Random chance is the essence of the lottery
To be safe, we’re putting a little distance in our schedule.

The World Lottery Summit is an opportunity to learn, engage and, most importantly, connect as an industry. And we want to keep it that way.

To ensure we can safely deliver a world-class event and give you the opportunity to experience the beauty and excitement (and restaurants!) of Vancouver, we’ve decided to postpone WLS 2020 to 2022 due to concerns with COVID-19.

We’ll keep you informed as we continue to plan and adapt, and we look forward to seeing you in Vancouver for WLS 2022.

Save the date: Oct 16-20, 2022
Moving beyond 2020

As we leave 2020 behind, we have great hope for better times ahead. The ongoing pandemic disrupted our day-to-day business, but we are emerging wiser and stronger. Working together, we can ensure that the lottery and betting sector has a bright and positive future.

The pandemic crisis and how it has affected the lottery and betting sector, is a theme that has dominated the numerous webinars that we have held since the lockdown. The various speakers from both inside and outside the industry shared their knowledge on what has changed through the pandemic, on how we have adapted to change, and on how we should best move forward. For those of you who may have missed any of these insightful webinars you will find video recordings of the complete webinars on the WLA website.

Despite the crisis, we have steadfastly continued to work on many of the goals that we had set prior to the pandemic. Among these goals was the revamp of the WLA's corporate image. In November of last year we began this endeavor with the redesign of the WLA logo. We sought a strong visual design that reflects the tradition of the lottery yet embraces the vibrant technology-based future that the lottery sector is rapidly moving toward. After considering various ideas we settled on a design proposal by the Buntin Group, a brand identity agency from Nashville, Tennessee, USA. The new WLA logo was presented to the public in mid-March.

After the design of the new logo, one of the first measures undertaken was to relaunch the WLA website. The new website, which made its debut on March 12, 2021, boasts a modern, mobile-friendly, content-rich design that is both intuitive and comfortable to use. One noteworthy addition to the website is a rubric dedicated to good causes: it is becoming increasingly important that the public becomes more aware of the good work that our members do to support their respective communities. A highlight of the new good causes section is the presentation of the WLA's Play for Society project. Launched in 2020, the Play for Society project provides WLA members with a platform to shine a light on their beneficiary programs. From the numerous submissions received, a video collage has been produced celebrating the Play for Society Project. We hope you will take the time to view the good causes section of the website and join us in celebrating the Play for Society project. Please take the time to visit the new website at www.world-lotteries.org.

We then set out to revamp our flagship publication, the WLA magazine, the premiere issue of which you are reading right now. The new WLA magazine has a fresh modern look that complements the new WLA logo. The magazine design was done by Shine Communication of Lausanne, Switzerland. Going forward, we will continue working with Shine Communication to further refine our corporate image and ensure that all further WLA publications have a consistent look and feel.

In other news, we have taken the final step in our move to Lausanne, Switzerland. As we announced to the members at the beginning of March, the WLA has settled into its permanent headquarters on the premises of Loterie Romande, the state-regulated lottery for the French-speaking cantons of Switzerland. The move to the Loterie Romande campus provides us numerous advantages, such as direct access to the EL and GLMS, who are also co-located at Loterie Romande, and access to Loterie Romande’s extensive infrastructure, including supporting services. It will also allow the WLA to be fully immersed in a lottery environment, putting the WLA staff in close contact with the inner workings of a lottery. We look forward to working with the EL, GLMS, and Loterie Romande going forward, and take this opportunity to thank Loterie Romande CEO Jean-Luc Moner-Banet and his staff for graciously welcoming us onto their premises.

Wishing our northern members a safe and relaxing summer break, and our southern members a joyous and enchanting winter season. We look forward to continue serving you in 2021!
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The willingness to adapt and move forward

Interview with WLA President Rebecca Paul Hargrove

With the pandemic gradually ebbing in many parts of the world, we had a chance to chat with WLA President Rebecca Paul Hargrove. In this informal interview, the President speaks about how the lottery sector has evolved through the crisis and how technology continues to reshape the way we operate our games and run our businesses.

With vaccinations rolling out, we are beginning to see light at the end of the tunnel, at least in North America and Europe. Where should lotteries be putting their focus as we emerge from the pandemic?

Lotteries should put their focus on understanding which adaptations they made during COVID are worth continuing and which are worth ending. If there is a silver lining to the industry during this crisis, it would be the requirement to innovate.

The impetus to change and innovate is lowest when everything is going well. A crisis can be the catalyst to think differently about how we operate and take appropriate action. When the world returns to normal, those innovations or adjustments can lead to more funding for good causes and more value to all of our stakeholders. But you have to do it now, while the experience is still fresh.

Lotteries have had to adapt their business strategies in the past year, to deal with health and safety measures designed to curb the ongoing pandemic. Of the changes that have been instituted in the past year, which do you feel will remain?

What will remain is the internal process of identifying efficiencies throughout the organization. COVID forced everyone to find a more resourceful way to conduct their business because of the severe limitations across the board. We identified efficiencies throughout the pandemic that were employee-based, systems-based and operations-based. But again, every lottery and its jurisdiction is different, so solutions certainly look different depending on the location. But what will certainly remain is the process established to identify how to do business in the most effective and efficient possible manner.

What opportunities for the lottery sector do you feel have arisen from this crisis?

Each lottery will have its own opportunities based upon its jurisdiction, but what has persevered throughout the pandemic is our willingness to adapt and move forward in whatever context our individual lotteries operate. The challenge will be to stay innovative, to stay creative. That’s where the WLA can step in and continue bringing energy to sharing ideas and best practices.

But I think from a high-level, the main opportunity is carving out more space in the digital commerce world because if we’re going to fulfill our respective missions while digital commerce grows and grows, then we have to play in that sandbox, so to speak, to the degree we can, without alienating our retailers.

Technology has played a major role in helping lotteries weather the pandemic, and will certainly continue to shape the way lotteries do business. Do you foresee a time when lotteries are fully digitized?

I really don’t see a time when lotteries are fully digitized. I do think that they’ll become more and more digital because everything is going that way. But as we just experienced through the global pandemic, humans need to see and be around other humans. There will always be the need to get out of the house or run to the store if for no other reason than some basic human interaction. And as long as that happens, lottery products will be in stores. Obviously all of this depends on the laws and rules in any given jurisdiction.

This issue of the WLA magazine features an article on Random Number Generators (RNG). The Tennessee Education Lottery (TEL) was one of the early adopters of RNGs in the US. Today, a large portion of TEL’s gaming products rely on random number generators. What advantages do RNGs provide lotteries and how do players benefit from this?

Let me speak from the Tennessee Lottery’s experience. Our core mission is to generate funds for education in Tennessee. Many factors went into making the decision to switch to automated drawings, driven mainly by adherence to the TEL’s mission. When the decision was made in 2007, renewing contracts with TV stations...
and rising production costs would have increased our costs. So if our mission is to generate funds for education, part of that is keeping costs low. Switching to RNGs allowed us to continue operating in an efficient and effective fashion while ensuring the security and integrity of our games. Utilizing this type of system also allows us to then direct resources to developing new and exciting games for our players and remain competitive with other lotteries along our borders.

A significant portion of the playing public does not feel comfortable with computer-driven draws and would prefer lotteries to continue using classical ball-tumbler draw machines. What can you say to reassure players that RNGs are safe, secure, and reliable?

At the end of the day, we sell integrity. The integrity and security of our games are of utmost importance to us, and our decision would have never been made without our full confidence in the security of these type drawings. Since switching to RNG drawings in 2007, our players have become comfortable with and have trust in the integrity of the drawing process.

Critics of RNG-driven lottery draws point to their apparent lack of transparency. Classical ball-tumbler draw machines allow players to see chance happening in real time. What needs to be done to satisfy critics in this regard?

It’s about sustaining excellence and transparency. It’s about player education and understanding that just because your numbers aren’t physically drawn doesn’t mean 1) your numbers don’t have a fair chance of being drawn, and 2) a game isn’t being operated with the highest level of integrity. We have a third party that conducts a system certification for us and anyone can call our headquarters to make an appointment to come view a drawing. It’s all of those things wrapped up together and executed over and over again that has created player confidence.

Many players like classical ball-tumbler draw machines because of the entertainment aspect they provide in lottery draws. Do you foresee a day when the classical ball-tumbler draw machines will become extinct?

Not really. There’s always a market for vintage, right?

As lotteries move to digitize, they must be careful not to alienate retailers, one of their key stakeholders. How can lotteries best use digital technology to drive players to the retailer?

It’s about fully understanding the relationships a lottery has with its retailers while also understanding the vast array of digital tools we might all have to drive business. You take those two tracks and work together to leverage the power of digital technology so the lottery and its retail partners can continue to thrive.

Despite the ongoing pandemic, sports betting has continued to grow, especially in your home state of Tennessee. You recently reported to the Sports Wagering Advisory Council of Tennessee that since the launch of legalized sports betting in the state on November 1, 2020, gross handle had topped USD 1 billion, bringing in more than USD 18 million in taxes. To what do you attribute the success of sports betting in Tennessee?

We’re still in our first year, and we all know that the past 12-14 months have been unlike anything we’ve seen. That makes it hard to extrapolate out from the few months that we have under our belt.

But Tennessee is home to a broad fan base across multiple sports, and our unique statute establishes internet-based sports wagering, which many sportsbooks find attractive. We’re obviously watching how it will all go as we transition back into “normal” times.

If there is a silver lining to the industry during this crisis, it would be the requirement to innovate. The impetus to change and innovate is lowest when everything is going well. A crisis can be the catalyst to think differently about how we operate and take appropriate action.
Random chance is the essence of the lottery

On the role of Random Number Generators in modern lottery operations
Players feel comfortable with the classic lottery draw, as it allows them to see chance happening. In reality EDSs provide better control of the gaming environment.

To the public, the classic lottery-ball tumbler has become emblematic. When one thinks about “the lottery” – besides winning a mega-jackpot – one often imagines the weekly draw on television with the classic ball tumbler machine spinning and regurgitating five to seven numbered balls in succession. This has become a familiar and trusted ritual, and the integrity of the draw is seldom questioned. Players feel comfortable with the classic lottery draw, as the process is for the most part transparent, and it allows them to see chance happening.

Nowadays, we often speak about how technology is changing the lottery and gaming sector. In the last decade, the Internet and mobile devices have both greatly changed the way players interact with the lottery. One technology that is increasingly playing a major role in lottery operations is the Electronic Drawing System or EDS. More and more, we are seeing the classic ball-drop drawing machine being replaced by its electronic counterpart.

More and more, we are seeing the classic ball-drop drawing machine being replaced by its electronic counterpart.

The Random Number Generator (RNG)

In general, the generation of random numbers plays a critical role in many important areas – cryptography, statistics, and of course, the lottery and gaming industry. But what exactly is a random number and what are we looking for in random number generation? For the purpose of this article, we’ll say that a
A seemingly unusual draw

On December 1, 2020, a Powerball draw of the South African Lottery attracted worldwide attention. The numbers drawn in order were 8, 5, 9, 7, 6 and the Powerball number draw was 10. When sorted from lowest to highest the resulting sequence is 5, 6, 7, 8, 9 and 10. This was cause for suspicion among the general public, in particular from critics of the lottery. Twenty players won that night, splitting a jackpot of 114 million South African rand between them.

