

# I rather share my knowledge

## Applying gamification approach and nudge theory to develop an incentive system

Gamification  
approach and  
nudge theory

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### Abstract

**Purpose** – This paper aims to propose an approach by understanding how Oil Industries' Commissioning and Operation Company (OICO) company fostered its knowledge sharing (KS) by using gamification approach and nudge theory. It also ascertains the process and challenges that OICO confronted during its three-year journey for improving its organizational knowledge performance.

**Design/methodology/approach** – The study used a qualitative research method and case study design. Data were collected from several sources, including the first-hand experiences and observations of the author during contributing in the company's canonical action research, several in-depth face-to-face interviews conducted with the KM Department team members, the data gathered from the company's KM software and studying the related organizational procedures and documents.

**Findings** – The results reveal that the gamification approach suits for developing KS reward system and knowledge performance management. It also explains that informing project managers about their project's knowledge performance accompanied by emoticons would lead to higher supports of KM. The proposed approach by this case study improved the organizational KS and performance by 22 per cent semi-annually.

**Practical implications** – The described case is detailed deeply and would help KMers to follow it easily. The study would spark some ideas of how to use nudge theory in KM context. Besides, KMers can design a KM reward system based on the explained case.

**Originality/value** – This study contributes to the KS and KM rewarding system, especially in project-based organizations, as limited studies have been conducted to investigate the roles that the gamification approach can play in this field. Moreover, this is the first time that use of nudge theory and choice architecture is investigated in the context of KM.

**Keywords** Knowledge sharing, Choice architecture, Knowledge management, Gamification, Canonical action research, Nudge theory, Reward system, Case study

**Paper type** Case study

### Introduction

Undisputedly, knowledge is one of the most significant organizational resources that in the past two decades has drawn attention as an organizational competitive advantage (Gelard *et al.*, 2014; Philsoophian *et al.*, 2016), and hence, it is worthy to be managed and shared effectively. Organizations can derive several benefits from well-established knowledge-sharing (KS) practices, such as human resource improvement (Malik and Kanwal, 2018), market development and penetration, improving management–employee relations, individual, workgroup and organizational performance and productivity improvement, and enhancing organizational learning and innovation (Connelly and Kelloway, 2003; Tohidinia



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and Mosakhani, 2010). While KS can result in many organizational improvements, lack of KS can make severe issues for organizations (Lin, 2008).

KS is one of the crucial and most challenging processes of knowledge management (KM). The main reason is that KS is a multifaceted construct that its occurrence is influenced by lots of factors, such as the nature of shared knowledge (Arpaci and Balo, 2016), people motivation to share their knowledge (Suder *et al.*, 2017), attitudes and intentions (Dehghani *et al.*, 2015), opportunities to share (Ipe, 2003), culture (Foss *et al.*, 2010), psychological aspects (Afshar-Jalili and Ghaleh, 2018) and behavioral aspects (Hsien *et al.*, 2014).

Moreover, KS will not happen if people do not tend to share their knowledge with their colleagues or other workgroup members. Davenport and Prusak (1998) claimed that keeping knowledge for themselves is a natural tendency. Therefore, managers still have difficulties to enforce people sharing their knowledge (Chow and Chan, 2008), while enhancing employees' propensity to share their knowledge is recognized as a high priority of organizational obsession in the knowledge economy. Considering that KS is a discretionary behavior, managers cannot force people to do that, and, ultimately, employees decide for themselves to what extent they share or hide their knowledge (Serenko and Bonits, 2016; Friedrich *et al.*, 2019). Hence, it is required that managers change the environment into a situation in which people freely choose, by their autonomy, to share their knowledge. *Nudge theory* and *gamification* are two approaches that can be used in this context.

The potential of gamification for motivating people to share their knowledge has been recognized by a growing amount of studies conducted in recent years (Kwon *et al.*, 2015; Swacha, 2015; Silic and Back, 2017). The scientific literature mainly contains theoretical papers, but investigating the long-term effects of gamification in the context of corporate KM is still rare (Friedrich *et al.*, 2019). On the other hand, *nudge management* and *nudge theory* have drawn the attention of management researchers recently. A review of the literature exposes that a nudge in the sense of applying choice architecture to push people to select desired behavior works well (Cai, 2019). Although *nudge theory* offers a new exciting approach to improve KS (Ebert and Wolfgang, 2017), this Nobel prize winner theory and its associated concept, *choice architecture*, is not considered properly in KM literature.

