The Operational Benefits of Enterprise Resource Planning (ERP): A Case Study on Food Processing and Manufacturing Companies in Jordan[1]

Dr. Ziad Moh'd. Ali Smadi
Associate Professor
Department of Business Administration
Faculty of Business & Finance
Al-al-Bayt University
Al-Mafraq-Jordan

Abstract

Enterprise resources planning (ERP) systems are very vital tools in today's world competitive business environment. This research study presents the importance of the operational benefits of enterprise resource planning (ERP) in food processing and manufacturing companies in Jordan. A review of recent research studies on ERP systems in the relevant literature was carried out. The researcher tried to identify the main benefits of ERP systems implementation in cost reduction, production cycling, continuous improvement, data quality improvement and customers' service improvement. A questionnaire was designed and developed with the help of recent research studies related to ERP implementation, the questionnaires was distributed to officials who occupy managerial positions in those processing and manufacturing companies. The study result revealed that the implementation of ERP helped food-manufacturing companies mostly in reducing the communication cost, meeting cost, delivery cost and traveling cost. It also improves the production process, as well as the stock procurement process, so it reduces production cycling. In addition, ERP leads to restructuring of job functions, reducing of order cancellation, increasing of employee satisfaction, benefiting from continuous improvement, reducing risk of price miscalculation, Improving of data accuracy, thereby improving data quality and improving customer satisfaction by enhancing customer services. The result revealed that many manufacturing companies have enjoyed numerous benefits from the systems having been brought to them, while some others have faced challenges in the implementation of ERP as benefits were not noticed immediately, but can be noticed in the future. The researcher noticed that implementation of ERP is not only successful when designed for large organizations. Small- and medium- sized organization can also have the same benefits from ERP implementation.

Keywords: Operational benefits, Enterprise Resource Planning (ERP), Food processing and manufacturing companies, Jordan

Introduction

Globalization has stressed the need to raise the level of firms' competitiveness in order to compete worldwide. This challenge leads to the expansion of markets and increases the pressure on competitors to fulfill customers' expectations in order to win them, by providing them fair prices, higher/(right) quality in products or services and more reliable delivery dates. As a result, contemporary tools have to be intensely disseminated, especially in today's business environments to lower the total production cost in the entire supply chain, through reducing inventories. The larger scope of ERP systems allows the tracking of orders and other important planning and control information throughout the entire company from procurement to ultimate customer delivery. Many ERP systems are capable of allowing managers to share data between firms, which means that managers can potentially have visibility across the complete span of the supply chain share.

[1] "This work has been carried out during sabbatical leave granted to the author (Ziad Moh'd Ali Smadi) from Al Al-Bayt University during the academic year 2014-2015".

The primary difference between an ERP system and its predecessors is that ERP spans the whole organization and business functional processes and not only the production related operations. Therefore, the large scope of ERP systems allows the tracking of orders and other important planning and control information throughout the entire company from procurement to ultimate customer delivery. The ERP system is capable of allowing managers to share data between firms, so managers can potentially have visibility across the complete span of the supply chain (J.R. Tony Arnold, Stephen N. Chapman and Lloyd M. Clive, 2008). Therefore, organizations must continue to change their processes to stay relevant and productive, so that there is no exception in this matter. For small-or medium-sized enterprises, adapting new technologies is no longer an options but a requirement in this highly competitive world. That is why this research was concentrated on small-and medium-sized food processing and manufacturing companies in Jordan, to prove that the application of ERP can be successful, not only in large-sized service /manufacturing firms, but also in small-and medium-sized firms. In a research conducted by Yajun Zeng, Yujie Lu and Miroslaw J. Skibniewski (2012), it was introduced ERP systems that are designed to achieve seamless integration of all of the information flowing through an organization, by integrating information-based processes within and across different functional departments, such as those of accounting, finance, human resources, manufacturing and distribution. They also help connect the organization to its customers and suppliers, thus enabling the integration of organizations beyond their boundaries.

2. Review of Related Literature

The paper of Shari Shang and Peter B. Seddon (2002) focused on the benefits that organizations may achieve from their investments in enterprise systems (ES). It proposed an ES benefit framework for summarizing benefits in the years after ES implementation. Based on an analysis of the features of enterprise systems, the literature on information technology (IT) value, data from 233 enterprise system vendor-reported stories published on the Web and interviews with managers of 34 organizations using ES, the framework provided a detailed list of benefits that have been acquired through ES implementation. This list of benefits is arranged into five benefit dimensions: operational, managerial, strategic, IT infrastructure and organizational, and illustrated using perceived net benefit flow (PNBF) graphs. In a detailed example, the paper shows how the framework has been applied to the identification of benefits in a longitudinal case study on four organizations. Al-Fawaz, K., Al-Salti, Z. and, Eldabi, T. (2008) attempted to identify the main benefits of ERP systems, their drawbacks, as well as the critical success factors for their implementation. Their findings revealed that despite some organizations have faced challenges undertaking ERP implementation, many others have enjoyed the benefits that the systems have brought to them. ERP systems facilitate the smooth flow of common functional information and practices across the entire organization, improve the performance of the supply chain and reduce the cycle time. However, ERP system implementation needs top management support with appropriate business plan and vision, re-engineering of business processes, education and training of employees.

The main purpose of Ahmed Elragal and Moutaz Haddara (2012) was to study the development of ERP systems and other related areas to construct the mainstream literature, by analyzing the literature and development history of ERP that help reach the key constructs of ERP systems. They clarified that through the years, ERP systems have evolved and advanced since the emergence of material requirements planning (MRP) and manufacturing resource planning (MRPII) systems.

Organizations cannot gain the full benefits of such complex systems and the risk of failure might be at a high level. However, Yajun Zeng, Yujie Lu and Miroslaw J. Skibniewski (2012). Considered Enterprise Resource Planning (ERP) systems as wide information system packages that integrate information and information-based processes within and across functional areas in an organization. Many organizations have adopted ERP and accepted it as a de facto industry standard for the replacement of legacy systems. Their research paper analyzes and presents the costs and benefits of ERP systems for project-based industries, which have lagged behind other major industries in adopting ERP systems due to their project-centric nature and the high stakes involved in ERP implementation. They identified the challenges during the process of ERP implementation as part of the efforts to understand the costs implied in an ERP system.

Ivo De Loo1 et al. (2011) tried to assess the impact of ERP implementation on the development of organizational benefits, as described by Shang and Seddon (2002) and Eckartz et al. (2009). They assessed this impact for Dutch small-and medium-sized enterprises, using a small but unique dataset.

Several types of organizational benefits (concerning, among others, employee morale and the creation of a common vision among employees) are compared before and after the introduction of an ERP system in a variety

of organizations. They took into account a three-year period, correcting/controlling for several possibly influential factors in the process (like organizational size, financial health and sectoral differences). They concluded that organizational benefits did not increase significantly in organizations that implemented an ERP system in the past three years compared to organizations that did not implement such a system. They also concluded that organizations that recently implemented an ERP system did not have significantly lower organizational benefits three years ago compared to organizations that did not implement such a system. Albeit limited to Dutch SMEs, these results contradict with some of the views expressed in ERP related literature on the subject.

