

The role of employees' empowerment as an intermediary variable between knowledge management and information systems on employees' performance

Role of employees' empowerment

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Received 24 August 2017
Accepted 17 December 2017

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Abstract

Purpose – The purpose of this paper is to investigate the interrelationships among knowledge management (KM), information systems (IS) and employees' empowerment (EE) on employees' performance (EP).

Design/methodology/approach – Accordingly, a structural model is developed that delineates the interactions among these constructs and explores the mediating effect of EE on the relationship between KM, IS and EP. A questionnaire-based survey was designed to test the aforementioned model based on dataset of 287 employees' pharmaceutical industries in Jordan. The model and posited hypotheses were tested using structural equation modeling analysis.

Findings – The results indicated that KM and IS positively and significantly affect EE, in which the latter impact EP as well. However, neither KM nor IS proved to be positively related to EP. Additionally, EE positively and significantly mediated the relationship between KM and EP, besides the relationship between IS and EP.

Originality/value – This is one of the few studies which investigate the interrelationships among KM, IS and EE on EP, and the first to test the model on companies in the pharmaceutical industries in Jordan.

Keywords Information systems, Knowledge management, Organisational performance, Employee empowerment

Paper type Research paper



1. Introduction

The changes in circumstances of the organizations these days, either political, cultural, social or economical, are the result of many sequential changes because of the knowledge explosion and information and communication revolution (Hsu and Sabherwal, 2012; Kasasbeh, 2015), the increased internal and external competition resulted in more challenges and difficulties for the organizations to keep up with these changes and adopting to them (Sweis *et al.*, 2011; Krylova *et al.*, 2016), all these events forced the organizations to respond to the changes creatively and to find modern and innovative ways and then they became obliged to make basic changes in their management styles; through finding creative individuals and provide the required and suitable tools that help creating new methods and modern work techniques and quick administrative solutions to face these challenges (Mughraj, 2015). The creative individual is considered as a fortune better than the materialistic fortune, and even the investment in developing the human element is one of the most successful investments; in addition to that, the human resource is one of the most important factors that help in the sustainability of the organizations by achieving the sustainable competitive advantage as a result of his creative abilities, skills and tacit or explicit knowledge (Hawajrh and Al-Mahasneh, 2015; Inkinen, 2016). Thus, the trend of the organizations toward innovation should not be restricted to introducing the modern tools and techniques, but the management should be convinced that the employees can innovate and create solutions for the problems they face (Mughraj, 2015). Information systems (IS) are considered as a main part of the success of the modern organizations in light of competition and quick change and uncertainty, that gave the IS a very vital role in the success and efficiency of any organization and in the completion of the administrative tasks efficiently and effectively (O'Brien and Marakas, 2011); it also helps in cooperation and coordination between the members of the organization and between different organizations; this requires efficient design and management of these systems (Giampaoli Gil, 2009). Knowledge management (KM) is considered as the most important competitive advantage that the organizations are seeking to acquire and use; this resource is very important for the organizations in light of the huge development in communication and information; thus, KM became an important power for the success of business; in addition, such knowledge should be integrated in the strategies of the organization to respond to the environmental changes (Ababneh and Hatamleh, 2013; Giampaoli *et al.*, 2017).

While human interest, management, direction and motivation have become more important than other areas related to money, technology and organizational structures (Khansharifan *et al.*, 2015), that is why from the human-related subjects emerged the employees' empowerment (EE), as a modern management concept and one of the most promising (Khansharifan *et al.*, 2015). EE means giving the employees the powers and responsibilities, encouraging them to participate in decision-making and enriching them with the confidence and freedom to perform in their own way without direct involvement of the management; mainly, it strengthens the relationship between the management and the employees, helps encourage the employees and enhance them to participate in decision-making and breaks the ice between the management and the employees, that makes the attention paid to empowerment a basic element in the success of the organizations (Awamleh, 2013). The purpose of this research is to investigate the interrelationships among KM, IS, and EE on employees' performance (EP). The study also aims at studying the impact of IS and KM on the EP by using EE as a mediating variable.

The rest of this paper is organized as follows. It begins with the relevant literature and previous studies about KM processes, IS (efficiency and effectiveness), EE and EP, as well as other previous studies that link information management and IS with EE, and link KM and

IS with employee performance and KM and IS with EE and impact EP. Then, the methodology in which the research theoretical model, hypotheses, population and sample, data collection, analysis methods and the validity and reliability of the study are presented. It is then followed by testing the proposed hypotheses in the data analysis section. The discussion and conclusion are then provided and areas for future research are also addressed.

2. Literature review

2.1 Knowledge management

The world is going through a very developed stage by changing from the industrial era to the knowledge era, and thus the organizations realized the importance of the information as a stock in their human resources, and the organization then started to think of the methods to make better use of the knowledge in creating qualified human elements able to innovate and excel (Shih and Tsai, 2016). Knowledge is considered as one of the most valuable assets in the modern organizations; it became one of the most important production factors with the human resources and the capital, and it is the main engine for economic growth and the catalyst for technology development and production enhancement; knowledge creates the innovation and then transforms it into processes and products (Maruf and Zhou, 2015). The main goal of KM is to provide knowledge for the organization on a permanent basis and make it a practical attitude that serves the goals of the organization (Masa'deh *et al.*, 2017; Soto-Acosta *et al.*, 2016). KM is a process that includes creating the knowledge, finding it and passing it in a consistent manner and learning to use it to achieve the goals. And it is organized by creating it, collecting it, purifying it and spreading it among the employees (Ababneh and Hatamleh, 2013; Masa'deh, 2016).

