The Impact of the Utilisation of Enterprise Resources Planning ERP Systems in the Operations of Egyptian Ports as a Service Sector[1]

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ABSTRACT

The Egyptian ports are key economic assets; a lack of port capacity and services may stifle economic growth. Smart ports that use intelligent information interchange improve port quality and efficiency through digitization and automation, increasing the economic function of ports leading towards higher economic development. The research paper aimed to identify the extent of the impact of the role of the use of enterprise resource planning information systems as a means of re-engineering (operations re-engineering) for Egyptian ports as a service sector, the factors that affect the success of the role of using enterprise resource planning information systems are investigated. These factors are assumed to be the senior management support, the human potential, the technical capabilities, the financial capabilities and the re-engineering process of the operations. The results demonstrate that there should be high compatibility between the preceding factors and the use of ERP enterprise resource planning information systems concluding with some recommendations for its implementation.

Keywords: *Enterprise Resources Planning ERP Systems, Re-engineering, Senior Management*

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1- Introduction

The study problem is about the Egyptian ports suffering from the expansion of administrative divisions and the failure to activate the cargo inventory system to know the movement of goods in the ports, as well as the lack of technical capabilities and the lack of communication with the Internet, which resulted in the large number of routine procedures in providing the service, the large number of paper documents, the slowness in making decisions, as well as the overlapping of the powers of the authority. The lack of utilization of human cadres is reflected negatively on performance and efficiency, where the problem is that the port operates in the traditional management system that is almost deficient in the performance level of the port.

The purpose of the study is to investigate the factors affecting the adoption of enterprise resource planning information systems to improve port operations through the determination of the extent to which:

- The senior management supports the decision to adopt information systems that establish port operations;
- Human capabilities backing information systems in the decision to adopt enterprise resource planning information systems;
- Technical capabilities endorse the decision to adopt enterprise resource planning information systems;
- The financial capabilities of the enterprise resource planning information systems reinforce the operations of the port;
- The re-engineering process is carried out in adopting the enterprise resource planning information systems decision for port operations.

2- Literature Review

Enterprises presently invest in a variety of areas, with the projected Return on Investment (ROI) ranging from cost reduction to profit maximisation to decision support. The cost of deploying ERP systems is one of the investment elements. The ERP system collects, records, integrates, manages, and distributes data and information throughout

the enterprise's functional units. It facilitates the exchange of data between inventories, production, planning, materials, engineering, finance, Human Resources, sales, marketing, operations, and all other departments within the company.

Higher quality, reduced time-to-market, greater communications, decision-making support, shortened lead times, increased productivity, and cheaper costs could all be benefits of deploying an ERP system. Reduced expenses can aid the company in improving customer service and increasing sales, market share, and profitability. Modern ERP systems are designed to be accessed via the internet. It was extended with ecommerce features, as well as the ability to integrate and collaborate with suppliers, partners, and customer portals, as well as improved tracking of arriving row material and outgoing finished goods to increase visibility and control both inside and outside the company. Many businesses solely consider the cost of the software licence when estimating the cost of an ERP implementation. n practise, there are numerous factors to consider when planning the budget for an ERP system deployment, such as software licence fees, hardware, implementation services and maintenance fees, and training prices. ERP system implementation is a costly procedure that grows in cost with the size of the company.

ERP is a software system that tries to cooperatively integrate all of the enterprise's functional units. ERP, according to Genoulaz et al. (2005), is a critical component of an infrastructure that delivers a business solution. ERP is defined by Klaus et al. (2000) as a comprehensive software package that aims to integrate the whole spectrum of a company's activities and functions in order to present a holistic perspective of the company from a single data and IT architecture.

ERP systems have undergone a lot of evolution and update processes over time in order to improve their functionality and integration capabilities. ERP companies such as Oracle, SAP, PeopleSoft, J. D. Edwards, and others created several modules to cover and support all of the enterprise's functional units. Traditional ERP systems can be divided into two categories, according to Klaus et al. (2000), on-premise ERP and hosted ERP. On-premise ERP uses enterprise infrastructure such as servers, networks, platforms, computers, and so on to load and

run the system. The ERP system is run, operated, and managed by the company using a software licence model. Running costs, operational costs, and maintenance costs are all factors to consider.

According to the United Nations Conference on Trade and Development's 2017 Review on Maritime Transport, global maritime freight demand increased modestly. The rise in global maritime trade volume was 2.6 per cent, up from 1.8 per cent in 2015, but still below the average growth rate of 3% for the last four decades. There was an increase of over 260 million tonnes of cargo with a total volume of 10.3 billion tonnes. According to UNCTAD estimates, marine trade would account for 2.8 per cent of global trade in 2017, with a total volume of 10.6 billion tonnes. The medium-term forecast also indicates a rise in cargo flows. Still, UNCTAD predicts that between 2017 and 2022, seaborne trade will grow by an average of 3.2 per cent. The value undoubtedly has a significant impact on the design and operation of the maritime transportation system, particularly the marine port.

