

Enhancing Digital Congkak with Rewards

Noraziah ChePa, Wan Ahmad Jaafar Wan Yahaya, Nur Intan Syafiqah Abdullah

Abstract: Realizing that traditional games are nearly forgotten and going extinct, effort has been made to digitize the original versions. One of them is the traditional Congkak. Although many digital versions of Congkak are available on different platforms, none has incorporated rewards as one of the features. This study focuses on incorporating rewards in digital Congkak. Experiments were conducted involving 40 gamers among the millennials. The enhanced digital Congkak and self-administered questionnaire were used as the tools in the experiment. Findings suggested that rewards have enhanced the game, managed to attract players to play and keep playing, hence making the game stand out from the crowd.

Index Terms: Digital Congkak, digital games, game rewards, games engagement.

I. INTRODUCTION

Many parties have realized that traditional games are going extinct due to many factors. Young generations are more attracted to modern games compared to the traditional ones. Doughty (2015) claimed that traditional games like card games are dying out because of the dominance of computer games, the rise of computers and social media. Hence, efforts are made to attract young generations with the intention to preserve, cultivate, conserve and protect national heritage by digitizing the games. Study conducted by Ruiz et al (2009) has explored several of traditional games as an inspiration to convert it into modern computer games. By conducted an experiment they found out that evolution of traditional games into digital games is more acceptable to millennials.

Despite the hard works of promoting and preserving the digital version of traditional games, these efforts are yet to success. This genre of games losing their appeal among young generations. They are yet to get attracted and engaged to it due to the dominance of modern contemporary games (ChePa & Yahaya, 2017; ChePa, Bakar & Mohd, 2015; Doughty, 2015). Digital traditional games have its lacking that can attract player's attention. One of it is reward in games. Based on the issues discussed, efforts are needed to enhance digital traditional games with rewards. Therefore, this article discusses the effort of enhancing Congkak, one of popular digital traditional games.

Revised Manuscript Received on February 05, 2019.

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Rewards are incorporated in its gameplay, towards improving players engagement. This article is organized as follows; Section II discusses various versions of digital Congkak. Rewards and examples of current scenarios of rewards are covered in Section III. Methods of enhancing digital Congkak are presented and thoroughly discussed in Section IV and V. Finally, conclusion and discussions are covered in Section VI.

II. DIGITAL CONGKAK

Congkak is originated from 'Congak' which means counting in the old Malay language. It is a Malaysian cultural game used to be played by women during ancient times. Known as a game of strategy, it is played by two players; each player will have seven holes in a row with one large hole at their left end respectively called home or *storehome*. Each hole will consist of seven balls, often made of pebbles, tamarind seeds or even shells. It involves counters or pieces being moved on a surface or board according to a set of rules. Unlike chess or checkers, Congkak board game refers to the holes being housed on a wooden board (ChePa et al., 2013).

To play the game, each player will start simultaneously and will move to their left (clockwise) while depositing one pebble in each hole including the storehouse (same move rule applied) until both had ended their turn. The last player who ended their turn last will go first in the next turn. The endgame is reached whenever a player had the entire holes on his side empty. Both players will count the total pebbles collected in their storehouse. Player with the highest number of pebbles wins, and player who lose will start first in the next round. To start the next round, both players will fill back their empty holes with pebbles from their storehouse. The players must do it from the left to the right hole (on their side), and each hole must be filled with exactly seven pebbles and the remainder will be stored in the storehouse. A non-filled hole is considered burnt and will be ignored during game (this is called burnt house rule). The burnt house rules allow the losing player to reclaim pebbles from their opponent in next round (Yaakub, 1981).

Congkak has evolved since the day it was played, starting on the ground, moved to a board, running on a standalone machine and the latest version is running on mobile platform. Traditionally, the game was played by digging up holes on the ground. As it evolved, people used a wooden board mimicking the holes on the ground. Digital versions of it are then develop and being played on a machine as the outcome of game preservation.



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Today, various versions of digital Congkak have been developed and available on Internet. Figure 1 shows some versions of it.