To close the mentioned literature gaps, this case study intends to answer two main questions including:

- Q1. How can *nudge theory* and *gamification* improve employees' tendency to share their knowledge in an actual environment?
- Q2. How *gamification* and *nudge theory* can be used as a part of a knowledge performance and reward system?

Hence, this paper offers a detailed case study of how Oil Industries' Commissioning and Operation Company (OICO) employed *nudge theory* as well as *gamification* to foster its employees' collaboration and participation in KS practices.

This paper would contribute to knowledge in three ways. First, this is the first study conducted using *nudge theory* in the knowledge management field. Besides, this is the first research combined the two concepts of *gamification* and *nudging*, which can be used for directing people behavior. And, finally, only limited number of studies have investigated the results of *gamification* in a real context. This case study addresses the mentioned literature deficiency as its contribution.

The findings of this study would help researchers to develop conceptual frameworks, employing *nudge theory* and *gamification* and examine them in empirical studies. Moreover,

managers can be benefitted by the results of this case study, as a benchmark, to develop a mechanism for enhancing their employees' KS behavior.

### Context of the study, Oil Industries' Commissioning and Operation company

OICO was established in 2011, as a private joint-stock company in Iran, to manage and execute commissioning and startup, operation, maintenance and training courses for oil, gas and petrochemical industries. Although OICO is quite a new established company, it plays vital roles in more than 15 Iranian Oil and Gas mega-projects. OICO's vision is to become one of the leading oil and gas companies in the field of pre-commissioning and commissioning in the region (Middle East), relying on a custom-made methodology.

The unique and human resource-intensive nature of OICO's business necessitates special attention and considerable investment in the area of knowledge management and human resources development. To maintain its leadership in the market, OICO has invested extensively in developing and maintaining a qualified and skillful resource pool. Therefore, growth and sustainability of OICO strongly depend on implementing successful knowledge management solutions to acquire, produce and re-use required knowledge by the aim of improving the chance of repetition of successful experience and decrease the risk of repetition of failures.

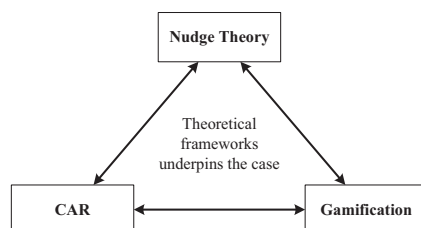
Because of the importance of KM, OICO organized a KM Department (KMD) to diagnose knowledge gaps and design, implement and develop KM solution through the organization to bridge them creatively. An outstanding solution that developed by the department is Knowledge Appraisal/Reward system which is explained by this case study.

### Underpinning theoretical frameworks

Illustrated by [Figure 1](#), this case study consists of three theoretical building blocks, comprising canonical action research (CAR), nudge theory and choice architecture, and gamification. Following, the theoretical background of these building blocks is described ([Figure 1](#)).

#### *Canonical action research, the underlined approach for improvement*

For improving KS participation and knowledge performance, action research (AR) approach is chosen by KMD. AR is a systematic approach for investigating, which enables people to effectively tackle problems they encounter in their daily lives. AR provides the instruments by which organizations may improve their productivity ([Stringer, 2007](#)). Because of the popularity of AR in solving organizational problems, several forms of AR have been developed to date ([Chiasson et al., 2008](#)). All AR forms are shaped to both solve organizational problems and contribute actively to scholarly knowledge ([Avison et al., 1999](#)). However, KMD interested in the canonical form, also known as CAR, is characterized first