Although the sequential pattern received a lot of media coverage, draws of this nature are really not that unusual. The probability of a draw result coming up in a sequential order and the probability of a draw result coming up in a non-sequential order are exactly the same. The fact is, that one tends to notice more unusual outcomes and treats them as anomalous when they are actually quite normal. Although a sequence of five or more consecutive numbers is uncommon, sequences of three to four numbers come up frequently. According to the website national-lottery.com, an independent results service of national lotteries from around the world, three-number sequences have appeared ten times in the last six months in Lotto draws of the UK National Lottery. The website also reveals that five three-number sequences have appeared in EuroMillions draws and 12 three-number sequences have appeared in Irish Lotto draws in the last six months. The above-mentioned draws are done on mechanical lottery-ball tumblers, which would indicate that the occurrence of sequential draws is not restricted to Electronic Drawing Systems.

To assuage critical elements of the public, Ithuba, operator of the South African National Lottery had the draw verified by independent auditors. In fact, the South African National Lottery’s Electronic Drawing System is backed by technology from Szrek2Solutions which verifies the integrity of the draw, both at the time it occurs and after the draw has taken place. Szrek2Solutions’s technology detects both hardware and software failures that can impact the result of a draw. It also detects if the draw has been tampered with in any way and can reconstruct the draw process in order to provide forensic evidence and proof of the validity of the draw. In the end the South African National Lottery’s Powerball draw proved to be valid and legitimate.

random number is a number generated by a process whose outcome is inherently unpredictable, and which cannot be reliably repeated. Ideally, an RNG should provide an outcome that fits this definition. According to the National Institute of Standards Technology (NIST), a random bit sequence could be interpreted as the result of the flips of a coin with sides that are labeled “0” and “1,” with each flip having a 50% probability of producing a “0” or “1.” Moreover, the flips are independent of each other—that is, the result of any previous coin flip does not affect future coin flips. The coin toss is thus the perfect random bit stream generator, since the “0” and “1” values will be randomly distributed. All elements of the sequence are generated independently of each other, and the value of the next element in the sequence cannot be predicted, regardless of how many elements have already been produced.

Clearly, the use of a coin for generating random bit sequences is impractical. However, the hypothetical output of such an idealized generator of a true random sequence may serve as a benchmark for the evaluation of RNGs.

When it comes to lottery draws, the possible combination of random numbers is almost infinite. This includes sequences in proper numerical order.

Although the sequence 1-2-3-4-5-6 appears to be less random than the sequence 10-21-35-59-2 it is just as likely to occur in a lottery draw as any other sequence. (See the inset box, “A seemingly unusual draw.”)

Pseudo Random Number Generators

As mentioned, the RNG generally works in close conjunction with an EDS. It is either a device or a program that produces a sequence of random numbers through a random process. There are two main
classifications of RNGs, Pseudo Random Number Generators (PRNG) and True Random Number Generators (TRNG).

PRNGs are software-driven, deterministic, and periodic. The software implements an algorithm into which some initial value – known as a seed – is fed. Through an iterative process, the algorithm produces a sequence of pseudo-random numbers. Being deterministic, the algorithm’s output is governed solely by the input, rendering the results predictable and reproducible. Owing to the periodic nature of the algorithm, the sequences of pseudo-random numbers generated will, after a given number of iterations, begin to repeat. In essence, PRNGs produce simulated randomness rather than actual randomness, hence the name Pseudo Random Number Generator. (See the inset box on page 13, “A PRNG algorithm explained”.)

The seed specifies the starting point when a computer generates a random number sequence; this can be any given number. Many PRNGs use the seconds on a computer system’s clock. A computer counts the seconds from January 1, 1970 — a system called Unix time. For instance, at the time of this writing, it is currently March 29, 2021 at 12:07 CET, which is 1,617,012,504 seconds after January 1, 1970. Given the range of integers this provides (0 to + billion), the probability that you will get the same seed twice is rather low. Other systems make use of Microsoft’s CryptoAPI, a Windows operating system facility that provides digital signatures. Digital signatures are ideal for use as RNG seeds as they are cryptographically strong. As such, they provide RNG seeds that are well protected against decryption and abuse, while allowing for analysis and verification by the operator.

A PRNG’s number sequence is completely determined by the seed: it is important that the seed be well chosen and that it remains secure

A PRNG’s number sequence is completely determined by the seed: thus, if a PRNG is reinitialized with the same seed, it will produce the same sequence of numbers. Since the sequence is repeatable, it is important that the seed be well chosen and that it remains secure, in order to safeguard against its abuse. If any element of the seed generation process is detected, there is the danger that the random number generation process may be predicted or manipulated for fraudulent purposes. In contrast, some modern PRNG systems apply the “no security by obscurity” approach, whereby the seed generation method and algorithm used are disclosed. Proponents of this approach argue that the PRNG algorithms and the seeding methodology should be in the public domain so that the security of the process does not have to rely on proprietary information, which could leak and be misused. Such systems rely on methodologies for the detection of factors that can impact the integrity of the random number generation, e.g., tampering, hardware deterioration, and software failure. Ideally, one should always be able to detect if a system has been breached by either an insider or an outsider, or if a hardware problem or a software glitch led to questionable results. That is, each time the PRNG generates random numbers, the seed should first be created in a way that the RNG results remain unpredictable, that any breach of the system can be detected, and that any issues with hardware or software failure can be identified. It is equally important that the seed cannot be reverse engineered through its generated values. No correlation between a seed and its values should be apparent.

TRNG takes a physical source of entropy - or random if you will - digitizes it and applies it like a seed to its algorithm

True Random Number Generators

Whereas PRNGs take a finite random seed and exploit it through a computational process, TRNGs take a physical

1. Unix time (also known as UNIX Epoch time) is a system for describing a point in time. It is the number of seconds that have elapsed since the Unix epoch, minus leap seconds; the Unix epoch is 00:00:00 UTC on 1 January 1970 (an arbitrary date). Leap seconds are ignored, with a leap second having the same Unix time as the second before it, and every day is treated as if it contains exactly 86400 seconds. Due to this treatment Unix time is not a true representation of UTC. Unix time is widely used in operating systems and file formats.
source of entropy – which generates a low-level, statistically random “noise” signal – as a seed and expands it through a computational process. Entropy is a measurement of disorder, or a measurement of random distribution of energy. The properties of the entropy source are what distinguish one TRNG from another TRNG, e.g., an entropy source based on classical physics versus an entropy source based on quantum physics. In generating random numbers, what we in essence are trying to do is grab a piece of entropy and turn it into something understandable. The TRNG takes a physical source of entropy – or randomness if you will – digitizes it, and applies it as a seed to its algorithm. RNGs of this nature allow us to get closer to true randomness.

TRNGs based on classical physics use real-world random occurrences, such as atmospheric noise or the number of times a computer hard drive is accessed within a given period of time, to generate a stream of completely random numbers, or bits. TRNGs based on quantum physics rely on the prediction of quantum mechanics – such as the nuclear decay of atoms – which is truly random. Indeed, until recently, the only Quantum Random Number Generators (QRNG) were based on the observation of radioactive decay of a given element. To illustrate in more detail, each atom of a radioactive substance has some probability of decaying within a given time interval. But the exact time of decay cannot be predicted and is thus considered random. Radioactive decay timing can be recorded through the use of a Geiger counter and applied as a source of entropy. QRNGs of this kind were costly and presented a bio-hazard owing to the radioactive element that they implemented.

Ideal distribution requires that all possible results are equally likely to occur.

Today, simpler, safer QRNGs based on optical systems are starting to emerge. These optical QRNGs are based on a simple and fundamentally random process that is easy to monitor. Optical QRNGs use a single photon light source pointed at a partially transparent mirror. The photons pass through the mirror at a measurable rate of 50%. That is, each photon has an equal chance of either going through the mirror or being reflected by the mirror. Whether an individual photon passes through the mirror or it is reflected by the mirror is subject to quantum mechanics and cannot be measurably predicted, much in the same way that the toss of a coin cannot be measurably predicted. Optical QRNGs have the advantage that the overall set-up is simple, well understood, and safer, owing to the fact that they do not involve the use of radioactive substances.

Nowadays, most lottery operations using RNGs employ a TRNG/PRNG hybrid mix. That is, a TRNG is used to generate the seed from a physical process and fed into a PRNG for random number generation and scaling of the results.

RNG testing and certification

Certifying for randomness is a tricky business. Can one ever be reasonably sure that a number is random, even if it appears to be random? How can we know that there is not a hidden deterministic pattern behind a stream of random numbers? Adding to this dilemma is the constant threat of cyberattack or system manipulation from within an organization. You often hear lotteries claiming that their RNG has been tested, reviewed, and certified by an independent auditor. Although certification of RNGs is essential, it is important to clarify what it is and what it is not.

Certification means that the RNG has undergone an independent statistical analysis and has been tested with regard to the randomness and distribution of its results, and that the results of the test have been shown to be compliant with a given specification.

As mentioned, in randomness we are looking for results that are inherently unpredictable and that cannot be reliably repeated. Ideal distribution requires that all possible results are equally likely to occur.

Unfortunately, no finite test can determine with certainty that a given RNG produces random strings. But there are tests stringent enough to ensure that an RNG produces strings that have properties that one would expect from random strings. In RNG testing and certification, it is important to note that neither the RNG’s vulnerability to cyberattack nor vulnerability to tampering with by perpetrators from within the organization are covered.

RNG security and integrity

Just as it is important that the randomness of the RNG is ensured, a lottery operation must guarantee the security and integrity of the draw. They must ensure that hardware is functioning properly and that there were no software errors.

A lottery operation must also ensure that the draw was not subject to a cyberattack or manipulated from within. Random Number Generators in Electronic Drawing Systems face security risks on numerous levels. Among these are:

NIST SP 800-22

A well-known test for determining the quality of an RNG’s random bits is the National Institute of Standards and Technology’s (NIST) Statistical Test Suite for Random and Pseudorandom Number Generators for Cryptographic Applications, also known as SP 800-22. SP 800-22 specifies that the following assumptions are to be made with respect to random binary sequences being tested:

› Uniformity
At any point in the generation of a sequence of random or pseudorandom bits, the occurrence of a zero or one is equally likely, i.e., the probability of each is exactly 1/2. The expected number of zeros (or ones) is n/2, where n = length of the sequence.

› Scalability
Any test applicable to a sequence can also be applied to subsequences extracted at random. If a sequence is random, then any such extracted subsequence should also be random. Hence, any extracted subsequence should pass any test for randomness.

