

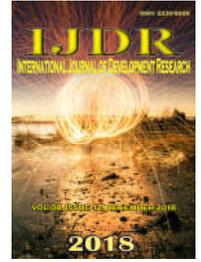


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## THE MODERATING ROLE OF GAMIFICATION IN THE RELATIONSHIP BETWEEN KNOWLEDGE MANAGEMENT AND PERFORMANCE

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### ABSTRACT

In the era of globalization, digitization, intensive competition due to the fast pace of technology development which challenged small and medium-sized enterprises (SMEs) to master their knowledge and to help them leverage their most critical resource in order to increase their levels of competitive advantage. But it is suggested that the rapid and emergent development of knowledge management (KM) concepts and practices offers the opportunity of new ways of developing competitive advantage in SMEs (du Plessis, 2008). Organizational knowledge is the most significant resource for SMEs in terms of access, availability, and depth. Successful SMEs are those who can manage their knowledge in an effective and efficient manner, to make the best use of resources, like land, labor, and capital. To have a sustainable competitive advantage, SME'S should realize how to utilize knowledge and how to attach it to organizational process. Another important issue that a manager should know what kind of knowledge they should seek to enhance organizational activity to get better performance hence sustainable competitive advantage. Employees are the most crucial resource, managers should rely on, to implement their strategy, gamification as an incentive tool will be proposed to help managers to recognize employees needs and their motivation in order to implement knowledge management activities either conversion or sharing or application. The purpose of this conceptual article is to identify the knowledge management impact on SMEs performance in Egypt. It seeks also to explore the moderating role of gamification to enhance the relationship between knowledge management on the SME'S performance. Primary findings show that gamification moderate the relationship between knowledge management and SMES performance by bringing significant improvement to the employee morale and performance, knowledge management practices. SMES managers, can benefit from developing or utilizing tools based on gamified knowledge systems in their firms.

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### INTRODUCTION

Small to medium-sized enterprises (SMEs) are an important part of any national economy. In economies which have high pace of development, knowledge and information are the most important factors of value (McAdam, R., 2000), exceeding in importance tangible and financial resources on their significance. Generally, an intellectual capital (IC) includes human capital, research and development as mentioned by Guthrie and Petty, 2000 and it is perceived crucial to achieve competitive advantage. Knowledge and Knowledge management - Knowledge is known as a valuable and strategic

resource for companies, which affords the company with opportunities for development and ability to gain competitive advantage (Naim, and Lenka, 2017). Knowledge management related with the handling of this knowledge. In any company, the management activities related to the way knowledge is created, acquired, transferred and applied is defined as knowledge management. (Moshari 2013). Modern firms have started to use computer-based information systems to manage knowledge in their work. This change in dealing with knowledge has divided the management of knowledge into two separate forms. One form deals with knowledge as an object created by people and stored in databases for retrieval later. The other form deals with knowledge as experience acquired by people which cannot be transformed into digital information. (Naim, and Lenka, 2017). Enterprises who are

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successful in leveraging knowledge, usually achieve increased efficiencies in operations, increased levels of customer service, higher rates of successful innovations. In addition to the traditional reasons for managing knowledge, SMEs should pay close attention to knowledge management for several important reasons. SMEs compete on their know-how and therefore have to use knowledge to their advantage even more than their traditional resources. SMEs normally do not have enough financial capability to spend on resources such as labor land, and capital. They must do more with less (Desouza & Evaristo, 2003). Companies, that have more knowledge, are certainly successful, but those who use their knowledge in the right way are much more successful (Bierly *et al.*, 2000). Companies don't respond to the competitive environment simply, but they attempt to create knowledge-based competitive advantage to struggle with their competitors. Gamification as a topic of study is relatively new, it has become a progressively popular manner to improve employees engagement and motivation.