In recent years, a number of global challenges relating to the maritime transportation system between countries have been actively debated, particularly those relating to marine information systems. The marine information system becomes a standard of analytical tools for public and commercial organisations in planning development, managing resources, and supporting maritime transportation management decisions using Geographic Information Systems (GIS). In their work, Nartey and Shi (2012) created the concept of a maritime information system. The Marine Information System is designed to give ship owners, company ships, and port authorities access to information. The information, however, cannot be accessed. However, due to the nature of marine information systems, external users are unable to access the data. Several governments in each region tend to have their own norms and regulations in decision-making, particularly in the marine port service system. The marine information system is further hindered by service systems that are still traditional and have not yet been integrated among stakeholders.

Some research looked into the interface between information systems and transportation or logistics systems, particularly ERP deployment (Rondinelli et al., 2000; Ince, 2013; Kandananond, 2014). The influence

of transportation and logistics systems on the physical environment (air, water, and land resources) will get more complex as they become more integrated. Multi-modal transportation infrastructure is in more demand as a result of economic globalisation, flexible manufacturing, quick delivery to markets, and supply chain management (Rondinelli, 2000).

Because the function of a port has grown to include a logistical platform, it can become an economic wheel providing efficiency in work. Because a seaport in a country is considered as a nerve centre for global trade, port efficiency is critical in international trade (TIWARI, 2011). Ports must adapt to technological and commercial change as the volume of international transportation grows, along with all types of offshore activities, resulting in increased shipping intensity in ports, along with the creation of exceptionally big ships. Significant increases in port throughput put pressure on port infrastructure development to be based on a sensible approach for cost-effective, long-term sustainability. The current research looks at how ERP systems affect port performance and consequently economic development. According to Alfred Weber and in Friedrich (1929), corporations hunt for "break-in-bulk" spots or places where two or more modes of transportation can link. R. Goss (1990) emphasised the role of ports in economic development since they improve competition by expanding enterprises' market areas, and lowering consumer prices. Gripaios-Gripaios (1995) demonstrated that port rent is disseminated across a bigger economic system than the one in which the port is located (Ferarri et al., 2012).

The term "economic development" was first connected with a consistent increase in per capita income in the late 18th century, when capitalism first developed. In the twentieth century, development was related to the rise of welfare in industrial countries. And in the early twenty-first century, a variety of obstacles confronted development, including social equity and environmental sustainability (Brox, 2014). Economists are looking into the efficiency and effectiveness of port activities in terms of regional development (Ferrari et al., 2012)

Seaports act as an economic infrastructure with strong multiplier effects on the domestic economy, according to Tiwari’s theory in 2011. When transportation systems are efficient, they give economic and

social opportunities and advantages, resulting in positive multipliers such as increased market access, employment, and investment (Rodrigue, 2013). As stated by Li-zhuo (2012), the growth of port logistics has an impact on the cost and efficiency of the manufacturing sector, and investments in logistics infrastructure have a favourable economic impact. Enhanced port logistics can lower transportation costs and increase efficiency in the manufacturing sector, which has an influence on economic growth for the reason that the demand for factors of production, materials, and new technologies and equipment would be boosted, the national income will increase several times as a result of the investment in port logistics (Wildenboer, 2015).

Ports are frequently mentioned in economic theory as essential determinants in economic development since they increase market opportunity and competitiveness for businesses (Rodrigue, 2013). Ports connect regional economies to global markets, boosting regional enterprises' competitiveness by lowering import and export costs. Attract new maritime-related sectors, such as shipbuilding. Because it is closely linked to the regional economic network, import and export traffic has a higher added value (Brox, 2014). Increased overseas commerce can also lead to increased economic growth. High trade costs prevent a country from reaping the benefits of specialisation and commerce in order to advance its economic development (Merk, 2013). Ports, on the whole, improve competitiveness and produce beneficial economic outcomes.

Improvements in port performance have an effect on the national economy since changes in port operation, infrastructure, and organisation impact supply chain efficiency and, as a result, cost. Productivity is defined as the output as an input function; and it is a measure of efficiency in terms of resource usage. The three primary output dimensions of organisational success are summarised in effectiveness, efficiency, and participant satisfaction, which are all measures of performance. Effectiveness refers to achieving explicit or implicit objectives, whereas efficiency denotes the output-to-input or benefit-to-cost ratio. The overall efficiency of a port is determined by the ratio of time, cost, and capacity, among other factors.

Port competitiveness, export trade competition, and import price of products affect efficiency. In case of ports' inefficiency, freight and handling costs rise, contributing to higher export and import prices. Exporters cut their profit margins to survive in competitive marketplaces. Inefficiency leads to underutilization of resources, decreased output, and longer ship turnaround times, all of which raise the cost (Begum, 2013).

Because shipping companies deal with a large amount of data, information systems like ERP systems are required to collect, analyse, and use this data in order to obtain useful information for decision-making and to facilitate transportation procedures amongst different market participants (United Nations Conference on Trade and Development UNCTAD, 2004). Since the introduction of EDI systems in the mid-1980s, ports have applied a number of innovative information and communication technologies. Various web-based technologies enabled cheaper data submission via the Internet. Furthermore, radio frequency identification (RFID), an automatic identification technology (auto-ID) that identifies an object by wireless transmission utilising radio waves, which was adopted by ports years ago. Bar code, optical character reader, and biometric technology are additional examples of other auto ID systems (Talley, 2009).

