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# The effect of information systems and human resources strategies on the success of information systems: Evidence from Jordanian commercial companies

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A B S T R A C T

The study aims at measuring the impact of human resources and information systems strategies on the success of information systems in the industrial companies operating in the Amman stock exchange. The study sample was made up of accounting and finance departments for these companies. The initial data were collected through a questionnaire that designed for this purpose. The results have confirmed a strong impact of information systems strategies on the information systems success. As well, the results have confirmed the impact of information systems strategies on human resources strategies. The study also has proved that human resources strategies have maintained a weak effect on the success of information systems. The study recommends the researchers in this field to re-study this subject by modifying the measuring variables methods, and study other economic sectors.



## 1. Introduction

Researchers realize that the relationship between investment in the Information technology and company performance is complex and multifaceted. Studies point to different predictions about the potential institutional performance effects of information systems on all performance aspects. As well, many empirical studies conclude that adapting information system (IS) strategies to business strategies is not an easy task, and knowing and restricting regulatory areas that affect information systems strategies will necessarily lead to successful implementation of these systems. The results of many studies have also pointed to the three most important factors for systems success: The commitment of senior management to the concept of organizational harmony with information systems strategies, and the managers' knowledge of the nature and needs of business accurately has an important impact on success. Moreover, the confidence of top management in the information system department affects significantly on the success of these systems (Gunes et al., 2003). The technical characteristics of information systems have played a significant role in improving the level of harmony of this technology with different regulatory requirements. Modern information systems have also provided considerable support in various forms to workers and decision makers, in order to achieve the optimal performance of their work (Bell et al., 2014). Some researchers emphasize the importance of technology's technical characteristics in improving its ability to keep up with business requirements, which indicates to the impact of these characteristics on the level of potential success of this technology (Suh et al., 2013). A series of studies also show the importance of strategic planning in succeeding organizations and their various processes. Since strategies of human resources are part of the overall organization strategy, some researchers study and classify these strategies in order to consider

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the potential impact of these strategies on the success of different organization activities (Aboramadan & Borgonovi, 2016). This study is an attempt to demonstrate the role of both information systems and human resources strategies to influence the level of information technology success. The following is a detailed explanation of these variables covered in this study.

## 2. Literature review

### *2.1 Strategic HR systems*

Human resources management faced significant challenges in order to justify its existence and importance in the regulation, as it has been established in times of financial prosperity and being financed by senior management, but the financial crises faced by organizations provided the possibility of reducing the human resources budget regarding that it is not important. However, the emergence of the strategic human resources management concept has created a new reinvestment challenge. The development of the concept of human resources management during the last two decades of the last century has produced the concept of strategic human resources management. There is also a growing awareness of the important role of human resources in the development process in the organizational structure of the organization. The management's awareness of the role of human resources for the success of the organization strategy contributes to the strategic dimension of human resources management. Furthermore, achieving the efficiency of strategic human resources management requires integrating the overall strategic objectives of management with the strategic objectives of human resources management (Besma, 2013, Andersen et al., 2007; Mitchell et al., 2013). Scientific ethics indicate that human resources strategies contribute to achieving organizational goals, support and contribute to the successful implementation of different organizational strategies. Furthermore, it creates and maintains of the organization's competitive advantage, and contributes to increase the number of potential strategic options of the organization. As well, it is an important partner with the senior management in the planning process. It contributes also to improve collaboration between human resources management and line managers. (Armstrong, 2008, Cummings, & Worley, 2009, Bowen & Ostroff, 2004). The spread of human resources management (HRM)'s expectedly contributes to improve the organization effectiveness, by developing a set of strategic options for human resources management that are appropriately linked to the business strategies. Researchers in this field recognize the importance of the HRM's role in improving organization performance from a resource-based view theory. Resource based View of Strategy suggests that the ability of this strategy in the company depends on the amount of resources that are significant and available to support this new concept. The theoretical researches in this field point out that human resources systems may contribute to improve the performance of the organization's work, provided they are compatible with different strategic factors, and may be a source of the sustained competitiveness advantage, because the organization's most complex and disparate systems create a unique organizational advantage (Besma, 2014). By looking at research ethics in this field, three different philosophical orientations are found:

First: the resource-based approach, which provides the philosophical basis for the strategic concept of human resources management as the most important and competitive asset for organizations, and for its proper long-term performance.