› Consistency
The behavior of a generator must be consistent across starting values (seeds). It is inadequate to test a PRNG based on the output from a single seed, or a TRNG on the basis of an output produced from a single physical output.
**PRNG algorithms explained**

Linear congruential generation (LCG) is one of the oldest and best-known methods for generating pseudorandom numbers. LCGs are readily implemented on modern computer hardware; moreover, the theory behind LCG is relatively easy to understand. To illustrate how a standard PRNG algorithm works, we explain LCG and show how the LCG algorithm yields a sequence of pseudo-randomized numbers.

The generator is defined by recurrence relation:

\[ X_{n+1} = (aX_n + c) \mod m \]

where the \( X_n, n = 0, 1, 2, \ldots, \) form the sequence of pseudorandom values and the variables

- \( m \) is the "modulus", \( 0 < m \)
- \( a \) is the "constant multiplier", \( 0 < a < m \)
- \( c \) is the "increment", \( 0 \leq c < m \)
- \( X_0 \) is the "seed" or "start value", \( 0 \leq X_0 < m \)

are fixed integers specifying the LCG parameters. The algorithm outputs a sequence of pseudorandom integers between 0 and \( m - 1 \).

The crucial ingredient in the recurrence relation \( X_{n+1} = (aX_n + c) \mod m \) is the "modulus" or mod operation, which yields the remainder (or signed remainder) of a division after one number is divided by another. For example, the expression 7 mod 2 evaluates to 1, because 7 divided by 2 has a quotient of 3 and a remainder of 1, while 9 mod 3 evaluates to 0, because 3 divides into 9 exactly. Roughly speaking, it is the "modulus" that ensures the pseudo-random properties of the LCG for generating numbers between 0 and \( m - 1 \).

By way of example, suppose \( m = 11, a = 5, c = 7, \) and \( X_0 = 9 \). Then

- \( X_0 = 9 \) by definition
- \( X_1 = [(5 \times X_0) + 7] \mod 11 = [(5 \times 9) + 7] \mod 11 = 52 \mod 11 = 8, \) as 11 divides into 52 with remainder 8, i.e. 52 = (4 \times 11) + 8
- \( X_2 = [(5 \times X_1) + 7] \mod 11 = [(5 \times 8) + 7] \mod 11 = 47 \mod 11 = 3, \) as 11 divides into 47 with remainder 3, i.e. 47 = (4 \times 11) + 3
- \( X_3 = [(5 \times X_2) + 7] \mod 11 = [(5 \times 3) + 7] \mod 11 = 22 \mod 11 = 0, \) as 11 divides into 22 exactly, i.e. 22 = (2 \times 11) + 0
- \( X_4 = [(5 \times X_3) + 7] \mod 11 = [(5 \times 0) + 7] \mod 11 = 7 \mod 11 = 7, \) as 11 divides into 7 with remainder 7, i.e. 7 = (0 \times 11) + 7
- \( X_5 = [(5 \times X_4) + 7] \mod 11 = [(5 \times 7) + 7] \mod 11 = 42 \mod 11 = 9, \) as 11 divides into 42 with remainder 9, i.e. 42 = (3 \times 11) + 9
- \( X_6 = [(5 \times X_5) + 7] \mod 11 = [(5 \times 9) + 7] \mod 11 = 52 \mod 11 = 8, \) as 11 divides into 52 with remainder 8, i.e. 52 = (4 \times 11) + 8.

Setting \( u_n = X_n / m, n = 0, 1, 2, \ldots, \) will then yield a normalized sequence of pseudo-random numbers with \( 0 \leq u_i < 1 \).

Observe that, from \( X_6 \) onwards, the sequence starts to repeat, i.e. the infinite sequence is \( 8, 3, 0, 7, 3, 0, 7, 9, 8, \ldots \) *ad infinitum*. This illustrates the periodic, hence pseudo-random, nature of the algorithm. In practice, the choice of parameters \( a, c, m, \) and \( X_0 \) drastically affects statistical properties such as mean, variance, and cycle length.

For large \( m \) and a judicious selection of values for the parameters \( a, c, \) and \( X_0 \), it can be shown that the period will be long. This fact, together with certain other technical considerations, means that long pseudo-random number sequences (i.e. pseudo-random number sequences suitable for real-world applications) can be generated in practice, despite the simplicity of the algorithm.
1. Direct attacks on the RNG in order to generate a predictable result. This is done through software or hardware substitution.

2. Attacks on the game code in order to circumvent the RNG results.

3. Timestamp substitution. In an offline or isolated system, the system time cannot be continuously verified. This means that the draw timestamp could conceivably be altered after the draw results are known by an inside perpetrator.

4. Phishing for desired draw combinations. A traditional RNG, and in particular an offline system, may allow for multiple generations of a given draw result. This would allow an insider to continue phishing until the desired draw result is found. The desired draw result could then be published as the proper draw outcome.

Fraud perpetrated against an EDS is generally a highly complex exploit and often executed from within an organization with external collusion.

1. Hardware deteriorating. RNG hardware may deteriorate over time, leading to non-random or repetitive draws.

2. Inadequacies in RNG software design may also lead to integrity degradation. Software design deficiencies could include:
   a. Weak algorithm cryptography
   b. Draw system software lacking built-in checks for hardware deterioration or hardware malfunction
   c. Software bugs and configuration errors

Each of these is difficult to detect, as incorrect or fraudulent numbers cannot be differentiated from numbers that are randomly generated. Adding to this problem is the fact that many lotteries lack the in-house expertise in cryptography, statistics, and RNG technology needed to evaluate third-party EDS systems.

Ensuring the security and integrity of electronic draws is dependent on two key elements:

1. Sound preventive measures to hinder draw manipulation and;

2. A system to verify the true and conclusive non-repudiation of the draw.

Preventive measures can be systematically incorporated into processes and best practices so that the likelihood of cyberattack or insider fraud is minimized. However, preventative measures alone are not sufficient. In order to ensure the integrity of an electronic draw, preventative measures must be paired with a system of non-repudiation.

Non-repudiation is a legal concept for the assurance that someone cannot deny the validity of something. In a legal setting, the term is often seen when the authenticity of a signature is being challenged.

While lotteries may see the live broadcast of a traditional drawing as an unnecessary overhead, a significant number of players view it as an essential way to maintain their confidence in fair draws.
The concept of non-repudiation has been widely adopted in the IT world. In information security, a system of non-repudiation provides proof of the origin of a given data set and the integrity of that data and allows for the verification of that data by an independent third party. By integrating a system of non-repudiation, lottery operators can ensure the integrity and origin of the draw data so that it can be audited and verified by a third party at any time. It facilitates the detection of fraud and is a reliable means of auditing for fraud detection at a later date. It also serves as legal protection providing verifiable proof in a court of law that a given draw was not interfered with or was affected by a faulty system.

**The player’s perspective**

For lottery operations, Electronic Drawing Systems offer an array of advantages. They offer support for more types of games, provide the ability to have more frequent draws, and allow for better management of draw outcomes. Since draws for all games can be handled by one system – as opposed to having a separate machine for each game – EDSs offer more cost efficiency, and they require fewer human resources to manage them. When security measures and draw transparency are correctly implemented, an EDS provides better control and protection of the gaming environment than a mechanical draw system. With such advantages, it is likely that the EDS will soon be a mainstay of modern lottery operations across the globe.

The petition has close to 11,000 signatures. Some of the reasons given for the launch of the petition are:

- The public’s lack of confidence in the randomness of the drawn numbers;
- Public concern with cybersecurity and the vulnerability of RNGs to attack from both outside and within the organization;
- Player-visible drawing methods are more fun and confidence-inspiring for lottery players.

Although these concerns are largely unfounded, they are something that the lottery industry needs to address. As we have seen, modern EDSs/RNGs are reliable and secure. What is needed is a way to offer the playing public transparency into the draw process. And we must provide a level of transparency that is simple and easy to understand. At the same time, we need to find a way to make electronic draws entertaining and engaging for players.

Allowing players to see chance happen in real-time is part of the allure and excitement of playing the lottery. Perhaps the next innovation in Electronic Drawing Systems will take these concerns into consideration.

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**Owing to their cryptic nature, Electronic Drawing Systems are viewed by a significant portion of the playing public with skepticism.**

However, owing to their cryptic nature, Electronic Drawing Systems are viewed by a significant portion of the playing public with skepticism. While lotteries may see the live broadcast of a traditional drawing as an unnecessary overhead, a significant number of players view it as an essential way to maintain their confidence in fair draws. The website lotterypost.com has set up an online petition to stop electronic draws and to impose federal guidelines on how lottery draws are to be conducted in the US.

Although these concerns are largely unfounded, they are something that the lottery industry needs to address. As we have seen, modern EDSs/RNGs are reliable and secure. What is needed is a way to offer the playing public transparency into the draw process. And we must provide a level of transparency that is simple and easy to understand. At the same time, we need to find a way to make electronic draws entertaining and engaging for players.

Allowing players to see chance happen in real-time is part of the allure and excitement of playing the lottery. Perhaps the next innovation in Electronic Drawing Systems will take these concerns into consideration.

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Commitment, dedication, and devotion: The iconic career of Lynne Roiter

On May 30, 2021, Lynne Roiter will step down from her position as President and CEO of Loto-Québec. As a 36-year industry veteran, Lynne helped shape the lottery sector as we know it today. Her career, her achievements, and her dedication to the world lottery community have set a high standard for lottery professionals across the globe.

After practicing law for more than a decade at the Commission des droits de la personne, the Régie de l’assurance automobile du Québec, and in private practice, Lynne Roiter joined Loto-Québec in 1985 as Director of Legal Affairs.

Loto-Québec was still a relatively young company at the time, having been established as a Crown Corporation by the provincial government in December 1969. By 1985, Loto-Québec was beginning to develop into the mega-company that it is today. And the growth of Loto-Québec paralleled the remarkable rise of Lynne Roiter’s career.

Shortly after she joined Loto-Québec, Lynne faced her first major legal challenge, successfully defending the company against the National Hockey League when Loto-Québec began selling sports betting products. Up until this time, Loto-Québec had only been selling lottery games when they ventured into the realm of sports betting.

Always seeing the opportunity in a challenge, Lynne continued to grow professionally. With the complexity of the lottery industry and the continued expansion of Loto-Québec, Lynne had many opportunities to satisfy her ambitions. Within a few years, Loto-Québec went from a company that just offered traditional lottery
games to having sports betting, casinos and construction affiliates, video lotteries, networked bingo, and joint ventures for hotels and casinos. Lynne has always been fascinated with finding legal solutions to business problems, and at Loto-Québec she found her life’s calling.

With each step in Loto-Québec’s evolution, the legal needs of the company increased accordingly. When Loto-Québec expanded its business into casinos in 1993 and established a network of video lottery terminals throughout the province in 1994, Lynne helped draft the enabling legislation for these business forays.

In November 1996, Lynne was named Corporate Secretary and Vice President of Legal Affairs, heading a staff of 13 lawyers. By this time Loto-Québec had grown from a company of 400 people to over 5,000. Through the years, Lynne witnessed an enormous change in the lottery business. When she started, lotteries were competing with packaged goods, fighting for counter space at the retailer. Today the competition comes from all forms of entertainment vying for the players’ attention and dollar. Back in 1985 it was said that lotteries were gambling and casinos were gambling. Today, the line of distinction between the two has blurred.