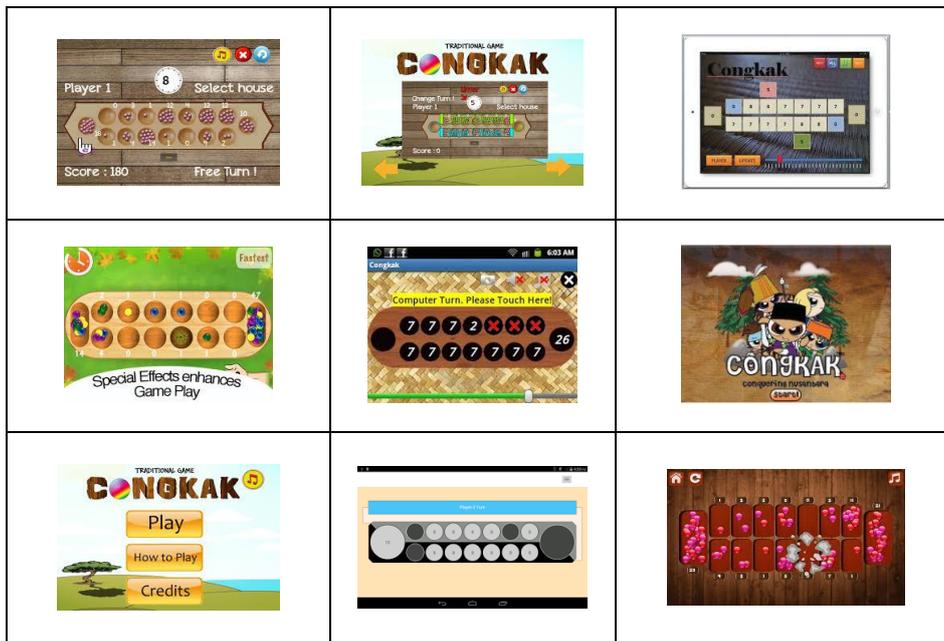


Fig. 1 Various versions of digital Congkak

Among recent Congkak that have been successfully developed are the ones developed by Mohamad et al. (2016); Shamsul (2015), and Congkak Master developed by Media and Game Innovation Centre of Excellence of Universiti Teknologi Malaysia.

Mohamad et al. (2016) have developed and described their digital Congkak style based on Malay Warriors icons on a field study with the aim of characterizing a promising application field for Human Computer Interaction (HCI). Their Congkak described featured characters and cultural traditional Congkak style using multimedia and animation. The most popular Congkak which has been highly downloaded is developed by Shamsul (2015). With simple interfaces and gameplay, it managed to attract many downloaders. Another effort in making Congkak interesting is the experiment by ChePa et al. (2013) which incorporated Artificial Intelligence (AI) technique in the engine of Congkak.

Although many versions of Congkak were developed, none of them has incorporated rewards, despite its importance. According to Wang and Sun (2011), rewards can motivate and encourage player to interact with digital games, as successfully implemented in contemporary digital games such as Pokemon Go and Candy Crush.

III. GAMES REWARD

Rewards are defined as something resulting from some event or action. Rewards also can be seen as something given in recognition of one's effort or achievement.

In games context, rewards are given when players achieved certain level of difficulty of games. It serves as an incentive to player to keep them playing and giving them assistance to solve tougher levels. For example, rewards are provided in Candy Crush when players reached certain levels. Rewards provided are in weapon form to assist players in facing challenges at tougher levels. Rewards and incentives are considered as a crucial piece in games engagements. With proper and thoughtful design, incentive and reward programs can be very effective in providing optimal motivations for driving engagement. Players are assisted to deal with the twelve games characteristics especially when dealing with their ego gratification in winning. Rewards are important in motivating, assisting and act as a pulling factor to keep players playing, thus make them engaged.

In digital games, reward system is one of the features that can get players engaged. According to Wang and Sun (2011), rewards system will provide players with the positive experience while engaging with various video games which they individuated eight kinds of rewards. They listed eight form of rewards in digital games; score systems, players control developable avatars by using experience point rewards system, item grating system rewards, resources that affect gameplay, achievement system, feedback message, plot animations and pictures, and unlocking mechanisms.



Fig. 2 Various types of rewards in contemporary games

Reward system in digital games can also be as motivators for the player when compromises for easing disappointment. In various video games environments, rewards can encourage player to keep engage with the games. In digital games design, understanding and incorporating effective rewards are common approaches in games that can be driven by theories, motivation and incentives (Siu & Riedl, 2016).

Many scholars have listed and defined reward systems in various ways. Philips et al. (2013) listed four categories in rewards duration system; timed rewards, transient rewards, permanent rewards and consumable rewards. Those durational characteristics rewards system are relevant to all types of reward. Study conducted by Amon (2016) listed rewards into three classes; enabling rewards, exchangeable rewards and subjective rewards. First class of rewards enables player to have privileges and added new skills in their games in order to making progress in the game. While the second class is to exchange goods from other player and get advantages from it. In games, rewards can be scheduled in four different types; Fixed ratio schedule, variable ratio schedule, fixed interval schedule, and variable interval schedule (J, 2016). This schedule types have been successfully applied in popular games like Candy Crush.