Second: The strategic fit approach, which focuses on the potential applications of the human resources management strategic concept through two different dimensions: Vertical integration, which seeks to harmonize human resources management practices and strategic business management planning, with horizontal integration that represents human resource management practices and different human resource management applications.

Third: is the strategic flexibility approach, which is defined as the organization's ability to adapt different environmental changes with the aim to improve the organizational performance. Through these efforts, the concept of a human resources management strategy must be in line with the general concept of organization, and with the specific concepts of each administrative unit, and in line with the overall strategy of the Organization; to improve overall organization performance (Cummings, & Worley, 2009, Bowen & Ostroff, 2004, Wright & McMahan, 1992). For the purposes of this study, the scale of Liza and Malcolm is adapted and developed in 2008, depending on a Miles and Snow scale, which focuses on the five most well-known areas of knowledge in human resources: Recruitment, Selection and Placement, Training and Development, Performance Appraisal, compensation. (Castro & Highgs, 2008)

### *2.2 Information systems strategies*

Many researchers point to a gap in studies that ensure that investing in the applications of modern information systems strategies has a positive impact on internal metrics of a company’s performance, such as market share or profitability. The modern complexities of business management and the nature of information systems requirements increases the importance of taking an appropriate approach to strategic planning for regulation, and adopting a modern concept in harmonizing business requirements. To facilitate harmonization, the nature of regulatory areas needs to be carefully known and managed, in order to promote success (Gunes et al., 2003). Modern organizations are increasingly seen as knowledge-based institutions, so that proactive knowledge management is important in improving competitiveness. Moreover, the management of knowledge-generating systems is a key factor in improving the organization's ability to deal with the Organization's competitive environment by creating a competitive advantage. So that, Information Systems (IS) are considered one of the important research topics in recent decades. Researchers focus on examining the concept of strategic information systems (ISs) in their

various forms, and attempting to link them with different strategic management concepts. The concepts and characteristics of information systems used in different organizations have changed significantly over the past decade, making them a renewed area for study and research (Ahlemann, 2009). During the late last century, there was growing awareness of the need to make information systems strategically important to the organization, as increasing the importance of providing appropriate information to decision makers, which pushes organizations to develop their information systems and link them to the concept of regulatory strategies. Strategic information systems are systems that support the organization's competitive strategy (Turban et al., 2006). Information systems strategy can be measured using different strategy models, at the corporate-level or business-level. In this research, the classification of Miles and Snow is adopted that distinguishes information systems strategies into three types (Prospectors, Defenders, and Analytics). Prospectors' strategy is a competitive, aggressive strategic organization, which attempts to be a leader in the delivery of innovative goods by developing a new marketing concept for available goods, and trying to find new marketing opportunities. While Defenders' strategy is the organizations that follow a conservative competitive strategy, which their contribution to commodity development is very little or nonexistent. They maintain their traditional marketing concept and rise from the concept of innovation in dealing with marketing opportunities. However, analyzers' strategy is a kind of moderate competitive strategy that develops products more slowly than prospectors, and they are fewer stable organizations of advocates (Dong et al., 2008)