On December 1, 2010, Loto-Québec entered the world on online gaming launching espacejeux.com. The launch of Espace Jeux faced opposition from elements concerned about the social impact of online gaming. Loto-Québec successfully defended its position, pointing to the around 2,000 illegal gaming sites online at the time, each with practically no responsible gaming measures in place. Loto-Québec was able to prove that it could channel its trusted gaming offering online in a controlled and secure environment, in yet another milestone for Loto-Québec.

In August 2016 Lynne Roiter became interim President and CEO of Loto-Québec when then-CEO, Mr. Simon Patenaude, was hospitalized with a serious heart condition. Mr. Patenaude unfortunately passed away later that year on October 28. She was subsequently confirmed as President and CEO of Loto-Québec and became a member of the board in May 2017. With that, Lynne became the first woman to head one of Québec’s three main provincial crown corporations, namely Loto-Québec, Société des alcools du Québec, and Hydro-Québec.

In fact, diversity has played an important role in the growth of Loto-Québec. When Lynne started with Loto-Québec in 1985, there were only around ten professional women out of the then-400 employees. When she joined the senior management team in 1996 she was the only woman. Today women play an important role in the leadership of the company, with nine out of twelve members of the Board of Directors being women. More importantly, a significant percentage of Loto-Québec’s managerial and professional positions are today held by women. The conscious effort to diversify Loto-Québec will be among Lynne Roiter’s lasting legacies.

International engagement

For many years there were two international organizations representing state lotteries, AILE (Association Internationale de Loteries d’Etat) and INTERTOTO (International Association of Toto and Lotto Organizations). Lynne Roiter, in addition to her duties at Loto-Québec, had already been serving two years as General Secretary of AILE when the association merged with INTERTOTO in 1999 to form the World Lottery Association (WLA).
With the merger, Lynne played a central role in the founding of the WLA, contributing greatly to the development of its by-laws and helping form the structure and direction of the new association. WLA headquarters were established in Basel, Switzerland under the direction of then-Executive Director, Yvonne Schnyder, and a North American office was established in Montreal, Canada, on the premises of Loto-Québec under the direction of Lynne Roiter.

Since the founding of the WLA, Lynne has remained an active member of the association’s Executive Committee. She served as the WLA’s legal advisor and figured prominently in the development and maintenance of the WLA Responsible Gaming Framework (WLA-RGF). Of the numerous talented professionals that founded the WLA in 1999, Lynne Roiter remains the only one who is still actively serving world lottery community.

Loto-Québec has also contributed greatly to the development, evolution, and maintenance of the WLA Security Control Standard with members of their IT security staff actively engaged in the WLA Security and Risk Management Committee. Under Lynne’s leadership, Loto-Québec hosted the WLA’s flagship event, the World Lottery Summit, in 2012. The World Lottery Summit 2012, held in cooperation with the North American Association of State and Provincial Lotteries (NASPL) in Montreal, proved to be one of the most successful conventions in the history of the WLA.

During her tenure at Loto-Québec, the company has become a role model for the world lottery community. Loto-Québec was one of the first lotteries to receive WLA-RGF Level 4 certification, the highest level of excellence in responsible gaming. In this regard, the company has stayed on a course of continuous improvement, remaining at Level 4 of the WLA-RGF for over a decade.

After a distinguished 36-year career at Loto-Québec, Lynne Roiter will retire on May 31, 2021. Although she will be leaving the lottery, she will continue serving the WLA through end of the next World Lottery Summit to take place from October 16-20, 2022, continuing to benefit both the association and the world lottery community by her experience and expertise. For this we are truly grateful.

We congratulate Lynne on her extraordinary career and dedicated service to the global lottery sector, and wish her a contented and long and happy retirement.
Lynne and I go way back. I first met Lynne when she was serving as General Secretary of AILE (the International Association of State Lotteries), one of two global lottery associations at that time. I got to know her best when AILE and Intertoto (the International Association of Toto and Lotto Organizations), AILE’s counterpart, began discussing the possibility of a merger in the late 1990s. Bringing the two organizations together required quite a feat of maneuvering and diplomacy on my part. Both association were steeped in their peculiar culture and rooted in decades of tradition. Egos, cultural differences, and years of distrust had caused a wide gap between AILE and Intertoto.

I was impressed by how Lynne endeavored to make the best of the difficult situation, striving to achieve a merger that was mutually acceptable to both associations. When the merger finally occurred in December 1999, and the World Lottery Association was formed, Lynne played a key role laying the groundwork for the WLA as we know it today. I will always be thankful for the support that Lynne gave me during the merger.

The world lottery community owes Lynne a debt of gratitude, for without her efforts, the merger might never have come to fruition. Through the years, I have remained in contact with Lynne. She is among the very few lottery veterans from the days of the merger that is still working in the industry. That speaks volumes about her commitment, fortitude, and will. I wish her all the best for a well-deserved retirement, and many years of joy and relaxation.

The first time I met Lynne Roiter I had a Diet Coke in my hand. Lynne is the only person I know who might drink more Diet Coke than I do, so we knew we’d be friends.

That meeting was at a Public Gaming Research Institute conference in 1985, and we first worked together when she became Secretary General of AILE, one of the organizations that merged to become the World Lottery Association. She has contributed to the global lottery industry in numerous ways, and she has steered Loto-Québec brilliantly throughout her illustrious career.

There isn’t anyone as talented, strong and thorough as Lynne. She’s very quiet in how she goes about accomplishing her goals, but she will accomplish them without question. She is a gentle giant and an iron lady of the industry. Recruiting and retaining more women like Lynne in the lottery world was one of the unspoken goals of our collective efforts around the Women in Lottery Leadership initiative, and her unassuming fortitude will be sorely missed.

Lynne loves Canadians and lawyers – her husband being first on both of those lists. Also at the top of the list of her great loves are her children and her grandchildren, whom she spoils consistently.

She is such a value to our lottery community that I’ve asked her to stay on as Secretary General of WLA through the World Lottery Summit 2022 in Vancouver for continuity. To my great friend Lynne – I wish you all the best in your retirement – great skiing and lots of time with family. You will be missed!
I have known Lynne for more than two decades. She has not only always been a great supporter of NASPL’s, but also a great friend to me personally. We have shared happy stories, sad stories and even great stories, and we always landed on the same spot. We planned, coordinated and executed many world-wide events with not only great success, but with great style.

I have a great deal of respect and admiration for you Lynne, and I hope you are always filled with wonderful times and lots of peace.

Love you, Lynne.

Richard Cheung
Executive Director, Customer and Marketing, HKJC Lotteries Limited, Hong Kong and WLA Vice President

Lynne has been world class leader in the lottery and her contribution to the industry is hard to summarize in a few words. I am especially impressed by her passion where it comes to WLA matters in the past decades. Even though we are 12 hours apart, I always find her extremely forthcoming in extending help needed by Asian members of the WLA.

When I joined the WLA Exco six years ago, she was very helpful in bringing up new Exco members like me to get up to speed on the historic context and ongoing challenges. She is really one of the very critical key-persons that bonds everyone together in the WLA community.

Hats off to Lynne!

Jennifer Westbury
Executive Vice President, Sales and Marketing, Pollard Banknote

Lynne’s commitment to, and passion for, the lottery industry has underpinned the growth of the worldwide lottery community for her entire career in lottery. She was always the quiet, steady voice committed to finding a way forward, and working for the good of all of us involved. She has always been incredibly modest about what she has done for the industry and the scope of her impact, and sometimes one has had to look carefully to see her fingerprints.

These fingerprints will be indelible on Loto-Québec, the Interprovincial Lottery Corporation, and the WLA. What really separated her though was her authenticity, her one-and-only personality and perhaps most importantly, her sense of humor. She always had a way of making me laugh, even in the most serious discussions. I will miss her professionalism immensely, but will always be grateful for her friendship.
I had the honor and privilege of working and being associated with Lynne for more than 20 years at the Interprovincial Lottery Association, the North American Association of State and Provincial Lotteries and the World Lottery Association. While each of these associations are comprised of members with commonalities they are also comprised of members with diverse cultures and priorities. Without doubt each of these organizations has benefitted enormously from Lynne’s extensive skills.

In every situation Lynne was the consummate professional, always meticulously prepared and deeply knowledgeable, always diplomatic and respectful with uncompromising ethics while acting in the best interests of the organizations she represented. Those who have worked with her are also aware of her legendary work habits, having received emails at all hours of the night. I am sure that I am not the only one who has benefited from seeking out Lynne’s thoughts and perspectives on difficult matters. Over the course of our association there were many occasions where Lynne provided calm unbiased leadership during complicated deliberations which ultimately resulted in the most optimal outcomes.

As accomplished as she is as a professional, she is an even better person, kind, caring and compassionate. Behind the scenes she would reach out to comfort and support colleagues experiencing personal hardships. She is also humble, not seeking recognition, but rather seeking to ensure that others were recognized for their efforts and contributions. Every organization that Lynne has been a part of has been made better by all that Lynne is and has contributed. She will be missed.

Congratulations to Lynne for a distinguished career filled with achievements and for having accomplished it with style, grace and dignity. Best wishes for a richly deserved long, healthy, happy retirement filled with the best life has to offer and many wonderful adventures surrounded by the love of friends and family.
Lynne was already a two-year “veteran” of the Lottery business when I began my lottery career in 1987. I would have met her for the first time in her role as Secretary General of AILE at one of the Congresses. I don’t know whether it was an Irish-Canadian thing, but we seemed to hit it off right from the beginning. I liked her no-nonsense approach to issues and problems and, possibly, she recognized a similar trait in me.

She was always ready to help this “new boy” with answers to, and patient explanations of, all things international. She also helped me set up visits by various stakeholders to Loto-Québec, which represented best practice in a number of dimensions of the business. But, it was mostly on the international stage that I witnessed her set of “quiet skills” play out. Lynne is a mistress of the compromise and could always find and propose an acceptable place to land from a contentious situation, particularly if it involved the niceties of law or regulation. I was genuinely pleased to see her appointed as well-deserved President and CEO of Loto-Québec in 2017.

I would never have described her as madly ambitious; perhaps I am wrong. I just felt she wanted to be the best at whatever her current position was. In the same way, I have never seen her make an issue of the fact that she is a woman in any of the positions she has held. Again, she was simply a manager doing the best job she could in the leadership role at the time.

I really believe what we share most—and what is so important—is a sense of humor based on our respective backgrounds which encourage a healthy dose of what, in Ireland, we call “slagging”, and what North Americans call “pulling one’s chain”. Lynne, long may it continue to be so. You will be sorely missed from the lottery community. I thank you for your friendship and I wish you many years of good health and energy to enjoy your new life with those you love.

