

## Design of Online Lottery System

Shivani K. Poddar<sup>1</sup>, Kirthana Nambiar<sup>2</sup>, Siddhi Saple<sup>3</sup>, Nisha Roy<sup>4</sup>

<sup>1,2,3,4</sup> Computer Engineering, Terna Engineering College

---

**Abstract-** In traditional lottery systems, the players choose some numbers on a ticket, enroll it to the lottery organizer and pay an amount of money for it. But this perspective offers no guarantee to the players that the lottery organizer doesn't manipulate the number selection to pay the least. This suspicion could be avoided is the lottery organizer didn't know the numbers selected by the players before the draw. This paper presents the design and the implementation of an online lottery system. The proposed system can provide accuracy, privacy, transparency, and verifiability. Using the proposed system, the government can operate lottery schemes with integrity. This design also guarantees that forging lottery tickets after the moment of draw or claim of a different ticket is not possible. Here, a random number generator function is used thus preventing the forging and manipulation. The user must create a profile, provide all the necessary details which will be stored in the database and then can participate in the lottery. They can buy any number of tickets to try their luck at winning prizes.

**Keywords-** online lottery system, random number generation, random ticket generation

---

### I. INTRODUCTION

Lottery is the most ancient known chance game. The basic idea of the game is the player chooses some random numbers on a ticket and enrolls in the lottery by paying an amount of money. He then waits for the result of the lottery and if the winning number matches with his lottery number then he can claim the prize amount. The lottery is a game of chance which provides people the opportunity to pay and win prizes. The total cost of the prizes is the amount that is left after expenses which includes the cost of promotion, the profits of the organizer and other taxes. The cost of the prizes is predetermined and profits of the organizer depends upon the number of tickets sold. The winners of the lottery generally have six months to one year of time to collect their prizes, depending on some rules. The winner generally has the option of accepting the prize in annual instalments or all at once. Either way, taxes are deducted from the sum. Even though the odds are extremely long, it does not stop people from participating in different lotteries.

The lottery application allows users to participate in different lotteries and claim their prizes while making it easy for the organizer to create and control the lottery system. The ticket numbers, prizes and all the details about the lottery can be decided by the organizer and can be changed from one lottery to another. The user needs to accept the terms and conditions prior to playing the lottery. The user needs to create a profile first and provide all the details which will be stored in a database for claiming the prize. In an online system, there is no limit on the number of tickets to be sold and the player has an unlimited choice to either choose numbers of his or her choice or they can opt for computer-generated random numbers for themselves.

The game should be in the benefit of the lottery because suspicious people who otherwise wouldn't play could be convinced that the chance to win is equal for all participants in the lottery game, leading to increasing the number of participants and increasing the profit. Such a system would also be in the advantage of the players by guaranteeing them that the lottery can't choose to award or

not to award the prizes as it pleases. The government is authorized to conduct such lotteries. In a government conducted lottery system, they offer the public a desirable chance of winning large cash prizes. It is in the benefit of the government as it increases government revenues without burdening the public with increased taxes. Also, in many instances, the amount generated from these government lotteries are dedicated to a particular goal or purpose. Since the government has the total control over the lottery system, such systems become questionable. Public trust cannot be achieved. People may think that the lottery is rigged. It can become a critical issue as unprotected data can be easily manipulated. The present lottery systems, whether offline or online, are centralized ones that have the following potential problems:

- (1) The traditional or offline lottery procedure takes a relatively long period, and it is inconvenient for individuals to hold a lottery event in a offline or traditional way.
- (2) If the third party fails to be totally fair while announcing the winners, the benefits of the players are hurt.
- (3) It is possible that the third party pays the winners a lesser amount of money or even nothing so that the third party itself can have some more interests.

The working of the lottery system should believe and follow the practices and core values of the World Lottery Association which are responsibility, integrity, professionalism, and innovation. The integrity value includes transparency and accountability. When changing from a traditional paper-based lottery system to an online lottery system, different security threats can emerge which can disrupt the functioning of the online lottery system. Only with proper prevention, reliable services can be provided. A simple, practical, safe and effective online lottery system is constructed in this paper, which can make the whole process online from buying lottery tickets to its expiry date.