### *2.3 IS Success*

There is a constant question among executive managers of different organizations about the quality of their information systems, and whether they are on track. Many researchers have tried to discover the relationship between the level of investment in information systems and their productivity (Bowen et al., 2007). Many researchers have also been concerned with evaluating the performance of information systems in order to identify the success factors of information systems management, with emphasizing that the role of information systems is to reduce costs. The process of measuring the performance of information systems by operational management is a difficult mission (Weill & Olson, 1989). In order to assess the performance of information systems effectively, the definition of the performance of information systems must be understood, although the performance of information systems is known in different ways, and should be distinguished from the organization performance or so-called organizational performance. The organization performance is defined as the total product of the organization at all its activities. It should be noted that the difficulty in studying the performance of information systems is that there are many possible stages, which are linked to the level of investment in information systems and financial organization performance; which means that information systems improve the nature of services provided to customers, thereby increasing customer confidence and the level of loyalty to organization. This leads to increased sales of regulation. The above-mentioned information points out that there are at least three possible phases to achieve the impact of investment in information systems on the financial performance of regulation. This is why the studies differ in adopting different performance measurement models regarding the measured performance stage (Norton & Kaplan, 2001). Many researchers provide many examples of successful information systems implementation. Delone and McClean provide an example of how information systems are successful, and this model is adopted by Shannon& Weaver, which indicates that there are three levels of success (Technical level, Semantic level, Influence level) (7). The study of Saunder and Jones (2001) aims to identify significant dimensions in the functional performance of information systems. The most important dimensions of the used scale are "the impact of an information system on strategic direction", which is many researchers use. The Delone and McClean (2003) introduce a six-dimensional model to measure the success of information systems. The dimensions are: (system quality, information quality, use, user behavior, individual impact, and systemic impact). The results of the study show that the system quality and the quality of information are affected by the use and the satisfaction of the user. Usage and user satisfaction are affected by each other, with an unknown direction. In this model, the individual and organizational impact has been combined into one dimension, which is net benefit. Service quality has also been added to the quality dimension. Suh et al, 2013 also present a model for assessing success factors by identifying the general factors that influenced the success level according to the organization's situation. The search model has been built by linking business strategies that reflect the internal and external environment and infrastructure, such as the organization structure or the IT architecture, and then the scale factor of investment in information systems has been added as an IS investment as an intermediate progress factor to achieve the success of information systems. Many researchers have made suggestions to measure the success of information systems in various ways, and some researchers have measured success through IT outputs, or measured the impact of information on users directly and indirectly. The utility of information systems has also been divided from the company's point of view into tangible and intangible benefits. The benefits of information systems can also be measured by the econometrics oriented or business process oriented. For the purposes of this study, the impact of information systems on business performance has been measured in quantitative terms, with emphasis on the importance of managers' awareness of this information and the difficulty of obtaining such information, referring to the validity of this method, which has been emphasized by a group of researchers (Delone & McClean, 1992, Buchta et al., 2009). This study has dealt with the benefits of process-level information systems and the executive's awareness of this survey. As well, the benefit dimensions of the IS success model have been adopted.

## 3. The proposed study

By reviewing the findings and recommendations of previous studies, this study adopts the main hypothesis that focuses on a statistically significant impact of human resources strategies on the success of information systems through information systems strategies as an intermediary factor:

1- **IT success:** for the purpose of this study, the model that is developed by Suh et al., 2013) has been adopted based on studies carried out by a number of researchers (Delone & McClean, 1992). The information technology variable has been divided into six dimensions (Planning and management support, Production and operations, Product and service enhancement, Supplier relations, Sales and marketing support and Customer relations)

2- **Human Resources strategies:** according to the purposes of this study, the definition that is developed by Christiansen and Higgs (2008) will be adopted depending on the theory of (Miles and Snow) measured by 11 paragraphs.

$H_1$: *There is a statistically significant impact of human resources strategies on information systems strategies.*

$H_2$: *There is a direct statistically significant impact of human resources strategies on the success of information systems*.

3- **IT strategies:** The models that measured this variable have been diversified, but for the purposes of this study the model developed by Dong et al. (2008) is adopted, which is based primarily on the model of Miles and Snow, which divides IT strategies into three strategies (Prospector, Defender, Analyzer).

$H_3$: *There is a statistically significant relationship to information systems strategies for the success of information systems.*

Fig. 1 demonstrates the structure of the proposed study of this paper.