Components of gamification - The game based interactions between the user and the gamified system are defined as the sum of game mechanics and game dynamics. (Dorling and McCaffery, 2012). The game mechanics generally consists of factors like the achievements, community collaboration, exercises, transparent results, time keeping and luck. (Morgan *et al.*, 2014 and Kim, 2015). The sense of accomplishment is provided by points usage, levels or bonuses to encourage users actions. Game dynamics, on the other hand, studies the behavior, feedback and progression aspects of the gamification. (Kim, 2015) The behavior is observed in the desired changes in behavior needed, which are used to develop users preferred skills. The feedback mechanism role is to control the direction of the change and to repeat the knowledge of the known skills. Progression is used to expand the skill level to accumulate more meaningful skills.

### Literature Review and Hypotheses Development

**Data, Information and Knowledge:** Awad and Ghaziri (2004) stated that data, information and knowledge have different aspects that can be summarized as following.

**Data** refers to raw facts missing any processing, organizing or analysis, thus has little meaning and slight benefits to managers and decision-makers. As mentioned by Ahmad, and Gaterell, 2008. Data is un-interpreted material upon which a decision is to be based and relied on facts that may include any thing known to be true or exist. While **Information** are data that has been processed and shaped to have more meaning to users. Ahmad, and Gaterell, 2008 claimed that information resulted from the interpretation of data in a given context. thus, a single content of data may yield different information contents if the context is different (Ahmad, and Gaterell, 2008.). Information includes facts that are arranged in a structured way, while knowledge integrates values, beliefs, judgments, perspectives, and know-how (Blumentritt & Johnston, 1999). Whereas **Knowledge** is the most beneficial form of contents for problem solving and decision making as it has more meaning than data and information and it combines information with experiences to display methods and procedures used by others, which can be rejected in the future to solve similar problems (Ramesh and Tiwana, 1999).

**Knowledge Classification Methods:** Classifying knowledge is an essential issue to help the organizations to manage vital knowledge resources effectively

### Explicit and Tacit Knowledge

**Explicit knowledge:** can be conveyed in formal and systematic language, and shared in the form of scientific methods, specifications, manuals. Explicit knowledge is easy to be captured, saved, shared and used as it can be expressed in words and numbers to be managed easily. Nickols, 2003 stated that Explicit knowledge is related to knowledge already articulated and/or codified in the form of text, diagrams, tables, photos, audios, videos, etc., so to be directly and entirely captured, used or shared, for instance documented articles, reports, books, manuals, specifications and standards.

**Tacit knowledge** is the most valued type of content as it gather information with experiences, skills and people understanding, which can assist people in finding best solutions and to reduce possibilities of repeating mistakes (Awad & Ghaziri, 2004; Tserng & Lin, 2004). Difficult to articulate, express using language or make explicit like people skills and experiences that can't be described as mentioned by Alonderiene *et al.*, 2006 such as how to treat with different people and understand the reaction of their faces or the ability work under time pressure, solve problems. While Nonaka, 2007; Lin *et al.*, 2006 mentioned that Tacit knowledge is greatly personal and difficult to be managed, shared as it comprises experiences, know-how and perceptions, which normally reside in individuals' heads and memories. The best technique to utilize tacit knowledge is by using methods and tools that encourage and facilitate cooperation and knowledge sharing between people of the organization. According to Nonaka and Takeuchi (1995) tacit knowledge can be further classified into technical knowledge and cognitive knowledge.

**Technical knowledge** depends mainly on personal experiences of individuals developed with time, captured in the form of "know-how", while cognitive knowledge depends mainly on mental models, beliefs and perspectives hence cannot easily be articulated (Nonaka, 2007). It comprises numerous shapes of knowledge, such as descriptions of problems and solutions, experience notes and procedures.