## II. LITERATURE REVIEW

Since the beginning, lotteries have been a part of human history. Old testaments have recorded different forms of lottery gambling; Roman emperors used to offer them for entertainment; French kings used them to balance state deficits; Lotteries were an important part of their public works to finance in modern states (Willman 1999).

At least 100 countries and 200 jurisdictions are involved in lotteries thus making it a big business, and worldwide sales of lotteries are estimated to amount to almost \$224.3 billion in 2007 (Cited in Scientific Games 2009, LaFleur's 2008 World Lottery Almanac).

Many people participate in a lottery which is a form of gambling in order to try their luck at winning prizes. Some governments organize or regulate the lottery, while others outlaw it. As early as between 205 and 187 B.C. the first recorded signs of a lottery were dated back during the Chinese Han Dynasty which was believed to be called as Keno, Major government projects like the Great Wall of China were financed by using lottery like games. In 15th-century Burgundy and Flanders, towns first used European Lotteries in the modern sense to raise money to fortify defenses or aid the poor. For recording purchases and printing tickets in a large-scale lottery a computer system is used. A person purchased a ticket preprinted with a number in earlier lottery games. The player had to wait for weeks for a drawing to determine if the ticket was a winner. These types of games were named as passive drawing games.

The Romanian lottery system 6/49 was started on August 8th 1993([www.loto49.ro](http://www.loto49.ro)), but the official lottery site ([www.loto.ro](http://www.loto.ro)) displays the results of the draws starting only from January 4th 1998. The Romanian lottery rules were the same as other similar lotteries. Players can participate in the Lottery by buying tickets. It is possible to choose one or two from the following variants from a ticket: trying to guess 6 numbers from 1 to 49 and/or trying to guess a luck number consisting of 7 figures. It is possible to buy tickets for the next draw, but not later than the day before the draw.

The authors considered it is necessary to investigate the randomness of the draws in some countries in order to evaluate the opportunity to develop and implement the proposed anonymous

lottery system. The randomness of three lotteries (Romanian, British and Canadian) was investigated for this purpose.

Lottery regulators monitor the operating procedures to check whether the winning selections are drawn randomly in most of the countries. The three main purposes for the monitoring and testing are: to identify possible sources of bias, to warn of possible corruption and to reassure the public that the draws are random.

The varieties of lotteries which are well known in many countries are:

1. Conventional lottery or the classic lottery: A player purchases a lottery ticket. One or more lottery numbers and a serial number are inscribed on the lottery ticket. To avoid fraud, the serial number is used as a simple method as it will identify each lottery ticket sold uniquely. The lottery number allows both the lottery system and the player to identify a winner. The lottery numbers are compared by the player to a “winning numbers list”, to determine if the player has won a prize or not.

2. Lotto: A set of numbers are chosen by the bettor. If all six of their numbers matches with those chosen during the random drawing, the player wins a bigger prize. The player wins comparatively smaller prizes for matching three, four, or five of the respective drawn numbers. The central lottery computer system selects random “quick-pick” lottery numbers in most of the lotto games. This saves the player’s time and inconvenience of picking his or her own numbers.

3. Scratch-off lottery: Tickets are preprinted and the prizes are predetermined. After the bettor buys the ticket, the bettor scratches off the spaces that have been coated with latex substance to reveal whether or not it is a winning ticket.

4. The number game: Bettors choose a number. For example, the bettor can pick a number from 0000 to 9999 in a four-digit lottery. The winning tickets have to match all digits in order or a different order.

5. Toto: The lottery which is used to bet on sports is the ToTo lottery. The tickets contain several matches. The bettor has the option of choosing the outcome of each match.

Some foreign countries allow a lottery player to buy fractional lottery tickets. Fixed fractions of certain high-cost lottery tickets are only allowed to be purchased by the players in these lottery systems. Only one-half or one-quarter of the full prize amount will be received by the winner of the lottery ticket.