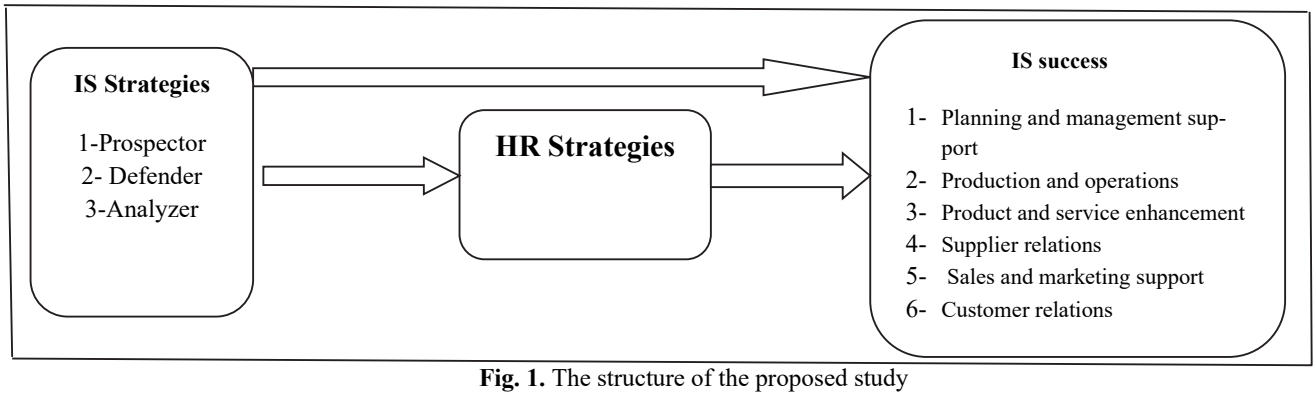


**Fig. 1.** The structure of the proposed study

The study community consists of the 58 industrial companies listed in Amman stock exchange, and the study sample was represented by the employees in the accounting and finance department (heads of different departments of the accounting department), and 142 of the survey sample was distributed to 100% of the study sample while 109 of the questionnaires were retrieved (76.7%) from the total number of distributed questionnaires. The Cronbach Alpha inner consistency measurement has been used for study sample responses, in order to ensure the internal consistency of the used scale. The alpha value of the HR strategy variable, information systems strategy and success variable in information systems are 0.704, 0.896 and 0.947, respectively.

*3.1 The fist hypothesis: The effect of information system strategies on information system success*

The first hypothesis of this paper examines the effect of information system strategies on information system success. The proposed study of this paper uses regression analysis. Table 1 presents the summary of ANOVA test.

**Table 1**
The summary of ANOVA test

| Model | Sum of Squares | DF | Mean Square | DW | F | R- Square | Sig |
|---|---|---|---|---|---|---|---|
| Regression | 23.81 | 1 | 23.81 | | | | |
| Residual | 17.66 | 108 | 0.16 | 1.89 | 145.55 | 0.574 | 0.000 |
| Total | 41.48 | 109 | | | | | |

* Statistically significant at the level of statistical significance ($\alpha \leq 0.05$)

It is noted from the Table 1 that the value (F = 145.557), which is statistically significant (0.00) is less than the level of statistical significance ($\alpha \leq 0.05$). Thus, a simple linear regression model is suitable for measuring the causal relationship between independent variable (Information System Strategies) and (IS success) dependent variable. A summary of the Model Summary analysis of simple linear regression is given in Table 2. The correlation is coefficient between the independent variable (Information System Strategies) and the dependent variable (IS success) that is (0.758). The value of the determination co-efficiency ($R^2$) (0.574), and the value of the adjusted coefficient determination (Adjusted $R^2$) (0.57) indicates that the independent variable (Information System Strategies) was able to explain that (57.0%) of the changes in the dependent variable (IS success), and

the rest attributed to other factors. In our research, we performed the DW test and the results showed a calculated value of (1.89). This result falls within the appropriate range, and even close to 2 which indicates that there is no autocorrelation problem affecting the validity of the study model.