**Cognitive knowledge:** Contains ideas, viewpoints and innovations. Although tacit knowledge is hard to be captured simply by normal tables, they can be captured and stored in forms similar to articles that provide more details and clarifications to the knowledge contents. One more useful method is by encouraging sharing such knowledge through direct contacts and indirect contacts. Tacit knowledge has been conducted by Bennet and Bennet (2008) in terms of four aspects; embodied, affective, intuitive, and spiritual, where each aspect represents different tacit knowledge sources with different characteristics

**Embodied tacit knowledge** related to the movement of the body, such as knowing a craft or how to use a tool, and the five human senses. This type of knowledge can be learned through practicing and training and with time it becomes inserted in memory and retrieved spontaneously when needed.

**Intuitive tacit knowledge** is the knowledge that may affect decisions and actions that arises from the individuals' sense and the person cannot explain the reason for taking this action. It has been developed in people's minds due to continuous learning through meaningful experiences that can be gained by practicing making decision and actions, gathering feedback on

these decisions and actions, and interpreting this feedback. These practices will help people to develop their ability to evaluate situations and to predict the consequences of such situations (Connell *et al.*, 2003).

**Affective tacit knowledge** related to people feelings that may have influence on behaviors, and responses. Hence, it is related to other types of knowledge as feelings is a form of knowledge can influence decisions and actions, such as feeling of fear or upset that could avoid the decision-maker from taking an action. Finally, *spiritual tacit knowledge* can be expressed as the principles of human life such as its moral aspects, the emotional part and mental abilities, which may affect thoughts and actions.

**Knowledge Management:** Knowledge Management (KM) is the new epoch technological application of knowledge in critical planning, decision making, appraisal, evaluation and redesign of firm's operative systems (Kipchumba *et al.*, 2010) cited by (Tarus. and Cheruiyot, 2015). Knowledge-based resources like patents afford heterogeneous capabilities that provide each company with its unique character and are the essence of competitive advantage (Bartol *et al.*, 2009). Yusoff and Daudi (2010) defined KM processes, including knowledge acquisition, knowledge conversion and knowledge application, to manage and enhance firm's performance. There are numerous definitions of the term „knowledge management“ (KM) such as McNerney (2002) who defined “Knowledge management (KM) as an effort to increase useful knowledge within the organization by encouraging communication, providing opportunities to learn, and promoting the sharing of appropriate knowledge artifacts. While Beijerse (2000) expressed KM as It is the management of information inside an organization by steering the strategy, culture structure, and systems and the capabilities and attitudes of people regarding their knowledge. It is the attainment of the organization's goals by focusing on knowledge as a productive factor. However, KM is defined in this article in a manner that copes with the goal of developing a KM model that presents structured procedures, techniques and method useful for successful management of knowledge in SMES sector which match with Quintas *et al.* (1997) cited by Bolisani, and Scarso, 2009 definition who defined KM as the process of frequently managing knowledge of all types to meet present and emerging needs, to identify and acquire knowledge resources and to develop new opportunities.

**SMES Performance:** The determinants of firm performance has long been a key objective within organizational research (Short *et al.*, 2009) as performance is considered the most vital criteria in evaluating organizations. In the last few years, the impact of knowledge Management (KM) on performance has been a key issue research theme in organizational theory (Li & Seidel, 2013). However, there is a necessity to extend the empirical literature through adding mediating and moderating variables in the relationship between KM and performance in knowledge-intensive organizations (Lara, *et al.*, 2012). As mentioned by Jafari *et al.*, (2010) in their research, non-financial indicators are appropriate for measuring performance as they can be implemented at all levels of organizations and represent a more precise image than financial indices whose results are superficial. Additionally, Zhang and Li (2009) perceived that financial indicators can only reflect past performance and cannot either current or future operating conditions.

**Knowledge management and SME'S performance:** In the context of SMEs, Liu and Abdalla (2013) and Hussain *et al.* (2011) have proven that KM influenced significantly and positively the performance of SMEs industry. Moreover Aliyu (2015) in Nigeria (2015) Aliyu. by using Smart Partial least square (PLS), reported a significant and positive relationship between the knowledge management and business performance of SMEs However, Durst and Edvardsson (2012) and Marra *et al.* (2012), mentioned that the benefits of KM adoption are not fully exploited by SMEs in developing countries, particularly in Rwanda.