Shipping IT business applications represented in online ship registration and chartering, electronic supply procurement, online reservation and e-payment systems, tracing and tracking, virtual deal rooms for document exchanges and processing, online publishing, and so on (United Nations Conference on Trade and Development UNCTAD, 2004). Customers can also get real-time tracking and tracing of cargo distribution and inventory levels, online documentation and payment services, and information about customs clearance and administrative procedures from Modern Logistics. As cargo information becomes more standardised and interchangeable, it helps to facilitate trade by facilitating more efficient customs procedures. The most significant component in improving port is technical efficiency (Merk and Dang, 2012). ERP systems lower costs, saves time, and eliminates human errors while also improving traceability, immediacy, and security. These benefits are highly valued by shipping businesses, and they are driving

ports toward paperless administration and electronic data management (Brox, 2014).

Logistics and ERP system implementation has proven that logistics practises and ERP systems have a favourable impact on corporate performance and competitive advantage (Ince, 2013). Accordingly, the effective installation of ERP is dependent on five key factors: creating business cases, configuring systems and users, stabilising for normal operation and maintenance, and improving (Kandananond, 2014). However, some past research hasn't looked at the impact of the IoT (Internet of Things) application trend on the adoption of the ERP system framework to support the marine transportation system.

3- Research Methodology

Here the problem arises in the presence of a technological gap, and the researchers are asking a question to find a solution to the problem, namely: What is the impact of re-engineering administrative processes by application on Egyptian ports as a service sector; in specific the influence of the use of enterprise resource planning information systems on the conduction of operations in ports?

3-1 Hypothesis

The use of enterprise resource planning information systems positively affects the flow of operations in the port, the possibility of using enterprise resource planning information systems as a mean of port reengineering.

The independent variable: factors affecting the success of enterprise resource planning information systems, which are summarised in the following:

- Senior management support;
- Human potential;
- Technical capabilities;
- Financial capabilities;
- The possibility of re-engineering.

Dependent variable: the use of enterprise resource planning information systems (the adoption of the ERP system).

3-1-1 Sub Hypotheses

Ha1: *Senior management support has a strong and positive relationship with the decision to adopt ERP.*

Ha2: *Human capabilities using information systems have a strong and positive relationship with the decision to adopt ERP.*

Ha3: *Technical capabilities have a strong and positive relationship with the decision to adopt ERP.*

Ha4: *Financial capabilities have a strong and negative relationship with the decision to adopt ERP.*

Ha5: *The possibility of reengineering process of the ports' operations and its compatibility with the adoption of enterprise resource planning information systems would be high.*

Ha6: *The enterprise resources planning information system would be suitable and compatible with the operation of the Egyptian ports*.

3-1-2 Formulating sub-questions

- What is the impact of senior management support on the success of enterprise resource planning information systems?
- What is the influence of human capabilities on the success of enterprise resource plan ing information systems?
- What is the effect of technical capabilities on the success of enterprise resource planning information systems?
- What is the consequence of financial capabilities on the organisation's information systems?
- What is the result of business process reengineering on the success of enterprise resource planning information systems?
- What is the extent of compatibility between the proposed utilisation of enterprise resource planning information systems with port operations?

4- Discussion

The following deals with the description and statistical analysis of the results of the responses of the survey participants presenting the primary statistical indicators for their answers through the arithmetic averages, and the standard deviations for the study variables, and

consequently testing the study's hypotheses, and the statistical significance of each of them.

The description of the study sample, whose opinions were surveyed, depended on a set of demographic variables, which are: (age, gender, educational qualification, number of training courses, and years of service).

Table (1) below shows the statistical description of the sample participants in accordance to their personal characteristics and traits.

Table 1: the distribution of the sample according to personal data (n = 106)

%	Number	Personal Data
		Gender
84.9	90	Male
15.1	16	Female
		Age in Years
3.8	4	25 and less
20.8	22	35 - 26
34.9	37	45 - 36
40.6	43	46 and more
		Education Level
48.1	51	Diploma and less
44.3	47	Bachelor
7.5	8	Master
		Number of Workshops the participant attended
15.1	16	Not once
16.0	17	One time
26.4	28	Two times
42.5	45	Three times and more
		Work Experience
0.0	0	3 years and less
2.8	3	6 - 4
12.3	13	9 - 7
18.9	20	12 - 10
66.0	70	More than 12 years

Table (1) indicates that 84.9% of the sample participants are males, and 15.1% are females, and this is attributed to the majority of male managers and heads of departments. 40.6% of the study sample participants are from the age group 46 years and over, and 3.8% are

from the age group 25 and less, which is recognised to the high age group of 46 and over.

Most of the study sample participants are from diploma holders and below, representing 48.1%. 42.5% of the study sample took three or more training courses. 66% of the study sample participants have 12 years or more of work experience.

The arithmetic means and standard deviations were extracted to identify the responses of the study sample participants to the role of using enterprise resource systems as a means of re-engineering the operations of the Egyptian seaports.

5- Factors Affecting the Success of Enterprise Resource Systems

This study included a set of factors that are considered influential in the success of enterprise resource systems, and these factors consist of: support of senior management, human capabilities, technical capabilities, financial capabilities, reengineering capabilities. The following is a presentation of the descriptive statistics related to each of these factors.