**Table 2**
The summary of simple linear regression (independent variable (Information System Strategies) and (IS success) dependent variable)

| Model | B | Std. Error | Beta | t | Sig |
|---|---|---|---|---|---|
| Constant | 1.675 | .175 | 23.81 | 9.574 | 0.000* |
| Information Systems Strategies | .586 | .049 | .758 | 12.065 | 0.000* |

* Statistically significant at the level of statistical significance ($\alpha \leq 0.05$)

The results of Table 2 show the following:

1. There is a statistical significance for the constant simple linear regression equation, where the value is (t-value = 9.574) and statistical significance is (0.000), which is less than the level of statistical significance ($\alpha \leq 0.05$). This indicates that without considering the effect of IS strategies, there is a positive chance of IS success.

2. There is a statistical significance for the coefficient of the regression equation (T = 12.065, Sig. = 0.000). This shows the impact of information system strategies on IS success. Thus, there is a significant coefficient of simple linear regression equation, which was (0.758) and Unstandardized (0.586).

*3.2 The second hypothesis: The effect of information system strategies on strategic HR system*

Table 3 presents the results of ANOVA test to study the effect of information system strategies on strategic HR systems as a mediating variable.

**Table 3**
The result for ANOVA for the relationship between Information System Strategies and strategic HR systems

| Model | Sum of Squares | DF | Mean Square | DW | F | R- Square | Sig |
|---|---|---|---|---|---|---|---|
| Regression | 1.011 | 1 | 1.011 | | | | |
| Residual | 18.358 | 108 | .170 | 1.42 | 5.949 | 0.052 | 0.016* |
| Total | 19.369 | 109 | | | | | |

* Statistically significant at the level of statistical significance ($\alpha \leq 0.05$)

It is noted from Table 3 that the value (F = 5.949) and statistically significant (0.00) is less than the level of statistical significance ($\alpha \leq 0.05$). Thus, a simple linear regression model is suitable for measuring the causal relationship between the independent variable (Information System Strategies) and the mediating variable (strategic HR systems). Table 4 shows the summary of the model for the regression analysis. The correlation coefficient between the independent variable (Information System Strategies) and the mediating variable (strategic HR systems) is (0.228), while the value of the coefficient of determination ($R^2$) (0.052), and that the value of the adjusted determination coefficient (Adjusted $R^2$) (0.043) indicate that the independent variable (Information System Strategies) is able to explain (4.3%) of the changes in the mediating variable (strategic HR systems) and the rest are attributed by the other factors. In our research, we performed the DW test and the results showed a calculated value of 1.42. This result falls within the appropriate range, and even close to 2 which indicates that there is no autocorrelation problem affecting the validity of the study model.

**Table 4**
The results of regression analysis between Information System Strategies and strategic HR systems

| Model | B | Std. Error | Beta | t | Sig |
|---|---|---|---|---|---|
| Constant | 1.581 | .178 | | 9.862 | 0.000* |
| Information Systems Strategies | .121 | .05 | .228 | 2.439 | 0.016* |

* Statistically significant at the level of statistical significance ($\alpha \leq 0.05$)

The results of Table 4 indicate the following:

1. There is a statistical significance for the constant simple linear regression equation, where the value of (T = 8.862) and statistical significance (0.000) are less than the level of statistical significance ($\alpha \leq 0.05$), which indicates that there is significance for the constant simple linear regression equation that reached (1.581).
2. There is a statistical significance for the coefficient of simple linear regression equation of Standardized and Unstandardized Coefficients that is related to the independent variable (information system strategies), where the value is (T = 2.439) and statistical significance is (0.016), which is lower than the level of statistical significance ($\alpha \leq 0.05$). This shows the impact of the information system strategies on (strategic HR systems). Thus, there coefficient significance of simple linear regression equation, which is (0.228) and Unstandardized (0.121).

*3.3. The third hypothesis: The effect of strategic HR systems on IS success*

The last hypothesis of this survey surveys the relationship between strategic HR systems and information system success. Table 5 shows the results of the ANOVA test between two variables.