IV. THE ENHANCED DIGITAL CONGKAK

There are three main phases involved in enhancing the digital congkak; analysis and design, Congkak redevelopment, and evaluation.

Analysis and Design

Several versions of digital congkak which are available on the Internet have been thoroughly studied. Elements that have been focused on are the games flow, interface and navigation, features of Congkak, added values included in the games compared to its original version, and the most important aspects are the drawbacks of the game that need to be improved. Due to its popularity shown through the download rate and positive comments given by the gamers, a version developed by Shamsul (2015) which is available on Google Play is chosen to be enhanced. At the moment, his Congkak have been downloaded and installed for more than 500 000 times.

Major drawbacks of the existing Congkak that have been identified are its gameplay which is based on Mancala (a board game which originated from South Africa that is similar to Congkak). It is played anti-clockwise, while original Congkak is played clockwise. Number of holes and pebbles in each hole are also not reflecting the original Congkak. No added values and special function included. Hence, this phase is focusing on re-designing Congkak by including rewards as one new feature. The idea of including rewards is adapted from some contemporary games such as Candy Crush, Fruit Ninja, and Pokemon Go.

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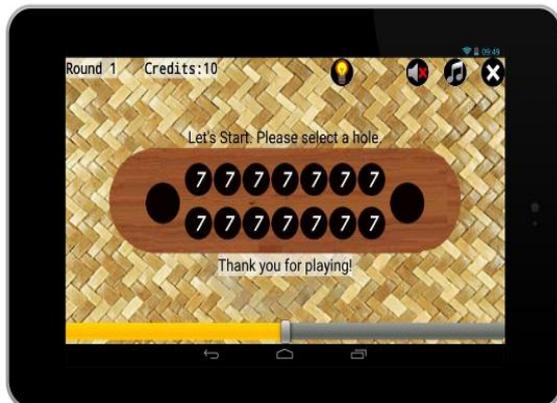
For Congkak, rewards are given in credit values that can be used throughout the game.

Congkak Redevelopment

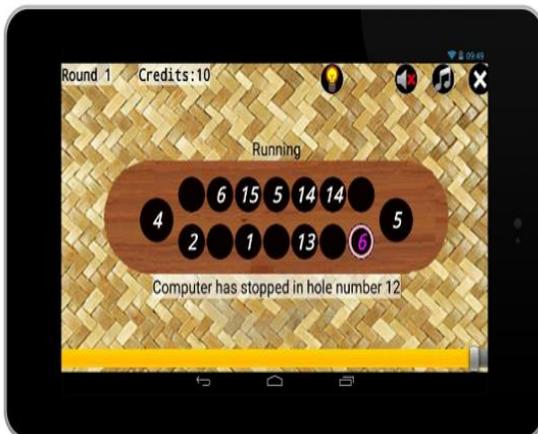
Main focus of this phase is redevelopment of the chosen Congkak by including rewards towards improving it, hence making it more attracted to young generations. With the cooperation with the original developer, an improved Android based Congkak has been redeveloped by including the new features designed in the previous phase. As a beginning, rewards are given in credit form. By default, 10 credit are given to start the game. The look of the improved Congkak with rewards are illustrated in Figure 3.



(a)



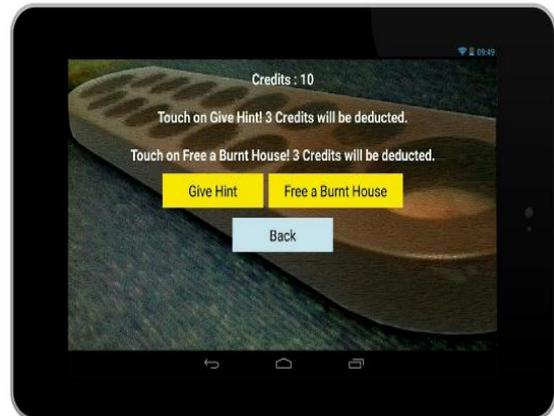
(b)