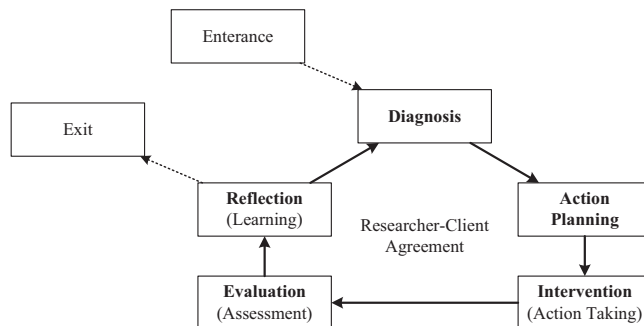
**Figure 1.**  
The underpinning  
theoretical  
framework

Figure 1 illustrates the mentioned procedure which is applied by KMD. Depicted in the figure, problems regarding KS were diagnosed and proper actions were planned. Then, the planned actions were taken and the results were assessed. Finally, the learning points of performing the planned actions were extracted in the “reflection” stage. This process helped KMD to diagnose its KS problems and tackle them effectively. Therefore, this case study is described based on the above-illustrated process.

Thaler and Sunstein (2008) first coined the terms nudge and choice architecture in their book, entitled “Nudge: improving decisions about health, wealth and happiness.” They defined “nudge” as “any aspect of the choice architecture that alters people’s behavior in a predictable way without forbidding any options [ . . . ] Nudge are not mandates. Putting fruit at eye level [hoping that people then choose fruit over unhealthy alternatives] counts as a nudge. Banning junk food does not” (Thaler and Sunstein, 2008: p. 6).

Furthermore, [Ebert and Wolfgang \(2017\)](#) claimed that nudge management proposes a new exciting opportunity for improving knowledge worker productivity. Despite the advantages of nudge theory in steering organizational and behavioral changes ([Pickler, 2019](#)), there was no literature background investigating its appliance in KM context. Considering the capacities of the theory, KMD relied on most of its efforts to apply nudge theory and emphasize the importance of architecting the choices rather than forcing people to share their knowledge.

Gamification is a new term with different existing definitions. [Deterding \*et al.\* \(2011\)](#) defined it as “the use of game design elements in non-game context.” A potential goal of



**Sources:** Based on Davison *et al.*, (2004); Susman and Evered (1978)

gamification is “serving a business purpose,” and fulfilling a business purpose (Zichermann and Linder, 2013: p. 51). Because of the effectiveness of gamification on directing behavioral change (Matallaoui *et al.*, 2015), it has received abundant attention from KM researchers in the last few years (Shpakova *et al.*, 2017; Silic and Back, 2017; Suh and Wagner, 2017).

There are some common game mechanics described as following that may strongly affect the employee’s motivation for changing their behavior (Hamari and Eranti, 2011):

- points, which are used for rewarding participants;
- leader-boards, which provide participants to compare themselves to others;
- levels, which can be integrated by a badge system, play the role of indicators that reveal the participant’s activity; and
- achievement systems, which include tasks toward goals in an achievement/reward system.

Moreover, gamification designers should target and satisfy the common desires of the participants. Some of these desires are as follows (Matallaoui *et al.*, 2015; Friedrich *et al.*, 2019):

- rewards which are given to people after conducting a determined behavior to enforce them to repeat it;
- status for encouraging people to engage in activities by gaining a desire prestige alongside respect of others;
- achievement which fulfills the need of accomplishing a given task. Because of this need, people tend to create repeatedly new challenges by setting new achievable goals to reach;
- self-expression enables people to depict that they are unique and distinguished; and
- competitions which helps people to be motivated intrinsically by comparing their achievements and themselves with others.

### *Gamification and nudge theory*

Nudging is about helping people to behave properly that they would select if they were better-disciplined and better-informed. Gamification has the same powerful effect on people behavior. The same as nudging, gamification can lead people to behave more productive. The same as nudging, gamification enabled people to make a better choice by its mechanisms and desires. Indeed, gamification and nudging are two sides of the same coin (Dorscheidt, 2015).