Crossman indicated that the main goal of KM is to provide knowledge for the organization on a permanent basis and make it a practical attitude that serve the goals of the organization to achieve efficiency and effectiveness through planning and organizing the cognitive efforts, to achieve the strategic and operational objectives of the organization (Crossman *et al.*, 1999; Almajali *et al.*, 2016). Ardin thinks that KM differs according to the approach used for studying it, the documents approach and the technical approach assure the sustainability operations, increasing the current knowledge, its impact, its use and reuse. In addition, the social organizational approach and the added value approach assure the creation of new knowledge, and according to these approaches, four basic KM processes were defined: creation of knowledge, sharing knowledge, storing knowledge and application of knowledge (Ardin, 2012). Based on the studies of some researchers (Al-Zou'bi and Al-Zaidy, 2012; Kasasbeh, 2015), these approaches were used in this, study, as these operations are the most common among the KM processes (Obeidat *et al.*, 2016) especially because the creation, storing, sharing and applying knowledge do not happen accidentally, but it happens in light of defining the required knowledge and its goals. Knowledge creation includes the interaction between the tacit and explicit knowledge, results in the finding, deriving and creation of new knowledge inside the organization to provide the different kinds of knowledge for the future decisions. Fernandez and Sabherwal defined knowledge creation as "the process of retrieving either explicit or tacit knowledge that resides within people, artifacts, or organizational entities. Also, the knowledge being captured might reside outside the organizational boundaries including consultants, competitors, customers, suppliers, and prior employers of the organization's new employees" (Fernandez and Sabherwal, 2010). Knowledge creation starts with an idea presented by the knowledge makers, through acquiring and innovation, and is one of the important keys for the organization in the long run; in addition to the competition in creating new ideas and

developing new operations (Kasasbeh, 2015), Al-Zou'bi and Al-Zaidy (2012) also indicated that knowledge creation means the innovation by the participation of the supportive working groups to create a new information capital in new practices and issues, that helps in defining and solving the problems in a continuous innovative manner. Knowledge storage includes all activities that keep the knowledge and allow it to stay in the systems, storing it, and renewing it to be retrieved easily by the users (Al-Ali, 2013). Knowledge storage can happen in many ways like when each individual in the organization records everything that happens to him; when all the new information the administration is collected and stored to make it available for everybody; or when the members of the organization give all their new information for a management member to analyze, purify and document (Ababneh and Hatamleh, 2013). Knowledge sharing aims to transfer the explicit and tacit knowledge to other individuals, and this transfer becomes effective if the receiver understands the information and is able to use it. The knowledge sharing indicates the social interaction, that involves skills, experiences and knowledge exchange among the employees in the department or the organization (Bouraghda and Dris, 2015). Awad and Ghaziri defined knowledge sharing as a continuous and mutual interaction among the individuals and work groups inside the organization and between the organization and the beneficiaries. Knowledge sharing and exchange occurs through joint work, communication, learning through work, training, face-to-face discussions and informal sessions or through documents exchange, especially because the modern technology ensures the availability of the knowledge when needed (Awad and Ghaziri, 2004). However, acquiring, storing and sharing the knowledge is not enough, what is important is to transform it into practical application. The success of any organization in KM depends on the ratio of the applied knowledge to the whole information (Dalkir, 2005). Knowledge must be implemented in problem-solving, because it is the main goal of KM process, by applying it in the organizational activities and processes like human resources management, decision-making and services and goods quality improvement (Sweis *et al.*, 2011). Application of knowledge requires setting the organization's environment to reach the maximum benefit. Like management leadership, KM requires an exceptional pattern in leadership where it focuses on openness, mutual trust and communication with others to achieve the highest level of productivity in the organization. Information technology aims to provide advanced business network, data bases, tools and software that facilitate the KM processes in the organization, in addition to the most suitable organizational structures for KM that is flexible and adoptable, easy to communicate, and has a quick response to changes by adopting the horizontal organizational structure (Ababneh and Hatamleh, 2013; Lopez *et al.*, 2004).

2.2 Information systems

The development and growth of IS and the spreading of its applications became the vital source of business for the organizations, not just a source of information, and without the management IS there will be no sustainability in the business organizations. Management IS are defined as the computer-based IS that make the information available for all users according to their needs and provide the management of the organization with past, current and future predicted information that helps them in decision-making (Raymond and George, 2007). Stair and George defined IS as a set of interrelated component that collects, manipulates, stores and disseminates data and information and provides a feedback mechanism to meet an objective (Stair and George, 2012). Macleod believes that there is a procedural definition of the IS, as it consist of a group of formal and informal systems that provide the management with past, current and predictive information, either in an oral, written or visual form, for the internal operations in the organization or for the surrounding

environment to support the managers in the high managerial levels, by providing accurate information in the suitable timeframe to help accomplish the work and make the decisions (Al-Kshali and Al-Qutob, 2007).

In the current circumstances of the business environment, the organizations cannot continue without the IS; it is the tool for the mutual relation to facilitate the communication between the organization and the surrounding environment, in addition to activating the horizontal and vertical communication channels between the managerial levels and units within the organization. It also helps in setting the circumstances for decision-making by providing the information in the right time and in the form that improves the quality (Al-Adwan *et al.*, 2015; Al-Batayneh, 2013; Allahawiah *et al.*, 2013; Laudon and Laudon, 2012).

