20].

2.8. Development of Hypotheses

In this study, firm size, prospector strategy and technological architecture as independent variables, firm performance as dependent variable have been chosen. Here, the relationships between dependent and independent variables (positive or negative) have been investigated and measured. With regard to this issue various hypotheses have been developed and the accuracy of these hypotheses was investigated. The correlation and multiple linear regression type relations between variables have been investigated.

H1: Firm Size has a positive effect on Firm Performance.

H2: Prospector Strategy has a positive effect on Firm Performance.

H3: Technological Architecture has a positive effect on Firm Performance.

3. Methodology

3.1. Research Goal

The contribution of this research should be discussed with respect to the progress made in methodological and empirical knowledge about the relationships between firm size, prospector strategy, architecture of information technology and firm performance.

3.2. Sample and Data Collection

This paper aims to present impacts of firm size, prospector strategy and technological architecture on firm performance. The data is analyzed empirically whether firm size, prospector strategy and technological architecture impacts the firm performance, or not.

In this study, firms which use information technologies in their operations in Isparta were chosen as the research population. Randomly selected 251 firms using information technologies were taken as the sample of the research.

Analysis has been carried out using data which were obtained from the firms in Isparta by using a questionnaire form in 2011. A questionnaire survey was carried out in Isparta, Turkey. In this study, respondents were asked to rate on seven-point Likert scales (1: certainly disagree, ….., 7: certainly agree). The respondents were chosen from the information systems professionals and managers same level in position in firms. Questionnaires were subjected to respondents by interviewing face to face.

The questionnaires were applied to 151 firms operating in Isparta. The number of firms registered to ITSO (Isparta Commerce and Industry Chamber) is 209 (population) in Isparta in 2011 (http://www.itso.org/index.php?dosya=firma_liste). The rate of randomly selected sampling is 72.3 % (151/209). Among them, however, only 13 questionnaires couldn't be used for the analysis because of incomplete reply from the respondents. After that, 13 questionnaires were also removed from the analysis due to the extreme values. Therefore, calculations were based upon 125 questionnaires.

Data collected from questionnaires were entered into the computer and analyzed with SPSS 15.0, a kind of statistical packet program. In the investigation of the relationship between variables; whether there was a relationship or not, and the direction and degree of relationship were taken into account.

4. Analyses and Results

First, mean values were appointed for the missing values in the rest of the questionnaires. Then, One-Sample Kolmogorov-Smirnov test was applied to data to check whether they fit a normal distribution in the scale base, or not. The values obtained from the Kolmogorov-Smirnov test are given in Table 1.

Table 1 One-Sample Kolmogorov-Smirnov Test

Variables	N	Mean	Std. Dev.	Kolmogorov-Smirnov Z	Asymp. Sig. (2-tailed)
Technological Deployment	125	117.2453	29.56549	1.092	.184
Strategic Activities	125	88.7410	13.80617	.831	.495
Firm Performance	125	58.7627	13.97812	.651	.790
a. Test distribution is normal. b. Calculated from data.					

As it is seen from the Table 2, according to Z values and Sig. values, the data fit the normal distribution. After that, the conformity factor analysis was applied. In this analysis, the variables which did not contribute to the factors were excluded. Therefore, the total score of the factors was taken for the data analysis. Finally, correlation and regression analysis were applied to see the aspect and the power of the relationships between the variables.

Reliability analysis, factor analysis, correlation analysis and multiple linear regression analysis for hypothesis tests were conducted respectively. Hypotheses were tested in accordance with the results emerged from multiple linear regression analysis. Analysis and the results are explained below.

Table 2 Frequency Tables

Operating Years	f	%	Number of Employees	f	%
1-10 years	43	34.4	1-9	33	26.4
11-20 years	36	28.8	10-49	58	46.4
21-30 years	41	32.8	50-249	21	16.8
31 years and above	1	0.8	250 and above	8	6.4
Missing Values	4	3.2	Missing Values	5	4.0
TOTAL	125	96.8	TOTAL	125	96.0

The alpha reliability (Cronbach's alpha) coefficients for variables are given in Table 3.

Table 3. Cronbach Alpha Values

Variables	Alpha Coefficient (α)
Firm Performance (Y)	.679
Prospector Strategy (X_2)	.870
Technological Architecture (X_3)	.900

Alpha coefficients obtained were accepted because they were higher than 0.50 and 0.70 defined by Bagozzi & Yi (1988) and Nunally (1978) respectively in the literature. As a result, reliability values for variables were higher than the value defined and accepted by international literature.

In factor analysis, the dependent and independent variables were considered separately and variables were analyzed in this way. Factor loadings for the prospector strategy are given in Table 4. Total variance explained is 66.212 %.

Table 4. Factor Loadings for Strategic Activities

Independent Variables	Questions	Component
Prospector Strategy (X_2)	B.01	.824
	B.02	.947
	B.03	.824
	B.05	.891

The results of factor analysis for technological deployment are given in Table 5. Total variance explained is 70.025 %.