The research of Nita Arryani Sari, Achmad Nizar Hidayanto and Putu Wuri Handayani (2012) aimed at formulating a catalog of ERP implementation benefits to measure ERP implementation success in organizations. The benefits catalog was developed by using the five dimensions from Shang and Seddon's ERP benefits framework and 73 sub-categories of dimensions from Ranti's Generic IS/IT value. Initiated in an agricultural company in Indonesia, the research identified that ERP brings benefits to the company in five dimensions: operational, managerial, strategic, IT infrastructure and organizational with a total of 25 categories and 41 subcategories accepted. According to a research of Boo Young Chung et al. (2008), ERP systems offer many benefits to the engineering–construction industry. Many construction firms recognize the benefits of ERP system implementation; however, they still hesitate to adopt these systems due to high cost, uncertainties and risks. Their study identified and analyzed critical factors that need to be considered to ensure successful ERP system implementation in the construction industry. First, this paper identifies the factors associated with the success and failure of ERP systems and provides indicators to evaluate the success of such systems. Then, the paper develops an information system success model to analyze the relationships between factors and success indicators. Finally, the paper provides recommendations for successful ERP systems based on the analysis. The derived success factors should help senior managers in construction firms in making better decisions.

Many related studies stress the need of using ERP systems in all manufacturing and service organizations. If a company wants to survive, it must adjust itself to the new competitive environments by providing goods or services at the right price in the right quantity and quality and at the right time and providing customers with maximum services exceeding their expectations. All this must be done at minimum cost. This must be done in order to gain and maintain customers and not to lose them. Therefore, companies must be able to cope with new innovation in producing goods or providing unique services. Business companies today face the challenges of increasing competition, expanding markets and rising customer expectations. This increases the pressure on companies to lower the total costs in the entire supply chain, shorten throughput times, drastically reduce inventories, expand product choice, provide more reliable delivery dates and better customer services, improve quality and efficiently coordinate global demand, supply and production. Elisabeth J. Umble , Ronald R. Haft and M. Michael Umble (2003) argued that corporation must upgrade their capability to generate and communicate timely and accurate information. To accomplish this objective, companies are increasingly turning to enterprise resource planning (ERP) systems. ERP provides two major benefits that do not exist in non-integrated departmental systems: (1) a unified enterprise view of the business that encompasses all functions and departments; and (2) an enterprise database where all business transactions are entered, recorded, processed, monitored and reported. This unified view increases the requirement for, and the extent of, interdepartmental cooperation and coordination and enables companies to achieve their objectives in increased communication and responsiveness to all stakeholders (C. Dillon, 1999).

3. Importance and Scope of ERP Systems

ERP system represents a very important business investment. Its scope is to help and assure competitiveness and fast response to customers' needs and increased productivity. Its success depends upon effective management and organizational changes by using advanced technology. It also requires a set of skills and knowledge. On the other hand, many companies fail to harness the full potential of ERP as planned and incur time and cost instead of increasing productivity and profitability. This research is designed to examine how far food processing and manufacturing companies in Jordan were successful in implementing ERP. These industries are of small and medium size.

As stated by Joseph R. Muscatello, Michael H. Small and Injazz J. (2003), these firms have limited resources and are less likely than their larger counterparts to survive or quickly overcome a failed implementation of an expensive ERP system. Therefore, it is extremely important to gather, analyze and disseminate information that

will help them choose appropriate ERP systems and then implement these projects successfully. In a research conducted by Elisabeth J. Umble et al.(2003),it was stated that enterprise resource planning (ERP) systems are highly complex information systems and that the implementation of these systems is a difficult and high-cost proposition that places tremendous demands on corporate time and resources. Many ERP implementations have been classified as failures, because they did not achieve the predetermined corporate goals. Their article identified success factors, software selection steps and implementation procedures critical to a successful implementation. Enterprise resource planning systems are a major investment.

Companies may invest between 50000$ and hundreds of millions of dollars in ERP software, using a variety of business justifications, including replacement of numerous legacy systems, reduction in cycle times from order to delivery and reduction in operation cost. On-line real time operational data that ERP systems provide enable managers to make better decisions and improve responsiveness to customer needs (Ross,Jeanne, Michael Vitale and Leslie Willcock. 2003). In a study by Lee, S., Arif, A. and Halpin, D. (2002), a simulation model to implement ERP in the material management was created. They implemented the model based on four distinct steps, which are: application integration, internal integration, external integration and automation. Their study showed that the durations of almost all of the activities involved in the material management process have successfully been reduced and even in many cases these activity durations have become eliminated. They stated in their study that an ERP system shortens procurement cycle by approximately 80%, through automating most of the repeating transactions and by reducing workers to perform the tasks.

Hereby, implementing of ERP systems in the material management area has measurable benefits in all other areas, which interface with the material management module (Lee et al., 2002), there is some evidence that organizations are satisfied with ERP. Based upon a sample of 117 firms in 17 countries, the Conference Board reports that 34% of the organizations were satisfied with ERP, 58% were somewhat satisfied, 7% were somewhat unsatisfied and only 1% were unsatisfied (McNurlin,2001). Robert J. et al. (2003) stated that ERP has come to mean many things over past several decades. Divergent applications by practitioners and academics, as well as by researchers in alternative fields of study, have allowed for both considerable proliferation of information on the topic and for a considerable amount of confusion regarding the meaning of the term. In reviewing ERP research, two distinct research streams emerge. The first focuses on the fundamental corporate capabilities driving ERP as a strategic concept. The second stream focuses on the details associated with implementing information systems and their relative success and cost. This paper briefly discusses these research streams stated above. Khaled Al-Fawaz et al. (2008) reported that enterprise resource planning systems, if implemented successfully, can bestow impressive strategic, operational and information-related benefits to the adopting firms. A failed implementation can often spell financial doom.

Currently, most of the information on failures and successes are based on reports on implementation in large manufacturing and service organizations. However, enterprise resource planning vendors are now steadily turning their marketing sights to small-and medium-sized manufacturers. The time is ripe for researchers to gather, analyze and disseminate information that will help these firms implement their projects successfully. Therefore, this research paper adopts a multiple study approach to investigate the implementation process in food manufacturing companies in Jordan, which are in small and midsize forms. The research focuses on implementation activities that foster successful installation and are developed using information gleaned from our field studies of research. Cookie et al. (2001), Holland et al. (1999) and Irani et al. (2001) have observed wide-scope possible benefits of enterprise systems, ranging from operational improvements through decision-making enhancement to support for strategic goals. However, these frameworks do not tell us how the dynamics of the benefit realization process are obtained. For effective management of the ES benefits, we would need to know when and how to measure these different types of benefits and how they are inter-related. Enterprise resource planning (ERP) systems attempt to integrate data and processes in organizations. Data is centrally stored in a single database. This database functions as a hub that stores, shares and circulates data from within the different departments and business functions. ERP systems are the most adopted information technology (IT) solutions in organizations Yajun Zeng et al. (2012) clearly proved that if ERP systems are successfully implemented, they can bring substantial benefits to organizations.

ERP systems have the potential to improve organizational effectiveness and productivity, by enabling the management to make informed decisions and enhancing the competitiveness of the organization in the marketplace. However, their implementation is characterized by large capital outlay, long is implementation

period, high complexity and proneness to failure. As early reported, the average implementation time of an ERP project was between 6 months and 2 years and the average cost was about US$ 1 million (PMP Research, 2001). This might keep many project-based companies away from adopting ERP systems due to their limited financial, technical and human resources, as well as due to the risks of success or failure.