For 22 years, Lynne served as General Secretary of the WLA. With good reason: her leadership and dedication, her knowledge of the gaming business, and her ability to find common ground between all the different actors in the WLA were qualities that were indispensable to the association. She managed every file with great precision, which is of course due to her solid legal experience. She also became the first woman to occupy the function of President and CEO of Loto-Québec. This accomplishment is a great example for other women.

Next to these professional qualities, Lynne is also a very human and helpful person, as testified by one of my staff members: “After my wife was diagnosed with a serious illness, we had the opportunity to participate in a clinical trial in Montreal. Jannie contacted Lynne to see if it would be possible to arrange something so that I could have a working space and could exchange know-how with Loto-Québec. She and her team immediately looked into the immigration issues and drafted an exchange agreement. This was a big worry taken off our shoulders in the hustle of this overwhelming move to Canada.”

It is the combination of great expertise and professionalism on the one hand and a very warm personality on the other that makes Lynne such a unique person.

Thank you for everything, Lynne, and let’s stay in touch!
Thank you Lynne. You are a key person in guiding people smart into the global environment of lotteries. Since knowing you through the WLA Executive Committee, I noticed that you’re investing a great amount of time and effort and taking over a lot of responsibilities for the association, always handling it in a smooth and diplomatic way.

You realized the threat of illegal operators very early and initiated the first strategic steps for WLA, followed by the commitment of resources from your company. That led to the first global evidence about illegal operators in the lottery market. When we built the Illegal Lotteries and Betting Committee it was clear that your knowledge, the understanding of cultures, people and markets is essential to form a successful global team with a strategy that fits to WLA.

I wish you all the best for your retirement and hope to meet again in person very soon.

All the Very Best for the Future Lynne!!

Lynne Roiter has been a great friend to the lottery and to me personally for the better part of four decades. Throughout her career there were a few turbulent times at the interprovincial level in Canada and on the international lottery stage. Lynne was the voice of reason throughout, offering sage advice to the leadership at Loto-Québec, the Interprovincial Lottery Corporation and the World Lottery Association (WLA). A loyal and steadfast leader in her own right Lynne counseled eight Presidents at Loto-Québec before assuming the well-deserved title herself. She helped to bring the right amount of diplomacy to create the smooth merger of the two international lottery associations which ultimately formed the WLA in the late nineties. Lynne then successfully counseled six WLA Presidents over two decades.

Lynne is a colleague and friend that one could always depend upon and trust. She is passionate about our business albeit in a very quiet way. She is also passionate about family and friends and I am so happy that she will now have the time to spend more time with them. Time that she has definitely earned! I feel lucky to have been a colleague of Lynne’s and luckier to be able to call her a friend.

When the retirement of a colleague as endearing as Lynne occurs, memories come to mind spontaneously and naturally. Such memories are most often of the unique traits and characteristics that define this person as a unique individual.

The first thing I remember about Lynne is her smile. I remember how she approached me at my first meeting of the WLA Executive Committee, showing appreciation for my attendance – even though the meeting was to be held in a language other than my native tongue – and thanked me for SELAE’s position on a sensitive issue. From that moment on, Lynne became a welcoming, approachable, and trustworthy person for me. I came to know her as a professional, well versed in the issues facing the world lottery community, and a person who shares her knowledge with others humbly yet confidently.

As a natural team player, Lynne has always been attentive to making everyone feel at ease and has always created a close familiar atmosphere among the members of the Executive Committee. This is a quality we must endeavor to preserve among us, once she is gone. Today, with great joy and appreciation, we wish Lynne all the best for the next phase in her life.
One of the many enduring memories I have of Lynne is her sitting at the many meetings of the Executive Committee of WLA with a large legal pad, scribbling furiously in her big looping handwriting, somehow capturing the essence of the often very complicated meeting discussion, made more complicated because of the many varieties of English and other languages being spoken around the table and turning our contributions—some more sensible and more coherent than others—into meticulous minutes. I was always impressed with Lynne’s ability to stay calm and focused during these long meetings, even during the most heated of debates and to extract the key points of the discussion while at the same time bringing her own expertise as a lawyer and as herself a senior Lottery Industry Executive to the issues.

That Lynne has decided after so many years at Loto-Québec in many roles since 1985 including in recent years, President and CEO and a Secretary General of AILE since 1997 and then of WLA from 1999, finally to stand down is credit to her incredible commitment to her own organisation and to the global lottery industry. Thirty-six years of service to Loto-Québec and twenty-four years to the international association is a remarkable record that is likely to stand unchallenged for many years and may never be surpassed in this age of rapid career changes.

Others I am confident will write about her professional achievements in this time, but my tribute is a personal one to Lynne, the warm, intuitive, kind friend as I regarded her in the years in which I was privileged to work with her as member of the Board of WLA. Lynne was always more than a colleague to me. Despite the workload associated with the ExCo meetings and the many WLA conferences and seminars we attended, Lynne always had time for others. She made people feel valued and included. Lynne was one of the people whose comradeship I missed greatly when my own time in the Lottery industry came to an end.

I offer my congratulations to Lynne on a stellar career. I hope she will look back with pride on what she has achieved and know she will embrace this new phase of her life with the same enthusiasm and grace as she has done in every aspect of life.

At the end of the month, our dear friend Lynne Roiter will retire from her position as CEO and President of Loto-Québec. Lynne has been, without a doubt, a cornerstone of the World Lottery Association with her role of General Secretary, Member of the WLA Executive Committee, and Chair of the Corporate Social Responsibility Committee.

Lynne has consistently demonstrated strong leadership. She has done a remarkable job throughout her career and has contributed to the great success of Loto-Québec. She is an example of integrity and dedication and has established best practices in governance and compliance.

I know that Lynne and I share many important values. At the head of Loto-Québec and in her role of Chair of the WLA Corporate Social Responsibility Committee, she has been keen to put forward the topics of Responsible Gaming and CSR.

Lynne has also been active in the WILL initiative, stressing her wish to see more and more women rise to senior positions in the lottery industry worldwide. She has always brought an inspiring and relevant point of view, participating with others in creating an environment that celebrates diversity.

As a fellow member of WLA Executive Committee, I would like to sincerely thank Lynne for all the work she has done as a General Secretary of the association. In addition to her crucial role in the creation of the WLA, she has always fulfilled her many responsibilities with a lot of talent and has enthusiastically contributed to the evolution of the association.

I wish you, Dear Lynne, all the best for this new chapter.
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Agile and information security: Two worlds that meet

Lotteries are facing significant challenges in the context of the current pandemic. Workforces have moved from face-to-face meetings in offices to video calls and teleworking while cybersecurity threats continue to rise. Additionally, many lotteries have had to adapt their service offerings to the new regulations put in place to prevent the spread of COVID-19. Moreover, many lotteries that previously enjoyed exclusivity in their respective markets are now challenged with rising competition from various gaming offerings on the Internet. Lottery organizations worldwide have had to adapt to these changes rapidly, and agility is a key component that allows them to continue to strive.

Agile project management and software development methodologies have been around for some time now. However, they have only gained mainstream use in recent years, in part due to their great effectiveness in keeping pace with the ever-increasing speed of technology development. In the broader context, they also provide a useful toolkit for organizations to remain competitive and sustainable in today’s fast-changing world.

Agile frameworks can enable information security by accelerating the delivery of security solutions that have demonstrable value.

The basics of agile

Let us take a step back and look at what agile project management is and how information security fits into its concepts. Different agile concepts and practices have been developed throughout the years. In 2001, the Agile Manifesto was conceived by seventeen people who met and exchanged ideas on common practices that enabled successful software development projects. These authors represented different methodologies, from Extreme Programming, Scrum, Feature-Driven Development, and more. They came up with four key values and twelve principles that were common to the known agile methodologies and allowed for favorable outcomes of IT projects.

One commonly used and successful framework that aligns with the Agile Manifesto is known as Scrum. Initially defined in 1993, Scrum provides a framework for managing project work. The basic premise of Scrum is to break down a project into multiple iterations...
and shift away from traditional waterfall-type project methodologies in which emphasis is put on processes that do not work. These include a long and elaborate preliminary analysis and fixed product requirements that lead to projects delivering several weeks, months, or even years late.

The key to using Scrum successfully is to assign dedicated people to a project. These people should share common values such as transparency, openness, respect, courage, and adaptability – as well as remain focused on delivery.

An iteration in Scrum is called a Sprint, which is typically a one to four-week period and generally no longer than a month. Work to be performed in a Sprint is planned at the beginning of each Sprint and is then executed and managed on a daily basis in order to deliver an incremental amount of work towards building a product.

After each Sprint, the product is useable and potentially releasable. Although the product might not yet look good – it may still have many missing features and still be full of bugs – it is usable enough that the team is always working with something concrete that can be continuously inspected and reviewed. This is why Scrum is viewed as an empirical approach to project management and software development since it is experience-based and allows a team to work with operational software and facts.

A key role in Scrum is the Product Owner. The Product Owner is the sole person responsible for defining the vision of a product and is the voice of the clients as the end-users or customers of the product. In larger organizations, a Product Owner can be backed by a committee, but the Product Owner is the only person that can define the priority of work to be done in a project.

In Scrum, the Product Owner defines the work to be prioritized in every Sprint and the work that remains to be done in future Sprints. Work to be done is managed in a so-called Product Backlog, an ordered and living list of everything that is known to be needed in the product, including features, functions, requirements, enhancements, and fixes that continue to evolve.

This list is continually updated to adapt to changing business needs, including market conditions and the evolution of technology.

So how does security fit into this?

In today’s world, it is pretty much impossible to define a vision of a product that does not include security. The increase in security threats and the monetization of information have demonstrated that practically every system can be hacked. In one example, hackers managed to penetrate a casino’s database using an IoT (Internet of Things)-enabled smart thermostat attached to a fish tank. The case demonstrates how even seemingly mundane connected devices can become points of vulnerability, used to steal sensitive information and plunging organizations into deep water (no pun intended).

A product’s security is certainly crucial to the organization offering the product, from the standpoint of preserving the reputation of the organization as a trusted provider. But, it is also critical from the customer or client perspective since no one wants to use a product in which you cannot trust the security and integrity.

So, a Product Owner is ultimately responsible for identifying and prioritizing security requirements in a product in order to maximize its value. A Product Owner may be advised by an information security analyst, a cybersecurity specialist, a security architect, or any other member of the development team, but the product owner remains responsible for the security of the product. These security requirements, often viewed as non-functional requirements, can take the form of success criteria that are an intrinsic part of the definition of a minimum viable product.

How does agile help security?

On the other hand, agile frameworks can also be of great help to security. In today’s world, ensuring the security of an organization is not a straightforward task. Information that an organization manages is omnipresent in various systems hosted on-premises, offshore, or in the cloud, with an ever-changing technology landscape and threats evolving at a very rapid pace.

Ensuring information security involves far more than simply installing a firewall and antivirus software. It encompasses multiple technologies, administrative procedures, and physical controls that implement varying levels of security, allowing an organization to augment its chances of identifying, protecting, detecting, responding to, and recovering from threats.

This is where security standards such as the WLA Security Control Standard and ISO 27001 come into play, providing a comprehensive list of controls and requirements for lottery and sports betting operators as well as their suppliers.