5-1 Senior Management Support

Table 2: Arithmetic means, standard deviations and percentages of the mean for the first axis: senior management support (n = 106)

Rank	Rating	% Average	SD	Mean	Senior Management Support	S.N
3	Medium	64.60	1.38	3.23	The senior management is keen to keep abreast of technical developments in the field of computer	1
7	Medium	59.60	1.51	2.98	There is continuous oversight by the senior management to ensure the electronic conduct of business	2
5	Medium	61.20	1.38	3.06	The senior management uses consulting bodies and experts to provide advice in the field of application of enterprise resource systems	3
1	High	77.00	1.34	3.85	The senior management reinforces the presence of a computer department in the institution	4

2	Medium	66.80	1.36	3.34	The senior management of the organization carries the policy of implementing systems and enterprise resources	5
4	Medium	63.80	1.44	3.19	Senior management provides specialized departments for electronic applications	6
6	Medium	61.00	1.38	3.05	Senior management supports the plan and a time strategy to implement the enterprise resource systems application	7
	Medium	64.80	1.19	3.24	Total	

It is obvious from the previous table that the arithmetic average of the axis of senior management support ranged between (3.85, 2.98), where the axis got a total arithmetic average of (3.24) and the percentage of the average (64.8), and statement number (4) got the highest arithmetic average, where it reached (3.85) with a mean percentage (77), and with a standard deviation (1.34), which is of a high level, and the statement states the following: (The senior management reinforces the presence of a computer department in the institution).

On the other hand, statement number (2) came with an arithmetic mean (2.98) and a percentage of the mean (59.6) and a standard deviation (1.51), representing the average level, as the paragraph stipulated the following: (There is continuous control by the senior management to ensure electronic business process).

This explains that the axis of senior management support was the average level from the point of view of the study sample members in the Canal Ports Company in Egypt.

5-2 Human Capabilities

Table 3: Arithmetic averages, standard deviations, and percentages of the mean for the second axis: human potential (n = 106)

Rank	Rating	% Average	SD	Mean	Human Capabilities	S.N
3	High	69.20	1.47	3.46	There are plans to train and qualify employees to use information technology	1
2	Very High	84.20	1.06	4.21	Users have the ability to interact with the computer well	2

1	Very High	85.60	1.09	4.28	The company has specialists in information technology and software development	3
4	Medium	64.60	1.34	3.23	There are qualified practitioners to train employees on information technology	4
	High	75.80	0.89	3.79	Total	

It can be seen from the preceding table that the arithmetic average of human capabilities ranged between (4.28, 3.23), where the axis scored a total arithmetic average (3.79) and the percentage of the average (75.8), and statement number (3) received the highest arithmetic average, which amounted to (4.28) and the percentage is (85.6) and with a standard deviation of (1.09), which is of a very high level, and the statement states the following (there are specialists in information technology and software development in the company).

On the other hand, and in the last place statement number (4) came with an arithmetic mean (3.23) and a mean percentage (64.6) and a standard deviation (1.34), which is an average level, as the statement stated the following: (There are practitioners qualified to train employees on information technology).

This explains that the human potential was of a high level from the point of view of the study sample participants in the Canal Ports Company in Egypt.

5-3 Technical Capabilities

Table 4: Arithmetic averages, standard deviations, and percentages of the mean for the third axis: technical capabilities (n = 106)

Rank	Rating	Average %	SD	Mean	Technical Capabilities	S.N
2	Medium	68.00	1.29	3.40	The latest computer devices are obtainable	1
5	Medium	62.00	1.26	3.10	Most recent Hardware and Software are supplied	2
3	Medium	64.20	1.34	3.21	Computer network access is provided to all offices	3
7	Medium	58.60	1.35	2.93	There is a connection	4

					between the main branch of the organisation and the other branches through computer networks	
4	Medium	62.40	1.38	3.12	There is an interface between the organization's network and the Internet	5
1	High	78.40	1.39	3.92	There is a website for the organisation on the Internet	6
6	Medium	61.60	1.58	3.08	Work email is used within the organization	7
	Medium	65.00	1.06	3.25	Total	

The table above shows that the arithmetic average of the technical capabilities ranged between (3.92, 2.93), where the axis got a total arithmetic average of (3.25) and the percentage of the average (65), and statement number (6) got the highest arithmetic average, which amounted to (3.92). With a mean percentage (78.4), and a standard deviation (1.39), which is of a high level, the statement states the following: (there is a website for the organisation on the Internet).

In the last place, statement number (4) came with a mean (2.93) and a percentage of the mean (58.6) and a standard deviation (1.35), which is average l, where the statement stated the following: (There is a connection between the main branch of the organisation and the other branches through computer networks).

This clarifies that the technical capabilities were of an average level from the perspective of the study sample participants in the Canal Ports Company.

5-4 Financial Capabilities

Table 5: Arithmetic averages, standard deviations, and percentages of the mean for the fourth axis: financial capabilities (n = 106)

Rank	Rating	Average %	SD	Mean	Financial Capabilities	S.N
2	High	70.20	1.51	3.51	The necessary support is available for the purchase of electronic technologies	**1**
3	High	68.20	1.40	3.41	Financial support is provided for the design and development of electronic	**2**

					programs	
1	High	81.80	1.26	4.09	Financial support is obtainable for hardware and software maintenance	**3**
4	Medium	62.0	1.34	3.10	Financial support is present for the use of qualified practitioners to train workers on the application of the electronic work mechanism	**4**
5	Medium	57.0	1.47	2.85	There exists an incentive system for the distinguished in the electronic field.	**5**
	Medium	67.80	1.18	3.39	Total	

It is clear from the Table above that the arithmetic average of the financial capabilities ranged between (4.09, 2.85), where the axis got a total arithmetic average of (3.39), with a percentage of the average (67.8), and statement number (3) got the highest arithmetic average, as it reached (4.09), the percentage of the mean (81.8), and with a standard deviation (1.26), which is of a high level, and the statement stipulated the following (the financial support needed to maintain hardware and software is available).