4. *Research Problem*

Many manufacturing companies nowadays have put extra effort in their resource planning activities through structured means, which might help manufacturing firms in solving the problems of resource planning, thereby leading to improvements and to the attainment the objectives of these companies. Jordanian manufacturing companies are not immune to those problems and can have a similar approach to what is being practiced worldwide. Thus this study will try to find out the answer for the main research problem which is:
To what extent do manufacturing companies in Jordan adopt Enterprise Resources Planning (ERP) in their operations?

5. *Research Objectives*

The main objective of this study is to track the benefit realization along a system's lifespan. This requires an exploratory and descriptive method of analysis. Taking into consideration the research problem mentioned above, the research objectives are summarized as follows:

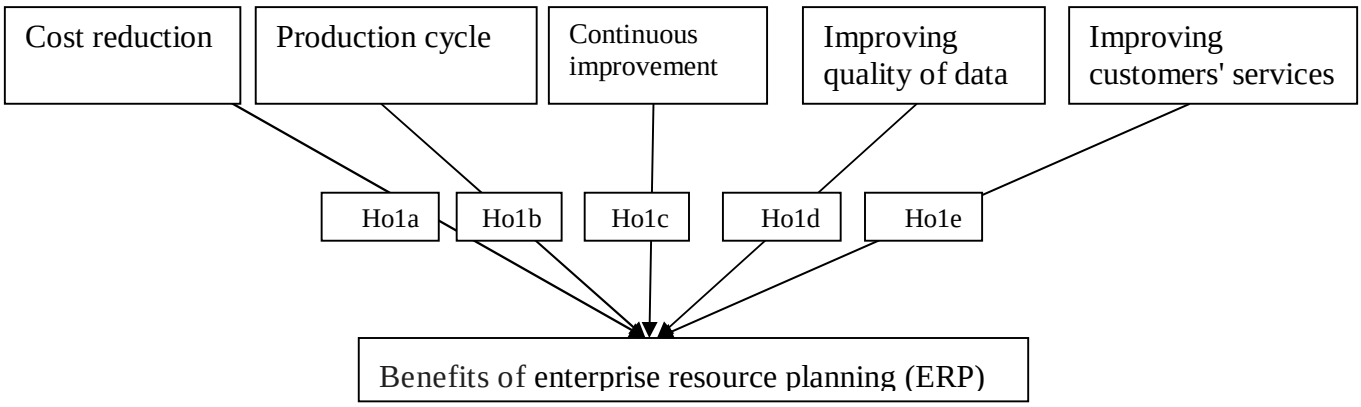
-To measure the extent of practice of the different Enterprise Resources Planning (ERP) operations, such as:
-Developing the ability to adopt enterprise resources planning (ERP).
-To know the benefits of adopting enterprise resources planning (ERP).
-To know to what extent Enterprise Resources Planning can help reduce the cost of operations.
-To know to what extent Enterprise Resources Planning can help reduce and improve production cycling.
-To know to what extent Enterprise Resources Planning (ERP) can help in improving operations (continuous improvement).
-To know to what extent Enterprise Resources Planning can help in improving the quality of data.
-To know to what extent Enterprise Resources Planning can help in generating the ability to strategically manage and improve customers' services.
-To provide understanding for the concept of Enterprise Resources Planning (ERP) operations that may improve the Jordanian manufacturing environment context.

6. *Research Model and Hypotheses*

6.1 Research Model

The present study uses the following ERP benefits: [cost reduction, improving production cycle, continuous improvement, improving quality of data, improving customers' services]. The research model tested in this study is shown in Figure 1.

Fig. 1: Research model*



*This model was developed by the researcher through revising many researches and papers, especially: 1) Shari Shang and Peter B. Seddon., (2002)
2) Nita Arryani Sari, Achmad Nizar Hidayanto and Putu Wuri Handayani.(2012).

6.2 Research Hypotheses

The researcher is trying to investigate the ERP implementation successes in small-and medium-sized food processing and manufacturing companies in Jordan. The case-study method was used to develop conclusions about activities that lead to successful ERP implementation. The research model depicted in Fig. 1 shows the benefits of enterprise resources planning (ERP). Therefore, the study tested the following hypotheses:

The first main null hypothesis:

H01: The manufacturing companies do not benefit from implementations enterprise resource planning (ERP) at $\alpha \leq 0.05$

From the main hypothesis, the researcher derived the following sub-hypotheses:

H01a- The implementation of enterprise resource planning (ERP) by manufacturing companies does not lead to cost reduction at level $\alpha \leq 0.05$

H01b- Using enterprise resource planning (ERP) by manufacturing companies does not lead to improve production cycling /fasting of the operations at level $\alpha \leq 0.05$

H01c- Using enterprise resource planning (ERP) by manufacturing companies does not lead to continuous improvement at level $\alpha \leq 0.05$

H01d- Using enterprise resource planning (ERP) by manufacturing companies does not improve quality of data at level $\alpha \leq 0.05$

H01e- Using enterprise resource planning (ERP) by manufacturing companies does not improve customers' services at level $\alpha \leq 0.05$

The second main null hypothesis:

H02: There are no significant differences at $\alpha \leq 0.05$ among the answers of the respondents pertaining to their demographic profile.

7. *Research Methodology*

A descriptive and analytical method was used in this study. In addition, the researcher utilized the study instrument that was developed by Shari Shang and Peter B Seddon (2002) and Nita Arryani Sari, Achmad Nizar Hidayanto and Putu Wuri Handayani (2012). This was useful to measure the benefits of Enterprise Resources Planning (ERP) adoption by food processing and manufacturing companies in Jordan. The instrument was checked to know whether it will be suitable to the Jordanian industrial environment. The instrument consisted of the following parts:

The first part covers the demographic profile of the respondents.

The second part includes the different benefits of enterprise resources planning (ERP) adoption by manufacturing companies (cost reductions, reduce and improving production cycling, continuous improvement, improving quality of data and improving customers' services). Nominal scale was used to get the answers of the respondents to their demographic profile, while likert scale was used to allow respondents to rate their answers regarding the different benefits of enterprise resources planning (ERP) adoption by manufacturing companies ranged from highly agree (the highest) to highly disagree (the lowest).

7.1. Population and Sample of the Study

Simple random sampling technique was used in distributing questionnaires to different management level employees: managers, deputy managers, operations, quality, and technical managers in food manufacturing companies. The total numbers of these industries in Jordan are 405, out of them 86% are in Amman city and Zarqa city (Middle region in Jordan) and the rest 14% are at Al-Hassan industrial City and northern region in Jordan (Jordan Chamber of Industry, 2014). The questionnaires were distributed in the middle region only. The total number of industrial companies selected for the purpose of the study was (30) only, with (3) respondents for each industrial company, which were of small and medium size. Out of 90 questionnaires distributed by the researcher, 78 were received and only 76 were valid for analysis after omitting two questionnaires, because they were not valid for analysis.

7.2. Data Collection Method and Instruments

A secondary source of data represented by references and published researches in the field of enterprise resource planning (ERP) contributed to the development of the theoretical framework that allowed the researcher to gain deep understanding of the topic.

In addition, primary data was obtained through the main instrument of the study by distributing questionnaires to different management levels. The questionnaire was designed using a Likert scale ranging from highly agrees to highly disagree. For discussion and interpretation of the results of the research, the researcher relied on computing the range through the following equation:

Range= (highest average value- lowest average value) ÷ (number of levels)

= (5-1) ÷ (3) =1.33;
1.33+1=2.33

Then, the low average response rate will be in the range from: (1to less than 2.33).
The medium average response rate will be in the range from (2.33 to less than 3.66), calculated as such (2.33+1.33=3.66)
The high average response rate will be assigned to responses that score more than 3.66 (from 3.66 to 5.00).