Table 5. Factor Loadings for Technological Deployment

Independent Variables	Questions	Component
Technological Architecture (X_3)	A.09	.574
	A.10	.658
	A.11	.783
	A.12	.847
	A.13	.743
	A.14	.649
	A.15	.665

Factor loadings for firm performance are given in Table 6. Total variance explained is 71.926 %.

Table 6. Factor Loadings for Firm Performance

Dependent Variables		Questions	Component
Firm Performance (Y)	Sales Growth	C.02	.912
		C.04	.916
		C.08	.712
	Profitability	C.05	.811
		C.10	.888
		C.12	.800
Rotated Component Matrix Solution (Extraction) Method: Principal Component Analysis			

The values for Pearson correlation coefficients are shown in Table 7. In the correlation table, one to one relationships between independent variable and dependent variables are given.

Table 7. Correlation Analysis

Variables		X_1	X_2	X_3	Y
X_1	Firm Size	1.000	.125	.073	-.062
X_2	Prospector Strategy	.125	1,000	.617**	.413**
X_3	Technological Architecture	.073	.617**	1.000	.336**
Y	Firm Performance	-.062	.413**	.336**	1.000
Pearson Correlation and Significance **. Correlation is significant at the 0.01 level (2-tailed) *. Correlation is significant at the 0.05 level (2-tailed)					

Hypotheses proposed in the model were tested by using multiple linear regression analysis. The equation defined as a mathematical model is given below:

$$Y = \beta_0 + \beta_1 * X_1 + \beta_2 * X_2 + \beta_3 * X_3 + \varepsilon$$

In the multiple linear regression model; ε defines un-standardized coefficients std. error, independent variable X_1 defines firm size, independent variable X_2 defines prospector strategy, independent variable X_3 defines technological architecture, and dependent variable Y defines firm performance. In the model, X_i is i.nth independent variable; β value is standardized beta regression coefficient. After conducting multiple linear regression analysis, according to β coefficients and significance level (ρ) of variables hypotheses would be accepted or rejected.

In the analysis, "Firm Performance" was taken as the dependent variable as shown in Table 8. Multiple linear regression analysis was conducted by choosing firm size, prospector strategy and technological architecture as independent variables. In this multiple linear regression model, R^2= .456 and F = 36.756 values were obtained. The results indicate that there exist significant relationships between "firm performance", "prospector strategy" and "technological architecture".

Table 8. Independent Variables Affecting Firm Performance

Model	Un-standardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig. (ρ)
Constant	2.268	.503		4.507	.000
Firm Size (X_1)	-.151	.110	.115	-1.372	.173
Prospector Strategy (X_2)	.347	.095	.322	3.378	.001
Technological Architecture (X_3)	.270	.084	.247	2.921	.009
R^2 = .456					
F= 36.756					
Dependent Variable "Firm Performance"					

The results of multiple linear regression analyses belonging to firm performance, firm size, prospector strategy and technological architecture are shown schematically in a collective manner in Figure 1 below. The relationships accepted are shown by arrows with thick lines. However, there is no relationship between the variables shown with dashed line.

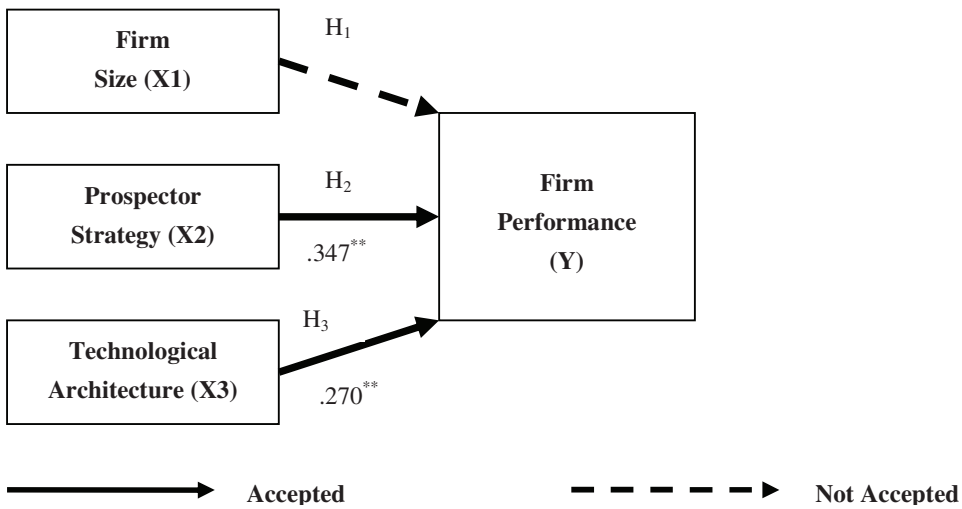

Figure 1. Final Research Model

5. Results

The findings of the research imply the relationships between firm size, prospector strategy, technological architecture and firm performance and and presents more information on the direction of the relationships. These outcomes have some implications for future research as well as for business practices.

In the multiple linear regression model; un-standardized coefficient (β_0) was calculated as 2.268, standardized coefficient of prospector strategy (β_2) was calculated as .347, standardized coefficient of technological architecture (β_3) was calculated as .270 and un-standardized coefficients std. error (ε) was calculated as .503. After conducting multiple linear regression analysis, according to β coefficients and significance level (ρ) of prospector strategy and technological architecture H_2 and H_3 hypotheses were accepted and H1 hypothesis was rejected.