On the other hand, and in the last place, statement number (5) came with an arithmetic mean (2.85), a mean percentage (57), and a standard deviation (1.47), which is of the average level, as the statement stated the following: (There exists an incentive system for the distinguished in the electronic field) .

This explains that the financial capabilities were of the average level from the point of view of the study sample participants in the Canal Ports Company in Egypt.

5-5 Re-engineering

Table 6: Arithmetic averages, standard deviations, and percentages of the mean for the fifth axis: reengineering (n = 106)

Rank	Rating	% Average	SD	Mean	Re-engineering	S.N
2	High	75.40	1.21	3.77	Reframing a new thought for the company's operations activity	1
4	High	73.00	1.32	3.65	Radically redesigning the company's processes to achieve immediate improveements in performance metrics	2
1	High	75.80	1.22	3.79	There is recognition of the need to change the systems and methods in force in the company's operations systems	3
3	High	75.20	1.32	3.76	There is an understanding by the company's officials of the importance of this change in the current systems	4
6	High	71.60	1.26	3.58	It is expected that the various departments within the company will cooperate in implementing the proposed approach to re-engineering its operations	5
5	High	72.40	1.26	3.62	It is anticipated that the new systems for managing operations in the company will be prepared and designed	6
7	High	68.40	1.31	3.42	It is expected that the change in thought and practices will take place in reality and not only in the titles of the incumbents	7
	High	73.20	1.00	3.66	Total	

The table before demonstrates that the arithmetic mean of the possibility of applying process re-engineering ranged between (3.79, 3.42), where the axis got a total arithmetic mean (3.66) and the percentage of the mean (73.2), and statement number (3) got the highest arithmetic average where It reached (3.79) and the average percentage is (75.8), with a standard deviation (1.22), which is of a high level, and the statement stipulated the following: (There is recognition of the need to change the systems and methods in force in the company's operations systems).

On the other hand, and in the last place, statement number (7) came with an arithmetic mean (3.42) and a mean percentage (68.4) and a

standard deviation (1.31), which is of a high level, as the statement stated the following: (It is expected that the change in thought and practices will take place in reality and not only in the titles of the incumbents).

This explains that the possibility of applying process re-engineering was high from the point of view of the study sample participants in the Canal Ports Company.

5-6 ERP Adoption

Table 7: Arithmetic averages, standard deviations, and average percentages for Sixth Axis: Use of Enterprise Resource Planning Information Systems (ERP Adoption) (n= 106)

Rank	Rating	% Average	SD	Mean	Use of enterprise resource planning information systems	S.N
7	High	74.80	1.16	3.74	The company's technology unit provides timely solutions to the problems facing the ERP system	1
3	High	76.40	1.08	3.82	It is expected to restructure the operations carried out by the company, in line with the requirements of development	2
5	High	75.60	1.12	3.78	It is anticipated that the application of ERP contributes to improving the performance of the company	3
7	High	74.80	1.12	3.74	The implementation of ERP is expected to increase the efficiency of the company	4
9	High	74.40	1.11	3.72	Information in the ERP system helps in decision making	5
6	High	75.20	1.12	3.76	ERP system is flexible that meets all the information inside the company	6
1	High	78.40	1.15	3.92	The ERP system contributes to enhancing the administrative employees' ability to control and reduce costs	7
4	High	75.80	1.13	3.79	It is easy to link the ERP system with other information systems within the company, which leads to increased effectiveness	8
2	High	78.00	1.15	3.90	Providing full support to system designers and suppliers to the company, financially and morally	9
	High	76.00	1.01	3.80	Total	

It can be recognised from the earlier table that the arithmetic average of the axis, the use of organisational information systems, ranged between (3.92, 3.72), where the axis got a total arithmetic average of (3.80) and the percentage of the average (76), and statement number (7) got the

highest arithmetic average, where It reached (3.92) with an average percentage of (78.4), and a standard deviation (1.15), which is of a high level, and the paragraph stated the following: (The ERP system contributes to improving the administrative employees' ability to control and reduce costs).

On the other hand, and in the last place, statement number (5) came with an arithmetic mean (3.72) and a percentage of the mean (74.4) and a standard deviation (1.11), which is of a high level, as the statement stated the following: (The information in the ERP system helps in decision-making).

This explains that the heading towards the use of enterprise resource planning information systems was relatively high from the perspective of the study sample participants in the Canal Ports Company.

The coming table illustrates the relationship of all axes and its impact when using ERP information systems.