7.3. Statistical Treatment

Several statistical techniques were applied in this study, such as:
1. Descriptive analysis (averages and standard deviations of the answered questionnaires of the study).
2.One sample t- test used to test the main hypotheses and sub-hypotheses.
3. One-way ANOVA was helpful to test the second main hypothesis regarding gender, education, position, experience and activities.
4. Pearson correlation was used to measure the inter-correlation between the factors of operational benefits of enterprise resource planning (ERP) in food processing and manufacturing companies in Jordan.

8. *Limitations of the Study*

The research has the following limitations:

The research study investigated only the operational benefits of ERP implementation. It did not show the costs of (ERP) implementation.
The research did not show ERP software applications and how to access and use ERP software. In addition, the research was implemented only on small- and medium- sized food processing and manufacturing companies in Jordan.

9. *Data Presentation and Analysis*

Data was collected and then analyzed by using SPSS (Statistical Package for Social Sciences), in order to view perspective, and analyze the interaction between the systems and their users, so that the researcher can examine and analyze the operational benefits of enterprise resource planning (ERP) implementation.
First: The researcher analyzed the biographical data of the respondents. The distribution of the study sample is shown in Table 1 below.

Table 1: Distribution of the study sample

Variable	**Category**	**Frequency**	**Percentage%**
Gender	Male	60	78.9
	Female	16	21.1
Managerial category	General manager	4	5.3
	Deputy manager	20	26.3
	Operation manager	20	26.3
	Quality manager	16	21.1
	Technical manager	16	21.1
Age of industrial company	Less than 4years	24	31.6
	From 4 to less than 8 years	40	52.6
	8 years and above	12	15.8
The company's target markets	Local market	48	63.2
	International market	8	10.5
	Local and international markets	20	26.3
Size of industrial company	Medium	8	44.44
	Small	10	55.56
No. of employees	Less than 10	0	0
	10 to less than 20	30	39.47
	20 to less than 40	24	31.58
	40 and above	22	28.95
	Total	**76**	**100%**

Table 1 shows that most of the study respondents were males with a percentage of (78.9%) and this is probably due to the nature of the job that is dominated by males, because working at these industries depends mostly on physical muscular forces.

The table also shows that most respondents were either deputy mangers or operation managers. 5.3% of the study sample who could be met were general managers because they were either traveling outside or busy. Most of the industrial companies were newly established (4 - 8 years) back. The local market was drowning with imported food product from international markets. Therefore, industries of this type find it difficult to compete with these international products. It is due to this reason that most of food industries that took part in the study were depending on the local market 63.2% with only 10.5% dealing with the international market. These industries were small- sized 55.56% and medium-sized with a 44.44%. The questionnaires were distributed equally about two respondents from each of these types. The total number of respondents was 76, most of whom were employed at manufacturing companies with 10 to less than 20 employees (39.47%). Such companies are considered of a small size.

Second: Reliability Test

Table 2 below shows the internal consistency of ERP for all factors that test the implementation of ERP.

Table 2: The internal consistency of ERP

Factors of Operational Benefits of Enterprise Resource Planning (ERP)	No. of Cases	No. of Items	Alpha
The implementation of ERP led to reduce operational cost (cost reduction).	76	12	0.711
The implementation of ERP led to reduce and improve the production cycling.	76	7	0.6316
The implementation of ERP led to continuous improvement.	76	4	0.7154
The implementation of ERP led to the Improvement of data quality	76	4	0.6402
The implementation of ERP led to improvement of customers' services	76	4	0.7004
Reliability for all	.7545		

Table 2 shows the values of internal consistency of coefficients for all factors of operational benefits of enterprise resource planning (ERP). The result was 75.45%, which is acceptable, since it is more than the minimum required percentage of 60% for social science research (Cronbach, 1951).

10. Resolving the Research Problem: To what extent do the manufacturing companies adopt Enterprise Resources Planning (ERP) operations?

To answer this question, the following null hypothesis was designed**:**

H01: The manufacturing companies do not benefit from enterprise resource planning

To find an answer to the question the sum of average means for all variables was calculated as shown in Table 3 below, that presents the results in detail for all factors (arithmetic means and standard deviations) in order to know which factor has the highest mean.

Table 3: Descriptive Statistics for all variables of ERP practice at food manufacturing companies.

Factors of Operational Benefits of Enterprise Resource Planning (ERP)	**No. of Cases**	**Mean**	**Std. Error**	**Std. Deviation**	**rank**
1- The implementation of ERP led to reduce the operational costs (cost reduction).	76	3.1711	0.0479	0.41764	5
2- The implementation of ERP led to reduce and improve the production cycling	76	3.3233	0.0417	0.36393	3
3- The implementation of ERP led to continuous improvement.	76	3.5263	0.0766	0.66781	1
4- The implementation of ERP led to the Improvement of data quality	76	3.3289	0.0398	0.34692	4
5- The implementation of ERP led to the improvement of customers' services	76	3.4079	0.0708	0.61758	2
Overall average	**3.3515**				

Table 3 shows that the highest mean go to the factor that the implementation of ERP led to continuous improvement and increase the productivity of the company. It is because the processes became faster. For employees to acquire data or send data, less time is needed now because data can be available on time. The second factor on which ERP has impact on is that the implementation of ERP led to improvement of customers'

services due to increased productivity, because the processes are taking less time than before, so that the customers are getting goods and services on time without any delay.

This all together led to increase the satisfaction of external customers. The Third and Forth factors with almost the same mean in implementing ERP are fasting the operations and reducing the number of mistakes. This is also because in ERP the work is going on in order and on time with very few or zero error operation. All these variables together lead to fasting, the operations and reducing the operations costs. As noted by Shang and Seddon (2002), many insights into benefits and problems can be gained from observing processes at both organizational and core-process levels.

From the main hypothesis, the researcher derived the following sub-hypotheses:

The first sub-hypothesis: H01a: The implementation of enterprise resource planning (ERP) by manufacturing companies does not lead to cost reduction at level α≤-0.05

Table 4 below: presents data related to the first sub-problem. This problem states that the implementation of ERP reduces the operational costs. The average responses were ranked and classified according to the respondents' rating for each item.

Table 4: First sub-problem

The implementation of ERP reduces the following operational costs	**No.**	**Mean**	**Std. Deviation**	**Rank**
Communication cost	76	3.78	0.080	1
Traveling cost	76	3.21	0.088	6
Staff/operator/employee cost	76	3.15	0.093	7
Meeting cost	76	3.42	0.068	2
Service cost	76	3.36	0.107	4
Product delivery cost	76	3.42	0.094	3
Training cost per employee	76	3.31	0.092	5
Incorrect delivery cost	76	2.89	0.105	10
Office supplies and printing cost	76	2.84	0.136	11
Inventory cost	76	3.00	0.091	8
Maintenance cost	76	2.94	0.087	9
Cost of waste and losses	76	2.68	0.112	12
Total average	**3.17**			

Table 4 shows that: the highest average among these queries was for that implementing ERP leads to reduce communication cost, with the highest average response of (3.78). This is because any one in the organization can communicate easily and can get data easily as mentioned earlier (Davenport,2000;Oilver,1999). Integrated systems provide shared information across the organization, and this information can be used to monitor business performance. Therefore, the meeting cost has also reduced with the second highest mean with an average of (3.42). Due to earlier factors, this leads to reduce the product delivery cost and traveling cost with an average response of (3.42) and (3.21) respectively. The average response of incorrect delivery cost was low, which means that almost all deliveries were correctly received. O'Leary, D. (2000) noted that some intangible benefits organizations may enjoy by implementing an ERP system include better customer satisfaction, improved vendor performance, increased flexibility, reduced quality costs, improved resource utility, improved information accuracy and improved decision-making capability (Siriginidi, 2000).