Ensuring information security involves far more than simply installing a firewall and antivirus software.

When deploying and updating security products, organizations face the challenges of choosing the right solution and deploying it with the right configurations and supporting processes.

A traditional approach involves identifying the perfect security product through the engagement of a long preliminary analysis in an attempt to evaluate the feasibility of a solution. Instead, one can opt for a more agile approach where different products are rapidly explored and tested in real life, refining solution requirements and operational processes through empirical testing. This way, one can quickly refine a product or simply define the requirements for a future solution that will be acquired.

In general, this agile approach increases the speed at which an organization can attain security control objectives. Furthermore, it is aligned with the principles of continual evaluation and improvement of an information security management system.

Conclusion

Information security is an integral part of a product’s value, and the responsibility lies with the Product Owner, who holds a critical role in agile frameworks such as Scrum. Agile frameworks can enable information security by accelerating the delivery of security solutions that have demonstrable value. Ultimately, adopting agile practices can accelerate both the delivery of products and their security.

By Anton Stiglic, M.Sc, MBA, Senior Corporate Director of Information Security, Gaming Compliance and IT Governance at Loto-Québec, and Vice Chair of the WLA SRMC Technical Working Group.
In recent years, ONCE has adopted a new biennial competition format to fulfill the “Research” requirement for responsible gaming certification through the European Lotteries. The aim of this requirement is to promote research into the factors that facilitate the appearance of risk behavior, in order to reduce, as far as possible, the potential negative impact that gambling can have on a very small sector of consumers.

In this fourth and latest edition of the competition, the winning paper was titled “Impact of advertising according to game type, sociodemographic factors and associated psychopathology,” presented by a team of researchers led by Dr. Marta Sancho from Hospital de la Santa Creu i Sant Pau (Barcelona). The paper analyzes the impact of gambling-related advertising on both persons with a gambling addiction (clinical sample), and persons without any such addiction (sample of the general public). The study included a total of 220 participants, 89 with a gambling addiction and 131 without. All participants were evaluated through questionnaires on gambling issues, other associated symptoms (anxiety or depression) and personality, and through a computer test to evaluate attention bias towards gambling-related stimuli, such as advertising.

The results gave rise to some noteworthy conclusions. The clinical sample showed greater interest in gambling machines, sports betting, and roulette compared to the general public sample, while the general public sample’s interest in lotteries was greater. Additionally, the clinical sample showed a greater vulnerability to the impact of gambling-related advertising, which increased in line with the seriousness of the gambling behavior. Furthermore, the study revealed that young people were more vulnerable to the impact of gambling-related advertising; increasing their interest in gambling, inducing a more pro-gambling attitude in them, and increasing their knowledge of gambling providers, especially in relation to online gambling sites.

In previous editions of the competition, studies focused on promoting research into variables that make it possible for behavioral alterations to occur in relation to gambling from different perspectives (2011) and developing an online expert system for identifying and intervening in gambling problems (2013). The third
and fourth editions of the competition concentrated on evaluating the addictive capacity of games of chance. The first winning paper, titled *Factors that facilitate pathological addictive gambling behaviors in young people and adolescents*, was presented by a team of researchers led by Dr. Ana Estévez, of Deusto University, Bilbao, Spain. The ultimate aim was to identify, relate and establish a relational map of the risk factors inherent in gambling that can activate the psychosocial processes that underlie addiction.

In the second edition, the winning project was titled, *Development of an on-line expert system for identifying and intervening in gambling problems*, presented by Dr. Francisco Labrador, who led a team from the psychology faculty from the Complutense University, Madrid, Spain. The aim of the study was to develop an online system for identifying and intervening in gambling problems. This system has been used by ONCE to improve its product design tool, providing an instrument for greater control over the risk impact of its products.

Another paper presented by Dr. Ana Estévez of Deusto University received an award in the third competition. The study was titled, *Influence of commercial advertising on the risk behavior of adolescents in sports betting: Guide for regulators, operators, institutions and the media*. The study measured the influence of commercial advertising on young people’s behavior in sports betting. Its findings highlight the responsibility of companies in the gambling sector, in designing advertising and marketing strategies that do not instigate gambling addiction.

ONCE’s commitment to responsible gaming and consumer protection is continuous and remains a top priority. The organization was the first operator in Spain to incorporate the responsible gaming standards established by the World Lottery Association and the European Lottery Association. The results of the winning studies in the various editions of the international competition are reported to the Spanish community, and particularly into the environments where they could be most useful when investigating, preventing or treating gambling-related pathology and problems. ONCE’s commitment to responsible gaming is materialized not only through this competition, but also through numerous measures implemented to protect consumers and its own employees. The competition is just one of many measures within ONCE’s commitment to research, responsible gaming and consumer protection.
Tabcorp Lotteries Customer Care

Tabcorp Lotteries of Australia has been certified to the WLA Responsible Gaming Framework (WLA RGF) since 2012 and attained Level 4 WLA RGF certification in 2017, the highest level of certification attainable. They recently re-certified to WLA RGF Level 4, renewing their commitment to protect their players and to maintain their responsible gaming program on a path of continuous improvement. In this article, Tabcorp Lotteries provide an overview of their responsible gaming program and present their Lotteries Early Intervention Model, considered an industry best practice by the global gaming community.

Tabcorp Lotteries is proud to have been recently re-certified to Level 4 of the WLA Responsible Gaming Framework. The highest certification level of this internationally recognized standard. Ensuring a safe environment for our Customers is paramount to our long-term success and through our Responsible Play Program we rigorously implement a suite of measures and safeguards to help minimize the potential for harm, prevent underage gambling, and assist those who may be at risk of experiencing problems to take action and access available support. Our games have been available for sale online since 2001. Our digital channels have evolved and grown over this time and now account for over 30 percent of lotteries sales, with more than 3.7 million active online players (FY21).

Entries into Tabcorp Lotteries’ draw lottery games can be purchased digitally via The Lott website (thelott.com), and via The Lott’s native iOS and Android mobile apps. Games available to play in digital channels include Powerball, Saturday Lotto, Oz Lotto, Monday and Wednesday Lotto, Set for Life, Lucky Lotteries, Super 66, and Lotto Strike games.

Like the rest of The Lott’s Responsible Play Program, our remote gaming channels program is national in scope, with some minor variances implemented to comply with relevant local regulatory requirements. From a Responsible Gambling (RG) perspective, we internally develop and deploy a range of effective harm minimization controls such as self-exclusion, purchase subscriptions, deposit and spend limit restrictions, and proof-of-age and identity verification. Withdrawals from player accounts are also restricted to customers that successfully meet regulatory identification requirements such as greenID verification of identity, age, and address. Such measures mitigate the risk of minors participating and receiving prizes in remote gaming channels.

In addition, and central to our Responsible Play program, is the implementation of a Lotteries Early Warning and Intervention program. At the core of this program is the development of an early warning system, which uses behavioral data and leverages machine learning techniques to identify customers who may be at increased risk of gambling harm. Through our digital channels, we have access to player interaction data that is applied for the specific purpose of targeting harm minimization. Output from our early warning system is deployed via a customer contact framework and intervention strategy. This intervention strategy utilizes direct communication channels including email and the Contact Centre, to provide customers with Responsible Gambling and Gambling Help referral and support.

Considered an industry best practice example, we presented this model at Australia’s leading responsible gambling event, the 2019 National Association for Gambling Studies conference. Further, and as part of our ongoing commitment to Customer Care and keeping our customers safe from Gambling harm, Tabcorp Lotteries has designed a Customer Care roadmap to guide the future development of our Responsible Gambling initiatives.
The roadmap was developed in consultation with customers, retailers, and stakeholders, and represents a continuation of our best practice approach to the field of harm minimization. There are three key focus areas for our Customer Roadmap that have been identified as future expansions of our Customer Care program. These include:

- **Enhance the Lotteries Early Intervention Model** – Enhancement of the Lotteries Early intervention machine learning model using academic research and behavioral science strategies to identify and track behavioral markers of harm that can aid in earlier and more effective identification of customers who have increasing risks of gambling harm.

- **Enhance Responsible Gambling information and communication** – Through the use of more targeted and effective communication, we aim to further minimize the risk of gambling harm. Examples of features include the introduction of in-play interventions through the use of messaging and through encouraging engagement with RG tools or content, particularly where a customer has been identified as having an increased risk of gambling harm. Also, the introduction of personal play dashboards and behavioral metrics for customers to allow them to measure their own play behavior. For example, graphically displaying their spend proximity to their weekly spend limit, or aid in identifying when they are spending more time or money playing, for example displaying spend vs prior comparison periods.

- **Enhance Responsible Gambling tools and controls** – The introduction of new and enhanced tools that enable customers to take greater control of their play. For example, ‘Take a Break’ functionality will enable customers to immediately pause their game play for set periods of time, from a few days to a few months. This stream also includes the expansion of Omni-Channel RG Controls to ensure that customers can access consistent controls regardless of which channel they choose to play in.

More details about the Lotteries Early Intervention Model

The Lotteries Early Intervention Model is built using base data set of self-excluded customers. Machine learning algorithms have been used to model behavioral attributes that predict customers who may be experiencing gambling harm. Twelve models are run independently to flag behavior attributes of concern, with customers identified as having multiple positive flags being selected for intervention via email or direct phone call.

To support interventions and more significant escalations, the data science team created a Customer Care Dashboard, which among other things shows the number of Early Intervention Model rules that have been breached, bet history, spend/deposit-limit change history, segmentation, and the propensity to play specific games.
When this pandemic is behind us, much will be written about the seismic shifts that have impacted just about every industry in the world. Among the anxiety and uncertainty felt by many businesses, stories of resiliency, courage, and optimism have reminded us of the power of innovation to transform challenge into opportunity.

Retail has been particularly challenged over the past year. In the face of unprecedented public health measures to slow the spread of COVID-19, many retailers were forced to quickly explore new ways to deliver their products and services to customers, translating their in-store shopping experiences to the online equivalent. By extension, customers who had successfully avoided online shopping for years suddenly found themselves navigating online payment and delivery options as they proceeded through the digital checkout.

Retail as a whole has demonstrated a remarkable resiliency, pivoting and adjusting to meet customers when, where, and how they want to shop, indicating that retail, as has been predicted for years, is not dead, but rather has shifted into a new era. While the focus was on the producer in the first era and the retailer in the second era, it has now shifted squarely to the consumer in this third era. In this era, the consumer shops in an online and offline world, based on their preference, convenience, and maybe even the time of day or weather.

It is their choice as to how they shop, and as a result, they decide how products are sold.

This new era has influenced the way many global brands approach the customer experience. For example, Nike has created numerous apps and services that complement their core products, such as sneakers and athletic gear, encouraging the customer to interact with the brand in new and different ways, when and where they want. During the pandemic, Nike opened a new store in Paris that serves as another channel in which it captures valuable customer data. Within a highly interactive shopping experience that combines online and offline elements, a customized one-to-one experience emerges. As a result, the Nike brand experience has expanded far beyond the purely commercial transaction that was once the norm.