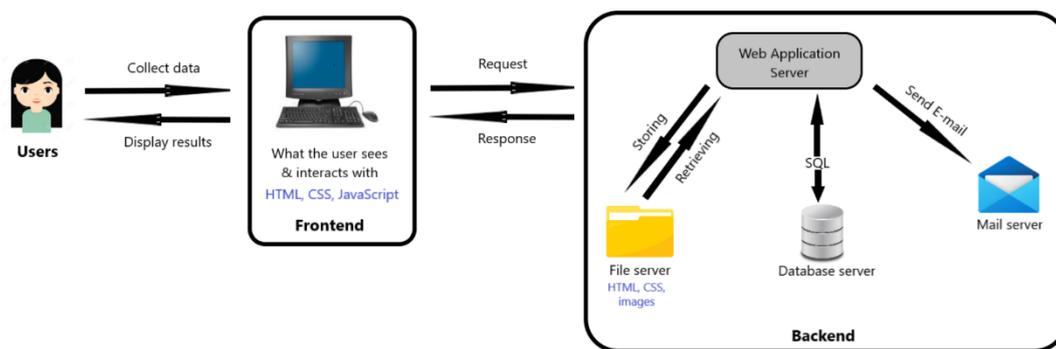
The existing lottery systems are time consuming. To play an offline lottery, you must go to a store, buy the ticket, and then wait around for the numbers to be announced. People do not get the benefit of playing the lottery anytime, anywhere. They must take time out of their lives to go stand in a queue and buy a ticket. It does not offer people the convenience of playing with the odds at home. In the traditional offline lottery system, chances of losing the tickets are high. You must make sure that the ticket is not damaged and also have to remember where you stored it. If you win, the physical ticket needs to be checked, double-checked, and verified to make sure you are the winner. This just increases the scope for errors. In this system, forging of tickets is also possible. People need to keep their tickets safely with them because if they lose the ticket, they will not be able to claim the prize.

The lottery system can be used for various purposes. The first major government funding agency that used the lottery to allocate research funding for the Explorer Grant scheme is the Health Research Council of New Zealand. Many researchers believed that funding must be allocated solely using peer review despite the documented problems of peer review, funding agencies around the world use peer review ubiquitously. The Health Research Council of New Zealand wanted to know about the acceptability of the randomization process and anonymity of applicants.

### **III. PROPOSED SYSTEM**

Our system proposes a method to generate random numbers on tickets such that neither the organizer of the lottery nor the player can know the winning number before the result is declared.

1. Aesthetics: The landing page of the website will consist of details about various ongoing lotteries and their winning amounts. Also, it will contain the tabs for login and signup. Any person who is interested in trying and winning the lottery can login/signup for it.
2. Cost: The total time cost that would be required to deliver the finished project is 6-8 months.
3. Customer: Any person who wants to participate in the lottery or organize a lottery of his own can be considered as a customer of our website.
4. Function: Part of the money taken in by a lottery is used to award the winners and to pay the costs of administering the lottery. The main purpose of the project is to provide needy people who enrol in the lottery with the cash prizes (if they win) in a way such that it can be beneficial for the organizer and players both. The money which is left is profit.
5. Safety: The project must be designed in such a way that the system cannot be manipulated and none of the party is able to do the frauds. To achieve this, a random generator function is used to generate the lottery tickets so that the organizer cannot do the manipulation. Also, the lottery winning amount is fixed, such that at the time of payment corruption can be prevented.



*Fig 1. Architecture diagram*

The numbers chosen by the players don't know the lottery organizer before the draw. It is possible to manipulate the draw by knowing the numbers on tickets before the draw in such a manner that nobody can win the intended prizes.

The players can participate in the lottery and keep secret the numbers he chose. It is noticeable if there is any modification of e-ticket by the player after the bet placing. Also, nobody can impersonate a winner or forge a ticket to claim a prize that does not belong to him.

It is inconvenient for the organizer or other party to determine played numbers before the draw.