Table 8: The correlation between the axes: (n = 106)

ERP Adoption	Re-engineering	Technical Capabilities	Senior Management Support	Human Capabilities	Financial Capabilities	Axes
					1	Financial Capabilities
				1	**0.626	Human Capabilities
			1	**0.647	**0.703	Senior Management Support)
		1	**0.734	**0.652	**0.683	Technical Capabilities
	1	**0.689	**0.645	**0.600	**0.621	Re-engineering
1	**0.603	**0.655	**0.638	**0.490	**0.662	ERP Adoption

It is noted from the preceding table that all axes are affected when using enterprise resources planning information systems, where there exists a direct correlation function between the financial capabilities and the use of ERP information systems and the Pearson correlation factor = 0.662 and it was a function at the level of 1 per cent and this indicates a strong direct correlation, and there is a direct correlation function between the human capabilities and the use of ERP information

systems and Pearson's correlation factor = 0.490 and it was a function at the level of 1 per cent, and this indicates an average direct correlation.

While it was found that there is a strong direct and significant correlation between the support of senior management and technical capabilities and re-engineering with the use of ERP information systems. This leads to the outcome that all the axes, with their assumptions, proved to be affected by the use of the organisation's ERP information systems.

The next figures show the correlation between the axes with the use of ERP information systems.

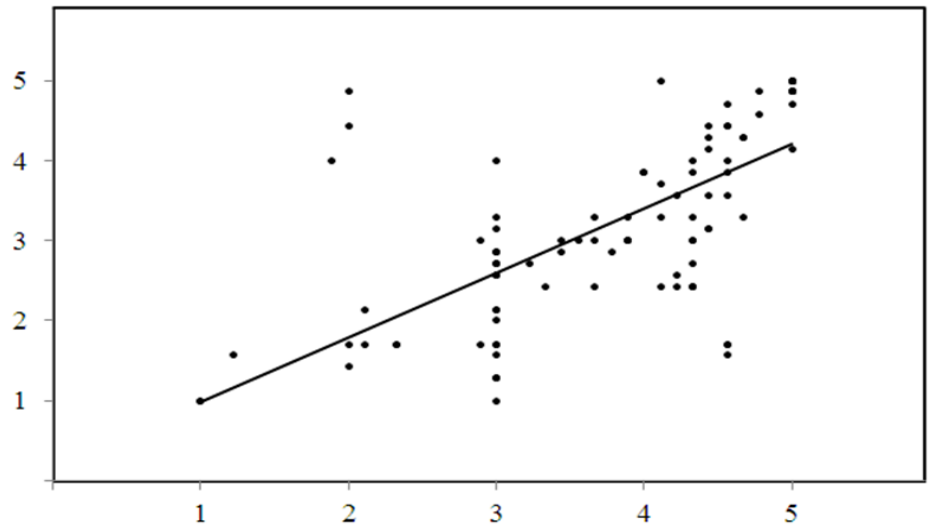

Figure 1: The relationship between the use of ERP information systems and the senior management support

The previous figure shows that there is a significant correlation between the support of the senior management and the ERP information systems that is the higher the support of the senior management, the higher the impact of the ERP information systems.

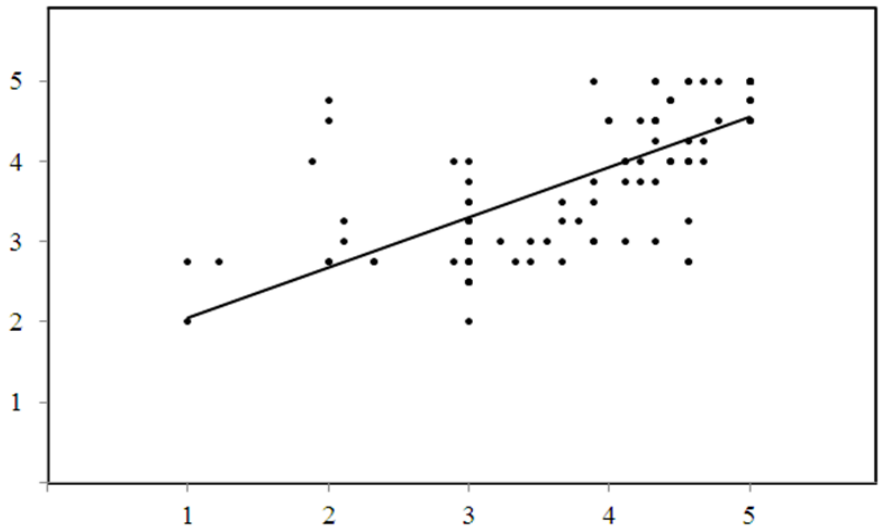

Figure 2: The relationship between the use of ERP information systems and human capabilities

Figure above shows that there is a significant correlation between human capabilities and ERP information systems, that is, the higher the capabilities, the higher the impact of ERP information systems.