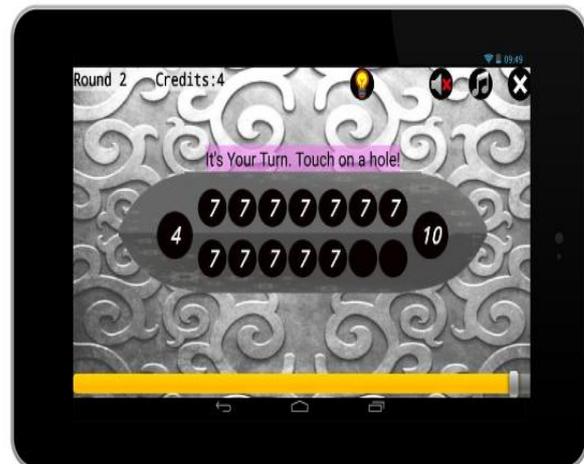
(c)

Fig. 3 The improved Congkak with rewards

As shown in Figure 3(a), to start the game in Round 1, 10 credits are given. Rewards can be used in two ways; 1) to buy hints which can be used to determine the best hole to continue the game and 2) to free or redeem burnt holes in the next round as shown in Figure 3(b). Buying hints will help players in making optimum move with longer round and collect more pebbles to fill up holes in the next round. Rewards can be collected if players win each round of the game. Rewards will be credited into player's account and can be used during the game or in the next round of the game.



(a)



(b)

Fig. 4 The use of rewards in the improved Congkak

Figure 4(a) shows three credits will be deducted from player's account everytime rewards are used. The updated credit is shown in the next round. In this case, the player has utilised 6 credits thus round 2 of the game will start with 4 credits left Figure 4(b). This player also didn't manage to secure enough pebbles in round 1 to fill up the holes. Two holes are burnt. These holes can be freed by using the left credits; three credits to free each hole. If the player chooses not to utilise the credits to free the burnt holes, this particular player will continue the game in round 2 with five holes, while the other two holes are burnt and not active.

Evaluation

Evaluation involved both verification (technical test) and validation (user test). Both tests are important in ensuring the enhanced Congkak works correctly as specified and accepted by the gamers. Technical test has been done with the developer in checking the calculation of the rewards. Series of tests have been conducted before the enhanced Congkak is ready to be tested by gamers.

Second part of testing involved combination of game demo, gameplay experience and interview. User tests have been carried out involving gamers which are among the millenials (age ranging between 14 – 34 years old, born between 1982 and 2003 and best known as Generation Y). This group of respondent is also known as the new “Great Generation” as they display ambition, confidence, optimism, and a capacity for high-level cooperative work (Wilson & Gerber, 2008). Table 1 shows demographic of the respondents.

Table. 1 Demographic of respondents

	Frequency	Percentage (%)
Age		
14 – 20 year old	5	12.5
21 – 29 year old	33	82.5
Above 30 year old	2	5
Gender		
Female	31	22.5
Male	9	77.5

Frequency playing game		
Below 1 hour	3	7.5
1 – 4 hour	30	75
More than 4 hour	7	17.5

User test began with demos of the enhanced Congkak, emphasizing on rewards element as a new feature that has been incorporated. Gamers then were giving chances to play, explore, experience and test the new feature. The last part was the survey which involved structured interviews with the gamers base on their game experience. Self-administered questionnaire used focusing on two main parts; gamers’ perception of rewards and the influence of rewards that get them hooked to the game.

V. FEEDBACK AND DISCUSSIONS

Feedbacks from validation (user test) have been analyzed quantitatively and qualitatively. There were three constructs used to measure gamer’s perception of rewards; C1 (importance of rewards in digital traditional games) and C2 (necessity of rewards in each level of digital traditional games), and C3 (necessity of rewards at difficult level of digital traditional games). Mean for the first two constructs are 4.275 and 4.325 respectively. This indicated that the gamers agree that rewards are important in playing games and needed at each level of the games. However, mean for C3 is 3.3 which indicated that rewards is needed not only at difficult levels. Figure 5 shows mean for all six constructs that have been tested.