2.2.1 Efficiency and effectiveness of information systems. The successful IS became an inseparable approach for the business organizations and an important pillar for the management of the organization, enhancing the organization's competitive ability and creating chances through which the organizations try to find new market shares. Thus, the benefits of the IS for the activities and processes became clear in helping achieving the goals in sustainability, growth, and profitability (O'Brien and Marakas, 2011). For any IS to succeed, it should be at high quality and achieve the beneficiary's goals and requirements in a way that covers all the required work procedures currently, and in the future, and the right manner and without mistakes, under the condition that the moral and physical returns be more than the total cost (Yassin, 2012). The efficiency and effectiveness of the IS is the degree of achieving the goals they were designed for in the least amount of the available resources; it was also defined as the contribution of the IS in achieving organizational goals, like its effect on the performance of the organization, and others, using the available resources (Khreisat, 2009).

The efficiency of IS: the ability of the system to achieve the defined goals according to predefined standards. Yassin clarified that efficiency is achieving the defined goals with the least use of resources. Efficiency focuses on the maximum benefit from the available resources with the least cost. Thus, the efficiency of the IS depends on two main indicators: the availability of the tangible and intangible resources and the ways of using these resources to achieve goals (Yassin, 2012).

Effectiveness of IS: which is defined as doing the right things, thus it is related to the correctness of the decision. To achieve the effectiveness, three main factors should be integrated: individuals, structure and information (Al-Kshali and Al-Qutob, 2007). Many basic approaches can give guidance to determine the effectiveness of IS; the goal approach, which is used mostly, defines effectiveness as the ability of the system to achieve the goals. The resources approach defines effectiveness in the frame of the system's position to the outer environment, where the effectiveness of IS indicates their ability to gain unique resources, where the inputs come in the place of the outputs in importance. The third approach is the satisfaction of the users where effectiveness is linked to the benefit of the users, where it is defined by the degree of beneficiaries' needs and expectations by the system. The operations' approach looks at the effectiveness of the IS as a reward for the internal correctness of the system and the right internal procedures and operations (Al-Tai, 2009; Tong and Yap, 1996).

Malkawi and Alsalem (2004) indicated that the indicators for measuring the efficiency and effectiveness of the IS are defined by the final beneficiary satisfaction, the size of usage, goals achievement, higher management support, time and cost effects and training and documentation. Al-Tai (2009) defined a group of characteristics through which we can measure the efficiency of the system, the value of the information, beneficiary's individual performance, organization's performance, system usage and beneficiary satisfaction, and he

indicated that the beneficiary satisfaction is one of the most used indicators because it reflects on the other characteristics like organization's performance and individual performance, and that increases the value of the information provided by the system.

2.3 Employees' empowerment

The need for changing the administrative work styles became more urgent especially with the beginning of the millennium; this need resulted from the accelerating technology development and information explosion (Shih and Tsai, 2016). The modern organizations also started seeking to change their management of human resources by following the strategies that focus on human resources which appeared through the development of managerial ideology, in a way that goes with the changes to gain the loyalty and affiliation of the individuals to achieve the organization's goals (Meyerson and Dewettinck, 2012). In addition, the competitive environment of the organization increased the speed and average in which organizations require the innovation to sustain and enhance its competitive position. The managers of modern organizations should keen to develop the abilities of employees in problem solving and participation in decision-making (Meyerson and Dewettinck, 2012). EE is one of the ways that increase the organization's ability in improving, developing and using the talents of the employees, and it is considered as a tool to enhance the employees in formulating their innovative ideas. EE can be defined as providing the employees with the information and power and the required resources to achieve the organization's goals (Meyerson and Dewettinck, 2012). Mohamadeya indicated that EE increases the employees' motivation to work by delegating the powers to the lower levels in the organization (Mohamadeya, 2016), while Abou Elnaga and Imran consider it as a transfer of power and responsibility, as an invitation to the employees to share the information and knowledge provided by the organization through its database and participating in problem analysis and decision-making, and consequently, the employee will be responsible for the equality of the activities he decided, and this will support the transfer of the power from the managers to the employees rationally (Abou Elnaga and Imran, 2014).

EE can be effective in reducing the work pressure; it helps the individuals to deal with the conditions that require a high effort because it provides them with important resources such as independency, participation in decision-making and competency; it also leads to having a positive effect for the roles of the employees (Abou Elnaga and Imran, 2014). Savery and Luks (2001) indicated the positive effect of EE on the self-confidence of the employee, and that it gives the employees a sense of what they offer to their organization, which increases the productivity. EE can also be considered as a tool to enhance the ability of organizational change and employees' participation; it also opens the door for trying the innovative abilities of the employees, gives them flexibility, independency and increase the employees' self-respect.

Delegation of authority, giving up on the powers to the employees to perform certain duties or the process when the manager gives some of his powers for the employees who have the required experience and give them the required space for performing these duties, and they should be accountable for their actions (Al-Jammal *et al.*, 2015).

Participation in decisions, when the management gives the chance to the employees to take their decisions without restrictions or laws that reduce their participation, to reach the best employment of their capacities and enhance their morale (Al-Jammal *et al.*, 2015).

2.4 Employees' performance

EP is one of the concepts that gained lots of attention by the researchers in the field of management sciences, and that was because of the importance of the concept for the individual and the organization. EP is defined as behavioral responses reflect what the employee learned or was trained on, and it is the product of the mental and psychological abilities, [Siljanen \(2010\)](#) thinks that the EP is the interaction of the employees' behaviors, and that behavior is determined by the interaction of the employee's efforts and abilities in the organization, as it represents the ability of the employee to achieve the goal of his job, and it is the result which the employee achieve when he does any job in the organization ([Kianto et al., 2016](#)). But we should differentiate between the behavior and accomplishment; the behavior is the work that the employee does in the organization, but the accomplishment is the impact or results left after the work stops, while the performance is the interaction between behavior and accomplishment; it is the sum of the results and behaviors achieved together ([Indermun and SaheedBayat, 2013](#)).