However, almost all other factors are at an average scale response. The overall average response scale is (3.17). The lowest average responses are related to cost of waste and losses, office supplies and printing cost and maintenance cost. As noted by the study of Davenport et al. (2002), benefits did not all appear immediately. For instance, cost savings were noted in most organizations, while other benefits, such as increased revenue, grew significantly four or more years after implementation. It seems that different types of benefits were realized differently in different situations. Therefore, cost of waste and losses, office supplies and printing cost and maintenance cost got the lowest averages of (2.68, 2.84, and 2.94, respectively), where cost reductions related to these factors may be noticed in the future.

Testing the first sub-hypothesis:

(H01a): The implementation of enterprise resource planning (ERP) by manufacturing companies does not lead to cost reduction at level α≤-0.05

Table 5 One-sample t- test

Operational Benefits of Enterprise Resources Planning (ERP)	t	df	Sig.(2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					(lower)	(upper)
Implementation of ERP (ERP) by manufacturing companies does not lead to cost reduction	3.571	75	0.01	0.1711	0.0756	0.2665

α≤ 0.05 Test Value = 3

The test shown in table 5 above show that the first sub-hypothesis should be rejected, because the t- value is higher than the tabulated t (3.571 > 1.96) under the significance level of (α ≤0.05). Therefore, the alternative hypothesis (H11a) was accepted, which means that the implementation of ERP by manufacturing companies leads to cost reduction in the manufacturing company.

The second sub-hypotheses:

(H01b): Using enterprise resource planning (ERP) by manufacturing companies does not lead to reduce and improve production cycling /fasting the operations at level α≤0.05.

Table 6: below presents data related to the second sub- problem. The average response were ranked and classified according to the respondents' rating for each item.

Table 6: Second sub-problem

Q	The implementation of ERP leads to reduce and improve production cycling /fasting of the operations	No.	Mean	Std. Deviation	Rank
1	Production process	76	3.84	0.633	1
2	Stock procurement process	76	3.55	0.700	2
3	Report making process	76	3.36	0.607	3
4	Data preparation process	76	3.28	0.649	4
5	Order checking process	76	3.26	0.929	6
6	Debt payment process	76	3.23	0.629	7
7	Transaction process	76	3.27	0.826	5
	Total average	**3.32**			

Table 6 shows that the overall average was 3.32, indicating a middle scale of average response for the variable: implementation of ERP leads to fasting of the operations. It is also important to point out that the item that got the highest rating was for the query related to that the implementation of ERP leads to improve the production process with an average of (3.84), followed by the second query: implementation of ERP leads to improve the stock procurement process with an average of (3.55). As noted earlier by Gardiner et al. (2002), ERP improves the performance level of a supply chain by reducing cycle time. The lowest rating was for query number (6) that stated that the implementation of ERP leads to improve the debt payment process with an average rating of (3.23). In all these queries, we find that the standard deviation for the all responses range from (0.607 to 0.929) which means that there are no big differences in responding to these queries.

Testing the second sub-hypothesis (H01b): Using enterprise resource planning (ERP) by manufacturing companies does not lead to reduce and improve production cycling /fasting of the operations at α ≤0.05.

Table 7. One-Sample t-test

Operational Benefits of Enterprise Resource Planning (ERP)	t	Df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
The implementation of ERP does not lead to reduce and improve production cycling /fasting the operations	7.745	75	0.00	0.3233	0.2401	.4065

α≤0.05. Test Value = 3

The table above shows that the second sub-hypothesis should be rejected, because the t- value is higher than the tabulated t (7.745 > 1.96) under the significance level of $\alpha \leq 0.05$.
Therefore, the alternative hypothesis(H11b) was accepted, which means that manufacturing companies that implement ERP benefit from fasting their operations, thereby improving the production cycling .

The third sub-hypothesis:
(H01c): using enterprise resource planning (ERP) by manufacturing companies does not lead to benefits in continuous improvement at level $\alpha \leq 0.05$.

Table number 8 below presents data related to the answer of the third sub- problem. The respondents' average responses for each question were ranked and classified accordingly.

Table 8: Sub-problem no.3

Q. No. No.	Benefits in continuous improvement	No.	Mean	Std. Deviation	Rank
1	Restructuring job function	76	3.68	0.657	1
2	Ease of operation knowledge	76	3.52	0.944	2
3	Ease of analysis	76	3.36	0.877	4
4	Increasing employee satisfaction	76	3.52	1.101	3
	Total average	**3.52**			

Table 8 shows that industrial companies that implement ERP benefit from continuous improvement. The average response for this variable was 3.52 which is a middle average. The variables related to restructuring job function got the highest average (3.68) with the lowest standard deviation of (0.657), followed by ease of operation knowledge with an average of (3.52) and a standard deviation of (0.944). The table also shows that the highest standard deviation was for the query no. (4), related to that the implementation of ERP led to increase the employee satisfaction with a value of (1.101), which means that there are differences in responding to this query. But this query got the second highest average response rate of 3.52, which means a medium satisfaction among employees with implementing ERP. As said before and noted by the study of Davenport et al. (2002), benefits did not all appear immediately. The lowest average rating was for the query; the implementation of ERP led to ease of analysis with a medium average response rate of (3.36) and a standard deviation of (0.877).

Testing the third sub-hypothesis (H01c): Using enterprise resource planning (ERP) by manufacturing companies does not lead to benefits in continuous improvement at level $\alpha \leq 0.05$.

Table 9: One-sample t-test

Operational Benefits of Enterprise Resource Planning (ERP)	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					lower	upper
The implementation of enterprise resource planning (ERP) does not lead to benefits in continuous improvement of the company	6.871	75	0.00	0.5263	0.3737	0.6789

$\alpha \leq 0.05$ Test Value = 3

Table 9 shows that the third null sub-hypothesis should be rejected, because the t-value is higher than the tabulated t (6.871 > 1.96) and under the significance level of $\alpha \leq 0.05$. Therefore, the alternative hypothesis (H11c) was accepted. This means that the implementation of enterprise resource planning (ERP) leads to benefits in continuous improvement of the manufacturing companies in Jordan. As noted by Shang and Seddon (2002) who argued that organizations benefit from ERP implementation, this presents a more extensive framework to assess the benefits that may be reaped in the years after the introduction of enterprise systems (ES) in an organization, with special attention to ERP system. They call this framework the 'enterprise system benefit framework'. It intends to help managers make sound evaluations of the perceived success of an ERP system some years after its 'go live' date (no specific time is though given).

The Fourth sub-hypothesis (H01d): Using enterprise resource planning (ERP) by manufacturing companies does not lead to benefits in improving data quality at level α≤0.05.

Table 10 below present's data related to the answer to the Fourth sub- problem. The respondents' average responses for each question were ranked and classified according to the respondents' rating for each item.