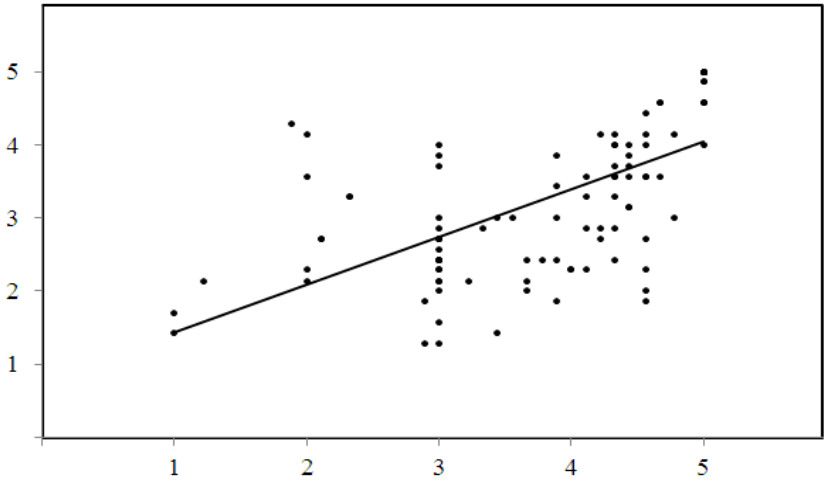

Figure 3: The relationship between the use of ERP information systems and technical capabilities

As can be shown from the prior figure there is a significant correlation between the technical capabilities and the ERP information systems

that is the higher the technical capabilities, the higher the impact of the ERP information systems.

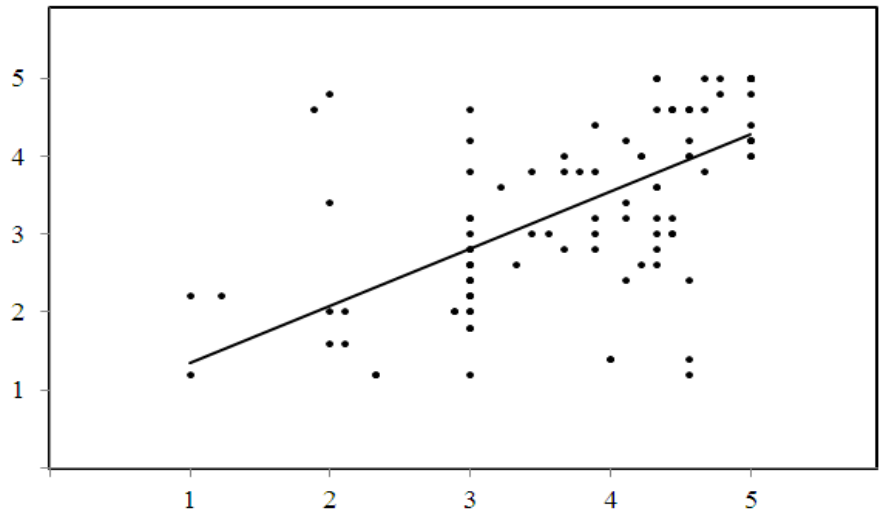

Figure 4: The relationship between the use of ERP information systems and financial capabilities

The above figure describes that the relationship between the use of ERP information systems and financial capabilities. It shows that there is a significant correlation between financial capabilities and ERP information systems, that is, the higher the financial capabilities, the higher the impact of ERP information systems.

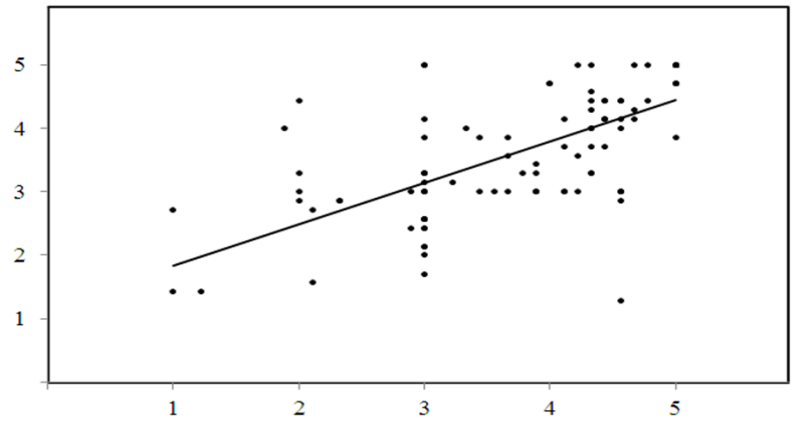

Figure 5: The relationship between the use of ERP information systems and re-engineering process of operations

The aforementioned figure displays that there is a significant correlation between reengineering and ERP information systems that is the higher the reengineering process of operations, the higher the impact of the ERP information systems.

Table 9: Linear regression analysis of the factors affecting the success of ERP information systems

T Test		Equation Constant	R^2	F Test		Axes
T value	Beta Coefficient			Significance	F Value	
*2.145	0.161	0.525	0.622	Significant	**32.847	Financial Capabilities
*2.495	0.285					Human Capabilities
1.326	0.119					Senior Management Support
0.978	0.086					Technical Capabilities
**3.001	0.266					Re-engineering

The above table exemplifies the linear regression equation (interaction of factors). It is observed from the table that there is an effect between the axes and the use of ERP information systems, where it is clear that the moral level of all axes is good and the percentage of achievement in the future is 0.622, as the ranking of the strong in influence when using ERP information systems was re-engineering process in the first place, followed by human capabilities and then followed financial capabilities, and the two axes (senior management support and technical capabilities) have equal influence.

This explains the interaction of factors with ERP information systems, where the assumed hypothesis is actually achievable by 62%, and it is considered statistically acceptable.

6- Conclusion

The researchers hope that the results of this study will lead to a set of important decisions for the Canal Ports Company in particular and for all companies in general. Through the following points, the findings of this study are presented.