As an example which has been combining nudging and gamification since 1959 is Holle Bolle Gijs (HBG) in a fairytale-theme park in The Netherlands. This HBG is bin gathers waste materials. Whenever kids put their wastes in its mouth, it says “thank you.” Children are nudged and excited to put more wastes. It eats about 460,000 kg of waste materials in a year (Dorscheidt, 2015). This is a sample of how gamification acts as a nudge for selecting better behavior. Therefore, combining and using nudging and gamification for directing behavior is quite a new way of thinking that includes opportunities wherever changing behavior is considered. The case, OICO company, investigated in this study is one of the first that has employed nudging and gamification systematically, based on the CAR framework, in knowledge management context to foster organizational KS.

## Research methodology

As there is no established theoretical framework explaining the integration of *nudge* theory and *gamification*, the case study strategy is selected for this study. The case study is a qualitative strategy of conducting research, by which a specific contemporary phenomenon is empirically investigated within its real-life context (Yin, 2018). By this strategy, which is suitable for exploratory studies, the researcher explores in-depth an activity or event over a determined period (Stake, 1995).

This study intends to investigate the “how” research questions, mentioned in the “Introduction” section, in a contemporary case. Yin (2018) claimed that “the more that your questions seek to explain some contemporary circumstances (e.g. “how” or “why” some social phenomenon works), the more the case study research will be relevant.” Therefore, the case study allows the author to observe and analyze how *nudge theory* and *gamification* have been applied in the studied population as an approach for fostering inter-organizational KS.

In this study, the population is OICO company which is described at a glance in “Context of the study” section. The required data were gathered by the author by spending time as a participant and member of the built team in KM Department. Besides, some in-depth interviews were conducted with team members to validate the content of the case study. Furthermore, regarding the measurement of knowledge performance, data were gathered from KM software. Finally, OICO’s KM procedures, specifically those which are related to this work, were studied during the research. Analyzing these data, the following sections investigate the findings.

## Presentation of findings

This section presents the findings of the study. The first subsection explains “how OICO raised its employee’s intention to share their knowledge?” as well as “how it applied gamification as part of its knowledge performance and reward system?” Next, the application of “nudge theory” and the way it is applied to enhance project managers’ KM support are described. CAR was the method used by KMD to address its KS problems. Therefore, in the following subsections, all the cases were demonstrated based on CAR process, including “diagnosis,” “action planning,” “action taking,” “evaluation,” and “learning,” which is expounded in “Underpinning theoretical frameworks” section.

### *The developed knowledge appraisal/reward system*

**Diagnosis:** In the first stage of the CAR process, KMD identified the reasons for the low rate of employees’ participation, especially in OICO’s projects where the critical lessons are generated. After holding several meetings, KMD introduced the absence of a knowledge appraisal system as the main reason for low rate KS in the organization. To triangulate this finding, a parallel investigation by interviewing random-chosen employees was conducted, which validated the diagnosed factor. Finally, a researcher–client agreement signed for escalating the conduction of the program in 2015.

**Action planning:** Gamification approach is chosen for shaping the platform of the knowledge appraisal/reward solution. Based on the concept of gamification described in the previous section, the system was designed by the help of a committee constituted of the representatives of KM and HR Departments. The considerations are detailed in Table I.

According to the diagnosed problem hindering KS participations, and the necessity of defining “achievements” described in Table I, the following knowledge behaviors (KBs) were determined by the collaboration of KM and HR Departments. Table II details the KBs and their descriptions.



**Table I.**  
Designing the KA/R  
system

Gamification mechanics and desires	Devised solutions
Achievements	Expected knowledge behaviors (KB) as the tasks that should be done by employees were defined; 14 behaviors were determined as KBs, listed in <a href="#">Table II</a> , which lead to added value for OICO
Points	Points were assigned to each determined KB. Accordingly, people by performing the determined KBs can gain related points Reporting the gained points in a semi-annually period in three different categories comprising individuals, units/projects and the organization, as part of the knowledge appraisal system by KMD Each individual has access to his/her knowledge performance whenever the report is issued
Levels	Ten levels are defined as the KA/R leveling system. Each individual can join to each level only if he/she gains the minimum required points identified for the levels
Leader-board	In the period of reporting, based on the accumulative points gained by individuals, a one-page report is issued which introduces top-performance knowledge workers
Competition	The knowledge performance report is accessible in OICO's internal portal that people can compare their performance with their colleagues Likewise, managers can compare the knowledge performance of their units with others
Self-expression and status	By joining the levels based on the gained points, each individual can be benefitted by the recognitions determined for each level, which is detailed in <a href="#">Table III</a>
Reward	Over 20% of the organizational members were interviewed to address "what kinds of rewards would motivate you to participate further in determined behaviors?" Collected answers were discussed in the committee and the reward systems developed. Based on this system, every individual by gaining accumulative points for conducting KBs can join into a determined level, which in turn can be benefitted by the several rewards identified for each level (detailed in <a href="#">Table III</a> )