Table 10: Sub-problem no. 4

Q	The implementation of ERP led to improving data quality	N	Mean	Std. Deviation	Rank
1	Reducing risk of price miscalculation	76	3.80	0.748	1
2	Data lost	76	3.64	0.724	2
3	Incorrect data	76	3.63	0.745	3
4	Increasing accuracy of data	76	3.46	0.807	4
	Total average	**3.32**			

Table 10 shows that the overall average for the Fourth sub–problem was the lowest with an average rating of (3.32) compared to other variables of (ERP) operational benefits. From the table above, it is obvious that the highest rating with an average of (3.80) and a standard deviation of (0.74) went to the item: the implementation of ERP led to reducing risk of price miscalculation. But, the lowest average was related to query number (4): the implementation of ERP led to increase accuracy of data with a rating of (3.46) and the highest standard deviation of (0.807).

Testing sub-hypothesis no. 4 (H01d): Using enterprise resource planning (ERP) by manufacturing companies does not lead to benefits in improving data quality at level α≤0.05.

Table 11: One-sample t-test.

Operational Benefits of Enterprise Resources Planning (ERP)	t	Df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	upper
Using enterprise resource planning (ERP) by manufacturing companies does not lead to benefits in improving data quality	8.266	75	0.00	0.3289	0.2497	0.4082

α≤0.05 Test Value = 3

Table 11 shows that (H01d) should be rejected, because the t- value was higher than the tabulated t (8.266> 1.96) under the significance level of (α≤0.05). Therefore, the alternative hypothesis (H11d) was accepted, which means that the implementation of ERP led to improving data quality.

The Fifth sub-hypothesis (H01e): Using enterprise resource planning (ERP) by manufacturing companies does not lead to benefits in improving customers' services at level α≤0.05.

Table 12 below present's data related to the answer to the Fifth sub- problem. The respondents' average responses for each question were It has been ranked and classified according to the respondents' rating for each item.

Table 12: Sub-problem no. 5.

Q.	The implementation of ERP led to improving customers services by:	N	Mean	Std. Deviation	Rank
1	Reducing order cancellation	76	3.31	0.657	3
2	Reducing customers' problems	76	3.36	0.813	2
7	Serving customers according to need	76	3.26	0.789	4
4	Improving customers' satisfaction	76	3.68	1.085	1
	Total average	**3.4079**			

Table 12 shows that the overall average for the query: the implementation of ERP led to improving customers' services was about (3.40), which is a medium response rate. The highest rating went to query number (4): improving customers' satisfaction with an average response rate of (3.68). It got also the highest standard deviation of (1.085). As noted by Elisabeth J. et al.(2003), a successful ERP project can cut the fat out of operating costs, generate more accurate demand forecasts, speed production cycles and greatly enhance the customers' services, which can save a company millions of dollars over the long run.

The second average response rate was related to reducing customers' problems, with a medium average rate of (3.36). From the table, the lowest standard deviation was, which related to the query ERP reduces order cancellation with a standard deviation of (0.657), which means that all employees have the same idea that ERP cannot lead to reduce order cancellation.

Testing sub-hypothesis number 5 (H01e): Using enterprise resource planning (ERP) by manufacturing companies does not lead to benefits in improving customers' services at α≤0.05.

Table 13: One-sample t-test

Operational Benefits of Enterprise Resource Planning (ERP)	**t**	**df**	**Sig. (2-tailed)**	**Mean Difference**	**95% Confidence Interval of the Difference**	
					lower	**upper**
Using enterprise resource planning (ERP) by manufacturing companies does not lead to benefits in improving customers' services	5.758	75	0.00	0.4079	0.2668	0.5490

α≤0.05 Test Value = 3

Table 13 shows that the Fifth sub-hypothesis should be rejected, because t- value is higher than the tabulated t value (5.758> 1.96) and under the significance level of α≤0.05. Therefore, the alternative hypothesis (H11e) was accepted. So, using enterprise resource planning (ERP) by manufacturing companies led to benefits in improving customers' services.

The second main null hypothesis (H02): There are no significant differences at level α≤0.05 among the answers of the respondents pertaining to their demographic profile.

In order to accept or reject this hypothesis, one-way ANOVA was used and the results are shown in the Table 14 below.

Table 14. ANOVA results.

category		Sum of Squares	df	Mean Square	F	Sig.
gender	Between Groups	10.632	17	0.625	18.136	0.000
	Within Groups	2.000	58	0.034		
	Total	12.632	75			
Managerial categories	Between Groups	102.737	17	6.043	43.814	0.000
	Within Groups	8.000	58	0.138		
	Total	110.737	75			
Age of industrial company	Between Groups	32.105	17	1.889	54.768	0.000
	Within Groups	2.000	58	0.034		
	Total	34.105	75			
The company's target markets	Between Groups	49.684	17	2.923	21.189	0.000
	Within Groups	8.000	58	0.138		
	Total	57.684	75			
Size of industrial company	Between Groups	14.447	17	0.850	10.954	0.000
	Within Groups	4.500	58	0.078		
	Total	18.947	75			
No. of employees	Between Groups	26.658	17	1.568	3.712	0.000
	Within Groups	24.500	58	0.422		
	Total	51.158	75			

α≤0.05

Table 14 shows the differences among the answers of the sample of the study pertaining to their demographic profile. The result show a level of significance of less than 0.05 (0.0<0.05), which indicates high differences among the answers of the respondents regarding the operational benefits of enterprise resource planning (ERP).

The F value for all variables is higher than 1.96 (F value > 1.96), but the highest differences go to the category of the age of industrial company with F= 54.768. As said earlier, these companies will benefit more of the systems; not immediately but after some more years (Shang and Seddon, 2002). Benefits may be reaped in the years after the introduction of enterprise systems (ES) in an organization, with special attention to ERP systems. The second highest differences in the answers go to the category of managerial category with F= 43.814. The lowest differences were for the category of number of employees with F= 3.712, which means that we can implement ERP systems at any company size; being small, medium or large, as well as to all public or private industries, as Al-Fawaz et al. (2008) pointed out. Today, many public and private organizations worldwide are implementing ERP systems in place of the functional legacy systems that are not anymore well compatible with modern business environments

Correlation between the Variables of the Study

Table15: Correlation between all the variables of ERP.

		Benefits of (ERP) in Cost reduction	Benefits of (ERP) in reducing and improving production cycling	Benefits of (ERP) in continuous improvement	Benefits of (ERP) in improving data quality	Benefits of (ERP) in improving customers' services
A- Benefits of enterprise resource planning (ERP) in cost reduction	Pearson Correlation	1	0.308**	0.063	-0.286*	0.71
	Sig. (2-tailed)	------	0.007	0.587	0.012	0.545
B- Benefits of enterprise resource planning (ERP) in reducing and improving production cycling	Pearson Correlation		1	0.717**	0.399**	0.143
	Sig. (2-tailed)		------	0.000	0.00	0.219
C- Benefits of enterprise resource planning (ERP) in continuous improvement	Pearson Correlation			1	0.394**	0.329**
	Sig. (2-tailed)			------	0.00	0.004
D- Benefits of enterprise resource planning (ERP) in improving data quality	Pearson Correlation				1	0.314**
	Sig. (2-tailed)				------	0.006
E- Benefits of enterprise resource planning (ERP) in Improving customers' services	Pearson Correlation					1
	Sig. (2-tailed)					------

**Correlation is significant at the 0.01 level (2-tailed).

*Correlation is significant at the 0.05 level (2-tailed).