**Knowledge Conversion and Performance:** Knowledge conversion is a process where persons with different knowledge cooperate and thus create new knowledge which develop the quality and quantity of both tacit and explicit knowledge (Sa'ñchez & Palacios, 2008). Through knowledge conversion, the entire organization can share the explicit knowledge created and convert it into tacit knowledge for individuals as mentioned by Tseng (2010). Conversion and creation of knowledge arise based on explicit and tacit knowledge a person owns or has access to (Baets 2005).

**Knowledge Transfer and Performance:** Syed-Ikhsan and Rowland (2004) confirmed that there is no significant relationship between organizational structure and knowledge transfer performance. However management should ensure that knowledge is accessible and shared in the organization. While Saini (2013) revealed in his research that community involvement programs and training contributed in the implementation of KM practices because employees could exchange their ideas and contribute to knowledge sharing, transfer. Saini concentrated on KM practices including knowledge capturing, knowledge sharing, knowledge storing, knowledge transfer, and knowledge reuse. Becheikh *et al.*, (2013) suggested that linkage agents are central actors in the knowledge transfer process while applying their research in education and. Zaied *et al.*, (2012) stated that knowledge conversion, storing and human resources affect performance. Nevertheless, this study failed to integrate knowledge transfer in the KM framework and that Knowledge application and culture do not affect performance. Lin *et al.* (2013) revealed that technical design knowledge was mainly transferred through activities, such as peer-to-peer or group discussions to solve problems. Also, Knowledge transfer is associated with the process of moving useful information from one individual to another person (Ladd and Ward, 2002). According to (De Carvalh oand Ferreira, 2001) one of the main roles of information technology in knowledge management process is to increase the speed of knowledge transfer and creation. The core rule for developing knowledge transfer system is to provide users with multiple shift channels, but after analyzing which forms are optimal for certain tasks, purposes and environments (Wang *et al.* 2007). Knowledge transfer (KT) is very complicated process, which causes various difficulties. Rhodes *et al.* 2008 suggested that “difficulties associated with knowledge transfer are expected normally because, efforts to transfer knowledge had a specifically modest record of success.

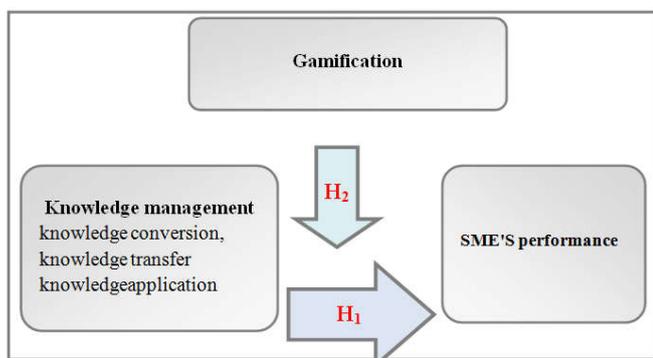
**Knowledge Application and Performance:** Knowledge application is the process through which knowledge is applied either to task performance or problem solving. Knowledge may be owned and applied by Persons or by whole teams (Ajmal & Koskinen, 2008). Companies usually benefit

not from the existence of knowledge but from its application (Gasik, 2011). Yossuff and Daudi (2010) concluded that knowledge application positively impacts performance. KM can be defined as the management of knowledge flows between individuals within an organization through the processes of knowledge identification, use, creation, sharing and storing (Heisig, 2009).