Algorithm for Random Ticket Generation:

1. Import random module
2. Function to generate single random number
 

```
def generate_lottery_number():
    randomNumber = random.randint(0, 9)
    return randomNumber
```
3. Function to generate lottery ticket number using previous function
 

```
def generateLotteryNumbers( totalTickets ): lotteryNumber = []
    for lotteryIndex in range( totalTickets ):
        randomNumber = generateRandomNumber()
        lotteryNumbers.append( randomNumber )
    return lotteryNumbers
```
4. Print randomly generated ticket number.
 

```
def printLotteryNumbers( lotteryNumbers ):
```

```
for lotteryIndex in range( len( lotteryNumbers ) ):
    print lotteryNumbers[lotteryIndex ]
```

Algorithm for Random Number Generation:

1. All the tickets numbers that have been generated are stored in a list.
2. Import the random module using which a ticket number is randomly selected from the list.
3. The randomly selected number is then declared as the winner of that particular lottery

The lottery website allows users to play lotteries, host lottery events and claim their prizes while the admin can create and control the lottery system. Different lottery events, their prizes and terms & conditions can be arranged or configured by the admin and it can be changed from one lottery to another. The user can participate in different lottery banners which are provided by the application. They just need to accept the terms and conditions prior to playing the lottery which are provided by the application. A user profile is to be created first by filling in the correct information and then verified by the means of valid ID proofs. The personal account details provided by the player for claiming prize money are stored securely in the database in an encrypted format to ensure security of critical information. The user can then participate in public lotteries or can even create private lottery. For private lottery, they just need to send the code to all the participants and also have to set the winning amount. For public lottery, they can participate in various lotteries ranging from low to high prize amounts. The users can buy as many tickets as they want. The tickets will be randomly generated and on the day of result a winner will be randomly selected. The user will be notified through an email if they have won the lottery or not. The winner needs to send their bank account details and after the winning amount will be deposited in their account within 7 working days.

#### IV. CONCLUSION

Of course, as long as there is doubt about number selection, the lottery can collude with specific players and play some chosen numbers which follow to be drawn. This problem can be avoided only without being partial and truly random number selection. Here, a random generator function will be used to generate random numbers to be printed on the lottery tickets. In this way, neither the organizer of the lottery nor the government will be able to manipulate the system.

In this system, the player can also create his/her own private lottery tickets which will also be protected.

Finally, the system is verifiable since the player can claim the winning number even if the data in the system is destroyed. Therefore, through this system, the lottery operation can be transparent.

#### ACKNOWLEDGEMENT

This research work would not have been possible without the research efforts of many individuals. We would like to pay our sincere gratitude to our professor, Mrs. Surekha Janrao for the opportunity that inspired us on this accomplishment.

#### REFERENCES

- [1] Ariyabuddhiphongs V. Lottery gambling: a review. *J Gambler Stud.* 2011 Mar;27(1):15-33. doi: 10.1007/s10899-010-9194-0. PMID: 20432057.
- [2] Medeleanu, Florin et al. "DEVELOPING AND MODELING A NEW E-LOTTERY SYSTEM USING ANONYMOUS SIGNATURES." *Scientific Bulletin of Naval Academy* 19 (2016): 242-248.
- [3] Liu, M., Choy, V., Clarke, P., Barnett, A., Blakely, T. & Pomeroy, L. (2020). The acceptability of using a lottery to allocate research funding: a survey of applicants.

- [4] Kuacharoen, P.. “Design and Implementation of a Secure Online Lottery System.” IAIT 2012 (2012).
- [5] System and method for performing lottery ticket transactions utilizing point-of-sale terminals.
- [6] Xing Y. (2013) The Research and Design of an Applied Electronic Lottery System. In: Zu Q., Hu B., Elçi A. (eds) Pervasive Computing and the Networked World. ICPCA/SWS 2012. Lecture Notes in Computer Science, vol 7719. Springer, Berlin, Heidelberg.
- [7] Martijn J. Burger, Martin Hendriks, Emma Pleeging& Jan C. Van “The joy of lottery play: evidence from a field expert”
- [8] Peter Keating, "Lotto Fever: We All Lose," *Money*, May 1996
- [9] Ellen Perlman, "The Game of Mystery Bucks," *Governing*, January 1988
- [10] Robyn Gearey, "The Numbers Game," *The New Republic*, May 19, 1997