Table 15 above shows the correlation between the different variables of the study. It is noted that almost all factors have very high correlation, except between the following variables:

First: Between the benefits of enterprise resource planning (ERP) in cost reduction and the benefits of enterprise resource planning (ERP) in continues improvement, with a low correlation factors of (0.587 > 0.05).

Second: Between the benefits of enterprise resource planning (ERP) in cost reduction and the benefits of enterprise resource planning (ERP) in improving customers' services, with a very low correlation factor of (0.545 >0.05).

Third: There is a weak relationship between the benefits of enterprise resource planning (ERP) in reducing and improving production cycling and the benefit of enterprise resource planning in improving customers' services with a correlation factor of (0.219>0.05).

11. ***Discussion of Results and Major Findings***

Based on the literature review and the questionnaire survey, the researcher concluded that:

1) Most of the workers were males. They represented (78.9%) of the study sample, and this is probably due to the nature of the job that is male dominated, because working at these industries depends mostly on physical muscular forces, so that the nature of the work at the industrial companies was more attractive to males than to females. Most respondents were either deputy mangers or production managers. Most of the industrial companies selected were newly established (from 4 to 8 years). Most participating company's part in the study were depending on the local market with a percentage of 63.2%. Theses companies were mostly of small size with a percentage of 55.63%, while 44.44% of them were of medium size. Most of the respondents were from industries that employed between 10 and less than 20 employees with a percentage of 39.47%.

2) The highest mean goes to the variable: the implementation of ERP led to continuous improvement of the productivity of the company. This is because processes became faster and there is no extra waste of time for employees to acquire data or send data, because data is available on time. The second variable that ERP has impact on is that: the implementation of ERP led to improvement in customers' services. This is due to increased productivity, because processes are taking less time than before, so that the customers are getting goods and services on time without any delay, which led to increase the satisfaction of external customers. The third and 4rth variables that ERP has impact on are related to the improvement of the production cycle and cost reduction. These improvements are due to reducing the number of mistakes, so that work is going on in order and on time, with very few or zero error operation. So, this leads to fasting the operations and reducing the costs.

3) The highest average response was for: implementing ERP led to reduce the communication costs, with an average response of (3.78). This is because any one in the organization can communicate and get data easily. As mentioned by(Davenport,2000;Oilver,1999), integrated systems provide shared information across the organization, and this information can be used to monitor business performance. Therefore, meeting cost has also reduced and got the second highest mean with an average of (3.42). ERP implementation led to reduce the delivery cost and traveling cost with an average response of (3.42) and (3.21), respectively. Cost of waste and losses, office supplies and printing cost and maintenance cost got the lowest averages of (2.68, 2.84, and 2.94, respectively), as different types of benefits are realized differently in different situations. Therefore, benefits may be noticed in the future. The test of the first sub-hypothesis shows the acceptance of the alternative hypothesis (H11a), hence the implementation of ERP leads to benefits in cost reduction of the manufacturing company.

4) It is also important to point out that the item that got the highest rating was the query related to that the implementation of ERP leads to improve the production process with an average of (3.84), followed by the second query: implementation of ERP leads to improve the stock procurement process with an average of (3.55). As noted by Gardiner et al. (2002), ERP improves the performance level of a supply chain by helping reduce cycle times. The lowest rating was for the query stating that the implementation of ERP leads to improve the debt payment process. The standard deviation for all the responses ranged from 0.607 to 0.929, which means that the respondents do not have big differences in responding to these queries. As for testing the second sub-hypothesis, the alternative hypothesis (H11b) was accepted, which means that manufacturing companies that implement ERP gain a reduction in the production cycling and hence improvement in production cycling or fasting the operations.

5) The industrial companies that implement ERP benefit from continuous improvement. The average response rate for all queries was at a medium average rating of (3.52). The variable related to restructuring of job function got the highest average mean of (3.68), followed by ease of operation knowledge with an average of (3.52). The highest standard deviation was for the variable: implementation of ERP led to increase employee satisfaction with a value of (1.101). This means that there are differences in responding to this query, meaning that there is medium satisfaction among employees with implementing ERP. As said before and noted by the study of Davenport et al. (2002), benefits did not all appear immediately.

The test of the third sub-hypothesis led to the acceptance of the alternative hypothesis (H11c), which means that the implementation of enterprise resource planning (ERP) leads to benefits in continuous improvement at the manufacturing companies in Jordan.

6) The highest rating with an average of (3.80) went to the item: the implementation of ERP led to reducing risk of price miscalculation. Nevertheless, the lowest average was related to the: implementation of ERP led to improve the accuracy of data with a rating of (3.46). The t-test for the fourth sub-hypothesis led to acceptance of the alternative hypothesis (H11d), which means that the implementation of ERP led to improving data quality.

7) Improving customers' satisfaction query got the highest average response of (3.68). It also got the highest standard deviation of (1.085). As noted by Elisabeth J. et al (2003), a successful ERP project can enhance customer services. The second average response rate was related to reducing customers' problems, with a medium average rate of (3.36). The lowest standard deviation was related to ERP implementation reducing order cancellation. Testing the fifth sub-hypothesis led to the acceptance of the alternative hypothesis (H11e), which means that using enterprise resource planning (ERP) by manufacturing companies led to benefits in improving customers' services.

8) One way ANOVA analysis showed that the highest differences were related to the category of the age of industrial company with (F= 54.768.) As said earlier, these companies will benefit more from the systems not immediately but after some more years (Shang and Seddon, 2002). The benefits may be reaped in the years after the introduction of enterprise systems. The lowest differences were for the category related to the number of employees at each of these industries with (F = 3.712), which means that we can implement ERP systems industries of small, medium or large sizes.

9) Almost all factors have very high correlation except between the benefits of enterprise resource planning (ERP) in cost reduction and the benefits of enterprise resource planning (ERP) in continuous improvement with a low correlation factor of (0.587 > 0.05), as well as between the benefits of ERP in cost reduction and the benefits of ERP in improving customers' services with a very low correlation factor of (0.545 >.05). In addition, there is a weak relationship between the benefits of enterprise resource planning (ERP) in improving production cycling and customers services with a correlation factor of (0.219>0.05).

Major Findings

The major findings are:

1- There is a significant direct relationship between the implementation of ERP and (continuous improvement, productivity of the company, improvement in customers' services, communication cost, risk of price miscalculation and operation process).
2- The operations became faster, so that there is no extra waste of time for employees to acquire data or send data, because data is available on time.
3- Implementation of ERP improves productivity and enhances customers' services, because goods and services are available on time without any delay.
4- Implementation of ERP improves the production cycle, and cost reduction improvements are due to reducing the number of mistakes, so that work is going on in order and on time with very few mistakes. This leads to fasting the processes and reducing the operation costs.
5- Implementation of ERP leads to improve the production process and the stock procurement process. Therefore, continuous improvement and operational benefits are achieved.

12. *Recommendations*

The research study recommends the following:

1- Industrial food companies should formulate a strategy that is able to develop and implement appropriate ERP systems and train their employees and operators on how to use these systems. Training is another aspect which is very crucial in the successful implementation of ERP systems in order to reduce incorrect delivery, reduce the use of office supplies and printing materials, reduce maintenance cost and reduce cost of waste and losses.