The first hypothesis is that the support of senior management has a strong and positive relationship with the decision to adopt ERP. It was found from the questionnaire that there is a strong direct correlation between the support of senior management with the decision to adopt ERP, and the graph proved that the higher the management support, the stronger the decision to adopt ERP.

The second hypothesis is that the human capabilities of using information systems have a strong and positive relationship with the decision to adopt enterprise resource planning, where it was found from the questionnaire that there is a moderate direct correlation between human capabilities and the decision to adopt enterprise resource planning.

The third hypothesis is that the technical capabilities have a strong and positive relationship with the decision to adopt ERP, as it was found from the questionnaire that there is a strong direct correlation between the technical capabilities and the decision to adopt ERP.

The fourth hypothesis is that financial capabilities have a strong and negative relationship with the decision to adopt enterprise resource planning, as it was found from the questionnaire that there is a strong correlation between financial capabilities and the decision to adopt enterprise resource planning, and it is considered to be the highest in terms of impact.

The fifth hypothesis is the extent of the possibility of reengineering and compatibility between the proposed enterprise resource planning information systems and their suitability for port operations, as it was found from the questionnaire that there is a strong correlation between reengineering and the decision to adopt enterprise resource planning.

It is well noted that all the previous hypotheses have affected the decision to adopt information systems for institutions, from medium to the highest impact strength.

The sixth hypothesis is the extent of compatibility between the proposed use of enterprise resource planning information systems with port operations, as it was found from the questionnaire that the model was actually able to achieve 62% and it is considered statistically

acceptable, and it is clear that the moral level of all axes is good, also the axis (reengineering factor) has higher and stronger Impact on the decision to adopt enterprise resource planning.

In ports, ERP systems increase command flows and supply chain management, resulting in better asset utilisation and productivity. In a wide range of uses, ERP systems had amplifying effects on sea transportation. Its usage improved supply chain integration by allowing for greater control over freight movements, security, and cargo concerns as endorsed by Rodrigue in 2010. Port economic operations in the realm of logistics IT innovations have been spurred by attaining economies of scale, merging distinct processes, and through a quick integration of functions and information in global supply chains. The potential of the whole supply chain to derive profit for shipping companies and logistics service operators along the freight handling process has increased the port's value added as revealed by Brox in 2014. Port competitive advantage is derived from location, infrastructure, transport capacity, port integration into logistics chains, effective and efficient port operations, and competitive labour costs and skills, updated and adequate equipment and technology, information systems, and port coordination, all of which help to reduce uncertainty, transaction, and transportation costs (Brox, 2014).

7- Recommendations

From the above, the use of ERP systems lowers transportation costs, increases international trade, and improves economic development as a result of the following improvements in port performance: secure information transmission between port actors, reduced waiting time, optimal use of port space and resources, fast loading and unloading speeds, real-time data exchange, operational monitoring and control in real time, management reporting and decision support, automated information registration, paperless working environment, transportation mode coordination, effective use of existing resources, improved work instructions and yard allocation, better integration of logistical systems, and efficient cargo handling management.

The following represents recommendations that ports can adopt in order to eliminate bottlenecks in system development and to assure

system efficiency; a well-established information technology infrastructure prior to the system's adoption to prevent system failures, bringing business procedures in the ports up to date so that they are consistent with the system, improving port equipment so that it can work in tandem with the new system, enhancing port infrastructure and supporting services, reinforcing the support of the institution, collaborating between members of the private and the public sectors of the community, and upgrading port personnel technical skills and language to better understand new modern technologies and accordingly being capable of the use of ERP systems in an efficient way.

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تأثير استخدام أنظمة تخطيط موارد المؤسسات في عمليات الموانئ المصرية كقطاع خدمي

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ملخص البحث باللغة العربية

تعتبر الموانئ المصرية أصول اقتصادية رئيسية، وقد يؤدي نقص قدرة الموانئ والخدمات إلى خنق النمو الاقتصادي. تعمل المنافذ الذكية التي تستخدم التبادل الذكي للمعلومات على تحسين جودة الميناء وكفاءته من خلال الرقمية والأوتوماتية ، مما يزيد من الوظيفة الاقتصادية للموانئ لينتج عنه تنمية اقتصادية أعلى. هدفت هذه الورقة البحثية إلى التعرف على مدى تأثير دور استخدام نظم معلومات تخطيط موارد المؤسسات كوسيلة لإعادة هندسة (إعادة هندسة العمليات) للموانئ المصرية كقطاع خدمي، والعوامل التي تؤثر على النجاح. يتم التحقيق في دور استخدام نظم معلومات تخطيط موارد المؤسسة. ويفترض أن يكون هذه العوامل هي دعم الإدارة العليا، والإمكانات البشرية، والقدرات الفنية، والقدرات المالية، وعملية إعادة هندسة العمليات. توضح النتائج أنه يجب أن يكون هناك توافق كبير بين العوامل السابقة واستخدام نظم معلومات تخطيط موارد المؤسسة لتخطيط موارد المؤسسات (ERP) مع اختتام بعض التوصيات لتنفيذها.

الكلمات الدالة: تخطيط موارد المؤسسات نظم تخطيط موارد المؤسسات ،إعادة الهندسة ،الإدارة العليا

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