With lottery and retail inextricably intertwined, this third era of retail holds particular significance for our industry. Now more than ever before, we need to place the player at the center of the lottery experience and develop new and unique ways for them to engage with lottery whenever, wherever, and however they choose. By extension, we need to help our retail partners find new ways to sell lottery products, a strategy that has only gained in importance over the past year.
At Pollard Banknote, we have been very fortunate to keep the engine of innovation running throughout these turbulent times, with a special focus on creating new, innovative solutions across the three pillars for lottery success – Outstanding Games, Retail Excellence, and Digital Innovation – while ensuring that the player remains at the centre of it all.

Engaging new games that prioritize the player experience

Take, for example, the breakthrough success of several unique instant games launched in the past year that prioritize the player’s gameplay experience above all. Pollard Banknote collaborated with Loterie Romande on Loto Party, a boxed instant game that provides play action for up to eight players using the Swiss game style of Bingo known as ‘QUINE’. Loto Party proved to be a hit within the first few weeks of sales as players sought out new forms of at-home entertainment, and because of this success, a second launch of this game is planned for this fall. Offering a similar social play experience, British Columbia Lottery Corporation (BCLC) leveraged Pollard Banknote subsidiaries Schafer Systems and Diamond Game, is a small-footprint ITV currently being piloted by the Ohio Lottery in bars and restaurants across the state, allowing players to play familiar instant tickets in a new environment. With its compact size and intuitive interface, Select 4™ can easily be deployed in a variety of new lottery retail channels, including coffee shops, gyms, salons, small convenience stores, or tobacconists.

Pollard Banknote collaborated with subsidiaries Fastrak Retail and Diamond Game to develop easyVEND™, a new patent-pending in-lane vending solution that integrates into the retailer POS system, allowing for the in-lane purchase of instant tickets in a single transaction with other purchases, adding an unprecedented level of convenience for customers. This solution also significantly lightens the labour that instant ticket play and encourages players to try the online game experience within the familiarity of an instant ticket.

Retail solutions to meet players in new places

Ensuring that lotteries have the ability to meet more players where they want to play has taken on new relevance in recent months. That’s why Pollard Banknote is pleased to introduce two new solutions that offer players the opportunity to purchase and engage with lottery in new ways. Select 4™, developed by Pollard Banknote subsidiaries Schafer Systems and Diamond Game, is a small-footprint ITV currently being piloted by the Ohio Lottery in bars and restaurants across the state, allowing players to play familiar instant tickets in a new environment. With its compact size and intuitive interface, Select 4™ can easily be deployed in a variety of new lottery retail channels, including coffee shops, gyms, salons, small convenience stores, or tobacconists.

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Digital solutions that deliver choice

On the digital front, the lotteries we work with on loyalty and engagement programs have seen a tremendous increase in both player registration and interaction during the pandemic, as players sought out new ways to engage with lottery. iLottery has become the primary way a subset of those players choose to interact with lottery, we’ve seen approximately 130% growth

We’ve seen lotteries develop their own unique online programs that offer players more choice than ever.

The online gifting section of Svenska Spel’s website offers customers the option to gift a ticket digitally or physically. A code is then sent to the lucky recipient, and they have the choice to either redeem the gift as a digital instant experience or as a physical ticket at retail. By providing multiple ways for both the gift giver and the recipient to interact with the Lottery, Svenska Spel is ensuring a frictionless purchase and customized experience for both parties.

A player-centric future

Our primary goal is to continue to help our lottery clients and their retail partners emerge from the pandemic stronger and better than ever. By placing the customer at the center of the lottery experience and developing solutions that allow them to play when and where they want, we will turn the challenges of the past year into opportunities for innovation, growth, and engagement for many years to come.
The balancing act of sustainable growth

An interview with lottery marketing strategist Chris Allen

Despite the rollercoaster year of shutdowns, slowdowns, and surges, 15-year lottery veteran Chris Allen is embracing the ride and all of its twists and turns. “While this was definitely one for the history books, each year that goes by, I continue to be impressed with how resilient the industry is to the changing operating environment by always putting the players first,” says Allen, VP of Lottery Marketing & Strategy for Scientific Games in Europe.

With a degree from the University of Leeds in the UK and a sharp, analytical mindset, Allen began working for the company as a marketing analyst evaluating global instant game performance. He now heads up growth strategy development working with major lotteries across the world. Allen recently spoke at the European Lotteries/World Lottery Association Marketing Seminar about what the company is doing to help lotteries grow safely and sustainably. “It is hard to imagine a business strategy conversation or a product innovation brainstorm that doesn’t include the topics of sustainability and social responsibility,” he shares. “This focus is with good reason.” In a recent survey in the UK and US, when asked about the choices they make when deciding to buy a product, consumers overwhelmingly indicated that companies should:

- reduce their carbon footprint and become carbon neutral
- source ingredients and components responsibly
- manufacture in an environmentally friendly manner

“An accelerating viewpoint is that more and more, the products consumers choose to buy are influenced by a brand’s record in sustainability,” says Allen. “The global trend is across all demographics as consumers consider the long-term impact of human existence on the planet for future generations.”

People, Planet, Profit

Yet it’s not a new trend. More than 25 years ago, John Elkington, British author and authority on corporate responsibility and sustainability, coined the phrase “people, planet, and profit”. Now, it’s better known as the “triple bottom line”. Elkington’s observations highlighted the need for sustainability to be at the heart of a company’s business strategy to ultimately achieve success—a fact that the Economist stated would be the difference between those who succeed and those that didn’t. Over recent decades, much has been done to reduce harms to the planet caused by humans, but a great deal more remains to be done. Later this year, the United Nations Conference of Parties (COP26) will take place in Glasgow, bringing leaders from all around the world together to accelerate action towards the goals of the Net Zero by 2030 initiative. “It is not just about governments agreeing globally to impact change, COP26 will demonstrate the urgency and opportunities towards a zero-carbon economy and the power of international cooperation to address the gravest challenges our planet faces,” explains Allen. “It is really about all of us and brands taking action,” says Allen.

An excellent example is Adidas, one of the largest sportswear manufacturers in the world. With its fight against plastic waste, Adidas saw an opportunity to tackle the issue with an innovation focus to create products that could support the initiative. In 2020, they set a goal to sell 20 million shoes created from recycled plastic components. With its Sky Ocean Rescue project and #PassOnPlastic campaign, British media and telecom brand Sky News International is focused on ocean clean up initiatives across the world, and more importantly the removal of all single-use plastics across its entire supply chain: cables; cups; tv controllers; technology, etc. The auto industry is beginning to move to electric, with ambitious companies like Volvo not only looking to remove all fossil
fueled but continuously driving to make transport safer and more productive.

Even companies that rely on carbon fuel are changing the way they do business to ensure neutrality and a positive impact from their actions. For example, Formula One international auto racing has a Sustainability Strategy for 2030 focused on race cars and production, and on how spectators and fans interact with the brand at events. They’re also using Formula One’s recognizable brand to lead changes that help create more diversity and inclusion. “It’s no different in the international lottery industry. Lotteries are some of the most recognizable consumer brands on the planet,” Allen points out. “It is behooven on all of us to continue on the journey to a more sustainable and socially responsible way of operating our industry. As a leading supplier to the global industry, Scientific Games’ mission goes beyond driving maximum funding for good causes to enrich lives through positive play.”

Healthy Play

The company, one of the first to achieve certification by the World Lottery Association (WLA) as a responsible gaming supplier, is delivering on its promise with an approach to people, planet and prosperity with its new Healthy Play sustainability strategy. Developed after extensive industry research and market analysis, Healthy Play includes expanded engagement and integration of the WLA’s responsible gaming principles throughout the Scientific Games Lottery group, as well as nurturing the development of innovative Healthy Play products, technologies and services. “Healthy Play is built on fundamental responsible gaming principles underpinned by a simple goal: ‘Have Fun. Do Good. Play Healthy.’ To promote the healthy enjoyment of lottery games and education that improves lottery literacy, reducing harms,” explains Allen.

Scientific Games has always recognized the need to do more and has organized its SG Cares ™, SG Green™ and SG Grows ™—focused respectively upon people, planet and prosperity—within its Healthy Play sustainability initiatives.

“With SG Cares, people are at the heart of our business whether they are employees, business partners, suppliers, or stakeholders. SG Green begins and ends with the planet because the only earthly footprint we endeavour to leave is joy from healthy play. And with SG Grows, we believe success is a shared value through our customers’ prosperity. Gaming for good means all stakeholders win with sustained growth.”

Reducing risk, maximizing returns

Scientific Games continues to innovate data-driven approaches to create more diverse product portfolios that reaches a wider audience and considers the uniqueness of each lottery’s player segments while identifying the similarities. Its games portfolio optimization approach assesses the current game mix in the market and identifies the ways to make it more responsible with new game launches to reach new players. Additionally, the company’s innovation in digital player engagement offers more fun and exciting content through a platform that encourages responsible play. “Responsible growth is a balancing act—reducing risk while maximizing returns to good causes,” says Allen.

“Every day we are striving to help lotteries achieve your goals — all underpinned by our commitment to help deliver growth in a safe and sustainable way.”
Why instants are here for the long haul

What’s in store for instant games in the European market? How has this product channel been affected by the rising popularity and availability of eInstant games? And what strategies can lotteries leverage to create new growth opportunities for instant games?

There’s no denying that eInstant games are on the rise in Europe. Research firm H2 Gambling Capital estimates that there was a 37% YOY increase in iLottery in Europe in CY2020, with even greater amounts in individual countries, such as Italy (56%) and Belgium (48%). As a result, a natural question emerges: “Does this spell trouble for the paper instant ticket?” In short — no, far from it. There is still enormous potential for paper instants, even following the tremendous growth of the instant category in recent decades (see figure).

In this respect, it’s instructive to consider the U.S. market. “Since 2010, some believed that the U.S. market had attained maturity and would be difficult to surpass, but as an industry we have, year after year, created 6% average annual growth,” notes Jacqueline Deragon, IGT Senior Director International Sales, Instants Services, who participated in the Suppliers Panel discussion during the recent European Lotteries’ Instant Games Webinar. “At the core, the decades-long upward instants growth trend in the U.S. is the result of continually augmenting our understanding of the diverse needs and motivators of players, and, in turn, moving to diversify our product offerings accordingly,” she observes (see sidebar).

“In Europe, many markets are far from their maturity, and this is where the real significant growth lies in the next 10 years.” Whether the growth will be driven by fewer legislative restrictions or by optimization of the portfolio, prize structures, and distribution network, the opportunity is clearly there. For although the pandemic negatively affected some facets of the lottery and gaming industry, sales have risen in Europe in the retail instants category following the lockdowns, with some markets seeing increases of 20-40% or more, continuing to this day.

The same has been true in other markets across the world. Not only are instants surviving, but they are thriving. Nevertheless, questions persist.
The enduring appeal of instants

Will instants end up like the music industry, where streaming represented over 80% of the U.K. and U.S. markets in 2020? Or will instants go the way of the book industry, where paper books still represent 70% of the industry in some markets?