**Gamification:** Gamification is a diverse application of game elements implemented by firms in various circumstances to motivate customers or employees. Due to the advancement of information and telecommunication technologies, more dynamic and interactive gamified experiences have been developed as strategies to retain customers and encourage employees. As the increasing application of social and mobile games plays important trends, enterprises need to understand the value of adding the elements of games into customer's every encounter. Deterding *et al.*, (2011) defined Gamification as the use of game design elements in non-game contexts. Gamification is a process of game thinking that encourages users with mechanics to implement particular tasks to solve problems or engages customers (Zichermann and Cunningham, 2011). Deterding *et al.* (2011) denote uses of game elements for further purposes than in entertainment games. These aims may be to motivate, to educate, to build habits or to provide training. To achieve these goals, not only gamified applications are used, but serious games too. A serious game, is a full game with all the game features, even though it satisfies non-entertainment goals while being fun (DeSmet *et al.*, 2014). A serious game is intended to be played from start to end entirely to provide the non-entertaining benefit (Rinc, 2014). The dynamic application of gamification has made a big difference in the approach businesses interact with customers and is becoming increasingly applied to product design and promotion to encourage desirable Website usage behavior (Zichermann and Linder, 2010).

### Conceptual Framework

The current research framework is illustrated in figure 1-1, where research variables



Accordingly, the research hypotheses could be formulated as follows:

- H1:** Knowledge management has positive significant relationship with performance of SME'S in Egypt.  
**H01:** Knowledge conversion has positive significant relationship with performance of SME'S in Egypt.  
**H02:** Knowledge transfer has positive significant relationship with performance of SME'S in Egypt.

**H03:** Knowledge application has positive significant relationship with performance of SME'S in Egypt.

**H2:** Gamification moderate the relationship between knowledge management and performance of SME'S in Egypt.

The specific objectives of the research are as follows:

- To develop a new KM model that enables ideas and suggestions of employees to be captured and shared, and deals with creating value from SMES operations. The KM model will provide practical help to firms for taking the first step into applying new KMSs and improving their existing systems. The proposed KM model formulates a strategic framework to develop and apply KM in SMES. This model will also help SMES to identify what knowledge is important for their performance, where it can be found, and how it can be shared among employees or stored in the KMS repositories for future reuse.
- To propose gamification as a tool for motivating employees' for knowledge conversion sharing and application. Lately , gamification attracted a lot of interest, in research (Reiners and Wood, 2015) and business circles (Narayanan, 2014), which shed light to its multiple implementations in many areas, covering banking (Rodrigues *et al.*, 2014) and tourism (Negruşa *et al.*, 2015).
- To provide recommendations for the future development of KM implementation and application in SMES in Egypt.

### Conclusion

The main aim of this paper was to give a contribution to increase the body of knowledge in the field of KM in SMEs while moderating gamification. Through a literature review, three research questions were identified:

- What are the main activities of knowledge management ?
- What is the relationship between knowledge management and performance of SME'S in Egypt ?
- To what extent does the relationship knowledge management and performance of SME'S in Egypt vary according to gamification?
- What are the main benefits of the application of gamification technique in SMES?

Preliminary results show that we are witnessing an evolving process. Today, SMEs progressively have adopted knowledge management systems , which rely mainly on human factor to achieve required performance level as a first step to attain competitive advantage However, even today, SMEs do not exploit all the opportunities offered by new technologies. In the coming years, overcoming this gap could minimize the distance between SMEs and large companies in the field of knowledge management. Which lead the researcher to introduce the usage of gamification as an intensive tool to encourage employees to adopt and transfer knowledge management in SMES. The hypothesis proposed to fulfill research objectives earlier in the article seem to hold, in the face of the proof found in favor of them. The gamification technique seems to offer a sense of positive support to the users in the desired direction that can be governed by the

system developers. Gamification similarly has been used to increase the motivation for employees. It can be used as a user engagement tool, to use when the employees are working on new and unfamiliar projects. Moreover It will work as an effective way to manage the business changes.

### Limitations

Research in gamification is limited as a new field. Although gamification is a promising area, no enough research is yet available on the best practices of utilizing it through SMES various operations. This leaves the research exposed to critique mainly as the gamifying methods are still being amended and modified. Empirical research in this area would permit the current research to have a more potential impact in the future to ascertain that the gamification in knowledge management field would indeed provide the said benefits.

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