Moreover, for designing the KA/R system, ten levels including minimum points to join as well as related rewards and recognition were developed, which are depicted in [Table III](#).

*Action taking (intervention):* For implementing the designed KA/R system in OICO, the following activities were performed:

- *Selecting a pilot:* Examining the effectiveness of the designed KA/R system, KMD decided to choose a pilot involving in a critical knowledge area. Eventually, the process discipline of a development gas field mega-project in South-Pars Gas Field was chosen to implement the KA/R system as a pilot.
- *Creating awareness:* All the people employed in the pilot were educated about the concept of KM, implemented lessons learned the process as well as KA/R system elements including determined KBs, the way they can earn points, and identified rewards and recognitions. This training program was planned for 3 h.
- *Promoting the KA/R system:* A one-page pamphlet was prepared by KMD and distributed to all the pilot members for encouraging them to participate.
- *Rewarding publicly:* After six months, the collected points of people accounted and publicly rewarded based on the defined levels. Likewise, the top knowledge performers were introduced in provided leader-board.

**Table II.**  
Determined  
knowledge behaviors  
(achievements)

Knowledge behavior	Description
Submitting lessons learned	Submitting a lesson learned in the approved format of KM Department
Suggesting an improving idea	Suggesting ideas by which the organizational services or processes are improved
Evaluating registered ideas/lessons learned	Assessing and evaluating technically the content of registered ideas or lessons to ensure whether they are applicable and worthy enough to be learned
Performing the assigned actions to each approved lesson	Actions should be assigned to all the approved lesson to be learned and make changes throughout the organization. OICO encourages employees who perform the assigned actions to each lesson
Authoring article	Submitting an article in a conference or a scientific journal related to OICO's critical knowledge areas that contribute effectively
Authoring/translating book	Authoring or translating books related to OICO's critical knowledge areas
Teaching as an internal instructor	Teaching a short-term training program which has been arranged by the Training Department
Creating/revising a procedural knowledge	Engaging in development, creation or amendment of a procedural knowledge
Designing and developing an innovative tool or technique	Addressing organizational technical problems by designing and developing an innovative tool or technique
Storytelling	Participating in a storytelling section and presenting a registered lesson which is approved and evaluated by field experts
Developing video/audio teaching content	Developing a corporate video-sharing system similar to YouTube, OICO encourages knowledge sharing, specifically lessons exchange, in the format of video/audio
Recognizing as a top participant in training courses	Training Department introduces three top participants in each training program
Blogging	Blogging about the topics which are related to OICO's services
Participating in a CoP	Participating in knowledge creation as a member of a community of practice
Participating in research projects	Participating in a research project by which organizational problems are tackled

- *Improving the KA/R system:* Based on the results and findings, the system was altered to be generalized in all OICO's projects.
- *Generalizing:* The same procedure, including the training program, was conducted by KMD to generalize the application of the KA/R system throughout the organization.

*Evaluation (assessment):* Implementing the KA/R system improves knowledge performance and KS in OICO by the increasing rate of 17 per cent in each period of assessing. The total knowledge performance of each individual is the accumulative score that one can get by conducting each determined KB. Correspondingly, the total knowledge performance of the company is the summaries of each individual's performance during per period of assessment, six months.

*Learning (reflection):* it is an indisputable fact that there are learning opportunities in each activity while designed and applied for the first time. Hence, KMD has the following learning that can be taken into account:

- Determined KBs focused further on knowledge sharing, and knowledge receiving was neglected while absorbing knowledge is as important as knowledge sharing (Ayoubi *et al.*, 2017).