As with books, the tactile nature of the instant product has an enduring appeal that cannot be understated. The fact is that instants and eInstants co-exist harmoniously, as they answer different needs of the player base. Among lotteries that are already in a digital space, the unanimous feedback is that it improves the relevance of the lottery brand and actually increases the purchase propensity when the consumer is in a retail environment. This is supported by sales numbers.

In the U.S., for example, the Michigan Lottery has seen strong sales growth across both retail and digital channels from FY15 though FY20. The instant retail product also coexists very well with digital- and internet-based second-chance programming. Beyond this, retail games and eInstants support one another in an omnichannel offering, allowing lotteries to capitalize on branding and marketing synergies. The two are synergistic in other important ways: Of course, eInstants games benefit from the features and progress made by paper instant games. Many of the successful eInstants games IG provides are based on top-performing paper instant games to encourage new player acquisition by providing familiar themes and icons. Customers leverage popular IGT slot titles across both the instant and eInstants categories with notable performance. And the reverse is now possible as well. IGT’s omnichannel approach to game development is well established, and the company is scheduled to print a retail instant ticket derived from an eInstants game for cross-channel launch in the North American market this year.

This approach allows for omnichannel games to be launched more quickly. IGT continues to optimize and innovate for omnichannel strategies, whether retail to digital (lottery or casino) or digital to retail, to answer player needs and expectations. “We are also currently adapting a draw-based game to create an eInstants game for a North American lottery,” notes Deragon, demonstrating that the possibilities are only expanding.

“IGT is evolving with all aspects of the instants market and continually looking for ways to provide lotteries with forward-looking tools for growth, she adds. “For example, it may seem like all possible innovations have already been done on the production side of instant tickets, but there is still plenty of room to innovate, a point of view we are supporting with new plans and investments.”

Focusing on the needs of the player

When discussing the European instants market, it’s also necessary to take into account that growth factors vary from lottery to lottery, as legislative dictates range from conservative to less restrictive. There are many variables in play, and they need to work seamlessly to ensure success. Apart from the distribution, marketing, and retail network, there are factors from a product perspective, including price points, payouts, play styles, and more – each needs to be considered in order to ensure a lottery’s product mix includes offerings for all types of players. “When it comes to price points – and the introduction of higher ones – it’s important to consider everything in a portfolio’s

![Graph showing Instant Sales from 2002 to 2020](source: IGT Marketing Intelligence, La Fleur’s Almanac, Worldwide Master Sales spreadsheets for Calendar Year 2002-2020)
mix and balance the portfolio in a socially responsible way, so there is a game that appeals to every type of player,” says Deragon. While higher price points are attractive to those players who seek a higher value — a number of whom were acquired during the shutdown of casinos and gaming halls caused by the pandemic — lotteries cannot ignore their low and mid-tier price point games either. Low price points often serve as introductory offerings for new players, as they learn what they like. Similarly, mid-tier price point games (which is often where extended play games appear) cater to another specific type of player.

There are still European lotteries that do not offer extended play games, but for those that do, extended play games can represent up to 30% of the portfolio. “Introducing this category offers a strong opportunity for growth and for acquiring a new player base,” notes Deragon.

Generally, most European lotteries offer games up to the EUR 10 or equivalent price point, though some jurisdictions have entered the arena of EUR 20 or higher, and it’s only a matter of time until the number of lotteries offering these higher price points increases as legislative perspectives evolve and become more accepting.

But it’s not always about top prize. Mid-tier prizes are sometimes even more important to players. “Higher price points also require increased play value and higher reward — not necessarily higher prizes,” observes Deragon. “This is where the heart of the game comes into play, and the payout and prize structure will dictate the success of the games, even with lower top prizes. As the world is evolving, so are players. Today we have high-performing games at higher price points and lower top prizes with very innovative prize structures that wouldn’t have been thought possible 10 years ago.”

Development of the payout structure is a crucial component of a game’s value proposition, and jurisdictional regulations can have a significant impact here in cases where they restrict a lottery from reaching all segments of its players. “It’s important to remember that each game addresses the needs of a different segment of the population,” says Deragon. “Lotteries should be able to address the needs of the players across all segments.” This is a competitive edge for lotteries in comparison to other types of gaming, and even as regulators want lotteries to capture more players within their territory, the restrictions imposed are creating the opposite.

In all of these considerations, the significance of research cannot be ignored. A well-developed research program is of tremendous utility in guiding robust long-term product design and marketing solutions, which includes, among other things, bringing to market new price points and play styles, prize structure refinement, and new product innovations. A strong research program also addresses shorter-term needs, such as game-concept refinement, assessing the strongest game concepts to take to market, and crafting associated marketing messages. “Using a blend of tactical and strategic research methodologies helps to provide compelling insights to influence a lottery’s future strategies,” says Deragon. “It is essential that the introduction of new, innovative playstyles and products be done relative to the market in which they’re being introduced.”

Last, but certainly not least, the player mix has changed during the pandemic, which created new trials for retail instants. Even if players tried lottery as one of the only entertainments available, after more than a year, some have added lottery to their routine. There is a corresponding need to understand today’s player’s mix and research the changes to meet the needs of some new player segments even as other entertainments reopen.

“We need to ensure we help lotteries keep those new players by understanding them and understanding what they want to play,” Deragon notes. “Lotteries will also need to evolve their price-point strategy accordingly and align to be even more in harmony with the e-offering going forward.”

IGT’s Instant Advantage suite of products and services supports customers in maximizing every opportunity for growth across the instant category.

For more information, contact your IGT account representative.

What can propel instant success in an evolving market?

As with any product, it’s critical to continue evolving the instant product strategy. Success in the U.S. market over the past decade was initially driven by price-point and game-theme expansion and a corresponding increase in the display footprint at retail to accommodate increased portfolio size.

Later success was propelled by the expansion of consistently popular game themes into multi-price point, self-promoting families. Line extensions to higher price points of game categories such as Crossword with appeal to a more limited, though wildly loyal, player base resulted in reliably incremental sales success.

More recently, instant success has been spurred by increasing the variety of game-prize outcome value propositions within price points that resonate well with specific instant player subsegments — even as some of these new games have defied prior conventional wisdom as to what makes a successful instant game.

Popular portfolio additions now include games that trade off high top prizes or low overall odds of winning any prize in favor of more frequently won yet still exciting mid-level prizes that are cashed (and seen) at retail.
Players want the in-store experience to be convenient, clean, and contactless.

IGT’s mobile app technology offers cashless payment and digital play options to build stronger relationships with your players and transform lottery at retail.

IGT now provides 15 lotteries with mobile app technology. Learn how we can help you transition to what’s next at IGT.com/FutureForward.
The world lottery community was deeply saddened by the passing of former WLA General Secretary, Yvonne Schnyder.

Yvonne died on May 6, 2021 at the age of 78 at her home in Bottmingen, Switzerland. She was preceded in death by her husband of 55 years, Werner Schnyder, who passed away in September 2020.

Yvonne’s career of more than forty years was devoted to the world lottery community. In the mid-1960s she began working as assistant to the General Secretary of Intertoto. Twenty years later, in 1985, she moved up to become General Secretary of the association, serving under then Intertoto President, Lothar Lammers. When Intertoto merged with the International Association of State Lotteries (AILE) to form the WLA in 1999, the General Secretaries of both predecessor associations called upon Yvonne Schnyder to run WLA headquarters in Basel, Switzerland, with Lynne Roiter overseeing the new association’s North American office in Montreal, Canada. Throughout her tenure as General Secretary of the WLA, Yvonne worked tirelessly to bring members from AILE and Intertoto together, and contributed significantly to laying the groundwork for the WLA as the industry-leading body it is today. She stepped down as WLA General Secretary in 2006 and went on to establish a successful lottery consultancy, which she ran until her retirement in 2011.

Yvonne was recognized for her vast knowledge of the lottery industry, which she gained throughout her long career. She had a genuine interest in people and was loved by those who worked with her for her humanity and her ability to make people feel at home.

Through her diplomatic skills and her profound sensitivity to the cultural differences between WLA member jurisdictions, she gained the admiration of WLA members around the globe.

Her love of the lottery industry and the people that work in it motivated Yvonne throughout her career and remained with her until the end of her life.

She will remain in our memory for years to come.
Cryptocurrencies and illegal betting

The Asian Racing Federation’s Council on Anti-illegal Betting and Related Financial Crime released a report on blockchain and the use of cryptocurrencies in illegal betting. The comprehensive 12-page report, published in May 2021, concludes that cryptocurrencies in betting and dedicated blockchain gambling apps are widespread, and their use by illegal operators is growing rapidly.

Owing to the innate features that many cryptocurrencies have, they facilitate the avoidance of anti-money laundering (AML) and know-your-customer (KYC) procedures by betting operators, they help illegal betting operators evade international betting regulatory and licensing requirements, and they allow instantaneous and anonymous cross-border transactions from bettors and operators. As such, blockchain technology has become a threat to the legal betting industry. Cryptocurrencies and blockchain are being used by illegal betting operators in multiple ways: they are used as a substitute for fiat currency and traditional payment processes; they are used in decentralized gambling applications (known as dapps) that are built on blockchain technology; they are used to transfer funds to betting agents; and they are used to launder profits taken from illegal betting. Each of these features facilitates illegal activity and poses a threat not only to legal betting operators but also to society at large.

As cryptocurrency transactions are virtually untraceable, they enable punters, in jurisdictions where online betting is illegal or restricted, to circumvent the law. Cryptocurrency is also used to move funds related to illegal bookmaking and has been adopted by Macau casino junket operators to evade Beijing’s tight capital controls. According to the Asian Racing Federation’s report, China’s Ministry of Public Security maintains that cryptocurrency facilitates an annual transfer of CNY 1 trillion in gambling related funds out of the country. Macau casino junket operators have been enthusiastic adopters of cryptocurrencies because they support one of their core business interests — moving money anonymously.

As illegal betting operations continue to flourish in Asia, NGO’s have highlighted cryptocurrency’s huge potential for facilitating money-laundering and other criminality. In February 2020, the Financial Action Task Force (FATF), a global anti-money-laundering watchdog, put Myanmar on its increased monitoring watchlist for deficiencies in its AML regime.

The rise of cryptocurrency and blockchain among illegal betting operators demonstrates that criminals will always be quicker and more agile in adapting new technologies and ready to exploit regulatory loopholes. However, the ability of law enforcement agencies to disrupt the cryptocurrency financial infrastructure has improved, as demonstrated recently by the FBI having recovered more than half the money paid to hackers of the Colonial Pipeline Company after a ransomware attack. Although cryptocurrency has enjoyed a reputation as a hard-to-trace medium of exchange, crypto experts say that it is at times easier to track than hard currencies. Perhaps the days of criminal elements hiding behind cryptocurrencies is slowly coming to an end.

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The complete report can be downloaded from the website of the Asian Racing Federation at www.asianracing.org.
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