[Edgar and Geare \(2005\)](#) think that there are four main elements for the process of performance management including determining the expectations where the managers and the employees determined the work to be performed, where to perform it, how to perform it and what are the expected results of impact of this performance. There are also the direction and returning the effect which are informal meetings between the management and the employees to evaluate the performance and how to enhance it. Training the employees and introducing them to the evaluation criteria and preparing them to meet the goals set in performance plan that they participated in, in addition to the follow up that depends on the psychological and information support provided by the manager to the employee, and these are formal meetings to discuss the expectations met and how to enhance them, and how to solve the problems that faced the performance. And at the end, the reward according to the performance where the managers make the decision to amend the reward and give the suitable compensation for the employees after the evaluation of performance ([Edgar and Geare, 2005](#); [Massaro et al., 2016](#)).

2.5 Knowledge management, information systems, employees' empowerment and employees' performance

2.5.1 Knowledge management and employees' performance. Knowledge is one of the most important resources of the organization because it lies within the minds of its employees, clients, suppliers, documents and routines; it is the result of data processing that was transformed into information and became knowledge after they were understood, applied repeatedly and practiced during the work until they became rooted in the mind of the individual as a mental state that is shown clearly through the experiences, skills and cleverness of the employees ([Fernandez and Sabherwal, 2010](#)). In addition to that, KM is considered one of the main pillars that the organizations seek to apply and one of the best ways they go through to enhance the performance, by rehabilitating, educating and training the work forces on KM, organizations also are looking for collecting, storing, spreading over all administrative levels and developing the information to invest in having new knowledge and using the currently possessed knowledge with the maximum capacity and efficiency to reach the excellence in performance ([Shih and Tsai, 2016](#)). [Jaradat et al. \(2011\)](#) indicated that the impact of KM on the employees is done by affecting the one's learning, and learning is the rational or constant change in behavior, and it is the process that allows the individual to gain information and skills through his interaction with the surrounding social and cultural systems.

2.5.2 Knowledge management and employees' empowerment. Davenport clarified that in the future, the competition will be on attracting the skills and capacities that are called the knowledge employees. To keep them, the management should be aware that the bureaucracy is not appropriate for the knowledge employees. They like to perform without strict control and without strict procedures and formal work systems. The bureaucratic environment can be expelling for those employees because they will not have the freedom in thinking and the independency in innovation and creation (Davenport, 2001). It is known that free thinking, trying, experiencing, failure, innovation and creation are in the core of the knowledge employee work, and here we see the importance of the knowledge as a main pillar in EE and granting them the freedom in actions and participation (Ardin, 2012). This is natural because with the increased experience of the individual and the increased skills and knowledge comes bigger ability to perform the tasks with efficiency and competency and more independency (Haghighi et al., 2014).

2.5.3 Information systems and employees' performance. It is a certainty that information is the natural input for the decision-making process, thus having a base for the data and information that is characterized by accuracy and accurate classification and easy calling might help a lot in putting strong basis for setting the alternatives and choosing from them (Al-Arabi, 2012). The technologies employed by the organizations in collecting, analyzing and presenting the information are faster and more competent, thus, all the operations and tasks in the business organizations stated depending basically on the technology and modern IS and the techniques they provide that are able to ease the work, and it also provide specialized information for all sectors, and help in making good decisions in the right time which is reflected on the EP and the goals to be achieved (Ahrabi and Darestani, 2016).

Al-Qadah (2007) clarified that the relationship between IS and EP are characterized by the following:

- To a high extent, it improved the EP. By passing doing many routine works which led to more speed, accuracy and efficiency in completing the tasks.
- Affected the employees' morale toward increasing their loyalty and belonging to the organization through the opportunities it provides to viewing the information easily, which enhances their participation in decision-making.
- Reduced the work burden on the managers, and the time saved can be used for planning and drawing policies for the organization, which increased the efficiency and effectiveness of the higher management.

2.5.4 Information systems and employees' empowerment. Empowerment is linked to IS and technologies in light of the modern global changes, where restructuring those organizations became urgent, in addition to training the leaders and human resources to use the modern IS in performing the tasks according to the modern procedures (Tahir and Mehdi, 2011). IS contribute to EE in two views. First, innovative solutions for organizational problems requiring (need) to accept and do responsibility by employees under the proper conditions. So, the organizations have to consider open culture and give its employees a good space to decide and act and managers learn to abandon their "ruling" roles. Emerging IS and IT can support this direction by providing information that is required to build the trust of employees in management. IS can keep staff fully informed of the company's performance results sales, profits and competitors' performance, the company's plans and goals and sensitive issues such as sell-off options and possibilities of down-sizing (Qudah and Melhem, 2011). On the other hand, Information Systems is essential element in empowerment of the employee because they provide the information employee need to make decision, the

employee might also be empowered to develop or use their own personal IS, and addition IS assist the traditional organizational to short its structure and decrease the layers help to reduce the number of management levels, or layers, in structure, this type of structure often called a flat organization structure, empower employee at lower levels to make decision and solve problem without needing permission from midlevel manger, empowerment gives employee and their manger more responsibility and authority to make decision, take action and have more control over their jobs (Laudon and Laudon, 2012; Stair and George, 2012).