As a result of findings, the equation considered as a mathematical model is given numerically below:

$$Y = 2.268 + .347^{**} X_2 + .270^{**} X_3 + .503$$

The results regarding the hypotheses are shown in Table 9. Totally 3 hypotheses are ranked in the Table. With regard to the results; Beta coefficiants (β), Significance (ρ) and ACCEPTED/REJECTED

(A/R) status are also given in the Table. According to these results; 2 hypotheses was accepted at significance level of 0.01 level.

Table 9. The Results Belonging to Hypotheses

No	Hypothesis	(β)	Sig. (ρ)	A/R
H_1	Firm Size has a positive effect on Firm Performance	-.115	.173	R
H_2	Prospector Strategy has a positive effect on Firm Performance	.347**	.001	A
H_3	Technological Architecture has a positive effect on Firm Performance	.270**	.009	A

Firms implementing the prospector strategy tend to improve their firm performance and develop their technological architecture effectively (See Fig 1). According to results of correlation and multiple linear regression analysis, we have seen that the prospector strategy affects the firm performance with the significance of .001 and β_2 coefficient (.347**). However, the technology alone is not the primary driver of firm performance. These firms have more capabilities in finding new ideas, launching new products and are more open to taking risks than they have finding and appliying information technology to gain a competitive advantage. It is their excellence in prospector strategy that makes them more effective and more performant.

It is important for firms that the technological architecture be flexible and support the rapid changes required by their industry. The results indicate that technological architecture is related to a higher firm performance. Technological architecture has a positive effect on firm performance with the significance of .009 and β_3 coefficient (.270**).

In addition to these results, it is worthwhile to discuss the effect of prospector strategy and technological architecture on firm performance. The prospector strategy has a positive effect on firm performance. The architecture of information technology helps the firms implying the prospector strategy, and it increases the firm performance. Thus, the main effect on firm performance comes from prospector strategy supported by an adequate architecture of information technology.

This study has some limitations. First, the questionnaire approach is not entirely free from the subjectivity of the respondent. Second, only one questionnaire for each organization has been used.

6. Conclusion

Strategic activities play a significant role in today's business environment due to rapid globalization, advances in information technologies and rapid change in consumers' demands. Miles and Snow introduced four types of strategic activities implemented in firms. These strategic activities are prospector, defender, analyzer and reactor strategies.

Firms implementing the prospector strategic activities solve the entrepreneurial problem easily. They find and benefit from new product and market opportunities. These firms develop in changing business environments and investigate the market for new opportunities. Moreover, prospector firms have many products or services and promote creativity and productivity. The prospector firms prioritize new product development and innovation to meet new and changing customer needs and demands and to create new demands. For these reasons, we decided to research the prospector strategy among other strategies.

The information technology is used to help the firm for gaining a competitive advantage and meet customer demands. Information technology is aligned with business strategy. Therefore, firms could adopt different types of technological deployment depending on their various business strategies. According to Das et al. (1991), the information technology activities of organizations of the prospector type would be characterized by a more intensive use of information technology, more decentralized and flexible technological infrastructures than the ones associated with the defender type. The technological infrastructure addresses the information technology architecture and the formalized procedures used to guide and control the firm's information technology resources. Consequently, we decided to research the technological architecture of firms in this study.

It has been noted by researchers that firm size is a contextual or enabler variable in the use of technologies and that it is common for small firms to lag behind larger firms in implementing new technologies. Therefore, we tried to research the cause of this situation and the relationships between firm size, prospector strategy, technological architecture and firm performance.

The contribution of this research should be discussed with respect to the progress made in methodological and empirical knowledge about the impact of firm size, prospector strategy and technological architecture on firm performance.

In summary the first hypothesis hasn't supported the existence of a positive link between firm size and firm performance. The second hypothesis, proposing the relationship between prospector strategy and firm performance is accepted. The third hypothesis, which concerns the existence of positive relationship between technological architecture and firm performance, is accepted.

The findings of our research show that there is no relationship between firm size and firm performance. As we look at frequencies results of the descriptive statistics of our research, we see that most of the surveyed firms (89.6 %) are SME's. Therefore, we couldn't compare and make comparison with large firms. The difficulty of presence of large firms and the small number of large firms operating in the field of information technology or use of information technology in Isparta have also affected this result.

The effect of prospector strategy ($.347^{**}$) is more than the effect of architecture of information technology ($.270^{**}$) on firm performance. This is understandable since firms implementing prospector strategy have more capabilities in creating new ideas and new products and are more open to their business environment for getting new opportunities than they have having advanced technological architecture to gain a competitive advantage. Their prospector strategic activities make firm more effective and more performant.

Finally, the results indicate that firms could increase their performance by supporting prospector strategy and developing their technological architecture accordingly.

In terms of future research, this study could be resumed using other types of application of strategic activities such as those applied by Croteau and Bergeron (2001). Moreover, conducting the study among small and medium-sized firms and large-sized firms would further advance the research.

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