2- The implementation of ERP systems could benefit more by providing better integration of working environment, more automation and more flexibility in operations and information access.

Industrial companies should be designed in a way that creates fitness and consistency of using of ERP systems, through proper data preparation, order checking and transaction processes.
3- No improvement will succeed without the availability of sufficient ERP knowledge and analysis of resources.
4-Managements of industrial companies should implement and reinforce a learning climate of using ERP as a culture to improve data accuracy.
5- ERP software vendors must work with the professionals in food industry to develop more customized solutions for those types of (ERP) that lead to reduce customers' problems, serving customers according to need and hence improving customers' satisfaction.

13. ***References***

Ahmed Elragal and Moutaz Haddara. (2012). The Future of ERP Systems: Look Backward Before Moving Forward, Published by Elsevier Ltd. Selection and/or Peer Review underResponsibility of CENTERIS/SCIKA - Association for Promotion and Dissemination of Scientific Knowledge. Open access under CC BY-NC-ND license. Available online at: www.science direct.com, Procedia Technology 5 (2012) 21 – 30
DOI: 10.1016/j.protcy.2012.09.003

Al-Fawaz, K., Al-Salti, Z. and Eldabi, T. (2008). Critical Success Factors in ERP Implementation: A Review, Proceedings of European and Mediterranean Conference on Information Systems (EMCIS2008), May 25-26, 2008, Al Bustan Rotana Hotel, Dubai.

Al-Mashari, M., Al-Mudimigh, A., and Zairi, M. (2003). Enterprise Resource Planning: A Taxonomy of Critical Factors. European Journal of Operational Research, 146(2), 352-364,

PMP Research (2001). Industry Reports: Infrastructure Management Software.

Boo Young Chung, Mirosław J. Skibniewski, Henry C. Lucas Jr. and Young Hoon Kwak. (2008).Analyzing Enterprise Resource Planning System Implementation Success Factors in the Engineering–Construction Industry. JOURNAL OF COMPUTING IN CIVILENGINEERING © ASCE / NOVEMBER/DECEMBER 2008 / 373.
DOI: 10.1061/_ASCE_0887-3801_2008_22:6_373_

Cookie, D., Gelman, L. and Peterson, W.J. (2001). ERP Trends, The Conference Board, ResearchReport R-1292-01-RR), June.

Cronbach, L. J. (1951). Coefficient Alpha and the Internal Structure of Tests. Psychometrika, 16(3), 297-334.

Davenport, T. (2000).Mission Critical :Recognizing the Promise of Enterprise Systems .Cambridge: Harvard University Press.

Davenport, T., Harris, J. and Cantrell, S. (2002). The Return of Enterprise Solutions: The Director's Cut, Accenture, October 14, 2002.

Dillon, C., (1999). Stretching Toward Enterprise Flexibility with ERP, APICS—The PerformanceAdvantage (October-1999), 38–43.

Elisabeth J. Umble, Ronald R. Haft and M. Michael Umble. (2003). Enterprise Resource Planning: Implementation Procedures and Critical Success Factors, European Journal of Operational Research 146 (2003)241–257 (Shankarnarayanan, ERP Systems—Using IT to Gain a Competitive advantage, March 23, 2000, Downloadable from website:<http://www.expressindia.com/newads/bsl/advant).

Gardiner, S. C., Hanna, J.B. and LaTour, M.S. (2002). 'ERP and the Re-engineering of IndustrialMarketing Processes: A Prescriptive Overview for the New-age Marketing Manager.Industrial Marketing Management, 31, 357-365.

Holland, C.P. and Light, B. (1999). A Critical Success Factors Model for ERP Implementation, IEEE Software, 16 (3), 30-36.

Irani, Z. and Love, P.E.D. (2001). The Propagation of Technology Management Taxonomies for Evaluating Investments in Information Systems, Journal of Management InformationSystems, (17) 161-178.

Ivo De Loo1, Jan Bots, Edwin Louwrink, Dave Meeuwsen, Pauline van Moorsel and Chantal Rozel.(2011). The Effects of ERP-Implementations on Organizational Benefits in Small-and Medium-Sized Enterprises in the Netherlands, 8th.International Conference on Enterprise Systems, Accounting and Logistics (8th ICESAL 2011)11-12 July 2011, Thassos Island, Greece, 59-78.

J.R. Tony Arnold, Stephen N. Chapman and Lloyd M. Clive. (2008). Introduction to Material Management, Pearson Education, Inc., Pearson Prentice Hall, U.S.A. p30.

Joseph R. Muscatello, Michael H. Small and Injazz J.Chen (2003). Implementing Enterprise Resource Planning (ERP) Systems in small- and Midsize Manufacturing Firms, International Journal of Operations & and Production Management, Emerald, 23 (8), 850- 871 q MCB UP Limited 0144-3577
DOI: 10.1108/0144357031048632

Jordan Chamber of Industry, 2014, Amman, Jordan

Lee, S., Arif, A. and Halpin, D. (2002). Simulation Modeling by Enterprise Resource Planning Implementation in Medium Sized Corporation. Proceedings of First International Conference on Construction in the 21st. Century (CITC-2002), Miami, Florida, pp 663-670.

McNurlin, B. (2001). Will Users of ERP Stay Satisfied. Sloan Management Review, 42 (13).

Nita Arryani Sari, Achmad Nizar Hidayanto and Putu Wuri Handayani (2012). Toward Catalog of Enterprise Resource Planning (ERP) Implementation Benefits for Measuring ERP Success.IBIMA Publishing, Journal of Human Resources Management Research, Article ID 869362, 16 Pages. http://www.ibimapublishing.com/journals/JHRMR/JHRMR.html
DOI: 10.5171/2012.869362

Oilver, R. (1999). ERP Is Dead. Long Live ERP. Management Review 88,12-13.

O'Leary, D. (2000). Enterprise Resource Planning Systems: Systems, Life Cycle, ElectronicCommerce and Risk. New York: Cambridge University Press.

Ross,Jeanne, Michael Vitale and Leslie Willcock. (2003). The Continuing ERP Revolution: Sustainable Lessons, New Models of Delivery. In Second Wave Enterprise ResourcePlanning System, Graeme Shanks, Peter Seddon and Leslie Willcocks (Eds.) Cambridge:Cambridge University Press, pp.102-103.

Robert Jacobs and Elliot Bendoly. (2003). Enterprise Resource Planning: Developments andDirections for Operations Management Research, Published in the European Journal ofOperational Research 146(2).

Shari Shang and Peter B Seddon. (2002). Assessing and Managing the Benefits of Enterprise Systems: Business Managers' Perspective, Information Systems Journal 12, (4), pp. 271– 299.© Blackwell Science, Ltd.

Siriginidi, S.R. (2000). Enterprise Resource Planning in Re-Engineering Business, Business Process Management Journal, 6(5), 376-91

Staehr, L. (2007). Assessing Business Benefits from ERP Systems: An Improved ERP Benefits Framework, Proceedings of the International Conference on Information Systems 2007 (ICIS 2007), 31 December 2007, Canada. [Online], http://aisel.aisnet.org/icis2007/36.

Yajun Zeng, Yujie Lu, and Miroslaw J. Skibniewski. (2012). Enterprise Resource Planning Systemsfor Project-Based Firms: Benefits, Costs & Implementation Challenges, PBSRG Journal for the Advancement of Performance Information and Value , 4 (1).