2.5.5 *Employees' empowerment and employees' performance.* Simard and Rice (2007) indicated that the excellence in the performance can occur by encouraging the employees, providing them with the resources and delegating the powers to them; granting them the freedom includes avoiding the over control and giving them the chance to share their opinions, take their decisions and do their work. Thus, we can see that when the indicators of EE are enhanced, the organization will be finest, because the employee will be more loyal to the organization, and puts all his efforts to serve it (Meyerson and Dewettinck, 2012). Shih and Tsai (2016) added that the empowerment aims at satisfying the employees toward their jobs, their organizations, and then make them to perform better, that is also applicable on the moral and psychological status. Empowerment is also considered an administrative strategy used to reach high efficiency and increased effectiveness.

3. Theoretical framework and hypotheses development

3.1 Research framework

This research is based on the proposed framework (Figure 1). The framework considers the effect of IS, KM on EE and EP.

- H1. There is a positive effect knowledge management on employees' empowerment.
- H2. There is a positive effect of information systems on employees' empowerment.
- H3. There is a positive effect of knowledge management on employees' performance.
- H4. There is a positive effect of information systems on employees' performance.
- H5. There is a positive effect of employees' empowerment on employees' performance.
- H6. Employees' empowerment positively mediates the relationship between knowledge management and employees' performance.
- H7. Employees' empowerment positively mediates the relationship between information systems and employees' performance.

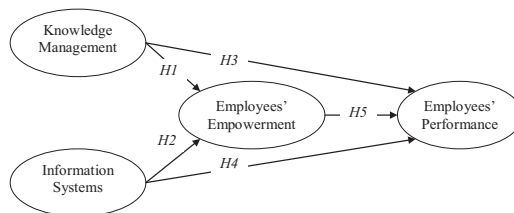


Figure 1. The proposed research model

4. Methodology

4.1 Survey

A questionnaire was developed to achieve the study goals that aim at measuring the impact of management IS with its dimensions (efficiency and effectiveness of IS) and KM with its dimensions (creating the knowledge, storing the knowledge, sharing the knowledge, and applying the knowledge) on the EP, in addition to the impact of IS and KM on the EP with the mediator variable, EE of human resources, in Pharmaceutical industries in Jordan. To achieve the main goal of the study, the questionnaire was used as a main tool to collect data regarding the independent variables: IS (efficiency and effectiveness of IS) and KM (knowledge creation, storing, sharing, and applying), and the dependent variable EP and the mediator variable EE. The questionnaire was developed according to the administrative literature related to the study subject, respondent answered all item on five-point Likert-scale ranging from "1" of "strongly disagree" to "5" of "strongly agree".

To examine the direct impact of the independent variables on the dependent variable, and the indirect impact of the independent variables on the dependent variable in the presence of the mediator variable. The primary study tool (the questionnaire) consisted of four parts, where the first part contained the demographic information (gender, education level, position and years of experience). The second part contained the paragraphs that measure the dimensions of the independent variables, KM, where it contained four dimensions (knowledge creation, application, storing and sharing); this part was designed according to the studies of [Kasasbeh \(2015\)](#), [Ababneh and Hatamleh \(2013\)](#), [Giampaoli et al. \(2017\)](#) and [Sweis et al. \(2011\)](#), in addition to the dimensions of IS (efficiency and effectiveness); this part was designed according to the studies of [Al-Kshali and Al-Qutob \(2007\)](#). The third part included measuring the mediator variable which is the EE and its dimensions (delegation of authority and participation in decisions) and was designed based on the studies of [Mohamaddeya \(2016\)](#) and [Mughraj \(2015\)](#). The fourth part included the dependent variable (EP) and was designed based on the study of [Al-Bahussin and El-Garaih \(2015\)](#).

Before final distribution of the questionnaire, it was pre-tested with 4 faculty members and then pilot tested with 20 potential participants to provide validity and reliability of the items being measured.

4.2 Study sample

Data were collected from 300 employees working in pharmaceutical industries at all levels using a convenience sampling technique. In total, 13 questionnaires were eliminated and 287 were considered for final analysis. Out of the 287 participants, 160 (55.7) were male with the majority of them having a bachelor's degree (70 per cent), and 161 (56.1 per cent) of them had less than 5 or less years of experience in their job ([Table I](#)).

4.3 Research results

Construct validity was assessed using exploratory and confirmatory factor analyses. First, exploratory factor analysis was performed with ProMax rotation method and principal component analysis. We entered all the question items simultaneously. Because of the large number of items, many items showed cross-loadings and were deleted. Additionally, some items showed factor loadings less than 0.40 and were also deleted. Finally, we got four distinct factors as was initially expected (i.e. KM, IS, EE and EP). Eigenvalues for the four factors were greater than 1.0. Cronbach's α coefficient was applied to test the reliability of the constructs. The reliability of the constructs including the overall constructs of KM, IS, EE and EP was satisfactory with $\alpha > 0.60$ indicating acceptable internal consistency

Table I.
Description of the respondents' demographic profiles

Category	Frequency	Percentage (%)
<i>Gender</i>		
Males	160	55.7
Female	127	44.3
<i>Qualification</i>		
High school or less	27	9.4
Bachelor	203	70.0
Postgraduate studies	60	20.6
<i>Position</i>		
Middle level management	149	67.6
Low level management	93	32.4
<i>Years of experience</i>		
Less than 5 years	161	56.1
5-less than 10 years	76	26.5
10-less than 15 years	33	11.4
More than 15 years	16	5.6