Level	Minimum points to join	Rewards and recognitions
1	5 points	\$50 cash 5 h accounted for overtime
2	15 points	\$120 cash Cinema tickets (2 persons)
3	30 points	\$170 cash Theater tickets (2 persons) Book purchasing bonus
4	50 points	\$240 cash Concert tickets (2 persons) Book purchasing bonus
5	75 points	\$330 cash Recognition letter related to Vice President Book purchasing bonus Financial support for attending a local conference or training program Financial aid for sport activities
6	120 points	\$360 cash Recognition letter from CEO Financial aim for a trip (2 persons) Three days leave incentive Financial aid for sport activities
7	180 points	\$480 cash Recognizing as a knowledge worker in the annual ceremony of the company Financial aim for a trip (2 persons) Three days leave incentive \$1200 loan opportunity
8	250 points	\$720 cash Recognizing as a knowledge worker in the annual ceremony of the company Financial aim for a trip (2 persons) Five days leave incentive \$3550 loan opportunity
9	350 points	\$1200 cash Recognizing as a knowledge worker in the annual ceremony of the company Recognition letter from board members Financial supporting for attending an international conference abroad
10	500 points	\$1200 cash Recognizing as a knowledge worker in the annual ceremony of the company Recognition letter from board members Promotion opportunity Financial supporting for attending an international conference abroad accompany with the spouse \$240 monthly payment Awarding as a knowledge memorable person

**Table III.**  
Levels, minimum  
points, and rewards  
and recognitions

- In the first version of KBs, there were no points for whom initiating KM solutions (e.g. AAR and peer assist) in their workplace. Adding this behavior to the list, it was encouraged and more people participated in developing KM solutions.
- Setting cut points as the minimum requirement for joining the levels in KA/R systems, an essential theory that should be considered is “Flow Theory,” which was

coined by Csikszentmihalyi (2008). According to this theory, people may do a repetitive task enjoyably even at great cost, for the sheer sake of doing it, only if not getting bored, on the one hand, and not feeling anxious, on the other hand (Matalaoui *et al.*, 2017).

- Improving the productivity of OICO, knowledge performance should be considered as part of the organizational performance measurement system. Managing knowledge performance separately may promote the message that “KM is something separate than the ordinary tasks.”
- Some people may not care about their knowledge performance. For addressing this issue, KMDs report the individual knowledge performance to their direct supervisors and ask them to provide a plan for improving their performance.

The implemented KA/R system, described as above, is a sample of choice architecting. People have their autonomy whether to participate in KBs. However, they may lose some benefits by not involving in KBs. That is exactly what choice architecture follows, changing behaviors by the use of libertarian paternalism.

#### *Smiles, frowns and increasing knowledge sharing*

*Diagnose:* After implementing the KA/R systems, KMD confronted a new problem which was the insufficient support of project managers. For dealing with this issue, KMD decided to inform them semi-annually about their project knowledge performance and the average performance of the organization. However, the results did not meet the expectations. Project managers with their project’s knowledge performance above the average, as soon as they were informed about their high performance, depleted their supports on KM and moved their focus on current issues of their projects.

*Action planning and action taking:* Addressing the diagnosed problem, maintaining project managers support, KMD benchmarking an applied social nudge declared in the case study of San Marcos, CA about saving energy (described by Thaler and Sunstein, 2008). KMD decided to inform the project managers about their unit’s knowledge performance and organizational average performance, but instead of just announcing the average, the information was accompanied by a happy or unhappy “emoticon,” such as Figures 3 and 4. Project managers with the performance of higher than the average receive the happy card, which is hatched by green, attached with a report of their performance. Conversely, managers with below-average performance receive the unhappy card hatched by red.

*Evaluation (assessment):* After two semi-annual reports, the organizational knowledge performance rate increased from 17 to 22 per cent. The result reveals that sending the report including the emoticons was successful in enhancing project managers’ support, which means that the designed social nudge worked.

*Learning (reflection):* the learning items of implementing the described social nudge are listed as follows:

- One of the important learning points is that if you want to nudge people into behavior, do not let them know that their performances are better than the social norms. This finding is called the boomerang effect (Thaler and Sunstein, 2008).
- When above-average project managers received the happy emoticon, the boomerang effect disappeared, and, in turn, they retained their knowledge performance level and, in some cases, they had significant progress.
- Receiving the unhappy emoticon, the below-average knowledge performers put further effort to improve their performance.