**Table 5**
The result for ANOVA table for mediating variable (strategic HR systems) and the dependent variable (IS success)

| Model | Sum of Squares | DF | Mean Square | DW | F | R- Square | Sig |
|---|---|---|---|---|---|---|---|
| Regression | 3.505 | 1 | 3.505 | | | | |
| Residual | 37.975 | 108 | .352 | 1.58 | 9.967 | 0.084 | 0.002* |
| Total | 41.480 | 109 | | | | | |

* Statistically significant at the level of statistical significance ($\alpha \leq 0.05$)

It is noted from Table 5 that the value (F = 9.967) and statistically significant (0.00) are less than the level of statistical significance ($\alpha \leq 0.05$). Thus, a simple linear regression model is suitable for measuring the causal relationship between the mediating variable (strategic HR systems) and the dependent variable (IS success). A summary of the linear regression is given in Table 6. The correlation co-efficiency between the mediating variable (strategic HR systems) and the dependent variable (IS success) is (0.219). The value of the determination coefficient ($R^2$) (0.084), and the adjusted determination co-efficient (Adjusted $R^2$) (0.076) indicates that the mediating variable (strategic HR systems) is able to explain (7.6%) the changes in the dependent variable (IS success) and the rest attributed to other factors. In our research, we performed the DW test and the results showed a calculated value of (1.58). This result falls within the appropriate range, and even close to 2 which indicates that there is no autocorrelation problem affecting the validity of the study model.

**Table 6**
The coefficients for simple linear regression between mediating variable (strategic HR systems) and the dependent variable (IS success)

| Model | B | Std. Error | Beta | T | Sig |
|---|---|---|---|---|---|
| Constant | 2.881 | .276 | | 10.44 | 0.000* |
| Information Systems Strategies | .425 | .135 | .291 | 3.157 | 0.002* |

* Statistically significant at the level of statistical significance ($\alpha \leq 0.05$)

Table 6 shows the following:

There is a statistical significance for the constant of the simple linear regression equation, where the value of (T = 10.44) and statistical significance is (0.000) are less than the level of statistical significance ($\alpha \leq 0.05$), which indicates that without any strategic HR we may expect IS success. There is a statistical significance for the coefficient simple linear regression equation of Standardized and Unstandardized Coefficients that are related to the mediating variable (strategic HR systems), where the value (T = 3.157) and statistical significance (0.002) are lower than the level of statistical significance ($\alpha \leq 0.05$), which shows the impact of the strategic HR systems on (IS success). Thus, there is a significance for the coefficient simple linear regression equation, which is (0.291) and Unstandardized (0.425).

**4. Conclusion and recommendation**

Through statistical analysis of the sample responses of the study, and its linkage with the results of previous studies, the following results have been achieved:

1- The results have confirmed that there is a strong impact of information systems strategies on the success of information systems, with emphasizing that Analyzer's strategy has the greatest impact on the success of information systems. It has been shown that using these systems helps to address the risk analysis the organization faces, and that these systems are highly supportive of assessing the performance of human resources.
2- The impact of the information systems strategy on human resources strategies has been shown, but the prevalence of relatively low influence indicates weak integration and consistency between micro-human resources strategies and the dominant strategy of organization. This indicates poor coordination and overtaking.
3- The results also confirm that human resources strategies have an impact on the success of information systems, but the impact is relatively small. This suggests that there is a reduced contribution of human resources to the success of information systems, regarding factors that have a greater impact than the HR strategy, by influencing the success of these systems.

The following recommendation is also made.

1. Emphasizing the importance of Information Systems Strategy role in achieving the success of information systems through improved harmonization,

2. Emphasizing the role of the human resources strategy in achieving the success of information systems, with emphasis on reexamining this variable from different points of view, in order to ensure the variable's effect on the success of information systems,

3. Re-examining the theory with adjusting the parameters of variables and changing the study community, so that the results of all economic sectors can be more fully confirmed.

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