(Hair *et al.*, 2010). Next, confirmatory factor analysis (CFA) was applied based on the output of EFA using Amos 20. We had to further delete some question items with loadings less than 0.50 (Hair *et al.*, 2010) to improve model fit indices (i.e. EF3 = 0.273; EF4 = 0.322; EK4 = 0.336; DA2 = 0.178; DA3 = 0.166; BV2 = 0.272). The fit indices of the final model using first order constructs showed satisfactory levels ($\chi^2 = 503.336$; d.f. = 269; $\chi^2/d.f. = 1.871$; GFI = 0.921; CFI = 0.932; NFI = 0.903; NNFI = 0.925; RMR = 0.048 and RMSEA = 0.041). The normed chi-square of 1.871 was below the maximum value of 3.0 (Bollen, 1989). Goodness-of-fit index (GFI), comparative fit index (CFI), normed-fit index (NFI) and non-normed fit index (NNFI) were higher than the recommended minimum value of 0.90 (Garver and Mentzer, 1999). Root mean square residual (RMR) was 0.048 and root mean square error of approximation (RMSEA) was 0.041 implying satisfactory level of unidimensionality and convergent validity (Garver and Mentzer, 1999; Hu and Bentler, 1999).

Furthermore, the standardized coefficients for all the question items were higher than twice of their standard errors, providing additional support for convergent validity (Anderson and Gerbing, 1988). Besides, the factor loadings of all the items were greater than 0.50. In addition, average variance extracted (AVE) values for all the measurement scales were higher than 0.50 providing additional evidence of convergent validity (Fornell and Larcker, 1981). The composite reliability of all the scales was greater than 0.70 providing a satisfactory level of reliability (Fornell and Larcker, 1981; Garver and Mentzer, 1999).

CFA analyses were repeated using second order factors of KM and IS. The final model fit indices using second order constructs (EE and EP) fitted the data well ($\chi^2 = 461.595$; d.f. = 243; $\chi^2/d.f. = 1.899$; GFI = 0.932; CFI = 0.945; NFI = 0.912; NNFI = 0.937; RMR = 0.041 and RMSEA = 0.038). These indices indicated an acceptable level of unidimensionality and convergent validity. Also, the standardized coefficients of all the constructs were higher than twice of their standard errors, providing evidence of convergent validity (Anderson and Gerbing, 1988). Moreover, all the factor loadings were higher than 0.50. Likewise, AVE values for all the constructs exceeded 0.50 supporting the convergent validity (Fornell and Larcker, 1981). The composite reliability of the two second order constructs exceeded 0.70 indicating sufficient levels of reliability (Fornell and Larcker, 1981; Garver and Mentzer,

1999). Table II shows the standardized factor loadings of EFA and CFA, Cronbach's α values and composite reliability of the first and second order constructs.

Discriminant validity was assessed by ensuring that the square root of each AVE value is greater than the absolute correlation value between that scale and other scales. All first and second order constructs met this criterion providing sufficient evidence of discriminant validity (Fornell and Larcker, 1981). In addition, The AVE value for each construct was higher than maximum shared squared variance (MSV) and average shared squared variance (ASV) values providing further evidence of discriminant validity (Hair *et al.*, 2010). Table III reports discriminant validity results for first order constructs and Table IV reports the results of the final model with second order constructs.

Structural equation modeling using AMOS 22 was performed to test the study hypotheses. Structural equation modeling allows simultaneous testing of all hypotheses including direct and indirect effects. Additionally, structural equation modeling has the option of applying bootstrapping re-sampling approach to test the mediating effect. Bootstrapping is superior to the approach described by Baron and Kenny (1986) as normal distribution assumption of the indirect effect is not required and the accuracy of the results is not affected by the sample size (Hayes, 2009). As recommended by Hayes (2013), we selected 5,000 bootstrap samples with 99 per cent bias-corrected confidence intervals. An alternative hypothesis regarding the mediating effect is accepted if the lower and upper bounds of confidence intervals do not contain zero. This implies that the indirect effect is not zero with 99 per cent confidence level. If the two bounds contain zero, then the alternative hypothesis is rejected (Hayes, 2013).

The results of the direct effects show that KM is positively and significantly related to EE ($\beta = 0.338, P < 0.000$), therefore *H1* is supported. Also, IS is positively and significantly related to EE ($\beta = 0.325, P < 0.000$), so *H2* is also supported. The direct effect of EE on EP is also positive and significant ($\beta = 0.314, P < 0.000$), therefore *H5* is supported. However, *H3* and *H4* were not supported ($\beta = 0.042; \beta = 0.104$), respectively. As for the mediating effect, the bootstrapping results show that the standardized indirect effect of KM on EP through EE is 0.214 with $P < 0.000$. Thus, *H6* is supported. Also, *H7* is supported as the standardized indirect effect of IS on EP through EE is 0.212 with $P < 0.000$. Further, the coefficient of determination (R^2) for EE and EP were 0.46 and 0.17 respectively, which indicates that the model does moderately account for the variation of the proposed model. Table V below provides summary of the tested hypotheses.

5. Discussions and conclusions

The results of the study supporting *H1* were found to have a positive impact of KM on EE, and these results agree with the study of Haghghi *et al.* (2014), where the results of this study showed a positive relation between the KM operations and functional empowerment in Iran Airways, especially after applying the knowledge, where KM plays a vital role in the success of the organization. This study also agrees with the study of Khodabakhshi *et al.* (2013) which found a fruitful relation between KM and functional empowerment, where the KM facilitates the cooperation among employees and makes them able to increase their knowledge and skills. It also agrees with the study of Somayyeh and Morteza (2015) that showed a statistical relation between KM and the dimensions of functional empowerment, self-efficacy, self-confidence and sense of belonging. It also showed that the staff shall carry out their duties well and have the skills and abilities required and the objectives of the organization is well known. The tool that can be helpful in this area to managers is KM process and therefore it is empowerment. It also agrees with the study of Fardin, (2012) and the study of (Harandi and Motlagh, 2014), they all assured the presence of direct impact for the dimensions of KM on the Employee empowerment.