**Well Done! Your project's knowledge  
performance is above the average.**

**Figure 3.**  
The happy emoticon

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**Sadly, your project's knowledge  
Performance is below the average.**

**Figure 4.**  
The unhappy  
emoticon

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- Considering the successful result of the social nudge, KMD decided to generalize the experience into all operational managers and supervisors.

### Discussion and conclusion

KS is a human-centric process, which means people decide to what extent share or hide their knowledge (Afshar-Jalili and Ghaleh, 2018). Therefore, managers need to provide a supportive environment to encourage people to share their knowledge. Making such an environment requires productively using *nudge theory* and *gamification*. By integrating these theories, people select to share their knowledge based on their judgments without any external forces (Smith and Toprakkiran, 2019). However, there is a literature gap that this

study tried to bridge it. Although the importance of *gamification* and *nudge theory* in directing people behavior has been interpreted, no research has investigated these concepts together in the KM domain. Therefore, this study investigated how these two concepts, *nudging* and *gamification*, can be used to improve organizational knowledge sharing? and how the mentioned concepts can be used in a real experience as a knowledge performance and award system? Considering that there is no defined theoretical framework addressing the stated “how” questions, this study used a case study research method. Based on this exploratory strategy, OICO company was investigated as population.

First, *gamification* was used in the context of knowledge appraisal/reward system, also referred to as KA/R. OICO's KM Department develops KA/R system based on gamification mechanics and desires, which are achievements, points, levels, leaderboards, competition, self-expression and reward. Effectively applying these rules, all the expected KBs were defined in the company. Points were assigned to each behavior, and hence, individuals can earn points by conducting determined KBs. By the accumulative points earned semi-annually, they can join to a performance level based on the defined minimum requirements. Several benefits including rewards and recognitions are guaranteed by joining to each level. The findings reveal that the described case gains 17 per cent growth in organizational knowledge performance score. The score is the sum of the individual accumulative scores gained semi-annually. Considering that KA/R underpins by *gamification* approach, it can be induced that this approach is proper for fostering KS. The outcomes of similar studies in recent years acknowledge the potential of gamification to encourage people for KS (Friedrich et al., 2019).

Next, *nudging* was used for enhancing the KA/R system developed based on the *gamification*. For this aim, OICO's KM team used a *smile* or *frown* pictures attached to the reports sent to the project managers. Respectively, project managers with performance above the average received happy emoticon and others who placed below the average gained the frown emoticon. Results exposed that, in project managers who received the smile emoticon with their high-performance report, the boomerang effect disappeared and they were encouraged to select more support of KM activities in their department. Besides, findings postulated that the *nudging* positively affected the KM supports in managerial level. Simply said, the study asserted that informing project managers about their project's knowledge performance accompanied with happy and unhappy emoticons, as a social nudge, would lead to enhancing their KM supports, which, in turn, increases organizational KS and performance.

The primary limitation of this research is that qualitative approaches such as case studies may limit the generalizability and applicability to other settings (Edwards and Belanger, 2008). However, it is also a strength because contextualized and detailed insights (Yin, 2018) are provided into a unique set of practices using *nudging* and *gamification* approaches in the KM domain. Therefore, as a recommendation for future research, *nudging* and *gamification* should be examined quantitatively for enhancing the generalizability of the study. Additionally, considering that *nudging* is quite new in management literature, there are abundant research opportunities that can be taken into account for future studies. Besides, *nudges* may need to be designed variously depending on different organizational culture, and hence, the generalizability of nudges should be assessed. Finally, qualitative research can be conducted for determining possible *nudging* practices.

The contribution made to the existing body of literature is integrating two new developed concepts, *nudging* and *gamification*, in KM field, which was successful in increasing KS participation. Besides, this is the first study investigating the feasibility of *nudging* in a knowledge management practice. Furthermore, this research detailed the usage of the mentioned approaches as a practical guide for managers to follow in their organizations.

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