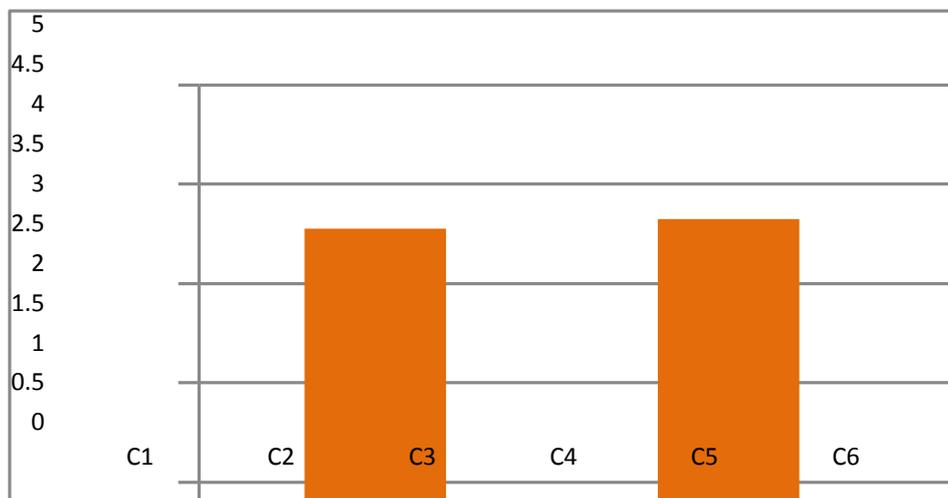


Fig. 5 Mean for six constructs on rewards of Congkak

Measuring the influence of rewards on engagement of Congkak involved another three constructs; C4 (rewards motivate gamers), C5 (rewards help to survive the game), and C6 (rewards keep gamers playing). Mean for the three constructs are 4.425, 4.275 and 4.35 respectively. High value of mean for this section indicated that gamers agree rewards can motivate and help them in surviving the game, particularly Congkak. The most interesting part is, they agree that rewards helps them to keep playing and get them hooked to the game.

The last part are suggestions and feedbacks on rewards to be incorporated in digital traditional games, based on gamer’s experience with the enhanced Congkak. They suggested types of rewards that can be implemented in other digital traditional games. Table 2 listed different types of rewards suggested by the gamers.



Table. 2 Different types of suggested rewards

Rewards for Congkak	
Variety marbles and stones selection as rewards	
Rewards for other digital traditional games	
Coin rewards	Gems and booster rewards
Free life rewards	Money rewards
Gold rewards	Point collection rewards
Rewards that can break game's rule	Trophy rewards

Based on the feedbacks from the gamers involved, rewards can give both positive and negative impact to players. Rewards can make players feel more excited to achieve the highest level and win every level of the games. Some gamers suggested free life rewards to be included in case the player have stuck at certain level. It can be used to redeem their life and survive the games, as adapted from Candy Crush's life redeem concept. Some feedbacks regarding the use of rewards in digital traditional games are recorded as follows:

Gamer 1:	"I prefer rewards that can give value and assist me in games"
Gamer 2:	"different types of rewards play as important factor that can attract me to play"
Gamer 3:	"rewards gave me negative impact. I want to challenge myself without help"
Gamer 4:	"with rewards, I can learn the games better"
Gamer 5:	"rewards are needed to survive the game. If i'm stuck at certain level, i need rewards to help me continue the game"
Gamer 6:	"with rewards, it encourage players to keep playing and get engaged to the games"

Various kind of rewards play an important factor in attracting young generations to play hence get them engaged. Although some gamers do not prefer rewards in helping them, but most gamers prefer rewards that can give value and assist them in games. Coin and money rewards can be used to redeem weapon to survive the game. Other concept of rewards is unlocking mechanisms that will help players in breaking the levels of the games. Rewards like selection of different marbles and trophy rewards can also encourage players to get engaged to digital traditional games. Other types of rewards like coin and trophy reward will help in improving game's self esteem when they can prove or show their achievement or score to other players.

VI. CONCLUSION

The existing Congkak has been successfully enhanced by incorporating rewards as one of the attractions towards making it engaging to young generations. From the feedbacks gathered and observations carried out when they played it, gamers show positive reactions to the new added feature.

This study is expected to be useful and beneficial to many parties. The findings can be useful to new psychologists to obtain more understanding pertaining to games engagement through some experiments of rewards in traditional games. This study can also be useful and beneficial to game developers. Ideas of incorporating rewards in digital traditional games can be considered to be implemented in other digital traditional games like Dam Aji and Gasing. It is concluded that rewards have enhanced the game, managed to attract players to play and keep playing, hence and making the game stand out from the crowd.

ACKNOWLEDGMENT

This research is funded by Universiti Utara Malaysia (UUM) through University grant [SO code: 13725 (2017)]. Authors fully acknowledged UUM for the approved fund which makes this important research viable and effective. Credit also goes to the game developer, Mr *Shamsul Bahrin Abd Mutalib*.

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