Construct	Item no.	Loadings		Cronbach's α	Composite reliability
		EFA	CFA		
<i>KM: knowledge generation (KG)</i>	KG1	0.854	0.968	0.860	0.867
	KG2	0.644	0.750		
	KG3	0.602	0.638		
<i>KM: knowledge storage (KS)</i>	KS1	0.881	0.975	0.789	0.811
	KS2	0.501	0.521		
	KS3	0.528	0.692		
<i>KM: sharing knowledge (SK)</i>	SK1	0.821	0.849	0.907	0.921
	SK2	0.705	0.753		
	SK3	0.841	0.928		
<i>KM: applying knowledge (AK)</i>	AK1	0.875	0.918	0.865	0.889
	AK2	0.835	0.901		
	AK3	0.561	0.598		
<i>IS: the efficiency of IS (EF)</i>	EF1	0.675	0.720	0.829	0.856
	EF2	0.473	0.507		
<i>IS: the effectiveness of IS (EK)</i>	EK1	0.792	0.910	0.874	0.924
	EK2	0.872	0.846		
	EK3	0.506	0.692		
<i>EE: delegation of authority (DA)^a</i>	DA1 ^b	0.502	0.597	0.756	0.798
	DA4 ^b	0.488	0.504		
<i>EE: participation in decisions (PD)^a</i>	PD1 ^b	0.599	0.660	0.699	0.756
	PD2 ^b	0.511	0.533		
	PD3 ^b	0.812	0.882		
	PD4 ^b	0.512	0.544		
<i>EP: employees' behaviour (BV)^a</i>	BV1 ^b	0.552	0.596	0.652	0.819
	BV3 ^b	0.516	0.575		
	BV4 ^b	0.521	0.544		
<i>EP: employees' personality (PS)^a</i>	PS1 ^b	0.898	0.950	0.895	0.909
	PS2 ^b	0.813	0.840		
	PS3 ^b	0.743	0.884		
	PS4 ^b	0.621	0.642		
<i>EP: employees' results (RS)^a</i>	RS1 ^b	0.612	0.649	0.839	0.886
	RS2 ^b	0.832	0.886		
	RS3 ^b	0.772	0.791		
	RS4 ^b	0.798	0.941		

Notes: ^aconstruct loading; ^bitem loading

Table II.
Reliability and validity of the constructs

The study also assured the presence of a positive impact between IS and EE, and this clarifies the vital role of IS in delivering the information for the employees which facilitate the power delegation and decision participation, in this area it is supported by the study of (Al-Raja and Alomiam, 2013) which found a positive relation between IS and functional empowerment in the governmental sector in Jordan (Municipality of Amman), but it indicated that despite of the impact of IS on all the dimensions of empowerment, it did not reach a high degree of effect. The study also agreed with the study of (Qudah and Melhem, 2011) which aimed at clarifying the impact of IS on functional empowerment in the private schools in Irbid, and found a positive impact for the components of IS (tools, software, databases) on functional empowerment.

The study did not support *H3*, where it was found that there is no positive impact between the KM and EP, and this does not necessarily mean that the management do not know the importance of knowledge, but the management depends more on other tools to

Table III.
Means, standard deviations, AVE, MSV, ASV and correlation matrix of first order constructs

Construct	Mean	SD	AVE	MSV	ASV	1	2	3	4	5	6
1. KG	3.819	1.113	0.578	0.335	0.213	0.760					
2. KS	3.229	0.728	0.589	0.324	0.274	0.545	0.767				
3. SK	3.620	1.154	0.642	0.322	0.198	0.512	0.431	0.801			
4. AK	3.436	0.941	0.621	0.311	0.207	0.532	0.382	0.561	0.788		
5. EF	3.856	0.673	0.559	0.318	0.167	0.436	0.441	0.479	0.487	0.773	
6. EK	3.329	0.744	0.601	0.276	0.116	0.321	0.378	0.327	0.298	0.302	0.775

Note: Square root of AVE is on the diagonal

Table IV.
Means, standard deviations, AVE, MSV, ASV and correlation matrix of second order constructs

Construct	Mean	SD	AVE	MSV	ASV	1	2	3	4	5
1. DA	3.339	0.562	0.613	0.312	0.233	0.782				
2. PD	3.428	0.551	0.624	0.343	0.221	0.447	0.789			
3. BV	3.126	0.501	0.549	0.298	0.219	0.431	0.541	0.740		
4. PS	3.169	0.703	0.541	0.325	0.226	0.389	0.547	0.521	0.735	
5. RS	3.275	0.553	0.576	0.382	0.195	0.399	0.438	0.349	0.369	0.758

Note: Square root of AVE is on the diagonal

Hypothesis	Path	Standardized effect	Result
<i>H1</i>	KM→EE	0.338 ^{***}	Supported
<i>H2</i>	IS→EE	0.325 ^{***}	Supported
<i>H3</i>	KM→EP	0.042	Not Supported
<i>H4</i>	IS→EP	0.104	Not Supported
<i>H5</i>	EE→EP	0.314 ^{***}	Supported
<i>H6</i>	KM→EE→EP	0.214 ^{**} (indirect effect)	Supported
<i>H7</i>	IS→EE→EP	0.212 ^{**} (indirect effect)	Supported

Table V.
Summary of results

Notes: ^{***} $p < 0.001$; ^{**} $p < 0.01$; KM: Knowledge Management; IS: Information Systems; EE: Employees' Empowerment; EP: Employees' Performance

enhance EP, in addition to the way they manage knowledge especially the way they apply it. The results also do not agree with the study of (Al-Ghunaim, 2013) which found that the higher use of KM gives higher performance, and it came after creation of knowledge in the impact on the performance where the interaction between the employees helps in solving work problems. And that the organization has the ability to transfer the implicit knowledge in the minds of the employees to explicit knowledge by sharing and experience exchange. It also did not agree with the study of (Gholami *et al.*, 2013) which showed that the KM processes have a positive impact and are statistically significant, where they indicated that the improvement in the practices of KM (the most effective after spreading the knowledge) may play a vital role in improving the productivity, EP, employees' creativity and employees' work relations which is reflected on the performance of the organization as a whole.

The study also showed that there is no positive impact between IS and EP, and this may be explained by the fact that the company uses IS in a tradition way to achieve the daily routine work, and certainly, this is not reflected on achieving the work in the required efficiency, and this may be because the company does not follow the developments in the IS specially the tools of analyzing the data, which help the employees to achieve their work professionally, help them to innovate, and collect the data about the surrounding work circumstances. The results also do not agree with the study of Shih and Tsai (2016) that aimed at knowing the relation between IS and the employees' administrative performance and showed that the devices come in the first place in improving the performance, and then the users, then software, and the last were databases. The organizations should improve their infrastructure of IS to go with the modern tools and technologies, and the administrative policies of the organizations should direct the management IS toward improving the performance to enhance the efficiency and effectiveness. The results also do not agree with the study of (Ahrabi and Darestani, 2016) which indicated a positive impact between the IS and the EP, and that the organization which uses the modern IS helps the managers to reach the information regarding the financial performance quickly, in addition to helping in increasing the satisfaction of the employees which increase their performance more than the organizations that do not use the modern IS.

The results support *H5* that suggests a positive impact of EE on EP, and in this regard, it agrees with the study of Nzuve and Bakari (2012). EE may affect the performance in two different ways; first by determining the goals, where every employee will be aware of what to be done (and clarify his tasks) and this will reflect on the overall structure of the organization, afterwards the employees will be able to make their own decisions, and then they will be experienced in decision-making with the time passes. The second way is that empowerment means accountability, which means freedom in decision-making, and that, will put all the employees under accountability and they will perform more efficiently and effectively. It also agrees with the study of (Shih and Tsai, 2016) that found that the benefits of functional empowerment may help in changing the employees' views and gain more efficiency.

Despite all of that, the results of the study are positive and agree with *H6* where there is a positive impact of the KM on the performance through the mediator variable of EE, the results also support *H7* that suggests a statistically significant effect between the IS and performance through the mediator variable. Although the KM and IS do not have a positive impact on performance, but with the presence of EE, these important assets became effective in increasing the performance through the best use of the employees' energies by the fruitful information they provide, either implicit or explicit, and by sharing this information with the employees using the IS. This assures that EE is one of the most important guarantees for the

sustainability of the organization, because applying the empowerment has many benefits at all levels and increases the commitment of the employees to more responsibilities and unleashes them to activate their innovative abilities and give them the power to go on.

5.1 Managerial implications

The pharmaceutical industries in Jordan is pioneering, with high investment opportunities and high competitive advantage, and it needs more development and trust from the distributing companies which depends on the imported medicines some times. The results of the study pointed to some recommendations for the managers in the dataset of 287 employees' of Pharmaceutical industries in Jordan should look at empowerment as one of the priorities to be developed in the company through some procedures that will enhance the empowerment for the employees, like; spread the concept of EE among the employees by enhancing their organizational values, delegate the powers to them and make them participate in decision-making and support the cooperation and mutual trust to enhance the empowerment.

The empowerment supporting environment should be reinforced by the cooperation between different departments and information sharing through an efficient IS that deliver the information in the right time to every employee according to his needs, enhances the communication, and provide tools to develop the employees' skills, encourage the initiatives and give them the space to determine their own style to achieve the job. Working on eliminating the obstacles that prevent the information from reaching the individuals in the administrative and production departments, by giving the employees the complete freedom in their own knowledge and in applying this knowledge, and that will allow them to understand the importance of the information and find the way to best apply it. More attention to applying KM by participating in the internal and external information networks, build the capacities of the employees and increase their abilities to use these networks, and focus on attracting the specialists in KM to use their experiences in developing the cognitive processes in the Pharmaceutical industries in Jordan. Facilitate finding, transferring, spreading, exchanging the information and use the electronic information resources and the valuable available information to help developing their abilities to go with the development in the competitive business environment.

5.2 Future research directions

To sum up, the goal of the study is to test a comprehensive and experimental model to study the relation between KM, IS and EP in the presence of EE as a mediator variable. The study presented some results that agree with previous studies in this area, where it found an impact of KM and IS on EE. But the results had some unexpected results also, where it showed that KM and IS have no impact on the EP, and this does not agree with many previous studies in this area. But, these intangible assets, KM and IS, have indirect impact on the performance with the presence of EE as a mediator variable. Thus, the study will give a clear view on the relation between KM, IS and EE when they all help in increasing the EP in the organization.

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Further reading

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